SR-710 North Project

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LOS ANGELES COUNTY, CALIFORNIA
07-LA-710 (SR 710)
E.A. 187900
EFIS 0700000191

Final Environmental Impact Report/ Environmental Impact Statement and Individual Section 4(f) Evaluation

Volume I

Prepared by:
State of California Department of Transportation
and the
Los Angeles County Metropolitan Transportation Authority

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Metro

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016, and executed by FHWA and Caltrans.

November 2018

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SCH# 1982092310
07-LA-710 (SR 710)
EA 187900
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Improvements on SR 710 and/or the surrounding area, north to I-210, south to I-10, east to I-605, and west to I-5 and SR 2.

Final Environmental Impact Report/Environmental Impact Statement and Individual Section 4(f) Evaluation

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C) and 49 USC 303

THE STATE OF CALIFORNIA
Department of Transportation

COOPERATING AGENCIES:
United States Army Corps of Engineers
United States Environmental Protection Agency

RESPONSIBLE AGENCIES:
Los Angeles County Metropolitan Transportation Authority, California Department of Fish and Wildlife, California Transportation Commission, Los Angeles County Regional Water Quality Control Board, Los Angeles County Flood Control District, the County of Los Angeles, and cities within the study area for the SR 710 North Project

11/26/2018
Date of Approval

JOHN C. BULINSKI
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Abstract: The purpose of the proposed project is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles, including improving the efficiency of the existing regional freeway and transit networks, reducing congestion on local arterials adversely affected due to accommodating regional traffic volumes, and minimizing environmental impacts. The Build Alternatives would potentially result in the short-term and/or long-term substantial effects related to: land use, community impacts, traffic and transportation, visual and aesthetics, cultural resources, paleontological resources, hazardous wastes and materials, air quality, noise and vibration, wetlands and other waters. The Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative has been identified as the Preferred Alternative for the proposed project.

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Executive Summary

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Executive Summary

Introduction

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro) proposes transportation improvements to improve mobility and relieve congestion in the area between State Route 2 (SR 2), SR 2/Interstate 5 (I-5), and Interstates 10, 210, and 605 (I-10, I-210, and I-605, respectively) in east/northeast Los Angeles and the western San Gabriel Valley.

The information in this Executive Summary is based on the analyses and other information documented in the Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and the technical studies in support of the EIR/EIS for the State Route 710 (SR 710) North Project.

NEPA Assignment

California participated in the "Surface Transportation Project Delivery Pilot Program" (Pilot Program) pursuant to 23 USC 327, for more than 5 years, beginning July 1, 2007, and ending September 30, 2012. MAP-21 (P.L. 112-141), signed by President Obama on July 6, 2012, amended 23 USC 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, Caltrans entered into a Memorandum of Understanding pursuant to 23 USC 327 (NEPA Assignment MOU) with FHWA. The NEPA Assignment MOU became effective October 1, 2012, and was renewed on December 23, 2016 for a term of 5 years. In summary, Caltrans continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. With NEPA Assignment, FHWA assigned and Caltrans assumed all of the United States Department of Transportation (USDOT) Secretary's responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off of the State Highway System within the State of California, except for certain categorical exclusions that FHWA assigned to Caltrans under the 23 USC 326 CE Assignment MOU, projects excluded by definition, and specific project exclusions.

Identification of a Preferred Alternative

Rationale for Identifying Preferred Alternative

The TSM/TDM Alternative has been identified as the Preferred Alternative. This final determination is based on the engineering and environmental technical analysis, the project's impact on the environment, and the comments and concerns expressed during the public review period.

This Final EIR/EIS was prepared to address all public comments and incorporate any refinements made to the project design, environmental setting and impacts that have been identified since the Draft EIR/EIS and Focused RDEIR/SDEIS was completed.

After comparing and weighing the benefits and impacts of the study alternatives summarized in Table ES-1 of the Executive Summary of the Final EIR/EIS; reviewing the comments received during the public circulation of the Draft EIR/EIS and Focused RDEIR/SDEIS; and completing technical studies and performance evaluations for each of the alternatives, the Freeway Tunnel Alternative with Single Bore Tunnel design variation was determined to provide operational benefits. However, with the lack of funding and the lack of community consensus, the Single Bore Tunnel Alternative, estimated at $3.15 billion, cannot be accomplished successfully within a reasonable period of time.

The TSM/TDM Alternative would attain the purpose and need of the project, as discussed in Section 2.4 of this Final EIR/EIS and would improve local traffic operations, mobility and accessibility and enhance modal choice while accommodating planned growth within the study area and minimizing environmental impacts. The TSM/TDM Alternative would provide direct benefits for traffic circulation on local arterials and some benefit to the regional freeway and transit networks resulting from the following improvements:

- Signal optimization
- Local street and intersection improvements
- Transit service improvements
- Bus service enhancements
- Bicycle facility improvements

The TSM/TDM Alternative consists of relatively small capital cost investments with low impacts that include operational improvements and strategies that increase the efficiency and capacity of the existing transportation system, while reducing the effects of localized bottlenecks and chokepoints. The TSM component of this alternative includes Intelligent Transportation Systems (ITS), local street and intersection improvements and Active Traffic Management (ATM) throughout the study area. The TDM component of the alternative includes expanded bus service, bus service improvements and bicycle facility improvements throughout the study area. The TSM/TDM Alternative also encourages automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system.

The TSM/TDM Alternative has the fewest number of freeway segments that would be adversely affected and is tied with the BRT Alternative for the lowest number of total intersections and freeway segments adversely affected.[1]

Please note the following list of additional factors for supporting the identification of the Preferred Alternative is not in order of importance and does not represent all of the benefits or impacts associated with the Preferred Alternative.

- **Community Impact Factors:**
  - The Preferred Alternative is generally consistent with the Pasadena, Rosemead, San Gabriel, San Marino, and South Pasadena General Plans and most of the local jurisdictions' Specific Plans as discussed in Section 3.1.2 of the Final EIR/EIS.
  - The Preferred Alternative would have the lowest overall adverse effects related to property acquisitions and it would not displace any residents or residential land uses.
  - The Preferred Alternative would have the least number of historic resource impacts when compared to all of the other build alternatives.
- **Local Traffic Circulation Factors:**
  - The Preferred Alternative includes signal optimization on corridors with signal coordination hardware already installed as a part of LA County's Traffic Signal Synchronization Program (TSSP). The corridors include Del Mar Avenue, Rosemead Boulevard, Temple City Boulevard, Santa Anita Avenue, Fair Oaks Avenue, Fremont Avenue, and Peck Road.
    - The Intelligent Transportation Systems (ITS) improvements (traffic signal upgrades and synchronization, transit signal prioritization, changeable message signs and detection systems) provide incremental benefits that are independent of any capital transportation improvements.
  - The Preferred Alternative includes local street and intersection improvements within the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, and San Marino.
    - Intersection improvements will reduce delay at individual intersections regardless of other local or regional transportation projects.

[1] Depending on the design and operational variation, the Tunnel Alternative could have 2 fewer total intersections and freeway segments adversely impacted or could have up to 16 more total intersections and freeway segments adversely impacted.

   - The Preferred Alternative includes transit service improvements by enhanced bus headways between 10 and 30 minutes during the peak hour and between 15 and 60 minutes during the off-peak period. Some of the bus service enhancements almost double existing bus service.
     - The expanded bus service can be implemented incrementally to provide increased transit service for existing and future users.
   - The Preferred Alternative includes bicycle facility improvements that consist of on-street bicycle facilities that support access to transit facilities throughout the study area; in addition to expanded bicycle parking facilities at existing Metro Gold Line stations.
     - The expanded bicycle network will enhance access to both local destinations and the regional transit system.
- **Natural Resource Factors:**
   - The Preferred Alternative does not impact any State jurisdictional wetlands or any Federal or Regional jurisdictional drainages.
- **Economic and Fiscal Factors:**
   - The construction cost estimate for the Preferred Alternative is approximately $105 million and can be funded utilizing existing resources, unlike the single bore freeway tunnel that is estimated to cost approximately $3.15 billion and subject to local fund restrictions (use of Measure M funds to construct a 710 tunnel is prohibited).
   - Available funding for the Preferred Alternative includes local Measure R funds.
   - A process is underway for community consensus to be achieved for the expenditure of $105 million from Measure R funds for the Preferred Alternative.

For the above reasons, the Preferred Alternative has also been identified as the Environmentally Superior Alternative (pursuant to CEQA).

Under the California Environmental Quality Act (CEQA), Caltrans will certify that the project complies with CEQA, prepare Facts and Findings for all significant impacts identified, prepare a Statement of Overriding Considerations (SOC) for impacts that will not be mitigated below a level of significance under CEQA, and certify that the findings and SOC have been considered prior to project approval. Caltrans will then file a Notice of Determination with the State Clearinghouse that will identify whether the project will have significant impacts, if mitigation measures were included as conditions of project approval, that findings were made, and that an SOC was adopted. With respect to the National Environmental Policy Act (NEPA), Caltrans, as assigned by the FHWA, will document and explain its decision regarding the selected alternative, project impacts, and mitigation measures in a Record of Decision (ROD).

Overview of the Project Area

Study Area

As shown on Figure ES-1, the study area for the SR 710 North Project is approximately 100 square miles (sq mi) and generally bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west. The study area also includes portions of East Los Angeles and Monterey Park south of I-10.

Existing Facilities

Metro currently operates 7 bus routes in the study area to downtown Los Angeles, and other routes provide east-to-west and north-to-south service in the study area.

Metro Rail service in the study area is provided via the Gold Line, a 19.7-mile light rail line that connects Pasadena and East Los Angeles with Union Station in downtown Los Angeles. The Gold Line includes 15 stations located in Pasadena, South Pasadena, Highland Park, Arroyo Seco (Mount Washington), Lincoln Heights, and East Los Angeles, as well as 6 additional stations in parts of Los Angeles outside the study area.

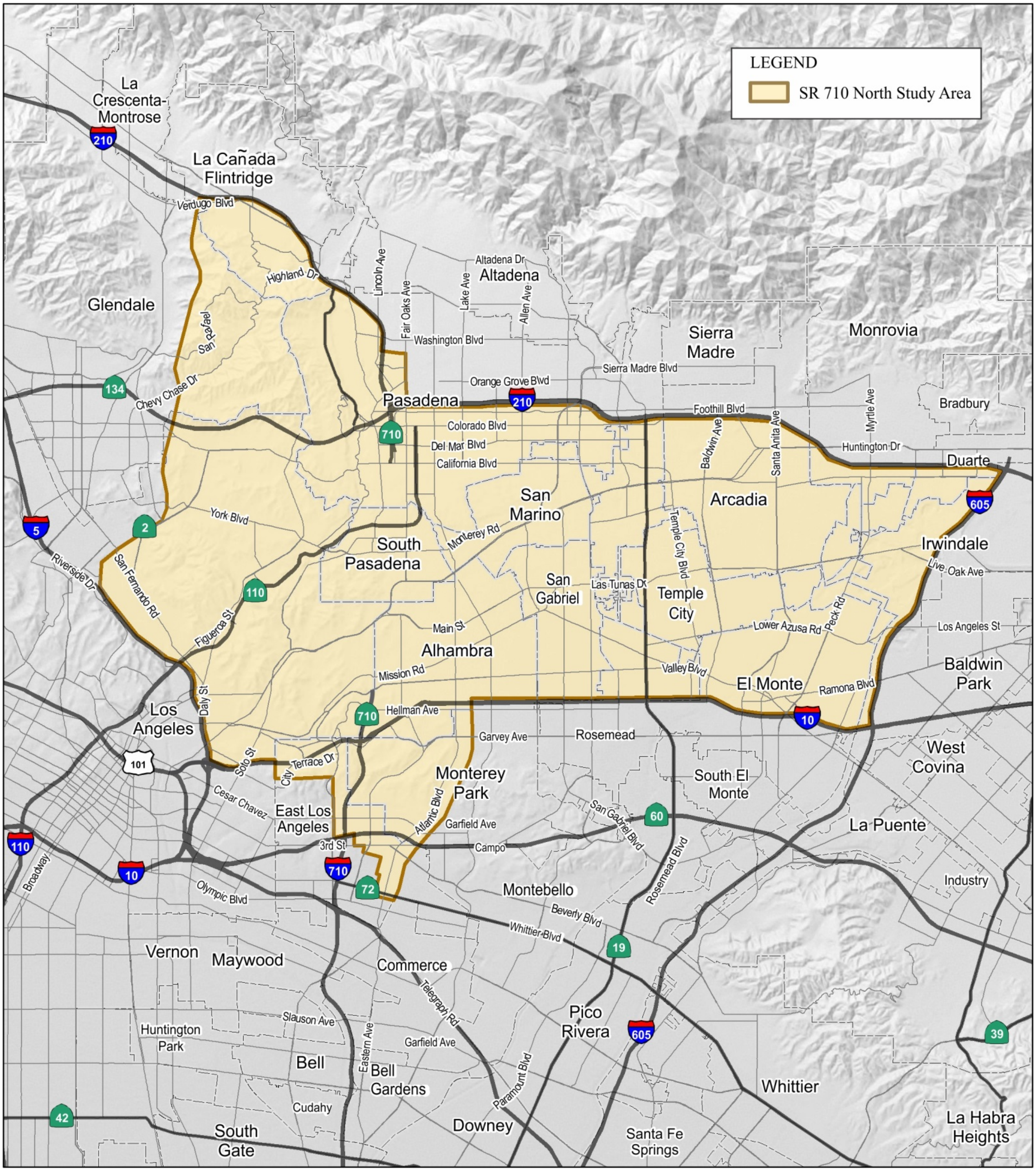


Figure ES-1: SR 710 North Project Study Area

There are four major north-south freeway routes (I-5, State Route 110 [SR 110], Interstate 710 [I-710], and I-605) and two east-west freeway routes (I-210 and State Route 134 [SR 134]) that are located partially in the study area, two of which (SR 110 and SR 710) terminate in the study area without connecting to another freeway. The limits of the planned SR 710 corridor were originally defined in 1933 as extending from San Pedro east to Long Beach and north to the vicinity of Monterey Park. In 1959, the planned northern limits of SR 710 were extended to the planned I-210. The segment of the facility from Long Beach to I-10 has been constructed and was incorporated in 1983 into the Interstate Highway System as I-710. The segments from I-10 to Valley Boulevard and from Del Mar Boulevard to the I-210/SR 710/State Route 134 (SR 134) interchange were designated SR 710 in 1984. The segment between Valley Boulevard and I-210 has not been constructed.

Purpose and Need

Project Purpose

The purpose of the proposed action is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles, including the following considerations:

- Improve efficiency of the existing regional freeway and transit networks.
- Reduce congestion on local arterials adversely affected due to accommodating regional traffic volumes.
- Minimize environmental impacts related to mobile sources.

Project Need

The need for the SR 710 North Project is based on consideration of the following factors:

- **Capacity, Transportation Demand, and Safety:** As shown in Figure ES-1, five north-south freeways are partially in the study area (I-5, SR 110, I-710/SR 710, SR 2, and I-605) and three of those (SR 2, SR 110, and I-710/SR 710) terminate in the study area without connecting to another freeway. The lack of continuous north-south transportation facilities in those two corridors in the study area affects the overall efficiency of the larger regional transportation system, which results in congestion on freeways in the study area, cut-through traffic that affects the local streets in the study area, and poor transit operations in the study area due to congestion on the local arterial roads. Figure ES-2 shows the transit travel times to downtown Pasadena from locations within the project study area, illustrating the lack of continuous north-south transportation facilities.
- **Modal Interrelationships and System Linkages:** Because SR 110 and I-710 terminate in the study area without connecting to other freeways, a high percentage of the north-south regional travel demand is concentrated on a few freeways or diverted to local streets in the study area. This effect is exacerbated by the overall southwest-northeast orientation of I-605, which makes it an unappealing route for traffic between the southern part of the region and the urbanized areas to the northwest in the San Fernando Valley, the Santa Clarita Valley, and the Arroyo-Verdugo area.
- **Social Demands or Economic Development:** The Preferred Alternative, TSM/TDM, is included in the Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future, in the SCAG 2017 Federal Transportation Improvement Program (FTIP) and amendments, and Metro's 2009 Long Range Transportation Plan (LRTP).
- **Environmental Factors:** Since the 1950s, growth in Southern California, the County of Los Angeles, and the study area has resulted in dramatic increases in population, changes to land use patterns, and a substantial increase in vehicle use and traffic congestion on the regional freeway system and local roadway network. Increased traffic congestion

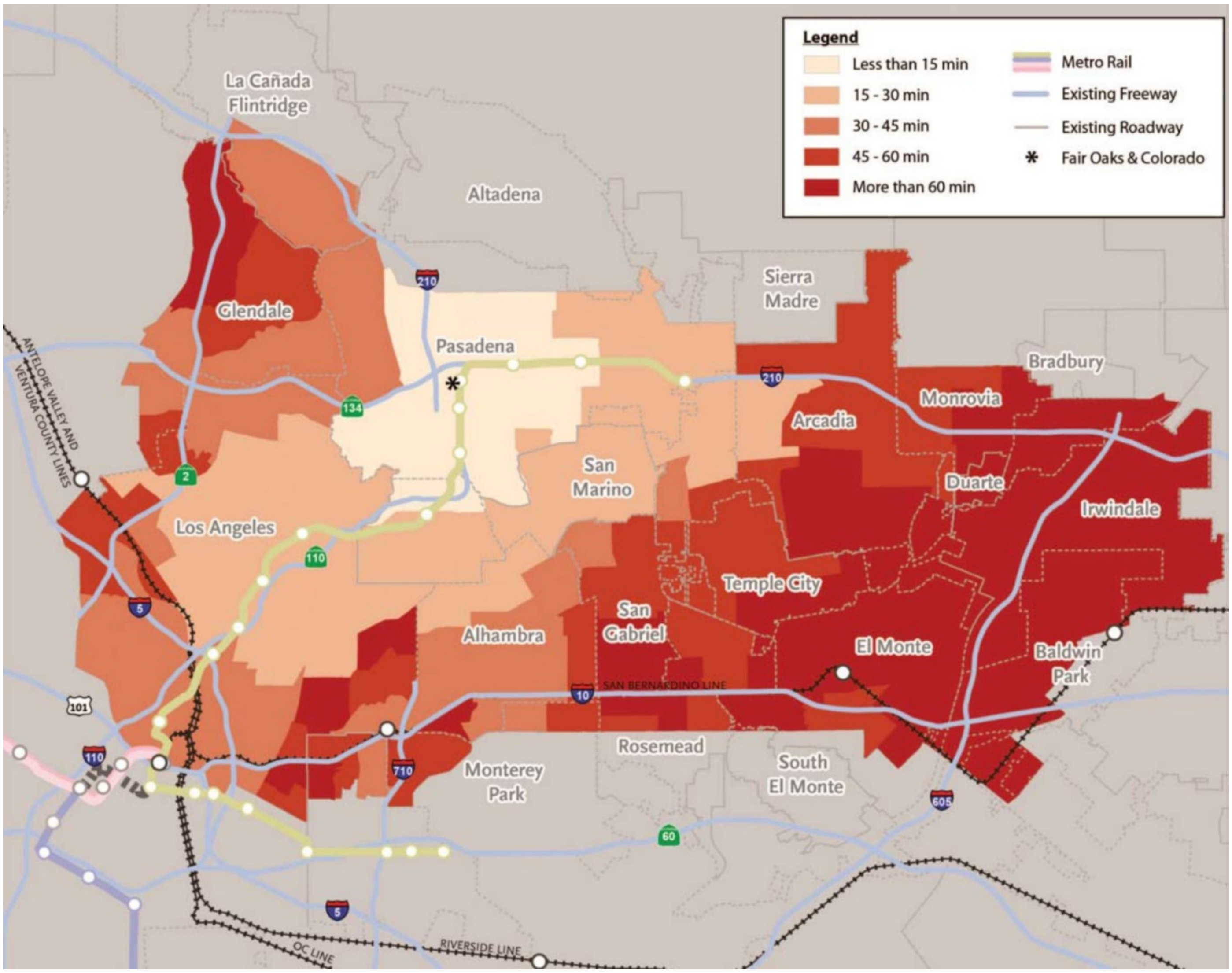


Figure ES-2: Transit Travel Times in Minutes to Downtown Pasadena

throughout the region and study area has contributed to increased noise levels near freeways and roadways as well as elevated ambient air pollution levels. By 2035, the study area population and employment base are forecasted to increase by approximately 12 percent, which will continue to decrease the overall efficiency of the larger regional transportation system. These system degradations would exacerbate existing congestion throughout the County of Los Angeles and communities in the study area and the environmental effects related to mobile sources.

- **Legislation:** Measure R, a one-half-cent sales tax dedicated to transportation projects in Los Angeles County, was approved by a two-thirds majority of Los Angeles County voters in November 2008 and took effect in July 2009. Over 30 years, Measure R is projected to generate $40 billion for mobility improvement programs. The goals of Measure R focus on reducing congestion, improving traffic flow, improving mobility, and increasing accessibility to public transportation. Included in the Measure R plan is the commitment of $780 million for improvements to SR 710 (See Measure R

Expenditure Plan Ordinance # 08-01: Proposed One-Half Cent Sales Tax for Transportation: Expenditure Plan 30 Years, Fiscal Year (FY) 2010 – 2039, as adopted by the Los Angeles County Metropolitan Transportation Authority Board of Directors July 24, 2008). In the event that a Capital Project identified in the Measure R Expenditure Plan Ordinance # 08-01 as a "Highway Project" is completed without the expenditure of the amount of Net Revenues allocated by this Ordinance, any surplus Net Revenues allocated to that Capital Project shall be credited to the Highway Capital Subfund and expended for Capital Projects located within the same subregion as the project so completed

Proposed Action

Project Alternatives

Each of the alternatives under evaluation in the EIR/EIS are described below. Please note that the alternatives are not listed in any order of priority. Construction cost and schedule will be further refined after the ROD when the Preferred Alternative is selected and moves into final design.

No Build Alternative

The No Build Alternative does not include any improvements to the SR 710 North Project area. The traffic modeling for the Opening Year and Horizon Year for the No Build Alternative includes projects/planned improvements through 2035 that are contained in the FTIP, as listed in the SCAG 2012 RTP/SCS, Measure R, and the funded part of Metro's 2009 LRTP. Those projects are shown later on Figure 2-1 in Chapter 2, Project Alternatives.

Transportation System Management/Transportation Demand Management Alternative (Preferred Alternative)

The Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative consists of strategies and improvements to increase efficiency and capacity for all modes in the transportation system with lower capital cost investments and/or lower potential impacts. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. The TSM and TDM improvements included in the TSM/TDM Alternative are described in the following sections.

Transportation System Management. TSM strategies increase the efficiency of existing facilities by identifying actions that increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Examples of TSM strategies include: ramp metering, auxiliary lanes, turning lanes, reversible lanes, and traffic signal coordination. TSM also encourages multimodal transportation, including automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements, as elements of a unified urban transportation system. TSM strategies in the TSM/TDM Alternative are:

- **Intelligent Transportation System (ITS) Improvements:** As shown on Figure ES-3, ITS improvements include traffic signal upgrades, synchronization and transit prioritization, arterial changeable message signs (CMS), and arterial video and speed data collection systems. The TSM/TDM Alternative includes signal optimization on corridors with signal coordination hardware already installed as part of Metro's Traffic Signal Synchronization Program (TSSP). These corridors include Del Mar Avenue, Rosemead Boulevard, Temple City Boulevard, Santa Anita Avenue, Fair Oaks Avenue, Fremont Avenue, and Peck Road. The only remaining major north-south corridor in the San Gabriel Valley in which TSSP has

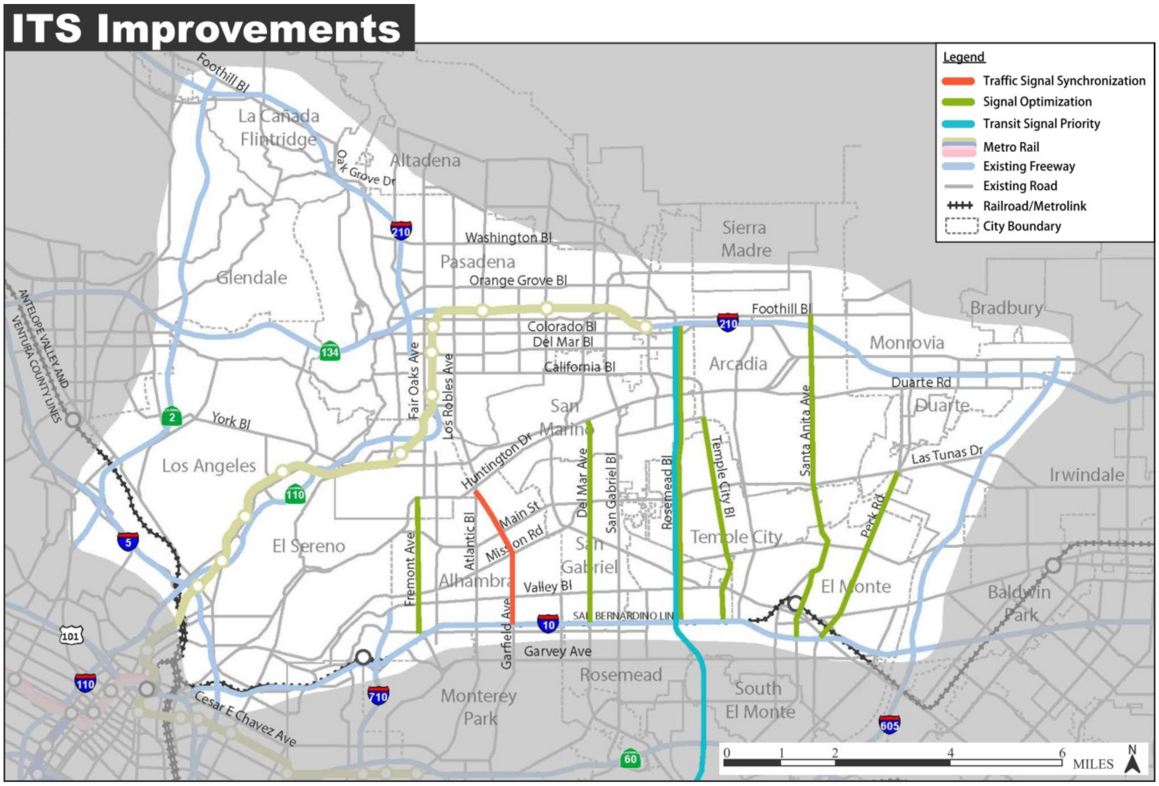


Figure ES-3: TSM/TDM Alternative ITS Improvements

not been implemented is Garfield Avenue; therefore, TSSP on that corridor is included in the TSM/TDM Alternative.

- **Local Street and Intersection Improvements:** As shown on Figure ES-4, local street and intersection improvements are proposed in the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, and San Marino.
- **Active Traffic Management (ATM):** The major elements of ATM are arterial speed data collection and CMS. Data on arterial speeds would be collected and distributed through Los Angeles County's Information Exchange Network. Travel time data collected through this effort could be provided to navigation system providers for distribution to the traveling public. Arterial CMS or "trailblazer" message signs would be installed at key locations to make travel time and other traffic data available to the public.

Transportation Demand Management. TDM strategies focus on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. The TDM strategies included in the TSM/TDM Alternative are: Expanded Bus Service and Bus Service Improvements (Figure ES-5) and Active Transportation Improvements (Figure ES-6).

Improvements in the TSM/TDM Alternative have also been incorporated into the remaining Build Alternatives, with the following exceptions because those improvements would conflict with the improvements proposed in the other Build Alternatives:

- Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road), the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10), and enhancements to Bus Route 762 would not be implemented with the Bus Rapid Transit (BRT) Alternative.

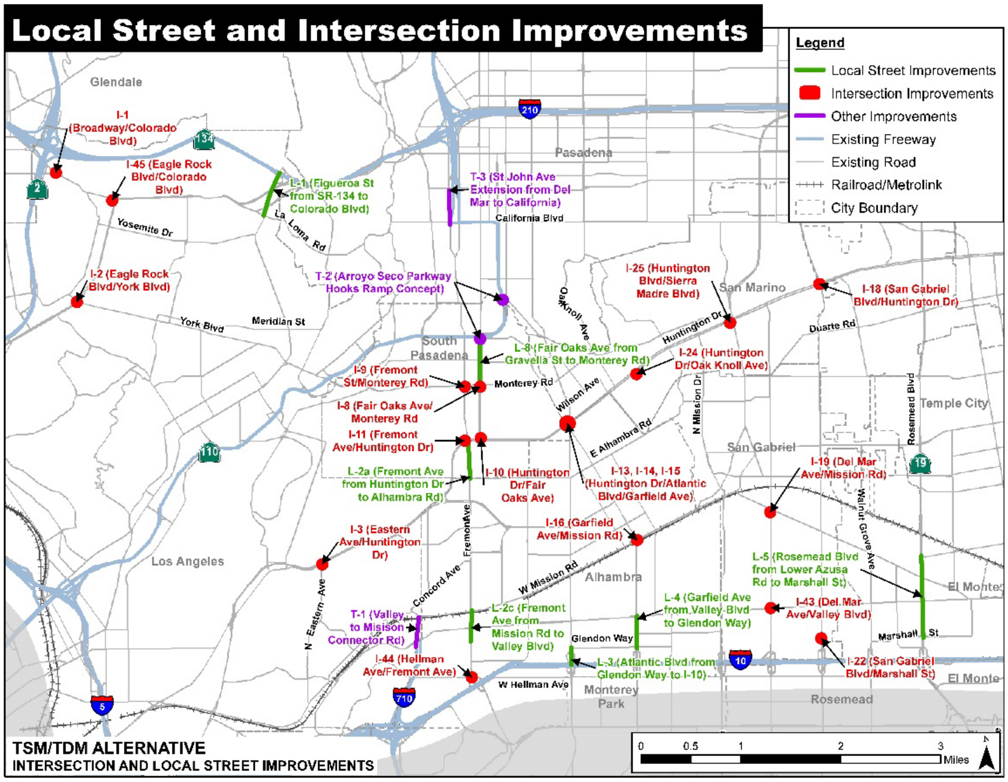


Figure ES-4: TSM/TDM Alternative Local Street and Intersection Improvements

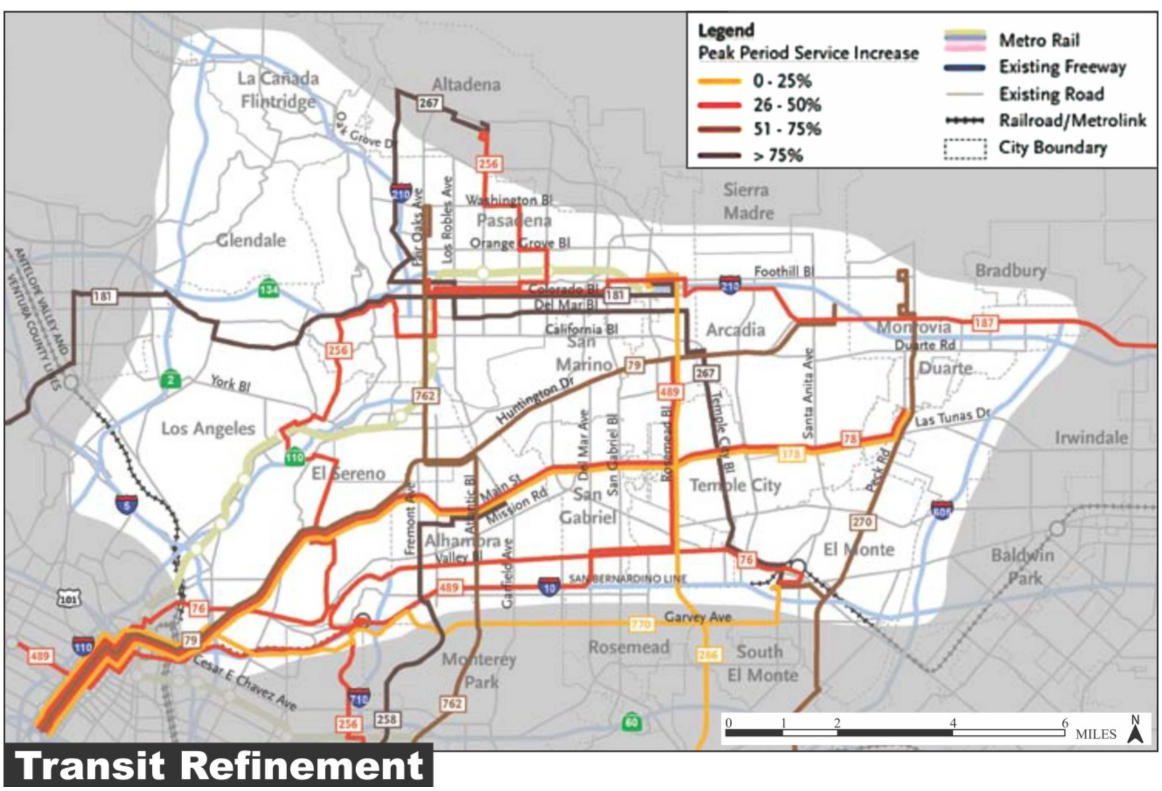


Figure ES-5: TSM/TDM Alternative Transit Refinement Improvements

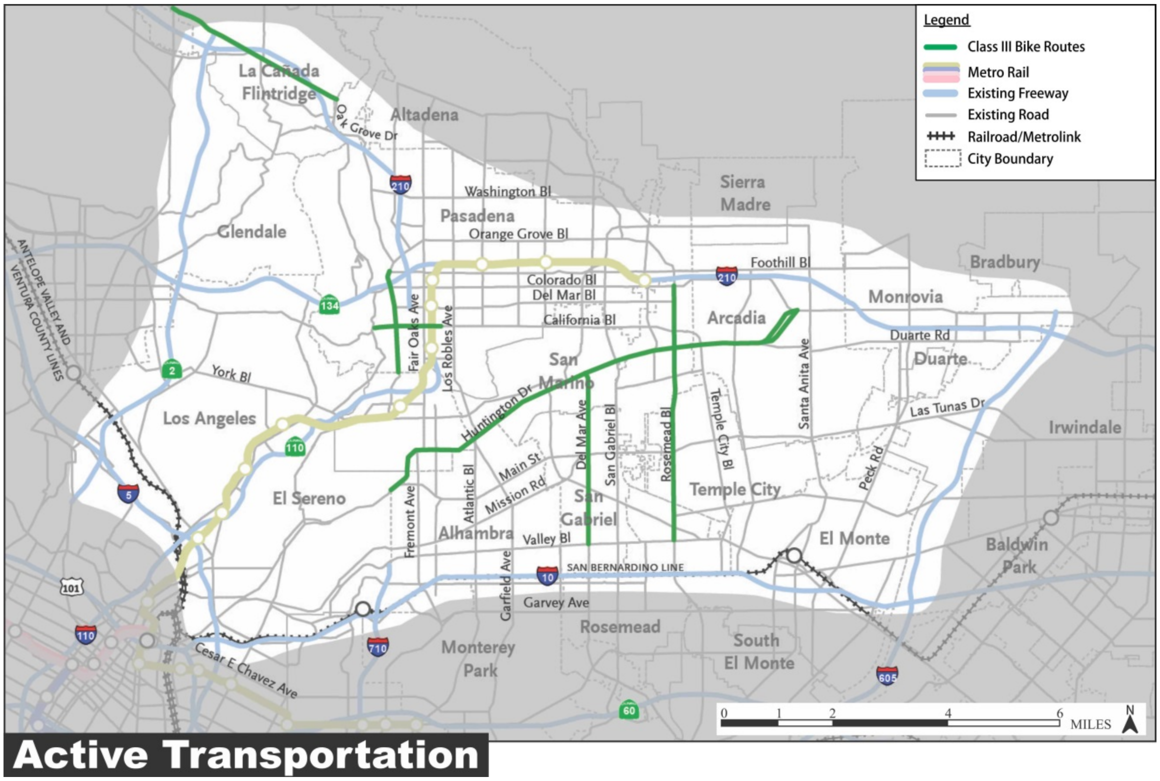


Figure ES-6: TSM/TDM Alternative Active Traffic Management Improvements

- Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) would not be implemented with the Light Rail Transit (LRT) Alternative.
- Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector) and T-3 (St. John Extension between Del Mar Boulevard and California Boulevard) would not be implemented with the Freeway Tunnel Alternative.

The construction of the TSM/TDM Alternative is estimated to cost approximately $105 million (in 2014 dollars) and $126 million (in 2020 dollars), which includes structures, utilities, and right of way costs. Construction of the improvements in the TSM/TDM Alternative is expected to take approximately 2 years.

Bus Rapid Transit Alternative

The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, dedicated, and existing bus lanes and mixed-flow traffic lanes to key destinations between East Los Angeles and Pasadena. The proposed route length is approximately 12 miles.

The BRT Alternative includes the BRT arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connecting bus services. Buses would operate every 10 minutes during peak hours and every 20 minutes during off-peak hours. The BRT service would generally replace the existing Metro Route 762 service in the study area. As shown on Figure ES-7, the approximately 12-mile-long BRT route would begin at Atlantic Boulevard and Whittier Boulevard to the south; extend along Atlantic Boulevard, Huntington Drive, Fair Oaks Avenue, and Del Mar Boulevard; and end with a terminal loop in Pasadena to the north. Buses operating in the corridor would be given transit signal priority from a baseline transit signal priority project that will be implemented separately by Metro.

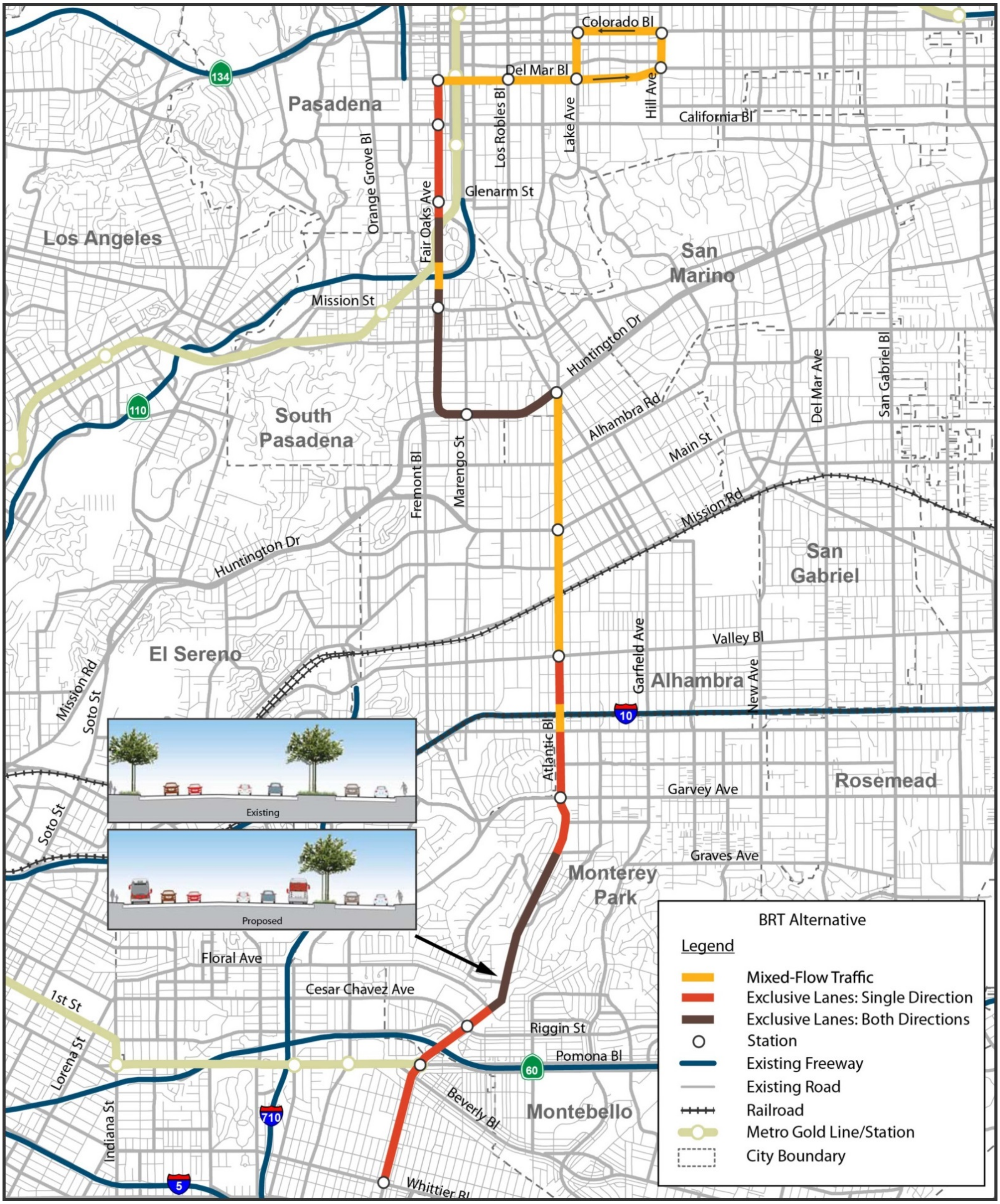


Figure ES-7: BRT Alternative

Buses would operate in dedicated bus lanes adjacent to the curb, either in one direction or both directions, during peak periods. The new dedicated bus lanes would generally be created within the existing street rights of way through a variety of methods that include restriping the roadway, restricting on-street parking during peak periods, and narrowing medians, planted parkways, or sidewalks. Buses would share existing lanes with bicyclists and vehicles in cases where there is not enough right of way. The dedicated bus lanes would be limited to buses and right-turning traffic during AM and PM peak hours only. At other times of day, the dedicated bus lanes would be available for on-street parking use.

Typical Bus Rapid Transit Vehicles

The BRT service would be operated using 60-foot-long articulated buses with three doors, and would have the latest fare collection technology such as on-board smart card (transit access pass [TAP] card) readers to reduce dwell times at stations.

Additionally, the BRT Alternative would include bus feeder routes that would connect additional destinations with the BRT Alternative alignment. Two bus feeder routes are proposed: (1) Colorado Boulevard, Rosemead Boulevard, and Valley Boulevard to the El Monte transit station; and (2) Atlantic Boulevard near the Gold Line station to the Metrolink stations in the Cities of Commerce and Montebello via Beverly Boulevard and Garfield Avenue. In addition, the frequency and/or span of service for other existing bus services in the study area, such as the El Sol shuttle routes that serve East Los Angeles, would be increased.

The total estimated cost of the BRT Alternative is approximately $241 million (in 2014 dollars) and $288 million (in 2020 dollars), which includes the vehicles, stations, roadway improvements, structures, and right-of-way costs for the BRT Alternative and the TSM/TDM Alternative improvements included in the BRT Alternative. The total cost includes $102 million (in 2014 dollars) and $122 million (in 2020 dollars) for the TSM/TDM improvements. Construction of the improvements in the BRT Alternative is expected to take approximately 2 years.

Typical Light Rail Trains

Light Rail Transit Alternative

The LRT Alternative would include a passenger rail line that is operated along a dedicated guideway similar to other Metro light rail lines. The LRT alignment is approximately 7.5 miles long, with approximately 3 miles of aerial segments and approximately 4.5 miles of bored tunnel segments, and 7 stations (Figure ES-8).

The LRT Alternative would begin at an aerial station on Mednik Avenue adjacent to the existing East Los Angeles Civic Center Station on the Metro Gold Line (Eastside Extension). The alignment would remain elevated as it travels north on Mednik Avenue, west on Floral Drive, north across Corporate Center Drive, and then along the west side of I-710, primarily in State right of way, to a station adjacent to California State University, Los Angeles (Cal State LA). The alignment would descend into a tunnel south of Valley Boulevard and travel northeast to Fremont Avenue, north under Fremont Avenue, and east to Fair Oaks Avenue. The alignment would then cross under SR 110 and end at an underground station beneath Raymond Avenue, adjacent to the existing Fillmore Station on the Metro Gold Line in Pasadena. The LRT service would be operated using light rail trains similar to the trains on the existing Metro light rail lines.

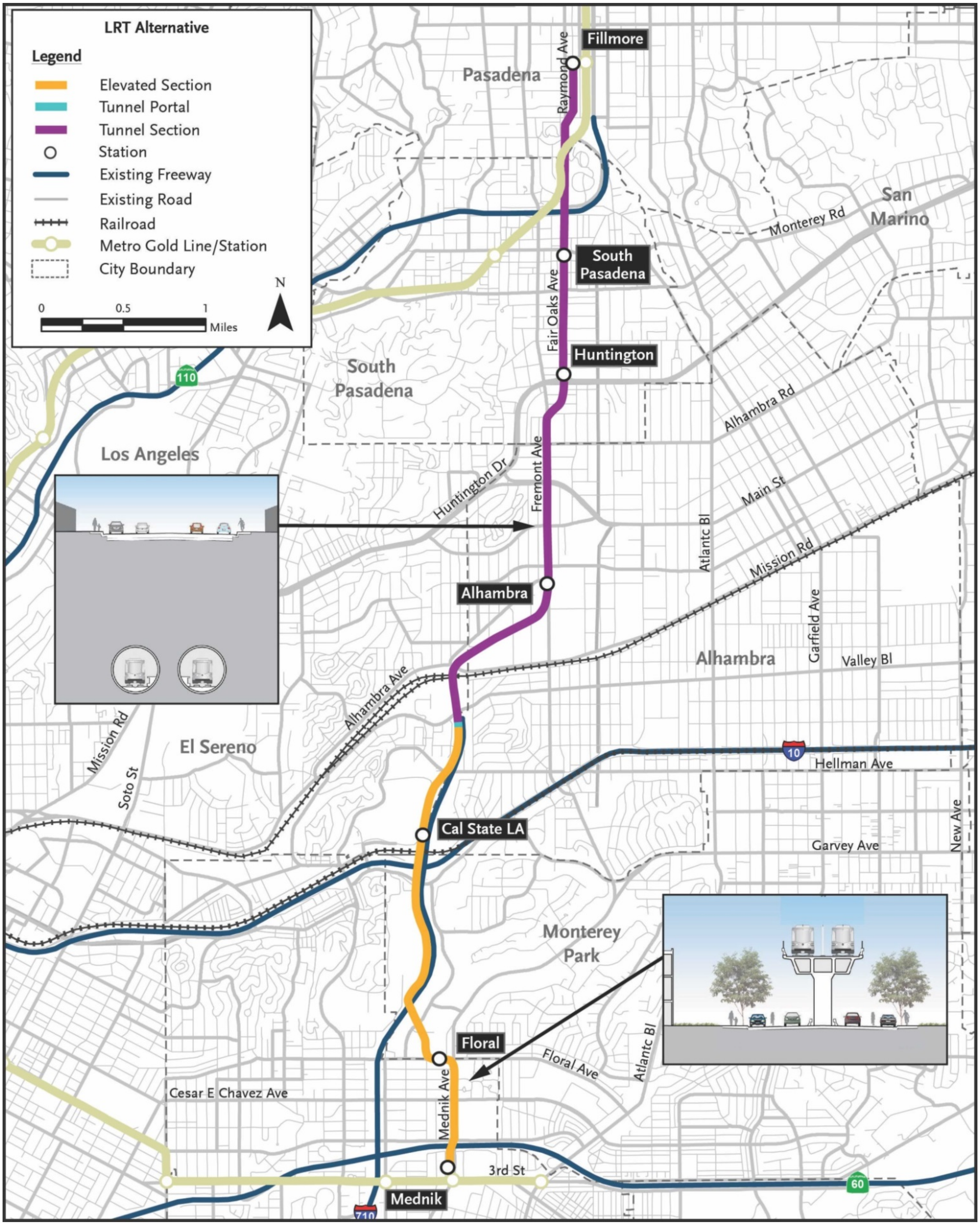


Figure ES-8: LRT Alternative

Two approximately 20-foot-diameter tunnels (one in each direction) are proposed with cross passages connecting the tunnels to allow for emergency access. The LRT tunnels are expected to be constructed using pressurized-face tunnel boring machines (TBMs) while the portals and the stations would be constructed using the cut-and-cover construction method. A TBM has a rotating cutting head at the front of the machine that excavates soil and rock as it is advanced through the ground. The excavated materials are typically removed from the tunnel by rail cars or a continuous conveyor system and taken to the construction portal. As the TBM advances, positive face pressure can be maintained to address ground loss at the face of the excavation, and a precast concrete tunnel lining system is installed, providing immediate support of the ground. The vertical and horizontal alignments would be refined during final design, if this alternative is selected, based on more detailed geotechnical investigations and engineering.

Cross passages are anticipated to be excavated using the sequential excavation method (SEM) from within the tunnels excavated by the TBMs. In the SEM, tunnel excavation and support is typically performed in a series of drifts, depending on the anticipated ground conditions, which are sequenced to develop successively larger openings until the design profile is achieved. As the SEM excavation is taking place, the appropriate ground support measures are installed to maintain stability of the excavation.

The depth of the bored tunnel will vary from approximately 20 to 90 feet below ground surface (bgs) measured from the crown (top) of the tunnel. The depth would be shallower near the construction portals. The cut-and-cover tunnel would vary from 5 to 20 feet bgs.

The tunnel design would include a ventilation system that would maintain the air velocity and temperature within the tunnel and underground stations at a comfortable level for passengers and staff.

The tunnel design would also include a fire detection and suppression system, and emergency evacuation walkways for pedestrians. An Emergency Response Plan for tunnel operations would be prepared during final design in coordination with the applicable agencies, including the Los Angeles County Sheriff, the State Fire Marshal, and local fire agencies.

Two bus feeder services would also be provided as part of the LRT Alternative: one from the Commerce Station on the Orange County Metrolink line and the Montebello Station on the Riverside Metrolink line to the Floral Station, via East Los Angeles College; and the other from the El Monte Bus Station to the Fillmore Station via Rosemead and Colorado Boulevards. In addition, the frequency and/or span of service of other existing bus services in the study area, such as the El Sol shuttle, would be increased.

The LRT Alternative would also include four park-and-ride facilities located adjacent to the following stations:

- **Floral:** A four-story parking garage on Kern Avenue would have 415 parking spaces. Entrances to the parking garage would be provided on Kern Avenue and Monterey Pass Road.
- **Alhambra:** A two-story parking garage on Fremont Avenue would have 382 parking spaces. An entrance would be provided on Fremont Avenue.
- **Huntington:** A three-story parking garage on Huntington Drive would have 400 parking spaces. Entrances would be provided on Fremont Avenue.
- **South Pasadena:** A surface parking lot on Mission Street would have 338 parking spaces. Entrances would be provided on Fair Oaks Avenue and Mission Street.

The total estimated cost of the LRT Alternative structures and right of way is approximately $2,420 million (in 2014 dollars) and $3,066 million (in 2022 dollars). The total cost includes $52 million (in 2014 dollars) and $66 million (in 2022 dollars) for TSM/TDM improvements. Construction of the improvements in the LRT Alternative is expected to take approximately 6 years.

Freeway Tunnel Alternative

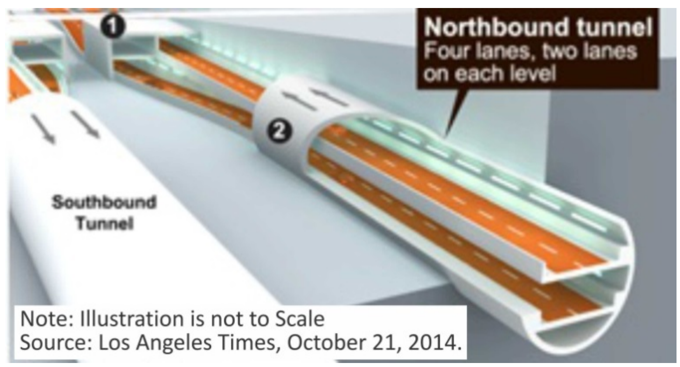
As shown on Figure ES-9, the alignment for the Freeway Tunnel Alternative would start at the existing southern stub of SR 710 in Alhambra, north of I-10, and connect to the existing northern stub of SR 710, south of the I-210/SR 134 interchange in Pasadena. Short segments of cut-and-cover tunnels would be located at the south and north termini to provide access via portals to the bored tunnels. The portal at the southern terminus would be located south of Valley Boulevard. The portal at the northern terminus would be located north of Del Mar Boulevard. No intermediate interchanges are planned for the tunnel.

Current design plans indicate that the bored tunnel section of the Freeway Tunnel Alternative would be excavated using pressurized-face TBMs. It is expected that the freeway tunnels would be constructed using two TBMs for each bore (two TBMs for the single-bore design variations and four TBMs for the dual-bore design variations). Please refer to the description of TBM operation provided earlier in the LRT Alternative discussion for additional detail regarding the operation of TBMs and other construction activities associated with tunnels.

The Freeway Tunnel Alternative includes two design variations related to the number of tunnels (i.e., dual-bore and single-bore). The dual-bore design variation includes two tunnels that independently convey northbound and southbound vehicles. The single-bore design variation includes one tunnel that carries both northbound and southbound vehicles. These design variations are described below.

- **Dual-Bore Tunnel:** The dual-bore tunnel design variation is approximately 6.3 miles long, with approximately 4.2 miles of bored tunnel, 0.7 mile of cut-and-cover tunnel, and 1.4 miles of at-grade segments. The dual-bore tunnel variation would consist of two side-by-side tunnels (one northbound, one southbound), each of which would have two levels. Each tunnel would consist of two lanes of traffic on each level, traveling in one direction, for a total of four lanes in each tunnel. Roadway shoulders will also be provided within each tunnel. The easterly tunnel would be constructed for northbound traffic, and the westerly tunnel would be constructed for southbound traffic.

  Each bored tunnel would have an outside diameter of approximately 60 feet and would be located approximately 20 to 280 feet bgs from the top of the tunnel. Vehicle cross passages would be provided connecting the two tunnels for use in an emergency situation. The cross passages would be excavated using the SEM, similar to the LRT Alternative.



Conceptual Plan of the Dual-Bore Design Variation for the Freeway Tunnel Alternative

- **Single-Bore Tunnel:** The single-bore tunnel design variation is also approximately 6.3 miles long, with approximately 4.2 miles of bored tunnel, 0.7 mile of cut-and-cover tunnel, and 1.4 miles of at-grade segments. This tunnel design variation would consist of a single, two-level, bored tunnel with two lanes on each level in each direction. Northbound traffic would use the two lanes on the upper level, and southbound traffic would use the two lanes on the lower level. The single-bore tunnel would provide a total of four travel lanes.

  The single bore tunnel would also have an outside diameter of approximately 60 feet and would be located approximately 20 to 280 feet bgs. The single-bore tunnel would be in the same location as the northbound tunnel in the dual-bore tunnel design variation.

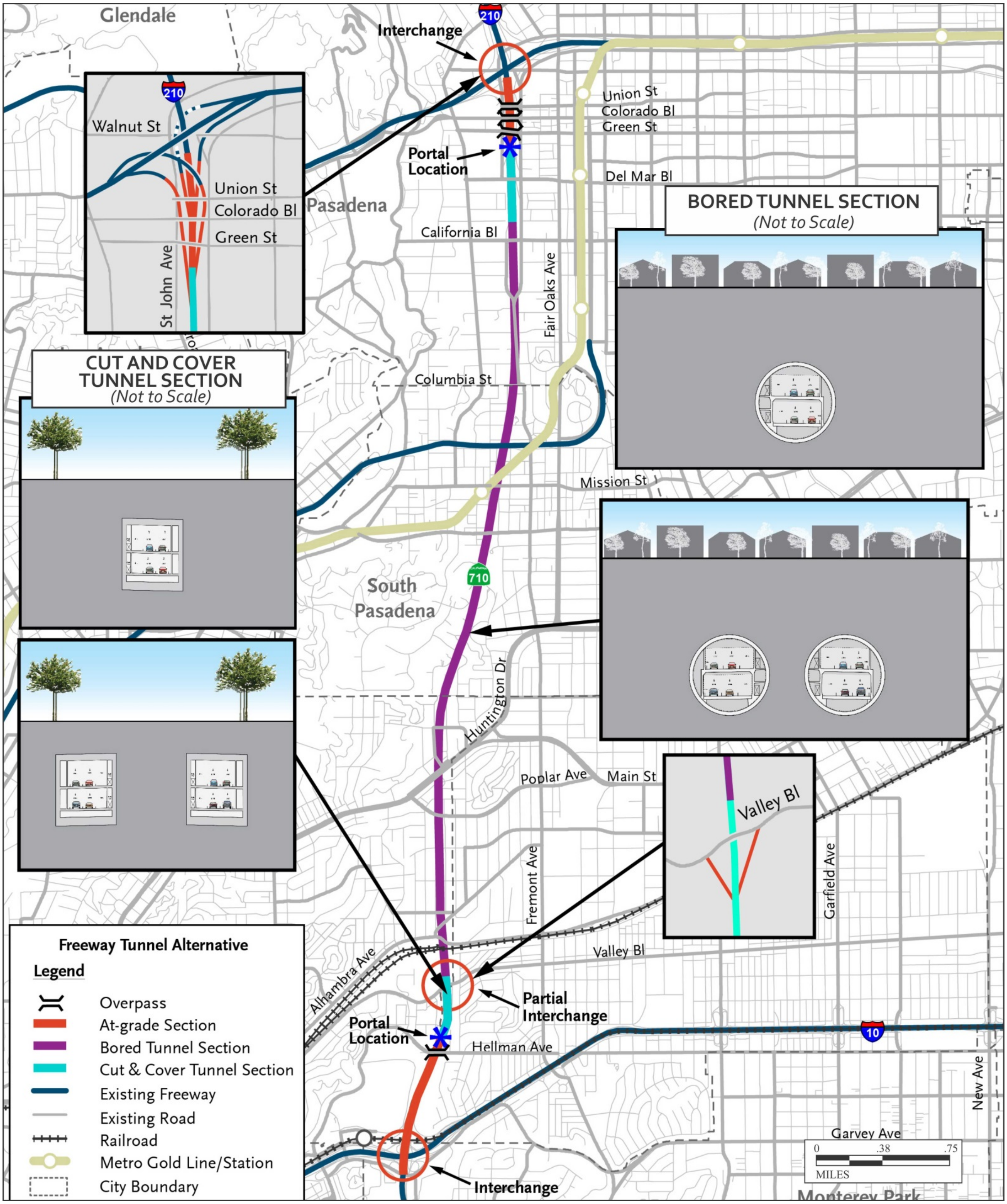


Figure ES-9: Freeway Tunnel Alternative

The depth of the tunnels for the Freeway Tunnel Alternative with the single-bore and dual-bore design variations would be shallower near the north and south construction portals. The majority of the underground segment of the freeway is expected to be constructed using a TBM while the remaining segments are expected to be constructed using the cut-and-cover construction method. The top of the cut-and-cover tunnel in the south portal would be approximately 5 to 60 feet bgs. The top of the cut-and-cover tunnel segment at the north portal would be approximately 0 to 30 feet bgs. The vertical and horizontal alignments would be refined during final design, if this alternative is selected, based on more detailed geotechnical investigations and engineering.

Operational variations have been identified for the Freeway Tunnel Alternative dual-bore and single-bore design variations, as described below:

- **Dual-Bore Operational Variation:**
  - **No Tolls:** The facility would operate as a freeway with all travel lanes open to all vehicles.
  - **No Tolls and No Trucks:** The facility would operate as a freeway, but trucks would be excluded from using the tunnel. Signs would be provided along I-210, SR 134, I-710, and I-10 to provide advance notice of the truck restriction.
  - **With Tolls:** All vehicles, including trucks, using the tunnels would be tolled.
- **Single-Bore Operational Variation:**
  - **With Tolls:** All vehicles, including trucks, using the tunnel would be tolled.
  - **With Tolls and No Trucks:** The facility would operate as a tolled freeway, but trucks would be excluded from using the tunnel. All automobiles would be tolled. Signs would be provided along I-210, SR 134, I-710, and I-10 to provide advance notice of the truck restriction.
  - **With Tolls and Express Bus:** The single-bore tunnel would operate as a tolled facility and would include an Express Bus component. Express Buses would be allowed in any of the travel lanes in the tunnel. The tunnel would not include any bus-only or restricted lanes. The Express Bus route would start at the Commerce Station on the Orange County Metrolink line, and then serve the Montebello Station on the Riverside Metrolink line and East Los Angeles College before entering I-710 at Floral Drive. The bus would travel north to Pasadena via the freeway tunnel, making a loop serving Pasadena City College, the California Institute of Technology, and downtown Pasadena before re-entering the freeway and making the reverse trip.

The tunnel design would include a ventilation system that would maintain the air velocity and temperature within the tunnel at a comfortable level for travelers using the tunnel.

The tunnel design would also include a fire detection and suppression system and emergency evacuation walkways for pedestrians. An Emergency Response Plan for tunnel operations would be prepared in coordination with the applicable agencies, including the California Highway Patrol, the State Fire Marshall, and local fire agencies.

The total estimated cost of the Freeway Tunnel Alternative roadway, structures, and right of way is approximately $5,650 million (in 2014 dollars) and $7,158 million (in 2022 dollars) for the dual-bore design variation and $3,150 million (in 2014 dollars) and $3,991 million (in 2022 dollars) for the single-bore design variation. The total cost includes approximately $50 million (in 2014 dollars) and $64 million (in 2022 dollars) for TSM/TDM improvements.

Construction of the Freeway Tunnel Alternative would take approximately 4 to 5 years for the single-bore design variation and approximately 5 years for the dual-bore design variation. A maximum of four TBMs would be used to construct either the dual- or single-bore design variation.

Vehicles carrying flammable or hazardous materials would be restricted from using the tunnel under both the single-bore and dual-bore design variations.

The TSM/TDM Alternative has been identified as the preferred alternative (see the "Identification of Preferred Alternative" discussion at the beginning of the Executive Summary).

Alternatives Considered but Not Carried Forward

During the preliminary studies for the SR 710 North Project, a wide range of possible transportation alternatives was evaluated. Alternatives were identified based on past studies and comments from stakeholders, including elected officials, city and agency staff, and the community. The resulting alternatives were evaluated and refined through a sequential screening process (including preliminary, initial, and secondary screenings) to identify the alternatives that best meet the Need and Purpose of the study. Alternatives that were evaluated and not carried forward included two BRT, three LRT, four freeway, and two highway alternatives.

Joint CEQA/NEPA Document

The proposed project is a joint project by Caltrans and Metro, and is subject to State and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both CEQA and NEPA. Caltrans is the lead agency under NEPA and CEQA. In addition, FHWA's responsibility for environmental review, consultation, and any other actions required in accordance by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 United States Code Section 327 (23 USC 327) and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, often a "lower level" document is prepared for NEPA.

Since the TSM/TDM has been identified as the Preferred Alternative, Caltrans is completing this Final EIR/EIS. As the project moves forward to final design and construction, Metro may adopt the approved EIR, conduct additional environmental studies, and/or prepare or cause to be prepared any needed additional CEQA documentation. Alternatively, Caltrans may also conduct additional studies and/or prepare or cause to be prepared any needed additional CEQA documentation. Caltrans and Metro will enter into cooperative agreement(s) to specify and clarify their respective roles as the project is advanced to final design and construction. Caltrans, as assigned by FHWA, will remain the NEPA lead agency.

The Draft EIR/EIS prepared for this project was circulated for public review between March 5, 2015 and August 5, 2015. Caltrans, in cooperation with Metro, held five public hearings at various locations from April through June 2015 (see details in Chapter 5 and Volume III). The Focused RDEIR/SDEIS was circulated for public review between May 21, 2018 and July 5, 2018. Caltrans, in cooperation with Metro, held one public hearing on June 13, 2018. All comments received during the public review period of the Draft EIR/EIS and Focused RDEIR/SDEIS were considered.

As shown on Figure ES-10, after receiving comments from the public and reviewing agencies, a Final EIR/EIS has been prepared. Caltrans prepared additional environmental and/or engineering studies to address comments. This Final EIR/EIS was prepared to address all public comments and incorporate any changes to the project design, environmental setting, and impacts that have occurred since the Draft EIR/EIS and Focused RDEIR/SDEIS was completed.

After this Final EIR/EIS is distributed, if Caltrans approves the project, a NOD will be published for compliance with CEQA, and a ROD will be published for compliance with NEPA.

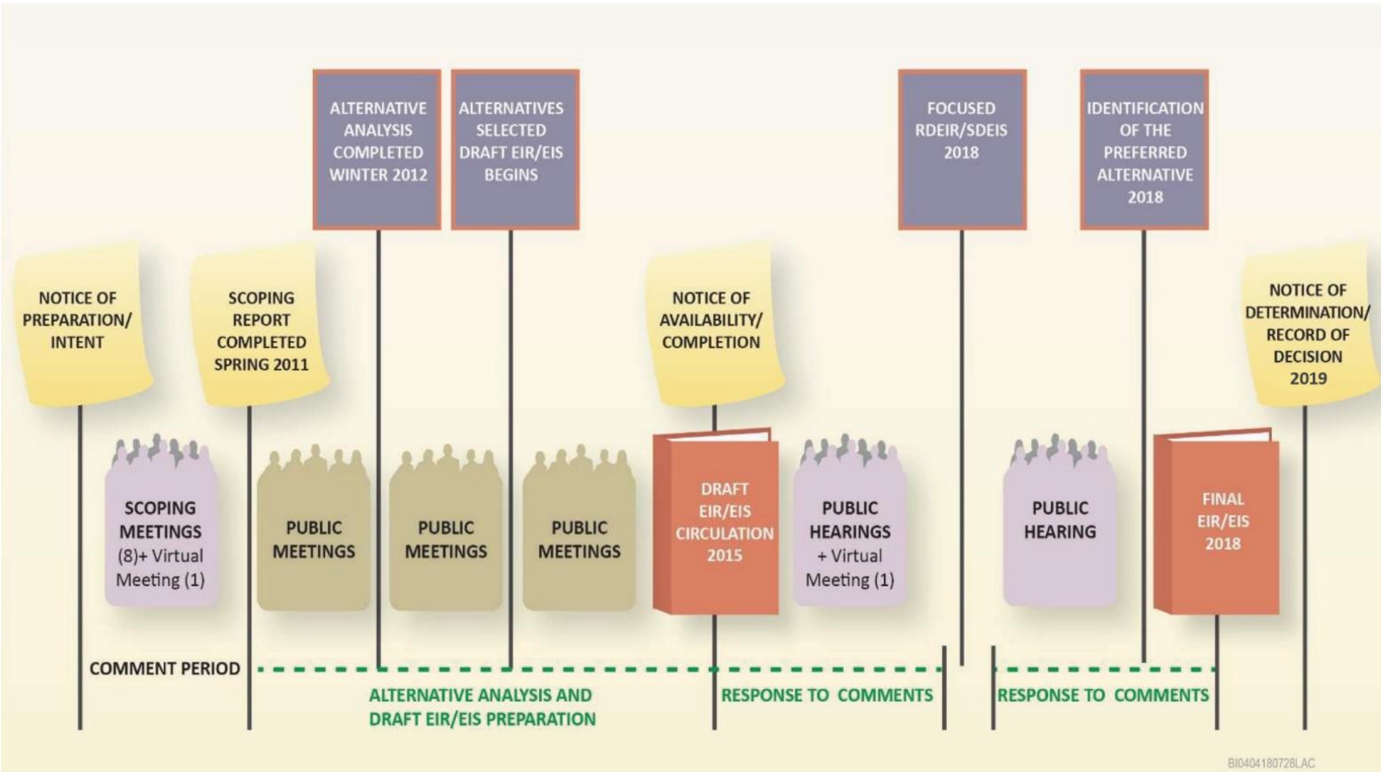


Figure ES-10: Environmental Process Timeline

NEPA requires that the effects of a project be considered and addressed. However, because NEPA is concerned with the significance of the project as a whole, NEPA does not require that a determination of significant impacts be stated in an EIS. Therefore, some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA.

CEQA, on the other hand, does require Caltrans to identify each “significant effect on the environment” resulting from the project as well as ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated, if reasonably feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA.

Project Impacts

Summary of Impacts and Measures

Table ES-1 (following the last page of text in the Executive Summary of this Final EIR/EIS) provides a brief comparison of the impacts associated with each of the Build Alternatives based on the environmental and technical studies conducted for the project. Table ES-1 also describes avoidance, minimization, and mitigation measures included in the Build Alternatives to address adverse environmental impacts of those alternatives. The environmental impacts related to Community Character and Cohesion, Relocations and Real Property Acquisitions, Traffic and Transportation, Visual/Aesthetics, Cultural Resources, Air Quality, and Construction Impacts have been raised by many people during the environmental process and are discussed briefly in the following sections.

Temporary and short-term effects are impacts that would occur during and as a result of project construction activities. Permanent and long-term effects are impacts that would occur as a result of the project construction and/or operations activities that would occur over a period longer than the project construction period. The environmental impacts described below for the Build Alternatives would not occur under the No Build Alternative.

Community Character and Cohesion

Because the TSM/TDM and Freeway Tunnel Alternatives would result in one non-residential displacement and the BRT Alternative would not result in any non-residential displacements, these alternatives would not affect the character or cohesion of the communities in which the improvements would be located.

Although the LRT Alternative would result in a number of nonresidential displacements, those displacements would not affect the character or cohesion of most of the communities in which the LRT Alternative improvements would be located (i.e., Alhambra, El Sereno, Irwindale, Monterey Park, Pasadena, and South Pasadena). However, in the unincorporated community of East Los Angeles, the LRT Alternative would result in the displacement of 17 businesses along Mednik Avenue just south of State Route 60 (SR 60), which may disrupt the social fabric of the community in this area. Based on the currently available properties for relocation, these businesses are not likely to be relocated in the immediate vicinity of their current locations. Due to the types of services these businesses offer (i.e., laundromat, drinking water, credit union, and restaurants), their location near the East Los Angeles Civic Center, and the high percentage of transit-dependent residents in the area, local residents are likely to rely on the services provided by these businesses on a day-to-day basis. Therefore, the displacement of 17 businesses would adversely affect the community character and cohesion of this part of East Los Angeles.

Relocations and Real Property Acquisitions

The TSM/TDM Alternative would result in 1 full parcel acquisition in Pasadena and 30 partial parcel acquisitions in Alhambra, Eagle Rock, Pasadena (which would not displace any existing land uses), Rosemead, San Gabriel, and South Pasadena. The TSM/TDM Alternative would also result in the displacement of 1 business with 6 employees that has a lease on a State-owned parcel in El Sereno. No residential relocations would be required.

The BRT Alternative would require no full parcel acquisitions and 45 partial parcel acquisitions in Alhambra, East Los Angeles, Monterey Park, Pasadena, and South Pasadena. No business or residential relocations would be required.

The LRT Alternative would result in 58 full parcel acquisitions in Alhambra, East Los Angeles, Monterey Park, Pasadena, and South Pasadena and 11 partial parcel acquisitions in Alhambra, East Los Angeles, El Sereno, Monterey Park, Pasadena, and South Pasadena. The property acquisitions would require 73 business relocations, which would displace 645 employees. In addition, displacement of 1 business with a lease on a State-owned parcel in El Sereno would displace 30 employees. No residential relocations would be required.

The Freeway Tunnel Alternative single-bore and dual-bore design variations would result in 1 full parcel acquisition in Alhambra. The single-bore and dual-bore design variations would result in 2 and 3 partial parcel acquisitions, respectively, in El Sereno. Both design variations would result in 1 full parcel acquisition in Alhambra, which would result in the relocation of 1 business and the displacement of 5 employees. Both design variations would also result in the displacement of 1 business with a lease on a State-owned parcel in El Sereno, which would displace 30 employees. No residential relocations would be required.

Traffic and Transportation

Temporary Effects. Construction of the improvements in the TSM/TDM Alternative would require lane width reductions, reductions in the number of lanes, and/or restrictions on the number of lanes during off-peak hours.

These restrictions would be relatively minor, and no detours are anticipated to be needed. Temporary lane restrictions and delays for the traveling public could occur in Alhambra, Eagle Rock, El Sereno, Glassell Park, Pasadena, Rosemead, San Gabriel, San Marino, South Pasadena, and the Unincorporated San Gabriel Valley Communities during construction of the TSM/TDM Alternative.

For the BRT Alternative, where widening or improvements are proposed on Atlantic Boulevard, Huntington Drive, and Fair Oaks Avenue in Alhambra, East Los Angeles, Monterey Park, and South Pasadena, temporary lane restrictions would be required, including lane width reductions, reductions in the number of lanes, and/or restrictions on the number of lanes during off-peak hours. No detours are anticipated to be required. Construction activities associated with the improvements under the BRT Alternative would result in minor delays for the traveling public.

Construction of the LRT Alternative could result in temporary lane restrictions at several locations. In addition, where the elevated alignment of the LRT would cross SR 60, I-710, or other roads, overnight closures of those roads would be required to accommodate the placement of concrete barriers adjacent to the median and the construction of falsework. Although no road closures are anticipated to require signed detour routes, the weekend full road closures would require public and driver notification to use alternative routes. Some construction activities associated with the improvements under the LRT Alternative would result in delays for the traveling public.

Construction of the single- and dual-bore design variations of the Freeway Tunnel Alternative would result in delays and detours for the traveling public in in the vicinity of the south tunnel portal in Alhambra, El Sereno, and Monterey Park, and in the City of Pasadena in the vicinity of the north tunnel portal. In addition, the construction of either design variation is anticipated to require temporary closures of the freeway on- and off-ramps, which may inconvenience the traveling public.

Construction of the TSM/TDM and BRT Alternatives would involve only minor street work (e.g., restriping or changes to curbs) and would be temporary and short in duration. The temporary loss of some on-street parking spaces during the minor street work construction would only result in very limited impacts to on-street parking availability. Temporary parking losses of 240 spaces would occur during construction of the LRT Alternative. All but 4 of those on-street parking spaces would be restored and available for use after construction is complete. The Freeway Tunnel Alternative would include construction on, and the temporary closure of, the Green Street Bridge, resulting in the temporary loss of 17 parking spaces on that bridge. At the completion of construction at the Green Street Bridge, all the parking spaces on that bridge will be restored and available for normal use.

Construction of the Build Alternatives may require temporary closures of sidewalks, crosswalks, and bicycle facilities to protect the safety of pedestrians, bicyclists, and construction workers. As a result, pedestrian and bicycle access routes and Americans with Disabilities Act accessibility would be temporarily disrupted during construction.

Permanent Effects. In 2035, the TSM/TDM, BRT, and LRT Alternatives would all result in minor increases in AM and PM peak-hour vehicle miles traveled (VMT). VMT is defined as the number of miles traveled by vehicles in a specific region (in this case, the project study area) for a specific time period (in this case, the AM and PM peak hours). The Freeway Tunnel Alternative single-bore design variation would result in a 110,000-mile (1.0 percent) increase in the combined AM and PM peak-period VMT. The Freeway Tunnel Alternative dual-bore design variation would result in a 210,000-mile (approximately 2.0 percent) increase in the combined AM and PM peak-period VMT, which is the most additional capacity and largest differences in mobility of all the Build Alternatives. By shifting trips to freeways, the

Freeway Tunnel Alternative would divert VMT off of local arterials, resulting in less cut-through traffic.

In 2035, the TSM/TDM, BRT, and LRT Alternatives would all result in either no change or very minor changes in AM and PM peak-hour vehicle hours traveled (VHT). VHT is defined as the number of hours spent traveling in a specific region (in this case, the project study area) for a specific time period (in this case, the AM and PM peak hours). The Freeway Tunnel Alternative single-bore design variation would result in a 4,000-hour (approximately 1.4 percent) reduction in total peak-period study area VHT. The Freeway Tunnel Alternative dual-bore design variation would result in a 7,000-hour (approximately 2.5 percent) reduction in VHT, which is the largest reduction in study area VHT of all the Build Alternatives.

In 2035, the TSM/TDM, BRT, and LRT Alternatives would all result in minor increases in daily north-south person trips though the study area. The Freeway Tunnel Alternative single-bore design variation would result in approximately half the increase in person throughput (trips) as the dual-bore operational variations. The Freeway Tunnel Alternative dual-bore design variation would result in the largest increase in the total north-south person throughput (trips) of all the Build Alternatives.

The Build Alternatives would result in increases in job accessibility of between 20,000 and 65,000 jobs compared to the No Build Alternative. The Freeway Tunnel Alternative would result in the highest increase in job accessibility due to the increased mobility and speed provided by the single-bore tolled operational variations.

In 2035, the TSM/TDM, BRT, and LRT Alternatives would all result in a minor decrease in freeway performance and modest increase in arterial performance. The Freeway Tunnel Alternative would have the largest increase in freeway and arterial performance, with the dual-bore design variation performing slightly better than the single-bore design variation.

In 2035, the truck VMT for the TSM/TDM, BRT, and LRT Alternatives is the same as for the No Build Alternative. For the Freeway Tunnel Alternative, the arterial system truck intensity generally decreases for all the design and operational variations. The freeway system truck intensity will be the same as or lower than the No Build Alternative, depending on the design and operational variation.

The potential for the Build Alternatives to result in adverse effects at intersections and on freeway segments is based on the level of service (LOS) criteria. The numbers of intersections and freeway segments projected to experience adverse effects under the Build Alternatives in 2035 are summarized in Table ES-1.

Typical Noise Barrier Along a Freeway

Visual/Aesthetics

The TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives would have short-term temporary impacts to visual quality during construction that would cease after completion of construction. Construction of the tunnel for the Freeway Tunnel Alternative would take up to approximately 5 years, and construction of the LRT Alternative could take up to approximately 6 years; therefore, the construction of the LRT and Freeway Tunnel Alternatives would result in temporary impacts to visual quality due to construction activities for a longer period than the TSM/TDM and BRT Alternatives. The TSM/TDM, BRT, and LRT Alternatives would result in moderate to moderately high visual impacts during construction while the Freeway Tunnel Alternative would result in moderately low to moderate visual impacts during construction. Existing land uses would not experience glare from night lighting during the construction of the tunnel and/or the associated freeway. Overall, construction activities would be temporary, and the visual impacts related to construction activities would cease after completion of construction.

The Build Alternatives would result in the following permanent visual impacts to Key Views:

- **TSM/TDM Alternative:** The TSM/TDM Alternative mainly involves minor improvements to existing roads and intersections without substantive changes in the physical facilities or views to and from these improvements. As a result, there would only be minor visible impacts to the environment under the TSM/TDM Alternative. Due to the low-profile (ground-level) nature of these improvements and the low perspective of potential viewers, the TSM/TDM Alternative would not result in permanent visual impacts. The TSM/TDM Alternative would also not result in permanent impacts related to views, light, glare, shade, and shadows. Seven noise barriers proposed for the TSM/TDM Alternative would result in potential visual impacts on the areas near the noise barriers.

- **BRT Alternative:** The BRT Alternative would result in the addition of new bus stops and signage that would not change the existing condition or the visual quality, and the overall resource change would be low. The operation of the BRT Alternative would result in a low permanent visual impact based on the visual quality, the resource change, the visual character and the viewer response to the implementation of this alternative. The BRT Alternative would also not result in permanent impacts related to views, light, glare, shade, and shadows. The BRT Alternative would result in no change to visual quality from the existing condition for the Key Views evaluated. Three noise barriers proposed for the BRT Alternative would result in potential visual impacts on the areas adjacent to the noise barrier.

- **LRT Alternative:** The LRT Alternative would result in a moderately low to moderate permanent visual impact based on the visual quality, the resource change, the visual character, and the viewer response to this alternative. The LRT Alternative would result in low permanent impacts related to views, light, glare, shade, and shadows. No noise barriers are proposed for the LRT Alternative. A new screen wall with a height of 8 feet is proposed along the perimeter of the LRT maintenance yard (which is proposed on both sides of Valley Boulevard at the terminus of SR 710) and would result in a moderate impact.

- **Freeway Tunnel Alternative:** The Freeway Tunnel Alternative would result in a moderately low to moderate permanent visual impact based on the visual quality, the resource change, the visual character, and the viewer response to the implementation of this alternative. The Freeway Tunnel Alternative would not result in permanent impacts related to light, glare, shade, and shadows. The Freeway Tunnel Alternative would result in moderately low to moderate visual changes. Four noise barriers proposed for the Freeway Tunnel Alternative dual-bore and single-bore design variations would have a visual impact on the adjacent area. Two additional preliminary noise barriers ranging in height from 12 to 20 feet are proposed only for the dual-bore design variation and would also have a visual impact on the adjacent area. The visual impacts as a result of the noise barriers would range from moderate to high, depending on the wall location, height, and affected viewer group.

Cultural Resources

There are 74 historic properties in the Area of Potential Effects (APE) for the Build Alternatives that are listed or eligible for listing in the National Register of Historic Places (National Register), including buildings, Historic Districts, and archaeological sites in the Cities of Los

Angeles, Monterey Park, Alhambra, South Pasadena, Pasadena, San Gabriel, Rosemead, and San Marino, and the unincorporated communities of East Los Angeles and El Sereno. There are an additional 10 properties that are historical resources pursuant to CEQA but are not listed or eligible for listing in the National Register. Based on the *Finding of Adverse Effect for the State Route 710 North Project*, the Build Alternatives would result in an adverse effect, a conditional no adverse effect, a no adverse effect, or no effect under NEPA, and a significant impact, less than significant impact with mitigation, less than significant impact, or no impact under CEQA on historic properties in the APE.

For all the Build Alternatives, there is potential for previously undocumented cultural materials or human remains to be unearthed during site preparation, grading, or excavation. Because there are no identified Native American sacred sites/Traditional Cultural Properties in the APE for the Build Alternatives, the construction and operation of the Build Alternatives would not result in impacts on those types of resources. **TSM/TDM Alternative:** The TSM/TDM Alternative would have an adverse effect on one historic property, no adverse effect on eight historic properties, and no effect on one historic property. The TSM/TDM Alternative would also have a significant impact on one historic resource.

BRT Alternative: The BRT Alternative would have an adverse effect on one historic property (due to the TSM/TDM components), a conditional no adverse effect on eight historic properties, no adverse effect on eight historic properties, and no effect on one historic property. The BRT Alternative would also have a significant impact on one historic resource (due to the TSM/TDM components).

LRT Alternative: The LRT Alternative would have an adverse effect on two historic properties (one adverse effect is due to TSM/TDM components), a conditional no adverse effect on four historic properties, no adverse effect on 14 historic properties, and no effect on one historic property. The LRT Alternative would also have a significant impact on two historic resources (one significant impact is due to the TSM/TDM components).

Freeway Tunnel Alternative: The Freeway Tunnel Alternative would have an adverse effect on five historic properties (one adverse effect is due to the TSM/TDM components), a conditional no adverse effect on seven historic properties, a no adverse on seven historic properties, and no effect on 33 historic properties. The Freeway Tunnel Alternative would also have a significant impact on five historic resources (one significant impact is due to the TSM/TDM components).

Air Quality

Temporary Effects. During construction of the Build Alternatives, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment during construction of the Build Alternatives are anticipated and would include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_X), volatile organic compounds (VOCs), ozone (O_3), directly-emitted particulate matter (particulate matter less than 10 and 2.5 microns in size [PM_{10} and $PM_{2.5}$, respectively]), and toxic air contaminants (TACs) such as diesel particulate matter plus diesel exhaust organic gases (diesel PM). Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of paving activities. Those odors would be quickly dispersed below detectable thresholds as the distance from the paving activities increases.

All the Build Alternatives would comply with applicable South Coast Air Quality Management District (SCAQMD) requirements related to the control of construction dust and equipment emissions.

Long-Term Effects. The proposed project is listed in the 2016 financially constrained RTP/Sustainable Communities Strategy (SCS) and the 2017 FTIP and amendments. The TSM/TDM Alternative was identified as the

Preferred Alternative and is exempt under 40 CFR 93.126 from conformity requirements.

The SR 710 North Project area is in a nonattainment area for the federal $PM_{2.5}$ standards and in an attainment/maintenance area for the federal CO and PM_{10} standards. CO hot spot analysis demonstrated that the Build Alternatives are not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards.

A $PM_{2.5}$ and PM_{10} hot-spot form (May 2014) was submitted to and reviewed by the Transportation Conformity Working Group (TCWG). The TCWG determined that the TSM/TDM, BRT, and LRT Alternatives are not Projects of Air Quality Concern (POAQC). The Freeway Tunnel Alternative single-bore and dual-bore design variations are considered POAQCs. If the Freeway Tunnel Alternative with either the single-bore or dual-bore design variation was identified as the Preferred Alternative, a quantitative PM hot-spot analysis would have been conducted to demonstrate that the project would not delay attainment of, worsen existing violation of, or cause an exceedance of the $PM_{2.5}$ or PM_{10} NAAQS, and meets conformity requirement.

The TSM/TDM Alternative was identified as the Preferred Alternative. Based on the above discussion, the TSM/TDM Alternative was determined not to be a POAQC through TCWG interagency consultation and is exempt from conformity requirements. Therefore, the Project would not be expected to cause or contribute to new localized $PM_{2.5}$ and PM_{10} violations or increase frequency or severity of existing violations. $PM_{2.5}$ and PM_{10} hot spot analyses were performed for the Freeway Tunnel Alternative based on the EPA *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (November 2013). This modeling demonstrates that the highest 24-hour $PM_{2.5}$, annual hour $PM_{2.5}$, and annual hour PM_{10} concentrations for both design variations of the Freeway Tunnel Alternative would not exceed the 2025 and 2035 No Build Alternative concentrations.

The Build Alternatives would not generate new vehicular traffic trips because it would not construct new homes or businesses. However, there is a possibility that some traffic currently using other routes would use the new facilities, thereby increasing VMT and vehicle emissions in the project area.

In 2020/2025 and 2035, the regional criteria pollutant emissions for all Build Alternatives would be lower than existing condition emissions, with the exception of the Freeway Tunnel Alternative dual-bore design variation PM_{10} emissions in 2035. The 2020/2025 regional criteria pollutant emissions for the Build Alternatives would be lower than the 2020/2025 No Build Alternative emissions with exception of the following:

- TSM/TDM PM_{10} emissions
- Freeway Tunnel Alternative single-bore design variation PM_{10} and $PM_{2.5}$ emissions
- Freeway Tunnel Alternative dual-bore design variation CO and ROG emissions

The 2035 regional criteria pollutant emissions for the Build Alternatives would be lower than the 2035 No Build Alternative emissions with exception of the following:

- TSM/TDM, BRT, and LRT, and Freeway Tunnel Alternative (dual-bore) CO, NO_X, PM_{10}, and $PM_{2.5}$ emissions
- Freeway Tunnel Alternative single-bore design variation PM_{10} and $PM_{2.5}$ emissions

A substantial decrease in mobile source air toxics (MSAT) emissions can be expected between the existing (2012) and future (2020, 2025, and 2035) No Build Alternative. The 2020/2025 MSAT emissions for the Build Alternatives would be lower than the 2020/2025 No Build emissions with the exception of diesel PM emissions for the LRT and Freeway Tunnel Alternatives. The 2035 MSAT emissions for the Build Alternatives would be lower than the 2035 No Build emissions with the exception of diesel PM emissions for the TSM/TDM, BRT, and Freeway Tunnel Alternatives. While the Build

Alternatives would result in a small increase in localized MSAT emissions, the EPA vehicle and fuel regulations, coupled with fleet turnover, would result in substantial reductions over time that would cause regionwide MSAT levels to be substantially lower than they are today.

The EPA and FHWA have not issued explicit guidance or methods to conduct project-level greenhouse gas (GHG) analysis. The four strategies set forth by the FHWA to lessen climate change impacts (i.e., improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of VHT) correlate with efforts that the State of California has undertaken and is undertaking to deal with transportation and climate change.

Construction Impacts

For all Build Alternatives, both typical and resource-specific construction impacts could occur. Construction impacts typical to all of the Build Alternatives include delays from lane closures and narrowing, roadway drainage pattern alterations, waste from roadway widening, and short-term increases in noise levels and air pollutant emissions. Resource-specific construction impacts are listed below:

- **Land Use:** Construction of the Build Alternatives would temporarily affect nearby land uses and would include disruption of local traffic patterns and access to residences and businesses; temporary construction easements; increased traffic congestion; and increased noise, vibration, and dust.
- **Parks and Recreation:** Parks, recreation resources, and bikeways within 500 feet of the physical improvements of the Build Alternatives that would be constructed at or above the ground surface would be subject to short-term air quality, noise, and traffic/access impacts. In some cases, on-street bikeways in the vicinity of the Build Alternative improvements may need to be temporarily rerouted around construction zones. Detoured on-street bikeways would be restored to their original condition at the completion of construction. The BRT Alternative would require the temporary use of 0.02 acre for a TCE during project construction and the permanent acquisition of 0.011 acre of Cascades Park in Monterey Park.
- **Community Character and Cohesion:** Construction of the improvements for the Build Alternatives is anticipated to result in short-term access disruptions related to construction and therefore result in a short-term impact to community character and cohesion. A Traffic Management Plan (TMP) would be implemented during construction with minimal interference to the traveling public. In addition, construction jobs would be created by the construction of the Build Alternatives.
- **Environmental Justice:** Construction activities would potentially temporarily affect environmental justice populations and non-environmental justice populations in the study area. However, construction activities would provide jobs, which would benefit local economies that include minority and low-income populations.
- **Utilities and Emergency Services:** Construction activities that require closures of travel lanes and ramps could result in traffic delays that could affect the ability of fire, law enforcement, and emergency service providers to meet response time goals within the Study Area. Measures will be implemented to protect utilities in-place to avoid utility service disruptions.
- **Traffic Circulation/Transportation:** During construction, the Build Alternatives would result in temporary impacts to traffic circulation due to traffic diversions resulting from temporary closures to local roadways, sidewalks and bikeways, and freeway lanes and ramps. A TMP will be implemented to address changes in traffic flows and provide measures to minimize the effects of construction activities on traffic flows and travel within the Study Area.
- **Visual/Aesthetics**: Short-term visual impacts under the Build Alternatives would occur during the construction period and would include removal of existing structures and vegetation, construction of the Build Alternative improvements, construction vehi-

cles, and construction staging areas. Construction activities are temporary, and the visual impacts related to construction activity would cease after completion of construction.

- **Hydrology/Floodplains:** Construction impacts would only affect the Laguna Regulating Basin and Dorchester Channel (dual-bore design variation only) under the Freeway Tunnel Alternative. Land and vegetation would be cleared, exposing soil to the potential for erosion and downstream transport of sediments to occur.
- **Water Quality:** Events such as the accidental discharge of waste products produced during construction are of primary concern. Other concerns, such as disturbed soil and erosion; runoff from the construction site; and groundwater de-watering (LRT and Freeway Tunnel Alternative) are potential issues during construction of the Build Alternatives. Standard construction practices require the capture and treatment of all runoff from the construction area.
- **Geology, Soils, Seismic, and Topography:** Construction activities related to the Build Alternatives may result in temporary impacts including the potential for minor ground settlement. The construction activities associated with the proposed Build Alternatives could potentially be affected by ground motion, liquefaction, and fault-induced ground rupture if an earthquake were to occur during construction, although the probability is low.
- **Paleontology:** Earth-moving operations could result in the destruction of fossils and fossiliferous rock units within the construction disturbance limits. These types of impacts can be partially mitigated by collecting and preserving a representative sample of the entire fossil assemblage and associated geological information in the areas disturbed by project construction.
- **Hazardous Waste:** There is potential for all four Build Alternatives to encounter hazardous materials during ground-disturbing activities. Hazardous materials that may be encountered during construction of the Build Alternatives include aerially deposited lead (ADL); asbestos-containing materials (ACMs), polychlorinated biphenyls (PCBs), and/or lead-based paint (LBP); and elevated concentrations of metals such as lead.
- **Air Quality/Greenhouse Gases:** During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, NOX, volatile organic compounds (VOCs), PM_{10}, $PM_{2.5}$, toxic air contaminants, and GHGs.
- **Construction Noise:** The operation of equipment and other related activities will result in temporary noise impacts during construction of the Build Alternatives. These noise levels would vary depending on the types of equipment and construction activities occurring at a specific time. These impacts would be temporary and would cease when construction of the Build Alternatives is completed.
- **Energy:** Construction equipment and construction worker vehicles operating during construction of the Build Alternatives would use fossil fuels. This increased fuel consumption would be temporary, would cease at the end of construction activities, and would not have a residual requirement for additional energy input. The marginal increases in fossil fuel use resulting from project construction are not expected to have appreciable impacts on energy resources.
- **Wetlands/Other Waters:** Temporary impacts to jurisdictional areas may occur during construction where wetlands or waters are temporarily disturbed during construction of the Freeway Tunnel Alternative
- **Plant Species:** Temporary impacts to populations of special-status plant species and trees protected by local ordinances could occur under the LRT and Freeway Tunnel Alternative
- **Animal Species:** Temporary impacts to animal species may occur during construction where habitats

are temporarily disturbed during grading or other construction-related activities. Temporary indirect construction effects to animal species are expected as a result of construction noise, light, vibration, dust, and human encroachment.

- **Threatened & Endangered Species**: Temporary impacts to threatened and/or endangered species may occur during construction where habitats are temporarily disturbed during grading or other construction-related activities. Temporary construction effects to listed species are expected as a result of construction noise, light, vibration, dust, and human encroachment.
- **Invasive Species:** Construction of the SR 710 Build Alternatives has the potential to spread invasive species through the entering and exiting of construction equipment contaminated by invasive species, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species so that its seed is spread through construction equipment.
- **Cumulative Impacts:** Temporary cumulative impacts as a result of the Build Alternatives, in combination with other past, present, and reasonably foreseeable future projects, are anticipated to occur if projects are under construction concurrently. Temporary impacts described above sections, as well as impacts for other projects in the Study Area, will be minimized or mitigated and will, therefore, not have an cumulative impact on humans or the physical environment. Additionally, it is possible that, if more than one project is being constructed in the same general area, there could be a cumulative effect on consumption of local resources such as fuel, energy, construction materials, etc. Temporary cumulative impacts to traffic and circulation can also result from the construction of more than one project in a general area. In this case, TMPs for each project will be coordinated to ensure adequate circulation in the area.

Summary of Significant Unavoidable Adverse Impacts Under CEQA

Even with implementation of the proposed mitigation measures, some of the project impacts identified would still remain significant, a summary of which is provided below.

Land Use and Planning

Conflict with Land Use Plans

The four Build Alternatives would result in the permanent acquisition and conversion of land currently planned for non-transportation uses into transportation uses, which would result in inconsistencies with land use designations in local jurisdictions' General Plans. If a Build Alternative is selected for implementation, those inconsistencies would exist until the applicable local General Plans are amended to reflect the use of the affected land for transportation improvements in the selected Build Alternative. Neither Metro nor Caltrans has land use planning authority, and neither has authority to require local jurisdictions to amend their General Plans. Therefore, it will be the decision of the affected local jurisdictions on how and when to address the identified General Plan land use inconsistencies. However, because it is generally desirable that the General Plans be consistent with existing conditions, Metro and Caltrans will request that the applicable local jurisdictions amend their General Plans to reflect the permanent use of land for the improvements included in the selected Build Alternative, as specified in Measure LU-1. However, because Metro and Caltrans have no authority to require a General Plan amendment, a significant unavoidable impact would remain until the General Plans are amended.

Transportation and Traffic

The TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives would result in impacts to study area intersections and freeway segments in 2035. Improvements to address those impacts are not proposed at all the impacted intersections and freeway segments because some of the improvements would result in increased full and partial property acquisitions, would require substantial physical or structural improvements (bridges, overcrossings, retaining walls, grade-separated roundabouts or flyovers, and/or tieback walls) that could result in additional environmental effects, would provide only nominal congestion relief in a limited area, would result in relatively minor improvement in traffic operations, and/or could have potential effects on Union Pacific Railroad (UPRR) rail operations. As a result, the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives would all result in significant impacts on study area intersections and freeway segments that cannot be mitigated to below a level of significance under CEQA.

Visual/Aesthetics

The I-710 corridor currently has an open view, with vegetation and office buildings on the east and an undeveloped steep slope on the west. However, under the LRT Alternative, the elevated light rail line would run diagonally across the freeway at a height of approximately 25 feet above the road. The visual quality of this view would be reduced because the proposed LRT Alternative facility would block most of the view to the San Gabriel Mountains in the distance as it crosses over the freeway.

As shown on Figure ES-11, Key View 13-LRT would experience a major reduction in visual quality because a narrow concrete median would be installed to accommodate the concrete columns for the LRT Alternative overhead. A safety railing would also be built on top of the elevated track, resulting in the view being dominated by high retaining walls and the LRT Alternative overpass. The overall visual change would be major. Therefore, the visual quality would be reduced due to the proposed installation of the elevated LRT Alternative facility.

Based on the above discussion, the LRT Alternative would have a significant visual impact, specifically at Key Views 13-LRT and 9-LRT (Figures ES-11 and ES-12, respectively).

The construction of the Build Alternatives would result in significant adverse impacts on historical resources. The TSM/TDM Alternative would result in significant unavoidable adverse impacts on one historical resource (Arroyo Seco Parkway Historic District). The BRT, LRT, and Freeway Tunnel Alternatives would all also result in significant unavoidable adverse impacts on the Arroyo Seco Parkway Historic District as a result of the inclusion of that component of the TSM/TDM Alternative in those Build Alternatives. The BRT Alternative would not result in significant unavoidable adverse impacts on any other historical resources. The LRT Alternative would result in

Figure ES-11: View Simulation of the LRT Alternative at the Maintenance Yard (Key View 13-LRT)

Figure ES-12: View Simulation of the LRT Alternative at Floral Drive (Key View 9-LRT)

significant unavoidable adverse impacts on one additional historical resource, the Maravilla Handball Court and El Centro Grocery (counted as one historic resource). The Freeway Tunnel Alternative would result in significant unavoidable adverse impacts on four additional historical resources (Markham Place Historic District, Caroline Walkley House and Small Apartment, Driscoll House, and the Neighborhood Church/ Sequoyah School).

Paleontological Resources

All of the Build Alternatives involve some amount of ground disturbance that may impact paleontological resources. In particular, the LRT and Freeway Tunnel Alternatives involve excavations using traditional methods, such as excavators and backhoes, as well as excavations using a TBM, which prevents access to the rock face and grinds the soil and rock. However, the size of the pieces of rock recovered from the TBM will vary from approximately silt to cobble size and is dependent on the type of TBM used during excavation for the portals and underground stations, fossil recovery would not be limited. To reduce impacts to paleontological resources that may be present in the areas proposed for grading and excavation for the Build Alternatives, Measure PAL 1 requires the preparation of a detailed Paleontological Mitigation Plan (PMP) for the Freeway Tunnel Alternative or Paleontological Resources Impact Mitigation Program (PRIMP) for the TSM/TDM, BRT, and LRT Alternatives during final design and implementation of the PMP or PRIMP during construction. Measure PAL-1 requires monitoring during construction, collection of fossils, documentation/recording of the fossils, and curation of the fossils in a permanent repository. Measure PAL-1 requires training of construction staff regarding procedures in the event fossils are encountered during construction.

Although construction would be a short-term activity, even with implementation of Measure PAL-1, depending on the type of TBM used, the loss of fossil remains and the fossil-bearing soil and rock formations from the tunnel boring would be a permanent, significant unavoidable impact of the LRT and Freeway Tunnel Alternatives based on the scientific significance of formations in the study area.

Cumulative Impacts

The Build Alternatives, when combined with other cumulative projects, would contribute to impacts that are not fully mitigated or offset and that were determined to contribute to unavoidable significant cumulative impacts to:

- **Visual (LRT Alternative only):** The LRT Alternative proposes an elevated track alignment and stations in unincorporated East Los Angeles, and the Eastside Transit Corridor proposes at-grade segments and stations in East Los Angeles and aerial segments and stations just to the east in the City of Monterey Park. Although it is anticipated that, to the extent feasible, the new features constructed as part of these projects would be visually compatible with the surrounding areas, it would still result in a large visual change to the area, and cumulative visual impacts would be significant and unavoidable.

Coordination with the Public and Other Agencies

Early and continuous coordination with the general public and public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation and the level of analysis required and to identify potential impacts and avoidance, minimization, and/or mitigation measures and related environmental requirements. To date, Metro has conducted 92 community meetings, participated in six-sponsored community forums, and held over 200 briefings with community stakeholders. Metro and Caltrans are fully committed to an open and transparent process. The following describes the opportunities for public participation conducted for this project:

- **Scoping Process:** The scoping process for the SR 710 North Project was initiated with the preparation and distribution of a Notice of Preparation (NOP) and the publication of a Notice of Intent (NOI) in the Federal Register. The formal scoping process period was initiated on March 3, 2011, and ended on April 14, 2011. The NOP was posted at the State Clearinghouse (SCH No. 1982092310) and was circulated to public agencies and other interested parties in compliance with Section 15082 of the CEQA Guidelines on March 3, 2011. The NOI was published on March 3, 2011, in the Federal Register in compliance with Federal Regulation 40 CFR 1508.28. In addition to the NOP/NOI, eight scoping meetings were held as part of the scoping process.
- **SR 710 Conversation Series Meetings:** This series of public meetings held in early 2011 were intended to provide broad overviews of the history of the SR 710 North and the key steps in the environmental process. Each meeting was offered in a number of cities and communities in the overall study area.

Community Outreach Meeting in the Study Area

- **Legislative and Municipal Government Meetings:** Briefings with elected officials representing State, federal, and local government were conducted throughout the study process. The objective was to keep officials apprised of major study milestones and to obtain their feedback regarding outreach to their constituencies.
- **Stakeholder Outreach Advisory Committee (SOAC) Meetings:** The SOAC is composed of elected or appointed officials from the jurisdictions in the study area. The SOAC meetings were held approximately quarterly and were intended to provide updated information on the project engineering, the progress of the technical studies, and the public outreach activities.
- **Technical Advisory Committee (TAC) Meetings:** The TAC is composed of representatives from public works, engineering, and planning departments in the cities and other agencies in the study area. These meetings were typically held quarterly and were intended to provide updated information on the project engineering and environmental planning tasks, the project schedule, and to discuss issues and concerns.
- **All Communities Convening (ACC) Information Sessions and Open House Meetings:** The ACC is composed of interested members of the general public. The ACC Information Sessions and Open House meetings were held in communities throughout the study area. The purpose of the meetings was to provide general information related to the Build Alternatives under consideration, alternatives withdrawn from consideration, and topics to be evaluated in the EIR/EIS. Attendees were offered opportunities to provide verbal and written comments at the meetings.
- **Community Liaison Council (CLC) Meetings:** The CLCs consisted of representation from each community in the study area to reflect the ethnic and cultural diversity among the communities as well as the diversity of interests of residents, local businesses, major employers, community leadership, etc. The role of this Council was to keep the project team informed on the success of outreach and to provide recommendations for outreach. Meetings were held with the CLC from April 2012 to August 2013.

Community Outreach Meeting in the Study Area

- **Other Sources of Information Regarding the SR 710 North Project:** In addition to the meetings and public information/comment opportunities described above, Metro used social media platforms (Facebook and Twitter) and a project-specific page on their website for the SR 710 North Project to provide updated project information to all interested parties. These electronic information sources are updated as appropriate to ensure that current project-related information is available.

  The Draft EIR/EIS prepared for this project was circulated for public review between March 5, 2015 and August 5, 2015. Caltrans, in cooperation with Metro, held five public hearings at various locations from April through June 2015 (see details in Chapter 5 and Volume III). The Focused RDEIR/SDEIS was circulated for public review between May 21, 2018 and July 5, 2018. Caltrans, in cooperation with Metro, held one public hearing on June 13, 2018. All comments received during the public review period of the Draft EIR/EIS and Focused RDEIR/SDEIS were considered.

- **Section 106 Outreach**: Starting in early 2013, Caltrans and Metro reached out to a large number of individuals, organizations, and other parties that were potentially interested in participating in the Section 106 process for the project, including Native American Tribes. That coordination and consultation effort is described in detail in Chapter 5 in the EIR/EIS, in the *Historic Property Survey Report* (2015), and in the *Finding of Adverse Effect* (2017). This included representatives from public agencies, historic associations, museums, and local community groups as well as representatives from several Native American Tribes. Input solicited from these parties was specifically related to known cultural and historic properties in the project study area and their concerns regarding possible project effects on those properties. The Section 106 outreach process overlapped with and was part of the outreach efforts under CEQA and NEPA. This included outreach conducted during the public circulation period for the Draft EIR/EIS. As part of the 106 process, the following parties requested to be consulting parties for the project, pursuant to 36 CFR 800.2(c)(5): City of South Pasadena, Los Angeles Conservancy, West Pasadena Residents' Association, Sequoyah School, National Trust for Historic Preservation, Pasadena Heritage, and No on 710 Action Committee. These consulting parties have been involved throughout the Section 106 process.

Permits and Approvals

Depending on the Alternative, some or all of the permits, reviews, and approvals shown in Table ES-2 would be required for project construction and operation. (Table ES-2 is provided following the last page of Table ES-1 at the end of this Executive Summary.) The applicability of the permits, reviews, and approvals to each Build Alternative is also shown in Table ES-2.

Areas of Controversy and Unresolved Issues

Based on public input received during scoping in early 2011 as well as ongoing public outreach efforts, the following summary of public concerns is provided. These particular concerns and other comments received during scoping and outreach activities were considered during preparation of the EIR/EIS.

- **Purpose and Need**
  - Some parties have made assertions that the project need is not sufficiently defined or supported by data
  - Some parties have claimed the SR 710 North Project will invite trucks to travel through the project area for goods transport to/from the Ports of Los Angeles and Long Beach

- **Alternatives**
  - Keep all modal options on the table (TSM/TDM; surface, subsurface, and elevated structures; transit [bus and rail], freight management systems, advanced technologies, no build)
  - Need for a cost/benefit analysis
  - Cost of the Freeway Tunnel Alternative has been underestimated
  - Rationale for the single-bore design variation for the Freeway Tunnel Alternative

    Alternatives analysis process identifying alternatives to be evaluated in the Draft EIR/EIS was flawed and biased toward freeway alternatives
  - Safety within the tunnels and at tunnel portals
  - Constructability of tunnels of this size and potential for machinery malfunction
  - Locations of the materials disposal site/sites for the LRT and Freeway Tunnel Alternatives
- **Environmental Impacts of the Alternatives**
  - Concerns regarding the environmental effects of each Build Alternative on the affected communities, the primary concerns of which have been traffic, noise, air quality, health risk, and effects on historic properties
  - Environmental justice concerns regarding the elevated section of the LRT in East Los Angeles
  - Effects on communities during construction

Caltrans and Metro are continuing to work with the affected communities to resolve concerns through the ongoing community participation framework for the SR 710 North Project.

As noted earlier, Table ES-1 is provided starting on the following page. Table ES-1 provides a brief comparison of the impacts associated with each of the Build Alternatives based on the environmental and technical studies conducted for the project. Table ES-1 also describes avoidance, minimization, and mitigation measures included in the Build Alternatives to address the adverse environmental impacts of those alternatives. The information in Table ES-1 is based on the analyses and other information documented in the Final EIR/EIS and the technical studies in support of the EIR/EIS for the SR 710 North Project.

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Table ES-1: Summary of Potential Environmental Impacts of the Build Alternatives and Measures Addressing Those Effects

TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
LAND USE				
• Direct, construction-related effects on existing land uses • Air quality, noise, traffic/access, and/or parking effects on community facilities, parks, recreation resources, and bikeways within 500 feet of the physical improvements • Temporary construction easements on approximately 16 parcels	• Direct, construction-related effects on existing land uses • Air quality, noise, traffic/access, and/or parking effects on community facilities, parks, recreation resources, and bikeways within 500 feet of the physical improvements • Temporary construction easements on approximately 36 parcels • Temporary occupancy of approximately 0.02 acre of land in Cascades Park and permanent incorporation of approximately 0.011 acre of land from Cascades Park	• Direct, construction-related effects on existing land uses • Air quality, noise, traffic/access, and/or parking effects on community facilities, parks, recreation resources, and bikeways within 500 feet of the physical improvements • Temporary construction easements on approximately 13 parcels • Temporary loss of approximately 240 parking spaces	• Direct, construction-related effects on existing land uses • Air quality, noise, traffic/access, and/or parking effects on community facilities, parks, recreation resources, and bikeways within 500 feet of the physical improvements • **Single-Bore:** Temporary construction easements on approximately 52 parcels • **Dual-Bore:** Temporary construction easements on approximately 47 parcels • Temporary loss of approximately 17 parking spaces	• **Cascades-1 – Temporary Construction Easements:** Return land in Cascades Park that would be occupied for temporary construction easements to a condition that is at least as good as that which existed prior to the project, and clearly sign temporary pedestrian detours prior to the intersections of Atlantic Boulevard and El Portal Place to avoid making pedestrians backtrack to get to a safe crossing.
• Acquisition of approximately 0.6 acre and conversion of land currently planned for non-transportation uses into transportation uses, which would require amendment of General Plans • Loss of approximately 26 on-street parking spaces during the weekday AM and PM peak periods and the permanent loss of approximately 220 on-street parking spaces during all hours • Inconsistency with individual policies, objectives, and program goals in the City of Alhambra, City of Los Angeles, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan • Two aerial easements related to bridge construction • Noise effects to approximately six parks and recreation resources	• Acquisition of approximately 0.3 acre and conversion of land currently planned for non-transportation uses into transportation uses, which would require amendment of General Plans • Loss of approximately 1,029 on-street parking spaces during the weekday AM and PM peak periods and the permanent loss of approximately 114 on-street parking spaces during all hours • Inconsistency with individual policies, objectives, and program goals in the City of Alhambra, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan • Noise effects on approximately four parks and recreation resources	• Acquisition of approximately 18.0 acres and conversion of land currently planned for non-transportation uses into transportation uses, which would require amendment of General Plans • Loss of approximately four on-street parking spaces • Inconsistency with individual policies, objectives, and program goals in the City of Alhambra, City of Los Angeles, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan • Tunnel easements beneath approximately 183 parcels, permanent aerial easements above approximately 12 parcels, and permanent subsurface easement beneath approximately 1 parcel • Noise effects to approximately one park	• Acquisition of 1.5 acres and conversion of land currently planned for non-transportation uses into transportation uses, which would require amendment of General Plans • Inconsistency with individual policies, objectives, and program goals in the City of Alhambra and City of South Pasadena General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan • **Single-Bore:** Tunnel easements under approximately 324 parcels, footing easements on approximately 3 parcels, and subsurface easements beneath approximately 32 parcels • **Dual-Bore:** Tunnel easements under approximately 563 parcels, subsurface easements under approximately 41 parcels, footing easements on 3 parcels, and a maintenance easement on 1 parcel	• **Parks-1 – Compliance with the Public Park Preservation Act:** Provide compensation for the acquisition of land from Cascades Park. • **Cascades-2 – Permanent Incorporation of Land:** Replacement of the sidewalks, shrubs, and/or trees in Cascades Park after consultation with the City of Monterey Park. • **LU-1 – General Plans:** Request the applicable local jurisdictions to amend their General Plans and/or other local land use plans after the acquisition of land for the selected alternative to reflect the improvements in that Build Alternative. • **LU-2 – RTP/SCS and FTIP:** Coordinate with the Southern California Association of Governments on needed amendments to the next cycle of the RTP/SCS and FTIP if needed.
GROWTH				
No impact. Although the SR 710 Build Alternatives will improve mobility and circulation, the study area is largely built out, and none of the Build Alternatives provide new access to undeveloped or underdeveloped areas. In addition, the improved mobility and accessibility resulting from the improvements associated with each of the Build Alternatives would be insufficient to attract new development to areas not already proposed for development or to modify the type, location, or timing of developments in those areas. Therefore, the SR 710 North Project is not expected to result in unplanned growth in the study area.				No avoidance, minimization, and/or mitigation measures are required.
COMMUNITY IMPACTS				
Community Character and Cohesion				
• Temporary and permanent air quality, noise, traffic/access, and/or parking effects to community facilities within 500 feet of the Build Alternatives • Minor temporary lane restrictions during construction	• Temporary and permanent air quality, noise, traffic/access, and/or parking effects to community facilities within 500 feet of the Build Alternatives • Temporary lane restrictions during construction	• Temporary and permanent air quality, noise, traffic/access, and/or parking effects to community facilities within 500 feet of the Build Alternatives • Temporary lane restrictions during construction • Overnight closures along the elevated segments • Displacement of approximately 17 businesses along Mednik Avenue in East Los Angeles	• Temporary and permanent air quality, noise, traffic/access, and/or parking effects to community facilities within 500 feet of the Build Alternatives • Temporary lane restrictions during construction • Temporary delays and detours for the traveling public at multiple locations in the study area during construction • Permanent approximately 0.6 acre easement • Permanent acquisition of approximately 1.0 acre of land	• **CI-1 – Property Acquisition:** All acquisition of property for improvements in the Build Alternatives will be conducted in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) of 1970 as amended. • **T-1 –** Transportation Management Plan • **AQ-1 –** Fugitive Dust • **AQ-2 –** Equipment and Vehicle Emissions • **AQ-3 –** Diesel Fuel Emissions and Sensitive Receptors

Table ES-1: Summary of Potential Environmental Impacts of the Build Alternatives and Measures Addressing Those Effects

TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
				• **N-1 –** Construction in State Right of Way • **N-2 –** Construction Outside State Right of Way • **N**-3 – Tunnel Boring Machine • **N-4 –** Supply and Muck Trains • **N-5 –** Ground-Borne Noise and Vibration • **V-1 –** Vividness • **V-2 –** Intactness • **V-3 –** Unity • **V-4 –** Walls with Aesthetic Treatments • **V-5 –** Built Structures • **V-6 –** Landscaping • **V-7 –** Short-Term Visual
Relocation				
• Temporary construction easements on approximately 16 parcels • Creation of approximately 1,400 person-year jobs • Generate approximately $64.7 million (in 2010 dollars) in employment earnings	• Temporary construction easements on approximately 36 parcels • Creation of approximately 3,100 person-year jobs • Generate approximately $148.6 million (in 2010 dollars) in employment earnings	• Temporary construction easements on approximately 13 parcels • Creation of approximately 31,500 person-year jobs • Generate approximately $1.5 billion (in 2010 dollars) in employment earnings	**Single-Bore** • Temporary construction easements on approximately 52 parcels • Creation of approximately 41,100 person-year jobs • Generate $1.9 billion (in 2010 dollars) in employment earnings **Dual-Bore** • Temporary construction easements on approximately 47 parcels • Creation of approximately 73,700 person-year jobs • Generate approximately $3.5 billion (in 2010 dollars) in employment earnings	No avoidance, minimization, and/or mitigation measures are required.
• Displacement of 1 business with 6 employees on a leased State-owned parcel • 1 full parcel acquisition • Approximately 30 partial parcel acquisitions, none of which would result in the displacement of businesses or employees • Creation of approximately 300 person-year jobs • Generation of approximately $10.5 million per year (in 2010 dollars) in employment earnings • Loss of approximately $1,000 in annual property tax revenue and approximately $1,939 in sales tax revenue	• Approximately 45 partial parcel acquisitions • Creation of approximately 600 person-year jobs • Generation of approximately $19.6 million (in 2010 dollars) per year in employment earnings • Loss of approximately $2,111 in annual property tax revenue and approximately $1,939 in sales tax revenue	• Displacement of 1 business with 30 employees on a leased State-owned parcel • 58 full parcel acquisitions and approximately 11 partial parcel acquisitions, requiring the relocation of approximately 73 businesses and resulting in the displacement of approximately 645 employees • Creation of approximately 1,300 person-year jobs • Generation of approximately $45.4 million (in 2010 dollars) per year in employment earnings • Loss of approximately $50,885 in annual property tax revenue and approximately $75,425 in sales tax revenue	• Displacement of 1 business with 30 employees on a leased State-owned parcel (single-bore and dual-bore) • 1 full parcel acquisition, requiring the relocation of approximately 1 business and the displacement of approximately 5 employees (single-bore and dual-bore) • Approximately 2 and 3 partial parcel acquisitions (single-bore and dual-bore, respectively) • **Single-Bore** – Approximately 800 to 900 person-year jobs – Generation of approximately $28.6 million to $32.1 million (in 2010 dollars), respectively, per year in employment earnings • **Dual-Bore** – Approximately 1,000 to 1,200 person-year jobs – Generation of approximately $33.5 million to $41.2 million (in 2010 dollars), respectively, per year in employment earnings • Loss of approximately $1,042 in annual property tax revenue and no loss of sales tax revenue (single-bore and dual-bore)	• **CI-1 – Property Acquisition:** All acquisition of property for improvements in the Build Alternatives will be conducted in compliance with the Uniform Act.

Table ES-1: Summary of Potential Environmental Impacts of the Build Alternatives and Measures Addressing Those Effects

TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
Environmental Justice				
None of the Build Alternatives would result in disproportionate impacts on environmental justice populations.	None of the Build Alternatives would result in disproportionate impacts on environmental justice populations.	None of the Build Alternatives would result in disproportionate impacts on environmental justice populations.	None of the Build Alternatives would result in disproportionate impacts on environmental justice populations.	• **CI-1 – Property Acquisition:** All property acquisition for the Build Alternatives will comply with the Uniform Act.
UTILITIES AND EMERGENCY SERVICES				
All of the Build Alternatives would potentially result in temporary utility relocation and emergency services delays during construction.	All of the Build Alternatives would potentially result in temporary utility relocation and emergency services delays during construction.	All of the Build Alternatives would potentially result in temporary utility relocation and emergency services delays during construction.	All of the Build Alternatives would potentially result in temporary utility relocation and emergency services delays during construction.	• **T-1 – Transportation Management Plan:** To address short term adverse transportation impacts during construction, the TMP would be implemented.
TRAFFIC AND TRANSPORTATION/PEDESTRIAN AND BICYCLE FACILITIES				
• Temporary closures of sidewalks, crosswalks, and bicycle facilities to protect pedestrians, bicyclists, and construction workers; Americans with Disabilities Act accessibility would be affected during those closures. • Lane restrictions that may impact access and circulation at approximately 24 individual locations • Loss of some on-street parking spaces during minor street work	• Temporary closures of sidewalks, crosswalks, and bicycle facilities to protect pedestrians, bicyclists, and construction workers; Americans with Disabilities Act accessibility would be affected during those closures. • Lane restrictions that may impact access and circulation at approximately 24 individual locations (all from the TSM/TDM Alternative improvements) • Lane restrictions during off-peak hours at approximately 6 locations • Loss of some on-street parking spaces during minor street work	• Temporary closures of sidewalks, crosswalks, and bicycle facilities to protect pedestrians, bicyclists, and construction workers; Americans with Disabilities Act accessibility would be affected during those closures. • Lane restrictions that may impact access and circulation at approximately 29 locations (24 from the TSM/TDM Alternative improvements and 5 additional locations) • Lane restrictions during utility relocations and temporary road deck installation and removal • Delays from haul route disposal traffic • Weekend full road closures • Overnight closures where the elevated alignment would cross SR 60, SR 710/I-710, or other roads to accommodate placement of concrete barriers • Loss of on-street parking spaces	• Temporary closures of sidewalks, crosswalks, and bicycle facilities to protect pedestrians, bicyclists, and construction workers; Americans with Disabilities Act accessibility would be affected during those closures. • Lane restrictions that may impact access and circulation at approximately 24 individual locations (from the TSM/TDM Alternative improvements) • Delays at several locations in the vicinity of the south and north tunnel portals • Construction-related closures of freeway on- and off-ramps • **Single-Bore Temporary Closures:** Five on northbound SR 710, seven on southbound SR 710, and one on westbound I-210 • **Dual-Bore Temporary Closures:** Five on northbound SR 710, five on southbound SR 710, and two on westbound I-210 • Delays from haul route disposal traffic • Closure of on-street parking on the Green Street Bridge • Loss of some on-street parking spaces during minor street work	• **T-1 – Transportation Management Plan:** To address short term adverse transportation impacts during construction, the TMP would be implemented. • **T-2 – Pedestrian and Bicycle Facility Closures:** When sidewalks, crosswalks, and/or bicycle facilities are temporarily closed during construction, pedestrian and bicycle detours will be clearly signed.
In the Horizon Year (2035), compared to the No Build Alternative, the TSM/TDM Alternative would result in: • A minor increase in combined AM and PM peak-period regional area vehicle miles traveled • Slight improvement in combined AM and PM peak-period regional area vehicle hours traveled • A minor increase in daily person throughput (trips) at the east-west screenline • Moderate increase in job accessibility • Modest increase in total daily vehicle volumes crossing the east-west screenline on arterials and freeways • No reduction in vehicle miles traveled on local arterials • Modest increase in the percent of long-distance trips using local arterials • No improvement in travel times • Third highest number of new linked transit trips	In the Horizon Year (2035), compared to the No Build Alternative, the BRT Alternative would result in: • A minor increase in combined AM and PM peak-period regional area vehicle miles traveled • A slight improvement in combined AM and PM peak-period regional area vehicle hours traveled • A minor increase in daily person throughput (trips) at the east-west screenline • Moderate increase in job accessibility • Modest increase in total daily vehicle volumes crossing the east-west screenline on arterials and freeways • Minor decrease in vehicle miles traveled on local arterials • Modest increase in the percent of long-distance trips using local arterials • No improvement in travel times • Second highest number of new linked transit trips	In the Horizon Year (2035), compared to the No Build Alternative, the LRT Alternative would result in: • A minor increase in combined AM and PM peak-period regional area vehicle miles traveled • A slight improvement in combined AM and PM peak-period regional area vehicle hours traveled • A minor increase in daily person throughput (trips) at the east-west screenline • Moderate increase in job accessibility • Modest increase in total daily vehicle volumes crossing the east-west screenline on arterials and freeways • Modest increase in vehicle miles traveled on local arterials • Modest increase in the percent of long-distance trips using local arterials • Minor improvement in travel times • Greatest number of new linked transit trips	In the Horizon Year (2035), compared to the No Build Alternative, the Freeway Tunnel Alternative would result in: • The largest increase in combined AM and PM peak period regional area vehicle miles traveled • The greatest improvement in AM and PM peak period regional area vehicle hours traveled • The greatest increase in daily person throughput (trips) at the east-west screenline • The greatest increase in job accessibility • The greatest increase in total daily vehicle volumes crossing the east-west screenline on arterials and freeways • The greatest reduction in vehicle miles traveled on local arterials • Substantial reduction in the percent of long-distance trips using local arterials • Lowest number of new linked transit trips • No increase in transit mode split • Lowest daily transit person trips crossing the east-west screenline	No avoidance, minimization, and/or mitigation measures are required.

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TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
• No change in transit mode split • Lowest daily transit person trips crossing the east-west screenline • No change in percent of study area population and employment within 0.25 mile of high-frequency transit service • Adverse effects at 18 intersections and on 8 freeway segments • Permanent loss of approximately 26 on-street parking spaces in the AM and PM peak periods and approximately 220 on-street parking spaces during all hours of the day • Delays at intersections for pedestrians and bicyclists	• Minor increase in transit mode split • Greatest daily transit person trips crossing the east-west screenline • No change in percent of study area population and employment within 0.25 mile of high-frequency transit service • Adverse effects at 13 intersections and on 13 freeway segments • Permanent loss of approximately 1,055 on-street parking spaces in the AM and PM peak periods and approximately 334 on-street parking spaces during all hours of the day • Delays at intersections for pedestrians and bicyclists	• Minor increase in transit mode split • Greatest daily transit person trips crossing the east-west screenline • Minor change in percent of study area population and employment within 0.25 mile of high-frequency transit service • Adverse effects at approximately 13 intersections and on approximately 17 freeway segments • Permanent loss of approximately 26 on-street parking spaces in the AM and PM peak periods and approximately 89 on-street parking spaces during all hours of the day • Delays at intersections for pedestrians and bicyclists	• No change in percent of study area population and employment within 0.25 mile of high-frequency transit service • Adverse effects at approximately 6 to 11 intersections and on approximately 18 to 31 freeway segments, depending on the design and operational variations • Permanent loss of approximately 26 on-street parking spaces in the AM and PM peak periods and approximately 85 on-street parking spaces during all hours of the day • Delays at intersections for pedestrians and bicyclists • The greatest improvement in travel times	
VISUAL AND AESTHETICS				
• Moderate to moderately high visual impacts due to construction activities	• Moderate to moderately high visual impacts due to construction activities	• Moderate to moderately high visual impacts due to construction activities	• Moderately low to moderate visual impacts due to construction activities	• **V-7 – Short-Term Visual Effects:** The final design will include features to minimize views of construction areas.
• Minor physical changes or visible impacts to the environment • A minimal increase in lighting in existing business and residential areas • Limited changes in glare from changes in traffic control cycles and additional travel lanes • Approximately seven noise barriers that may result in a low to high visual impact	• Minor new shade and shadow effects at new bus stops and signage • Low permanent visual impacts on key views • Approximately three noise barriers may result in a moderate to moderately high visual impact	• Moderately low to moderate permanent visual impacts on key views • Low permanent impacts related to light, glare, and shade and shadows	• Moderately low to moderate visual impacts on key views • Minimal vehicle headlight glare from new non-tunnel segments built below the existing grade level • Minimal shade and shadow impacts • Approximately five noise barriers for the dual-bore design variation may result in moderate to high visual impacts • Approximately three noise barriers for the single-bore design variation may result in moderate to high visual impacts	• **V-1 – Vividness:** Effects of the Build Alternatives related to a reduction in the vividness of views will be based on a number of measures in the final design. • **V-2 – Intactness:** Effects of the Build Alternatives related to a reduction in the intactness of views will be based on a number of measures in the final design. • **V-3 – Unity:** Effects of the Build Alternatives related to a reduction in the unity of views will be based on a number of measures in the final design. • **V-4 – Walls with Aesthetic Treatments:** Sound walls and retaining walls adjacent to viewer groups or within sensitive Key Views will be designed based on Caltrans Highway Design Manual standards, consideration of community input, and Metro design standards. • **V-5 – Built Structures:** Will be designed to blend with or enhance the surrounding areas. • **V-6 – Landscaping:** Different levels of visual impacts related to walls and berms and for screening views of project features will be addressed during final design.
CULTURAL RESOURCES				
• No effect on one historic property: San Marino Municipal Building • No adverse effect on eight historic properties: Rialto Theatre, Fair Hope Building, Markham Place Historic District, Neighborhood Church/Sequoyah School, Ambassador West Cultural Landscape Historic District, Ambassador College Dining Hall, Ambassador Auditorium Performing Arts Center, and Route 66; • Adverse effect on one historic property: the	• No effect on one historic property: the Bekins Storage Company Roof Sign • No adverse effect on eight historic properties: Golden Gate Theater, Saint Alphonsus Church, South Pasadena Middle School, Community Facilities Planners Building, War Memorial Building, Raymond Hill Waiting Station, Glenarm Building and Electric Fountain (counted as one historic property), and Route 66; • Conditional no adverse effect on eight historic properties: Dr. Henry K. Kawamoto Office Building,	• No effect on one historic property: the Horatio Rust Site • No adverse effect on 14 historic properties: Edward R. Roybal Comprehensive Health Center, 4777 East Cesar E. Chavez Avenue, 2020 Fremont Avenue, South Pasadena Middle School, Community Facilities Planners Building, Fair Hope Building, Oaklawn Historic District, Oaklawn Bridge and Waiting Station, War Memorial Building, Raymond Hill Waiting Station, Glenarm Building and Electric Fountain, Hospital Veterinary, and	• No effect on 33 historic properties (31 that are included in Appendix E of the Finding of Adverse Effect; Route 66, and Horatio Rust Site); • No adverse effect on the following seven historic properties: Pasadena Avenue Historic District, Hurlbut Street Fire Station No. 5, Reverend Hiram Hill/Alonzo Beal House, Ambassador West Cultural Landscape Historic District, Ambassador College Dining Hall, Ambassador Auditorium Performing Arts Center, and the Colorado Street Auto Row; • Conditional no adverse effect on the following seven historic properties: 801 South Pasadena Avenue, Tompkins House, Page	**TSM/TDM Alternative** • Arroyo Seco Parkway Historic District – **CUL-1** – Pre-Construction Surveys – **CUL-2** – Arroyo Seco Parkway Historic District – SOIS Plan – **CUL-12** – Property Specific Protection Plans – **CUL-13** – Post-Construction Building Surveys **BRT Alternative** • Arroyo Seco Parkway Historic District (see TSM/TDM above) – **CUL-1** – Pre-Construction Surveys

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Arroyo Seco Parkway Historic District	Jardin del Encanto and Cascades Park, Rialto Theatre, Fair Hope Building, Oaklawn Historic District, Oaklawn Bridge and Waiting Station (counted as one historic property), the Old Pasadena Historic District, and the Horatio Rust Site • Adverse Effect on one historic property due to the TSM/TDM component of the alternative: the Arroyo Seco Parkway Historic District	Route 66 • Conditional no adverse effect on four historic properties: Rialto Theatre, 100 North Fremont Avenue, the Raymond Florist Historic District, and the Otsungna Village Site; • Adverse effect on one historic property: Maravilla Handball Court and El Centro Grocery (counted as one historic property) • Adverse Effect on one historic property due to the TSM/TDM component of the alternative: the Arroyo Seco Parkway Historic District	House, Miss Markham House, Caroline Walkley/Alice and Robert Wood House (dual-bore only), and 206-216 West California Boulevard, and Old Pasadena Historic District; • Adverse effect on the following four properties: Markham Place Historic District, Caroline Walkley House and Small Apartment (counted as one historic property), Driscoll House, and Neighborhood Church/Sequoyah School; and • Adverse Effect on one historic property due to the TSM/TDM component of the alternative: the Arroyo Seco Parkway Historic District	– **CUL-3** – Jardin Del Encanto and Cascades Park – SOIS Plan – **CUL-13** – Post-Construction Building Surveys • Dr. Henry K. Kawamoto Office Building, Old Pasadena Historic District, Rialto Theatre, Fair Hope Building, Oaklawn Bridge and Waiting Station, Oaklawn Historic District, and Substation No. 2 PERC: – **CUL-1** – Pre-Construction Surveys – **CUL-6** – Vibratory Effects of Demolition – **CUL-13** – Post-Construction Building Surveys • Horatio Rust Site – **CUL-14** – Post-Review Discovery and Monitoring Plan **LRT Alternative** • Arroyo Seco Parkway Historic District (see TSM/TDM above) • Raymond Florist Historic District: – **CUL-1** – Pre-Construction Surveys – **CUL-4** – Settlement Monitoring Plan – **CUL-5** – SOIS Plans (Settlement) – **CUL-7** – Vibration Management and Monitoring Plan (Raymond Floristic Historic District) – **CUL-8** – SOIS Plan (Raymond Florist Historic District) – **CUL-13** – Post-Construction Building Surveys • Rialto Theatre and 100 North Fremont Avenue: – **CUL-1** – Pre-Construction Surveys – **CUL-11** – Groundborne Noise Effects (100 North Fremont and Rialto Theatre) – **CUL-13** – Post-Construction Building Surveys • Maravilla Handball Court and El Centro Grocery: – **CUL-1** – Pre-Construction Surveys – **CUL-9** – Indirect Visual Effects (Maravilla Handball Court and El Centro Grocery) – **CUL-12** – Property-Specific Protection Plans – **CUL-13** – Post-Construction Building Surveys • Otsungna Village Site: – **CUL-14** – Post Review Discovery and Monitoring Plan **Freeway Tunnel Alternative** (tunnel segment) • Arroyo Seco Parkway Historic District (see TSM/TDM above) • Old Pasadena Historic District: – **CUL-1** – Pre-Construction Surveys – **CUL-10** – Indirect Visual Effects (Old Pasadena Historic District) – **CUL-13** – Post-Construction Building Surveys • 801 South Pasadena, Tompkins House, Page House, Miss Markham House, Caroline Walkley/Alice and Robert Wood House, and 206-216 West California Boulevard: – **CUL-1** – Pre-Construction Surveys

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				– **CUL-4 –** Settlement Monitoring Plan – **CUL-5 –** SOIS Plans (Settlement) – **CUL-13 –** Post-Construction Building Surveys • Markham Place Historic District, Caroline Walkley House and Small Apartment, Driscoll House, and Neighborhood Church/Sequoyah School: – **CUL-1 –** Pre-Construction Surveys – **CUL-4 –** Settlement Monitoring Plan – **CUL-5 –** SOIS Plans (Settlement) – **CUL-12 –** Property-Specific Protection Plans – **CUL-13 –** Post-Construction Building Surveys
• Would potentially result in impacts to previously undocumented cultural materials or human remains.	• Would potentially result in impacts to previously undocumented cultural materials or human remains.	• Would potentially result in impacts to previously undocumented cultural materials or human remains.	• Would potentially result in impacts to previously undocumented cultural materials or human remains.	• **CUL-15 –** Public Outreach • **CUL-16 –** Discovery of Cultural Resources • **CUL-17 –** Discovery of Human Remains • **CUL-18 –** Construction Worker Training
HYDROLOGY AND FLOODPLAINS				
No encroachment within floodplains.	No encroachment within floodplains.	No encroachment within floodplains.	• Temporary construction impacts and potential erosion from clearing of land and vegetation. • No permanent impacts on floodplain values. • A nominal reduction of the floodplain boundaries of the Dorchester Channel and Laguna Regulating Basin, which would not result in an increase in the water surface elevation in the Laguna Regulating Basin and would result in only a minor increase in water surface elevation in Dorchester Channel (dual-bore design variation only).	No avoidance, minimization, and/or mitigation measures are required.
WATER QUALITY AND STORM WATER RUNOFF				
• Temporary disturbance of approximately 21 acres of soil during construction	• Temporary disturbance of approximately 35 acres of soil during construction	• Temporary disturbance of approximately 33 acres of soil during construction • Groundwater de-watering during construction	• Temporary disturbance of approximately 81 acres and 93 acres of soil, respectively, for the single-bore and dual-bore design variations during construction • Groundwater de-watering during construction	• **WQ-1 – National Pollutant Discharge Elimination:** Compliance with the provisions of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) Order No. 2009-0009-DWQ • **WQ-2 – Dewatering:** Compliance with the requirements of Order No. R4-2013-0095 (NPDES No. CAG994004) for construction site dewatering. • **WQ-3 – Groundwater Monitoring:** A comprehensive investigation to establish a baseline for groundwater levels and quality where tunneling or excavation would occur. • **WQ-4 – Improvements in State-Owned Right of Way:** Compliance with the provisions of the NPDES Permit, Statewide Storm Water Permit, Waste Discharge Requirements (WDRs). • **WQ-5 – Improvements Outside State-Owned Right of Way:** Compliance with the Standard Urban Storm Water Mitigation Plan (SUSMP) prepared for the Los Angeles Regional Water Quality Control Board WDRs for Municipal Separate Storm Sewer System Order No. R4-2012-0175 • **WQ-6 – Improvements in State-Owned Right of Way:** A Caltrans-approved Design Pollution Prevention BMPs will be prepared.

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				• **WQ-7 – Improvements in State-Owned Right of Way:** Caltrans-approved Treatment BMPs will be implemented.
• Permanent increase in impervious surface area of approximately 3.8 acres • Treatment of 76% of newly created or replaced impervious surface area storm water runoff within State-owned right of way	• Permanent increase in impervious surface area of approximately 1.2 acres • Treatment of 575% and 114%, respectively, of the new impervious surface area within and outside State-owned right of way	• Permanent increase in impervious surface area of approximately 16.5 acres • Treatment of 31% and 47%, respectively, of the new impervious surface area within and outside State-owned right of way	• Permanent increase in impervious surface area of approximately 1.7 acres and 13.5 acres, respectively, for the single-bore and dual-bore design variations • Treatment of 5,350% and 705%, respectively, of the net new impervious surface area for the single-bore and dual-bore design variations	No avoidance, minimization, and/or mitigation measures are required.
GEOLOGY, SOILS, SEISMIC, AND TOPOGRAPHY				
• Minor grading activities with no modification of existing topography • Low potential to encounter naturally occurring oil or gas during construction • Potential to experience fault rupture or seismically-induced ground motion and/or liquefaction • Low potential for soil settlement, collapse, and expansion • Improvements proposed in a Liquefaction Hazard Zone • Moderate erosion of surficial soils • Improvements that cross the active Raymond Fault and potentially active San Rafael Fault • Improvements in a potential dam inundation area	• Minor grading activities with no modification of existing topography • Low potential to encounter naturally occurring oil or gas during construction • Potential to experience fault rupture or seismically-induced ground motion, liquefaction, and/or landslides • Low potential for soil settlement, collapse, and expansion • Improvements in a Landslide Hazard Zone • Moderate erosion of surficial soils • An alignment that crosses the active Raymond Fault and potentially active San Rafael Fault	• Soil excavation and tunneling • Low to moderate potential to encounter naturally occurring oil or gas during construction • Potential to experience fault rupture or seismically-induced ground motion, liquefaction, and/or landslides • Low potential for soil settlement, collapse, expansion, and lateral spreading • Improvements in a Liquefaction Hazard Zone and a Landslide Hazard Zone • Moderate erosion of surficial soils • An alignment that crosses the active Raymond Fault and potentially active San Rafael Fault • Improvements in a potential dam inundation area • Slope instability • Low potential for small ground settlements above and adjacent to tunnel excavations	• Soil excavation and tunneling • Low to moderate potential to encounter naturally occurring oil or gas during construction • Potential to experience fault rupture or seismically-induced ground motion, liquefaction, and landslides • Low potential for soil settlement, collapse, expansion, and lateral spreading • Improvements in a Liquefaction Hazard Zone and a Landslide Hazard Zone • Moderate erosion of surficial soils • An alignment that crosses the active Raymond Fault and potentially active San Rafael and Eagle Rock Faults • Improvements in a potential dam inundation area • Slope instability • Low potential for small ground settlements adjacent to tunnel excavations	• **GEO-1 – Final Geotechnical/Baseline Report:** Design level geotechnical/baseline reports will be prepared. • **GEO-2 – Quality Assurance/Quality Control Plan:** Comprehensive real time monitoring with geotechnical tunnel data management software and implementation of an observational approach to construction management will be implemented during construction of the LRT or Freeway Tunnel Alternatives. • **GEO-3 – Tunnel Design:** Measures to prevent effects from tunnel construction and operation will be included in the design-level geotechnical/baseline report and the project design and specifications. The Freeway Tunnel Alternative will be designed to Caltrans standards, and the LRT Alternative will be designed to Metro standards. A robust construction instrumentation and monitoring program will be implemented to monitor ground movements. • **GEO-4 – Tunnel Construction:** Pre-qualified contractor with experience with large, pressurized-face TBMs will be selected and excavation methods will be used that can limit ground movements.
PALEONTOLOGY				
• Minor ground disturbance in areas with high sensitivity for paleontological resources. • During excavation and grading, fossils would be able to be recovered	• Minor ground disturbance in areas with high sensitivity for paleontological resources. • During excavation and grading, fossils would be able to be recovered	• Improvement located in areas with high sensitivity for paleontological resources • The potential for fossil recovery during tunnel excavation will depend on the type of tunnel boring machine used	• Located in area with high sensitivity for paleontological resources • The potential for fossil recovery during tunnel excavation will depend on the type of tunnel boring machine used	• **PAL-1 – Paleontological Mitigation Plan and Paleontological Resources Impact Mitigation Program:** A PMP or PRIMP is required that addresses monitoring and treatment of fossils.
HAZARDOUS WASTE AND MATERIALS				
• Four properties with known hazardous waste contamination are located adjacent to or within the TSM/TDM Alternative • Widening and/or demolition of bridges may encounter asbestos-containing materials	• Three properties with known hazardous waste contamination are located adjacent to the BRT Alternative • No bridge widening/demolition proposed	• Four properties with known hazardous waste contamination are located adjacent to or within the LRT Alternative • No bridge widening/demolition proposed • Bored tunnel will be water and gas tight, and the intrusion of hazardous materials/gas into the tunnel is not expected	• Two properties with known hazardous waste contamination are located adjacent to the Freeway Tunnel Alternative • Widening and/or demolition of existing bridges may encounter asbestos-containing materials • Bored tunnel will be water and gas tight and the intrusion of hazardous materials/gas into the tunnel is not expected	• **HW-1 – Striping and Pavement Markings:** Sampling, handling, treatment and disposal of striping and pavement markings will be conducted in accordance with applicable regulations. • **HW-2 – Transformers:** Transformer removal, required, removed and disposed of in accordance with applicable regulations. • **HW-3 – Lead Compliance Plan:** A Lead Compliance Plan will address the presence of aerially deposited lead (ADL) in the soils in the project area and the health and safety of construction workers. • **HW-4 – Aerially-Deposited Lead Investigation:** Sampling, handling, treatment and disposal ADL will be conducted consistent with applicable regulations, • **HW-5 – Demolition of Structures and Bridges:** Structures

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				planned for demolition will be assessed for the possible presence of asbestos-containing materials (ACM), lead-based paint (LBP), and equipment containing chlorofluorocarbons (CFCs). • **HW-6 – SCAQMD Rule 1403:** Compliance with SCAQMD Rule 1403 during demolition of bridges and structures. • **HW-7 – Phase II Site Investigations:** Will be conducted to determine if special handling, treatment, or disposal provisions associated with hazardous wastes will be required. • **HW-8 – Soils Adjacent to the Railroad Right of Way:** Soils adjacent to railroad right of way will be sampled to determine whether they require special handling and disposal. • **HW-9 – Tunnel Construction Activities:** Tunnel spoils will be tested prior to removal off-site and disposed of at an appropriate landfill or designated site. • **HW-10 – Unknown Hazards:** Excavation and demolition activities will be monitored and if unknown hazards are encountered, characterization, treatment, and disposal will be consistent with applicable regulations.
AIR QUALITY				
• Short-term air quality impacts from construction emissions	• Short-term air quality impacts from construction emissions • The construction schedule for the TSM/TDM component would not overlap with the construction schedule for the BRT component; therefore, construction emissions would not be additive	• Short-term air quality impacts from construction emissions • The construction schedule for the TSM/TDM component would not overlap with the construction schedule for the LRT component; therefore, construction emissions would not be additive.	• Short-term air quality impacts from construction emissions • The construction schedule for the TSM/TDM component would not overlap with the construction schedule for the freeway tunnel; therefore, construction emissions would not be additive.	• **AQ-1 – Fugitive Dust:** Compliance with South Coast Air Quality Management District Rule 403. • **AQ-2 – Equipment and Vehicle Emissions:** Reduce vehicle and equipment emissions during all site preparation, grading, excavation, and construction. • **AQ-3 – Diesel Fuel Emissions and Sensitive Receptors:** Implement measures to reduce diesel fuel emissions near sensitive receptors. • **AQ-4 – Caltrans Standard Specifications for Construction:** Comply with Caltrans Standard Specifications for Construction (Sections 14-9.03 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plant Emissions]). • **AQ-5 – Metro Green Construction Policy:** Comply with Metro's "Green Construction Policy."
• 2020 PM_{10} emissions higher than the 2020 No Build Alternative emissions • Criteria pollutant emissions higher than the 2035 No Build Alternative emissions, with the exception of reactive organic gases and NOx • 2035 diesel particulate matter emissions higher than the 2035 No Build Alternative emissions • The TSM/TDM Alternative is exempt from transportation conformity requirements per 40 CFR 93.126 as determined by SCAG as shown in the 2017 FTIP, project ID 1M0101 (SCAG, 2018).	• Inconsistency with the project description in the 2016 Regional Transportation Plan, the 2017 Federal Transportation Improvement Program, and the "open to traffic assumptions" in the Southern California Association of Governments' regional emissions analysis • Criteria pollutant emissions higher than the 2035 No Build Alternative emissions, with the exception of reactive organic gases and NOx • 2035 diesel particulate matter emissions higher than the 2035 No Build Alternative emissions The operational air quality analysis for the BRT Alternative includes the effects of the TSM/TDM Alternative improvements that would be included in the BRT Alternative	• Inconsistency with the project description in the 2016 Regional Transportation Plan, the 2017 Federal Transportation Improvement Program, and the "open to traffic assumptions" in the Southern California Association of Governments' regional emissions analysis • Criteria pollutant emissions higher than the 2035 No Build Alternative emissions with the exception of reactive organic gases and NOx • 2035 diesel particulate matter emissions higher than the 2035 No Build Alternative emissions The operational air quality analysis for the LRT Alternative includes the effects of the TSM/TDM Alternative improvements that would be included in the LRT Alternative	**Single-Bore** • PM_{10} and $PM_{2.5}$ emissions higher than the 2025 and 2035 No Build Alternative emissions • Highest 24-hour and annual $PM_{2.5}$ and annual PM_{10} concentrations similar or higher than the No Build Alternative • Diesel PM emissions lower than the 2025 and 2035 No Build Alternative emissions • Inconsistency with the project description in the 2016 Regional Transportation Plan, the 2017 Federal Transportation Improvement Program, and the "open to traffic assumptions" in the Southern California Association of Governments' regional emissions analysis **Dual-Bore** • 2025 criteria pollutant emissions higher than the 2025 No Build Alternative emissions, with the exception of reactive organic	No avoidance, minimization, or mitigation measures are required.

Table ES-1: Summary of Potential Environmental Impacts of the Build Alternatives and Measures Addressing Those Effects

TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
			gases, carbon monoxide and NOx • 2035 criteria pollutant emissions higher than the 2035 No Build Alternative emissions with the exception of reactive organic gas emissions, carbon monoxide and NOx • PM_{10} 2035 emissions higher than the existing condition emissions • Highest 24-hour and annual $PM_{2.5}$ and annual PM_{10} concentrations similar or higher than the No Build Alternative • Diesel PM emissions lower than the 2025 and 2035 No Build Alternative emissions • Inconsistent with the project description in the 2016 Regional Transportation Plan, the 2017 Federal Transportation Improvement Program, and the "open to traffic assumptions" in the Southern California Association of Governments' regional emissions analysis for the tolled operational variation The operational air quality analysis for the Freeway Tunnel Alternative includes the effects of the TSM/TDM Alternative improvements that would be included in the Freeway Tunnel Alternative	
NOISE				
• Temporary noise impacts from construction traffic and activity	• Temporary noise impacts from construction traffic and activity • Due to the distance between the TSM/TDM Alternative improvements and the other Build Alternatives, construction-related impacts are not expected to compound should they be constructed simultaneously.	• Temporary noise impacts from construction traffic and activity • Short-term ground-borne noise and vibration effects from tunnel boring construction activity • Due to the distance between the TSM/TDM Alternative improvements and the other Build Alternatives, construction-related impacts are not expected to compound should they be constructed simultaneously.	• Temporary noise impacts from construction traffic and activity • Short-term ground-borne noise and vibration effects from tunnel boring construction activity • Due to the distance between the TSM/TDM Alternative improvements and the other Build Alternatives, construction-related impacts are not expected to compound should they be constructed simultaneously.	• **N-1 – Construction in State Right of Way:** Within State-owned rights of way, noise will be controlled in conformance with Caltrans Standard Specifications Section 14 8.02, "Noise Control." • **N-2 – Construction Outside State Right of Way:** During construction outside State-owned rights of way, noise reduction/avoidance requirements in the applicable jurisdiction's Municipal Code and/or Noise Ordinance will be required. • **N-3 – Tunnel Boring Machine:** The Construction Contractor will be required to maintain machinery in good working order during all tunnel boring activities. • **N-4 – Supply and Muck Trains:** Specific minimization measures will be included in the Plans, Specifications, and Estimates (PS&E) if supply or muck trains are used to remove spoils: • **N-5 – Ground-Borne Noise and Vibration:** The Construction Contractor will be required to carry out construction activities for the LRT and Freeway Tunnel Alternatives in compliance with applicable federal, State and local noise and vibration guidance. No pile driving will be allowed during construction of the TSM/TDM and BRT Alternatives. • **N-6 – Grifols Vibration Study:** During PS&E for the LRT and Freeway Tunnel Alternatives, the Project Engineer will prepare a site-specific evaluation of potential airborne dust due to vibration associated with construction in the vicinity of the Grifols facility. The results of the evaluation and any specific measures to maintain International Organization for Standardization (ISO) standards will be included in the PS&E. No pile driving will be allowed during construction of the TSM/TDM Alternative.

Table ES-1: Summary of Potential Environmental Impacts of the Build Alternatives and Measures Addressing Those Effects

TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
• Noise levels at approximately 70 receptor locations that would approach or exceed the Noise Abatement Criteria as applicable to the land uses at each sensitive receptor location • Seven noise barriers were found to be reasonable and feasible	• Operational long-term traffic noise impacts • Noise levels at approximately 129 receptor locations that would approach or exceed Noise Abatement Criteria as applicable to the land uses at each receptor location • Three noise barriers were found to be reasonable and feasible for the BRT Alternative • Five noise barriers in the TSM/TDM Alternative would also be included in the BRT Alternative	• Long-term ground-borne noise during operation • Ground-borne vibration impacts to approximately 450 residential buildings and 1 commercial office building • With the daily operations of the light rail trains, prior to mitigation, approximately 12 receptors will experience a moderate impact while approximately 5 receptors will experience a severe noise impact as defined by Federal Transit Authority noise criteria. • Five noise barriers in the TSM/TDM Alternative would also be included in the LRT Alternative	• Operational long-term traffic noise impacts associated with traffic noise • The noise levels at approximately 66 receptor locations for the single-bore design variation and approximately 75 receptor locations for the dual-bore design variation would approach or exceed the Noise Abatement Criteria as applicable to the land uses at each sensitive receptor location • Four and six noise barriers were found to be reasonable and feasible for the single-bore and dual-bore design variations, respectively. • Five noise barriers in the TSM/TDM Alternative would also be included in the Freeway Tunnel Alternative	• **N-7 – Vibration Isolation Systems:** During final design of the LRT Alternative, additional field testing and analysis will be conducted for the specific identification of ground-borne noise impacts and will incorporate the vibration isolation system or systems to comply with FTA ground-borne noise level criteria. • Noise barriers as noted by alternative.
ENERGY				
• Construction would require approximately 33,600 billion British thermal units	• Construction would require approximately 55,300 billion British thermal units	• Construction would require approximately 422,000 billion British thermal units	• For the single-bore design variation, construction would require approximately 523,000 billion British thermal units • For the dual-bore design variation, construction would require approximately 926,000 billion British thermal units	• **E-1 – Construction Efficiency Plan:** As part of the PS&E phase, a construction efficiency plan will be prepared.
• Maintenance-related energy consumption would increase approximately 0.3% in the study area compared to the 2035 baseline condition (No Build Alternative) • Operational energy consumption in the study area would result in no change from the 2035 baseline condition (No Build Alternative)	• Maintenance-related energy consumption would increase approximately 0.3% in the study area compared to the 2035 baseline condition (No Build Alternative) • Operational energy consumption in the study area would result in no change from the 2035 baseline condition (No Build Alternative)	• Maintenance-related energy consumption would increase approximately 0.2% in the study area compared to the 2035 baseline condition (No Build Alternative) • Operational energy consumption in the study area would result in an approximately 0.7 %decrease from the 2035 baseline condition (No Build Alternative)	For the single-bore design variation: • Maintenance-related energy consumption would increase ranging from 0.6 to 1.6 percent in the study area compared to the 2035 No Build Alternative • Operational energy consumption in the study area would result in an approximately 0.7 to 1.0 % increase compared to the 2035 No Build Alternative. For the dual-bore design variation: • Maintenance-related energy consumption would increase ranging from 0.6 to 1.6 percent in the study area compared to the 2035 No Build Alternative. • Operational energy consumption in the study area would result in no change compared to the 2035 No Build Alternative.	No avoidance, minimization, and/or mitigation is required.
NATURAL COMMUNITIES				
No temporary or permanent impacts on sensitive natural communities Temporary impacts to non-sensitive plant communities (0.3 acre of nonnative grassland and 0.5 acre of disturbed/developed) Permanent impacts to non-sensitive plant communities (less than 0.1 acre of nonnative woodlands and 0.7 acre of disturbed/developed)	No temporary or permanent impacts on sensitive natural communities Temporary impacts to non-sensitive plant communities (0.6 acre of disturbed/developed) Permanent impacts to non-sensitive plant communities (1.9 acres of nonnative grassland and 123.8 acres of disturbed/developed)	No temporary or permanent impacts on sensitive natural communities Temporary impacts to non-sensitive plant communities (2.1 acres of nonnative grassland, 8.0 acres of nonnative woodland, and 29.7 acres of disturbed/developed) Permanent impacts to non-sensitive plant communities (12.6 acres of nonnative grassland, 3.9 acres of nonnative woodland, and 93.6 acres of disturbed/developed)	The single-bore and dual-bore design variations would each result in permanent impacts to approximately 1.09 acres of wetland complex and would potentially result in indirect temporary impacts to nearby riparian habitats. The single-bore design variation would result in temporary impacts to non-sensitive plant communities (2.9 acres of nonnative grassland, less than 0.1 acre of nonnative woodland, and 53.4 acres of disturbed/developed) The dual-bore design variation would result in temporary impacts to non-sensitive plant communities (2.2 acres of nonnative grassland, 1.1 acres of nonnative woodland, and 51.7 acres of disturbed/developed) The single-bore design variation would result in permanent impacts to non-sensitive plant communities (25.2 acres of nonnative grassland, 31.6 acres of nonnative woodland, and 244.9 acres of disturbed/developed)	• **NC-1 – Riparian/Riverine Habitat Protection:** Environmentally Sensitive Area (ESA) fencing or other marker will be installed around any riparian or riverine habitats to be preserved. No grading or fill activities or structures will be authorized in marked areas. • **NC-2 – Construction Plan:** Nonsensitive upland habitat areas will be designated for equipment maintenance, staging, fueling, and other related activities. • **NC-3 – Compliance Monitoring:** The Construction Contractor will be required to have a qualified biologist monitor during construction in the vicinity of riparian and riverine areas. • **WQ-1 – National Pollutant Discharge Elimination:** Compliance with the provisions of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) Order No. 2009-0009-DWQ.

Table ES-1: Summary of Potential Environmental Impacts of the Build Alternatives and Measures Addressing Those Effects

TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
			The dual-bore design variation would result in permanent impacts to non-sensitive plant communities (25.2 acres of nonnative grassland, 32.4 acres of nonnative woodland, and 244.9 acres of disturbed/developed)	• **IS-1 –** Weed Abatement Program • **WET**-1: Obtain United States Army Corps of Engineers Section 404 Dredge and Fill Permit • **WET**-2: Obtain CDFW Streambed Alteration Agreement • **WET**-3: Obtain RWQCB Section 401 Water Quality Certification
WETLANDS AND OTHER WATERS				
No temporary or permanent impacts to wetlands or other waters.	No temporary or permanent impacts to wetlands or other waters.	No temporary or permanent impacts to wetlands or other waters.	• The single-bore design variation would result in approximately 0.02 acre of temporary impacts to non-wetland waters under United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board jurisdiction. • The dual-bore design variation would result in approximately 0.2 acre of temporary impacts to non-wetland waters under United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board jurisdiction. • The single-bore design variation would result in approximately 0.06 acre of permanent non-wetland water impacts under United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board jurisdiction to the Laguna Channel • The dual-bore design variation would result in approximately 0.5 acre of permanent non-wetland water impacts under United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board jurisdiction to the Laguna Channel • The permanent impacts on the Laguna Channel would not impact the Arroyo Seco	• **WET-1 –** Obtain United States Army Corps of Engineers Section 404 Dredge and Fill Permit • **WET-2 –** Obtain CDFW Streambed Alteration Agreement • **WET-3 –** Obtain RWQCB Section 401 Water Quality Certification • **NC-1:** Riparian/Riverine Habitat Protection • **NC-2:** Construction Plan • **NC-3 –** Compliance Monitoring • **WQ-1 –** National Pollutant Discharge Elimination • **WQ-2:** Dewatering • **WQ-3:** Groundwater Monitoring • **WQ-4:** Improvements in State-Owned Right of Way • **WQ-5:** Improvements Outside State-Owned Right of Way • **WQ-6:** Improvements in State-Owned Right of Way • **IS-1 –** Weed Abatement Program
PLANT SPECIES				
No temporary or permanent direct or indirect impacts to plant species (Parish's gooseberry, slender mariposa-lily, and Coulter's goldfields)	No temporary direct or indirect impacts to plant species (Parish's gooseberry, slender mariposa-lily, and Coulter's goldfields) The BRT Alternative would potentially result in removal of approximately 136 trees protected by local tree ordinances.	• No temporary or permanent direct or indirect impacts on Parish's gooseberry and slender mariposa-lily • Temporary impacts to approximately 8 trees within the State right of way not protected by a local ordinance • Temporary indirect impacts and exacerbate existing indirect permanent edge effects on a Coulter's goldfields population within approximately 250 feet of the permanent impact area for the LRT Alternative • Removal of approximately 21 trees protected by various local tree ordinances	• No temporary or permanent direct or indirect impacts to plant species (Parish's gooseberry, slender mariposa-lily, and Coulter's goldfields) • Temporary impacts to approximately 36 trees in the City of Pasadena that are protected by the City's Trees and Tree Protection Ordinance • Potential permanent impacts to the Coulter's goldfields within the permanent impact area of the single-bore and dual-bore design variations • Potential permanent impacts to a Southern California black walnut tree that is approximately 4 feet outside the permanent impact area for the Freeway Tunnel Alternative • The single-bore and dual-bore design variations would result in removal of approximately 84 trees protected by local tree ordinances	• **PS-1 – Coulter's Goldfields:** Should the LRT Alternative be selected and documentation of the planting efforts of the population of Coulter's goldfields in the Biological Study Area (BSA) be unavailable, effects of the LRT Alternative on the Coulter's goldfields population will be addressed. • **PS-2 – Coulter's Goldfields:** Should the Freeway Tunnel Alternative be selected and documentation of the planting efforts of the population of Coulter's goldfields in the BSA be unavailable, the effects of the Freeway Tunnel Alternative on the Coulter's goldfields population will be addressed. • **PS-3 – Southern California Black Walnut:** Implement measures to address the project effects on the Southern California black walnut. • **PS-4 – Trees Protected by City and/or County Ordinances:** Avoid/minimize impacts to trees where feasible. If not feasible, obtain appropriate tree removal permits.

Table ES-1: Summary of Potential Environmental Impacts of the Build Alternatives and Measures Addressing Those Effects

TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
ANIMAL SPECIES				
• Temporary and permanent adverse impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake • Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc. if nighttime construction activities take place • Temporary indirect impacts through habitat loss if special-status bats begin using bridges (including the Garfield Avenue Bridge) proposed for demolition or widening as roosting habitat • Temporary and permanent impacts to a limited amount of nonnative grasslands that may support milkweed plants required for monarch butterfly breeding and is suitable habitat for western spadefoot toad and San Bernardino ring-necked snake	• Temporary and permanent adverse impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake • Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc. if nighttime construction activities take place • Permanent impacts to a limited amount of nonnative grasslands that may support milkweed plants required for monarch butterfly breeding, and is suitable habitat for western Spadefoot toad and San Bernardino ring-necked snake	• Temporary and permanent adverse impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake • Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc. if nighttime construction activities take place • Indirect temporary impacts to riparian obligate bird species as a result of the proximity of potential nonbreeding habitat in the riparian areas due to project construction activities • Temporary impacts through habitat loss if special-status species bat populations begin using bridges proposed for removal as roosting habitat • Temporary and permanent impacts to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies	• Temporary and permanent adverse impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake • Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc. if nighttime construction activities take place • Indirect temporary impacts to riparian obligate bird species as a result of the proximity of potential nonbreeding habitat in the riparian areas due to project construction activities • Temporary and permanent impacts to a limited amount of nonnative grasslands that may support milkweed plants required for monarch butterfly breeding and is suitable habitat for western spadefoot toad and San Bernardino ring-necked snake • Temporary and permanent impacts to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies • Temporary impacts through habitat loss if special-status species bat populations begin using bridges proposed for removal as roosting habitat	• **AS-1 – Bats:** Due to the presence of marginally suitable roosting habitat, avoidance and minimization efforts will be implemented. • **AS-2 – Monarch Butterfly:** Avoidance and minimization measures in areas of potentially suitable habitat for winter roosting aggregations of monarch butterfly and the species' egg, caterpillar, and pupal stages will be implemented. • **AS-3 – Amphibians and Reptiles:** Avoidance and minimization measures in areas of potentially suitable habitat for coast range newt, western spadefoot, two-striped garter snake, western pond turtle, San Bernardino ring-necked snake, and South Coast garter snake species will be implemented. • **AS-4 – Other Special-Status Bird Avoidance and Minimization Measures:** Avoidance and minimization efforts for birds protected under California Fish and Game Code Sections 3503 and 3503.5, and the Migratory Bird Treaty Act (MBTA) will be implemented.
THREATENED AND ENDANGERED SPECIES				
Potential temporary indirect impacts through habitat loss to Townsend's big-eared bats if they are discovered using bridges proposed for widening as roosting habitat and indirect temporary impacts to foraging bats may occur from if nighttime construction activities take place.	Determined to have no direct or indirect temporary impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	Potential impacts are limited indirect temporary impacts to listed riparian obligate bird species as a result of the proximity of potential nonbreeding habitat in the riparian areas due to project construction activities	Potential impacts are limited indirect temporary impacts to listed riparian obligate bird species as a result of the proximity of potential nonbreeding habitat in the riparian areas due to project construction activities	• **NC-1 –** Riparian/Riverine Habitat Protection • **NC-2 –** Construction Plan • **NC-3 –** Compliance Monitoring • **AS-1 –** Bats
Determined to have no direct or indirect permanent impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	Determined to have no direct or indirect permanent impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	Determined to have no direct or indirect permanent impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	Determined to have no direct or indirect permanent impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	No avoidance, minimization, and/or mitigation measures are required.
INVASIVE SPECIES				
All of the Build Alternatives would potentially result in impacts related to the spread of invasive species through construction activities.				• **IS-1 –** Weed Abatement Program
CUMULATIVE IMPACTS				
Visual/Aesthetics: No cumulative impact.	**Visual/Aesthetics:** No cumulative impact.	**Visual/Aesthetics:** Potential to contribute to an cumulative impact for the Eastside Phase II Transit Corridor Project	**Visual/Aesthetics:** No cumulative impact.	Measures V-1 through V-7, provided above under Visual and Aesthetics.
Animal Species: Potential to contribute to a cumulative impact on nesting or breeding birds under the Migratory Bird Treaty Act	**Animal Species:** Potential to contribute to a cumulative impact on nesting or breeding birds under the Migratory Bird Treaty Act	**Animal Species:** Potential to contribute to a cumulative impact on nesting or breeding birds under the Migratory Bird Treaty Act	**Animal Species:** Potential to contribute to a cumulative impact on nesting or breeding birds under the Migratory Bird Treaty Act	Measure AS-4, provided above under Animal Species.
Cultural Resources: Potential to contribute to a cumulative impact on historic properties and historical resources.	**Cultural Resources:** No cumulative impact.	**Cultural Resources:** Potential to contribute to a cumulative impact on historic properties and historical resources.	**Cultural Resources:** Potential to contribute to a cumulative impact on historic properties and historical resources.	Measures CUL-1, CUL -2, CUL-4, CUL-5, and CUL-7 through CUL-18, provided above under Cultural Resources.

Table ES-1: Summary of Potential Environmental Impacts of the Build Alternatives and Measures Addressing Those Effects

TSM/TDM Alternative [1] (Preferred Alternative)	BRT Alternative [2]	LRT Alternative [3]	Freeway Tunnel Alternative [4]	Avoidance, Minimization, and Mitigation Measures
CLIMATE CHANGE				
Construction would result in approximately 21,137 metric tons of carbon dioxide equivalent emissions.	Construction would result in approximately 2,553 metric tons of carbon dioxide equivalent emissions.	Construction would result in approximately 54,607 metric tons of carbon dioxide equivalent emissions.	Construction of the single-bore and dual-bore design variations would result in approximately 51,916 and 71,380 metric tons of carbon dioxide equivalent emissions, respectively.	Measures AQ-1 through AQ-5, provided above under Air Quality.
Operation would result in small decreases in carbon dioxide emissions within the region when compared to No Build conditions in 2020 and a small increase in 2035. GHG emissions would be lower than existing conditions.	Operation would result in small decreases in carbon dioxide emissions within the region when compared to No Build conditions in 2020 and a small increase in 2035. GHG emissions are lower than existing conditions.	Operation would result in small decreases in carbon dioxide emissions within the region when compared to No Build conditions in 2025 and a small increase in 2035. GHG emissions would be lower than existing conditions.	With the exception of the Freeway Tunnel Alternative (dual-bore no truck operational variation) scenarios in 2035, the Freeway Tunnel Alternative would result in small decreases in carbon dioxide emissions within the region when compared to No Build conditions. GHG emissions would be lower than existing conditions.	No measures are proposed.

1 The impacts of the improvements in the TSM/TDM Alternative included in the BRT, LRT, and Freeway Tunnel Alternatives would also occur under those Build Alternatives.
2 In addition to the impacts described for the BRT Alternative, the impacts of the improvements in the TSM/TDM Alternative included in the BRT Alternative would also occur under the BRT Alternative.
3 In addition to the impacts described for the LRT Alternative, the impacts of the improvements in the TSM/TDM Alternative included in the LRT Alternative would also occur under the LRT Alternative.
4 In addition to the impacts described for the Freeway Tunnel Alternative, the impacts of the improvements in the TSM/TDM Alternative included in the Freeway Tunnel Alternative would also occur under the Freeway Tunnel Alternative.

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Table ES-2: Permits, Reviews, and Approvals Required for Project Construction

Agency	Permit/Approval	Timing	Does it apply to the Build Alternative? (● indicates the permit or approval would likely be required) TSM/TDM (Preferred Alternative)	BRT	LRT	Freeway Tunnel
FEDERAL AGENCIES						
Federal Highway Administration (FHWA)	Approval for Modified Access Report to the Interstate System	Obtained prior to project approval.				●
	Major Project Operational Independence and Non-Concurrent Construction Determination	Obtained prior to Final EIR/EIS.				●
	Cost Estimate Review (only for FHWA projects over $500 million)	Obtained prior to Final EIR/EIS.				●
	Draft Project Management Plan	Obtained prior to Final EIR/EIS.				●
	Final Project Management Plan	Obtained no later than 90 days after approval of the Record of Decision.				●
Federal Transit Administration (FTA)	New Starts Application Approval	Obtained prior to Final EIR/EIS.			●	
	Full Funding Grant Agreement	Obtained prior to completion of final design.			●	
	Small Starts Application Approval	Obtained prior to Final EIR/EIS.		●		
United States Army Corps of Engineers (USACE)	Section 404 Permit for filling or dredging waters of the United States	Obtained during final design.				●
STATE AGENCIES						
California Department of Fish and Wildlife (CDFW)	1602 Agreement for Streambed Alteration	Obtained during final design.				●
State Water Resources Control Board (SWRCB)	Section 402 National Pollutant Discharge Elimination System Permit (Construction Activity)	Obtained during final design.	●	●	●	●
	Section 402 National Pollutant Discharge Elimination System Permit (Caltrans National Pollutant Discharge Elimination System Permit)	Obtained during final design.				●
	Section 402 National Pollutant Discharge Elimination System Permit (Industrial Activities)	Obtained during final design.	●	●	●	
State Historic Preservation Officer (SHPO)	HPSR concurrence with the determination of eligibility	Received on February 26, 2015	●	●	●	●
	SHPSR concurrence with the determination of eligibility	Received on November 9, 2017				
	Concurrence on the Finding of Adverse Effect	Received on May 3, 2018	●	●	●	●
	Memorandum of Agreement (MOA)	Executed on October 18, 2018				
California Division of Occupational Safety and Health (Cal/OSHA)	Approval of construction permit	Obtained prior to construction.	●	●	●	●

Table ES-2: Permits, Reviews, and Approvals Required for Project Construction

Agency	Permit/Approval	Timing	Does it apply to the Build Alternative? (● indicates the permit or approval would likely be required)			
			TSM/TDM (Preferred Alternative)	BRT	LRT	Freeway Tunnel
Department of Toxic Substances Control (DTSC)l	Permits for disposal, treatment, and/or handling of hazardous materials encountered during excavation activities.	Obtained during final design.		●	●	●
California Public Utilities Commission	Compliance with California Public Utilities Code Sections 1201 et al (CPUC authority to construct rail crossings)	Obtained during final design.			●	
	Compliance with California Public Utilities Code Sections 2111, 2122, and 99152 (rail transit safety)	Obtained during final design.			●	
	Compliance with CPUC Rules of Practice and Procedure (Formal Application process for construction or modification of a public rail crossing)	Obtained during final design.			●	
	Compliance with CPUC General Orders (GOs) including but limited to: GO 26-D, 72-B, 75-D, 88-B, 95, 118, 128, 143-B, and 164-D	Obtained during final design.			●	
	Compliance with the California Manual on Uniform Traffic Control Devices (2014) for railroad and light rail transit grade crossings	Obtained during final design.			●	
	Compliance with federal regulations including: Title 49 Code of Federal Regulations (CFR) Parts 213, 214, 236, and 37	Obtained during final design.			●	
REGIONAL AND/OR LOCAL AGENCIES AND UTILITIES						
County of Los Angeles Department of Public Works (LADPW)	Approval of encroachment permits	Prior to any construction that would affect LADPW facilities	●	●	●	●
	Approvals to relocate, protect-in-place, or remove LADPW facilities	Prior to any construction that would affect LADPW facilities	●	●	●	●
Regional Water Quality Control Board (RWQCB)	Section 401 Water Quality certification	Obtained during final design.				●
	Section 402 National Pollutant Discharge Elimination System (Groundwater Dewatering)	Obtained during final design.	●	●	●	●
	Approval of waste discharge requirements	Obtained during final design.	●	●	●	●
	Approval of encroachment permits	Obtained during final design.	●	●	●	●

Table ES-2: Permits, Reviews, and Approvals Required for Project Construction

Agency	Permit/Approval	Timing	Does it apply to the Build Alternative? (● indicates the permit or approval would likely be required)			
			TSM/TDM (Preferred Alternative)	BRT	LRT	Freeway Tunnel
Cities of Alhambra, Los Angeles, Pasadena, and South Pasadena	Approval of modifications to existing freeway agreements or new freeway agreements	Obtained prior to construction.				●
County of Los Angeles and the Cities of Alhambra, Los Angeles, Monterey Park, Pasadena , Rosemead, San Gabriel, San Marino, and South Pasadena	Approval of encroachment permits, street construction permits, street closures, detours, and associated improvements in the public right of way; and modifications or protection in-place of existing utility facilities	Obtained prior to construction.	●	●	●	●
Cities of Alhambra, Los Angeles, and Pasadena; County of Los Angeles Sanitation District; and County of Los Angeles Flood Control District	Approvals for discharges into drainage and sewer systems required under MS4 Permits related to groundwater dewatering, if groundwater contamination is present	Obtained prior to construction.			●	●
County of Los Angeles, and the Cities of Alhambra, Los Angeles, Monterey Park, Pasadena, and South Pasadena	Demolition permits	Obtained prior to demolition.	●	●	●	
City of Monterey Park	Section 4(f) consultation for Cascades Park	Obtained prior to the Final EIR/EIS.		●		
	Park Preservation Act consultation for Cascades Park	Obtained prior to the Final EIR/EIS.		●		
Utility Providers (electrical, water, storm drain, telecommunications, sanitary sewer, natural gas)	Approvals to relocate, protect in-place, or remove utility facilities	Prior to any construction activities that would affect utility facilities.	●	●	●	●
	Approval of encroachment permits	Prior to any construction activities that would affect utility facilities.	●	●	●	●
	Approval of connections to existing utility facilities	Prior to initiation of construction			●	●
	Approval of connections to existing utility facilities	Prior to initiation of operations			●	●
Union Pacific Railroad Company (UPRR)	Memorandum of Understanding and a Construction and Maintenance Agreement with the railroad	Prior to any construction within, above, or below railroad right of way.	●		●	●
Southern California Regional Rail Authority (SCRRA)	Approval of right-of-way encroachment permits	Prior to any construction above SCRRA railroad right of way.			●	●

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1. Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro) proposes transportation improvements to improve mobility and relieve congestion in the area between State Route 2 (SR 2) and Interstates 5, 10, 210 and 605 (I-5, I-10, I-210, and I-605, respectively) in east/northeast Los Angeles and the western San Gabriel Valley. The study area for the State Route 710 (SR 710) North Project as depicted on Figure 1-1 is approximately 100 square miles (sq mi) and generally bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west. The study area also includes portions of East Los Angeles and Monterey Park south of I-10. Caltrans is the lead agency under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

The SR-710 North Project is listed in the Southern California Association of Governments (SCAG) financially constrained 2016 Regional Transportation Plan (RTP)/ Sustainable Communities Strategy (SCS), the financially constrained 2017 Federal Transportation Improvement Program (FTIP) and amendments and Metro's 2009 Long Range Transportation Plan (LRTP). The Project is proposed to be funded entirely or in part by Measure R, a half-cent sales tax dedicated to transportation projects in Los Angeles County.

1.1.1 Existing Facility

Existing Interstate 710 (I-710) south of the interchange with I-10 has three general-purpose lanes in the northbound direction and three to four general-purpose lanes in the southbound direction. All the general-purpose lanes are 12 feet (ft) wide. Median and outside shoulders are provided; however, the shoulder widths are non-standard (i.e. less than the standard 10 ft width) in some segments. In the northbound direction, the median is 15 ft and the outside shoulder is 8 ft. In the southbound direction, the median has a total width of 30 ft between the edge of travel way and the median barrier/metal beam guard railing that separates the opposing traffic. The outside shoulder ranges from 8 to 10 ft.

Existing SR 710 north of the I-710/I-10/SR 710 interchange has two to three general-purpose lanes in both the northbound and southbound directions. All those general-purpose lanes are 12 ft wide. In the northbound direction, the paved median is 15 ft wide and the shoulder is 8 ft wide. In the southbound direction, the existing median is 30 ft wide with a barrier/metal beam guard railing separating the opposing lanes of traffic. Most of the southbound median area is gravel finished with a 6 ft wide paved section adjacent to the edge of the freeway. The existing 8 to 10 ft wide southbound shoulder is paved.

As the northbound SR 710 gets closer to its terminus at the Valley Boulevard exit, the lanes decrease to two lanes. At the northbound SR 710 off-ramp at Valley Boulevard, there are a left-turn lane, a center lane that can turn either left or right, and a right turn at this signalized intersection. A second signalized intersection at the southbound SR 710 on-ramp allows for traffic to use two left-turn lanes from westbound Valley Boulevard to enter the freeway in the southbound direction. A right-turn lane for eastbound Valley Boulevard traffic allows traffic to turn onto the southbound lanes of SR 710.

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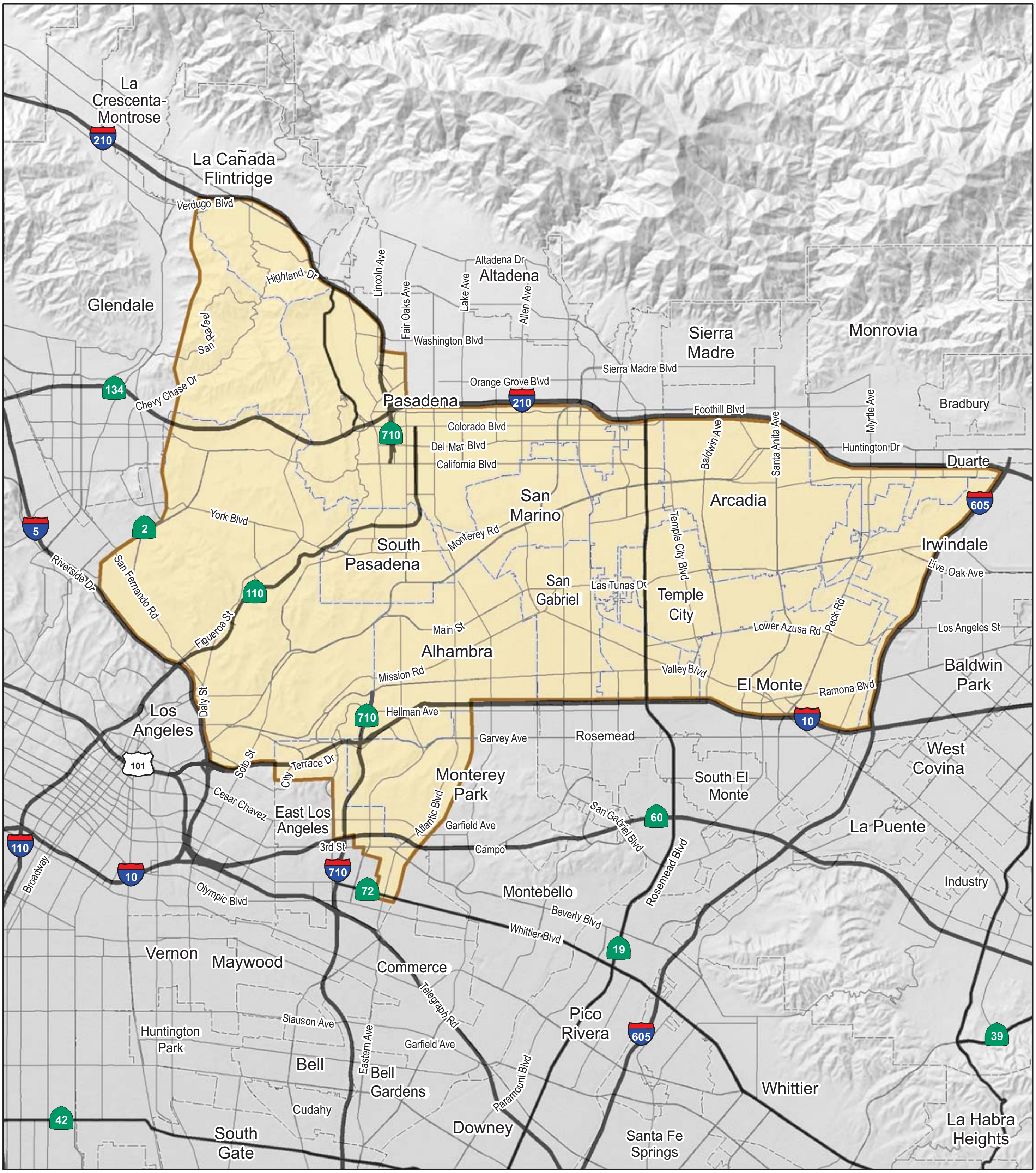

LEGEND

FIGURE 1-1

SR 710 North Study Area

N

0 1.25 2.5

MILES

SOURCE: ESRI (2008); LSA (2013)

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SR 710 North Project

Project Location

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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Existing SR 710 south of the I-210/State Route 134 (SR 134) interchange has one to three lanes in the northbound direction and two lanes in the southbound direction. All general-purpose lanes are 12 ft wide. In the northbound direction, SR 710 begins as two ramps connecting from Pasadena Avenue near West Del Mar Boulevard. The outside shoulder is 8 ft and the median varies from 10–15 ft. In the southbound direction, the outside shoulder varies from 8–14 ft and the median is 36 ft. Just north of the SR 134/I-210 interchange, the number of lanes on SR 710 northbound expands to six 12 ft lanes, and includes a 10 ft outside shoulder and 15 ft median. In the southbound direction, SR 710 terminates at an off-ramp that connects to St. John Avenue just north of West Del Mar Boulevard, the number of lanes increases to four 12 ft lanes, and includes an 8–10 ft outside shoulder and 12–36 ft median.

In addition to SR 710 and I-710, the following Interstate and State highways are within or in the vicinity of the study area for the SR 710 North Project as shown on Figure 1-1:

- **Interstate 210:** I-210 extends southeast from its interchange with I-5 in northwestern Los Angeles County to its terminus in San Bernardino County, a distance of approximately 86 miles (mi). I-210 is aligned west-east along the northern boundary of the project study area as shown on Figure 1-1.
- **Interstate 10:** I-10 generally extends east and then southeast from its interchange with Highway 1 in Santa Monica to the California/Arizona border and then further east to Florida. I-10 is aligned west-east along the southern boundary of the project study area as shown on Figure 1-1.
- **Interstate 5:** I-5 extends north from the California/Mexico border to the California/Oregon border, a distance of approximately 800 mi. I-5 is aligned south-north along the southwest boundary of the project study area as shown on Figure 1-1.
- **Interstate 605:** I-605 extends northeast from State Route 22 (SR 22) in Seal Beach to its terminus at I-210 in Irwindale, a distance of approximately 27 mi. I-605 is aligned south-north along the eastern boundary of the project study area as shown on Figure 1-1.
- **State Route 2:** SR 2 extends northeast from its interchange with Lincoln Boulevard and I-10 in Santa Monica to its terminus at State Route 138 (SR 138) east of Wrightwood, a distance of approximately 87 mi. SR 2 is aligned south-north along the western boundary of the project study area as shown on Figure 1-1.
- **State Route 110:** State Route 110 (SR 110) extends northeast from United States Route 101 (US-101) to its terminus at Colorado Boulevard in Pasadena, a distance of approximately 9 mi. The northern segment of SR 110 is known as the historic Arroyo Seco Parkway. SR 110 is aligned south-north and extends across the central part of the project study area as shown on Figure 1-1.
- **State Route 19:** State Route 19 (SR 19) extends north from its intersection with Lakewood Boulevard and Del Amo Boulevard in Lakewood to its terminus at I-210 in Pasadena, a distance of approximately 21 mi. SR 19 is aligned south-north across the project study area as shown on Figure 1-1.
- **State Route 134 (SR 134):** SR 134 extends northeast from the US-101/State Route 170 (SR 170)/SR 134 interchange in North Hollywood to the I-210/SR 710 interchange in Pasadena, a distance of approximately 13 mi. SR 134 is aligned west-east and extends across the northern part of the project study area as shown on Figure 1-1.

1.1.2 Background and History

The history of the planning efforts to complete the SR 710 corridor dates back to 1933 when Legislative Route 167, later renamed State Route 7 (SR 7), was defined to run from San Pedro east to Long Beach and north to the vicinity of Monterey Park. In 1959, the proposed northern limits of SR 7 were extended to the planned Foothill Freeway (which is now I-210). The part of the facility from Long Beach to the I-10 has been constructed and was incorporated in 1983 into the Interstate Highway System as I-710. From I-10 to Valley Boulevard (southern stub) and from the I-210 to the I-210/SR 710/SR 134 interchange (northern stub) were designated SR 710 in 1984.

Over the years, planning efforts continued for SR 710 to evaluate alternatives and address community and agency concerns, eventually leading to the issuance of a Record of Decision (ROD) in 1998 by the FHWA for a surface freeway. After litigation initiated by some of the affected communities, FHWA rescinded the ROD in 2003, citing changes in project circumstances such as funding uncertainty and the opening of the Metro Gold Line to Pasadena, and requiring a more thorough evaluation of the feasibility of a bored tunnel.

In 2006, Metro completed the feasibility assessment of extending SR 710 from Valley Boulevard to I-210. The feasibility evaluation was principally focused on deep subterranean bored or mined tunnel construction methods instead of the more environmentally intrusive shallow trench excavation or “cut-and-cover” tunnel methods. Three tunnel alignments were considered that would extend from the existing SR 710 in south Alhambra to the existing I-210. The assessment concluded that the tunnel concept was feasible to complete a freeway, and no fatal flaws were identified.

Between 2008 and 2010, a geotechnical feasibility study of a tunnel extending SR 710 was conducted. Based on requests from local communities, the study was to be guided by “route-neutral” principles. The route-neutral approach specified that no one route for the tunnel should be favored over another; therefore, all practicable routes for extending SR 710 were considered based on factual data. As part of the route-neutral concept, Caltrans and Metro identified five study zones to represent the corridors for extending SR 710. The geotechnical study was conducted to evaluate the geologic, groundwater, and seismic conditions to determine the viability of a tunnel option in each of the five zones considered. Field explorations and laboratory testing programs were conducted in each of the five tunnel zones. Geotechnical conditions such as geology, faults, seismicity, groundwater, contaminated materials, and potential for gassy conditions were studied in each zone. Based on the information collected and reviewed as part of the geotechnical study, tunneling is considered to be geotechnically feasible in all five zones.

In November 2008, Measure R (a half-cent sales tax dedicated to transportation projects in Los Angeles County) was approved by a two-thirds majority of county voters. Included in the Measure R plan is the commitment of $780 million for the I-710 North Gap Closure (tunnel) Project to improve the connection along the SR-710 alignment between I-10 and I-210 (See Measure R Expenditure Plan Ordinance # 08-01: Proposed One-Half Cent Sales Tax for Transportation: Expenditure Plan 30 Years, Fiscal Year (FY) 2010 – 2039, as adopted by the Los Angeles County Metropolitan Transportation Authority Board of Directors July 24, 2008). In the event that a Capital Project identified in Measure R Expenditure Plan Ordinance # 08-01 as a "Highway Project" is completed without the expenditure of the amount of Net Revenues allocated by this Ordinance, any surplus Net Revenues allocated to that Capital Project shall be credited to the Highway Capital Subfund and expended for Capital Projects located within the same subregion as the project so completed.

In June 2010, Metro (in coordination with Caltrans) authorized moving forward with an environmental review phase for the SR 710 North Project. The scoping process for the SR 710 North Project EIR/EIS was initiated with the preparation and distribution of a Notice of Preparation (NOP) and the publication of a Notice of Intent (NOI) on March 3, 2011 (Appendix I).

Many community briefing events were held to provide information and keep the public informed with the progress of the study. After the formal scoping process, project-specific professional committees and outreach teams (e.g., a Technical Advisory Committee [TAC] and Stakeholder Outreach Advisory Committee [SOAC]) were formed, and the SR 710 Alternatives Analysis phase of the North Project began. Starting in early 2011, a series of meetings was held to collect ideas, from which possible transit/non-transit suggestions were considered and discussed.

As discussed in the *Alternatives Analysis Report* (2012), a screening analysis was conducted to determine the alternatives to be carried forward for analysis in this Environmental Impact Report/Environmental Impact Statement (EIR/EIS). The alternatives were screened in the following sequence:

a. **Preliminary Screening:** Preliminary screening was conducted on a large set of alternatives that were identified during a review of prior studies and public input received during the "710 Conversations" scoping process conducted by Metro and Caltrans in 2011. From that large set of alternatives, 42 alternatives representing a reasonable range of modes and alignments were selected for initial screening. Criteria used for the preliminary screening included the potential to accommodate regional north-south travel, reduce local street congestion, minimize community impacts, minimize the potential to encounter contaminated soil and groundwater, and accommodate ridership potential (for relevant modes). Within each travel mode, alternatives were evaluated against each other, and the most promising alternatives from each mode were selected for initial screening.

b. **Initial Screening:** The initial screening evaluated 42 alternatives carried forward from the preliminary screening based on the following project objectives: minimize travel time; improve connectivity and mobility; reduce congestion of freeway system; reduce congestion on local street system; increase transit ridership; minimize environmental and community impacts related to transportation; ensure consistency with goals and policies in the 2012–2035 RTP/SCS, the goals in Measure R, and the strategies for the San Gabriel Valley included in Metro's 2009 LRTP; and maximize the cost efficiency of public investments. Based on the results of the initial screening, which relied on available data and schematic representations of each alternative, the best performing alternatives in each transportation mode were carried forward into the secondary screening.

c. **Secondary Screening:** As a result of the initial screening, the *Alternatives Analysis Report* analyzed the following twelve alternatives (some with design variations): the No Build Alternative, a Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative, two Bus Rapid Transit (BRT) Alternatives, two Light Rail Transit (LRT) Alternatives, four Freeway Alternatives, and two Highway/Arterial Alternatives. For these alternatives, additional data were collected and more detailed analysis was conducted, including assessments of the impacts to land use and planning, the community, and the social and economic systems in the study area. Based on the more detailed analysis, five viable alternatives (No Build, TSM/TDM, BRT, LRT, and Freeway Tunnel) were carried forward for further evaluation in the Draft EIR/EIS.

1.2 Purpose and Need

1.2.1 Purpose of the Project

Due to the lack of continuous north-south transportation facilities in the study area, there is congestion on freeways, cut-through traffic that affects local streets, and poor transit operations in the study area. Therefore, the following project purpose has been established.

The purpose of the proposed action is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles, including the following considerations:

- Improve efficiency of the existing regional freeway and transit networks.
- Reduce congestion on local arterials adversely affected due to accommodating regional traffic volumes.
- Minimize environmental impacts related to mobile sources.

1.2.2 Need for the Project

The need for the project is described in detail in this section, based on consideration of the following factors:

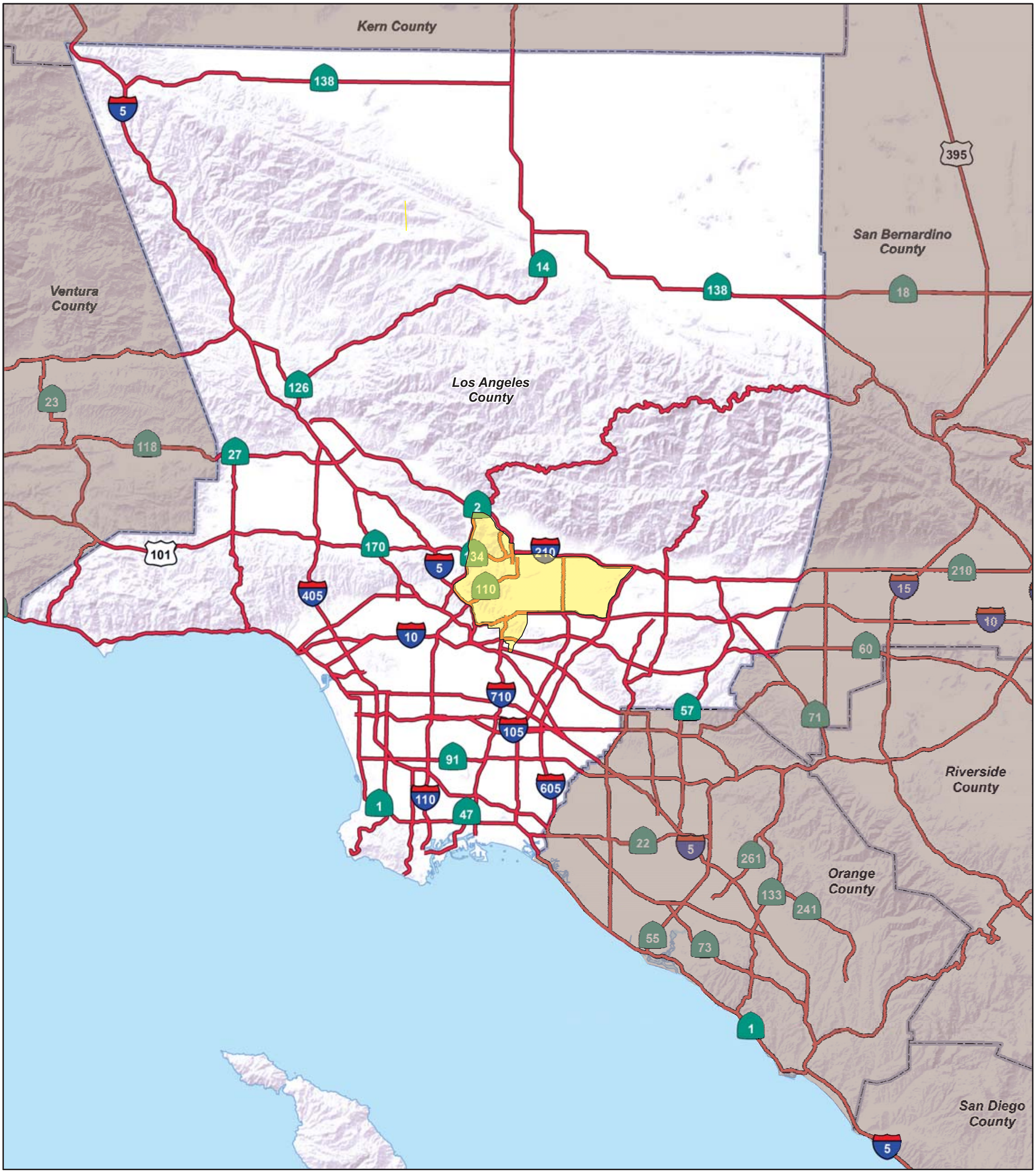
- Capacity, Transportation Demand, and Safety
- Social Demands or Economic Development
- Legislation
- Modal Interrelationships and System Linkages
- Environmental Factors

1.2.2.1 Capacity, Transportation Demand, and Safety

Capacity and Transportation Demand

The study area includes all or parts of the Cities of Alhambra, Arcadia, Duarte, El Monte, Glendale, La Cañada Flintridge, Los Angeles, Monrovia, Montebello, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South Pasadena, and Temple City. It also includes several distinct neighborhoods, including El Sereno, Arroyo Seco, Cypress Park, Eagle Rock, Glassell Park, Highland Park, and Lincoln Heights within the City of Los Angeles and parts of several unincorporated communities, including Altadena, East Los Angeles, East Pasadena, East San Gabriel, La Crescenta-Montrose, Mayflower Village, North El Monte, and San Pasqual, in the western San Gabriel Valley and foothills.

The study area is centrally located within the extended urbanized area of Southern California, as illustrated on Figure 1-2. With few exceptions, the area from Santa Clarita in the north to San Clemente in the south (a distance of approximately 90 mi) is continuously urbanized. Physical features such as the San Gabriel Mountains and Angeles National Forest on the north and the Puente Hills and Cleveland National Forest on the south have concentrated urban activity between the Pacific Ocean and these physical constraints. This urbanized area functions as a single social and economic region, identified by the Census Bureau as the Los Angeles-Long Beach-Santa Ana Metropolitan Statistical Area (MSA).



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SR 710 North Study Area

FIGURE 1-2

0 6 12
MILES

SOURCE: ESRI (2008); LSA (2013)

SR 710 North Project

Southern California Region

07-LA-710 (SR 710)
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Within this urbanized area, social and economic activity creates a great demand for travel between and among residential and employment centers. Greater Los Angeles is notable for its decentralized pattern of development, with 47 employment centers concentrating 10,000 jobs or more within 10 acres (ac) in Los Angeles and Orange Counties (Giuliano et al. 2007). As a result, travel patterns are complex, with people living in each part of the region and traveling to other parts of the region to go to work and to carry out other activities in their daily lives.

There are seven major east-west freeway routes and seven major north-south freeway routes in the central portion of the Los Angeles-Long Beach-Santa Ana MSA:

- Major East-West Freeway Routes
  - State Route 118 (SR 118)
  - US-101/State Route 134 (SR 134)
  - I-210
  - I-10
  - State Route 60 (SR 60)
  - Interstate 105 (I-105)
  - State Route 91 (SR 91)
- Major North-South Freeway Routes
  - Interstate 405 (I-405)
  - US-101/SR 170
  - I-5
  - SR 110
  - I-710/SR 710
  - I-605
  - State Route 57 (SR 57)

Of the seven north-south routes, four of them are located partially within the study area (I-5, SR 110, I-710/SR 710, and I-605), and two of these (SR 110 and I-710/SR 710) terminate within the study area without connecting to another freeway. The lack of continuous north-south transportation facilities in those two corridors in the study area affects the overall efficiency of the larger regional transportation system, which results in congestion on freeways in the study area, cut-through traffic that affects the local streets in the study area, and poor transit operations in the study area due to congestion on the local arterial roads. A high volume of north-south regional travel demand is concentrated on a few freeways, or diverted to local streets within the study area. This effect is exacerbated by the overall southwest-northeast orientation of I-605, which makes it an unappealing route for traffic between the southern part of the region and the urbanized areas to the northwest in the San Fernando Valley, Santa Clarita Valley, and Arroyo-Verdugo region.

SCAG growth forecasts project out over a 20-year period. SCAG anticipates population, housing, and employment growth to occur through 2035, even though a large area of Los Angeles County is urbanized and close to being built out, especially in the SR 710 North Project area. In 2008, there were 9,778,000 residents and 4,340,000 people employed in the County. According to SCAG's 2012 RTP/SCS Growth Forecast, the County's population is forecast to increase to approximately 11,353,000 and employment is forecast to increase to approximately 4,827,000 by 2035, increases of approximately 16.1 percent and approximately 11.2 percent. In 2012, the study area had a population of approximately 0.95 million people and an employment base of approximately 389,000 jobs. By 2035, the study area is forecast to have a population of approximately 1.06 million people and an employment base of approximately 438,000 jobs, increases of approximately 11.6 percent and approximately 12.6 percent.

The traffic analysis was based on the 2012 RTP/SCS model, which was the current regional model for traffic analysis when the evaluation was conducted. After the traffic analysis was completed, the 2016 RTP/SCS was approved and released, with the analysis based on the corresponding 2016 model. The traffic analysis was not updated to use the 2016 RTP/SCS model, consistent with standard practice.

The SCAG 2012 and 2016 RTP models were compared. While the horizon years are different (2035 for the 2012 model and 2040 for the 2016 model), the demographic data used as the core of the models is very similar. Horizon year total population in the SCAG region is the same in both models (22.1 million), and the total households and total employment are only slightly higher in the 2016 forecast model. Therefore, the core forecasts would remain largely unchanged with the 2016 RTP model as a base.

As discussed below, this growth would continue to decrease the overall efficiency of the larger regional transportation system, increase freeway congestion and cut-through traffic on local streets in the study area, and decrease bus transit operation efficiency within the study area.

Regional Transportation System Performance

According to the 2012 *Annual Urban Mobility Report* (Texas Transportation Institute 2012), the Los Angeles-Long Beach-Santa Ana MSA ranks second (second worst) in the United States for total travel delay and total congestion cost, slightly behind New York-Newark NY-NJ-CT but almost 85 percent higher total travel delay and approximately 70 percent higher total congestion cost than the third worst metropolitan area, Chicago-IL-IN. The Los Angeles-Long Beach-Santa Ana MSA ranks first (worst) in travel time index (the ratio of travel time during congested conditions to free flow) for automobile travel. The urban area of the Los Angeles-Long Beach-Santa Ana MSA ranks second for yearly delay for auto commuters and congestion cost per auto commuter, third for excess fuel used per auto commuter, first (worst) in freeway travel time index (measuring the reliability of freeway travel), and fifth for delay per non-peak traveler.

Transit users in the region also experience travel delay. Most transit use in the region occurs on buses, which generally operate on the same streets as automobiles and suffer from the same congestion. According to June 2012 Metro ridership statistics, approximately 76 percent of daily system-wide transit boardings occur on buses. The average speed of these buses has decreased over the past two decades, eroding the benefits achieved through the introduction of Metro Rapid Bus routes in 2000. The average speed of all Metro bus routes increased from 16 miles per hour (mph) in 1992 to 18.5 mph in 2005 after the introduction of Metro Rapid Bus service, but it has since decreased to 17.1 mph due to increasing arterial congestion (Metro Congestion Management Program, 2010).

Travelers in the region are projected to experience continuing and worsening freeway and arterial congestion through 2035. The SCAG 2012 RTP/SCS regional travel demand model was validated for the study area to evaluate existing conditions (2012) and future (2035) transportation system performance within the study area and region. Total vehicle miles traveled (VMT) is a key transportation indicator that represents total miles traveled by vehicles across a particular study area or region. Total vehicle hours traveled (VHT) represents total hours traveled by these same vehicles.

The total daily north-south travel in the study area for Existing (2012), Opening Year (2020/2025), and Horizon Year (2035) conditions was quantified as the number of people traveling across the east-west screenline (shown on Figure 1-3) by automobile or transit.

Table 1.1 summarizes the existing (2012), opening year (2020/2025), and horizon year (2035) daily and peak-period VHT and VMT for the study area and for the region. The opening year is defined as 2020 for the TSM/TDM and BRT Alternatives and as 2025 for the LRT and Freeway Tunnel Alternatives. The TSM/TDM and BRT Alternatives can be constructed more quickly so they have an earlier opening year than the LRT and Freeway Tunnel Alternatives which would take longer to construct. As shown in Table 1.1, the daily regional, and peak-period VMT and VHT are projected to continue to increase between the years 2013 and 2035. The combined VHT and VMT is the sum of the AM (6:00 to 9:00) and PM (3:00 to 7:00) peak periods.

TABLE 1.1:
Existing and Future System VMT, VHT, and Person Trips for the Study Area and Region

	Existing (2012)	No Build (2020)	No Build (2025)	No Build (2035)
Total Vehicular Travel Distance (miles)				
Daily VMT in the study area	24,150,000	24,275,000	24,560,000	25,120,000
Combined AM and PM Peak Period VMT in the study area	9,980,000	10,025,000	10,120,000	10,320,000
Daily VMT in the region	391,890,000	422,010,000	438,440,000	471,435,000
Combined AM and PM Peak Period VMT in the region	160,910,000	172,760,000	178,530,000	190,110,000
Total Vehicular Travel Time (hours)				
Daily VHT in the study area	660,000	667,000	681,000	706,000
Combined AM and PM Peak Period VHT in the study area	275,000	279,000	283,000	291,000
Daily VHT in the region	9,740,000	10,473,000	10,997,000	12,107,000
Combined AM and PM Peak Period VHT in the region	4,060,000	4,375,000	4,570,000	4,985,000
Daily Person Throughput (persons)				
Daily Person Trips across the East-West Screenline for Autos and Transit	3,029,000	3,090,000	3,133,000	3,210,000

Source: *Transportation Technical Report* (2014).
VHT = vehicle hours traveled
VMT = vehicle miles traveled

Study Area Freeway System

The freeways within the study area are often highly congested, resulting in travel delays. Many segments of the freeway network operate at or over capacity during peak periods. Table 1.2 presents data from Caltrans' 2008 State Highway Congestion Monitoring Program (HICOMP) report (the most recent data available) showing the hours that key freeway segments in the study area are congested on a typical weekday[1]. As Table 1.2 indicates, the 2008 peak hours of congestion span several hours each day, and the periods of congestion are expected to increase with the growth of the region.

Of the four north-south regional freeways that enter the study area (I-5, SR 110, I-710/SR 710, and I-605), only I-5 is continuous through the study area and oriented in a direction that serves the northern portion of the Los Angeles-Long Beach-Santa Ana MSA. As a result, I-5 carries a disproportionate share of regional trips. Analysis using the SCAG 2012 RTP/SCS travel demand model shows that over one-quarter of the traffic on I-5 between I-10 and SR 110 does not have an origin or destination between SR 710 and SR 134. In other words, much of the regional and

1 2008 was the last year of Caltrans developing the HICOMP.

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FIGURE 1-3

SR 710 North Project
East-West Screenline

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Transportation Technical Report (2014)

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TABLE 1.2:
Periods of Recurring Freeway Congestion (2008)

Freeway	Segment (Direction)	AM Peak Congestion Time	PM Peak Congestion Time
I-5	SR 134 to I-110 (southbound)	7:00–11:30	–
	I-10 to SR 2 (northbound)	9:00–noon	3:45–7:15
I-10	I-605 to I-710 (westbound)	6:00–10:45	–
	I-5 to I-605 (eastbound)	–	1:45–7:00
I-605	I-210 to I-10 (southbound)	7:30–9:30	–
I-210	I-210 to SR 2 (westbound)	8:15–9:30	–
	SR 134 to I-605 (eastbound)	–	3:15–6:15
SR 2	SR 134 to I-5 (southbound)	6:45–9:00	–

Source: Caltrans 2008 State Highway Congestion Monitoring Program (HICOMP).
Note: Caltrans 2008 HICOMP defines congestion as speeds less than 35 mph.

inter-regional traffic on I-5 is using one of the most congested areas of the regional freeway network. Traffic that does not need to be on I-5 to reach its destination contributes to recurring delay on the I-5 freeway.

In addition to recurring delay during peak hours, speeds and delays on the freeways at the same time of day are often highly variable from day to day. Figure 1-4 displays an example of the speed variation on I-5, a major regional freeway at the edge of the study area. The figure shows that peak-hour (5:00 PM to 6:00 PM on Tuesdays, Wednesdays and Thursdays) speeds on I-5 between Washington Boulevard and SR 134 are highly variable and unpredictable within a single month (October 2013). For example, the speed approaching the segment between SR 60 and I-10 varied from over 65 mph to below 20 mph at the same time of day.

As a result of the unreliable and unpredictable travel conditions, travelers must build “buffer time” into their travel plans to allow for the possibility of longer-than-usual delays. Based on data from Caltrans’ Performance Measurement System (PeMS), the time it takes to travel on I-5 from I-710 to SR 134 during the weekday peak varies from less than 15 minutes to more than 25 minutes. Even the average travel time on that segment of I-5 is approximately 53 percent higher than the travel time at the free-flow speed of 60 mph. Due to this speed variation, travelers need to allow a buffer of 97 percent of free-flow travel time to assure their arrival at their destination by a particular time.

The time required to make many north-south trips is exacerbated by the spacing between north-south freeways in the study area. Because of the approximate 12 mi spacing between north-south freeways (I-5 and I-605) on either side of the study area, many north-south trips must first travel east-west on the freeway system to reach a north-south freeway. The additional out-of-direction travel increases the required travel time in two ways. First, the actual distance traveled is longer than it might otherwise be, so travel time would be increased even under free-flow conditions.

Second, the additional travel on the east-west freeways degrades the operation of those freeways, so travel speeds are reduced beyond what they would otherwise be on those freeways.

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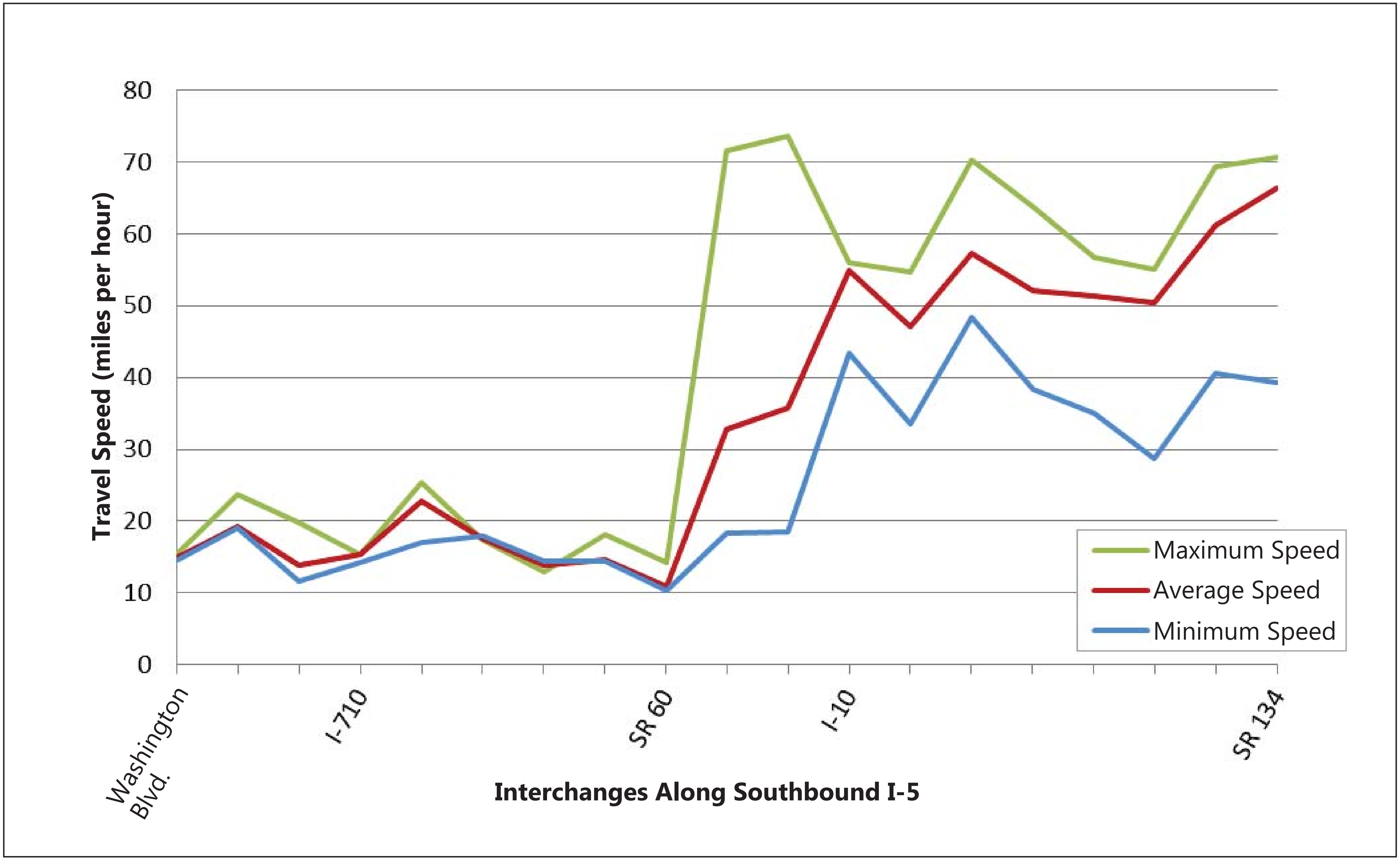

FIGURE 1-4

SR 710 North Project

PM Peak Hour Speed Variations on I-5 Southbound

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Alternatives Analysis Report (CH2M HILL, October 2013)

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Figure 1-5 illustrates these effects. The graphic highlights the length of a trip from two residential areas (East Los Angeles and El Monte) to an employment center in the study area (downtown Pasadena). The freeway travel distance from each residential area to the employment center is at least twice the direct, straight line distance. The result is that travelers are spending unnecessary time, traveling unnecessary distances, and increasing congestion on the regional freeway network.

The *Mobility Performance Report* (MPR) prepared by Caltrans is the annual traffic congestion report that provides system performance information based on data collected every day of the year, 24 hours/day, by automated vehicle detector stations deployed on urban-area freeways. The 2011 MPR lists the top 10 bottlenecks in the AM and PM periods in the Counties of Los Angeles and Ventura (Caltrans District 7) (see Tables 1.3 and 1.4). Of the top 10 bottleneck locations in each period, two bottlenecks in the AM period and three in the PM period are in or near the SR 710 North Project area. According to the January 2014 *Mile Marker: A Caltrans Performance Report*, I-5 is the most congested freeway in the State.

TABLE 1.3:
Top Ten AM Period Bottlenecks in Los Angeles County in 2011

Rank	County	City	Freeway	Dir	CA Post Mile	Approximate Location	Average Vehicle Hours of Delay	Average Duration (hours)	% of Days Active
1	LA	Los Angeles	I-710	S	R15.26	Magnolia Boulevard	2,392	2.8	86
2	LA	Los Angeles	US-101	S	19.8	Louise Avenue	1,730	2.3	93
3	LA	Los Angeles	I-110	N	21.36	Washington Boulevard	1,525	3.2	100
4	LA	Los Angeles	I-405	S	33.04	Sunset Boulevard	1,599	1.8	71
5	LA	Los Angeles	I-10	W	R7.81	Robertson Boulevard	1,185	1.7	95
6	LA	Downey	I-5	N	8.86	Paramount Boulevard	1,044	1.5	78
7	LA	Downey	I-5	N	8.41	Lakewood Boulevard	848	1.3	90
8	**LA**	**Los Angeles**	**SR 60**	**W**	**0.45**	**Soto Street**	**955**	**2.7**	**78**
9	LA	Los Angeles	I-110	N	19.16	Vernon Avenue	793	1.3	92
10	**LA**	**Los Angeles**	**I-5**	**N**	**15.14**	**Calzona Street**	**738**	**3.1**	**96**

Source: California Department of Transportation, *Mobility Performance Report* (2011).
Note: Indicates AM period bottlenecks in or near the SR 710 North Project Area.

TABLE 1.4:
Top Ten PM Period Bottlenecks in Los Angeles County in 2011

Rank	County	City	Freeway	Dir	CA Post Mile	Approximate Location	Average Vehicle Hours of Delay	Average Duration (hours)	% of Days Active
1	**LA**	**Commerce**	**I-5**	**S**	**11.3**	**Malt Avenue**	**2,357**	**3.1**	**100**
2	LA	Montebello	SR 60	E	R7.91	Paramount Boulevard	1,786	3.4	94
3	LA	Diamond Bar	SR 60	E	R22.94	Brea Canyon Road	1,999	3.2	80
4	LA	Diamond Bar	SR 57	N	R3.4	Pathfinder Road	1,609	3.8	98
5	**LA**	**La Puente**	**I-605**	**N**	**R19.502**	**Valley Boulevard**	**1,374**	**3.6**	**98**
6	LA	Long Beach	I-405	S	0.11	North of I-605	1,353	2.6	94
7	LA	Los Angeles	I-405	N	29.16	National Boulevard	1,861	4.0	65
8	**LA**	**El Monte**	**I-10**	**E**	**30.69**	**Durfee Avenue**	**1,225**	**2.2**	**95**
9	LA	Carson	I-405	S	11.82	South of Del Amo Boulevard	1,246	2.6	92
10	LA	Downey	I-605	S	R9.75	North of I-5	1,101	3.5	100

Source: California Department of Transportation, *Mobility Performance Report* (2011).
Note: Indicates PM period bottlenecks in or near the SR 710 North Project Area.

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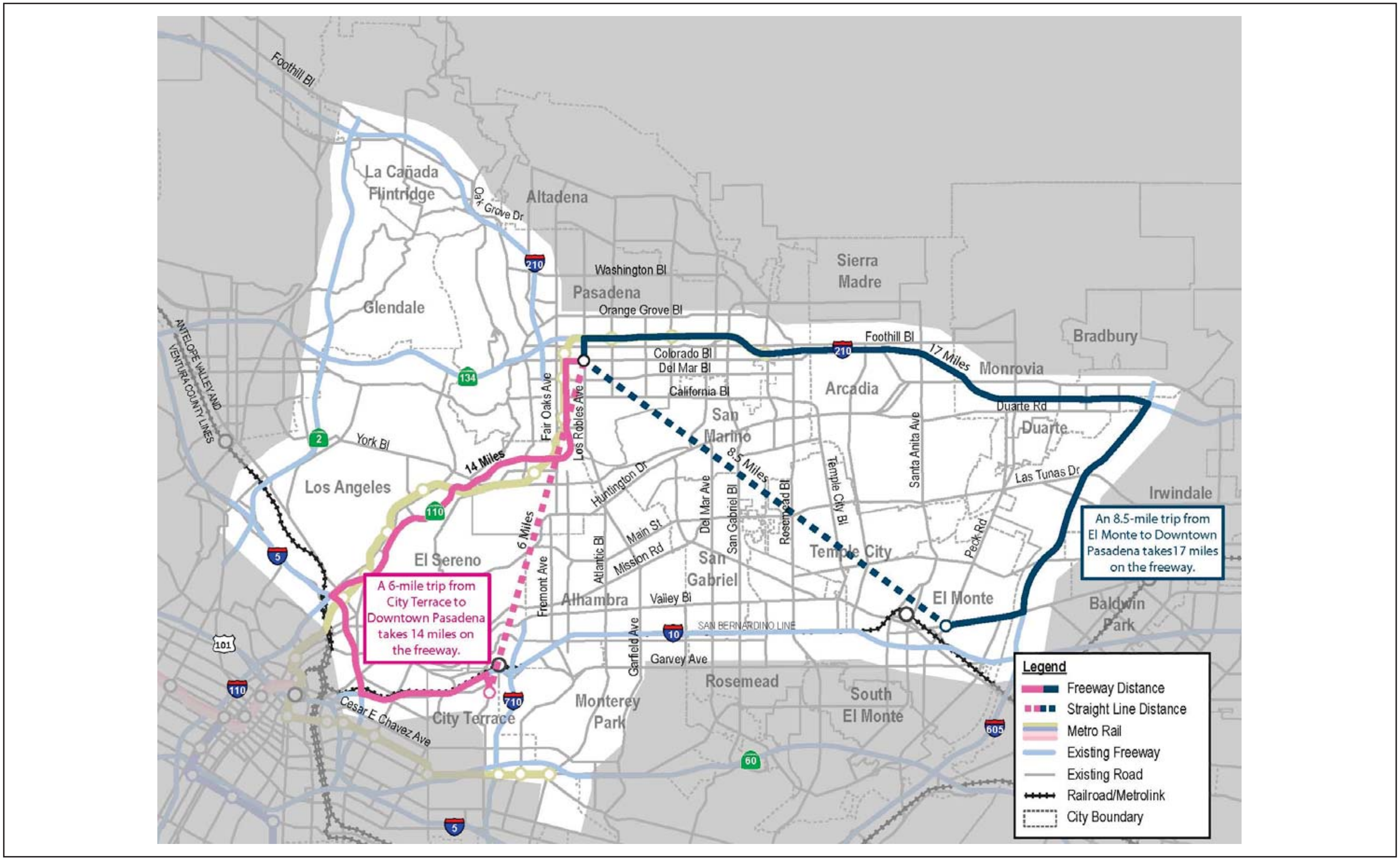

FIGURE 1-5

SOURCE: CH2M HILL (December 2012)

SR 710 North Project

Out-of-Direction Travel

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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Tables 1.5 and 1.6 are a summary of the existing (2013) and future (2035) traffic volumes on the nine freeways in the study area and provide ranges of daily and peak-hour traffic volumes. Average daily traffic (ADT) is for both directions, while the peak-hour volumes are shown for the peak direction only. The volume ranges are relatively large because of the length of the freeways (approximately 7 to 37 mi). As shown in Tables 1.5 and 1.6, the traffic volumes are generally predicted to increase between the years 2013 and 2035.

TABLE 1.5:
Existing Conditions (2013) Freeway Volumes

Freeway	Limits	Volume		
		ADT[1]	AM Peak[2]	PM Peak[2]
I-5	Between I-710 and SR 134	87,000-285,000	3,800–10,400	5,300–12,700
I-10	Between I-5 and I-605	114,000–237,000	4,900–8,900	4,900–10,200
I-210	Between I-5 and I-605	55,000–281,000	1,800–11,100	2,400–13,900
I-605	Between SR 60 and I-210	102,000-251,000	3,700–9,600	2,200–9,800
I-710/SR 710[3]	Between I-5 and Valley Boulevard	43,000–205,000	2,200–10,200	3,000–9,900
SR 2	Between I-5 and I-210	45,000–162,000	2,600–9,200	2,300–8,700
SR 60	Between I-5 and I-605	109,000–267,000	5,800–10,800	4,600–12,800
SR 110	Between I-5 and Fair Oaks Avenue	37,000–191,000	1,300–11,200	1,600–7,100
SR 134	Between I-5 and I-210/SR 710	93,000–224,000	4,300–8,900	3,500–8,300

Source: *Transportation Technical Report* (2014).
[1] Both directions.
[2] Peak direction only.
[3] SR 710 between I-10 and Valley Boulevard.

TABLE 1.6:
Future (2035) No-Build Freeway Volumes

Freeway	Limits	Volume		
		ADT[1]	AM Peak[2]	PM Peak[2]
I-5	Between I-710 and SR 134	91,000–290,000	3,900–10,500	4,900–12,800
I-10	Between I-5 and I-605	123,000–260,000	6,100–10,100	4,800–10,900
I-210	Between I-5 and I-605	63,000–288,000	4,300–11,100	2,500–14,300
I-605	Between SR 60 and I-210	107,000–256,000	3,900–9,800	2,600–9,900
I-710/SR 710[3]	Between I-5 and Valley Boulevard	45,000–230,000	2,300–11,400	3,100–11,300
SR 2	Between I-5 and I-210	45,000–162,000	2,500–9,100	2,300–8,600
SR 60	Between I-5 and I-605	113,000–265,000	5,900–11,000	4,900–12,500
SR 110	Between I-5 and Fair Oaks Avenue	39,000–193,000	1,300–11,100	1,700–7,000
SR 134	Between I-5 and I-210/SR 710	93,000–239,000	4,200–9,400	3,600–8,900

Source: *Transportation Technical Report* (2014).
[1] Both directions
[2] Peak direction only
[3] SR 710 between I-10 and Valley Boulevard

Even with the implementation of other planned transportation improvements, increasing travel demands would exceed freeway system capacity, and traffic operations on the already congested freeway network in the study area would continue to decline. Freeway traffic flow can be defined in terms of level of service (LOS). There are six defined LOS, ranging from LOS A to LOS F. For freeways, LOS A represents free traffic flow with low traffic volumes and high speeds, and LOS F represents traffic volumes that exceed the facility's capacity and result in forced flow operations at low speeds, as shown on Figure 1-6.

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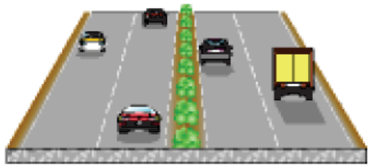
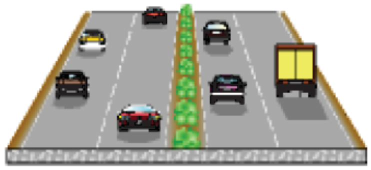
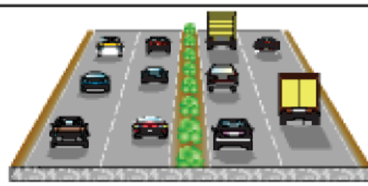
Level of Service	Flow Conditions	Operating Speed (mph)	Technical Descriptions
A		70	Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. **No delays**
B		70	Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. **No delays**
C		67	Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful making lane changes. **Minimal delays**
D		62	Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. **Minimal delays**
E		53	Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. **Significant delays**
F		<53	Very congested traffic with traffic jams, especially in areas where vehicles have to merge. **Considerable delays**

FIGURE 1-6

SR 710 North Project

Level of Service for Freeways

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Caltrans; 2000 HCM, Levels of Service for Freeways

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Tables 1.7 and 1.8 present an overview of the existing and future LOS for the nine study area freeways. As shown in these tables, I-5 has the highest percentage of LOS E and F segments, while SR 110 (north of I-5) has the lowest. Between 2013 and 2035, traffic volumes are generally projected to increase, and LOS is worse for 2035 conditions.

TABLE 1.7:
Existing Conditions (2013) Freeway LOS

Freeway	Limits	No. of Segments[1]	Percentage[2] of Segments					
			LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
I-5	Between I-710 and SR 134	94	0%	0%	6%	30%	30%	34%
I-10	Between I-5 and I-605	75	2%	9%	37%	25%	13%	15%
I-210	Between I-5 and I-605	175	4%	23%	30%	22%	7%	14%
I-605	Between SR 60 and I-210	34	0%	12%	37%	26%	12%	13%
I-710/SR 710[3]	Between I-5 and Valley Boulevard	31	3%	15%	24%	23%	15%	21%
SR 2	Between I-5 and I-210	41	20%	41%	16%	11%	6%	6%
SR 60	Between I-5 and I-605	66	0%	14%	32%	23%	14%	17%
SR 110	Between I-5 and Fair Oaks Avenue	38	9%	37%	32%	16%	4%	3%
SR 134	Between I-5 and I-210/SR 710	52	0%	8%	50%	32%	7%	4%

Source: *Transportation Technical Report* (2014).
[1] Both directions
[2] Both directions, both peak periods
[3] SR 710 between I-10 and Valley Boulevard

TABLE 1.8:
Future (2035) No-Build Freeway LOS

Freeway	Limits	No. of Segments[1]	Percentage[2] of Segments					
			LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
I-5	Between I-710 and SR 134	94	0%	1%	7%	22%	29%	42%
I-10	Between I-5 and I-605	75	2%	5%	29%	31%	15%	17%
I-210	Between I-5 and I-605	175	3%	22%	27%	23%	10%	15%
I-605	Between SR 60 and I-210	34	0%	15%	31%	26%	12%	16%
I-710/SR 710[3]	Between I-5 and Valley Boulevard	31	2%	15%	24%	18%	10%	32%
SR 2	Between I-5 and I-210	41	16%	40%	21%	11%	6%	6%
SR 60	Between I-5 and I-605	66	0%	11%	32%	26%	12%	20%
SR 110	Between I-5 and Fair Oaks Avenue	38	9%	36%	33%	16%	4%	3%
SR 134	Between I-5 and I-210/SR 710	52	0%	3%	47%	36%	12%	3%

Source: *Transportation Technical Report* (2014).
[1] Both directions
[2] Both directions, both peak periods
[3] SR 710 between I-10 and Valley Boulevard

Figure 1-7 shows average PM peak-period travel speeds on freeways in and around the study area based on 2008 data from the 2012 RTP/SCS. As shown, those travels speeds are below 34 mph on a number of the freeway segments in the study area and the surrounding areas. By 2035, the number of freeway segments operating at less than 34 mph in the PM peak period will increase, with more segments operating at 24 mph or less than in 2008, as shown on Figure 1-8.

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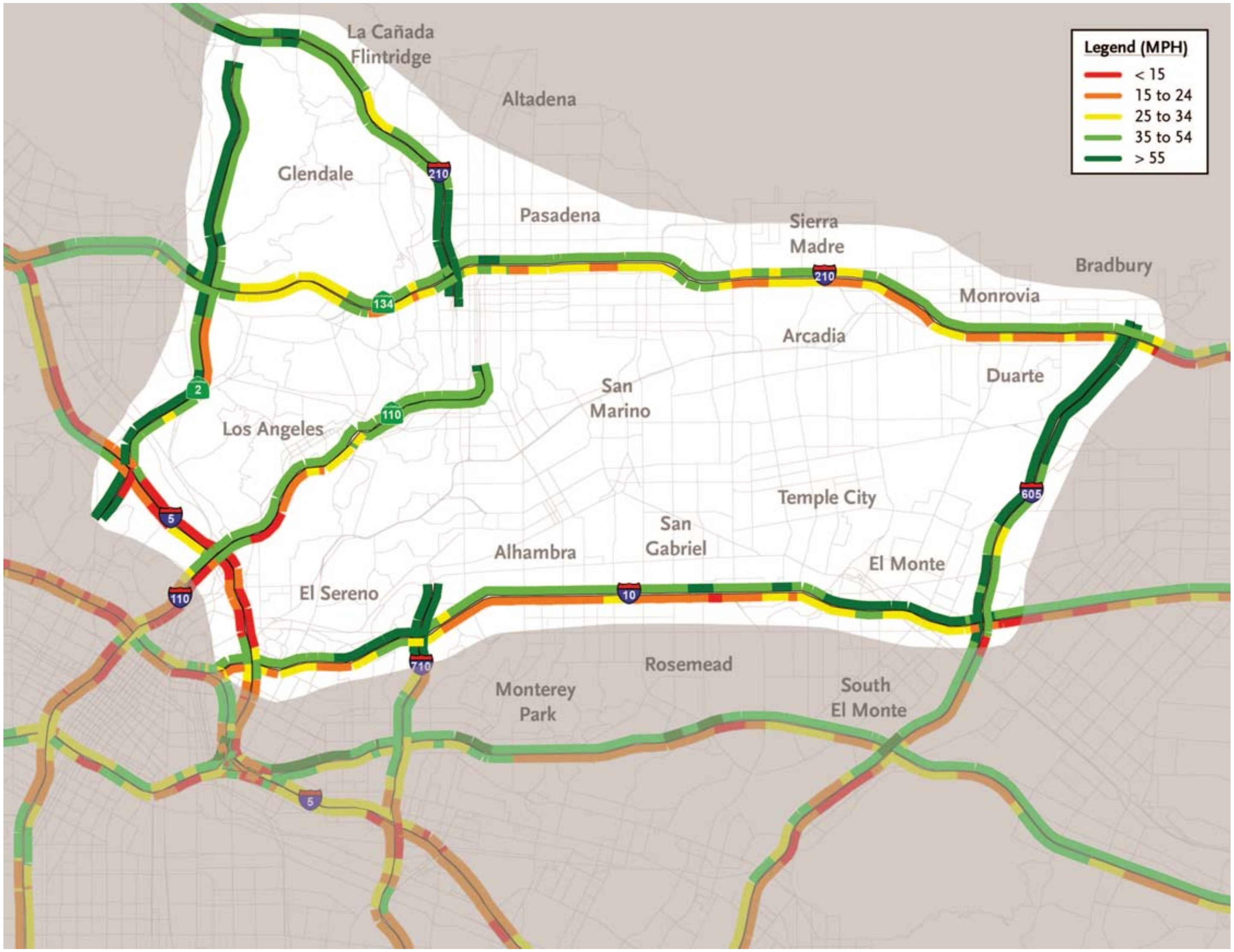

FIGURE 1-7

SR 710 North Project

Year 2008 Average PM Speeds

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: 2012 RTP

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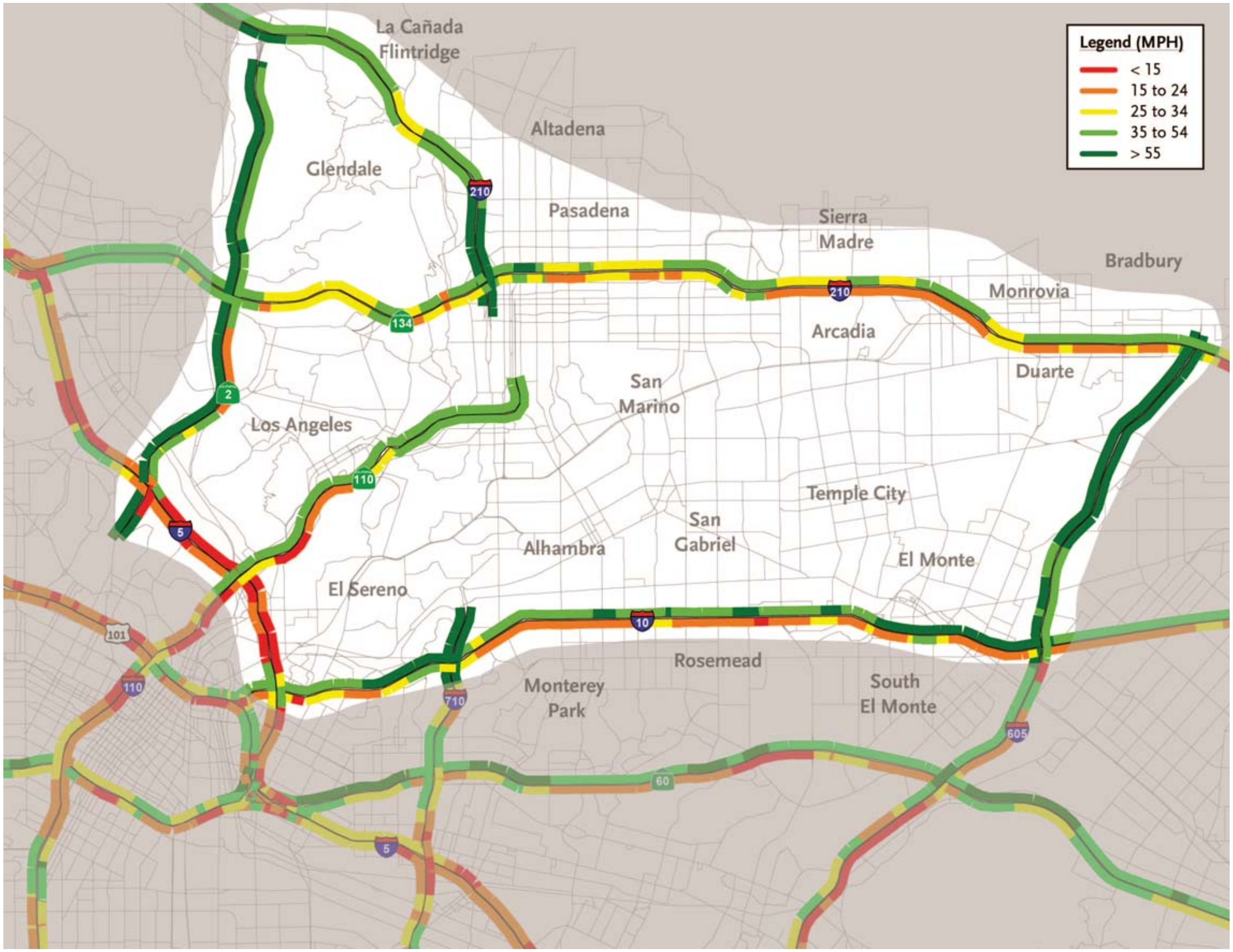

FIGURE 1-8

N

SR 710 North Project

Year 2035 Average PM Speeds

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: 2012 RTP

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One way to quantify the degree to which mobility is constrained in the north-south direction compared to the east-west direction is to compare the volume/capacity (v/c) ratios of freeways in each of those directions. The total volume of traffic on the freeways at select locations compared to the total capacity of the freeways at those locations represents the v/c ratio for traffic in that direction. According to analysis with the SCAG RTP/SCS travel demand model, the v/c ratio for traffic on north-south freeways is more than 10 percent greater than that for east-west freeways during the PM peak period.

Local Street System

One result of the distances between freeways and the congestion on the freeway system is that travelers use local streets in the study area to complete their regional trips. The high volume of cut-through traffic in the study area plays a major role in contributing to arterial congestion.

Congestion on local streets can be measured by intersection traffic flow defined by LOS. For intersections, LOS A represents very short delays (less than 10 seconds per vehicle) and LOS F represents high delays (more than 80 seconds per vehicle), as shown on Figures 1-9 and 1-10.

Table 1.9 summarizes the existing (2013) and future (2020, 2025, and 2035) No Build intersection operations on 156 local streets in the study area. As shown in Table 1.9, delay is projected to increase at 124 of the intersections in the morning peak hour and 128 of the intersections in the afternoon peak hour. LOS is projected to degrade at 35 of the intersections in the morning peak hour and at 34 of the intersections in the afternoon peak hour. (Intersections operating at or forecast to operate at LOS E or F are shown in **bold** text.) In the morning peak hour, 7 of the intersections currently operate at LOS E and none operate at LOS F. In the afternoon peak hour, 12 of the intersections currently operate at LOS E and 6 operate at LOS F. By 2035, the number of intersections operating at LOS E is projected to increase from 7 to 13 for the morning peak hour and from 12 to 15 for the afternoon peak hour. The number of intersections operating at LOS F is projected to increase from 0 to 5 for the morning peak hour and from 6 to 11 for the afternoon peak hour.

The high volume of cut-through traffic in the study area contributes to the arterial congestion in the study area. Figure 1-11 illustrates the roadway segments that cross the east-west screenline (shown on Figure 1-3) that were used to calculate the number of north-south cut-through trips in the study area. As shown in Table 1.10, in 2012, approximately 7.0 percent of the AM peak period, 12.4 percent of the PM peak period, and 10.5 percent of the daily trips on selected arterials are cut-through trips. In 2035, cut-through trips are projected to increase to approximately 7.5 percent in the AM peak period, 13.7 percent in the PM peak period, and 11.5 percent for the daily trips. There are projected increases in cut-through traffic even with the implementation of multiple highway and transit projects in the region to improve mobility, including the Gold Line Foothill and Eastside extension, Exposition Light Rail Line Phase II, Purple Line Westside Subway extension, Regional Connector, I-5 improvements north and south of downtown Los Angeles, managed lanes on SR 110 and I-10, and construction of high-occupancy vehicle (HOV) lanes on I-405.

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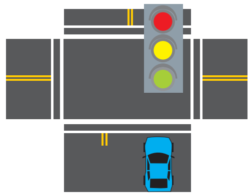
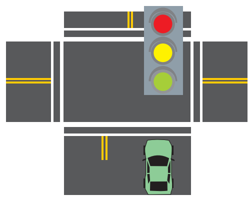
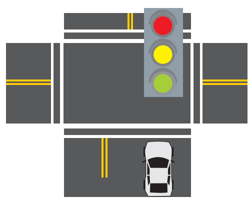
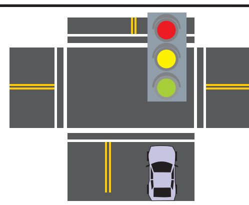
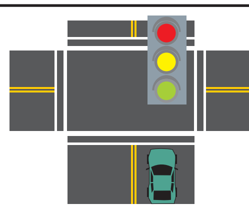
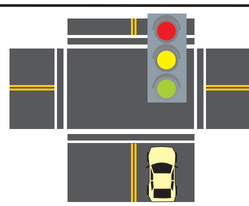
Level of Service	Delay per Vehicle (seconds)
A	 ≤10
B	 11-20
C	 21-35
D	 36-55
E	 56-80
F	 >80

Factors Affecting LOS
of Signalized Intersections

Traffic Signal Conditions:
- Signal Coordination
- Cycle Length
- Protected left turn
- Timing
- Pre-timed or traffic activated signal
- Etc.

Geometric Conditions:
- Left- and right-turn lanes
- Number of lanes
- Etc.

Traffic Conditions:
- Percent of truck traffic
- Number of pedestrians
- Etc.

FIGURE 1-9

SR 710 North Project

Level of Service for Signalized Intersections

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Caltrans; 2000 HCM, Exhibit 16-2, Levels of Service for Signalized Intersections

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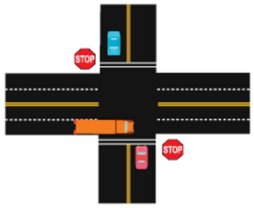
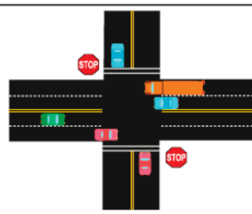
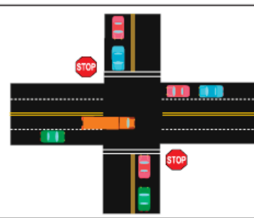
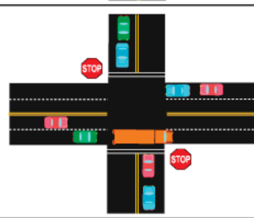
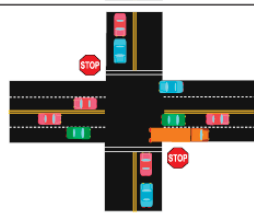
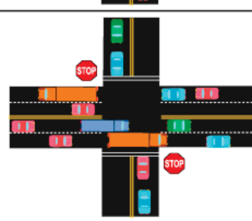
Level of Service	Flow Conditions	Delay per Vehicle (seconds)	Technical Descriptions
A		≤10	Very short delays
B		11-15	Short delays
C		16-25	Minimal delays
D		26-35	Minimal delays
E		36-50	Significant delays
F		>50	Considerable delays

FIGURE 1-10

SR 710 North Project

Level of Service for Two-Way Stop Controlled Intersections

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Caltrans; 2000 HCM, Exhibit 17-2, Levels of Service for TWSC Intersections

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TABLE 1.9:
2013 and 2035 Intersection Level of Service

No.	Intersection *(All are signalized unless otherwise noted.)*	Existing (2013)				No Build (2020)				No Build (2025)				No Build (2035)			
		AM		PM		AM		PM		AM		PM		AM		PM	
		Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS
1	Atlantic Blvd/Glendon Way	49.4	D	18.3	B	64.1	E	19.2	B	70.3	E	20.4	C	77.1	E	22.6	C
2	Atlantic Blvd/Main St	39.4	D	44.1	D	39.7	D	44.2	D	41.0	D	44.8	D	42.6	D	46.2	D
3	Atlantic Blvd/Mission Rd	32.9	C	54.2	D	36.7	D	67.1	E	38.0	D	65.8	E	39.7	D	67.4	E
4	Atlantic Blvd/Valley Blvd	42.8	D	51.0	D	43.8	D	57.8	E	46.7	D	58.1	E	47.7	D	57.1	E
5	Fremont Ave/Commonwealth Ave	19.7	B	29.9	C	20.7	C	30.0	C	21.1	C	31.1	C	21.4	C	32.1	C
6	Fremont Ave/Concord Ave	11.2	B	14.9	B	11.4	B	13.2	B	11.8	B	13.3	B	13.3	B	13.6	B
7	Fremont Ave/Hellman Ave	33.7	C	40.5	D	36.7	D	40.8	D	39.7	D	43.2	D	48.2	D	48.0	D
8	Fremont Ave/Main St	25.3	C	32.5	C	27.3	C	33.8	C	27.3	C	35.1	D	27.9	C	36.8	D
9	Fremont Ave/Mission Rd	45.9	D	59.6	E	47.5	D	65.6	E	49.1	D	65.2	E	51.2	D	69.8	E
10	Fremont Ave/Norwood Ave (unsignalized)	44.3	E	773.1	F	51.4	F	OVF	F	58.2	F	OVF	F	71.6	F	OVF	F
11	Fremont Ave/Poplar Blvd	9.9	A	8.8	A	10.6	B	8.9	A	10.5	B	8.9	A	10.5	B	7.4	A
12	Fremont Ave/Valley Blvd	43.8	D	46.4	D	45.5	D	47.9	D	45.3	D	48.8	D	48.5	D	51.2	D
13	Garfield Ave/Glendon Way	16.5	B	15.4	B	17.5	B	15.7	B	18.1	B	16.4	B	19.2	B	17.6	B
14	Garfield Ave/Main St	30.9	C	45.0	D	30.9	C	52.3	D	30.8	C	52.3	D	31.2	C	51.7	D
15	Garfield Ave/Mission Rd	40.4	D	60.5	E	49.2	D	65.1	E	53.2	D	67.8	E	55.5	E	72.7	E
16	Garfield Ave/Norwood Pl (unsignalized)	10.2	B	9.1	A	10.5	B	9.3	A	10.6	B	9.4	A	10.7	B	9.7	A
17	Garfield Ave/Valley Blvd	38.8	D	44.7	D	40.6	D	49.3	D	42.1	D	50.5	D	43.6	D	51.3	D
18	Huntington Dr/Main St	0.9	A	0.6	A	1.0	A	0.6	A	0.7	A	0.6	A	0.7	A	0.7	A
19	SR 710 NB Off-Ramp/Valley Blvd	28.5	C	12.8	B	29.5	C	15.5	B	32.0	C	18.0	B	33.5	C	17.2	B
20	SR 710 SB On-Ramp/Valley Blvd	48.4	D	75.5	E	50.6	D	89.0	F	69.5	E	158.5	F	51.7	D	95.3	F
21	Baldwin Ave/Foothill Blvd	20.0	C	28.7	C	18.4	B	30.1	C	19.1	B	30.2	C	19.6	B	29.2	C
22	Baldwin Ave/Huntington Dr	38.4	D	47.7	D	38.4	D	52.7	D	39.1	D	54.7	D	39.6	D	55.9	E
23	Santa Anita Ave/Duarte Rd	22.0	C	23.2	C	22.7	C	22.2	C	24.3	C	23.0	C	28.3	C	23.6	C
24	Santa Anita Ave/Live Oak Ave	30.5	C	33.2	C	31.4	C	33.3	C	31.8	C	33.6	C	32.1	C	33.5	C
25	Sunset Blvd/Huntington Dr	53.1	D	53.0	D	57.2	E	58.2	E	58.7	E	59.2	E	62.4	E	62.0	E
26	I-605 NB Ramps/Ramona Blvd	25.8	C	53.3	D	33.6	C	48.5	D	34.3	C	48.4	D	36.5	D	43.0	D
27	Atlantic Blvd/Beverly Blvd	28.8	C	45.3	D	30.3	C	47.5	D	30.7	C	47.9	D	32.1	C	50.6	D
28	Atlantic Blvd/Pomona Blvd	35.4	D	65.0	E	36.8	D	51.3	D	37.1	D	52.5	D	37.5	D	54.9	D
29	Atlantic Blvd/Whittier Blvd	24.2	C	30.4	C	25.8	C	33.4	C	26.3	C	34.5	C	27.3	C	39.5	D
30	Campus Rd/Ramona Blvd	27.3	C	20.1	C	27.9	C	19.8	B	28.0	C	19.9	B	29.7	C	20.0	C
31	Rosemead Blvd/California Blvd	25.7	C	30.6	C	26.0	C	30.1	C	26.4	C	30.2	C	27.6	C	32.1	C
32	Rosemead Blvd/Colorado Blvd	27.8	C	70.0	E	30.8	C	87.9	F	31.4	C	96.0	F	38.8	D	116.5	F
33	Baldwin Ave/Valley Blvd	32.6	C	38.5	D	35.0	C	44.7	D	35.5	D	45.3	D	36.5	D	47.1	D
34	Durfee Ave/Valley Blvd	50.9	D	70.5	E	63.2	E	86.9	F	70.7	E	93.1	F	76.2	E	111.1	F
35	Peck Rd/Garvey Ave	16.1	B	17.0	B	16.6	B	19.5	B	18.6	B	20.1	C	19.8	B	21.9	C
36	Peck Rd/I-10 EB Ramps	**Free**				**Free**				**Free**				**Free**			
37	Peck Rd/Lower Azusa Rd	49.8	D	69.9	E	55.4	E	80.3	F	57.0	E	82.2	F	60.9	E	84.5	F

TABLE 1.9:
2013 and 2035 Intersection Level of Service

No.	Intersection *(All are signalized unless otherwise noted.)*	Existing (2013)				No Build (2020)				No Build (2025)				No Build (2035)			
		AM		PM		AM		PM		AM		PM		AM		PM	
		Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS
38	Peck Rd/Valley Blvd	34.7	C	42.8	D	38.2	D	48.2	D	38.7	D	50.0	D	39.4	D	53.2	D
39	Santa Anita Ave/I-10 EB Ramps	16.2	B	26.0	C	16.7	B	24.6	C	16.9	B	25.0	C	17.2	B	25.5	C
40	Santa Anita Ave/Lower Azusa Rd	55.7	E	66.1	E	61.6	E	70.0	E	63.6	E	71.0	E	66.8	E	73.6	E
41	Santa Anita Ave/Valley Blvd	37.4	D	36.6	D	40.4	D	41.2	D	43.9	D	41.6	D	45.4	D	42.0	D
42	Tyler Ave/Valley Blvd	13.2	B	14.5	B	13.8	B	17.5	B	13.9	B	17.5	B	14.1	B	17.6	B
43	Valley Blvd/Garvey Ave	22.5	C	32.7	C	23.3	C	37.1	D	23.5	C	37.7	D	24.2	C	41.3	D
44	Harvey Dr/Wilson Ave	25.1	C	30.1	C	29.1	C	31.9	C	29.6	C	31.9	C	29.2	C	31.2	C
45	Myrtle Ave/Longden Ave	16.4	B	33.1	C	17.9	B	38.7	D	18.1	B	39.8	D	18.1	B	42.0	D
46	Peck Rd/Myrtle Ave/Live Oak Ave	27.3	C	40.3	D	27.4	C	40.6	D	27.7	C	40.8	D	28.3	C	40.7	D
47	Angeles Crest Hwy/Foothill Blvd	14.0	B	12.4	B	13.7	B	13.5	B	13.8	B	13.5	B	13.7	B	13.6	B
48	Gould Ave/Foothill Blvd	20.4	C	25.3	C	21.1	C	25.6	C	21.6	C	25.6	C	21.7	C	25.9	C
49	I-210 EB Ramps/Berkshire Pl (unsignalized)	25.7	D	14.2	B	15.5	C	13.1	B	18.5	C	13.1	B	15.3	C	13.0	B
50	I-210 EB Ramps/Foothill Blvd	Free				Free				Free				Free			
51	I-210 WB Ramps/Berkshire Pl (unsignalized)	22.3	C	12.1	B	19.1	C	11.9	B	19.3	C	12.1	B	18.5	C	12.2	B
52	I-210 WB Ramps/Foothill Blvd	12.5	B	11.3	B	13.3	B	12.6	B	15.4	B	12.7	B	16.2	B	12.7	B
53	Ocean View Blvd/Foothill Blvd	23.1	C	24.2	C	23.5	C	24.0	C	23.9	C	24.7	C	27.0	C	28.3	C
54	SR 2 Ramps/Foothill Blvd	9.2	A	9.5	A	12.4	B	20.7	C	12.2	B	20.9	C	12.1	B	23.5	C
55	Verdugo Blvd/Foothill Blvd	20.7	C	21.4	C	20.9	C	21.4	C	21.1	C	21.2	C	21.6	C	21.5	C
56	Ave 20/Broadway	20.3	C	15.9	B	19.6	B	16.5	B	19.6	B	16.7	B	20.4	C	16.8	B
57	Ave 64/York Blvd	23.6	C	24.4	C	22.1	C	24.4	C	22.3	C	24.7	C	23.1	C	25.2	C
58	Broadway/Colorado Blvd	12.8	B	106.2	F	14.7	B	124.0	F	15.2	B	132.9	F	14.9	B	160.1	F
59	Collis Ave/Huntington Dr	30.9	C	21.5	C	38.3	D	18.6	B	44.3	D	18.8	B	49.2	D	18.9	B
60	Concord Ave/Alhambra Ave (unsignalized)	26.5	D	57.9	F	32.4	D	72.9	F	34.2	D	100.1	F	40.8	E	113.2	F
61	Daly St/Broadway	52.2	D	29.6	C	77.5	E	36.5	D	82.4	F	37.8	D	88.2	F	38.3	D
62	Eagle Rock Blvd/SR 2 Ramps	41.5	D	40.0	D	34.5	C	37.7	D	34.3	C	37.9	D	36.6	D	37.8	D
63	Eagle Rock Blvd/Verdugo Rd/Ave 40	29.6	C	43.6	D	31.6	C	49.0	D	31.4	C	50.8	D	30.6	C	50.0	D
64	Eagle Rock Blvd/York Blvd	15.3	B	20.2	C	15.3	B	20.4	C	15.4	B	20.5	C	15.7	B	20.6	C
65	Eastern Ave/Huntington Dr	26.0	C	118.2	F	26.7	C	122.9	F	27.6	C	138.0	F	28.1	C	165.0	F
66	Figueroa St/Ave 26	46.8	D	33.6	C	47.1	D	36.2	D	52.3	D	36.2	D	53.4	D	38.3	D
67	Figueroa St/Colorado Blvd	29.6	C	15.9	B	31.3	C	16.8	B	33.1	C	16.7	B	36.4	D	17.0	B
68	Figueroa St/SR 134 EB Ramps	1.0	A	1.0	A	1.0	A	1.0	A	1.0	A	1.0	A	1.0	A	1.0	A
69	Figueroa St/SR 134 WB Ramps (unsignalized)	44.9	E	38.8	E	19.5	C	40.0	E	19.9	C	38.3	E	20.2	C	44.3	E
70	Figueroa St/York Blvd	24.0	C	22.4	C	25.7	C	24.8	C	25.6	C	25.1	C	26.2	C	25.1	C
71	Griffin Ave/Broadway	18.3	B	18.6	B	18.0	B	19.8	B	18.2	B	20.1	C	18.8	B	20.3	C
72	Huntington Dr/Monterey Rd	45.1	D	33.6	C	51.8	D	32.7	C	54.2	D	32.9	C	53.7	D	33.4	C
73	Marengo St/Mission Rd	40.3	D	44.1	D	35.3	D	43.6	D	37.5	D	46.1	D	36.8	D	46.1	D
74	Pasadena Ave/Broadway	68.0	E	22.9	C	148.7	F	25.3	C	173.2	F	26.2	C	192.9	F	25.4	C

TABLE 1.9:
2013 and 2035 Intersection Level of Service

No.	Intersection (All are signalized unless otherwise noted.)	Existing (2013)				No Build (2020)				No Build (2025)				No Build (2035)			
		AM		PM		AM		PM		AM		PM		AM		PM	
		Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS
75	San Pasqual Ave/York Blvd	13.2	B	13.0	B	13.5	B	12.9	B	13.5	B	13.1	B	15.1	B	15.6	B
76	Soto St/Marengo St	15.6	B	12.2	B	15.7	B	12.4	B	16.0	B	12.6	B	17.1	B	12.8	B
77	Myrtle Ave/Duarte Rd	49.6	D	48.1	D	47.2	D	50.7	D	47.5	D	50.1	D	48.6	D	49.2	D
78	Myrtle Ave/I-210 EB Ramps	23.9	C	29.3	C	27.6	C	36.0	D	27.6	C	35.4	D	27.5	C	38.0	D
79	Atlantic Blvd/Cesar Chavez Ave	31.8	C	50.0	D	33.4	C	49.1	D	33.9	C	50.3	D	35.3	D	54.3	D
80	Atlantic Blvd/Garvey Ave	34.0	C	50.6	D	36.7	D	54.5	D	38.3	D	56.3	**E**	41.7	D	61.7	**E**
81	Atlantic Blvd/SR 60 EB Ramps	10.1	B	11.7	B	10.3	B	14.9	B	10.2	B	14.9	B	10.5	B	15.2	B
82	Atlantic Blvd/SR 60 WB Ramps	13.2	B	11.8	B	14.3	B	16.0	B	15.2	B	16.0	B	17.4	B	17.4	B
83	McDonnell Ave/Corporate Center Dr/Floral Dr	21.0	C	21.1	C	22.6	C	20.5	C	22.6	C	21.1	C	22.7	C	22.9	C
84	Arroyo Seco Pkwy/California Blvd	24.8	C	28.0	C	25.8	C	29.0	C	29.0	C	28.7	C	31.4	C	29.9	C
85	Arroyo Seco Pkwy/Colorado Blvd	15.8	B	18.0	B	15.5	B	17.5	B	15.7	B	17.6	B	15.5	B	18.1	B
86	Arroyo Seco Pkwy/Del Mar Blvd	23.9	C	26.9	C	23.2	C	26.1	C	23.5	C	26.3	C	23.9	C	27.1	C
87	Fair Oaks Ave/California Blvd	28.6	C	29.8	C	29.0	C	31.1	C	29.1	C	31.2	C	31.4	C	32.0	C
88	Fair Oaks Ave/Corson St (I-210 EB Off-Ramp)	21.8	C	18.7	B	13.6	B	19.3	B	14.0	B	19.4	B	14.4	B	19.4	B
89	Fair Oaks Ave/Del Mar Blvd	26.5	C	29.0	C	26.8	C	29.1	C	27.7	C	30.0	C	26.8	C	31.3	C
90	Fair Oaks Ave/Maple St (I-210 WB On-Ramp)	22.1	C	23.6	C	20.9	C	24.0	C	21.1	C	23.9	C	21.0	C	24.2	C
91	Fair Oaks Ave/Mountain St	12.9	B	12.2	B	12.8	B	12.3	B	12.9	B	12.3	B	12.9	B	12.3	B
92	Fair Oaks Ave/Orange Grove Blvd	30.9	C	26.1	C	31.2	C	27.7	C	31.3	C	27.8	C	31.4	C	27.7	C
93	Fair Oaks Ave/Raymond Hill Rd	9.3	A	8.7	A	9.7	A	9.8	A	9.2	A	10.8	B	8.9	A	10.3	B
94	Fair Oaks Ave/Walnut St	23.5	C	26.1	C	23.2	C	24.1	C	23.1	C	24.2	C	23.3	C	24.9	C
95	Hill Ave/Corson St (I-210 EB Off-Ramp)	30.6	C	33.5	C	28.0	C	31.7	C	28.5	C	31.2	C	30.1	C	31.4	C
96	Hill Ave/Maple St (I-210 WB On-Ramp)	38.6	D	19.1	B	25.9	C	26.1	C	26.2	C	23.1	C	26.0	C	28.4	C
97	I-210 EB Ramps/Mountain St (unsignalized)	36.0	**E**	22.1	C	28.6	D	21.2	C	27.5	D	19.7	C	38.8	**E**	21.3	C
98	I-210 WB Ramps/Mountain St (unsignalized)	15.7	C	21.4	C	12.8	B	20.2	C	15.8	C	19.6	C	15.0	C	19.9	C
99	Lake Ave/Corson St (I-210 EB Off-Ramp)	17.2	B	19.9	B	17.2	B	19.8	B	17.3	B	20.0	C	17.5	B	20.6	C
100	Lake Ave/Maple St (I-210 WB On-Ramp)	40.0	D	23.0	C	40.0	D	24.0	C	46.3	D	24.9	C	46.3	D	25.1	C
101	Lincoln Ave/Orange Grove Blvd	12.2	B	12.4	B	13.0	B	12.8	B	12.8	B	12.7	B	13.3	B	12.7	B
102	Los Robles Ave/Colorado Blvd	13.4	B	14.6	B	13.0	B	15.2	B	13.6	B	15.4	B	13.8	B	15.7	B
103	Los Robles Ave/Walnut St	13.9	B	15.0	B	14.4	B	18.1	B	14.0	B	19.1	B	14.6	B	23.0	C
104	Marengo Ave/Colorado Blvd	17.4	B	20.1	C	17.9	B	19.5	B	17.8	B	19.6	B	17.9	B	19.9	B
105	Marengo St/Corson St (I-210 EB Ramps)	16.0	B	16.5	B	20.2	C	15.2	B	20.3	C	15.3	B	17.4	B	15.3	B
106	Marengo St/Maple St (I-210 WB Ramps)	23.7	C	25.6	C	25.8	C	34.8	C	25.0	C	36.6	D	25.5	C	36.5	D
107	Orange Grove Blvd/Colorado Blvd	19.1	B	17.3	B	19.9	B	17.7	B	19.7	B	17.8	B	19.7	B	17.8	B
108	Orange Grove Blvd/Walnut St	6.2	A	7.6	A	5.9	A	7.4	A	6.0	A	7.4	A	6.1	A	7.4	A
109	St. John Ave/California Blvd	27.2	C	21.1	C	27.3	C	20.8	C	27.0	C	21.2	C	28.8	C	22.0	C
110	St. John Ave/Colorado Blvd	12.2	B	13.0	B	12.7	B	12.7	B	12.3	B	12.9	B	12.7	B	13.1	B
111	St. John Ave/Del Mar Blvd	8.6	A	9.0	A	8.4	A	8.7	A	8.6	A	8.7	A	8.4	A	8.9	A

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2013 and 2035 Intersection Level of Service

No.	Intersection *(All are signalized unless otherwise noted.)*	Existing (2013)				No Build (2020)				No Build (2025)				No Build (2035)			
		AM		PM		AM		PM		AM		PM		AM		PM	
		Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS
112	San Rafael Ave/SR 134 EB Ramps	2.9	A	3.4	A	3.4	A	10.6	B	5.6	A	10.6	B	26.8	C	46.1	D
113	San Rafael Ave/SR 134 WB Ramps	13.7	B	13.2	B	14.5	B	13.4	B	14.5	B	13.4	B	14.9	B	16.0	B
114	Sierra Madre Blvd/Del Mar Blvd	28.5	C	34.9	C	29.5	C	32.4	C	30.5	C	33.8	C	33.7	C	34.3	C
115	Rosemead Blvd/Lower Azusa Rd	27.9	C	24.1	C	28.3	C	24.3	C	27.2	C	24.3	C	26.5	C	25.3	C
116	Rosemead Blvd/Marshall St	30.6	C	43.4	D	31.2	C	44.1	D	33.2	C	45.3	D	35.4	D	48.1	D
117	Rosemead Blvd/Mission Dr	47.7	D	50.3	D	43.7	D	51.0	D	44.8	D	51.4	D	45.5	D	50.3	D
118	Rosemead Blvd/Valley Blvd	50.3	D	55.7	E	51.1	D	55.8	E	53.9	D	55.9	E	56.4	E	56.0	E
119	Temple City Blvd/Valley Blvd	57.0	E	56.5	E	64.4	E	59.9	E	66.2	E	61.5	E	67.4	E	63.2	E
120	Walnut Grove Ave/Mission Dr	13.9	B	14.4	B	14.1	B	14.3	B	14.5	B	14.5	B	13.7	B	14.1	B
121	Walnut Grove Ave/Valley Blvd	16.6	B	19.6	B	19.4	B	21.8	C	20.0	B	23.2	C	20.7	C	25.7	C
122	Del Mar Ave/Mission Rd	53.7	D	49.2	D	82.8	F	61.3	E	98.2	F	62.6	E	97.3	F	66.7	E
123	Del Mar Ave/Valley Blvd	33.5	C	46.8	D	34.7	C	52.6	D	35.8	D	53.4	D	41.4	D	68.5	E
124	Rosemead Blvd/Huntington Dr	31.7	C	48.6	D	32.4	C	50.4	D	33.0	C	51.2	D	34.6	C	53.2	D
125	San Gabriel Blvd/Las Tunas Dr	45.4	D	98.5	F	54.5	D	96.9	F	56.9	E	98.8	F	58.3	E	103.0	F
126	San Gabriel Blvd/Marshall St	41.9	D	33.1	C	45.8	D	34.5	C	45.9	D	36.1	D	118.1	F	79.2	E
127	San Gabriel Blvd/Mission Rd	25.6	C	26.3	C	25.8	C	25.6	C	27.4	C	25.1	C	27.6	C	25.3	C
128	San Gabriel Blvd/Valley Blvd	37.2	D	51.9	D	37.6	D	58.1	E	38.2	D	58.8	E	49.7	D	77.3	E
129	Walnut Grove Ave/Broadway	15.6	B	25.2	C	15.2	B	27.7	C	15.6	B	28.7	C	15.6	B	29.6	C
130	Atlantic Blvd/Garfield Ave	26.6	C	26.2	C	27.5	C	26.5	C	27.4	C	26.4	C	27.4	C	26.7	C
131	Atlantic Blvd/Huntington Dr	56.5	E	86.7	F	57.7	E	85.0	F	61.2	E	89.2	F	60.0	E	96.6	F
132	Del Mar Ave/Huntington Dr	25.9	C	26.6	C	27.1	C	27.1	C	27.9	C	27.6	C	30.0	C	28.4	C
133	El Molino Ave/Huntington Dr (unsignalized)	32.0	D	17.4	C	34.6	D	17.6	C	37.3	E	17.8	C	39.8	E	18.7	C
134	Garfield Ave/Huntington Dr	15.8	B	15.1	B	17.6	B	15.4	B	17.9	B	15.5	B	16.5	B	15.3	B
135	Oak Knoll Ave/Huntington Dr	17.1	B	11.8	B	16.4	B	11.8	B	17.1	B	12.0	B	18.1	B	12.2	B
136	San Gabriel Blvd/Huntington Dr	50.9	D	47.3	D	49.6	D	48.4	D	51.0	D	49.7	D	53.7	D	52.4	D
137	San Marino Ave/Huntington Dr	41.4	D	36.5	D	44.7	D	36.6	D	47.4	D	37.3	D	52.3	D	39.4	D
138	Virginia Rd/Huntington Dr	30.7	C	30.6	C	32.9	C	31.9	C	34.3	C	32.9	C	35.1	D	32.8	C
139	Fair Oaks Ave/Huntington Dr	18.3	B	21.2	C	18.5	B	21.0	C	18.7	B	21.3	C	19.2	B	21.6	C
140	Fair Oaks Ave/Mission St	39.7	D	43.9	D	39.4	D	40.9	D	37.1	D	42.8	D	38.7	D	42.7	D
141	Fair Oaks Ave/Monterey Rd	17.7	B	21.5	C	18.2	B	22.0	C	18.1	B	21.9	C	18.3	B	22.5	C
142	Fair Oaks Ave/SR 110 NB Off-Ramp	9.6	A	18.0	B	4.5	A	10.5	B	4.6	A	10.2	B	7.1	A	17.6	B
143	Fair Oaks Ave/SR 110 SB On-Ramps	15.0	B	14.5	B	11.6	B	12.5	B	11.9	B	12.7	B	14.5	B	14.3	B
144	Fremont Ave/Alhambra Rd	34.4	C	37.9	D	39.8	D	43.1	D	41.9	D	43.7	D	46.4	D	44.2	D
145	Fremont Ave/Huntington Dr	44.1	D	68.5	E	44.1	D	79.5	E	47.5	D	79.7	E	48.8	D	83.3	F
146	Fremont Ave/Monterey Rd	15.3	B	17.5	B	16.0	B	18.3	B	16.3	B	18.3	B	16.5	B	18.7	B
147	Pasadena Ave/Monterey Rd	17.6	B	18.6	B	17.5	B	18.8	B	17.5	B	18.8	B	17.7	B	18.8	B
148	Rosemead Blvd/Las Tunas Dr	33.3	C	38.7	D	35.7	D	40.9	D	35.7	D	41.1	D	36.3	D	40.3	D

TABLE 1.9:
2013 and 2035 Intersection Level of Service

No.	Intersection (All are signalized unless otherwise noted.)	Existing (2013)				No Build (2020)				No Build (2025)				No Build (2035)			
		AM		PM		AM		PM		AM		PM		AM		PM	
		Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS	Delay (sec/v)	LOS
149	Fremont Ave/Montezuma Ave	20.2	C	21.7	C	51.1	D	23.2	C	53.4	D	23.9	C	21.8	C	24.3	C
150	Marengo Ave/Main St	15.1	B	16.5	B	15.1	B	16.2	B	15.6	B	16.4	B	16.4	B	16.8	B
151	Marengo Ave/Mission Rd	19.0	B	22.4	C	20.6	C	27.7	C	20.8	C	26.8	C	22.1	C	27.1	C
152	Marengo Ave/Valley Blvd	38.2	D	34.9	C	35.5	D	36.8	D	36.6	D	38.1	D	46.8	D	40.7	D
153	Mednik Ave/Cesar Chavez Ave	11.9	B	16.2	B	11.3	B	17.3	B	12.7	B	18.0	B	13.5	B	20.3	C
154	Mednik Ave/First St	14.1	B	13.8	B	13.9	B	13.7	B	15.6	B	13.9	B	18.0	B	14.0	B
155	Mednik Ave/Floral Dr	11.4	B	13.9	B	12.5	B	14.9	B	12.6	B	15.6	B	12.6	B	17.8	B
156	Eagle Rock Blvd/Colorado Blvd	14.9	B	15.3	B	14.8	B	15.4	B	15.0	B	15.5	B	15.4	B	15.7	B

Source: *Transportation Technical Report* (2014).
Ave = Avenue
Blvd = Boulevard
Dr = Drive
EB = eastbound
Free = Unsignalized intersection with free movements. Delay and LOS are not reported.
Hwy = Highway
I-10 = Interstate 10
I-210 = Interstate 210
I-605 = Interstate 605
LOS = level of service
NB = northbound
OVF = overflow delay
Pkwy = Parkway
Pl = Place
Rd = Road
SB = southbound
SR 2 = State Route 2
SR 60 = State Route 60
SR 110 = State Route 110
SR 134 = State Route 134
SR 710 = State Route 710
St = Street
sec/v = seconds per vehicle
WB = westbound

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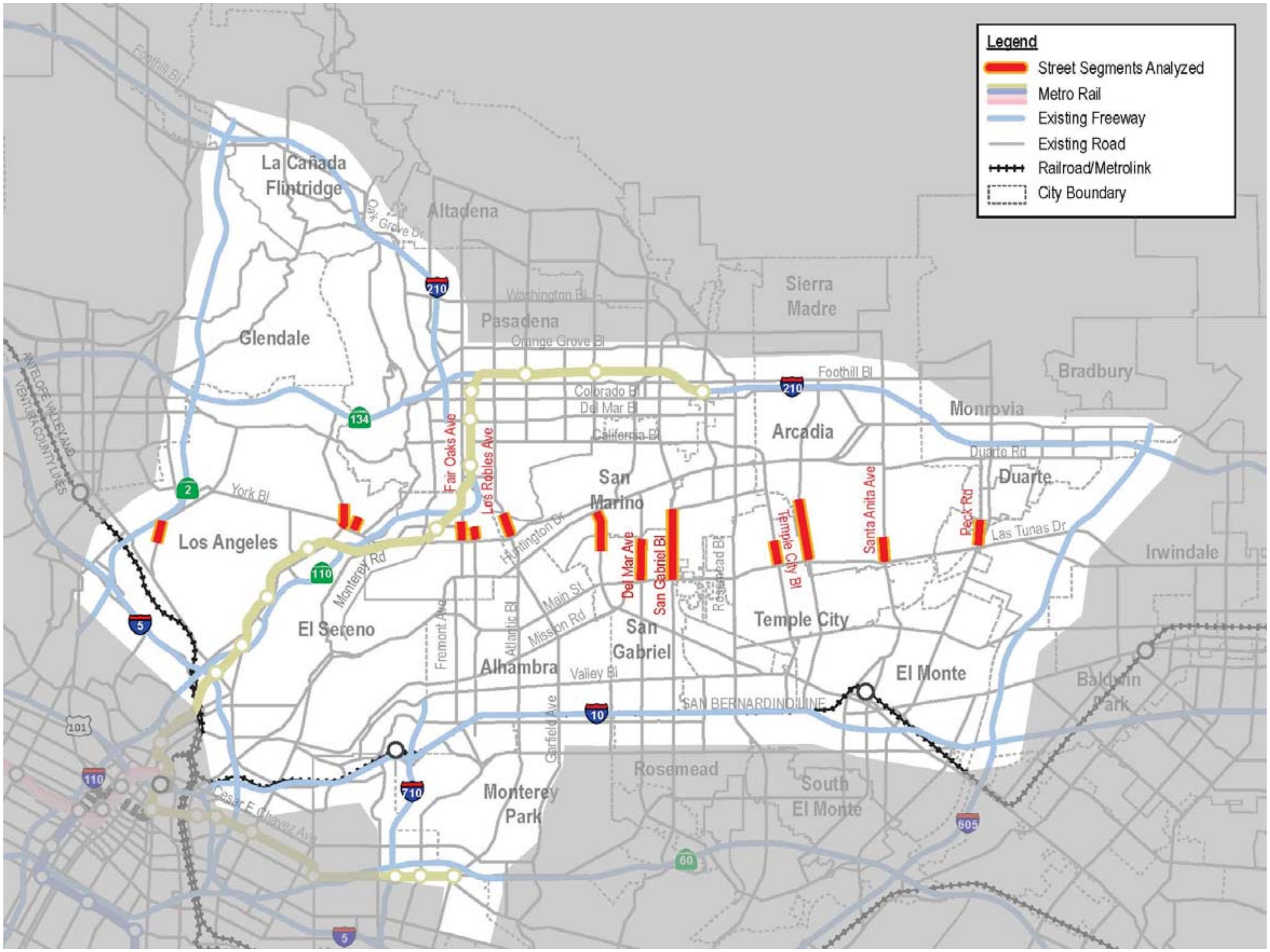

FIGURE 1-11

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MILES

SOURCE: Transportation Technical Report (2014)

SR 710 North Project

Study Area Street Segments Analyzed for Cut-Through Traffic

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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TABLE 1.10:
Existing and Future Arterial Usage in the Study Area

	Existing (2012)	No Build (2020)	No Build (2025)	No Build (2035)
Volume (Vehicle Trips) Served				
Daily North-South Volume on Arterials	835,000	853,000	864,000	881,000
Daily North-South Volume on Freeways	1,036,000	1,015,000	1,023,000	1,042,000
Traffic Diversion to Local Arterials				
Daily Study Area VMT on Arterials	7,645,000	7,810,000	7,945,000	8,180,000
Use of Local Arterials for Long Trips				
PM Peak Period Percent Cut-Through	12.4%	14.2%	13.9%	13.7%

Source: *Transportation Technical Report* (2014).

Within the study area, higher traffic volumes are observed on north-south arterials than on east-west arterials. Figure 1-12 presents the 2012 ADT volumes on the study area's major arterials, based on modeled data. Throughout the study area, four-lane north-south arterials such as Fremont Avenue, Atlantic Boulevard, Garfield Avenue, San Gabriel Boulevard, and Rosemead Boulevard (SR 19) all have segments that carry over 35,000 vehicles per day. In contrast, only Huntington Drive, a six-lane arterial, carries that volume of traffic in the east-west direction. As shown in Table 1.10, the volume of vehicles traveling on the north-south study area freeway and arterial systems is projected to increase between the years 2012 and 2035.

As with the study area freeways, v/c ratios on north-south roadways for the local roadway network were compared to those on east-west roadways. As shown in Table 1.11, the v/c ratios for traffic on north-south roadways is about 25 percent greater than that for east-west roadways during the PM peak period.

TABLE 1.11:
Volume/Capacity Ratio by Direction of Travel

	All Roadways (PM Peak)		Freeway Only (PM Peak)		Arterials Only (PM Peak)	
	2012	**2035**	**2012**	**2035**	**2012**	**2035**
East-West Traffic (e.g., I-10, California Boulevard)	0.62	0.62	0.89	0.88	0.37	0.39
North-South Traffic (e.g., I-5, Rosemead Boulevard)	0.57	0.58	0.84	0.83	0.47	0.49
Difference	***-8.2%***	***-7.7%***	***-5.4%***	***-5.6%***	***24.6%***	***24.5%***

Source: *Transportation Technical Report* (2014).

Transit System in Study Area

In general, transit travel in the study area is affected by the same congestion on the roadway network that affects automobile travel. This is because most transit trips within the study area are made via a bus system, which operates on the local roadway network. According to the Metro transit model, approximately 79 percent of transit trips in the study area were made via bus in 2006, 20 percent were made via light rail (the Metro Gold Line), and less than 1 percent were made via commuter rail (Metrolink).

Table 1.12 summarizes the existing and future regional transit demand. Table 1.12 demonstrates that regional transit ridership is projected to increase between 2012 and 2035. In addition, the daily transit mode share in the study area for the existing year (2012) is approximately 3.5 percent, but by 2035 it would be approximately 4.2 percent. Transit mode split is a ratio of transit trips to total person trips. A higher mode split for transit indicates an increase in transit trips and transit ridership relative to other modes. By 2035, north-south

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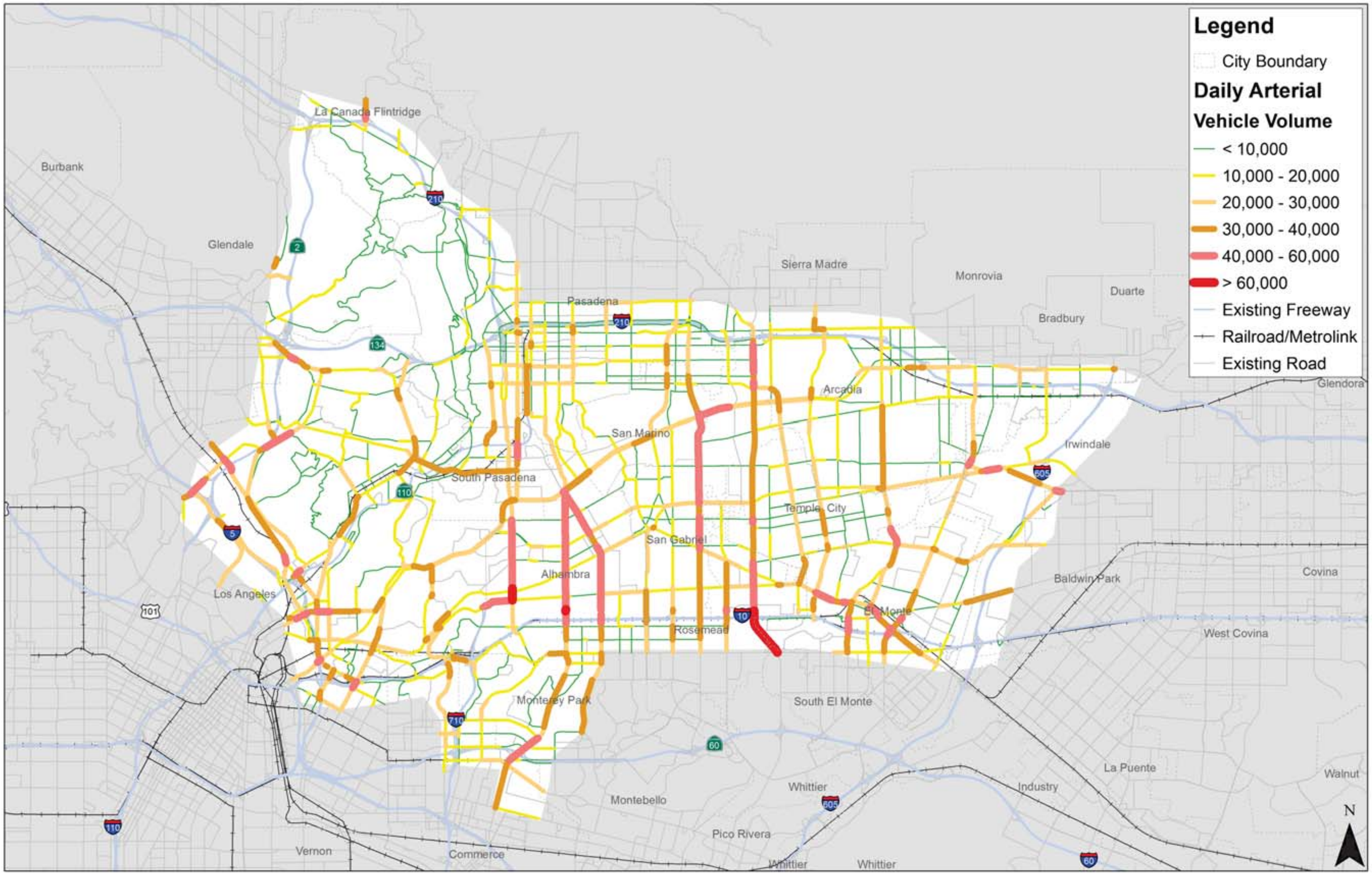

FIGURE 1-12

SR 710 North Project

Year 2012 Arterial Traffic Volumes

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2014)

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TABLE 1.12:
Existing and Future Transit Usage in the Study Area

	Existing (2012)	No Build (2020)	No Build (2025)	No Build (2035)
Transit Mode Share				
Study Area Mode Share	3.5%	3.9%	3.9%	4.2%
North-South Transit Throughput				
Daily North-South Person Trips	150,000	172,000	183,000	209,000
Transit Accessibility				
Percentage of study area and population and employment located within ¼ mile of a transit stop with high frequency	80.8%	80.3%	80.3%	80.6%

Source: *Transportation Technical Report* (2014).

transit throughput in the study area, defined as the volume of transit person trips crossing the east-west screenline, is anticipated to increase by almost 40 percent (from 150,000 to 209,000 daily trips).

As part of the Los Angeles County Congestion Management Program (CMP), transit speeds on a selected number of bus routes have been monitored for two decades (Metro 2010). Since 1992, the average speed of Metro Route 260, which travels through the study area on Fair Oaks Avenue and Atlantic Boulevard, has decreased from 14.8 mph to 11.6 mph.

Transit service in the study area experiences the same variability in travel time that automobile travel experiences. A bus trip from the Gold Line Atlantic Station to the Fair Oaks Avenue/ Colorado Boulevard intersection, a distance of approximately 9.3 mi, takes up to 48 minutes in the peak period (approximately 60 percent longer than during uncongested periods) (LA Metro Route 260 Schedule 2011).

As a result of slow transit speeds due to congested roadways, relatively short distances can take a long time to traverse by transit. Figure 1-13 illustrates the amount of time to travel by transit from various parts of the study area to the employment center in downtown Pasadena. Based on peak-hour transit headways and travel times, it can take residents of the communities of El Sereno, Alhambra, San Gabriel, and Rosemead approximately 60 minutes or more to get to downtown Pasadena by transit, even though all these communities are within approximately 7.5 mi of Pasadena. (These times do not include the time to walk from home to the transit stop, but they do include time waiting for the transit vehicle to arrive.)

As shown in Table 1.12, transit accessibility in the study area is high with approximately 80 percent of the employment of population centers in the study area located within 0.25 mi from a high-frequency transit stop.

1.2.2.2 Social Demands or Economic Development

2012–2035 Regional Transportation Plan/Sustainable Communities Strategy and Federal Transportation Improvement Program

SCAG's 2012–2035 RTP/SCS: Towards a Sustainable Future is a long-range plan that identifies multimodal regional transportation needs and investments through 2035 in Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties. The 2012 RTP/SCS is SCAG's long-range transportation plan that is developed and updated every 4 years. The 2012 RTP/SCS provides a

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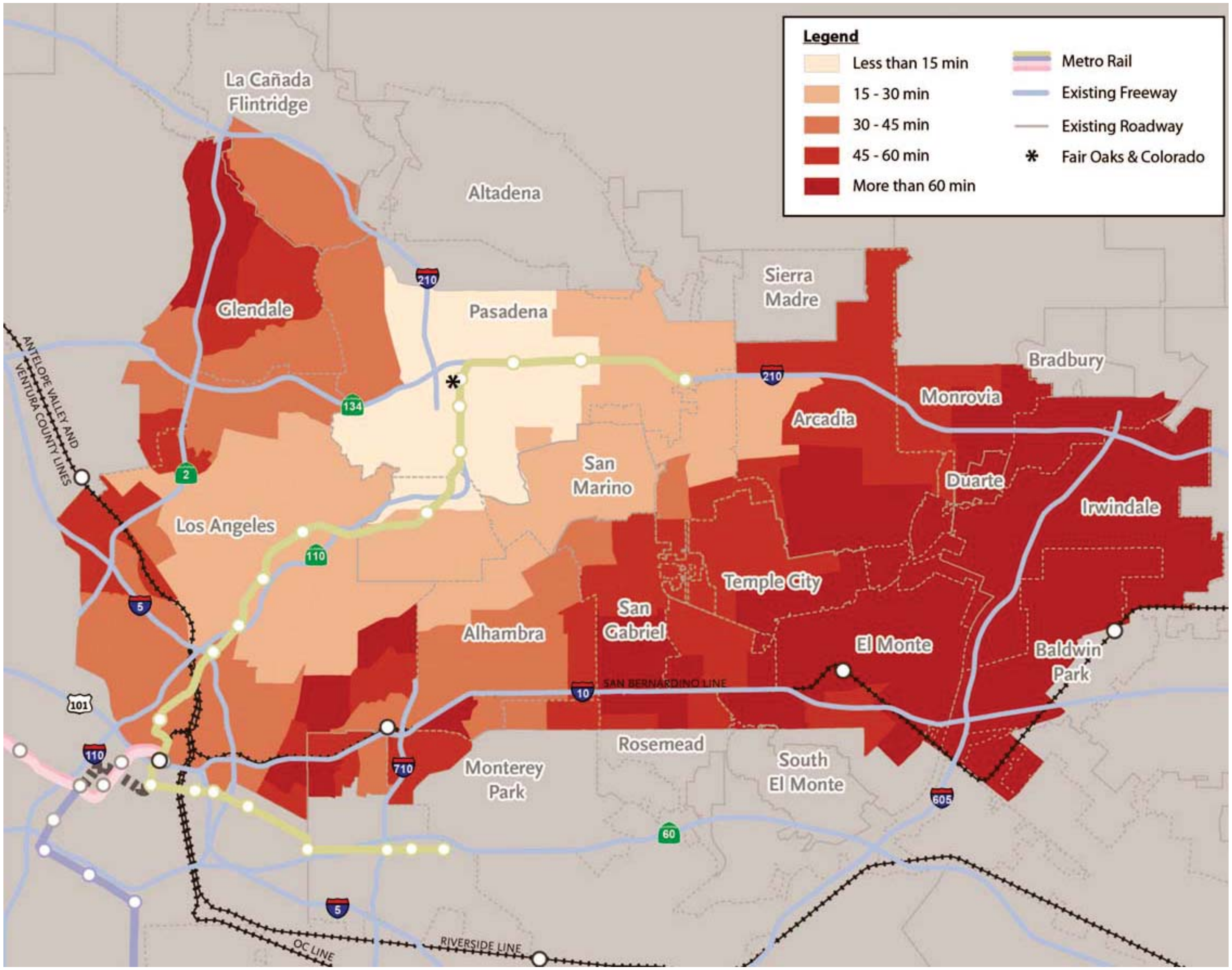

FIGURE 1-13

N

SR 710 North Project

Transit Travel Time (in Minutes) to Downtown Pasadena

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Alternatives Analysis Report (CH2M HILL, December 2012)

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vision for transportation investments throughout the region. Using growth forecasts and economic trends that project out over a 20-year period, the 2016 RTP/SCS considers the role of transportation in the broader context of economic, environmental, and quality-of-life goals for the future, identifying regional transportation strategies to address mobility needs. The SCS is a newly required element of the RTP that integrates land use and transportation strategies to comply with the federal Clean Air Act and to achieve California Air Resources Board (CARB) emissions reduction targets.

The vision for the 2016 RTP/SCS includes three key principles:

1. **Mobility:** Improve mobility by protecting, maximizing the productivity of, and strategically expanding the region's transportation system.
2. **Economy:** Provide economic benefits and create jobs through infrastructure investments.
3. **Sustainability:** Provide public health benefits by reducing pollutant emissions and expanding the transit network and opportunities for active transportation.

The SR 710 North Project is listed in the financially constrained 2016 RTP/SCS and 2017 FTIP amendments. It would comply with the applicable South Coast Air Quality Management District (SCAQMD) requirements.

Long Range Transportation Plan

Metro's 2009 LRTP takes a three-decade look ahead to identify transportation options to improve mobility, stimulate the local economy, and create jobs. The LRTP includes expansion of the rail system, investment in the bus system, and improvements to the highway system. The LRTP also invests in many other programs, including arterial capacity and speed improvements, transit operations, highway maintenance, bicycle and pedestrian improvements, carpool programs, and transit services for the disabled. The SR 710 North Project is included in Metro's LRTP.

1.2.2.3 Legislation

Measure R

Measure R, a one-half-cent sales tax dedicated to transportation projects in Los Angeles County was approved by a two-thirds majority of Los Angeles County voters in November 2008, and the tax took effect in July 2009. Over 30 years, Measure R is projected to generate $40 billion for mobility improvement programs. The goals of Measure R focus on reducing congestion, improving traffic flow, improving mobility, and increasing accessibility to public transportation. Included in the Measure R plan is the commitment of $780 million for improvement to SR 710. Ordinance # 08-01 (and amendments), the Traffic Relief and Rail Expansion Ordinance, provided for the establishment and implementation of a one-half of one percent Transactions and Use Tax, to be administered by the State Board of Equalization, and an expenditure plan for those tax funds.

Measure R funds available for the "I-710 North Gap Closure (tunnel) Project" would be allocated for the development and implementation of TSM/TDM Alternative improvements listed in Section 2.2.3.1.

Other Relevant State Legislation

In addition to Measure R, the following are recent legislation or actions of local jurisdictions in the Study Area that could affect the alternatives under consideration:

- **Senate Bill (SB) 86:** SB 86 (also referred to as the Roberti Bill) was enacted in 1979 and established laws to govern the sale of specified surplus property owned by State agencies.
- **Assembly Bill (AB) 751:** Approved by Governor Brown on October 3, 2011, AB 751 repeals provisions allowing Caltrans to build freeway segments within Metro jurisdiction without first securing a freeway agreement with affected local jurisdictions.
- **Senate Bill (SB) 416:** Approved by Governor Brown on October 3, 2013, SB 416 revised the laws governing the sale of specified surplus property owned by State agencies to give priority of purchase to current or former tenants; regulate the selling price; require proceeds to be used for funding projects in Pasadena, South Pasadena, Alhambra, La Cañada Flintridge, and the 90032 Zip Code; and that Alternative F-6 from the Alternatives Analysis, a freeway consisting of surface and depressed segments that would follow a similar alignment to the "Meridian Variation" approved in the Record of Decision in 1998, no longer be deemed feasible.
- **Senate Bill 743**: Approved by Governor Brown on September 27, 2013, SB 743 creates a process to change the way that transportation impacts are analyzed under CEQA. It requires the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to provide an alternative to LOS for evaluating transportation impacts. Particularly within areas served by transit, those alternative criteria must "…promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Measurements of transportation impacts may include vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated.
- **Senate Bill 1026:** Approved by Governor Davis on January 13, 2006. This bill would authorize the Los Angeles County Metropolitan Transportation Authority, until January 1, 2010, in consultation with the department, to use a specified design-build procurement process for the construction of a high-occupancy vehicle lane in the County of Los Angeles designated in the National Corridor Infrastructure Improvement Program, the federal "Safe, Accountable, Flexible, Efficient Transportation Equity Act," if certain conditions are satisfied.

1.2.2.4 Modal Interrelationships and System Linkages

Public Transit

Public transportation in Los Angeles County is provided by Metro, Foothill Transit, the Los Angeles Department of Transportation (LADOT), and various municipal transit lines. Metro provides local bus service (Metro Local), limited-stop bus service (Metro Limited, Metro Express, and Metro Rapid), and subway and light rail service (Metro Rail) in the study area. Metro operates 7 bus routes from the study area to downtown Los Angeles, 15 bus routes that provide east-to-west service in the study area, and 25 bus routes that provide north-to-south service in the study area. Metro Rail service in the study area is provided via the Gold Line, a 19.7 mi light rail line that connects Pasadena and East Los Angeles with Union Station in Downtown Los Angeles. The Gold Line provides service to 15 stations in Pasadena, South Pasadena, Highland Park, Arroyo Seco (Mount Washington), Lincoln Heights, and East Los Angeles, as well as 6 additional stations in parts of Los Angeles that are outside the study area.

Freeway Network

There are eight major north-south freeway routes (I-405, US-101/SR 170, I-5, SR 2, SR 110, I-710/SR 710, I-605, and SR 57) in the central portion of the Los Angeles-Long Beach-Santa Ana MSA. Of these eight, five are located partially within the study area (I-5, SR 2, SR 110, I-710/SR 710, and

I-605), and three (SR 2, SR 110, and I-710) terminate within the study area without connecting to another freeway. As a result, a high percentage of the north-south regional travel demand is concentrated on a few freeways, or diverted to local streets within the study area. This effect is exacerbated by the overall southwest-northeast orientation of I-605, which makes it an unappealing route for traffic between the southern part of the region and the urbanized areas to the northwest in the San Fernando Valley, the Santa Clarita Valley, and the Arroyo-Verdugo region. The lack of continuous north-south transportation facilities in the study area affects the overall efficiency of the larger regional transportation system, causing congestion on freeways in the study area, contributing to cut-through traffic that affects the local streets in the study area, and resulting in poor transit operations within the study area.

1.2.2.5 Environmental Factors

Growth within the Southern California region, the County of Los Angeles and the study area has resulted in dramatic increases in population and changes to land use patterns since the 1950s. Population growth increased by an annual average growth rate of approximately 2.9 percent between 1960 and 1990 and approximately 1.2 percent between 1990 and 2010. During this period of growth, vehicle use increased substantially, resulting in traffic congestion on the regional freeway system and local roadway network. Increased traffic congestion throughout the region and study area has contributed to increased noise levels proximate to freeways and roadways and elevated ambient air pollution levels (including greenhouse gases), as documented in the Program EIR for the 2012 RTP/SCS, prepared by the SCAG. As discussed earlier, by 2035, Los Angeles County's population is forecast to increase by approximately 16.1 percent and employment is forecast to increase by approximately 11.2 percent. By 2035, the study area population is forecast to increase by approximately 11.6 percent and its employment base by approximately 12.6 percent. This growth would continue to decrease the overall efficiency of the larger regional transportation system, increase freeway congestion and cut-through traffic on local streets in the study area, and decrease bus transit operation efficiency within the study area. These system degradations would exacerbate the existing congestion in the County as well as community and environmental effects related to mobile sources.

1.3 Independent Utility and Logical Termini

FHWA regulations (23 Code of Federal Regulations [CFR] 771.111 [f]) require that the action evaluated:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
2. Have independent utility or independent significance (be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made); and
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Part of the assessment of independent utility and logical termini is related to the project purpose and need. As described earlier, the purpose of the proposed action is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles, including the following considerations:

- Improve efficiency of the existing regional freeway and transit networks.
- Reduce congestion on local arterials adversely affected due to accommodating regional traffic volumes.
- Minimize environmental impacts related to mobile sources.

The need for the project was described earlier in this section based on capacity and transportation demand, social demands or economic development, and modal interrelationships and system linkages.

The ability of the Build Alternatives to comply with the FHWA regulations regarding logical termini and independent utility, as evaluated based on the FHWA Environmental Review Toolkit (http://environment.fhwa.dot.gov/projdev/tdmtermini.asp, accessed May 13, 2013) and the project purpose and need, is described in the following sections.

1.3.1 Logical Termini

The FHWA Environmental Review Toolkit defines logical termini for project development as "…rational end points for a transportation improvement, and have rational end points for a review of the environmental impacts…" Defining logical termini for a project is based on the project purpose and need and may result in a problem of segmentation if the identified transportation need extends throughout an entire corridor but environmental issues and transportation need are discussed for only a segment of that corridor.

The improvements in the Build Alternatives provide for logical termini and do not result in segmentation, as follows:

- **TSM/TDM Alternative:** The improvements in the TSM/TDM Alternative are generally limited to modest improvements at existing intersections and other individual locations throughout the study area. Those improvements are not within or along a single alignment and, as a result, would not be considered to have termini as used in the context of describing linear transportation facilities such as roads. As a result, the concept of logical termini is not relevant when describing the physical improvements in the TSM/TDM Alternative. Nonetheless, the improvements in the TSM/TDM Alternative meet the project purpose described above, provide some capacity improvements, and address some transportation demand in the study area. As a result, although the TSM/TDM Alternative does not have specific individual logical termini, it is not inconsistent with the concept of logical termini.
- **BRT Alternative:** The BRT Alternative includes bus lanes and bus services in a north-south corridor extending from Whittier Boulevard, south of I-10, north to the northern part of the City of Pasadena, south of SR 210. The alignment of the BRT Alternative provides north-south access to and from a substantial part of the study area as well as connections to extensive existing bus and light rail services in both the north-south and east-west directions. The termini of that alignment are rational end points, connect to other transit services, and serve major origins and destinations. The employment areas (e.g., downtown Pasadena) and educational institutions (California Institute of Technology and Pasadena City College) at the north end of the corridor are logical transit destinations for the largely residential areas to the south. The termini also connect with the Metro Gold Line and Metro Rapid Route 720 (the highest ridership Metro Rapid route). As described in detail in Section 3.5, Traffic and Transportation, Pedestrian and Bicycle Facilities, the BRT Alternative would meet some of the transportation demand in the

study area and would provide benefits to the traveling public consistent with the project purpose and need. Because it would provide connections to existing bus and rail services in the study area, those connection points are logical termini for the BRT Alternative.

In addition, the physical improvements along that alignment and the bus services proposed along that alignment define a project that allows for appropriate evaluation of the potential environmental impacts of both the alignment and the bus services in that part of the study area. As a result, the BRT Alternative has logical termini.

- **LRT Alternative:** The LRT Alternative includes an approximately 7.5 mi long light rail facility and light rail services in a north-south corridor extending from the Mednik Station on the south to the Fillmore Station on the north (both those stations provide direct connections to the existing Gold Line). The alignment of the LRT Alternative provides north-south access to and from a substantial part of the study area as well as connections to extensive existing bus and light rail services in both the north-south and east-west directions. The employment areas at the north end of the corridor (e.g., Pasadena) are a logical transit destination for the largely residential areas to the south. The East Los Angeles Civic Center and Edward R. Roybal Comprehensive Health Center at the south end are also logical transit destinations. The termini also connect with the Metro Gold Line at both ends. As described in detail in Section 3.5, the LRT Alternative would meet some of the transportation demand in the study area and would provide benefits to the traveling public consistent with the project purpose and need. Because it would provide connections to existing bus and rail services in the study area, those connection points are logical termini for the LRT Alternative.

  In summary, the termini of the alignment of the LRT Alternative are rational end points, connecting to other transit services and serving major origins and destinations. The physical improvements along that alignment and the light rail services proposed along that alignment define a project that allows for appropriate evaluation of the potential environmental impacts of both the alignment and the bus services in that part of the study area. As a result, the LRT Alternative meets the definition of logical termini and is of sufficient length to address environmental matters in the project study area on a broad scope.

- **Freeway Tunnel Alternative:** The alignment of the Freeway Tunnel Alternative extends approximately 6.3 mi between I-10 on the south and SR 210 on the north, traversing the Cities of South Pasadena and Pasadena. That alignment provides for direct connections to east-west travel routes (I-10 and SR 210) and north-south travel routes (I-710 and SR 210) as well as providing travelers direct connections between those routes on a limited access freeway. The termini directly connect with existing freeways. Traffic volumes are high on these connecting freeways (up to 281,000 vehicles per day on I-210, and 267,000 vehicles per day on SR 60, as reported in Table 1.5). These connecting freeways are independent sources of travel demand. As described in detail in Section 3.5, the Freeway Tunnel Alternative would meet transportation demand in the study area for a direct travel route between I-10 and I-210 through South Pasadena and Pasadena and would provide benefits to the traveling public consistent with the project purpose and need. Because it would provide connections to existing freeways in the study area, those connection points are logical termini for the Freeway Tunnel Alternative.

  In summary, the termini of the alignment of the Freeway Tunnel Alternative are rational end points, connecting to other major transportation facilities and providing access to major origins and destinations in and around the study area. The physical improvements proposed along that alignment define a project that allows for appropriate evaluation of the potential environmental impacts of that alignment in that part of the study area. As a result, the Freeway Tunnel Alternative meets the definition of logical termini and is of sufficient length to address environmental matters in the project study area on a broad scope.

1.3.2 Independent Utility

The FHWA Toolkit defines "…independent utility or independent significance…" to "…be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made…" The FHWA Toolkit further requires that proposed transportation improvements "…not restrict consideration of alternatives for other reasonably foreseeable transportation improvements…" The Build Alternatives would have independent utility and would not result in restrictions on other reasonable foreseeable transportation improvements as follows:

- **TSM/TDM Alternative:** The modest improvements in the TSM/TDM Alternative would be useable and would be a reasonable expenditure even if other transportation improvements are not implemented. Consistent with the project purpose and need described above, the improvements in the TSM/TDM Alternative would provide direct benefits to the traveling public. No other transportation improvements are needed for the TSM/TDM Alternative improvements to be useable and to meet the project purpose and need, as follows:
  - Intersection improvements will reduce delay at individual intersections regardless of other local or regional transportation projects.
  - The Intelligent Transportation Systems (ITS) improvements (traffic signal upgrades and synchronization, transit signal prioritization, changeable message signs [CMS], and detection systems) will provide incremental benefits that are independent of other capital transportation improvements.
  - The expanded bus service can be implemented incrementally and will provide increased transit service for existing and future users.

  In summary, the improvements in the TSM/TDM Alternative would have independent utility, would be usable, and would be a reasonable expenditure even if no other transportation improvements are implemented in the study area.

- **BRT Alternative:** The BRT Alternative includes bus lanes, bus stop facilities, and increased bus services in the study area as well as the improvements in the TSM/TDM Alternative. Those improvements would be useable and would represent a reasonable expenditure even if other transportation improvements are not implemented. Consistent with the project purpose and need described above, the improvements in the BRT Alternative would provide direct benefits to the traveling public. No other transportation improvements are needed for the BRT Alternative improvements to be useable and to meet the project purpose and need. Specifically, the BRT Alternative improvements will reduce travel time for transit users and encourage shifts from private vehicles to transit, thereby reducing congestion. These improvements to surface street operations would be achieved even if the BRT Alternative improvements were implemented on their own.

  In summary, the improvements in the BRT Alternative would have independent utility, would be useable, and would be a reasonable expenditure even if no other transportation improvements are implemented in the study area.

- **LRT Alternative:** The LRT Alternative includes rail tracks, stations, and support facilities and light rail service as well as the improvements in the TSM/TDM Alternative. Those improvements would be useable and would represent a reasonable expenditure even if other transportation improvements are not implemented. Consistent with the project purpose and need described above, the improvements in the LRT Alternative would provide direct benefits to the traveling public. No other transportation improvements are needed for the LRT Alternative improvements to be useable and to meet the project purpose and need. Specifically, the LRT Alternative improvements will provide reduced travel time for transit users and more direct transit routes. The LRT Alternative will also encourage shifts from private vehicles to transit, thereby reducing congestion. These improvements to surface street operations would be achieved even if the LRT Alternative was implemented on its own.

  In summary, the improvements in the LRT Alternative would have independent utility, would be useable, and would be a reasonable expenditure even if no other transportation improvements are implemented in the study area.

- **Freeway Tunnel Alternative:** The Freeway Tunnel Alternative includes the freeway facility and ramps/interchanges at existing freeway facilities as well as the improvements in the TSM/TDM Alternative. Those improvements would be useable and would represent a reasonable expenditure even if other transportation improvements are not implemented. Consistent with the project purpose and need described above, the improvements in the Freeway Tunnel Alternative would provide direct benefits to the traveling public. No other transportation improvements are needed for the Freeway Tunnel Alternative improvements to be useable and to meet the project purpose and need. Specifically, the Freeway Tunnel Alternative improvements will reduce congestion on local streets and some parallel freeways (e.g., I-5 and SR 2) by shifting traffic to a new route. These benefits will be achieved by users of both the new tunnel and other existing routes. These improvements to surface street and freeway operations would be achieved even if the Freeway Tunnel Alternative improvements were implemented on their own.

  In summary, the improvements in the Freeway Tunnel Alternative would have independent utility, would be useable, and would be a reasonable expenditure even if no other transportation improvements are implemented in the study area.

1.3.3 Consideration of Other Alternatives

The third criterion in 23 CFR 771.111(f) requires that the action evaluated not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. The improvements in the Build Alternatives would not restrict consideration of other reasonably foreseeable transportation improvements as follows:

- **TSM/TDM Alternative:** The improvements in the TSM/TDM Alternative would generally be limited to modest improvements at existing intersections and other individual locations throughout the study area. Those improvements would be designed, constructed, and operated consistent with the applicable jurisdiction’s requirements. Other reasonably foreseeable transportation improvements such as improved signalization, addition of turn lanes, road widenings, or increased bus/rail transit service could be accommodated in the areas where the TSM/TDM Alternative improvements would be located and would not be precluded by those improvements. As a result, the improvements in the TSM/TDM Alternative would not restrict consideration of other reasonably foreseeable transportation improvements in the study area.

- **BRT Alternative:** The BRT Alternative includes bus lanes and bus services in a north-south corridor extending from Whittier Boulevard, south of I-10, north to the northern part of the City of Pasadena, south of SR 210. The alignment of the BRT Alternative provides north-south access to and from a substantial part of the study area as well as connections to extensive existing bus and light rail services in both the north-south and east-west directions. Other reasonably foreseeable transportation improvements such as improved signalization, addition of turn lanes, road widenings, or increased bus/rail transit service could be accommodated in the areas where the BRT Alternative physical improvements and bus services would be located and would not be precluded by those improvements. As a result, the improvements in the BRT Alternative would not restrict consideration of other reasonably foreseeable transportation improvements in the study area.
- **LRT Alternative:** The LRT Alternative includes an approximately 7.5 mi long light rail facility and light rail services in a north-south corridor extending from the Mednik Station on the south to the Fillmore Station on the north (both those stations provide direct connections to the existing Gold Line), with several intermediate stations located along the rail alignment. Other reasonably foreseeable transportation improvements such as improved signalization, addition of turn lanes, road widenings, or increased bus service could be accommodated in the areas where the LRT Alternative physical improvements and rail services would be located and would not be precluded by those improvements. The LRT Alternative could preclude implementation of tracks for other light rail services in the area. However, the existing light rail system in this part of Los Angeles County and planned expansions of that system are based on consideration of overall demand for light rail services over that entire service area and not just the study area for the SR 710 North Project. Because the proposed LRT Alternative is consistent with the rest of the existing and planned regional light rail system, it would not preclude other improvements to that regional light rail system. As a result, the improvements in the LRT Alternative would not restrict consideration of other reasonably foreseeable transportation improvements in the study area.
- **Freeway Tunnel Alternative:** The alignment of the Freeway Tunnel Alternative extends approximately 6.3 mi between I-10 on the south and SR 210 on the north and would provide for direct connections to east-west travel routes (I-10 and SR 210) and north-south travel routes (I-710 and SR 210) as well as providing travelers direct connections between those routes on a limited access freeway. Other reasonably foreseeable transportation improvements such as improvements to other freeways in the study area, improved signalization, addition of turn lanes, road widenings, or increased bus/rail services could generally be accommodated and would not be precluded by the Freeway Tunnel Alternative improvements. The Freeway Tunnel Alternative could preclude other transportation facilities along the same alignment in the study area such as an at-grade light rail alignment, freeway, or arterial. However, there are no known reasonably foreseeable transportation improvements that propose those types of transportation facilities along the alignment of the Freeway Tunnel Alternative. As a result, the improvements in the Freeway Tunnel Alternative would not restrict consideration of other reasonably foreseeable transportation improvements in the study area.

2. Project Alternatives

2.1 Project Description

This section describes the proposed action and the alternatives developed to meet the purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives are the No Build Alternative, the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative, the Bus Rapid Transit (BRT) Alternative, the Light Rail Transit (LRT) Alternative, and the Freeway Tunnel Alternative. Caltrans, as lead agency under CEQA and NEPA, as assigned by the Federal Highway Administration (FHWA), and in cooperation with Metro has identified the TSM/TDM Alternative as the Preferred Alternative. The Preferred Alternative would meet the project's Purpose and Need, as discussed in Section 2.4.

Identification of the preferred alternative occurs only after specific effects and reasonable avoidance, minimization, and mitigation measures have been identified for each project alternative. The identification is made after all comments are received from the circulation of the draft environmental document for public comment and from the public hearing process. All comments received during the Draft EIR/EIS and Focused RDEIR/SDEIS public review period were considered and responded to. This Final EIR/EIS was prepared to address all public comments and incorporate any changes to the project design, environmental setting, and impacts that have occurred since the Draft EIR/EIS and Focused RDEIR/SDEIS was completed.

The project is located in east/northeast Los Angeles and the western San Gabriel Valley in the area between State Route 2 (SR 2) and Interstates 5, 10, 210 and 605 (I-5, I-10, I-210, and I-605, respectively). The purpose of the proposed action is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles, including the following considerations:

- Improve efficiency of the existing regional freeway and transit networks.
- Reduce congestion on local arterials adversely affected due to accommodating regional traffic volumes.
- Minimize environmental impacts related to mobile sources.

2.2 Alternatives

2.2.1 Project Alternatives

The proposed alternatives include the No Build Alternative, the TSM/TDM Alternative, the BRT Alternative, the LRT Alternative, and the Freeway Tunnel Alternative. As discussed in the *Alternatives Analysis (AA) Report* (December 2012), a screening analysis was conducted to determine the alternatives to be carried forward for analysis in this Environmental Impact Report/Environmental Impact Statement (EIR/EIS). The screening of alternatives followed a three-step sequential process: preliminary screening, initial screening, and secondary screening. Additional detail regarding each of these steps is provided later in Section 2.5, Alternatives Considered but Eliminated from Further Discussion.

Based on the findings of the *AA Report*, the rationale for carrying the five project alternatives forward is as follows:

- **No Build Alternative:** Under the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) Section 1502.14(d) requires analysis of the alternative of no action. Section 15126.6(e)(1) of the California Environmental Quality Act (CEQA) Guidelines requires that a "no project" alternative be evaluated to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. Therefore, the No Build Alternative was carried forward for analysis in this EIR/EIS.
- **TSM/TDM Alternative:** 23 CFR Section 450.320 requires that a TSM/TDM Alternative be considered on all proposed major highway projects in urban areas with a population of over 200,000 people. Therefore, the TSM/TDM Alternative was carried forward for analysis in this EIR/EIS.
- **BRT Alternative:** Of the BRT alternatives analyzed in the secondary screening process, the BRT Alternative carried forward in the EIR/EIS (referred to as BRT-6 in the *AA Report*) performed slightly better at increasing access to high frequency transit service and increasing north-south transit patronage compared to the other BRT alternatives analyzed. In addition, that selected BRT Alternative could be implemented with no or limited right of way (ROW) acquisition and would also have a smaller potential impact on sensitive habitat. Therefore, Alternative BRT-6 was carried forward for analysis in this EIR/EIS.
- **LRT Alternative:** Among the LRT alternatives analyzed in the secondary screening process, the LRT Alternative carried forward in the EIR/EIS (referred to as LRT-4A/B in the *AA Report*) would require less property acquisition and would result in fewer impacts to historic period properties and communities facilities than the other LRT alternatives analyzed. Therefore, Alternative LRT-4A/B was carried forward for analysis in this EIR/EIS.
- **Freeway Tunnel Alternative:** Among the freeway alternatives analyzed in the secondary screening process, the freeway alternative carried forward for analysis in this EIR/EIS (referred to as F-7 in the *AA Report*) would minimize travel times, improve connectivity and mobility, and reduce congestion on local streets. In addition, compared to the other freeway alternatives, F-7 would require substantially less property acquisition and would impact fewer historic period properties and community facilities. Therefore, Alternative F-7 was carried forward for analysis in this EIR/EIS.

The TSM/TDM Alternative improvements would also be constructed as part of the BRT, LRT, and Freeway Tunnel Alternatives. Because of physical constraints, some of the TSM/TDM Alternative improvements would not be constructed with the Build Alternatives. These exceptions are discussed under each of the Build Alternatives provided later in this chapter. The structures and ROW costs are included in these estimates.

Because of the wide range of Build Alternatives, they do not share many common design features and are discussed separately below.

2.2.2 No Build Alternative

The No Build Alternative does not include improvements associated with Build Alternatives identified within the SR 710 North study area. For several environmental topics (i.e., traffic, air quality, noise, and energy), the No Build condition used for analysis purposes includes improvements identified separately in the 2015 Federal Transportation Improvement Program (FTIP), as listed in the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), Measure R, and the funded part of the Los Angeles County Metropolitan Transportation Authority's (Metro) 2009 Long Range Transportation Plan (LRTP). The Opening Year and Horizon Year traffic forecasting for the No Build Alternative includes projects/planned improvements through 2035 that were contained in the FTIP, 2012 RTP, Measure R and the LRTP. The projects included in the No Build Alternative are illustrated and described on Figure 2-1 and in Table 2.1, respectively. These projects have been, or are being evaluated separately.

2.2.3 Build Alternatives

Due to existing constraints and limitations in the project study area, such as surrounding land uses and limited ROW, design exceptions would be sought by the appropriate agency if a Build Alternative is selected for implementation. Design exceptions of proposed non-standard features would require approval once a Preferred Alternative is selected. Design exceptions for the Freeway Tunnel Alternative would be reviewed and approved by Caltrans and, potentially, the Federal Highway Administration (FHWA). Design exceptions for the LRT Alternative would be reviewed and approved by Metro. Design exceptions for the BRT Alternative would be reviewed and approved by Metro for the bus design features and by the local jurisdictions for where street improvements are proposed. Design exceptions for the improvements in the TSM/TDM Alternative would be reviewed and approved by the local jurisdictions where street improvements are proposed.

In addition to the improvements described in the following sections, the Opening Year and Horizon Year traffic forecasting for all the Build Alternatives also include the projects/planned improvements through 2035 that are contained in the 2015 FTIP, 2012 RTP/SCS, Measure R, and the funded part of the Metro 2009 LRTP.

2.2.3.1 TSM/TDM Alternative (Preferred Alternative)

Caltrans, as lead agency under CEQA and NEPA, as assigned by the Federal Highway Administration (FHWA), and in cooperation with Metro has identified the TSM/TDM Alternative as the Preferred Alternative.

The TSM/TDM Alternative consists of strategies and improvements to increase efficiency and capacity for all modes in the transportation system with lower capital cost investments and/or lower potential impacts. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. Components of the TSM/TDM Alternative are shown on Figure 2-2.

The TSM/TDM Alternative is being evaluated as a stand-alone alternative. Improvements included in the TSM/TDM Alternative have also been incorporated into the other Build Alternatives. The components of the TSM/TDM Alternative that are incorporated into the other Build Alternatives are described under each alternative.

Transportation System Management

TSM strategies increase the efficiency of existing facilities (i.e., TSM strategies are actions that increase the number of vehicle trips a facility can carry without increasing the number of through lanes). TSM also encourages automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system. Modal alternatives integrate multiple forms of transportation modes, such as pedestrian, bicycle, automobile, rail, and mass transit. TSM strategies include Intelligent Transportation Systems (ITS), local street and intersection improvements, and Active Traffic Management (ATM):

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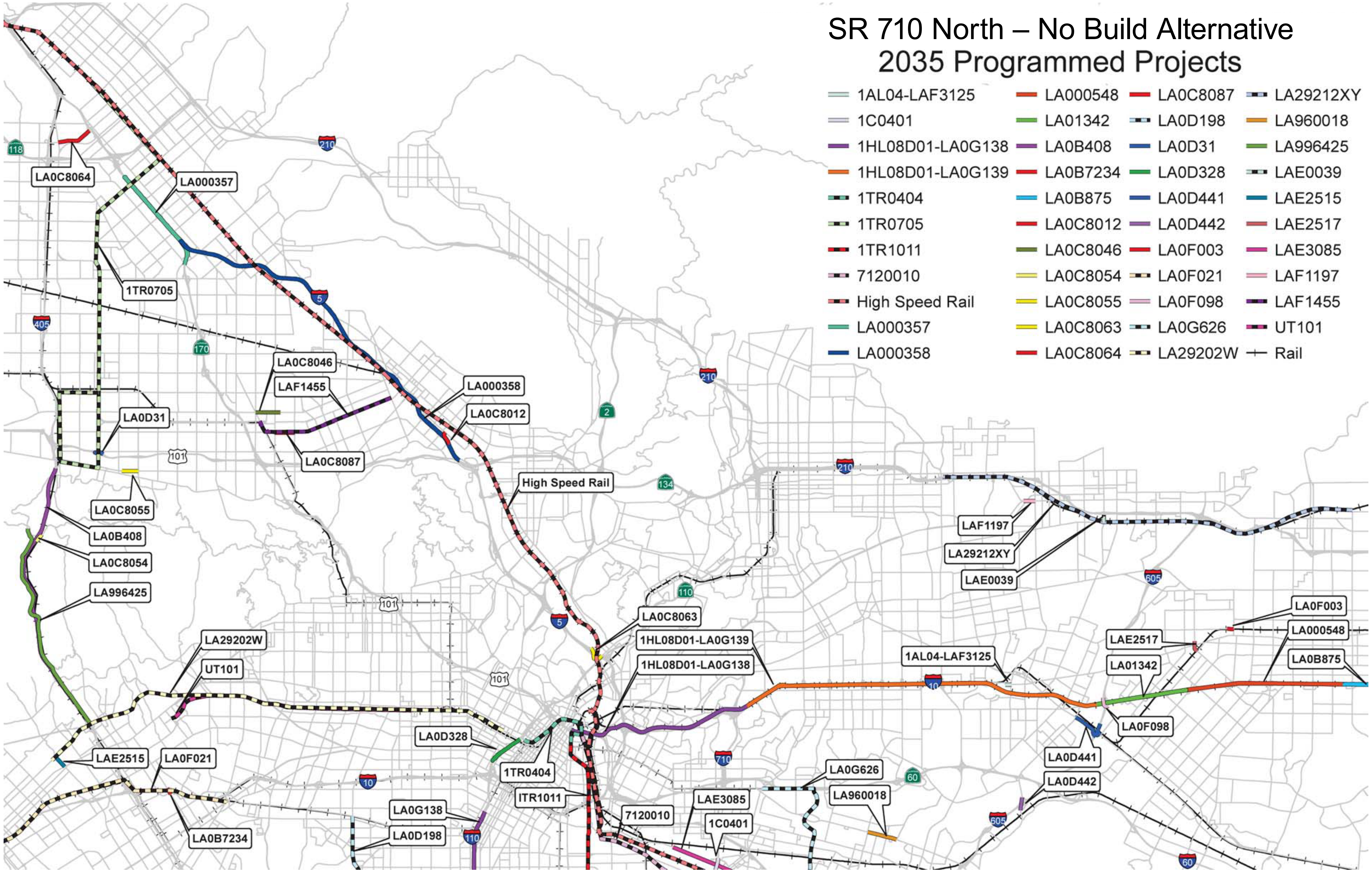

FIGURE 2-1

NOT TO SCALE

SOURCE: CH2M HILL (2013)

SR 710 North Project

No Build Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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TABLE 2.1:
Projects Included in the Traffic Modeling for the No Build Alternative

RTP ID	Project Name	Description	Anticipated Completion Date as of the 2012 RTP
1C0401	I-710 Corridor Project	The project would improve I-710 in Los Angeles County between Ocean Boulevard and SR 60. Major features include widening I-710 up to 10 general-purpose lanes (5 lanes in each direction), modernizing and reconfiguring I-405, SR 91 and a portion of the I-5 interchanges with I-710, modernizing and reconfiguring most local arterial interchanges along I-710, and providing a separated four-lane freight corridor to be used by conventional or zero-emission trucks.	2030
1TR0404	Regional Connector Transit Corridor	The Metro Regional Connector Project would provide light-rail in tunnels and would extend from the Metro Gold Line Little Tokyo/Arts District Station to the 7th Street/Metro Center Station in downtown Los Angeles, allowing passengers to transfer to Blue, Expo, Red, and Purple Lines, bypassing Union Station.	2020
1TR1004	Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension	The project would connect with and extend the Gold Line Eastside Extension light rail line, which runs between Union Station in downtown Los Angeles and Pomona and Atlantic Boulevards in East Los Angeles, to communities farther east. The project's goals include improving mobility in the study area and planning for future growth in a sustainable manner. Metro is leading this study effort in conjunction with the FTA.	2035
HSR	California High Speed Rail Project	The project would develop an 800 mi statewide system of high-speed trains from Southern to Northern California, potentially crossing the I-710 between Washington Boulevard and Bandini Boulevard and just north of Washington Boulevard.	2034
LA000357	I-5 Improvement Project between SR 118 to SR 170	The project is constructing an HOV lane in each direction on I-5 between the Hollywood Freeway (SR 170) and SR 118, a distance of 6.8 mi (3.4 mi in each direction). The project is also widening four undercrossings, replacing sections of pavement, and building a direct HOV connector at the I-5/SR 170 interchange. A direct HOV connector allows for freeway-to-freeway transfers without exiting the carpool lane.	2012
LA000358	I-5 Improvement Project between SR 134 to SR 170	1. The project would construct four segments of improvements on I-5 between SR 134 and SR 170 as follows: Western Avenue Interchange, realignment of the northbound I-5 Western Avenue on- and off-ramps. 2. SR 134 to Magnolia Boulevard: Addition of one HOV lane in each direction. 3. Magnolia Boulevard to Buena Vista Street: Addition of HOV lanes, Empire Avenue interchange modification, railroad realignment and relocation, Burbank Boulevard bridge reconstruction, and on- and off-ramp modifications. 4. SR 170 to Buena Vista Street: Addition of one HOV lane in each direction and pavement replacement.	2014

TABLE 2.1:
Projects Included in the Traffic Modeling for the No Build Alternative

RTP ID	Project Name	Description	Anticipated Completion Date as of the 2012 RTP
LA000548	San Bernardino Freeway (I-10) add one HOV Lane from I-605 to SR 57/71 and I-210 Puente to Citrus Segment	The project would construct one HOV lane in each direction on I-10 between I-605 and the SR 57/SR 71/I-210 interchange in three different segments. This segment of the project would construct one HOV lane in each direction on I-10 between Puento and Citrus Avenue.	2018
LA01342	San Bernardino Freeway (I-10) add One HOV Lane from I-605 to SR 57/71 and I-210 I-605 to Puente Segment	The project would construct one HOV lane in each direction on I-10 between I-605 and the SR 57/SR 71/I-210 interchange in three difference segments. This segment of the project would construct one HOV lane in each direction on I-10 between I-605 to Puente Avenue.	2014
LA0B408	I-405 Sepulveda Pass Improvements Project	This project would add a 10 mi HOV lane and improve supporting infrastructure such as ramps, bridges and sound walls on I-405 while widening lanes from the I-10 to US-101.	2018
LA0B7234	Overland Avenue Bridge Widening Project	This project would widen the west side of the Overland Avenue Bridge over I-10 from the National Boulevard/I-10 westbound ramps to National Boulevard/National Place to add one lane.	2012
LA0B875	San Bernardino Freeway (I-10) add one HOV Lane from I-605 to SR 57/71 and I-210 Citrus to SR 57/I-210 Segment	The project would construct one HOV lane in each direction on I-10 between I-605 and the SR 57/SR 71/I-210 interchange in three different segments. This segment of the project would construct one HOV lane in each direction on I-10 between Citrus Avenue and SR 57/I-210.	2018
LA0C8046	Burbank Boulevard Widening, Lankershim Boulevard to Cleon Avenue	The project would consist of the widening of a 0.6 mi stretch of Burbank Boulevard from Lankershim Boulevard to Cleon Avenue to add an additional through-lane in each direction. The road would be restriped to include two lanes for through traffic, a left-turn lane, and a parking lane in each direction.	2016
LA0C8054	Skirball Center Drive Widening Project	The project would widen and restripe Skirball Center Drive from I-405 to Mulholland Drive to provide an additional southbound lane.	2012
LA0C8055	Moorpark Street Widening, Woodman Avenue to Murietta Avenue	The project would widen an approximately 0.25 mi stretch of Moorpark Street from Mammoth Avenue to Colbath Avenue to accommodate an additional through lane in each direction and reconfigured left-turn lanes.	2012

TABLE 2.1:
Projects Included in the Traffic Modeling for the No Build Alternative

RTP ID	Project Name	Description	Anticipated Completion Date as of the 2012 RTP
LA0C8063	Riverside Drive Bridge and Grade Separation Replacement Project	The City of Los Angeles proposes to replace the existing Riverside Drive Bridge over the Los Angeles River and Riverside Drive Viaduct/Grade Separation Structure with an integrated two-lane, standard-curvature bridge and grade separation structure.	2016
LA0C8064	San Fernando Mission Boulevard Widening	The project would widen San Fernando Mission Boulevard from one to two lanes in each direction between Sepulveda Boulevard and I-5.	2012
LA0C8087	Magnolia Boulevard Widening	The project would widen Magnolia Boulevard from one to two lanes in each direction from Cahuenga Boulevard to Vineland Avenue.	2012
LA0D198	Crenshaw/LAX Transit Corridor	This project is an 8.5 mi light-rail line that would run between the Expo Line on Exposition Boulevard and the Metro Green Line.	2016
LA0D31	US-101/Van Nuys Boulevard Interchange Improvement Project	The project would construct one additional lane for the northbound and southbound off-ramps at the US-101/Van Nuys Boulevard interchange.	2016
LA0D328	I-110 Widening and Rehabilitation Project	The project limits extend on I-110 from a 0.5 mi south of Washington Boulevard to north of Wilshire Boulevard, and include West 6th and 8th Streets, and Olympic, Pico, and Venice Boulevards. The project widened lanes in both directions, widened bridge structures and ramps, realigned and reconstructed ramps, added merge and auxiliary lanes and a concrete median barrier, and improved the I-110/I-10 interchange connector.	2012
LA0D441	Riverside Drive Bridge and Grade Separation Replacement Project	Reconfiguration of Valley Boulevard on- and off-ramps to I-605 to improve mobility, circulation, and to relieve the current congestion at Valley Boulevard. Includes: right turn from Valley Boulevard onto the existing southbound on-ramp, construct dual westbound to southbound lanes to southbound on-ramp, and reconstruct entire southbound on-ramp, improvements at Valley/Temple/northbound I-605 off-ramp intersection, and widen eastbound Valley Boulevard to three lanes in advance of the southbound ramps.	2016
LA0D442	Peck Road Bridge over SR 605	The project would widen the existing two-lane Peck Road Bridge over SR 605 to accommodate four lanes (two lanes in each direction).	2016
LA0F003	Los Angeles Street at Big Dalton Wash	The project involved widening the north side of the Los Angeles Street bridge at Big Dalton Wash. The project would widen the two-lane bridge to four lanes.	2014
LA0F021	Exposition Transit Corridor, Phase 2	The project would expand the Metro Rail System by extending it westward to Santa Monica from the Metro Expo Line Culver City Station and would run along the old Pacific Electric Exposition right of way to 4th Street and Colorado Avenue in downtown Santa Monica. The 6.6 mi second phase would include seven new stations and would connect Santa Monica by rail to Downtown Los Angeles, Pasadena, San Fernando Valley, South Bay, and Long Beach.	2016
LA0G138	I-10 and I-110 HOT Lanes	This project proposes conversion of HOV lanes to HOT lanes on I-10 from Alameda Street to I-605 and on I-110 from 182 Street/Artesia Transit Center to Adams Boulevard in Los Angeles County.	2012

TABLE 2.1:
Projects Included in the Traffic Modeling for the No Build Alternative

RTP ID	Project Name	Description	Anticipated Completion Date as of the 2012 RTP
LA0G139	I-10 HOT Lanes	This project would expand the capacity of the I-10 HOT lane. The project includes restriping the existing lanes to add an additional (second) HOT lane on I-10 from Santa Anita Avenue to I-710 in the westbound direction and from I-710 to Baldwin Avenue in the eastbound direction.	2012
LA29202W	Wilshire Boulevard Bus Rapid Transit Project – Phases I and II	The project would consist of a 12.5 mi corridor with a 7.7 mi peak-period bus lane on Wilshire Boulevard within the City and County of Los Angeles from Valencia Street to the City of Santa Monica. Phase I includes street widening, curb lane repaving/reconstruction, improved traffic signal timing and bus signal priority. Phase II includes enhanced shelters and landscaping, street repair/reconstruction, concrete bus pads, and park-and-ride facilities.	2014
LA29212XY	Metro Gold Line Foothill Extension	The proposed extension consists of two phases. The first phase would continue from Sierra Madre Villa in Pasadena east over 11 mi, with stops in the Cities of Arcadia, Duarte, Irwindale, and Monrovia, and two stops in Azusa.	2016
LA960018	Beverly Boulevard Widening Project from Montebello Drive to Rea Drive	The project would widen Beverly Boulevard from four to six lanes from Montebello Boulevard to west of Rea Drive.	2014
LA996425	Sepulveda Boulevard Bike Lane and Intersection Improvement Project	The proposed project includes widening in spot locations along Sepulveda Boulevard to: (1) add northbound and southbound right-turn pockets at Wilshire Boulevard, (2) lengthen the northbound left-turn pocket at Moraga Drive, (3) lengthen the southbound right-turn lane at the I-405 southbound on-ramp (I-405 overpass north of Getty Center Drive), (4) install bike lanes between Skirball Center Drive and Bel Air Crest Road, (5) add a northbound right-turn lane at Skirball Center Drive, and (6) add a third southbound through lane on the approach to Skirball Center Drive.	2012
LAE0039	Gold Line Transit Plaza	This project involves the design and construction of a transit plaza adjacent to the Gold Line Arcadia Station. The transit plaza would include hardscape, softscape, street furniture (e.g., benches, trash receptacles and lighting fixtures), way-finding signage, and public art features.	2012
LAE2515	Bundy Drive Widening between Wilshire Boulevard and Santa Monica Boulevard	The project would widen Bundy Drive from two to four lanes between Wilshire Boulevard and Santa Monica Boulevard.	2014
LAE2517	Main Avenue Widening	The project would widen Maine Avenue Bogart Avenue and Ramona Boulevard to add one through lane, one right-turn lane, and one left-turn lane.	2014
LAE3085	Washington Boulevard Improvement Project	Widen and reconstruct Washington Boulevard (from two lanes to three lanes in each direction) from the western City boundary at Vernon (350 ft west of Indiana Street) to I-5 at Telegraph Road. The project would also increase turn radius and medians, upgrade traffic signals and street lighting, and improve sidewalks.	2014
LAF1197	Huntington Drive Capacity Improvements Project	The project includes the addition of one through lane and turn lanes, and the reconstruction of the median along Huntington Drive from Colorado Place to Santa Anita.	2014

TABLE 2.1:
Projects Included in the Traffic Modeling for the No Build Alternative

RTP ID	Project Name	Description	Anticipated Completion Date as of the 2012 RTP
LAF1455	Cross-Town Transit Connector and Service Expansion	The project would involve the acquisition of two CNG buses to implement new local transit service between the North Hollywood Red Line Station and Downtown Burbank.	2016
UT101	Metro Purple Line Westside Subway Extension	The project would extend the Metro Purple Line from the current terminus at Wilshire/Western westward for 9 mi to Century City, and would include seven new stations. Segment 1 of the project is from Wilshire/Western to La Cienega and Segment 2 is from La Cienega to Century City.	2023
WSATC	West Santa Ana Transit Corridor	This project provides for the development of a grade-separated transit corridor from the Los Angeles County line to downtown Los Angeles.	2030

CNG = compressed natural gas

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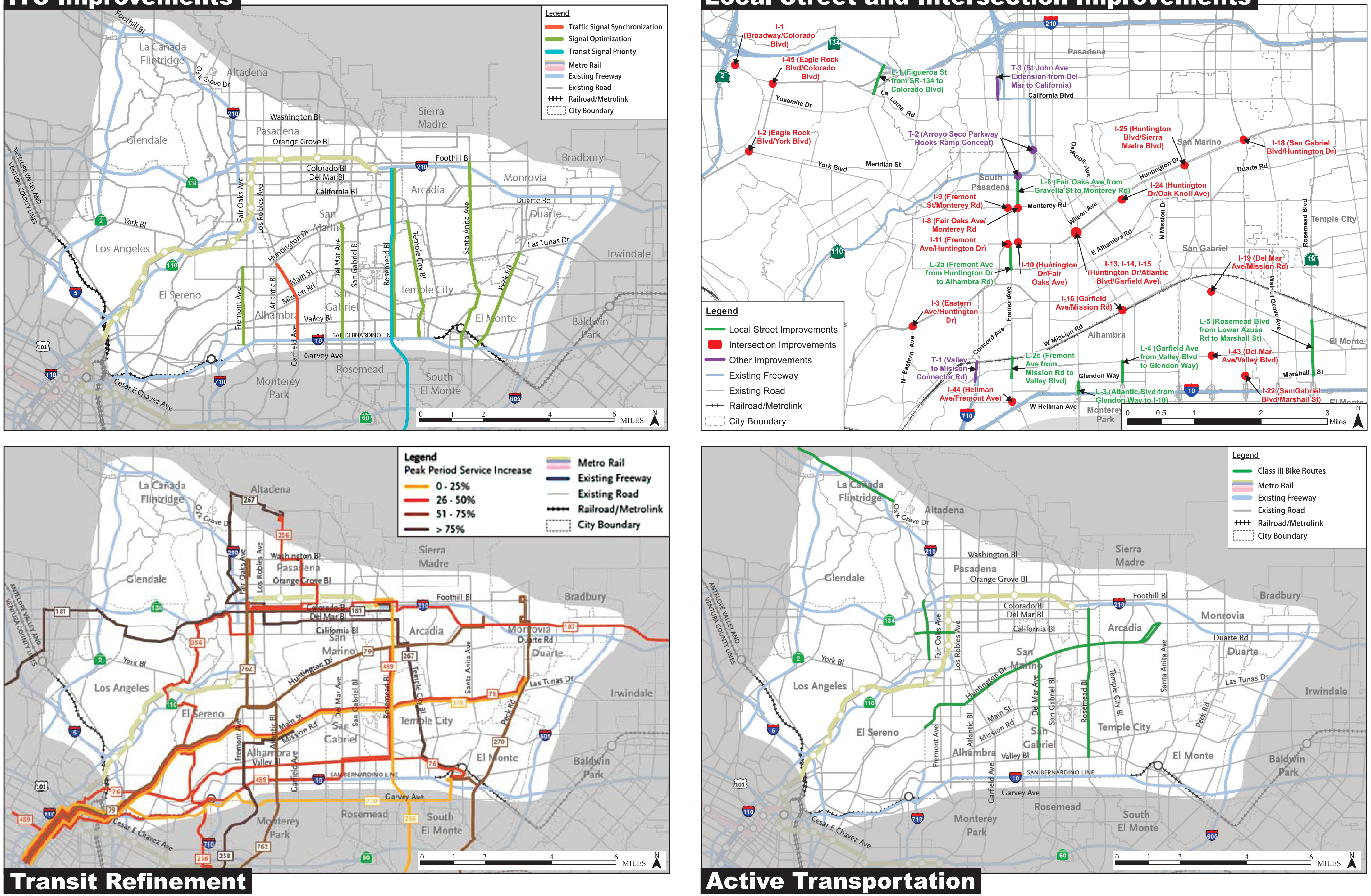

FIGURE 2-2

SR 710 North Project

TSM/TDM Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2013)

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- **ITS Improvements:** ITS improvements include traffic signal upgrades, synchronization and transit prioritization, arterial changeable message signs (CMS), and arterial video and speed data collection systems. The TSM/TDM Alternative includes signal optimization on corridors with signal coordination hardware already installed by Metro's Traffic Signal Synchronization Program (TSSP). These corridors include Del Mar Avenue, Rosemead Boulevard, Temple City Boulevard, Santa Anita Avenue, Fair Oaks Avenue, Fremont Avenue, and Peck Road. The only remaining major north-south corridor in the San Gabriel Valley in which TSSP has not been implemented is Garfield Avenue; therefore, TSSP on this corridor is included in the TSM/TDM Alternative. The locations are shown in Table 2.2. The following provides a further explanation of the ITS elements listed above.
  - Traffic signal upgrades include turn arrows, vehicle and/or bicycle detection, pedestrian countdown timers, and incorporation into a regional management traffic center for real-time monitoring of traffic and updating of signal timing.
  - Synchronization is accomplished through signal coordination to optimize travel times and reduce delay.
  - Transit signal prioritization includes adjusting signal times for transit vehicles to optimize travel times for public transit riders.
  - Arterial CMS are used to alert travelers about unusual road conditions, special event traffic, accident detours, and other incidents.
  - Video and speed data collection include cameras and other vehicle detection systems that are connected to a central monitoring location, allowing for faster detection and response to traffic incidents and other unusual traffic conditions.

TABLE 2.2:
TSM/TDM Alternative Elements

ID No.	Description	Location
Intelligent Transportation System Improvements		
ITS-1	Transit Signal Priority	Rosemead Boulevard (from Foothill Boulevard to Del Amo Boulevard)
ITS-2	Install Video Detection System on SR 110	SR 110 north of US 101
ITS-3	Install Video Detection System at Intersections	At key locations in study area
ITS-4	Arterial Speed Data Collection	On key north/south arterials
ITS-5	Install Arterial CMS	At key locations in study area
ITS-6	Traffic Signal Synchronization on Garfield Avenue	Huntington Drive to I-10
ITS-7	Signal optimization on Del Mar Avenue	Huntington Drive to I-10
ITS-8	Signal optimization on Rosemead Boulevard	Foothill Boulevard to I-10
ITS-9	Signal optimization on Temple City Boulevard	Duarte Road to I-10
ITS-10	Signal optimization on Santa Anita Avenue	Foothill Boulevard to I-10
ITS-11	Signal optimization on Peck Road	Live Oak Avenue to I-10
ITS-12	Signal optimization on Fremont Avenue	Huntington Drive to I-10

- **Local Street and Intersection Improvements:** The local street and intersection improvements are within the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, and San Marino. Table 2.3 outlines the locations of the proposed improvements to local streets, intersections, and freeway ramps as well as two new local roadways.

TABLE 2.3:
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location	Proposed Improvement/Modification
Local Street Improvements			
L-1	Figueroa Street from SR 134 to Colorado Boulevard	City of Los Angeles (Eagle Rock)	• Add a dedicated right-turn lane from NB Figueroa Street to the EB SR 134 on-ramp. • Add an additional merging lane to the EB SR 134 on-ramp from Figueroa Street, a dedicated right-turn lane from the EB SR 134/Figueroa Street off-ramp to NB Figueroa Street. • Add a dedicated right-turn lane from NB Figueroa Street to the WB SR 134 on-ramp. • Restriping.
L-2a	Fremont Avenue from Huntington Drive to Alhambra Road	City of South Pasadena	• Convert existing dedicated left-turn lanes along Fremont Avenue between Oneonta Knoll Street and approximately 150 ft north of the Fremont Avenue/Alhambra Road intersection into a reversible directional lane that would be reversed between the NB and SB directions to accommodate peak traffic flows. • Add a merging lane on northbound Fremont Avenue just north of the Fremont Avenue/Alhambra Road intersection. • Modify the intersections of Fremont Avenue/Oneonta Knoll Street, Fremont Avenue/Beech Street, Fremont Avenue/Maple Street, and Fremont Avenue/Elmpark Street to prohibit left-turn movements to and from Oneonta Knoll Street, Beech Street, Maple Street, and Elmpark Street by adding pork chop median islands. • Convert the dedicated right turn lane from NB Fremont Avenue to EB Huntington Drive into a shared through right-turn lane from NB Fremont Avenue. • Convert the dedicated SB right-turn lane at Fremont Avenue/Huntington Drive to a shared through right-turn lane. • Add a merging lane on SB Fremont Avenue just south of Huntington Drive. • Widen the west side of Fremont Avenue south of Huntington Drive. • Restripe adjacent lanes accordingly.
L-2c	Fremont Avenue from Mission Road to Valley Boulevard	City of Alhambra	• Remove raised median along Fremont Avenue between Valley Boulevard and Mission Road to extend NB and SB left-turn pockets at Mission Road and Valley Boulevard, respectively. • Restripe adjacent lanes accordingly.
L-3	Atlantic Boulevard from Glendon Way to I-10	City of Alhambra	• Add a dedicated right-turn lane on SB Atlantic Boulevard from Glendon Way to the WB I-10 on-ramp. • Modify the intersections of Atlantic Boulevard/Glendon Way and Atlantic Boulevard/Norwood Place by adding pork chop islands to prohibit left-turn movements to and from Glendon Way and Norwood Place, respectively. • Convert one of the existing NB through lanes on Atlantic Boulevard into a shared through-right turn lane at Glendon Way. • Convert the existing center lane, including left-turn pockets on Atlantic Boulevard between Valley Boulevard and Glendon Way into a reversible directional lane that would be reversed between the NB and SB directions to accommodate peak traffic flows. • Convert one of the existing SB through lanes on Atlantic Boulevard into a shared through right-turn lane at Glendon Way. • Add a merging lane on NB Atlantic Boulevard just north of

TABLE 2.3:
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location	Proposed Improvement/Modification
			Glendon Way. • Remove a portion of the raised median on Atlantic Boulevard south of Glendon Way. • Restripe adjacent lanes accordingly.
L-4	Garfield Avenue from Valley Boulevard to Glendon Way	City of Alhambra	• Add a reversible directional lane on Garfield Avenue that would be reversed between the NB and SB directions to accommodate peak traffic flows. • Add a dedicated right-turn lane on SB Garfield Avenue from Glendon Way to the WB I-10 on-ramp. • Modify the intersections of Garfield Avenue/Glendon Way and Garfield Avenue/Norwood Place by adding pork chop islands to prohibit left-turn movements to and from Glendon Way and Norwood Place, respectively. • Move the raised median and replace the NB left-turn lane on Garfield Avenue, south of Glendon Way, with a SB merge lane. • Restripe adjacent lanes accordingly.
L-5	Rosemead Boulevard from Lower Azusa Road to Marshall Street	City of Rosemead	• Widen outside through lane in each direction on Rosemead Boulevard between Lower Azusa Road and Marshall Street. • Add a dedicated right-turn lane from EB Marshall Street to SB Rosemead Boulevard.
L-8	Fair Oaks Avenue from Grevelia Street to Monterey Road	City of South Pasadena	• Convert existing dedicated left-turn lanes and median area along Fair Oaks Avenue between Monterey Road and Grevelia Street into a reversible directional lane that would be reversed between the NB and SB directions to accommodate peak traffic flows and prohibit left-turn movements from Fair Oaks Avenue to Oxley Street, El Centro Street, Mission Street, and Hope Street as well as left-turn movements from SB Fair Oaks Avenue to EB Monterey Road. • Convert the existing NB and SB outside lanes on Fair Oaks Avenue at Oxley Street, El Centro Street, Mission Street, and Hope Street intersections to shared through right-turn lanes. • Convert the NB left-turn lane and NB through left lane on Fair Oaks Avenue at the Grevelia Street intersection to two through lanes. • Add one SB through lane on Fair Oaks Avenue at Grevelia Street and eliminate parking on the west side of Fair Oaks Avenue south of Grevelia Street. • Restripe adjacent lanes accordingly.
Intersection Improvements			
I-1	West Broadway/ Colorado Boulevard	City of Los Angeles (Eagle Rock)	• Eliminate the left-turn pocket from EB Colorado Boulevard to Lockhaven Avenue by extending the raised median.
I-2	Eagle Rock Boulevard/ York Boulevard	City of Los Angeles (Eagle Rock)	• Add a second dedicated right-turn lane from NB Eagle Rock Boulevard to EB York Boulevard • Add a dedicated right-turn lane from WB York Boulevard to NB Eagle Rock Boulevard • Add a dedicated left-turn lane from EB York Boulevard to NB Eagle Rock Boulevard.
I-3	Eastern Avenue/ Huntington Drive	City of Los Angeles (El Sereno)	• Add a second left-turn lane from WB Huntington Drive to SB Eastern Avenue. • Add a dedicated left-turn lane from SB El Sereno Avenue to EB Huntington Drive. • Add a dedicated right-turn lane from NB Eastern Avenue to EB Huntington Drive. • Add a left turn from Eastern Avenue.

TABLE 2.3:
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location	Proposed Improvement/Modification
I-8	Fair Oaks Avenue/ Monterey Road	City of South Pasadena	• Convert the outer southbound through lane on Fair Oaks Avenue at Monterey Road into a shared through right-turn lane. • Extend the median island on Monterey Road west of Fair Oaks Avenue to restrict WB left turns at the Chase Bank driveway. • Extend NB left-turn pocket on Fair Oaks Avenue south of Monterey Road. • Implement adaptive traffic signal control. • Implement signal coordination. • Refer to Arterial L-8 of this table for improvements and modifications north of Monterey Road. • Restripe adjacent lanes accordingly.
I-9	Fremont Avenue/ Monterey Road	City of South Pasadena	• Add a second through lane in the NB direction on Fremont Avenue through the Fremont Avenue/Monterey Road intersection. • Widen the existing dedicated right-turn lane from SB Fremont Avenue to WB Monterey Road.
I-10	Huntington Drive/Fair Oaks Avenue	City of South Pasadena	• Remove a portion of landscaped median and add a third SB left-turn lane on Fair Oaks Avenue at Huntington Drive. • Relocate the existing crosswalk that crosses Huntington Drive farther west within the intersection. • Widen the outer WB through lane on Huntington Drive through the intersection. • Realign and restripe the existing crosswalks (3) across Fair Oaks Avenue. • Restripe adjacent lanes accordingly.
I-11	Fremont Avenue/ Huntington Drive	City of South Pasadena	• Convert a shared EB through right-turn lane on Huntington Drive at Fremont Avenue to a through lane and a right-turn lane. • Add a second WB left-turn lane on Huntington Drive. • Add a merging lane on SB Fremont Avenue just south of Huntington Drive. • Convert NB and SB exclusive right-turn lanes on Fremont Avenue to through right-turn lanes. • Modify the gore area on Huntington Drive, west of Fremont Avenue, and realign the westbound lanes (3). • Refer to Arterial L-2a of this table for improvements and modifications south of Huntington Drive. • Restripe adjacent lanes accordingly.
I-13	Huntington Drive/ Garfield Avenue	Cities of Alhambra/South Pasadena/San Marino	• Convert a shared through right-turn lane on EB Huntington Drive to a dedicated right-turn lane. • Widen Garfield Avenue to add a SB shared through right-turn lane at the approach to Huntington Drive. • Widen to add SB through right-turn lane on Garfield Avenue at Huntington Drive. • Widen Garfield Avenue to add a SB dedicated right-turn lane at Atlantic Boulevard. • Convert EB through lane on Huntington Drive to a dedicated left-turn lane at Garfield Avenue. • Restripe adjacent lanes accordingly.
I-14	Huntington Drive/ Atlantic Boulevard	Cities of Alhambra/South Pasadena/San Marino	• Refer to Intersection I-13 of this table for improvements and modifications.
I-15	Atlantic Boulevard/ Garfield Avenue	Cities of Alhambra/South Pasadena/San Marino	• Refer to Intersection I-13 of this table for improvements and modifications.

TABLE 2.3:
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location	Proposed Improvement/Modification
I-16	Garfield Avenue/Mission Road	City of Alhambra	• Widen the roadway bridge to add a dedicated NB right-turn lane at Mission Road. • Widen the roadway to add a dedicated SB right-turn lane at Mission Road. • Extend the northbound left-turn pocket storage on Garfield Avenue south of Mission Road. • Permanently remove three (3) on-street parking spaces on southbound Garfield Avenue north of Mission Road and one (1) off-street parking space (El Ranchero parking lot on the northwest corner.) • Restripe adjacent lanes accordingly.
I-18	San Gabriel Boulevard/ Huntington Drive	City of San Marino/ Unincorporated Los Angeles County (East Pasadena/East San Gabriel)	• Remove a portion of the median to accommodate a second EB left-turn lane at San Gabriel Boulevard. • Restripe adjacent lanes accordingly.
I-19	Del Mar Avenue/Mission Road	City of San Gabriel	• Add dedicated left-turn lanes for both directions of Mission Road at Del Mar Avenue. • Modify WB El Monte Street to prohibit left-turn movements to Del Mar Avenue. • Add one additional through lane in each direction on Del Mar Avenue through the intersection. • Upgrade traffic signal heads to 12-inch heads. • Permanent loss of 3 parking lot spaces and 10 on-street parking spaces. Del Mar Avenue heading north of Mission Road has a permanent loss of 3 on-street parking spaces. Property at southeast corner of Del Mar Avenue and Mission Road has permanent loss of 3 parking lot spaces as a result of reconfiguration. El Monte Street east of Del Mar Avenue has permanent loss of 1 on-street parking space. Mission Road WB east of Del Mar Avenue has permanent loss of 6 on-street parking spaces. • Restripe adjacent lanes accordingly.
I-22	San Gabriel Boulevard/ Marshall Street	City of San Gabriel	• Widen San Gabriel Boulevard to widen and realign NB lanes slightly east. • Add an additional SB through lane on San Gabriel Boulevard. Modify the existing median area on San Gabriel Boulevard south of Marshall Street. • Convert the existing dedicated right-turn lane from WB Marshall Street to San Gabriel Boulevard into a shared turn lane that would accommodate both right- and left-turn movements onto San Gabriel Boulevard. • Restripe adjacent lanes accordingly.
I-24	Huntington Drive/Oak Knoll Avenue	City of San Marino	• Add one additional through lane on EB Huntington Drive through the Huntington Drive/Oak Knoll Avenue intersection. • Convert the existing diagonal parking stalls along EB Huntington Drive between Oak Knoll Avenue and Chelsea Road into parallel parking stalls. • Remove 11 on-street parking stalls on Huntington Drive. • Permanent loss of 11 EB on-street parking spaces on the south side of Huntington Drive east of Oak Knoll Drive.
I-25	Huntington Drive/San Marino Avenue	City of San Marino	• Add one additional through lane on EB and WB Huntington Drive through the Huntington Drive/Sierra Madre Avenue intersection. • Convert the existing diagonal parking stalls along eastbound Huntington Drive between Westhaven Road and Ridgeway

TABLE 2.3:
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location	Proposed Improvement/Modification
			Road and westbound Huntington Drive between Kenilworth Avenue and Ridgeway Road into parallel parking stalls. • Remove 11 on-street parking stalls on Huntington Drive. • Permanent loss of 11 EB on-street parking spaces on the south side of Huntington Drive west of Sierra Madre Boulevard.
I-43	Del Mar Avenue/Valley Boulevard	City of San Gabriel	• Add a dedicated SB right-turn lane on Del Mar Avenue. • Extend green time for NB and SB through movements. • Add an additional NB merge lane on Del Mar Avenue north of Valley Boulevard. • Extend green time for the EB and WB left-turn phase. • Restripe adjacent lanes accordingly.
I-44	Hellman Avenue/ Fremont Avenue	City of Alhambra	• Remove existing median to add a through lane on NB Fremont Avenue between I-10 and Hellman Avenue. • Convert the existing shared through NB right-turn lane on Fremont Avenue to a dedicated right-turn lane. • Restripe adjacent lanes accordingly.
I-45	Eagle Rock Boulevard/ Colorado Boulevard	City of Los Angeles (Eagle Rock)	• Lengthen the existing left-turn pocket from WB Colorado Boulevard to SB Eagle Rock Boulevard. • Modify WB left-turn pocket on Colorado Boulevard.
Other Road Improvements			
T-1	Valley Boulevard to Mission Road Connector Road	Cities of Alhambra/Los Angeles (El Sereno)	• Construct a new connector road between Valley Boulevard and Mission Road. • Modify the Valley Boulevard/SR 710 on- and off-ramps. Realign the NB off-ramp approximately 40 ft west to allow the approach to be at a 90-degree angle from Valley Boulevard and aligning with the new connector road. Move the SB on-ramp approximately 215 ft east, adjacent to the NB off-ramp at Valley Boulevard. • Add a roundabout at the intersection of the new connector road and Alhambra Avenue–Mission Road. • Add a NB through lane as well as convert the existing left-right shared lane to a through-left shared lane. • Provide a roadway underpass crossing beneath the UPRR corridor. • Restripe adjacent lanes accordingly. • Construct a temporary shoofly track to construct the roadway underpass at the UPRR corridor.
T-2	SR 110/Fair Oaks Avenue Hook Ramps	Cities of South Pasadena/Pasadena	• Modify the alignment of the existing SB off-ramp at State Street to accommodate the addition of a one-lane SB on-ramp at State Street. • Widen the existing SR 110 NB off-ramp at Fair Oaks Avenue and add two lanes to convert the existing through left and through right lanes to two left lanes, one through, and a through-right lane. • Eliminate the two NB left-turn lanes at the SR 110 SB on-ramp at Fair Oaks Avenue and provide a SB right-turn lane with greater turning radius to eastbound State Street leading to the new SR 110 SB on-ramp. • Restripe and widen EB lanes on Grevelia Street east of the Fair Oaks Avenue intersection. • Add one NB lane and convert the outer NB lane to an exclusive right-turn lane along Fair Oaks Avenue south of State Street. • Terminate EB Grevelia Street at Mound Avenue, providing driveway access to the existing parking lot at the southwest corner of Fair Oaks Avenue and Grevelia Street.

TABLE 2.3:
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location	Proposed Improvement/Modification
			• Restripe adjacent lanes accordingly. • For improvements and modifications south of Grevelia Street, refer to Arterial L-8 of this table.
T-3	St. John Avenue Extension between Del Mar Boulevard and California Boulevard	City of Pasadena	• Extend St. John Avenue from Del Mar Boulevard to California Boulevard. • Construct a 14 ft wide through lane and add two traffic signals on southbound St. John Avenue. • Construct new intersections between the St. John Avenue extension at Waverly Drive, Bellevue Drive, and Palmetto Drive. • Modify the SB SR 710 off-ramp to California Boulevard.

- **Active Traffic Management:** ATM technology and strategies are also included in the TSM/TDM Alternative. The major elements of ATM are arterial speed data collection and CMS. Data on arterial speeds would be collected and distributed through Los Angeles County's Information Exchange Network (IEN). Many technologies are available for speed data collection or the data could be purchased from a third-party provider. Travel time data collected through this effort could be provided to navigation system providers for distribution to the traveling public. In addition, arterial CMS or "trailblazer" message signs would be installed at key locations to make travel time and other traffic data available to the public.

Transportation Demand Management

TDM strategies focus on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. TDM strategies facilitate higher vehicle occupancy or reduce traffic congestion by expanding the traveler's transportation options in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience. The TDM strategies include reducing the demand for travel during peak periods, reducing the use of motor vehicles, shifting the use of motor vehicles to uncongested times of the day, encouraging rideshare and transit use, eliminating trips (i.e., telecommuting), and improved transportation options. The TDM strategies associated with the TSM/TDM Alternative include expanded bus service, bus service improvements, and bicycle improvements:

Expanded Bus Service and Bus Service Improvements: Transit service improvements included in the TSM/TDM Alternative are summarized in Tables 2.4 and 2.5 and are illustrated on Figure 2-2. The transit service improvements enhance bus headways between 10 and 30 minutes during the peak hour and between 15 and 60 minutes during the off-peak period. Some of the bus service enhancements almost double existing bus service.

- **Bicycle Facility Improvements:** The bicycle facility improvements include on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Proposed bicycle facility improvements are outlined in Table 2.5.

TABLE 2.4:
Transit Refinements in the TSM/TDM Alternative

Bus Route	Operator	Route Type	Route Description	Existing Headways		Enhanced Headways	
				Peak	Off-Peak	Peak	Off-Peak
70	Metro	Local	From Downtown Los Angeles to El Monte via Garvey Ave	10–12	15	10	15
770	Metro	Rapid	From Downtown Los Angeles to El Monte via Garvey Ave/Cesar Chavez Ave	10–13	15	10	15
76	Metro	Local	From Downtown Los Angeles to El Monte via Valley Blvd	12–15	16	10	15
78	Metro	Local	From Downtown Los Angeles to Irwindale via Las Tunas Dr	10–20	16–40	10	15
378	Metro	Limited	From Downtown Los Angeles to Irwindale via Las Tunas Dr	18–23	–	20	30
79	Metro	Local	From Downtown Los Angeles to Santa Anita via Huntington Dr	20–30	40–45	15	30
180	Metro	Local	From Hollywood to Altadena via Los Feliz/Colorado Blvd	30	30–32	15	30
181	Metro	Local	From Hollywood to Pasadena via Los Feliz/Colorado Blvd	30	30–32	15	30
256	Metro	Local	From Commerce to Altadena via Hill Ave/Avenue 64/Eastern Ave	45	45	30	40
258	Metro	Local	From Paramount to Alhambra via Fremont Ave/Eastern Ave	48	45–55	20	30
260	Metro	Local	From Compton to Altadena via Fair Oaks Ave/Atlantic Blvd	16–20	24–60	15	30
762	Metro	Rapid	From Compton to Altadena via Atlantic Blvd	25	30–60	15	30
266	Metro	Local	From Lakewood to Pasadena via Rosemead Blvd/Lakewood Blvd	30–35	40–45	15	30
267	Metro	Local	From El Monte to Pasadena via Temple City Blvd/Del Mar Blvd	30	30	15	30
485	Metro	Express	From Union Station to Altadena via Fremont/Lake Ave	40	60	30	60
487	Metro	Express	From Westlake to El Monte via Santa Anita Ave/Sierra Madre Blvd/San Gabriel Blvd	18–30	45	15	30
489	Metro	Express	From Westlake to East San Gabriel via Rosemead Blvd	18–20	–	15	–
270	Metro	Local	From Norwalk to Monrovia via Workman Mill/Peck Rd	40–60	60	30	60
780	Metro	Rapid	From West Los Angeles to Pasadena via Fairfax Ave/ Hollywood Blvd/Colorado Blvd	10–15	22–25	10	20
187	Foothill	Local	From Pasadena to Montclair via Colorado Blvd/Huntington Dr/Foothill Blvd	20	20	15	15

TABLE 2.5:
Active Transportation and Bus Enhancements of the TSM/TDM Alternative

ID No.	Description	Location
Bus Service Improvements		
Bus-1	Additional bus service	See Table 2.4 and Figure 2-2
Bus-2	Bus stop enhancements	Along the routes listed in Table 2.4
Bicycle Facility Improvements		
Bike-1	Rosemead Blvd bike route (Classes II and III depending on the segment of Rosemead Blvd)	Colorado Blvd to Valley Blvd (through Los Angeles County, Temple City, Rosemead)
Bike-2	Del Mar Ave bike route (Class III)	Huntington Dr to Valley Blvd (through San Marino, San Gabriel)
Bike-3	Huntington Dr bike route (Classes II and III depending on the segment of Huntington Dr)	Mission Rd to Santa Anita Ave (through the City of Los Angeles, South Pasadena, San Marino, Alhambra, Los Angeles County, Arcadia)
Bike-4	Foothill Blvd bike route (Class III)	In La Cañada Flintridge
Bike-5	Orange Grove bike route (Class III)	Walnut St to Columbia St (in Pasadena)
Bike-6	California Blvd bike route (Class III)	Grand Ave to Marengo Ave (in Pasadena)
Bike-7	Add bike parking at transit stations	Metro Gold Line stations
Bike-8	Improve bicycle detection at existing intersections	Along bike routes in study area

Components of the TSM/TDM Alternative

Landscaping

Landscaping removed within Caltrans ROW would be replaced to the extent feasible. Landscaping removed outside of State-owned ROW would be replaced, as feasible, in coordination with the applicable local jurisdiction.

Bridges

The TSM/TDM Alternative would require widening of the Garfield Avenue Bridge. In addition, a new bridge would be constructed for the SR 710 connector road to Mission Road underpass crossing beneath the Union Pacific Railroad (UPRR) corridor.

Utilities

The TSM/TDM Alternative would require the relocation or protection in-place of various utilities as outlined in Table 2.6. A complete list of utilities is provided in Table 3.46 of Section 3.4, Utilities/Emergency Services.

TABLE 2.6:
TSM/TDM Utility Relocations and Protections In-Place

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection-in-Place)
Alhambra Utilities Department	Alhambra	4" CIP water	Would be protected in-place during construction
		12" VCP sewer (ABAND)	Would be protected in-place during construction
		8" VCP	Would be protected in-place during construction
		12" UNK (ABAND)	Would be protected in-place during construction
AT&T	Alhambra	2 Overhead Telecommunication	Would be relocated with power pole
	Eagle Rock	1 Overhead Telecommunication	Would be relocated with power pole
	El Sereno	1 Overhead Telecommunication	Would be relocated with power pole
	Pasadena	1 Overhead Telecommunication	Would be relocated with another pole
	Rosemead	12 Overhead Telecommunication	Would be relocated with power pole
	San Gabriel	2 Power Poles	Would be relocated to fit within proposed sidewalk
		4 Overhead Telecommunication	Would be relocated with power pole
	South Pasadena	2 Overhead Telecommunication	Would be relocated with power pole
Los Angeles Department of Water and Power	Eagle Rock	1 Power Pole	Would be relocated to fit within proposed sidewalk
		1 Overhead Electric	Would be relocated with power pole
	El Sereno	2 Power Poles	Would be relocated to fit within proposed sidewalk
		2 Overhead Electric	Would be relocated with power pole
Metropolitan Water District	Alhambra	60" Water	Would be protected in-place during construction
City of Pasadena Power Department	Pasadena	3 Power Poles	Would be relocated to fit within proposed sidewalk
		3 Overhead Electric	Would be relocated with power pole
Southern California Edison	Alhambra	4 Power Poles	Would be relocated to fit within proposed sidewalk
		4 Overhead Electric	Would be relocated with power pole
	Rosemead	4 Power Poles	Would be relocated to fit within proposed sidewalk
		11 Overhead Electric	Would be relocated with power pole
	San Gabriel	2 Power Poles	Would be relocated to fit within proposed sidewalk
		2 Overhead Electric	Would be relocated with power pole
	South Pasadena	1 Power Pole	Would be relocated to fit within proposed sidewalk
		1 Overhead Electric	Would be relocated with power pole
Time Warner Cable	Alhambra	1 Overhead Telecommunications	Would be relocated with power pole

Source: *Community Impact Assessment* (2014).
ABAND = abandoned
CIP = cast-iron pipe
VCP = vitrified clay pipe

Non-Motorized and Pedestrian Facilities (Active Transportation)

The TSM/TDM Alternative includes modifications to existing arterial streets and intersections, and freeway on- and off-ramps as shown in Table 2.3. It also includes enhancements to bus stops and the addition of several segments of on-street bike lanes as shown in Tables 2.4 and 2.5. Existing pedestrian and bicycle facilities along arterials, at intersections, and at freeway on- and off-ramps would be either protected in-place during construction of the TSM/TDM Alternative improvements or would be replaced in kind at the completion of the construction of those improvements. Any such improvements would be constructed to current Americans with Disabilities Act (ADA) standards for curb ramps and sidewalks. Improvements to the bus stops would also be constructed to ADA standards as feasible based on available public ROW to accommodate those types of improvements.

Specific improvements/changes in pedestrian and bicycle facilities under the TSM/TDM Alternative would include:

- On arterials and at intersections, the TSM/TDM improvements would accommodate pedestrians and would comply with ADA requirements.
- Class II and III bikeways would be accommodated, but some Class II and Class III bike lanes would not be accommodated, due to limited lane widths.
- On St. John Avenue from California Boulevard to Del Mar Boulevard, the proposed improvements are within State-owned ROW (freeway mainline only) and would provide for pedestrian access.
- At the Valley Boulevard connector road and T-2 hook ramps, the proposed improvements within the State-owned ROW (freeway mainline and off-ramps) would not provide pedestrian or bikeway access beyond what is currently allowed for emergency access in the Caltrans *Highway Design Manual* and *Standard Plans*.

Drainage Facilities

Existing catch basins affected by roadway widening or ramp improvements would be relocated to the new curb and gutter. The proposed T-1 improvement would include new gutters and catch basins that would direct roadway flows to the Dorchester Avenue storm drain.

Storm Water Treatment

Two Gross Solids Removal Devices (GSRDs), type Linear Radial (LR-4 and LR-6), are proposed at the southbound State Route 710 (SR 710) connector from Valley Boulevard as part of the Valley Boulevard to Mission Road Connector Road (Other Road Improvement T-1). Tree box filters are proposed as part of the Valley Boulevard to Mission Road Connector Road (Other Road Improvement T-1) and the SR 110/Fair Oaks Avenue Hook Ramps (Other Road Improvement T-2); the intersection improvements at San Gabriel Boulevard/Marshall Street (Intersection Improvement I-22), SR 710 northbound off-ramp/Valley Boulevard (Intersection Improvement I-5), Huntington Drive/Fair Oaks Avenue (Intersection Improvement I-10), and Del Mar Avenue/Mission Road (Intersection Improvement I-19); and the local street improvements at Rosemead Boulevard from Lower Azusa Road to Marshall Street (Local Street Improvement L-5).

Catch basin screens and filter inserts are proposed at new inlet locations as part of the St. John Avenue Extension between Del Mar Boulevard and California Boulevard (Other Road

Improvement T-3); the intersection improvements at Garfield Avenue/Mission Road (Intersection Improvement I-16); and the local street improvements at Rosemead Boulevard from Lower Azusa Road to Marshall Street (Local Street Improvement L-5).

Retaining Walls

Retaining walls would be installed at the bridge for the SR 710 underpass beneath the UPRR corridor. In addition, retaining walls would be built for the hook ramp improvements, at the northbound SR 110 off-ramp at Fair Oaks Avenue, and along the southbound SR 110 south of the State Street on-ramp and adjacent to State Street.

Noise Barriers

Preliminary abatement measures proposed for the TSM/TDM Alternative include five noise barriers: two for Local Street Improvement L-3, one for Local Street Improvement L-5, and two for Other Road Improvement T-1, as follows:

- L3/TSM/TDM Alternative Noise Barrier (TNB) No. 1 is a recommended barrier along the perimeter of the private swimming pool area at the Atlantic Riviera Apartments, located at 1417 South Atlantic Boulevard.
- L3/TNB No. 2 is a recommended barrier along the private property line of 1721 South Atlantic Boulevard.
- L5/TNB No. 1 is a recommended barrier along the private property line of 3955 Rosemead Boulevard.
- T1/TNB No. 1 is a recommended barrier along the Caltrans ROW/private property line along the northbound side of SR 710 south of Valley Boulevard.
- T1/TNB No. 2 is a recommended barrier along the edge of shoulder on the southbound side of SR 710 south of Valley Boulevard.

The analyzed noise barriers are shown on Figure 3.14-3 in Appendix N, Noise Tables and Figures. The final locations, heights, and lengths of noise barriers for the TSM/TDM Alternative would be determined during final design.

Property Acquisitions

The TSM/TDM Alternative would require the permanent acquisition of full and partial parcels of land that would be permanently incorporated into the transportation improvements in this Alternative as summarized in Table 2.7. The improvements in the TSM/TDM Alternative are not expected to require any permanent easements.

Ramp Metering

It is anticipated that the southbound SR 110 on-ramp at Fair Oaks Avenue (Other Road Improvement T-2) would require ramp metering because it is a downhill ramp leading to a relatively short weaving section, with a signal directly upstream. Thus, the ramp metering is recommended to enhance the operation of the ramp connection to the mainline freeway. In general, ramp metering reduces congestion by controlling traffic coming onto the freeway and reducing friction. By doing so, ramp metering helps to maintain more consistent freeway throughput, uses the capacity of the freeway more efficiently, and improves safety. Caltrans Deputy Directive 35 (DD-35) and Ramp Metering Design Manual specifically notes that

TABLE 2.7:
Summary of Permanent Acquisitions for the TSM/TDM Alternative

Type of Permanent Acquisition	Number of Parcels
Full parcel acquisition	1
Partial parcel acquisition	30
Aerial easement	0
Surface easement	0
Permanent tunnel easement	0
Permanent underground easement	0

Source: *Community Impact Assessment* (2014).

"Caltrans is committed to using ramp metering as an effective traffic management strategy to maintain an efficient freeway system and protect the investment made in constructing freeways by keeping them operating at or near capacity." Caltrans' Ramp Metering Policy Procedures state that "…projects which propose the modification of an existing interchange or the construction of a new interchange…should include provisions for ramp meters."

Construction Activities

Grading and Excavation

Many of the improvements included in the TSM/TDM Alternative, such as video detection systems, enhanced bus service, and bike routes, do not involve ground disturbance. However, other improvements (e.g., the installation of CMS and additional bus stops as well as the local street and intersection improvements) may require ground disturbance for their implementation. Excavation and construction for the local street and intersection improvements involve multiple components that vary in degree of ground disturbance. Examples of these components include changes to signs and lane striping; rehabilitation of traffic signals; removal of medians; and installation of new medians, sidewalks, pavement, noise barriers, and overhead cantilever signs for the reversible lanes. Anticipated depth of excavation for these components ranges from zero to approximately 10 ft. The majority of improvements within the TSM/TDM Alternative include one or more of these components. In addition to these smaller-scale components, a few improvements in this Alternative include more substantial changes such as new alignments for roads, on-ramps, and off-ramps. These larger-scale changes involve greater levels of ground disturbance with excavation that may reach depths of up to approximately 45 ft.

Traditional excavation equipment (e.g., scrapers, trackhoes, bulldozers) would be used for most components that involve ground disturbance. For signal poles, cast-in-drilled-hole (CIDH) piles that are up to approximately 30 inches in diameter would be used, and the shafts for these piles would be drilled up to approximately 10 ft deep using a drill rig equipped with an auger. No pile driving would be allowed during construction of the TSM/TDM Alternative.

Construction Staging and Phasing

Construction staging describes the steps taken to construct project improvements in a logical and effective order with minimal disruption to traffic and the adjacent community. The intent of construction staging is to mobilize work crews and materials and construct improvements in a progression that minimizes the need for multiple periods of construction in one area. Construction staging can include, but not be limited to, how and when utility relocations and modifications are implemented; how lane, ramp, and street closures are integrated with the construction of improvements in those areas; and the concurrent use of multiple work crews in different areas.

Construction phasing identifies project components that would be designed and implemented in discrete phases as a project is constructed over time. Typically, phased improvements build on earlier improvements. For example, if a freeway is proposed to be widened to add one general-purpose lane and one high-occupancy vehicle (HOV) lane in each direction, the freeway could be widened first to add the HOV lanes and then, as demand increases, the general-purpose lanes could be constructed at a later date. Phasing plans typically focus on identifying meaningful transportation improvements that would provide timely benefits to travelers. To be most effective, phased improvements should have independent utility and not depend on other transportation improvements to provide benefits to travelers.

As shown earlier on Figure 2-2 and in Tables 2.2 through 2.5, the TSM/TDM Alternative includes discrete improvements across the project area. Some of those improvements would require temporarily shifting or closing travel lanes to provide space to construct the improvements. Each improvement would be staged to minimize the disruption to traffic and maximize the effectiveness of the construction activities. However, because these are discrete improvements, they can be designed and implemented in any order without any specific overall phasing. For example, the ITS improvements listed in Table 2.2 could be implemented individually and are not dependent on other TSM/TDM improvements being in place. The ITS improvements would require coordination and integration with existing ITS improvements at the intersections or cross streets in the vicinity of the ITS improvements to maximize the effectiveness of those improvements.

A majority of the TSM/TDM improvements were designed within the existing right-of-way, which is consistent with the approach for this alternative. Minor street improvements, such as adding turning lanes or through lanes may require street widening, raised median removal, and restriping. It is anticipated that these types of improvements would result in minimal construction related impacts and require minimal import and/or export of material.

Other TSM/TDM improvements, such as T-1 (Valley Boulevard to Mission Road Connector Road), T-2 (SR 110/Fair Oaks Avenue Hook Ramps), and T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard and also I-16’s (Garfield Avenue/Mission Road) bridge widening would require more construction effort than other TSM/TDM locations. T-1 would be constructed within Caltrans property and it is anticipated that sufficient space would be available on this property for staging and storage of equipment and materials. Other Road Improvement T-1 would require a temporary shoofly track in order to construct the Valley Boulevard to Mission Road Connector Road underpass at the UPRR corridor. The shoofly (temporary) track would take approximately 30 days to construct and 15 days to remove, and would remain in place approximately 12 months. It is anticipated that the proposed roundabout of T-1 at Mission Road would be constructed in two stages. Roadway excavation would be reused where possible within the roadway right-of-way, and any excess material can be hauled away along the southbound SR 710 and eastbound I-10 to an existing Class I landfill and/or sold to a soil broker.

Other Road Improvement T-2 would require widening of the existing SR 110 northbound off ramp at Fair Oaks Ave and a retaining wall would be placed along the outside shoulder of the ramp. Construction in this area may require night or weekend closures along the off ramp.

Similarly, the relocated SR 110 southbound off and ramp at State Street and the proposed on SR 110 SB on ramp from State Street may require a weekend or night closure of the ramps during construction. Excavated material would be reused within the state right-of-way where possible, and any excess material can be hauled away to an existing Class I landfill and/or sold to a soil broker.

Improvement T-3 proposed the extension of St John Ave from Del Mar Blvd to California Ave. A majority of this work would be completed within Caltrans ROW and it is anticipated that sufficient space is available for storage of equipment and materials within Caltrans property. Additional space beyond the ROW boundary needed for construction is minimal and will be acquired as temporary construction easement (TCE). Excavated material would be reused within the roadway right-of-way where possible, and any excess material can be hauled away along the northbound SR 710 and eastbound I-210 to an existing Class I landfill and/or sold to a soil broker.

Bridge widening for Improvement I-16 would require removing part of the existing structure, followed by construction of the widened portion and lastly connecting the existing structure and widening with a concrete closure pour. Minimal excavation and imported material is anticipated at this location. As shown in Table 2.3, the majority of the improvements in the TSM/TDM Alternative would require some temporary closures of travel lanes, but only a few would require detours to minimize delays to the traveling public in those areas. Most of these closures and delays would be limited in duration (hours or days).

Temporary Construction Easements

Temporary construction easements (TCEs) are areas outside the permanent ROW that would be needed during construction of improvements adjacent to the TCEs. TCEs can be needed to provide space for constructing walls along the ROW, extending major drainage facilities and culverts, utility relocations and modifications, and widening bridges. TCEs may also be used to provide temporary access to a construction area or temporary storage for construction equipment and/or materials. Any land used as a TCE during construction would be returned to its original or better condition prior to the return of that land to the original owner after completion of the construction activities requiring that TCE.

The majority of the improvements in the TSM/TDM Alternative are anticipated to be constructed within existing publicly owned ROWs. It is anticipated that the TSM/TDM Alternative would require TCEs for the construction of improvements where there is not sufficient room within the public ROWs to accommodate the construction activities and/or storage of materials or equipment for those improvements. No permanent project features would be constructed within the boundaries of the TCEs used during construction of the TSM/TDM Alternative.

Equipment Storage and Parking, and Construction Employee Parking

During construction of the improvements in the TSM/TDM Alternative, all construction equipment would be stored and staged within the project limits or the TCEs. Construction employees would be required to park within the project construction limits or TCEs.

Cost

The TSM/TDM Alternative is estimated to cost approximately $105 million (2014 dollars) and $126 million (2020 dollars). This estimate includes all components of the TSM/TDM Alternative, including ITS improvements, local street improvements, ATM technology, bicycle improvements, and expanded bus service. The structures, utilities, and ROW costs are included in these estimates.

Schedule

The construction of the improvements in the TSM/TDM Alternative is expected to take approximately 2 years to complete.

2.2.3.2 BRT Alternative

The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, dedicated bus lanes and mixed-flow traffic lanes to key destinations between East Los Angeles and Pasadena. The proposed route length is approximately 12 miles (mi). Figure 2-3a illustrates the BRT Alternative.

The BRT Alternative includes the BRT trunk line arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connecting bus services. Buses are expected to operate every 10 minutes during peak hours and every 20 minutes during off-peak hours. The BRT service would generally replace, within the study area, the existing Metro Route 762 service. The approximately 12 mi route would begin at Atlantic Boulevard and Whittier Boulevard to the south, follow Atlantic Boulevard, Huntington Drive, Fair Oaks Avenue, and Del Mar Boulevard, and end with a terminal loop in Pasadena to the north. Buses operating in the corridor would be given transit signal priority from a baseline transit signal priority project that would be implemented separately by Metro.

Where feasible, buses would run in dedicated bus lanes adjacent to the curb, either in one direction or both directions, during peak periods. The new dedicated bus lanes would generally be created within the existing street ROWs through a variety of methods that include restriping the roadway, restricting on-street parking during peak periods, or narrowing medians, planted parkways, and sidewalks. Buses would share existing lanes with other traffic in cases where there is not enough ROW. The exclusive lanes would be limited to buses and right-turning traffic during AM and PM peak hours only. At other times of day, the exclusive lanes would be available for mixed-flow traffic and/or on-street parking use.

The BRT service would include 60 ft articulated buses with three doors, and would have the latest fare collection technology such as on-board smart card (transit access pass [TAP] card) readers to reduce dwell times at stations.

Specific project features of the BRT Alternative are discussed in detail below.

Components of the BRT Alternative

Bus Stops

A total of 17 BRT stations with amenities would be placed on average at approximately 0.8 mi intervals at major activity centers and cross streets. Typical station amenities would include new shelters, branding elements, seating, wind screens, leaning rails, variable message signs (next bus information), lighting, bus waiting signals, trash receptacles, and stop markers.

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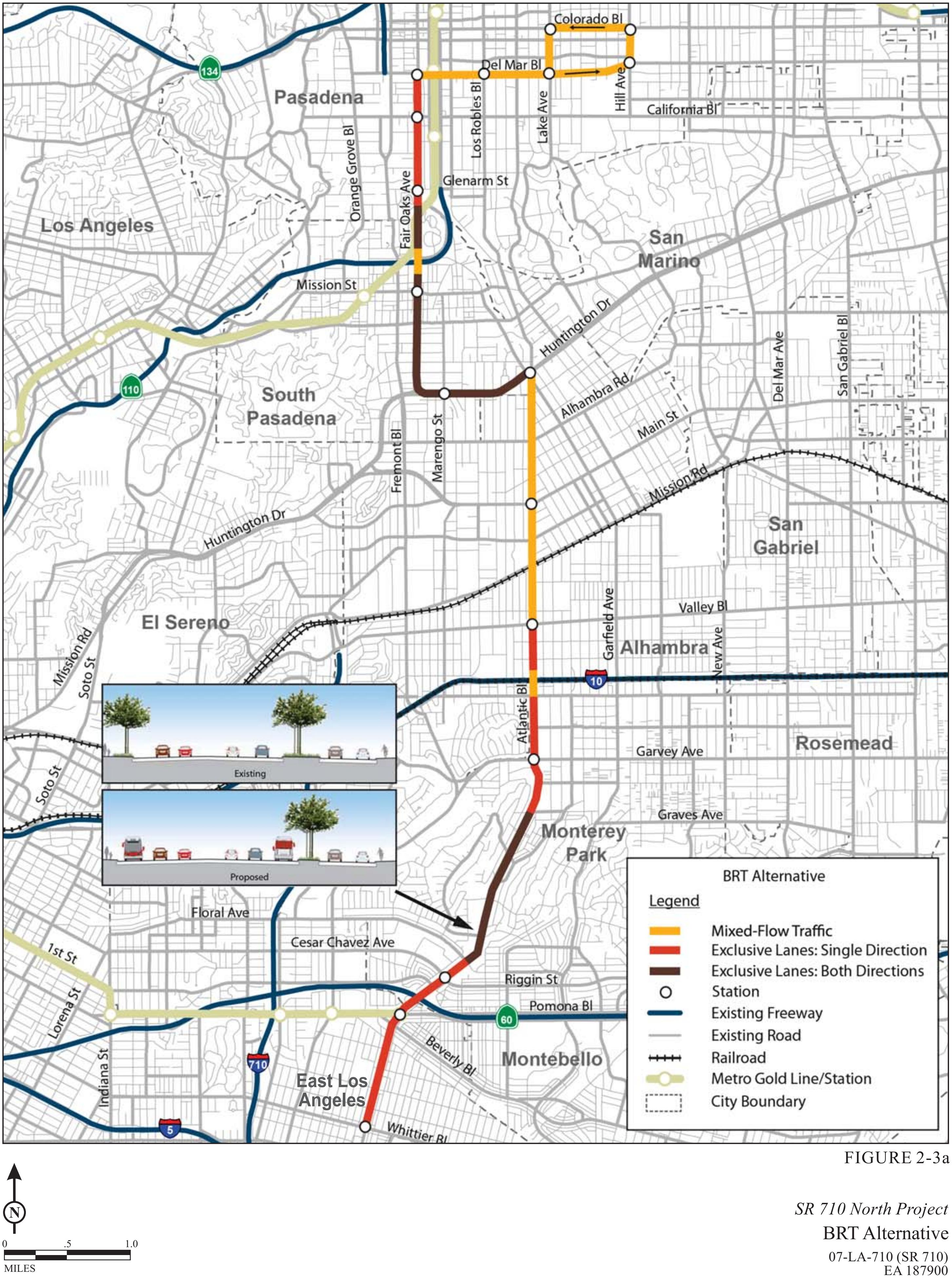

FIGURE 2-3a

SR 710 North Project

BRT Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2013)

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Some of these stops will be combined with existing stops, while in some cases, new stops for BRT would be provided directly adjacent to existing local stops on the same side of the street. The BRT stops would be provided at the following 17 locations:

- Atlantic Boulevard at Whittier Boulevard
- Atlantic Boulevard between Pomona Boulevard and Beverly Boulevard
- Atlantic Boulevard at Cesar Chavez Avenue/Riggin Street
- Atlantic Boulevard at Garvey Avenue
- Atlantic Boulevard at Valley Boulevard
- Atlantic Boulevard at Main Street
- Huntington Drive at Garfield Avenue
- Huntington Drive at Marengo Avenue
- Fair Oaks Avenue at Mission Street
- Fair Oaks Avenue at Glenarm Street
- Fair Oaks Avenue at California Boulevard
- Fair Oaks Avenue at Del Mar Boulevard
- Del Mar Boulevard at Los Robles Avenue
- Del Mar Boulevard at Lake Avenue
- Del Mar Boulevard at Hill Avenue (single direction only)
- Colorado Boulevard at Hill Avenue (single direction only)
- Colorado Boulevard at Lake Avenue (single direction only)

Street Improvements

Street widening would be required to accommodate the bus lanes and to add turn lanes or bus queue jump lanes approaching intersections. Below are locations of the proposed street widenings:

- **Atlantic Boulevard:** Between Whittier Boulevard and Hellman Avenue, between Glendon Way and Shorb Street, and between San Marino Avenue and Front Street
- **Huntington Drive:** Between Garfield Avenue and Fair Oaks Avenue
- **Fair Oaks Avenue:** Between Huntington Drive and Grevelia Street, between State Street and Columbia Street, and between State Street/Grace Terrace and Del Mar Boulevard

Bridges

The BRT alternative would not require widening or modification of any bridge structures. However, restriping of the travel lanes on bridges would be required at Atlantic Boulevard over the Alameda Corridor, Fair Oaks Avenue over SR 110, and Fair Oaks Avenue over the Metro Gold Line.

Bus Feeder Routes

Additionally, the BRT Alternative would include bus feeder routes that would connect additional destinations with the BRT mainline. Two bus feeder routes are proposed: (1) one that would run along Colorado Boulevard, Rosemead Boulevard, and Valley Boulevard to the El Monte transit station; and (2) another bus feeder route that would travel from Atlantic Boulevard near the Gold Line station to the Metrolink stations in the Cities of Commerce and Montebello via Beverly Boulevard and Garfield Avenue. In addition, other existing bus services in the study area would be increased in frequency and/or span of service. Figure 2-3b illustrates the bus feeder service proposed with the LRT Alternative.

Landscaping

The BRT Alternative would preserve existing landscaping on streets, including trees and other forms of vegetation, as much as possible. Landscaping removed outside of State-owned ROW would be provided, as feasible, in coordination with the applicable local jurisdiction. At constrained locations where larger diameter trees are not feasible, low groundcover, shrubs or smaller trees would be provided.

Utilities

Table 2.8 outlines the proposed utility relocations and those utilities that would be protected in-place. The list of utilities affected by the BRT Alternative is preliminary based on current design plans and may be modified during final design.

TABLE 2.8:
BRT Alternative Utility Relocations

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection-in-Place)
AT&T	Alhambra	1 Overhead Telecom	Would be relocated with pole
	East Los Angeles	1 Overhead Fiber	Would be relocated with pole
		4 Overhead Telecom	Would be relocated with pole
	Monterey Park	2 Overhead Telecoms	Would be relocated with pole
	South Pasadena	2 Overhead Telecoms	Would be relocated with pole
Southern California Edison	Alhambra	3 Power Poles	Would be relocated to fit within proposed sidewalk
		1 Overhead Electric	Would be relocated with pole
	East Los Angeles	9 Power Poles	Would be relocated to fit within proposed sidewalk
		5 Overhead Electric	Would be relocated with pole
	Monterey Park	3 Power Poles	Would be relocated to fit within proposed sidewalk
		2 Overhead Electric	Would be relocated with pole
	South Pasadena	2 Power Poles	Would be relocated to fit within proposed sidewalk
		2 Overhead Electric	Would be relocated with pole
Time Warner Cable	South Pasadena	2 Overhead Telecom	Would be relocated with pole
Verizon Wireless	East Los Angeles	1 Overhead Telecom	Would be relocated with pole
XO Communication	East Los Angeles	1 Overhead Telecom	Would be relocated with pole

Source: *Community Impact Assessment* (2014).

Non-Motorized and Pedestrian Facilities

The BRT Alternative includes modifications to existing arterial streets and intersections and freeway on- and off-ramps and the construction of bus lanes and bus stations. Existing pedestrian and bicycle facilities along arterials, at intersections, and at freeway on- and off-ramps would be either protected in-place during construction of the BRT Alternative improvements or would be replaced in kind at the completion of the construction of those improvements. Any such improvements would be constructed to current ADA standards for curb ramps and sidewalks. The bus stations would be constructed to ADA standards as feasible based on available public ROW to accommodate those types of improvements.

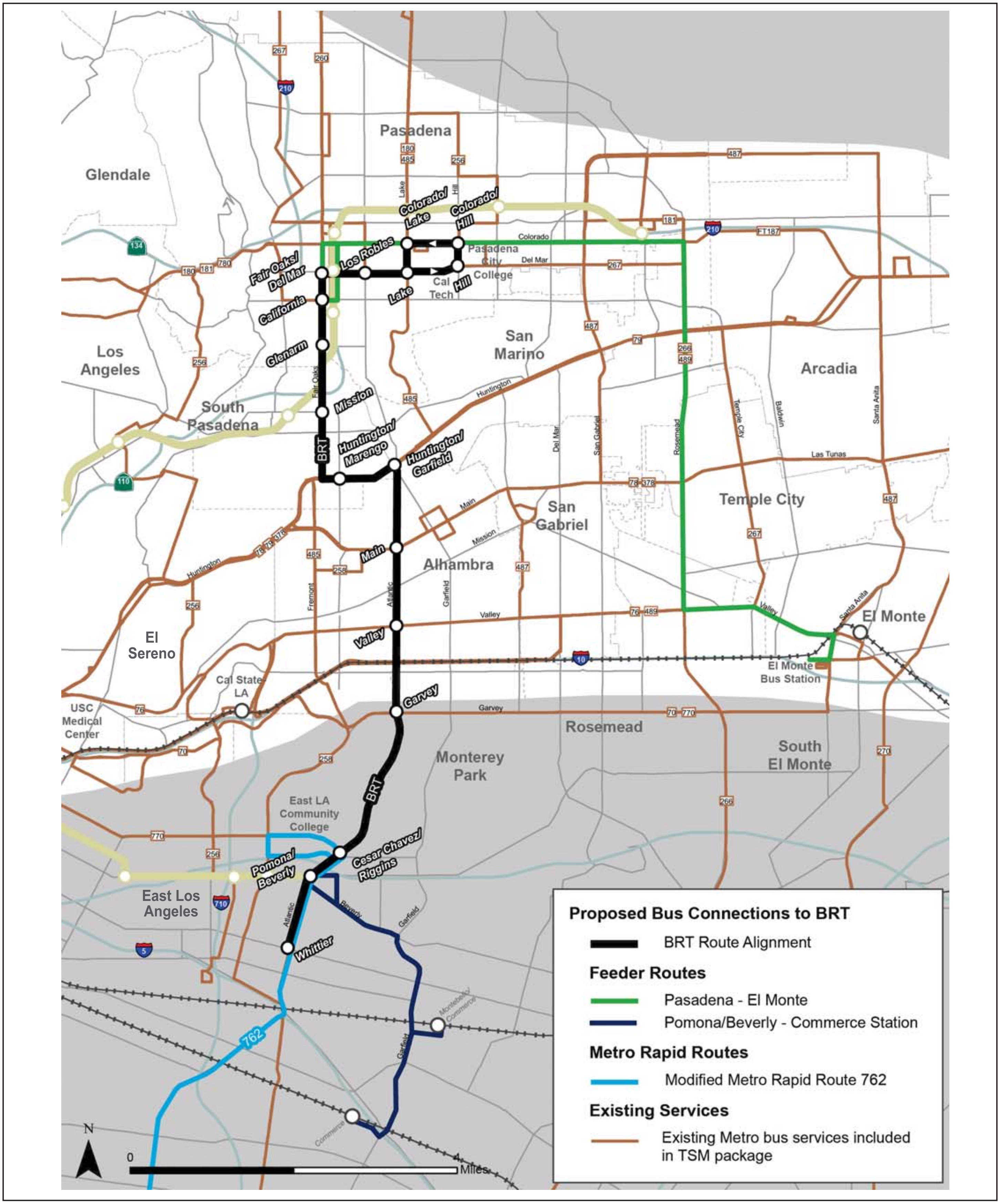

FIGURE 2-3b

SR 710 North Project

Proposed Bus Feeder Routes for BRT Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2014)

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Specific improvements and changes in pedestrian and bicycle facilities under the BRT Alternative would include:

- Bicyclists would be allowed to ride in the peak-period bus lanes at all times. Proper signage would be provided and would read “Bike OK.” During the a.m. and p.m. peak periods, bicycles would share the bus lane with buses and right-turning vehicles near intersections or at driveways. Outside of peak hours, bicyclists would share the outside general traffic lane with other vehicular traffic.
- ADA-compliant curb ramps and sidewalks would be provided where street modifications are proposed under the BRT Alternative.
- ADA-compliant tree grates at tree wells would be provided.
- Bike racks and/or lockers could be provided at the BRT stations if desired by the local jurisdictions and if they can be accommodated within the public ROW.
- The BRT Alternative would result in improved connectivity to the Metro Gold Line and many other points of interest along the BRT Alternative alignment for pedestrians and bicyclists.
- In areas with the bus lanes, the BRT Alternative would reduce sidewalk widths to a minimum of 8 ft at bus stops and a minimum of 6 ft elsewhere.
- The bus lanes on Atlantic Boulevard, Huntington Drive, and Fair Oaks Avenue would increase the lengths of pedestrian crosswalks at many locations.

Drainage Facilities

Widening of roadways to accommodate the proposed BRT Alternative would require the relocation of existing gutters and catch basins to the new curb.

Storm Water Treatment

Tree box filters are proposed at new catch basins along the BRT alignment where the sidewalk width is at least 7 ft wide, as required to meet ADA standards. Catch basin screens and curb inlet filters are proposed along the BRT alignment at locations with a new inlet where the sidewalk is less than 7 ft. A biofiltration swale is proposed within Caltrans ROW where the BRT alignment crosses SR 60.

Retaining Walls

Two retaining walls are proposed with the BRT Alternative to minimize impacts to the existing residential streets immediately adjacent to Atlantic Boulevard. One wall is located along the eastern edge of the proposed sidewalk on Atlantic Boulevard, between Repetto Drive and Sevilla Street, and the second wall would be located on the northwest corner of Atlantic Boulevard and Brightwood Street.

Noise Barriers

Preliminary abatement measures proposed for the BRT Alternative includes three noise barriers as follows:

- BRT Alternative Noise Barrier (BNB) No. 1 is a recommended barrier along the private property line of the multifamily residential use along Atlantic Boulevard and De La Fuente Street.

- BNB No. 3 is a recommended barrier along the private property line of the multifamily residential use along Atlantic Boulevard and De La Fuente Street.
- BNB No. 5 is a recommended barrier along the private property line at the northeast corner of Atlantic Boulevard and San Marino Avenue.

These noise barriers are shown on Figure 3.14-4 in Appendix N. The final heights, lengths, and locations of noise barriers for the BRT Alternative would be determined during final design. Five noise barriers proposed for the TSM/TDM Alternative would also be included in the BRT Alternative.

Property Acquisitions

The BRT Alternative would require the permanent partial acquisition of parcels of land that would be incorporated into the transportation improvements in this Alternative as summarized in Table 2.9. The improvements in the BRT Alternative are not expected to require any permanent easements.

TABLE 2.9:
Summary of Permanent Acquisitions for the BRT Alternative

Type of Permanent Acquisition	Number of Parcels
Full parcel acquisition	0
Partial parcel acquisition	45
Aerial easement	0
Surface easement	0
Permanent tunnel easement	0
Permanent underground easement	0

Source: *Community Impact Assessment* (2014).

TSM/TDM Components

The TSM/TDM Alternative improvements would also be constructed as part of the BRT Alternative. These improvements would provide the additional enhancements to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. All of the road improvements identified in Table 2.3 would be implemented with the BRT Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Additionally, enhancements to Route 762 identified in Table 2.4 would not be implemented with the BRT Alternative.

There are locations along the alignment of the BRT Alternative that overlay or cross areas that would also be improved under the TSM/TDM Alternative. All the improvements at those locations would be designed to ensure the effective operation of the BRT Alternative facilities and services in conjunction with the applicable TSM/TDM Alternative improvements. For example, ITS improvements under the TSM/TDM Alternative along or crossing the BRT Alternative alignment would be designed and implemented to compliment and support the transportation facilities and services in the BRT Alternative so as to maximize the benefits of those improvements for the traveling public.

Construction Activities

Grading and Excavation

Ground disturbance involved in the BRT Alternative is minimal and mainly concentrated in existing public ROW. These improvements include widening roadways, pavement, and sidewalk reconstruction, modifications to the SR 60/Atlantic Boulevard interchange, and installation of ancillary structures (e.g., traffic signs, power poles, small retaining walls, and noise barriers). Bus shelters constructed at the new bus stops would involve deeper excavation. Anticipated ground disturbance for their installation involves an approximately 3 ft diameter drilled shaft that may extend up to approximately 20 ft below the original ground surface.

Where roadways would be widened (e.g., along Atlantic Boulevard, Huntington Drive, and Fair Oaks Avenue), existing surface materials (landscaping, pavement, crushed rock, etc.) would be excavated to allow placement of the new pavement section. Similarly, for sidewalk reconstruction, existing material would be removed and replaced.

The proposed modification for the ramps at the I-710/SR 60 interchange does not include much change in the vertical profile from the existing alignments. As such, ground disturbance in this area would be minimal and possibly similar to that for widening the roadways.

The installation of smaller features, including traffic signal poles, traffic signs, electrical power poles, light poles, small retaining walls, and drainage facilities would occur in various places along the approximately 12 mi route. These features are similar to those included in the TSM/TDM Alternative improvements and would likely have similar levels of ground disturbance. Excavation for this Alternative would use traditional excavation equipment (e.g., scrapers, trackhoes, bulldozers) as well as construction of CIDH piles. No pile driving would be allowed during construction of the BRT Alternative.

Construction Staging and Phasing

As shown earlier on Figure 2-3 and as discussed above, the BRT Alternative includes the provision of high-speed, high-frequency bus service on a system of proposed dedicated bus and existing mixed-flow lanes. Seventeen BRT stations with amenities would be provided at major activity centers and cross streets. Construction areas required for these improvements would result in temporarily shifting or closing travel lanes. Each improvement would be staged to minimize the disruption to traffic and maximize the effectiveness of the construction activities. The construction staging and sequencing concepts for the BRT Alternative improvements are described briefly below.

Roadway and Station Improvements

The roadway and station improvements in the BRT Alternative are anticipated to be constructed in three primary construction stages:

1. Street widening and other modifications to provide for the dedicated bus lanes
2. Construction of the BRT Alternative stations
3. Widening and other intersection improvements to join the street widening and align the dedicated bus lanes and other travel lanes at and across intersections

Within each of those overall construction stages, preliminary construction staging of the improvements is expected to include some or all of the following:

- Restriping the existing travel lanes and/or intersections to shift traffic away from an active construction area, including providing for the same number of through lanes as in the existing condition, where feasible, based on the available ROW
- Installation of temporary traffic control devices and closure of the active construction area to traffic, including appropriate temporary traffic control, directional, and informational signing
- Provision of temporary pedestrian walkways and detours and temporary bicycle detours, including appropriate temporary traffic control, directional, and informational signing
- Modification and relocation of utilities and street lights, and modification of storm drain catch basins as needed
- Modification of existing traffic signals and signing
- Construction of new road pavement, curbs, and sidewalks, including striping and appropriate permanent traffic control, directional, and informational signing
- Construction and installation of the BRT station amenities including appropriate informational signing
- Re-opening the construction area to vehicles, pedestrians, and bicyclists

Most of these general staging activities would occur all along the alignment of the BRT Alternative as the improvements along each segment are constructed. It is anticipated that improvements would be constructed on one side of the street and when those improvements are complete, the improvements on the other side of the street would be constructed. As a result, the staging activities described above would apply as the improvements on the first side of the street are constructed, and then again as the improvements on the other side of the street are constructed. It is anticipated that these types of improvements would result in minimal construction-related impacts and would require minimal import and/or export of material. Excess material resulting from these improvements would be reused on site to the extent feasible, and any remaining material would be transported to a Class I landfill and/or sold to a soil broker.

Traffic Signal Modifications

The existing traffic signal equipment at signalized intersections would be modified where the roadways are widened, intersections are modified, or where stations in the BRT Alternative would conflict with the existing signal equipment. This would include replacing, relocating, and/or upgrading the existing traffic signal equipment.

Street Lighting Modifications

The existing street light poles and the supporting electrical facilities along Atlantic Boulevard and Fair Oaks Avenue would need to be modified where widening of those streets would occur under the BRT Alternative. The modifications to the existing street lighting would generally be staged after the installation of temporary traffic control devices on the roadway, placement of temporary lighting, and closure of the active construction area to traffic.

Temporary Construction Easements

The majority of the improvements in the BRT Alternative are anticipated to be constructed within existing publicly owned ROWs. However, it is anticipated that the BRT Alternative would require TCEs where there is not sufficient room within the public ROWs to accommodate the construction activities and/or storage of materials or equipment for those improvements. Any land used as a TCE during construction of improvements under the BRT Alternative would be returned to its original or better condition prior to the return of that land to its original owner following completion of the construction activities requiring that TCE. No permanent project features would be constructed within the boundaries of the TCEs used during construction of the BRT Alternative.

Equipment Storage and Parking, and Construction Employee Parking

During construction of the improvements in the BRT Alternative, all construction equipment would be stored and staged within the project limits or the TCEs. Construction employees would be required to park within the project construction limits or TCEs.

Cost

The total estimated cost of the BRT Alternative is approximately $241 million (2014 dollars) and $288 million (2020 dollars). Of that total, the cost of the TSM/TDM improvements that would be constructed with the BRT Alternative is estimated to be approximately $102 million (2014 dollars) and $122 million (2020 dollars). The structures and ROW costs are included in these estimates. This cost includes the vehicles, stations, roadway, structures, and ROW costs for the BRT.

Schedule

The construction of the improvements in the BRT Alternative is expected to take approximately 2 years to complete.

2.2.3.3 LRT Alternative

The LRT Alternative would include a passenger rail line that is operated along a dedicated guideway similar to other Metro light rail lines. The LRT alignment is approximately 7.5 mi long, with 3 mi of aerial segments and 4.5 mi of bored tunnel segments. Figure 2-4 illustrates the LRT Alternative.

The LRT Alternative would begin at an aerial station on Mednik Avenue adjacent to the existing East Los Angeles Civic Center Station on the Metro Gold Line (Eastside Extension). The alignment would remain elevated as it travels north on Mednik Avenue, west on Floral Drive, north across Corporate Center Drive, and then along the west side of I-710, primarily in Caltrans ROW, to a station adjacent to California State University, Los Angeles (Cal State LA). The alignment would descend into a tunnel south of Valley Boulevard and travel northeast to Fremont Avenue, north under Fremont Avenue, and easterly to Fair Oaks Avenue. The alignment would then cross under SR 110 and end at an underground station beneath Raymond Avenue adjacent to the existing Fillmore Station on the Metro Gold Line in Pasadena.

Two approximately 20 ft diameter tunnels (one in each direction) are expected to be constructed with cross passages connecting the tunnels to allow for emergency access. The LRT tunnels are expected to be constructed using tunnel boring machines (TBMs) except for at the portal and the stations, which would be constructed using the cut-and-cover construction method. The depth of the bored tunnel would vary from approximately 20 to 90 ft below ground surface (bgs) measured from the crown (top) of the tunnel. The depth would be shallower near the construction portal.

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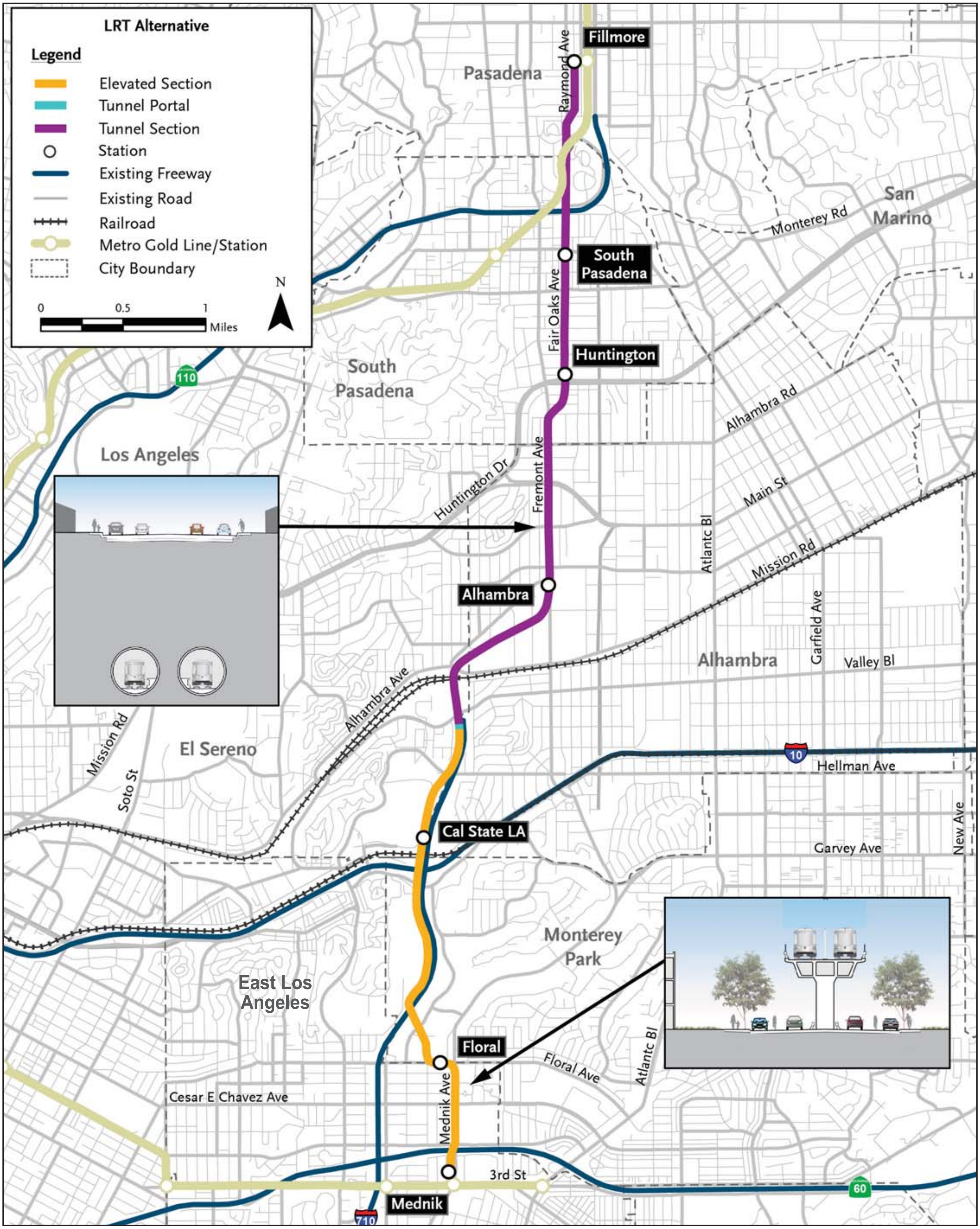

FIGURE 2-4a

SR 710 North Project

LRT Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: AECOM (2013)

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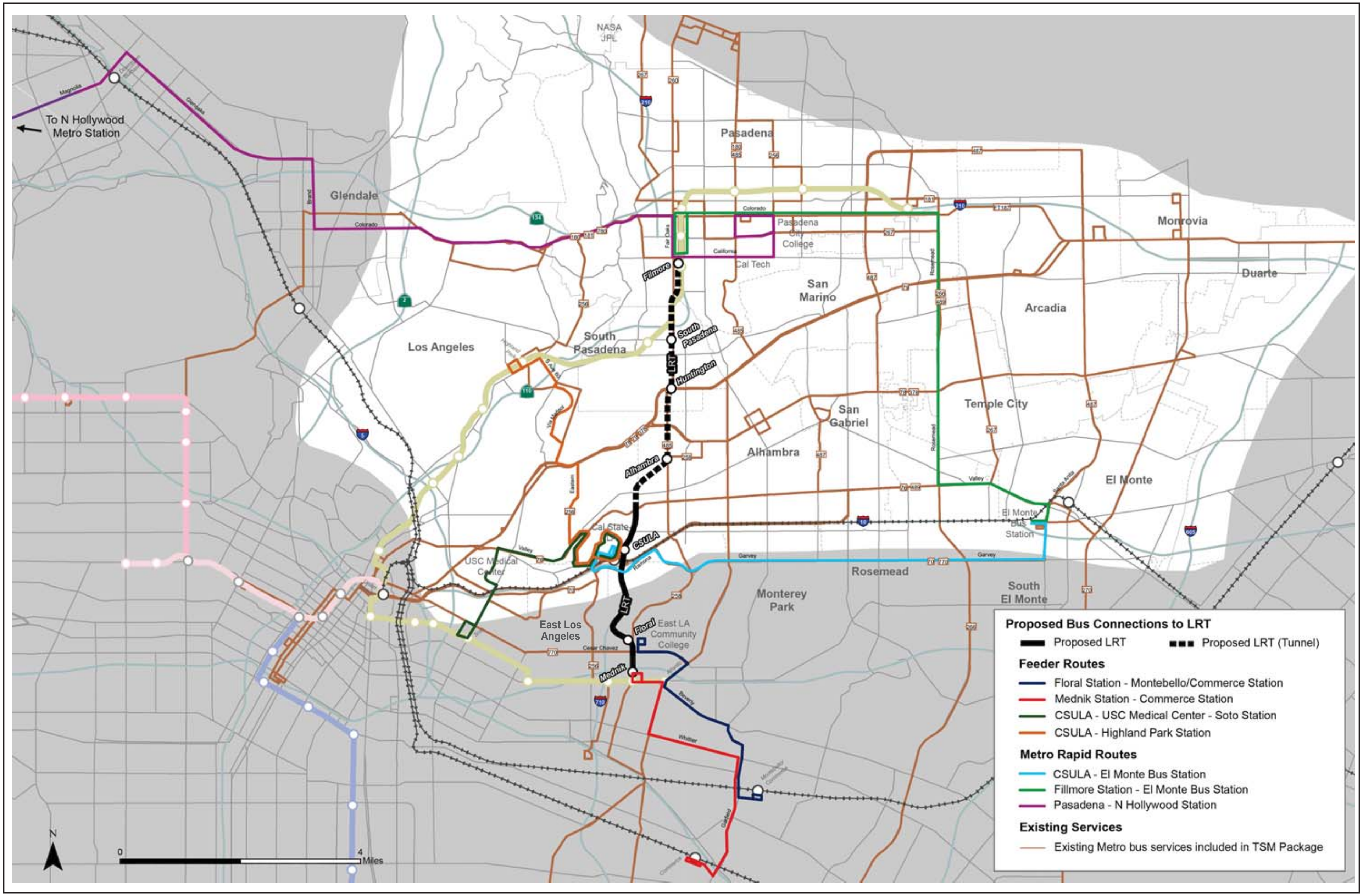

FIGURE 2-4b

SR 710 North Project

Proposed Bus Feeder Routes for LRT Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2014)

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The cut-and-cover tunnel would vary from 5 to 20 ft bgs. The vertical and horizontal alignments would be refined during final design, if this alternative is selected, based on more detailed geotechnical investigations and engineering.

Components of the LRT Alternative

Stations

Seven stations would be located along the LRT alignment:

- Mednik Station would be located at Mednik Avenue in East Los Angeles
- Floral Station at Floral Drive in Monterey Park
- Cal State LA Station at Cal State LA in Los Angeles
- Alhambra Station at Fremont Avenue in Alhambra
- Huntington Station at Huntington Drive in South Pasadena
- South Pasadena Station at Mission Street in South Pasadena
- Fillmore Station at Fillmore Street in Pasadena.

The Alhambra Station, the Huntington Station, the South Pasadena Station, and the Fillmore Station would be underground stations. The Huntington Station excavation would also include an underground crossover and the Fillmore Station would include underground tail tracks at the northernmost end of the alignment.

Park-and-Ride Facilities

Parking facilities would be provided for the LRT Alternative, at the following stations:

- **Floral:** A four-story parking garage on Kern Avenue would have 415 parking spaces. Entrances to the parking garage would be provided on Kern Avenue and Monterey Pass Road.
- **Alhambra:** A two-story parking garage on Fremont Avenue would have 382 parking spaces. An entrance would be provided on Fremont Avenue.
- **Huntington:** A three-story parking garage on Huntington Drive would have 400 parking spaces. Entrances would be provided on Fremont Avenue.
- **South Pasadena:** A surface parking lot on Mission Street would have 338 parking spaces. Entrances would be provided on Fair Oaks Avenue and Mission Street.

Maintenance Yard

A maintenance yard to clean, maintain, and store light rail vehicles would be located on both sides of Valley Boulevard at the terminus of SR 710. A track spur from the LRT mainline to the maintenance yard would cross above Valley Boulevard.

Connections to Existing Transit Services

The LRT Alternative would provide opportunities for riders to transfer to the existing Metro Gold Line at the Fillmore Station at the northern end and at the Mednik Station at the southern end. The entrance to the proposed Fillmore Station on the LRT Alternative would be approximately 120 feet from the entrance to the existing Fillmore Station on the Metro Gold Line. A small plaza would be constructed at the entrance to the new Fillmore Station that will allow patrons to walk directly to the existing Gold Line station.

The entrance to the proposed Mednik Station would be approximately 400 feet from the entrance to the existing East LA Civic Center Station on the Metro Gold Line. Existing sidewalks and crosswalks will allow patrons to walk from one station to the other. The LRT Alternative would also provide opportunities for riders to transfer at the Cal State LA Station to/from the Metrolink San Bernardino Line and to/from buses operating on the El Monte Busway via a new walkway along Circle Drive that would be constructed as part of the LRT Alternative. The walkway would connect the Cal State LA LRT Station to the Cal State LA Metrolink and Busway stations.

Bus Feeder Service

Two bus feeder services would be provided as part of the LRT Alternative. One would run from the Commerce Station on the Orange County Metrolink line and the Montebello Station on the Riverside Metrolink line to the Floral Station, via East Los Angeles College. The other would run from the El Monte Bus Station to the Fillmore Station via Rosemead and Colorado Boulevards. In addition, other existing bus services in the study area, such as the El Sol shuttle, would be increased in frequency and/or span of service. Figure 2-4a illustrates the bus feeder service proposed with the LRT Alternative.

Bridges

The LRT Alternative would require new aerial bridges over the entire elevated alignment, which includes bridges over SR 60 at Mednik Avenue, I-710 north of Floral Drive, the I-710/I-10 interchange, I-10S (El Monte Busway), and SR 710 at Hellman Avenue.

Ventilation System

The ventilation system would maintain the air velocity and temperature within the tunnel and underground stations at a comfortable level for passengers and staff. During normal operation, the air velocity in the tunnel is determined by the piston action of the trains traveling through the tunnels.

For maintenance operations, the emergency ventilation system can be used to provide the required air flow in the tunnels in the event of a fire, tunnel air velocity would be maintained between 150 and 2,200 ft per minute but no less than the critical velocity, which is the air velocity that controls the direction in which smoke travels.

If a fire were to occur on a train, the operator would attempt to reach the nearest station. If the train reaches the station, exhaust fans could be used to ventilate the station. As a result of the exhaust fans being activated, the pressure level in the station would be reduced. To compensate for the pressure differential between the station and the ambient air, fresh air would flow through the tunnel openings and evacuation paths into the station. Fresh air flowing through the evacuation paths would prevent the spread of smoke into the evacuation paths. As a result, the lower 8.2 ft of the evacuation path would be clear of smoke.

If a burning train is not able to reach the nearest station, it has to stop inside a tunnel. In this case, the overhead trackway exhaust inside the stations cannot be used to exhaust the smoke. The emergency ventilation would be maintained in the paths of evacuation and would be designed to keep the shortest evacuation path free of smoke in a situation like this. Jet fans at the ceiling of the tunnels and station fans are used to create an airflow directed to the longer evacuation path. This way a short path is available for self-rescue and the smoke would flow into the long part of the tunnel until it reaches the exhaust dampers and is drawn into the exhaust duct.

Communication and Surveillance System

The communication system for the LRT includes numerous components that detect, transmit receive, display, store and manage information related to the safe operation of the LRT system. Components of the communication system include the following;

- **Rail Operation Center (ROC):** This is the main control center for all rail lines operated by Metro. Currently, the ROC is located at Imperial Highway and Wilmington Avenue. The ROC would be upgraded to include monitoring equipment for all the communications systems associated with the LRT Alternative.
- **Cable Transmission System:** Provides high speed data transport system including all network data, voice and video traffic between the ROC and the stations and maintenance yard.
- **Telephone System:** Includes digital phones system used in stations and cross passage.
- **Transit Passenger Information System:** Provides live and prerecorded announcements on the public address system and visual message signs in the paid and unpaid passenger station areas.
- **Closed Circuit Television System:** Provides visual surveillance of station areas, cross passages and tunnel portals for safety, security, revenue protection and anticrime and antiterrorist monitoring.
- **Intrusion Detection and Controlled Access System:** Provides access control and/or intrusion detection for designated doors in the stations.
- **Fire Alarm Detection System:** Provides intelligent fire alarm and detection equipment and systems.
- **Gas Detection and Alarm System:** Provides a gas detection and alarm system that monitors for dangerous gas concentration levels in stations and cross passages.
- **Seismic Detection System:** Provides system for detecting recording and transmitting alarms of seismic events at each tunnel station.
- **Tunnel Portal Surveillance and Alarm System:** System that detects persons entering the tunnels at the portals in order to warn train operators and ROC of unauthorized entry.

Emergency Egress

The tunnel would include emergency evacuation for pedestrians. A walkway running the entire longitudinal length of each tunnel bore is necessary to provide passengers access to cross passages or stations in the event of an emergency. In the event of a stalled train on fire in a tunnel, passengers will evacuate the train and use the emergency walkway to reach the nearest appropriate cross passage, during which time they will be provided a tenable environment via the emergency ventilation system. The cross passage provides passengers access to the non-incident bore where they can either walk to the nearest station or be picked up by a rescue train. The emergency walkway and cross passages are designed to be ADA accessible.

In the event of a train fire in a station, the platform will be evacuated as quickly as possible, and the fire suppression and emergency ventilation systems will be activated promptly.
The concourse level will be used as a point of safety for evacuating passengers because the emergency ventilation system will draw enough air in through the station entrance to keep the smoke out of it.

Emergency Response Systems

An approved Emergency Response Plan for tunnel operations would be prepared during final design, in coordination with the applicable agencies, including the Los Angeles County Sheriff, the State Fire Marshal, and local fire agencies. A fire detection and suppression system and standpipe for fire department use would be provided in the tunnel. These systems, along with the ventilation and communications/surveillance systems, would work together in an emergency response situation. If possible, a train that is on fire will continue to the nearest station to facilitate evacuation and utilize the fixed fire suppression equipment in the station. If the train cannot continue to the nearest station, it will be evacuated in coordination with the ventilation system and local authorities as defined in the emergency response plan.

The station emergency response plan will also be coordinated with the appropriate authorities. Each station will have a local control panel that is able to visually display the emergency response procedure and serve as a command center for first responders.

Emergency fire suppression systems are being rapidly improved, and new devices and techniques may become available prior to tunnel construction. If available, innovative, state-of-the-art technical equipment would be considered.

Traction Power Supply System

The LRT Alternative would include a traction power supply and distribution system that would provide electricity to run the LRT trains. The traction power supply and distribution system would be designed to requirements listed in Metro Design Criteria Section 7/Electrical. This system includes three elements: Traction Power Substations (TPSS), a direct current (DC) power distribution system, and an overhead contact system (OCS).

TPSS would convert the alternating current (AC) power provided by the local utility to DC power for distribution to trains via the OCS. Preliminary placement of TPSS units has been identified at the following locations:

- Northeast corner of the planned park-and-ride lot for the Floral Drive station
- West side of I-710 south of I-10
- North side of Valley Boulevard at the LRT maintenance yard
- Underground at the Alhambra Station
- Underground at the Huntington Station
- Underground at the South Pasadena Station
- Underground just south of the Fillmore Station

The DC power distribution system connects the OCS to the TPSS through a system of cables. The OCS would consist of a set of two copper wires supported by steel poles mounted on the aerial guideway or suspended from the tunnel ceiling. OCS poles would be spaced along the LRT guideway, between or adjacent to the tracks, at a typical spacing of 150 ft.

Special Trackwork

Four double crossovers would be constructed as part of the LRT Alternative. Double crossovers allow trains to: switch from the northbound track to the southbound track or vice versa; reverse direction at the ends of the alignment; or, in case single-track operations are required, go around a disabled train. The proposed locations of the double crossovers are as follows:

- North of the proposed Mednik Station, approximately 750 ft north of 1st Street
- North of the proposed Cal State LA Station
- North of the proposed Huntington Station
- On the tail tracks north of the proposed new Fillmore Station

In addition, a pair of turnouts (switches) would be located on the southbound track immediately north of Hellman Avenue to provide access to the lead tracks into the maintenance yard. A single crossover approximately 400 ft south of Hellman Avenue would allow a train to switch from the northbound track to the southbound track to access the maintenance yard.

Street/Freeway Improvements

The following improvements to local streets and freeways are included in the LRT Alternative:

- A Class II bicycle lane would be provided on Mednik Avenue between First Street and Floral Drive.
  - Mednik Avenue would be permanently reduced to one lane in each direction in this area.
  - Left turn lanes would be maintained at all signalized intersections. Existing on-street parking would be maintained.
- Realigning SR 710 northbound off-ramp to be adjacent to southbound on-ramp, reducing the existing two intersections at Valley Boulevard/SR 710 to one signalized intersection.

Landscaping

Landscaping is recommended in the proposed median in Mednik Avenue, as feasible, in coordination with the local jurisdiction.

Utility Relocation/Protection-in-Place

The LRT Alternative would require the relocation or protection-in-place of various utilities, as outlined in Table 2.10. The list of utilities affected by the LRT Alternative is preliminary based on current design plans and may be modified during final design.

Non-Motorized and Pedestrian Facilities

The LRT Alternative includes modifications to existing arterial streets, intersections, and freeway on- and off-ramps, and the construction of light rail tracks and stations. Existing pedestrian and bicycle facilities along arterials, at intersections, and at freeway on- and off-ramps would be either protected in-place during construction of the LRT Alternative improvements or would be replaced in kind at the completion of construction of those improvements. Any such improvements would be constructed to current ADA standards for curb ramps and sidewalks.

TABLE 2.10:
LRT Alternative Utility Relocations and Protections In-Place

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection-in-Place)
AT&T	Alhambra	2" Telephone Conduit	Would be relocated east of Fremont Avenue and may require an easement
	El Sereno	14" Telephone Conduit	Would be protected in-place during construction
	Monterey Park	7" Telephone Conduit	Would be relocated south of Corporate Center Drive
	Pasadena	1–4" Telephone Conduit	Would be relocated east or west of Raymond Avenue and may require an easement
California Water Service	East Los Angeles	8" Water Line	Would be relocated east or west of proposed bent along Mednik Avenue
	East Los Angeles	2" Water Line (2 locations)	Would be relocated north or south of proposed bent
Charter Communications	Pasadena	1–4" TV Conduit	Would be relocated north or south of Fillmore Street and may require an easement
City of Alhambra	Alhambra	15" Sewer	Would be relocated east or west of Fremont Avenue and may require an easement
	Alhambra	8" Water	Would be relocated east or west of Fremont Avenue and may require an easement
	Alhambra	12" Water	Would be relocated east or west of Fremont Avenue and may require an easement
City of Los Angeles – Bureau of Sanitation	El Sereno	8" Sewer (ABAND) (1 location)	Would be protected in-place during construction
	El Sereno	8" Sewer (3 locations)	Would be protected in-place during construction
City of Monterey Park	Monterey Park	10" VCP Sewer	Would be protected in-place during construction
City of Pasadena	Pasadena	16" Sewer	Would be relocated east or west of Raymond Avenue and may require an easement
	Pasadena	24" Sewer	Would be relocated east or west of Raymond Avenue and may require an easement
	Pasadena	8" Sewer	Would be relocated north or south of Fillmore Street and may require an easement
City of Pasadena – Power Department	Pasadena	Underground Electric Line (2 locations)	Would be relocated east or west of Raymond Avenue and may require an easement
	Pasadena	Underground Electric Line (2 locations)	Would be relocated north of Fillmore Street and may require an easement
City of Pasadena – Water Department	Pasadena	4" Water	Would be protected in-place during construction
	Pasadena	16" Water	Would be relocated east of Raymond Avenue and may require an easement
	Pasadena	6" Water	Would be relocated north or south of Fillmore Street and may require an easement
City of South Pasadena	South Pasadena	8" Water (3 locations)	Would be relocated east or west of Fair Oaks Avenue
	South Pasadena	8" Sewer	Would be protected in-place during construction
	South Pasadena	6" Water	Would be relocated north or south of Mission Street, and may require an easement
	South Pasadena	6" Water	Would be relocated north or south of Spruce Street
	South Pasadena	16" Sewer	Would be protected in-place during construction
	South Pasadena	4"Water	Would be relocated west of Fair Oaks Avenue and may require an easement
	South Pasadena	4"Water	Would be relocated east or west of Fair Oaks Avenue
	South Pasadena	8" Sewer	Would be relocated east or west of Fair Oaks Avenue and may require an easement
	South Pasadena	6" Water	Would be relocated west of Fair Oaks Avenue and may require an easement
Crown Castle	South Pasadena	Fiber-Optic	Would be relocated west of Fair Oaks Avenue and may require an easement
	South Pasadena	Fiber-Optic	Would be protected in-place during construction
	South Pasadena	Fiber-Optic	Would be relocated west of Mission Street and may require an easement
Los Angeles County Sanitation District	East Los Angeles	8" sewer	Would be protected in-place during construction
	East Los Angeles	8" sewer	Would be relocated north or south of proposed bent along Fisher Street

TABLE 2.10:
LRT Alternative Utility Relocations and Protections In-Place

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection-in-Place)
Los Angeles Department of Water and Power	El Sereno	2 Overhead Electric Lines	Would be relocated with pole
	El Sereno	3 Power Poles	Would be relocated north or south of Valley Boulevard to fit within proposed bridge
	El Sereno	4" Water	Would be protected in-place during construction
	El Sereno	8" Water	Would be protected in-place during construction
Level 3 Communications	Pasadena	(2) 4-1.5" Fiber-Optic	Would be relocated north of Fillmore Street and may require an easement
	Pasadena	(2) 4-1.5" Fiber-Optic	Would be protected in-place during construction
Southern California Edison	Alhambra	Underground Street Light	Would be relocated east of Fremont Avenue and may require an easement
	Alhambra	Underground Conduit	Would be protected in-place during construction
Southern California Gas	Alhambra	2" Natural Gas Line	Would be relocated east of Fremont Avenue and may require an easement
	East Los Angeles	4" Natural Gas Line	Would be relocated east or west of proposed bent along Mednik Avenue
	East Los Angeles	4" Natural Gas Line	Would be relocated north or south of proposed bent along Dozier Street
	El Sereno	4" Natural Gas Line (ABAND)	Would be relocated east or west of Charnwood Avenue
	El Sereno	4" Natural Gas Line	Would be protected in-place during construction
	El Sereno	3" Natural Gas Line	Would be protected in-place during construction
	South Pasadena	6" Natural Gas Line	Would be protected in-place during construction
	South Pasadena	3" Natural Gas Line	Would be relocated west of Fair Oaks Avenue and may require an easement
	Pasadena	12" Natural Gas Line	Would be relocated east or west of Raymond Avenue and may require an easement
Verizon Wireless	East Los Angeles	4" Fiber-Optic Conduit	Would be relocated east or west of proposed bent along Mednik Avenue

Source: *Community Impact Assessment* (2014).
ABAND = abandoned
VCP = vitrified clay pipe

The stations for the LRT Alternative would be constructed to ADA standards. Specific improvements to non-motorized and pedestrian facilities include:

- Restriping of Mednik Avenue between First Street and Floral Drive to provide a new Class II bicycle lane;
- Providing new ADA-compliant sidewalks on the north and south sides of Valley Boulevard between the existing SR 710 northbound off-ramp (to be removed) and the southbound on-ramp (there is no existing sidewalk on the north side, and there currently is a non-ADA compliant sidewalk on the south side);
- Providing a pedestrian plaza between the proposed underground Fillmore Station and the existing at-grade Fillmore Station; and
- Providing a new sidewalk on Circle Drive that connects the Cal State LA Station to the existing El Monte Busway/Metrolink Station.

Drainage Facilities

The LRT Alternative includes the installation of deck drains near each column on the elevated train decks. A pipe inside the column drains water down to the street below. With the tunnel portion of the LRT Alternative, a pump would be installed at the lowest point of the tunnel, to pump out any fire sprinkler or seepage water to the proposed storage tank located in the maintenance yard. The wash or fire water would be tested then hauled away and properly disposed of consistent with federal and State regulations. In the train yard, underdrains are proposed under each track, and swales, catch basins, and pipes are proposed to collect and treat surface runoff within the train yard. This water would be collected and drained to the Dorchester Channel.

Storm Water Treatment

Best Management Practices (BMPs) are only proposed in areas outside the tunnel. Most of the LRT alignment outside the tunnel is on an elevated track above steep terrain, where BMPs are infeasible. Four biofiltration swales are proposed where the LRT alignment is within Caltrans ROW near the I-710/I-10 interchange. Tree box filters are proposed at multiple locations along the LRT alignment. Catch basin screens and filter inserts are proposed at new inlet locations along the LRT alignment. Within the rail yard, bioretention facilities are proposed for the parking lot areas, and media filters are proposed to treat the ballast areas.

Retaining Walls

Retaining walls would be provided at the following locations:

- South of the I-10/I-710 interchange
- Cal State LA Station
- Maintenance yard

Noise Barriers

Five noise barriers proposed for the TSM/TDM Alternative would be included in the LRT Alternative.

Property Acquisitions

The LRT Alternative would require the permanent acquisition of full and partial parcels of land that would be permanently incorporated into the transportation improvements in this Alternative as summarized in Table 2.11. The improvements in the LRT Alternative are also expected to require permanent easements as shown in Table 2.11.

TABLE 2.11:
Summary of Permanent Acquisitions and Easements for the LRT Alternative

Type of Permanent Acquisition	Number of Parcels
Full parcel acquisition	58
Partial parcel acquisition	11
Aerial easement	12
Subsurface easement	1
Permanent tunnel easement	182

Source: *Community Impact Assessment* (2014).

TSM/TDM Components

The TSM/TDM Alternative improvements would also be constructed as part of the LRT Alternative. These improvements would provide the additional enhancements to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. The only component of the TSM/TDM Alternative improvements that would not be constructed with the LRT Alternative is Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) because it would conflict with the LRT Alternative maintenance yard near Mission Road.

There are locations along the alignment of the LRT Alternative that overlay or cross areas that would also be improved under the TSM/TDM Alternative. All the improvements at those locations would be designed to ensure the effective operation of the LRT Alternative facilities in conjunction with the applicable TSM/TDM Alternative improvements. For example, ITS improvements under the TSM/TDM Alternative along or crossing the LRT Alternative alignment would be designed and implemented to compliment and support the transportation facilities and services in the LRT Alternative to maximize the benefits of those improvements to the traveling public.

Construction Activities

Grading and Excavation

Grading and excavation for the LRT Alternative can be divided into two general categories based on the methods, equipment, and section of the alignment: (1) construction of rail stations and the bored tunnel section, and (2) the cut-and-cover tunnel at the portal and other improvements.

Current design plans indicate that bored tunnel sections of the LRT Alternative would be excavated using pressurized-face TBMs. A TBM has a rotating cutterhead at the front of the machine that excavates soil and rock as it is advanced through the ground. The excavated materials are typically removed from the tunnel by rail cars or a continuous conveyor system and taken to the construction portal. As the TBM advances, positive face control can be maintained to address ground loss at the face of the excavation, and a precast concrete tunnel lining system is installed, providing immediate support of the ground. Cross passages are anticipated to be excavated using the sequential excavation method (SEM) from within the tunnels excavated by the TBMs. In the SEM, tunnel excavation and support is typically performed in a series of drifts, depending on the anticipated ground conditions, which are sequenced to develop successively larger openings until the design profile is achieved. As the SEM excavation is taking place, the appropriate ground support measures are also installed to maintain stability of the excavation.

Other tunneling methods are feasible and may be evaluated in future phases; however, it is not anticipated that open face shields or the SEM would be used to advance the main running tunnels.

Most of the aerial section would be supported by CIDH columns that are approximately 8 to 12 ft in diameter. For these columns, a drill rig equipped with an auger would drill a shaft approximately 100 to 125 ft below the ground surface. The columns may extend deeper depending on the final load calculations and properties of the subsurface material. After the shaft is drilled and the soil and rock removed, the shaft would be filled with reinforcement and concrete. In a few areas, the aerial section would be supported by mechanically stabilized earth (MSE) instead of columns.

Traditional excavation equipment (e.g., scrapers, trackhoes, bulldozers) would be used during development of the underground rail stations and associated parking structures, the portal to the bored tunnel, and other improvements listed below. Cut-and-cover construction at rail stations, and at the tunnel portal would be excavated from the surface to the depth of the bored tunnel, and would generally be constructed with minimal surrounding surface settlements by using appropriate support of excavation systems. Other areas of the LRT Alternative would involve ground disturbance to varying depths in order to implement their respective improvements. These improvements include:

- Widening Mednik Avenue by 20 ft between First Street and Floral Drive;
- Replacing the slope on the north side of Floral Drive with a retaining wall;
- Installing retaining walls and grading the area for the maintenance yard;
- Relocating the SR 710 northbound off-ramp to Valley Boulevard; and
- Constructing an embankment and an MSE wall to support the rail line along the I-710 ROW south of the I-10/I-710 interchange and the Cal State LA Station.

Disposal Sites and Haul Routes

Construction of the tunnel segments (i.e., bored and cut-and-cover) and the underground stations for the LRT Alternative would generate excess excavated material that cannot be reused within the project limits. That excess material is proposed to be disposed of at two former rock quarries (the Manning and Olive Pits) in the City of Irwindale. These pits have been previously environmentally cleared and licensed to accept clean soil from construction projects. The Manning Pit, 37 acres (ac) of which are owned by the City of Irwindale, is at Vincent Avenue and Arrow Highway and has a total capacity of 5 million cubic yards. The Manning Pit is accessible by both rail and truck. A 3.35 ac parcel of railroad ROW along 4th street (adjacent to and east of the Manning Pit) could be used to offload soil from incoming rail cars. The 187 ac Olive Pit is at Olive Street and Azusa Canyon Road and has a total capacity of 50 million cubic yards. The Olive Pit is accessible only by truck via East Arrow Highway and Vincent Avenue. Other Class I landfills and/or sale to a soil broker are other options for disposal of excavated materials.

As shown on Figure 2-5, the preliminary routes for hauling that excavated material from the LRT Alternative tunneling would include segments on Fair Oaks Avenue (from the South Pasadena and Fillmore Station sites) and Fremont Avenue (from the Huntington and Alhambra Station sites), on Arrow Highway and Live Oak Avenue (to/from I-605 at the disposal end of the haul trips), and on Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit). Those haul routes would be used only during construction of the LRT Alternative tunnel segments and underground stations.

If the LRT tunnel is expected to pass through potentially contaminated soil or groundwater, the Contractor would be required to set up an area at the construction portal to sample and classify the excavated material as it is excavated. A sampling and analysis plan would be required so that the excavated material is classified properly and the correct handling methods and disposal sites are selected. Excavated material that is determined to be hazardous and cannot be taken to the Manning or Olive Pits would be transported to a landfill certified for accepting hazardous waste appropriate for the waste encountered.

Additives such as foams, polymers, or bentonite may be used during TBM excavation to condition the soil. These additives or soil conditioners would be required to be non-toxic and biodegradable and when used in accordance with manufacturer’s recommendations are not expected to contribute to special disposal requirements specifically as a result of the additives.

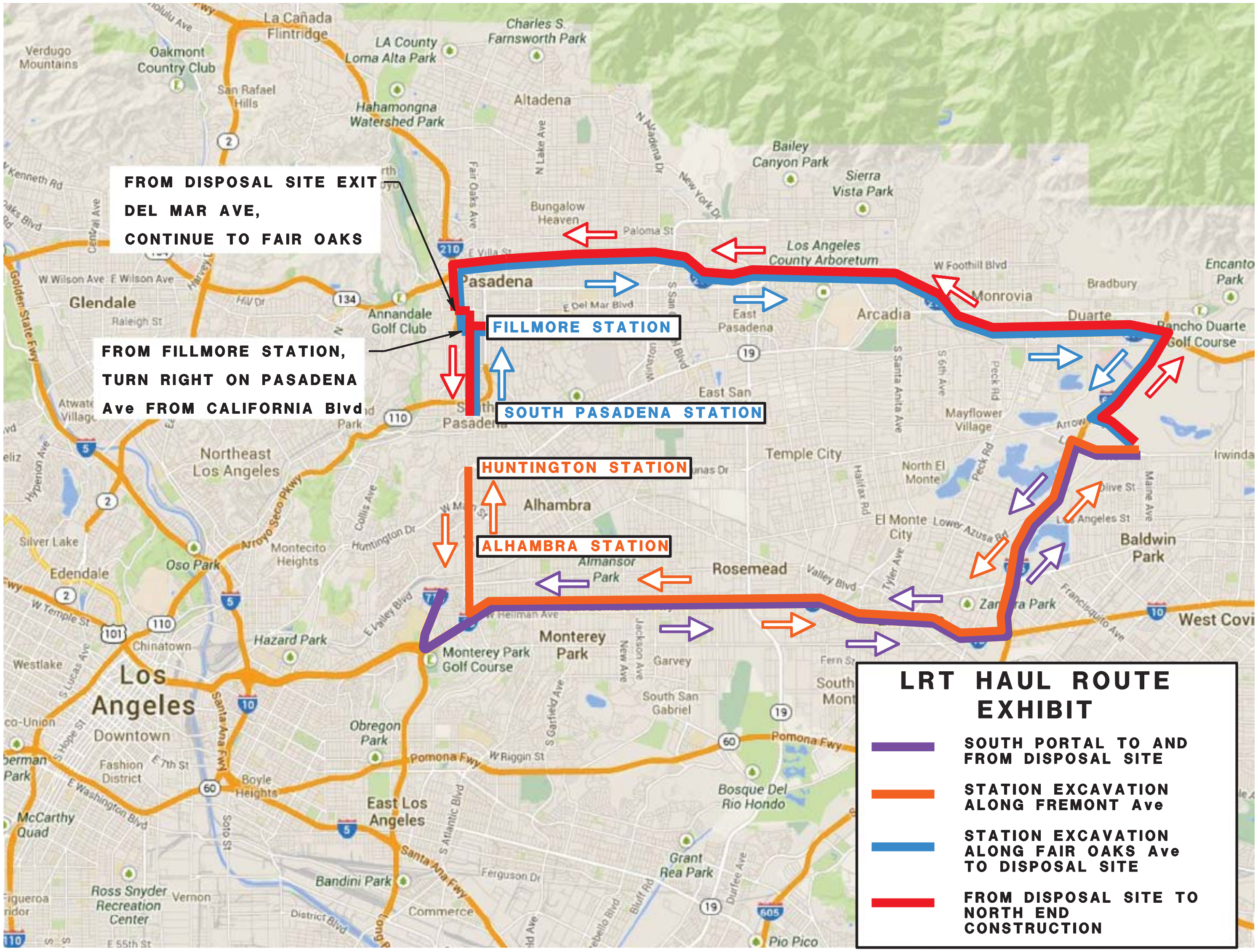

FIGURE 2-5

N

SR 710 North Project

Haul Route for the LRT Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Aerial Image © Google Earth, 2014. Annotation by CH2M HILL, 2014

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Water, including construction water, groundwater, and wet-weather flows, must also be sampled. If necessary, the water can be treated at the construction portal areas by the Contractor prior to discharge into the sewers. The Contractor would be required to have basic water treatment capabilities at the construction site. If the water cannot be treated to meet sewer discharge requirements or if the volume of water for disposal exceeds the discharge permit's capacity, it may need to be transported to an off-site disposal location. Disposal of all materials would need to meet all federal, State, and local regulations where applicable.

Construction Staging and Phasing

As shown earlier on Figure 2-4 and as discussed in Section 2.2.5, the LRT Alternative includes a passenger rail operated on a dedicated guideway with approximately 3 mi of aerial segments and approximately 4.5 mi of bored tunnel segments. There would be two bored tunnels, one for each of the LRT Alternative tracks. The LRT Alternative includes aerial and underground stations.

Each improvement would be staged to minimize the disruption to traffic and maximize the effectiveness of the construction activities. Preliminary construction staging of the LRT Alternative has been organized into the following components:

- Roadway improvements (including traffic signal modifications, and traffic control, directional, and information signing)
  - Where the elevated alignment crosses SR 60, I-710 or other roadways, overnight closures would be required for placement of K-rail adjacent to the median or construction of falsework. Other than these overnight closures, the roadways below the aerial alignment would remain open during construction of the elevated alignment. The falsework would be designed so there are no vertical clearance issues for vehicles passing under the falsework.
  - During construction of the elevated LRT alignment in the ROW for the I-710 and SR 710 ROW, occasional short (a few hours at most) closures of the outside southbound lane would be necessary to transport equipment and material to the construction area.
  - During construction of the Cal State LA Station, Circle Drive would be the access route for construction equipment and materials and may be blocked occasionally as equipment is transported to the construction area.
  - On Valley Boulevard, columns would be constructed in the #1 eastbound lane to support falsework for the bridge deck, which would require shifting the eastbound lanes on Valley Boulevard to the south.
- Utility relocations, protection in-place, and removal
- Boring of the tunnels
  - A construction portal would be excavated at the south end of the bored tunnel alignment to launch the TBMs. The portal would be excavated first by installing support of excavation walls around the perimeter of the planned excavation and then excavating the soil or rock within those walls, employing groundwater control measures where necessary. This south portal would eventually become a portion of the cut-and-cover tunnel. During bored tunnel excavation, it is expected that the Contractor would use this area for laydown to support construction operations.

  - It is anticipated that the LRT tunnels would be excavated using two pressurized-face TBMs launched from the south portal, and these tunnels are expected to be lined with a water and gasket-tight or pre-cast concrete segmental liner as the TBMs pass. With this approach, the south portal would be the main staging area for the launch of the TBMs and tunneling equipment, and the TBMs would be removed from the Fillmore Station excavation. Cross passages between the two tunnels would likely be excavated using the SEM; these cross passages would be excavated from within the LRT tunnels after the main bores have been excavated. Where necessary, ground treatment and pre-support would be installed depending on the ground type at each cross passage and would be implemented prior to excavation of the cross passages. A cast-in-place concrete lining with water and gas proofing where necessary would be installed in the cross passages after excavation is complete.
  - It is anticipated that the excavated material from the excavation of the tunnels would be removed from the south portal. Excavated material may need to be stockpiled at the construction staging areas if it is too wet from the tunneling operations to transport. Refer to the section on disposal sites and haul routes for more information about the disposal of excavated material.
  - Tunnel boring operations and muck handling could potentially occur 24 hours per day, 7 days per week.
  - After the TBMs pass each of the two active fault zones during excavation of the bored tunnels, oversized vaults would be constructed from within the tunnel in the areas of the fault crossings for each tunnel bore. This would require excavating a diameter slightly larger than that already excavated by the TBMs and supporting the ground with a robust cast-in-place concrete final lining. The oversized tunnel section is expected to be able to accommodate the anticipated movement from fault offset. Other methods to accommodate fault offset are also feasible and may be further evaluated during final design.
- Typical construction of the underground stations and support facilities for the tunnels
  - After utility relocations, the underground stations would be excavated from the top down, first by installing support of excavation walls around the perimeter of the planned excavation and then excavating the soil or rock within those walls, employing groundwater control measures where necessary.
  - The stations would be located in local streets, and therefore temporary decking would typically be required to allow for traffic over the excavations.
  - It is anticipated that the underground stations would be excavated prior to the TBM reaching each station location.
  - The construction sequence for the final station structure would include construction of the foundation base slab, followed by the installation of exterior walls and any interior column elements. Slabs are poured as the columns and intermediate floor and roof wall pours progress. Construction of portal structures would involve placement of concrete inverts, walls, and walkways. Station entrance locations are generally used as access points to the underground station during the construction process. Exterior entrances would be constructed after the station structure has been completed.

- Installation of track and tunnel systems - Direct fixation track consisting of steel rail attached to reinforced concrete plinth pads would be used on the alignment's aerial and underground sections. Gaps between the plinth pads would allow for drainage and cable runs.
- Construction of the elevated rail alignment and stations

During construction of the Floral Station:

- Parking would be temporarily prohibited on Floral Drive between Dangler Avenue and Mednik Avenue to allow the traffic lanes to be shifted to accommodate construction of the station; and
- The sidewalk on the north side of Floral Drive between Dangler Avenue and Mednik Avenue would be temporarily closed.

For all underground stations:

- Utility relocations would require daytime lane and sidewalk closures on weekdays. In most cases, at most one lane and one sidewalk would be closed at the same time.
- Drilling of piles to support the temporary roadway deck and the installation of the support excavation walls for the station would require daytime closures of one lane and possibly adjacent sidewalks. Cross streets may also be affected (e.g., Mission at Fair Oaks, California at Raymond, and the southbound right-turn lane from Fair Oaks to Huntington).
- Excavation of the first 10 to 15 ft of the station would be done without decking and would be conducted primarily in the evening and weekends, to the extent feasible.
- The installation of the roadway deck could require multiple consecutive weekend (Friday night to Monday morning) full road closures. Cross streets may also be affected (e.g., Mission at Fair Oaks, California at Raymond, and the southbound right turn lane from Fair Oaks to Huntington). The duration/sequencing of deck installation would be affected by engineering requirements and public input.
- The deck would be in place with all lanes open for traffic at most times.
- Removal of the deck when the station construction is complete could require full road closures similar to those during installation of the deck.

Laydown and storage areas during construction would be located at the portal area on Valley Boulevard and at each station location.

Temporary Construction Easements

The majority of the improvements in the LRT Alternative are anticipated to be constructed within existing publicly owned ROW. However, it is anticipated that the LRT Alternative would require TCEs where there is not sufficient room within the public ROWs to accommodate the construction activities and/or storage of materials or equipment for those improvements. Any land used as a TCE during construction of improvements under the LRT Alternative would be returned to its original or better condition prior to the return of that land to the original owner after completion of the construction activities requiring that TCE. No permanent project features would be constructed within the boundaries of the TCEs used for the construction of the LRT Alternative.

Equipment Storage and Parking, and Construction Employee Parking

During construction of the improvements in the LRT Alternative, all construction equipment would be stored and staged within the project limits or the TCEs. No construction equipment would be stored or staged on any public streets. Construction employees would be required to park within the project construction limits or TCEs.

Cost

The total estimated cost of the LRT Alternative is approximately $2,420 million(2014 dollars) and $3,066 million(2022 dollars). Of that total, the cost of the TSM/TDM improvements that would be constructed with the LRT Alternative are estimated to be approximately $52 million (2014 dollars) and $66 million (2022 dollars). The structures and ROW costs are included in these estimates.

Schedule

The construction of the improvements in the LRT Alternative is expected to take approximately 6 years to complete.

2.2.3.4 Freeway Tunnel Alternative

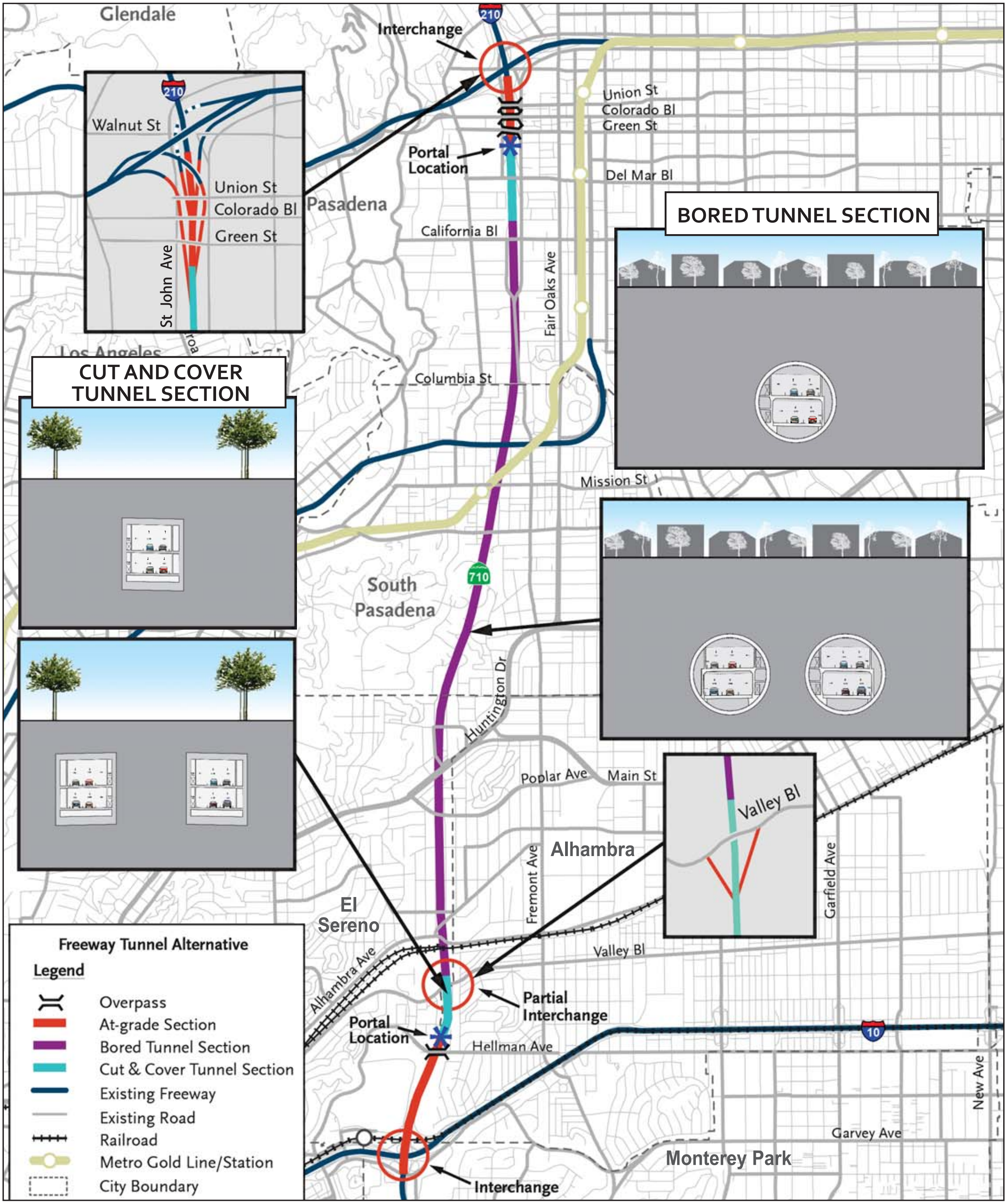
The alignment for the Freeway Tunnel Alternative starts at the existing southern stub of SR 710 in Alhambra, north of I-10, and connects to the existing northern stub of SR 710, south of the I-210/ State Route 134 (SR 134) interchange in Pasadena.

Design Variations

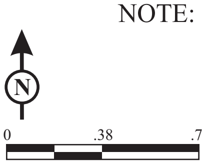
The Freeway Tunnel Alternative includes two design variations that relate to the number of tunnels constructed (i.e., dual-bore and single-bore). The dual-bore design variation includes two tunnels that independently convey northbound and southbound vehicles. The single-bore design variation includes one tunnel that carries both northbound and southbound vehicles. Figure 2-6 illustrates the dual-bore and single-bore tunnel design variations for the Freeway Tunnel Alternative. Each of these design variations is described below.

- **Dual-Bore Tunnel:** The dual-bore tunnel variation is approximately 6.3 mi long, with approximately 4.2 mi of bored tunnel, 0.7 mi of cut-and-cover tunnel, and 1.4 mi of at-grade segments. The dual-bore tunnel variation would consist of two side-by-side tunnels (one northbound, one southbound), each tunnel of which would have two levels. Each tunnel would consist of two lanes of traffic on each level, traveling in one direction, for a total of four lanes in each tunnel. The easterly tunnel would be constructed for northbound traffic, and the westerly tunnel would be constructed for southbound traffic. Each bored tunnel would have an excavated diameter of approximately 60 ft. Vehicle cross passages would be provided throughout this tunnel design variation that would connect one tunnel to the other tunnel for use in an emergency situation. Figure 2-7 illustrates the dual-bore tunnel design variation cross section.

  Short segments of cut-and-cover tunnels would be located at the south and north termini to provide access via portals to the bored tunnels. The dual-bore design variation requires widening State Route 710 (SR 710) along its east side adjacent to the portals in order to transition the existing number of lanes to 4 lanes in each direction proposed in the tunnel cross section. The portal at the southern terminus would be located south of Valley Boulevard. The portal at the northern terminus would be located north of Del Mar Boulevard. No intermediate interchanges are planned for the tunnel.



NOTE: Tunnel cross sections are illustrative and not to scale.



SOURCE: CH2M HILL (2013)

FIGURE 2-6

SR 710 North Project

Freeway Tunnel Alternative
Single and Dual Bore

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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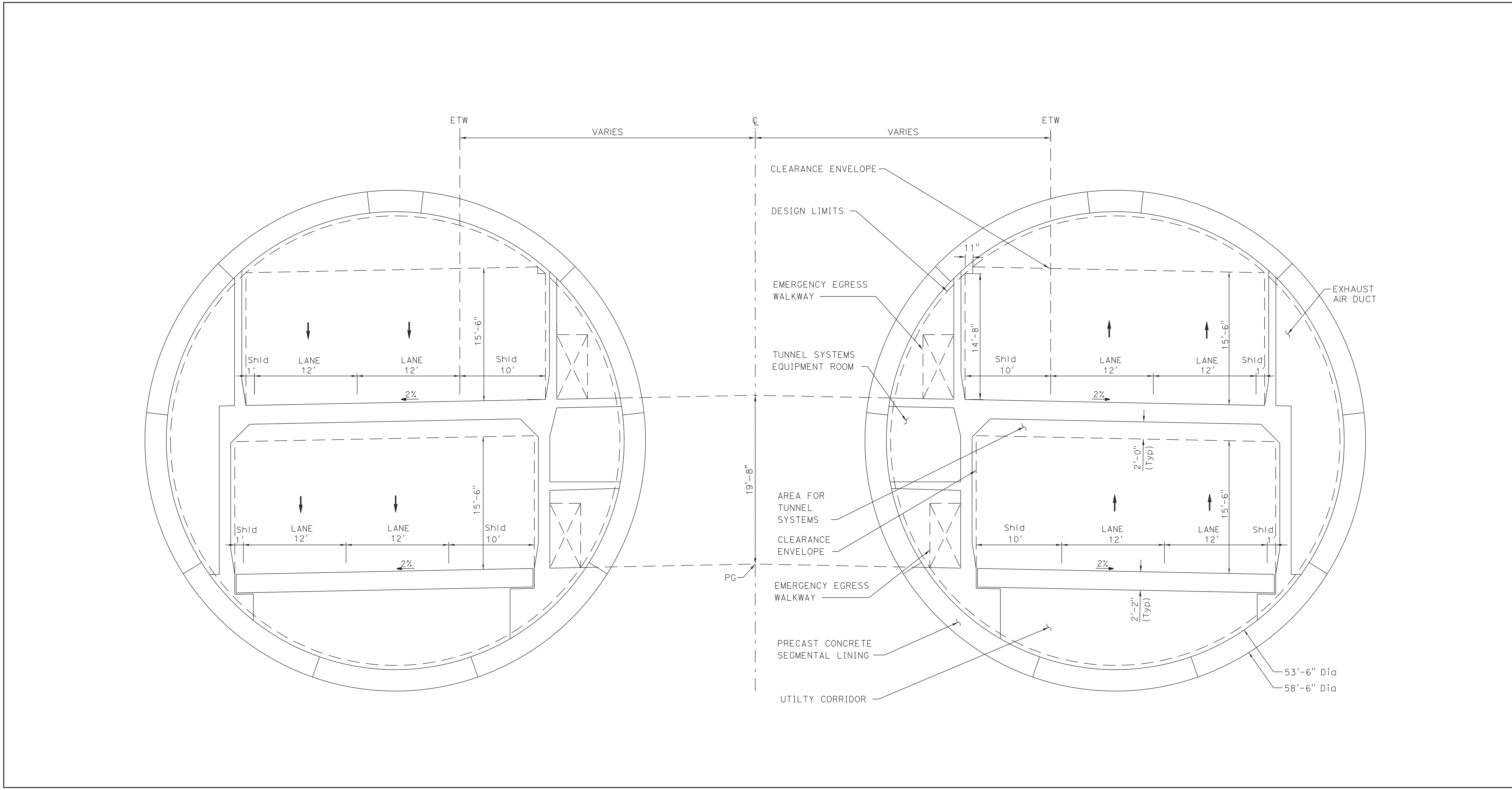

FIGURE 2-7

NOTE: Dimensions are approximate and will be refined during final design.

SR 710 North Project

Freeway Tunnel Alternative
Dual Bore Cross Section

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2014)

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- **Single-Bore Tunnel:** The single-bore tunnel design variation is also approximately 6.3 mi long, with 4.2 mi of bored tunnel, 0.7 mi of cut-and-cover tunnel, and 1.4 mi of at-grade segments. This tunnel design variation would consist of a single, two-level, bored tunnel with two lanes on each level. The northbound traffic would use the two lanes on the upper level, and the southbound traffic would use the two lanes on the lower level. The single-bore tunnel would provide a total of four travel lanes. The single bore tunnel would also have an excavated diameter of approximately 60 ft. The single-bore tunnel would be in the same location as the northbound tunnel in the dual-bore tunnel design variation. Figure 2-8 illustrates the single-bore tunnel design variation cross section.

The approximate depth of full-range bored tunnel for the Freeway Tunnel Alternative with the single-bore and dual-bore design variations is approximately 20 to 280 ft bgs measured from the crown (top) of the tunnel. The depth would be shallower near the north and south construction portals. The majority of the underground segment of the freeway would be constructed using a TBM while the remaining segments would be constructed using the cut-and-cover construction method. The cut-and-cover tunnel segment at the south portal would be up to approximately 5 to 60 ft deep bgs to the top of the tunnel. The cut-and-cover tunnel segment at the north portal would be up to approximately 0 to 30 ft bgs to the top of the tunnel. The vertical and horizontal alignments would be refined during final design, if this alternative is selected, based on more detailed geotechnical investigations and engineering.

Operational Variations

Operational variations have been identified for the Freeway Tunnel Alternative, as described below. It should be noted that vehicles carrying flammable or hazardous materials would be restricted from using the tunnel under all operational variations.

- **Freeway Tunnel Alternative without Tolls:** This operational variation would be considered for only the dual-bore tunnel design variation. The facility would operate as a freeway with lanes open to all vehicles.
- **Freeway Tunnel Alternative with Trucks Excluded:** This operational variation would be considered for the dual-bore tunnel design variation only. The facility would operate as a freeway; however, trucks would be excluded from using the tunnel. This operational variation would be considered for the dual-bore tunnel design variation only. Signs would be provided along I-210, SR 134, I-710, SR 710, and I-10 to provide advance notice of the truck restriction.
- **Freeway Tunnel Alternative with Tolls:** This operational variation would be considered for both the dual- and single-bore tunnel design variations described above. All vehicles using the tunnel(s) would be tolled.
- **Freeway Tunnel Alternative with Tolls and Trucks Excluded:** This operational variation would be considered for the single-bore tunnel design variation only. The facility would operate as a freeway and all vehicles would be tolled. Trucks would be excluded from using the tunnel. Signs would be provided along I-210, SR 134, I-710, SR 710, and I-10 to provide advance notice of the truck restriction.

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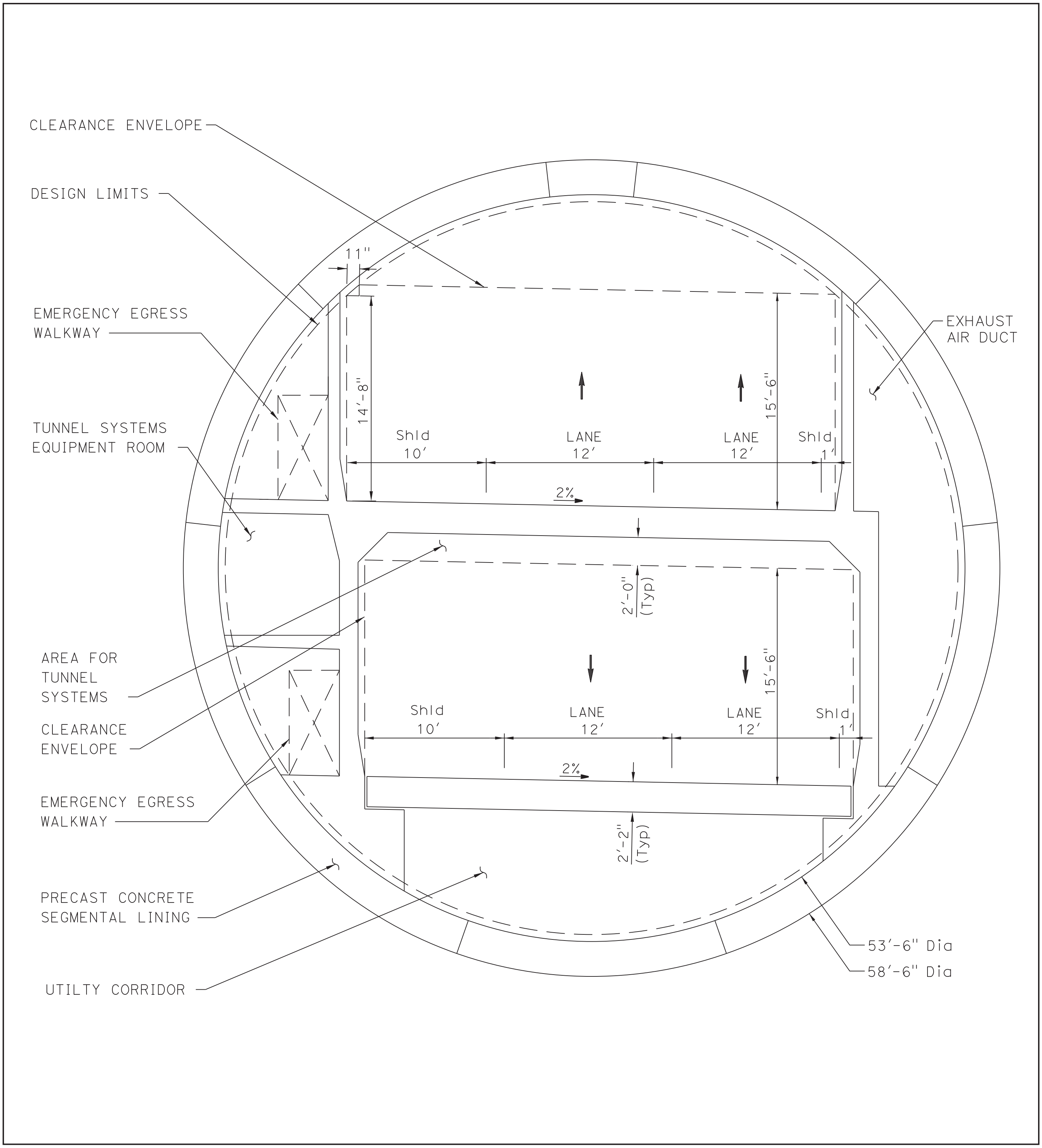

FIGURE 2-8

NOTE: Dimensions are approximate and will be refined during final design.

SR 710 North Project

Freeway Tunnel Alternative
Single Bore Cross Section

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2014)

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- **Freeway Tunnel Alternative with Toll and Express Bus:** This operational variation would be considered for the single-bore tunnel design variation only. The single-bore tunnel would operate as a tolled facility and include an Express Bus component. The Express Bus would be allowed in any of the travel lanes in the tunnel; no bus-restricted or exclusive lanes would be provided.

  The proposed Express Bus route would start at the Commerce Station on the Orange County Metrolink line, and then serve the Montebello Station on the Riverside Metrolink line and East Los Angeles College before entering I-710 at Floral Drive. The bus would travel north to Pasadena via the proposed freeway tunnel, making a loop serving Pasadena City College, the California Institute of Technology, and downtown Pasadena before re-entering the freeway and making the reverse trip.

Toll/no toll operational variations were considered because of the potential for tolled operations to improve the financial feasibility of a freeway tunnel. Truck/no truck operational variations were considered because of the potential for restricting use by trucks to address community concerns regarding the attraction of trucks to the tunnel because the tunnel would provide a connection between the I-10 and I-210. Scenarios without tolls are not feasible for the single-bore design variation because the traffic demand would exceed the capacity of the tunnel, which would result in queues in the tunnel. A freeway tunnel with express bus operational variation was considered because of the potential for this variation to improve the performance of the overall regional transit system, decrease north-south transit travel times through the study area, and attract additional transit ridership. Some combinations of variations involving express buses and/or truck prohibitions were evaluated for only the single- or dual-bore tunnel variations. To limit redundant analysis, only the single-bore or dual-bore variation with the biggest changes in traffic patterns, and therefore greatest impacts, was evaluated.

Components of the Freeway Tunnel Alternative

Street Improvements

Both the single- and dual-bore design variations propose to extend St. John Avenue from Del Mar Boulevard to California Boulevard. In addition, both variations would widen Pasadena Avenue to include a new lane from the proposed northbound SR 710 off-ramp at Pasadena Avenue to Colorado Boulevard.

Bridges

The dual-bore tunnel design variation would require widening of the Ramona Boulevard Undercrossing bridge and the SR 710/I-10 bridge.

Both the single- and dual-bore tunnel design variations would require demolition and replacement of the Hellman Avenue overcrossing and the Green Street overcrossing. The Del Mar Boulevard overcrossing would be demolished and replaced with an at-grade road for both design variations. In addition, a new bridge would be constructed at the Laguna Regulating Basin and a new overpass bridge would be constructed at Valley Boulevard for both the single- and dual-bore tunnel design variations.

Ventilation System

Proposed components of the ventilation system for the Freeway Tunnel Alternative include air scrubbers, two exhaust fans at each portal, an exhaust duct along the entire length of the tunnel, and jet fans located exclusively within the traffic area of the cut-and-cover tunnel. The design is a longitudinal ventilation (using jet fans) and smoke extraction by dampers that are connected to tunnel length ducts, which eliminate the need for intermediate vent shafts. There would be ventilation shafts located at each end of the tunnel, and jet fans would be provided to control the longitudinal velocity of the air flow. The ventilation system would have sufficient redundancy such that the system would still perform adequately even if one of the fans becomes inoperable.

At the south portal, an approximately 50 ft high ventilation structure would be integrated with the Operations and Maintenance Building (OMC) building. At the north portal, two locations for the ventilation structures are being considered. The first option would be an approximately 50 ft high ventilation structure located at the SR 710/SR 134 interchange. The second option would be four 50 ft high ventilation structures located at the SR 710/Colorado Boulevard interchange.

During normal operation, the tunnel ventilation system’s primary function is to maintain fresh airflow through the tunnel and reduce the level of harmful gases released to the surrounding environment, specifically particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and particulate matter less than 10 microns in diameter (PM_{10}) particles.

The tunnel ventilation system is designed to remove smoke and harmful gases during a tunnel fire. In case of fire, the fire detection system would be capable of locating the fire, and the smoke would be extracted by dampers located within the tunnel. Smoke in the traffic area would be extracted via two open dampers next to the fire location into the exhaust duct, by using exhaust fans located in the portal ventilation building. The design also includes a Fixed Fire Fighting System (FFFS) that works in conjunction with the ventilation system to control smoke and gases during a fire. This would maintain an acceptable environment for the evacuation of motorists and for the safe entry into the tunnel by first responders.

Operations and Maintenance Building

The tunnel would be managed from either of two OMCs that are located at the portal buildings. In addition to this redundant configuration at the tunnel, the design could include the capability for all OMC functions to be implemented from a remote facility, such as a Caltrans regional traffic management center.

The OMC functions to monitor and control the entire tunnel as well as the approach roadways. The layout consists of a control room with a video wall, several operator consoles, and a supervisor console.

In addition to the control room itself, other supporting rooms are recommended such as a computer equipment room, crisis management room, visitor gallery, and provisions for 24/7 staffing.

Communication and Surveillance System

Communication systems enable the communication for the tunnel motorists and for tunnel operators as well as for the emergency services. It functions to enable people to communicate in case of emergency and to instruct and guide them to exit dangerous areas. It consists of the telephone system for emergency and maintenance purposes, the radio system for radio frequency and voice communication inside the tunnel and of a public address system (PA) for announcements to tunnel drivers in case of emergency. A Supervisory Control and Data

Acquisition (SCADA) system would be provided for all 24-hour monitoring and control of systems and equipment within the tunnels, portals and portal buildings.

Traffic systems would be provided for detecting, monitoring, and controlling traffic within the tunnels, at the portals, and on the approach roadways. Detection would be implemented through video and acoustic analytics to provide real-time volumes and incident detection. Detected traffic data would be collected, processed, and historicized to assist traffic management and planning. Traffic control would allow the tunnel operator to manage lane or tunnel closures through activation of signs and gates. Traffic detection and control systems for the tunnel would be integrated with the Caltrans regional traffic management systems.

Communication and surveillance systems are being rapidly improved and new devices and techniques may become available prior to tunnel construction. If available, innovative, state-of-the-art technical equipment would be considered.

Emergency Systems

Emergency Egress

The tunnel would include emergency evacuation for pedestrians and suppression systems. A walkway running the entire longitudinal length of the tunnel is necessary to provide passengers access to an egress location in the event of an emergency. Fire walls rated at 2 hours adjacent to the motorway, would separate pedestrian emergency access paths from vehicles in the tunnel, and would provide protection from fire. Access to the emergency ADA accessible pedestrian walkways would be provided along each roadway level, consistent with National Fire Protection Association (NFPA) 502. In the event of an emergency, pedestrians would be able to enter the walkways and would be directed to another location in the tunnel where tenable conditions would be maintained by the emergency ventilation system. Additionally, emergency vehicle cross passages are expected to be provided along the dual-bore design variation at a spacing of approximately 3,000 ft; these would enable movement of vehicles from one tunnel bore to the other. The emergency walkways would be pressurized to prevent smoke from entering the walkways.

Emergency Response Systems

An approved Emergency Response Plan for tunnel operations would be prepared in coordination with the applicable agencies, including the California Highway Patrol, the State Fire Marshall, and local fire agencies.

Fire detection and suppression systems would be provided in the tunnel by one approximately 92,000-gallon (gal) tank located in the O&M building at the north portal. The tank would consist of an approximately 30,000 gal Fire Hose System that would store potable water from the City of Pasadena and an approximately 62,000 gal Deluge Foam System. During a fire, the system could be used for discharge of water first, followed by discharge of foam for a specified period, and then followed by water until manually shut off. The sequence of water and foam can be adjusted by the operator. These systems, along with the ventilation and communications/surveillance systems and the OMC building operations, would work together in an emergency response situation.

Emergency fire suppression systems are being rapidly improved and new devices and techniques may become available prior to tunnel construction. If available, innovative, state-of-the-art technical equipment would be considered.

A closed-circuit television (CCTV) system with automatic video detection capability would be provided for general supervision of traffic conditions within the tunnel. Video detection would identify wrong-way driving, smoke, debris on the roadway, and other hazards. The detection system would be linked to the fire alarm control panels (FACPs) to trigger alarms in case of smoke detection inside the tunnel. In the emergency walkways, fixed-view cameras would be installed and mounted for monitoring pedestrian evacuation.

For traffic surveillance purposes, color pan-tilt-zoom (PTZ) cameras would be mounted inside the tunnel near emergency exits and outside the tunnel. For incident detection purposes, color, fixed-view cameras would be mounted inside the tunnel.

An acoustic tunnel monitoring system would be provided in the tunnel. Junction boxes with integrated microphones would be mounted on the tunnel wall at the CCTV locations. The microphone signals would be transmitted to a centralized computer that would detect anomalous sounds such as a vehicle collision, squealing tires, or load spills. An alarm would then be generated and transmitted to the OMC for the tunnel operator to evaluate the situation.

Electrical Substation

An electrical substation is proposed to deliver temporary power to the tunnel boring machine during construction and permanent power for tunnel operations after construction is complete. The location of the substation would be coordinated with the Los Angeles and Pasadena Departments of Water and Power.

Landscaping

All existing planting that is removed or disturbed due to construction would be replaced following Caltrans Replacement Planting Policy and Procedure, to the extent feasible. Landscaping would be provided at the south and north portals, cut-and-cover tunnel sections, and within disturbed soil areas.

Utilities

The Freeway Tunnel Alternative would require the relocation or protection in-place of various dry utilities as outlined in Tables 2.12 and 2.13. The list of utilities affected by the Freeway Tunnel Alternative is preliminary based on current design plans and may be modified during final design.

Non-Motorized and Pedestrian Facilities (Active Transportation)

The Freeway Tunnel Alternative includes modifications to existing arterial streets and intersections, freeway on- and off-ramps, and the construction of new freeway and freeway tunnel facilities. Existing pedestrian and bicycle facilities along arterials, at intersections, and at freeway on- and off-ramps would be either protected in-place during construction of the Freeway Tunnel Alternative improvements or would be replaced in kind at the completion of the construction of those improvements. Any such improvements would be constructed to current ADA standards for curb ramps and sidewalks.

TABLE 2.12:
Freeway Tunnel Alternative Single-Bore Design Variation Utility Relocations and Protections-in-Place

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection-in-Place)
AT&T	El Sereno	Buried Cable	Would be relocated east or west of SR 710
	El Sereno	3” Crossover (2 locations)	Would be relocated east or west of SR 710
	El Sereno	Conduit (2 locations)	Would be relocated east or west of SR 710
	El Sereno	2.5” Crossover	Would be relocated east or west of SR 710
	El Sereno	4-3.5” Duct	Would be relocated east or west of SR 710
	El Sereno	12”, 8”	Would be protected in place during construction
	El Sereno	4 Overhead Telephone Lines	Would be relocated outside of Valley Boulevard
	El Sereno	Overhead Telephone Line	Would be relocated east or west of SR 710
	Pasadena	1 Paper Pipe	Would be relocated east or west of SR 710
	Pasadena	27 Duct	Would be relocated outside of Green Street
	Pasadena	12-4” TRD	Would be relocated outside of Colorado Street
	Pasadena	Underground Telephone Line	Would be relocated east or west of SR 710
	Pasadena	Underground Telephone Line (3 locations)	Would be relocated outside of I 210
Caltrans	El Sereno	Electric Conduit (8 locations)	Would be relocated east or west of SR 710
	El Sereno	Electric Conduit	Would be relocated outside of ramp to Valley Boulevard
	Pasadena	Street Light (3 locations)	Would be relocated east or west of SR 710
City of Alhambra	Alhambra	8” Sewer	Would be relocated to temporary bridge for utilities
City of Los Angeles – Bureau of Sanitation	El Sereno	8” Clay Pipe (Casing)	Would be relocated
	El Sereno	8” VCP Sewer (ABAND)	Would be relocated
	El Sereno	12” VCP Sewer	Would be relocated
	El Sereno	8” Sewer (3 locations)	Would be protected in place during construction
	El Sereno	8” (ABAND) Sewer (4 locations)	Would be protected in place during construction
	El Sereno	8 “ VCP Sewer	Would be relocated east or west of SR 710
	El Sereno	12 “ to 8 “ Sewer	Would be protected in place during construction
	El Sereno	12” Sewer	Would be protected in place during construction
Los Angeles Department of Water and Power	El Sereno	Underground Electric Conduit (2 locations)	Would be relocated to temporary bridge for utilities
	El Sereno	Underground Electric Conduit	Would be protected in place during construction
	El Sereno	Overhead Electric Line (4 locations)	Would be relocated outside of Valley Boulevard
	El Sereno	Street light (3 locations)	Would be protected in place during construction
	El Sereno	Overhead Electric Line	Would be relocated outside of southbound SR 710
	El Sereno	Overhead Electric Line	Would be relocated west of SR 710
	El Sereno	Power Pole	Would be relocated outside Valley Boulevard
	El Sereno	Power Pole	Would be relocated
	El Sereno	8” Water Line (ABAND)	Would be relocated to temporary bridge for utilities
	El Sereno	6” CIP Water	Would be relocated
	El Sereno	4” CIP Water	Would be relocated
	El Sereno	8” Water Line (3 locations)	Would be protected in place during construction
Level 3 Communications	Pasadena	4-1.50” HDPE in 12” Black Steel Pipe Casing	Would be relocated outside of Colorado Boulevard
Metropolitan Water District of Southern California	El Sereno	60” Water Line (2 locations)	Would be relocated
City of Pasadena	Pasadena	8” Sewer (2 locations)	Would be relocated to temporary bridge for utilities
	Pasadena	12” Sewer	Would be relocated to temporary bridge for utilities
	Pasadena	9” VCP Sewer	Would be relocated outside of Del Mar Boulevard
	Pasadena	8” VCP Sewer	Would be relocated outside of St. John Avenue
	Pasadena	8” Sewer	Would be relocated outside of St. John Avenue
	Pasadena	8” VCP Sewer	Would be relocated outside of Green Street
	Pasadena	8” VCP Sewer	Would be relocated outside of Colorado Boulevard

TABLE 2.12:
Freeway Tunnel Alternative Single-Bore Design Variation Utility Relocations and Protections-in-Place

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection-in-Place)
City of Pasadena Power Department	Pasadena	Overhead Electric Line (2 locations)	Would be relocated to fit proposed St. John Avenue
	Pasadena	Underground Electric Line (2 locations)	Would be relocated to temporary bridge for utilities
	Pasadena	Overhead Electric Line	Would be relocated outside of I 210 on-ramp
	Pasadena	Street Light	Would be relocated outside of Del Mar Boulevard
	Pasadena	4-4”	Would be relocated outside of Del Mar Boulevard
	Pasadena	Street Light	Would be relocated outside of St. John Avenue
	Pasadena	4-3.5” VT	Would be relocated outside of St. John Avenue
	Pasadena	Street Light (2 locations)	Would be relocated outside of Green Street
	Pasadena	Underground Electric Line (2 locations)	Would be relocated east or west of SR 710, outside of work area
	Pasadena	6-3.5”	Would be relocated outside of Green Street
	Pasadena	Street Light	Would be relocated outside of Colorado Boulevard
	Pasadena	7-3.5”	Would be relocated outside of Colorado Boulevard
	Pasadena	Street Lights (2 locations)	Would be relocated outside of Union Street
	Pasadena	Power Pole	Would be relocated east or west of southbound I-210
	Pasadena	Underground Electric Line	Would be relocated east or west of southbound I 210
City of Pasadena Water Department	Pasadena	6” CIP Water Line	Would be relocated outside of Del Mar Boulevard
	Pasadena	8” CIP Water Line	Would be protected in place during construction
	Pasadena	12” CIP Water Line	Would be relocated east or west of St. John Avenue
	Pasadena	16” STL Water Line	Would be relocated outside of Green Street
	Pasadena	12” STL Water Line	Would be relocated outside of Green Street
	Pasadena	10” CIP Water	Would be relocated outside of Colorado Boulevard
	Pasadena	12” CIP Water	Would be relocated outside of Colorado Boulevard
Southern California Gas	El Sereno	2” Natural Gas Line	Would be protected in place
	El Sereno	4” Natural Gas Line	Would be relocated to temporary bridge for utilities
	El Sereno	3” to 4” Natural Gas Line	Would be protected in place during construction
	El Sereno	2” Natural Gas Line	Would be protected in place during construction
	Pasadena	6” M w/10” Casing Natural Gas Line	Would be relocated outside of Colorado Boulevard
	Pasadena	2” Natural Gas Line	Would be relocated outside of St. John Avenue

Source: *Community Impact Assessment* (2014).
ABAND = abandoned
CIP = cast-iron pipe
HDPE = high-density polyethylene
MH = manhole
STL = Steel
VCP = vitrified clay pipe
VP = vitrified pipe
VT = vitrified tile

TABLE 2.13:
Freeway Tunnel Alternative Dual-Bore Design Variation Utility Relocations and Protections-in-Place

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection-in-Place)
AT&T	El Sereno	3" Crossovers (2 locations)	Would be relocated east or west of SR 710
		2.5 " Crossover	Would be relocated east or west of SR 710
		Buried Cable	Would be relocated east or west of SR 710
		4-3.5" Telephone Duct	Would be relocated to temporary bridge for utilities
		Underground Telephone Line	Would be relocated outside of SR 710
		12", 8"	Would be protected in-place during construction
		Overhead Telephone Lines (4 locations)	Would be relocated north or south of Valley Boulevard
		Overhead Telephone Line	Would be relocated outside of SR 710
	Monterey Park/ El Sereno	(1.5"–1.4") Telephone Duct (5 locations)	Would be relocated west of southbound SR 710
	Pasadena	Pipe	Would be relocated to temporary bridge for utilities
		27 Duct	Would be relocated outside of Green Street
		Underground Telephone Lines (2 locations)	Would be relocated outside of SR 710
		Underground Telephone Lines (3 locations)	Would be relocated west of southbound I-210
California Department of Transportation	El Sereno	Street Light	Would be relocated west of southbound SR 710
		1"–2" Conduit	Would be relocated to southbound SR 710 on-ramp
		Conduits (14 locations)	Would be relocated east or west of SR 710
		Conduit	Would be relocated west of Valley Boulevard ramp
	Pasadena	Street Light (3 locations)	Would be relocated east of or outside of SR 710
City of Alhambra	Alhambra	8" Sewer	Would be relocated to temporary bridge for utilities
City of Los Angeles, Bureau of Sanitation	El Sereno	8" Clay Pipe Sewer	Would be relocated east or west of SR 710, outside of work area
		8" VCP Sewer (ABAND)	Would be relocated
		12" VCP Sewer	Would be relocated
		8" Sewer (3 locations)	Would be protected in-place during construction
		12" VCP to 8" VCP Sewer	Would be protected in-place during construction
		8" Sewer	Would be relocated
		8" (ABAND) (4 locations)	Would be protected in-place during construction
		12" Sewer	Would be protected in-place during construction
City of Pasadena	Pasadena	8" Sewer (2 locations)	Would be relocated to temporary bridge for utilities
		12" Sewer	Would be relocated to temporary bridge for utilities
		9" VCP	Would be relocated outside of Del Mar Boulevard
		8" VCP	Would be relocated outside of St. John Avenue
		8" Sewer	Would be relocated outside of St. John Avenue
		8" VCP Sewer	Would be relocated outside of Green Street
City of Pasadena Power Department	Pasadena	Overhead Electric Line	Would be relocated to fit proposed St. John Avenue
		Underground Electric Line (2 locations)	Would be relocated to temporary bridge for utilities
		Overhead Electric Line	Would be relocated
		Street Light	Would be relocated outside of Del Mar Boulevard
		4-4"	Would be relocated outside of Del Mar Boulevard
		Street Light	Would be relocated outside of St. John Avenue
		4-3.5" VT	Would be relocated outside of St. John Avenue
		Overhead Electric Line	Would be relocated outside of St. John Avenue
		Underground Electric Line	Would be relocated outside of work area
		Street Lights (2 locations)	Would be relocated outside of Green Street
		6-3.5"	Would be relocated outside of Green Street
		Power Pole	Would be relocated with power pole
		Street Light (2 locations)	Would be relocated outside of work area
City of Pasadena Water Department	Pasadena	8" Water	Would be protected in-place during construction
		6" CIP Water Line	Would be relocated outside of Del Mar Boulevard
		12" CIP Water Line	Would be relocated outside of St. John Avenue
		16" STL Water	Would be relocated outside of Green Street
		12" STL Water	Would be relocated outside of Green Street

TABLE 2.13:
Freeway Tunnel Alternative Dual-Bore Design Variation Utility Relocations and Protections-in-Place

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection-in-Place)
Los Angeles Department of Water and Power	El Sereno	Underground Electric Line (2 locations)	Would be relocated to temporary bridge for utilities
		Overhead Electric Line	Would be relocated west of southbound SR 710
		Underground Electric Line	Would be protected in-place during construction
		Overhead Electric Line (5 locations)	Would be relocated outside of Valley Boulevard
		Power Pole	Would be relocated
		Street Light (3 locations)	Would be protected in-place during construction
		Overhead Electric Line	Would be relocated outside of southbound SR 710
		8” Water Line (ABAND)	Would be relocated outside of Hellman Avenue
		6” CIP Water Line	Would be relocated
		4” CIP Water Line	Would be relocated
		8” Water Line (3 locations)	Would be protected in-place during construction
Metropolitan Water District of Southern California	El Sereno	60” Water Line (2 locations)	Would be relocated
Southern California Gas	El Sereno	4” Natural Gas Line	Would be relocated north or south of Hellman Avenue, outside of work area
		2” Natural Gas Line	Would be protected in-place during construction
		3” to 4” Natural Gas Line	Would be protected in-place during construction
		2” Natural Gas Line	Would be protected in-place during construction
	Pasadena	2” Natural Gas Line	Would be relocated outside of St. John Avenue

Source: *Community Impact Assessment* (2014).
ABAND = abandoned
CIP = cast iron pipe
VCP = vitrified clay pipe
VT = vitrified tile

Specific improvements/changes in pedestrian and bicycle facilities under the Freeway Tunnel Alternative would include:

- The St. John Avenue extension would require the realignment of St. John Avenue and the widening of that street at Del Mar Boulevard. This would result in a slightly wider pedestrian crossing on the north side of Del Mar Boulevard and would add a pedestrian crossing on the south side of Del Mar Boulevard and a new sidewalk on the west side of the St. John Avenue extension from Del Mar Boulevard to California Boulevard. The existing bike path along St. John Avenue may be extended from Del Mar Boulevard to California Boulevard.
- The existing sidewalk on the west side of Pasadena Avenue between Green Street and Colorado Boulevard would be moved farther west to accommodate a new lane from the northbound Pasadena Avenue off-ramp.
- The existing crosswalk along the north and south sides of Green Street and across Pasadena Avenue would be lengthened as a result of the new lane from the northbound Pasadena Avenue off-ramp.
- For the dual-bore variation only, the existing crosswalk on the north and south sides of Green Street at St. John Avenue would be lengthened to accommodate a southbound SR 710 on-ramp from St. John Avenue.
- For the dual-bore variation only, the existing crosswalk on the south side of Colorado Boulevard at St. John Avenue would be lengthened to accommodate a new lane.
- A new sidewalk would be provided on westbound Valley Boulevard between the SR 710 northbound off-ramp and the SR 710 southbound on-ramp at Valley Boulevard.

Drainage Facilities

The Freeway Tunnel Alternative dual-bore and single-bore design variations would include numerous drainage improvements, including the following facilities. This Alternative would encroach horizontally on the maintenance road on the west side of the Laguna Regulating Basin. The roadway would be constructed on a bridge to minimize effects to the Basin. A new entrance and pull-out area from the I-10/I-710 Connector would be installed. Drainage associated with the southerly cut-and-cover section of the Freeway Tunnel Alternative would be conveyed via a series of pipes to a proposed pump station near Valley Boulevard. The pump station would convey runoff to the Dorchester Channel.

A sump pump would be constructed at the low point of the tunnel to collect fire sprinkler and seepage water inside the tunnel. This water would be conveyed via pipe to a storage tank located under the parking lot for the O&M Center, north of Valley Boulevard. There is a separate storm water drainage system located outside of the north portal that would need modifications. The wash or fire water would be tested and properly hauled away and disposed of consistent with federal and State regulations. The existing pump station and storage chamber south of Del Mar Boulevard would be relocated north of Del Mar Boulevard. Water from the storage chamber would be conveyed via a reinforced concrete pipe to the existing pipe in Del Mar Boulevard.

The dual-bore design variation of the Freeway Tunnel Alternative would relocate segments of the Dorchester Channel north and south of Hellman Avenue. The affected segments of the existing reinforced concrete channel would be replaced with a double reinforced concrete box along the original channel alignment. The single-bore design variation would not affect these segments of the Dorchester Channel.

Storm Water Treatment

Four biofiltration swales and eight gross solid removal devices (GSRDs) at two locations are proposed for the dual-bore design variation of the Freeway Tunnel Alternative. BMPs are only proposed in areas outside the tunnel. Biofiltration swales are proposed to be located in the SR 710 North to I-10 East loop ramp at the south portal and adjacent to northbound SR 710 at the Laguna Regulating Basin. Two treatment systems consisting of a pump station, GSRDs, and a biofiltration swale are proposed adjacent to southbound SR 710 at Valley Boulevard and adjacent to northbound SR 710 at the north portal near Pasadena Avenue. The pump stations would be designed such that the lower flows would be treated by the BMPs and larger flows would bypass the BMPs.

Three biofiltration swales and GSRDs are proposed for the single-bore design variation of the Freeway Tunnel Alternative. A biofiltration swale is proposed to be located adjacent to northbound SR 710 at the Laguna Regulating Basin. Two treatment systems consisting of a pump station, a GSRDs, and a biofiltration swale are proposed adjacent to southbound SR 710 at Valley Boulevard and adjacent to northbound SR 710 at the north portal near Pasadena Avenue. The pump stations would be designed such that the lower flows would be treated by the BMPs and larger flows would bypass the BMPs.

Retaining Walls

Retaining walls are proposed to limit ROW needs along the freeway alignment and near the tunnel portal areas for the segments of the freeway leading to and from the cut-and-cover tunnels.

Noise Barriers

Preliminary abatement measures proposed for the Freeway Tunnel Alternative include 6 noise barriers. Of these, 4 are feasible and reasonable for both the single-bore and dual-bore design variations while an additional two are feasible and reasonable for only the dual-bore design variation.

- **Single-Bore and Dual-Bore Design Variations**
  - Freeway Tunnel Alternative Noise Barrier (FTNB) No. 5 is a recommended barrier along the Caltrans ROW/private property line on the east side of SR 710 between Hellman Avenue and Valley Boulevard.
  - FTNB No. 7 is a recommended barrier along the Caltrans ROW/private property line on the west side of SR 710, south of Valley Boulevard.
  - FTNB No. 8 is a recommended barrier along the Caltrans ROW/private property line on the west side of SR 710, south of Valley Boulevard.
  - FTNB No. 10 is a recommended barrier along the Caltrans ROW/private property line at the northeast quadrant of the I-210 and SR 134 interchange for both the single-bore and dual bore design variations.
- **Dual-Bore Design Variation Only**
  - FTNB No. 6D is a recommended barrier along the edge of shoulder of the SR 710 Valley Boulevard southbound on-ramp.
  - FTNB No. 9 is a recommended barrier along the private property line of the restaurant at the corner of Pasadena Avenue and Colorado Boulevard.

The analyzed noise barriers for the single-bore and dual-bore design variations of the Freeway Tunnel Alternative are shown on Figures 3.14-6 and 3.14-9, respectively, in Appendix N. The final locations, heights, and lengths of noise barriers for the Freeway Tunnel Alternative would be determined during final design. Five noise barriers proposed for the TSM/TDM Alternative would also be included in the Freeway Tunnel Alternative.

Property Acquisitions

The design variations of the Freeway Tunnel Alternative would require the permanent acquisition of full and partial parcels of land that would be permanently incorporated into the transportation improvements in this alternative as summarized in Table 2.14. The improvements in the Freeway Tunnel Alternative are also expected to require permanent easements as shown in Table 2.14.

TABLE 2.14:
Summary of Permanent Acquisitions for the Design Variations of the Freeway Tunnel Alternative

Type of Permanent Acquisition	Number of Parcels
Dual-Bore Design Variation	
Full parcel acquisition	1
Partial parcel acquisition	3
Aerial easement	0
Subsurface easement	41
Permanent tunnel easement	563
Permanent footing[1] easement	3
Permanent maintenance easement[2]	2
Single-Bore Design Variation	
Full parcel acquisition	1
Partial parcel acquisition	2
Aerial easement	0
Subsurface easement	32
Permanent tunnel easement	324
Permanent footing[1] easement	3

Source: *Community Impact Assessment* (2014).
[1] This easement is required to accommodate structural foundations beneath the number of parcels listed in the table.
[2] These easements are required to permit ongoing inspection and maintenance of the transportation improvements above these parcels.

Ramp Metering

It is anticipated that ramp metering would be needed at the southbound SR 710 on-ramp at Valley Boulevard and the southbound SR 710 on-ramp at St. John Avenue. Ramp metering is recommended at these locations to enhance the operation of the ramp connection to the mainline freeway.

TSM/TDM Components

The TSM/TDM Alternative improvements would also be constructed as part of the Freeway Tunnel Alternative, including either the dual-bore or single-bore design variations. These improvements would provide the additional enhancements to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. The only components of the TSM/TDM Alternative improvements that would not be constructed with the Freeway Tunnel Alternative would be Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector) and Other Road Improvement T-3 (St. John Extension between Del Mar Boulevard and California Boulevard).

There are locations along the alignment of the Freeway Tunnel Alternative that overlay or cross areas that would also be improved under the TSM/TDM Alternative. All the improvements at those locations would be designed to ensure the effective operation of the Freeway Tunnel Alternative facilities and services in conjunction with the applicable TSM/TDM Alternative improvements. For example, ITS improvements under the TSM/TDM Alternative along or crossing the Freeway Tunnel Alternative alignment would be designed and implemented to compliment and support the transportation facilities and services in the Freeway Tunnel Alternative so as to maximize the benefits of those improvements for the traveling public.

Construction Activities

Transport of the TBM

TBM manufacturers can design TBMs in a way such that they are transported in pieces and assembled at the construction site. The TBM manufacturers take transportation restrictions into consideration when designing the TBMs, and the TBMs are routinely delivered in urban areas using existing infrastructure. The specific needs of this project and local jurisdictional permit requirements for transporting the TBMs or other equipment for this project would be considered when the TBM is fabricated.

Grading and Excavation

Excavation and ground disturbance for the Freeway Tunnel Alternative may also be grouped into three categories based on the methods, equipment, and section, including: (1) the central bored tunnel section, (2) cut-and-cover tunnels at the north and south portals, and (3) other modifications. Current design plans indicate that the bored tunnel section of the Freeway Tunnel Alternative would be excavated using a pressurized-face TBM. Please refer to the description of TBM operation provided in the LRT discussion above.

Emergency vehicle cross passages are anticipated to be excavated using the SEM from within the tunnels excavated by the TBMs. Please refer to the description of SEM operation provided in the LRT discussion above.

Cut-and-cover tunnels, located in the north and south portal areas of the bored tunnel would be constructed to allow vehicles to reach the depth of the bored tunnel from the at-grade portion of the freeway. These cut-and-cover tunnels would be excavated from the surface to the depth of the bored tunnel using traditional excavation equipment (e.g., scrapers, trackhoes, and bulldozers) and can generally be constructed with minimal surrounding surface settlements by using appropriate support of excavation systems.

Other elements of the Freeway Tunnel Alternative would also use traditional excavation methods and equipment for their development; however, the level of ground disturbance would be less extensive than for the cut-and-cover tunnels. These improvements include modifications to surface streets (e.g., Hellman Avenue, Del Mar Boulevard, St. John Avenue, and Valley Boulevard), on-ramps and off-ramps to and from SR 710, and the interchanges with I-10, I-210, and SR 134. In addition, CIDH piles would be used for new signs.

Disposal Sites and Haul Routes

Construction of the bored and cut-and cover tunnel segments of both design variations of the Freeway Tunnel Alternative would generate excess excavated soil and other materials that cannot be reused within the project limits. That material is proposed to be disposed of at the Manning and Olive Pits in Irwindale. The locations and capacities of those pits for accepting excess soils were described earlier in the discussion of the generation of excess soils during tunneling for the LRT Alternative. Other Class I landfills and/or sale to a soil broker are also options for disposing of the excavated material.

As shown on Figure 2-9, the preliminary route for hauling excavated material generated at the south tunnel portal and at the north tunnel portal would be via the existing SR 710. Haul trucks would enter SR 710 without traveling on local streets. The preliminary route at the disposal end of the trip under both design variations includes Live Oak Canyon and Arrow Highway (to/from I-605 at the disposal end of the haul trips), and Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit).

If the single-bore or dual-bore design variation of the Freeway Tunnel Alternative is expected to pass through potentially contaminated soil or groundwater, the Contractor would be required to set up an area at the construction portal to sample and classify the excavated material as it is excavated. A sampling and analysis plan would be required so that the excavated material is classified properly and so the correct handling methods and disposal sites are selected. Excavated material that is determined to be hazardous and cannot be taken to the Manning or Olive Pits would be transported to a landfill certified for accepting hazardous waste appropriate for the waste encountered.

Construction Staging and Phasing

Each component of the Freeway Tunnel Alternative would be staged to minimize the disruption to traffic and maximize the effectiveness of the construction activities. Preliminary construction phasing of the bored tunnel portions of the Freeway Tunnel Alternative are as follows:

- Construction at portals would be excavated at both the south and north ends of the bored tunnel alignment to launch the TBMs. The portal would be excavated from the top down, first by installing support of excavation walls at the headwall and along the sidewalls of the planned excavation and then by excavating the soil or rock within those walls, employing groundwater control measures where necessary. The Contractor may choose to excavate only the portion of the portal necessary to launch the TBMs prior to launching the machines, or could excavate the entirety of the area necessary for the cut-and-cover tunnels, as the cut-and-cover tunnels would eventually be located in the excavation of the construction portals. During bored tunnel excavation, it is expected that the Contractor would use these areas for laydown of the construction operations.
- It is expected that the freeway tunnels would be excavated using two pressurized-face TBMs for each tunnel bore, launched from each portal. This means that there would be two TBMs total for the single-bore design variation and four TBMs for the dual-bore design variation. With this approach, both of the portals would be launch sites for the TBMs and construction staging areas for the tunneling equipment.
- The bored tunnels would be lined with a water- and gas-tight pre-cast concrete segmental liner as the TBMs pass. However, where the freeway tunnels cross active fault zones, a specially designed steel and concrete composite segmental lining is expected to be installed. The lining would allow for more space inside the tunnel in the fault zones to accommodate expected movement from fault offset. The special lining could be installed by the TBMs as they excavate the tunnels just as the typical segmental concrete lining.

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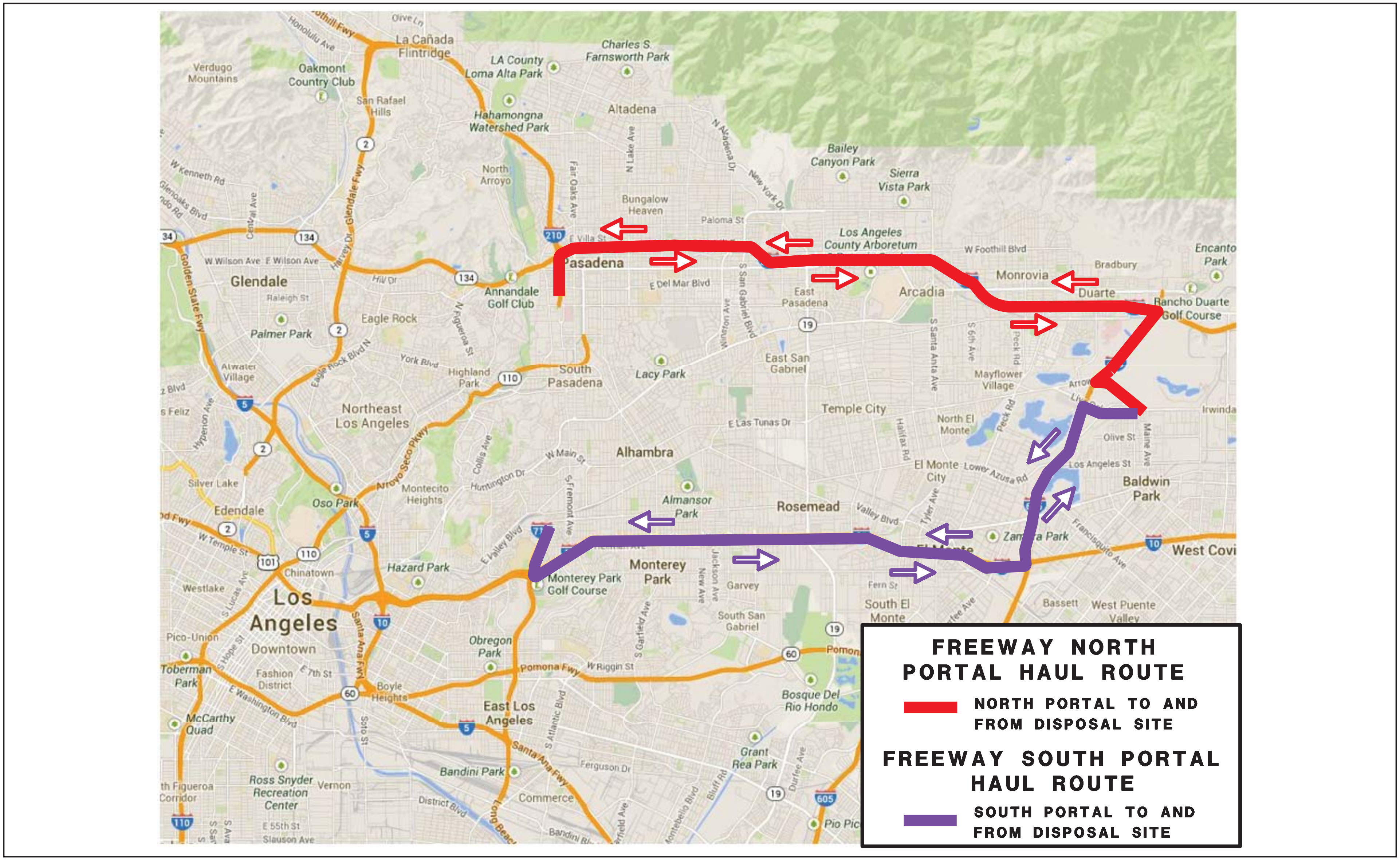

FIGURE 2-9

SR 710 North Project

Haul Routes for the Freeway Tunnel Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Aerial Image © Google Earth, 2014. Annotation by CH2M HILL, 2014

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- In the dual-bore tunnel design variation, emergency vehicle cross passages between the two tunnels would likely be excavated using the SEM; these cross passages would be excavated from within the freeway tunnels after the main bored tunnels are excavated. Where necessary, ground treatment and pre-support would be installed depending on the ground type at each cross passage and would be implemented prior to excavation of the cross passages. A cast-in-place concrete lining with water- and gas-proofing where necessary would be installed in the cross passages after excavation is complete.
- It is anticipated that the excavated material from the excavation of the tunnels and cross passages would be removed from both the north and south portals for the freeway tunnels. Excavated material may need to be stockpiled at the construction staging areas if it is too wet from the tunneling operations to transport. Refer to the section on disposal sites and haul routes for more information about the disposal of excavated material.
- Because it is anticipated that two TBMs would be used to excavate each bore, each TBM would excavate roughly half of the alignment and the TBMs would meet underground at the end of their drives. Because the TBMs would meet underground, the TBM shield would be left in place, providing temporary ground support while the remaining TBM components, including the trailing gear and cutterhead, would be removed from the tunnel. The cutterhead would be removed in pieces, with the Contractor supporting the ground around it additionally as needed, and a reinforced concrete cast-in-place final lining would be installed inside each TBM shield (between the segmental lining already installed by each TBM). Abandoning the TBM shield is a practice that is commonly performed if a TBM cannot be retrieved at a shaft or portal location at the end of its drive.
- As the bored tunnels are being excavated and lined, the installation of the roadway deck and concrete internal structure can begin to be installed some distance after the TBMs pass. The internal structure is expected to be a combination of pre-cast reinforced concrete and cast-in-place reinforced concrete.

Temporary Construction Easements

The majority of the improvements in the Freeway Tunnel Alternative are anticipated to be constructed within existing publicly owned ROWs. However, it is anticipated that the dual-bore design variation of the Freeway Tunnel Alternative would require TCEs where there is not sufficient room within the public ROWs to accommodate the construction activities and/or storage of materials or equipment for those improvements. Any land used as a TCE during construction of improvements under either design variation of the Freeway Tunnel Alternative would be returned to its original or better condition prior to the return of that land to the original owner after completion of the construction activities requiring that TCE. No permanent project features would be constructed within the boundaries of the TCEs used for construction of either design variation of the Freeway Tunnel Alternative.

Equipment Storage and Parking, and Construction Employee Parking

During construction of the improvements in the Freeway Tunnel Alternative, all construction equipment would be stored and staged within the project limits or the TCEs. Construction employees would be required to park within the project construction limits or TCEs.

Cost

The total estimated cost of the Freeway Tunnel Alternative is approximately $5,650 million (2014 dollars) and $7,158 million (2022 dollars) for the dual-bore design variation and $3,150 million (2014 dollars) and $ 3,991 million (2022 dollars) for the single-bore design variation. Of that total, the cost of the TSM/TDM improvements that would be constructed with either design variation of the Freeway Tunnel Alternative is estimated to be approximately $50 million (2014 dollars). The cost of the TSM/TDM improvements is estimated to be approximately $64 million (2022 dollars). The roadway, structures, and ROW costs are included in these estimates for both design variations.

Schedule

Construction of the Freeway Tunnel Alternative would take approximately 4 to 5 years for the single-bore design variation and approximately 5 years for the dual-bore design variation.

2.3 Comparison of Alternatives

Table 2.15 provides information for comparison of the four Build Alternatives and the No Build Alternative. The table summarizes the alternatives considered, including design features, environmental effects and measures identified.

In addition to the comparison of alternatives provided in Table 2.15, a Cost-Benefit Analysis has been prepared for the proposed project. The Cost-Benefit Analysis provides a means of comparing the costs of an alternative directly with the benefits that the alternative would deliver. In addition to environmental factors, the Cost-Benefit Analysis includes capital costs, operation and maintenance costs, time saving benefits, value of time, vehicle operating cost saving, and safety performance. The result of the Cost-Benefit Analysis will be considered in conjunction with the information provided in Table 2.15 during identification of the Preferred Alternative.

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
Alternative Descriptions and Features						
Alternative Descriptions	The No Build Alternative does not include any improvements included in the SR 710 North Project Build Alternatives.	The TSM/TDM Alternative would provide strategies and improvements to increase efficiency and capacity for all modes in the transportation system with lower capital cost investments and/or lower potential impacts including Intelligent Transportation Systems, local street and intersection improvements, Active Traffic Management, expanded bus service and bus service improvements, and pedestrian and bicycle facility improvements. This Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. The TSM/TDM Alternative includes: • Widening of the Garfield Avenue Bridge • Construction of a new bridge for the SR 710 connector road to Mission Road underpass crossing under the UPRR with retaining walls • Retaining Walls • Noise Barriers	The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, and dedicated and mixed-flow traffic lanes to key destinations between East Los Angeles and Pasadena. The proposed route is approximately 12 mi long. The BRT Alternative includes: • BRT trunk line arterial street and station improvements • Frequent bus service • New bus feeder services • Enhanced connecting bus services • BRT service would use 60 ft articulated buses with three doors • Latest fare collection technology such as on-board smart card (TAP card) readers • Two bus feeder routes that would connect additional destinations with the BRT mainline • 17 BRT stations • Minor Street Widening • Retaining Walls • Noise Barriers	The LRT Alternative would provide an approximately 7.5 mi long passenger rail line operated on a dedicated guideway, with 3 mi of aerial segments and 4.5 mi of bored tunnel segments. The LRT Alternative includes: • Seven LRT stations • New bus feeder services • Enhanced existing bus services • New aerial bridges along the entire elevated alignment • Realignment of the SR 710 NB off-ramp to be adjacent to the SB on-ramp • Restriping of Mednik Avenue between First Street and Floral Drive to provide a new Class II bicycle lane, with one vehicle lane in each direction, maintaining the on-street parking • Retaining walls • Noise barriers • Widening Mednik Avenue by 20 feet between First Street and Floral Drive and permanently reducing traffic lanes to one lane in each direction • New ADA-compliant sidewalks on the north and south sides of Valley Boulevard between the existing SR 710 northbound off-ramp and the southbound on-ramp	The alignment for the Freeway Tunnel Alternative will start at the existing southern stub of SR 710 in Alhambra, north of I-10, and connect to the existing northern stub of SR 710, south of the I-210/SR 134 interchange in Pasadena with either a single-bore or dual-bore tunnel configuration. The dual-bore and single-bore design variations are each approximately 6.3 mi long, with 4.2 mi of bored tunnel, 0.7 mi of cut-and-cover tunnel, and 1.4 mi of at-grade freeway segments. The single-bore and dual-bore design variations include: • Extension of St. John Avenue from Del Mar Boulevard to California Boulevard • Widening of Pasadena Avenue to include a new lane from the proposed NB SR 710 off-ramp at Pasadena Avenue to Colorado Boulevard • Replacement of the Hellman Avenue and Green Street overcrossing bridges • Demolition and replacement with an at-grade road of the Del Mar Boulevard overcrossing • A new bridge at the Laguna Regulating Basin and a new overpass bridge at Valley Boulevard • Emergency, communication, and ventilation systems • Pedestrian and bicycle facility improvements • Retaining walls • Noise Barriers The dual-bore design variation would also include widening of the Ramona Boulevard undercrossing and SR 710/I-10 bridges.	--
Alternative Costs	--	$105 million (2014 $); $126 million (2020 $)	$139 million (BRT improvements in 2014 $) plus $102 million for the TSM/TDM improvements. $241 million total (2014 $) $166 million (BRT improvements in 2020 $) plus $122 million for the TSM/TDM improvements. $288 million total (2020 $)	$2,368 million (LRT Alternative improvements in 2014 $) plus $52 million for the TSM/TDM Alternative improvements. $2,420 million total (2014 $) $3,000 million (LRT Alternative improvements in 2022 $) plus $66 million for the TSM/TDM Alternative improvements. $3,066 million total (2022 $)	$3,100 million (single-bore design variation in 2014 $) and $5,600 million (dual-bore design variation in 2014 $) plus $50 million for the TSM/TDM improvements Single-Bore Total: $3,150 million (2014 $) Dual-Bore Total: $5,650 million (2014 $) $3,927 million (single-bore design variation in 2022 $) and $7,094 million (dual-bore design variation in 2022 $) plus $64 million for the TSM/TDM improvements. Single-Bore Total: $3,991 million (2022 $) Dual-Bore Total: $7,158 million (2022 $)	--
Property Acquisition						
Full parcel acquisition	--	Approximately 1 parcel	0 parcels	Approximately 58 parcels	Single-Bore: Approximately 1 parcel Dual-Bore: Approximately 1 parcel	--
Partial parcel acquisition	--	Approximately 41 parcels	Approximately 45 parcels	Approximately 11 parcels	Single-Bore: Approximately 2 parcels	--

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
					Dual-Bore: Approximately 3 parcels	
Aerial easement	--	Approximately 2 parcels	0	Approximately 12 parcels	Single-Bore: 0 Dual-Bore: 0	--
Subsurface easement	--	0	0	1 parcel	Single Bore: Approximately 32 parcels Dual Bore: Approximately 41 parcels	--
Permanent tunnel easement	--	0	0	Approximately 183 parcels	Single Bore: Approximately 324 parcels Dual-Bore: Approximately 563 parcels	--
Permanent footing easement	--	0	0	0	Single-Bore: Approximately 3 parcels Dual-Bore: Approximately 3 parcels	--
Temporary construction easements	--	Approximately 16 parcels	Approximately 36 parcels	Approximately 13 parcels	Single-Bore: Approximately 52 parcels Dual-Bore: Approximately 47 parcels	--
Construction period	--	Approximately 2 years	Approximately 2 years	Approximately 6 years	Single-Bore: Approximately 4 to 5 years Dual-Bore: Approximately 5 years	--
Potential Environmental Impacts						
Land Use	No temporary land use effects would occur.	• Direct, construction-related effects on existing land uses • TCEs on approximately 16 parcels • Air quality, noise, traffic/access, and/or parking effects on community facilities, parks, recreation resources, and bikeways within 500 ft of the physical improvements	• Direct, construction-related effects on existing land uses • TCEs on approximately 36 parcels • Air quality, noise, traffic/access, and/or parking effects on community facilities, parks, recreation resources, and bikeways within 500 ft of the physical improvements • Temporary occupancy of approximately 0.02 ac of land in Cascades Park and permanent incorporation of approximately 0.011 ac of land from Cascades Park • The TSM/TDM Alternative improvements included in the BRT Alternative would also result in additional temporary land use impacts	• Direct, construction-related effects on existing land uses • TCEs on approximately 13 parcels • Temporary loss of approximately 240 parking spaces • Air quality, noise, traffic/access, and/or parking effects on community facilities, parks, recreation resources, and bikeways within 500 ft of the physical improvements	• Direct, construction-related effects on existing land uses • Air quality, noise, traffic/access, and/or parking effects on community facilities, parks, recreation resources, and bikeways within 500 ft of the physical improvements • TCEs: – Single-Bore: TCEs on approximately 52 parcels – Dual-Bore: TCEs on approximately 47 parcels • Temporary loss of approximately 17 parking spaces	• **Parks-1: Compliance with the Public Park Preservation Act (applies to the BRT Alternative):** As part of the right of way acquisition process for the BRT Alternative, the Los Angeles County Metropolitan Transportation Authority (Metro) Division of Right of Way personnel will coordinate with the City of Monterey Park to provide compensation for the acquisition of land from Cascades Park as required under the Public Park Preservation Act. • **Cascades-1: Temporary Construction Easements (applies to the BRT Alternative):** The Resident Engineer will require the Construction Contractor to return land in Cascades Park that would be occupied for temporary construction easements (TCEs) to a condition that is at least as good as that which existed prior to the project at the completion of the construction of the BRT Alternative in this area. The Los Angeles County Metropolitan Transportation Authority (Metro) will require the Construction Contractor to fence and properly secure all active construction areas in and adjacent to Cascades Park within the limits of construction to protect the safety of park patrons during construction. When the sidewalks in Cascades Park at Atlantic Boulevard are temporarily closed during construction, Metro will require the Construction Contractor to develop and clearly sign pedestrian detours prior to the intersections of Atlantic Boulevard and El Portal Place to avoid making pedestrians backtrack to get to a safe crossing. • **Cascades-2: Permanent Incorporation of Land (applies to the BRT**

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
						Alternative): Metro will include the replacement of the sidewalks affected by the permanent incorporation of land in Cascades Park in the adjacent areas of Cascades Park as part of final design. If any shrubs and/or trees are removed from the areas that will be permanently incorporated, the Construction Contractor will replace those trees elsewhere in Cascades Park after consultation with the City of Monterey Park.
	No permanent land use effects would occur.	• Two aerial easements related to bridge construction • Acquisition of approximately 0.6 ac and conversion of land currently planned for non-transportation uses into transportation uses, which would require amendment of General Plans • Loss of approximately 26 on-street parking spaces during the weekday AM and PM peak periods and the permanent loss of approximately 220 on-street parking spaces during all hours • Noise effects to approximately six parks and recreation resources • Consistent with individual policies, objectives, and program goals in the City of Alhambra, City of Los Angeles, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan	• Acquisition of approximately 0.3 ac and conversion of land currently planned for non-transportation uses into transportation uses, which would require amendment of General Plans • Loss of approximately 1,029 on-street parking spaces during the weekday AM and PM peak periods and the permanent loss of approximately 114 on-street parking spaces during all hours • Inconsistency with individual policies, objectives, and program goals in the City of Alhambra, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan • Noise effects on approximately four parks and recreation resources • The TSM/TDM Alternative improvements included in the BRT Alternative would also result in additional permanent land use impacts	• Tunnel easements beneath approximately 183 parcels, permanent aerial easements above approximately 12 parcels, and permanent subsurface easements beneath approximately 1 parcel • Acquisition of approximately 18.0 ac and conversion of land currently planned for non-transportation uses into transportation uses, which would require amendment of General Plans • Loss of approximately four on-street parking spaces • Inconsistent with specific individual policies, objectives, and program goals in the City of Alhambra, City of Los Angeles, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan • Noise effects to approximately one park and recreation resource • The TSM/TDM Alternative improvements included in the LRT Alternative would also result in additional permanent land use impacts	Potential permanent effects include: • **Easements:** – **Single-Bore:** Tunnel easements under approximately 324 parcels, footing easements on approximately 3 parcels, and subsurface easements beneath approximately 32 parcels – **Dual-Bore:** Tunnel easements under approximately 563 parcels, subsurface easements under approximately 41 parcels and footing easements on 3 parcels and a maintenance easement on 1 parcel • Acquisition of 1.5 ac and conversion of land currently planned for non-transportation uses into transportation uses, which would require amendment of General Plans • Inconsistency with specific individual policies, objectives, and program goals in the City of Alhambra and City of South Pasadena General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan • The TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative would also result in additional permanent land use impacts	• **LU-1: General Plans:** If a Build Alternative is selected for implementation, the Los Angeles County Metropolitan Transportation Authority (for the TSM/TDM, BRT, and LRT Alternatives) and the California Department of Transportation (for the Freeway Tunnel Alternative) will request the applicable local jurisdictions to amend their General Plans and/or other local land use plans after the acquisition of land for the selected alternative to reflect the improvements in that Build Alternative. • **LU-2: RTP/SCS and FTIP (applies to the BRT and LRT Alternatives or any Freeway Tunnel Alternative other than the Freeway Tunnel Alternative with the dual-bore tunnel design variation with the tolled operational variation):** If the BRT Alternative, LRT Alternative, or any Freeway Tunnel Alternative other than the Freeway Tunnel Alternative dual-bore design tolled operational variation is selected for implementation, the Los Angeles County Metropolitan Transportation Authority will coordinate with the Southern California Association of Governments on needed amendments to the next cycle of the RTP/SCS and FTIP to reflect the selected project and to delete the project. [Not Applicable to the TSM/TDM Alternative (Preferred Alternative)].
Growth	The No Build Alternative does not include any of the improvements in the SR 710 North Project Build Alternatives and, therefore, would not result in impacts related to growth that could occur under the Build Alternatives.	No impact. Although the SR-710 North Project will improve mobility and circulation, the study area is largely built out and none of the Build Alternatives provides new access to undeveloped or underdeveloped areas. In addition, the improved mobility and accessibility resulting from the improvements associated with each of the Build Alternatives would be insufficient to attract new development to areas not already proposed for development or to modify the type, location, or timing of developments in those areas. Therefore, the SR-710 North Project is not expected to result in unplanned growth in the study area.				No avoidance, minimization, and/or mitigation measures are required.

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	**No Build Alternative**	**TSM/TDM Alternative (PREFERRED ALTERNATIVE)**	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**Avoidance, Minimization, and Mitigation Measures**
Community Impacts						
Community Character and Cohesion	The No Build Alternative does not have temporary effects on community character and cohesion In addition, the No Build Alternative would not provide improvements to the transit, transportation, and circulation systems, and would not provide any transportation benefits for the traveling public. Congestion would increase, thereby exacerbating existing mobility conditions, including impacts associated with out-of-direction traffic using local arterials.	• Temporary and permanent air quality, noise, traffic/access, and/or parking effects to community facilities within 500 ft of the Build Alternatives • Minor temporary lane restrictions during construction. • Temporary disruption to community events during construction	• Temporary and permanent air quality, noise, traffic/access, and/or parking effects to community facilities within 500 ft of the Build Alternatives • Temporary lane restrictions during construction • Temporary disruption to community events during construction	• Temporary and permanent air quality, noise, traffic/access, and/or parking effects to community facilities within 500 ft of the Build Alternatives • Temporary lane restrictions during construction • Overnight closures along the elevated segments • Displacement of 17 businesses along Mednik Avenue in East Los Angeles • Temporary disruption to community events during construction	• Temporary and permanent air quality, noise, traffic/access, and/or parking effects to community facilities within 500 ft of the Build Alternatives • Temporary lane restrictions during construction • Temporary delays and detours for the traveling public at multiple locations in the study area during construction • Permanent 0.6 ac easement • Permanent acquisition of 1.0 ac of land • Temporary disruption to community events during construction	The following measures are applicable to all of the Build Alternatives: • **CI-1: Property Acquisition:** All acquisition of property for improvements in the Build Alternatives will be conducted in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) of 1970 as amended. • **T-1:** Transportation Management Plan • **AQ-1:** Fugitive Dust • **AQ-2:** Equipment and Vehicle Emissions • **AQ-3:** Diesel Fuel Emissions and Sensitive Receptors • **N-1:** Construction in State ROW (Not Applicable to TSM/TDM Alternative - Preferred Alternative) • **N-2:** Construction Outside State ROW • **N-3:** Tunnel Boring Machine (Not Applicable to TSM/TDM Alternative - Preferred Alternative) • **N-4:** Supply and Muck Trains (Not Applicable to TSM/TDM Alternative - Preferred Alternative) • **N-5:** Ground-Borne Noise and Vibration • **V-1:** Vividness (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-2:** Intactness (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-3:** Unity (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-4:** Walls with Aesthetic Treatments • **V-5:** Built Structures (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-6:** Landscaping (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-7:** Short-Term Visual
Relocation	No temporary effects to environmental justice populations.	The TSM/TDM Alternative would potentially result in: • TCEs on approximately 16 parcels • Creation of approximately 1,400 person-year jobs, which would generate a total of approximately $64.7 million (in 2010 dollars) in employment earnings	• TCEs on approximately 36 parcels • Creation of approximately 3,100 person-year jobs, which would generate a total of approximately $148.6 million (in 2010 dollars) in employment earnings	The LRT Alternative would potentially result in: • TCEs on approximately 13 parcels • Creation of approximately 31,500 person-year jobs, which would generate a total of approximately $1.5 billion (in 2010 dollars) in employment earnings	• TCEs on approximately 52 parcels for single bore and 47 parcels for dual bore • Creation of approximately 41,100 person-year jobs for single-bore and 73,700 for dual-bore, which would generate a total of approximately $1.9 billion (in 2010 dollars) in employment earnings for single-bore and approximately $3.5 billion (in 2010 dollars) for dual-bore.	No avoidance, minimization and/or mitigation measures are required.
	No permanent effects to environmental justice populations.	• Approximately one full parcel acquisition and approximately 30 partial parcel acquisitions, none of which would result in the displacement of businesses or employees	• Approximately 45 partial parcel acquisitions, resulting in a loss of approximately $2,111 in annual property tax revenue and approximately $1,939 in sales tax revenue	• 58 full parcel acquisitions and approximately 11 partial parcel acquisitions, requiring the relocation of approximately 75 businesses and resulting in the displacement of	• Require one full parcel acquisition, which would require the relocation of approximately 1 business and the displacement of approximately 5 employees.	• **CI-1: Property Acquisition:** All acquisition of property for improvements in the Build Alternatives will be conducted in compliance with the Uniform Relocation Assistance and

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
		• Displacement of one business from a State-owned parcel with approximately six employees at that business • Loss of approximately $1,000 in annual property tax revenue and approximately $1,939 in sales tax revenue • Creation of approximately 300 person-year jobs, which would generate approximately $10.5 million per year (in 2010 dollars) in employment earnings over the long term.	• Creation of approximately 600 person-year jobs, which would generate a total of approximately $19.6 million (in 2010 dollars) per year in employment earnings over the life of the improvements.	approximately 655 employees • Displacement of 1 business from a State-owned parcel with approximately 30 employees at that business • Loss of approximately $50,885 in annual property tax revenue and approximately $75,425 in sales tax revenue • Operation and maintenance is estimated to result in approximately 1,300 person-year jobs, which would generate a total of approximately $45.4 million (in 2010 dollars) per year in employment earnings over the life of the improvements	• Result in approximately 2 and 3 partial parcel acquisitions (single-bore and dual-bore, respectively) • Displacement of 1 business from a State-owned parcel with approximately 30 employees • Result in the loss of approximately $1,042 in annual property tax revenue no loss of sales tax revenue (single-bore and dual-bore) **Single-Bore:** Operation and maintenance would result in approximately 800 to 900 person-year jobs for the operational variation that includes trucks and tolls or approximately 900 person-year jobs for the operational variation that includes trucks, tolls, and express buses, which would generate a total of approximately $28.6 million or approximately $32.1 million (in 2010 dollars), respectively, per year in employment earnings. **Dual-Bore:** Operation and maintenance would result in approximately 1,200 person-year jobs for the operational variation that includes tolls or approximately 1,000 person-year jobs for the operational variation that excludes tolls, which would generate a total of approximately $41.2 million or $33.5 million (in 2010 dollars), respectively, per year in employment earnings.	Real Property Acquisition Policies Act (Uniform Act) of 1970 as amended.
Environmental Justice	No temporary or permanent effects to environmental justice populations.	None of the Build Alternatives would result in disproportionate adverse impacts on environmental justice populations				Measure **CI-1 is** applicable.
Utilities and Emergency Services	No temporary or permanent effects to utilities and emergency services.	No impact. Although the SR-710 North Project will improve mobility and circulation, the study area is largely built out and none of the Build Alternatives provides new access to undeveloped or underdeveloped areas; therefore, the SR-710 North Project is not expected to result in unplanned growth.				• **T-1: Transportation Management Plan**: This measure addresses short term adverse transportation impacts during construction of the Build Alternatives, including potential delays for emergency service providers through preparation of a Transportation Management Plan (TMP) during final design, including coordination of the development of the TMP with emergency services providers. The TMP would be implemented during project construction.
Traffic and Transportation/ Pedestrian and Bicycle Facilities	No temporary impacts related to traffic, transportation, pedestrian facilities, and bicycle facilities In addition, the No Build Alternative would not provide improvements to the transit, transportation, and circulation systems, and would not provide any transportation benefits for the traveling public. Congestion would increase, thereby exacerbating existing mobility conditions, including impacts associated with out-of-	Potential temporary effects include: • Lane restrictions that may impact access and circulation at approximately 24 individual locations • Loss of some on-street parking spaces during minor street work • Closures of sidewalks, crosswalks, and bicycle facilities to protect the safety of pedestrians, bicyclists, and construction workers. Because ADA-compliant local	Potential temporary effects include: • Lane restrictions that may impact access and circulation at approximately 24 individual locations • Lane restrictions during off-peak hours at approximately 6 locations • Loss of some on-street parking spaces during minor street work • Closures of sidewalks, crosswalks, and bicycle facilities, including ADA-	Potential temporary effects include: • Lane restrictions that may impact access and circulation at approximately 29 locations (24 from the TSM/TDM Alternative improvements and 5 additional locations) • Lane restrictions during utility relocations and temporary road deck installation and removal • Delays from haul route disposal traffic	Potential temporary effects include: • Lane restrictions that may impact access and circulation at approximately 24 individual locations • Loss of some on-street parking spaces during minor street work • Delays and detours at several locations in the vicinity of the north and south tunnel portals: – **Single-Bore:** Delays and detours at 5	• **T-1: Transportation Management Plan**: This measure addresses short term adverse transportation impacts during construction of the Build Alternatives, including potential delays for emergency service providers through preparation of a Transportation Management Plan (TMP) during final design, including coordination of the development of the TMP with

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
	direction traffic using local arterials.	streets, sidewalks, and crosswalks would be closed during construction of the Build Alternatives, ADA accessibility would also be affected during those closures.	compliant facilities, to protect the safety of pedestrians, bicyclists, and construction workers. • The BRT Alternative would include most of the improvements included in the TSM/TDM Alternative, therefore; the BRT alternative would result in similar temporary lane width reductions, reductions in the number of lanes, limited temporary losses of on-street parking spaces during minor construction work, and restrictions on the number of lanes during off-peak hours associated with the TSM/TDM Alternative improvements	• Loss of on-street parking spaces during minor construction • Weekend full road closures during construction • Overnight closures where the elevated alignment would cross SR 60, SR 710/I-710, or other roads to accommodate placement of concrete barriers adjacent to the median and the construction of falsework • Closures of sidewalks, crosswalks, and bicycle facilities, including ADA-compliant facilities, to protect the safety of pedestrians, bicyclists, and construction workers • The LRT Alternative would include most of the improvements included in the TSM/TDM Alternative, therefore; the LRT alternative would result in similar temporary lane width reductions, reductions in the number of lanes, limited temporary losses of on-street parking spaces during minor construction work, and restrictions on the number of lanes during off-peak hours associated with the TSM/TDM Alternative improvements	and 7 locations, respectively, in the vicinity of the south tunnel portal. Delays and detours at 8 and 11 locations, respectively, in the vicinity of the north tunnel portal – **Dual-Bore:** Delays and detours at 4 and 9 locations, respectively, in the vicinity of the south tunnel portal. Delays and detours at 8 and 11 locations, respectively, in the vicinity of the north tunnel portal • Construction-related closures of freeway on- and off-ramps • **Temporary Closures:** – **Single-Bore:** 5 on NB SR 710, 7 on SB SR 710, and 1 on WB I-210 – **Dual-Bore:** 5 on NB SR 710, 5 on SB SR 710, and 2 on WB I-210 • Delays from haul route disposal traffic • Closure of on-street parking on the Green Street Bridge • Closures of sidewalks, crosswalks, and bicycle facilities, including ADA-compliant facilities, to protect the safety of pedestrians, bicyclists, and construction workers • The Freeway Tunnel Alternative would include most of the improvements included in the TSM/TDM Alternative, therefore; the Freeway Tunnel alternative would result in similar temporary lane width reductions, reductions in the number of lanes, limited temporary losses of on-street parking spaces during minor construction work, and restrictions on the number of lanes during off-peak hours associated with the TSM/TDM Alternative improvements	emergency services providers. The TMP would be implemented during project construction. • **T-2: Pedestrian and Bicycle Facility Closures**: When sidewalks, crosswalks, and/or bicycle facilities are temporarily closed during construction, pedestrian and bicycle detours will be developed and clearly signed prior to closing the locations.
	The No Build Alternative would not provide improvements to the transit, transportation, and circulation systems, and would not provide any transportation benefits for the traveling public. Congestion would increase, thereby exacerbating existing mobility conditions, including impacts associated with out-of-direction traffic using local arterials.	In the Horizon Year (2035), compared to the No Build Alternative, the TSM/TDM Alternative would result in: • A minor increase in combined AM and PM peak-period regional area VMT • Slight improvement in combined AM and PM peak-period regional area VHT • A minor increase in daily person throughput (trips) at the east-west screenline • Moderate increase in job accessibility • Modest increase in total daily vehicle volumes crossing the east-west screenline on arterials and freeways • No reduction in VMT on local arterials • Modest increase in the percent of long-distance trips using local arterials • No improvement in travel times	In the Horizon Year (2035), compared to the No Build Alternative, the BRT Alternative would result in: • A minor increase in combined AM and PM peak-period regional area VMT • A slight improvement in combined AM and PM peak-period regional area VHT • A minor increase in daily person throughput (trips) at the east-west screenline • Moderate increase in job accessibility • Modest increase in total daily vehicle volumes crossing the east-west screenline on arterials and freeways • Minor decrease in VMT on local arterials • Modest increase in the percent of long-distance trips using local arterials • No improvement in travel times	In the Horizon Year (2035), compared to the No Build Alternative, the LRT Alternative would result in: • A minor increase in combined AM and PM peak-period regional area VMT • A slight improvement in combined AM and PM peak-period regional area VHT • A minor increase in daily person throughput (trips) at the east-west screenline • Moderate increase in job accessibility • Modest increase in total daily vehicle volumes crossing the east-west screenline on arterials and freeways • Modest increase in VMT on local arterials • Modest increase in the percent of long-distance trips using local arterials	In the Horizon Year (2035), compared to the No Build Alternative, the Freeway Tunnel Alternative would result in: • The largest increase in combined AM and PM peak period regional area VMT • The greatest improvement in AM and PM peak period regional area VHT • The greatest increase in daily person throughput (trips) at the east-west screenline • The greatest increase in job accessibility • The greatest increase in total daily vehicle volumes crossing the east-west screenline on arterials and freeways • The greatest reduction in VMT on local arterials • The greatest improvement in travel times • Substantial reduction in the percent of	No avoidance, minimization and/or mitigation measures are required.

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
		• Third highest number of new linked transit trips • No change in transit mode split • Lowest daily transit person trips crossing the east-west screenline • No change in percent of study area population and employment within 0.25 mi of high-frequency transit service • Adverse Effects at 18 intersections and on 8 freeway segments • Delays at intersections for pedestrians and bicyclists • Permanent loss of approximately 26 on-street parking spaces in the AM and PM peak periods and approximately 220 on-street parking spaces during all hours of the day	• Second highest number of new linked transit trips • Minor increase in transit mode split • Greatest daily transit person trips crossing the east-west screenline • No change in percent of study area population and employment within 0.25 mi of high-frequency transit service • Adverse Effects at 13 intersections and on 13 freeway segments • Delays at intersections for pedestrians and bicyclists • Permanent loss of approximately 1,055 on-street parking spaces in the AM and PM peak periods and approximately 334 on street parking spaces during all hours of the day • The traffic modeling projections listed above include the effects of the BRT Alternative improvements in addition to the effects of the TSM/TDM Alternative improvements associated with the BRT Alternative	• Minor improvement in travel times • Greatest number of new linked transit trips • Minor increase in transit mode split • Greatest daily transit person trips crossing the east-west screenline • Minor change in percent of study area population and employment within 0.25 mi of high-frequency transit service • Adverse Effects at approximately 13 intersections and on approximately 17 freeway segments • Delays at intersections for pedestrians and bicyclists • Permanent loss of approximately 26 on-street parking spaces in the AM and PM peak periods and approximately 89 on-street parking spaces during all hours of the day • The traffic modeling projections listed above include the effects of the LRT Alternative improvements in addition to the effects of the TSM/TDM Alternative improvements associated with the LRT Alternative.	long-distance trips using local arterials • Lowest number of new linked transit trips • No increase in transit mode split • Lowest daily transit person trips crossing the east-west screenline • No change in percent of study area population and employment within 0.25 mi of high-frequency transit service • Adverse Effects at approximately 6 to 11 intersections and on approximately 18 to 31 freeway segments, depending on the design and operational variations • Delays at intersections for pedestrians and bicyclists • Permanent loss of approximately 26 on-street parking spaces in the AM and PM peak periods and approximately 85 on-street parking spaces during all hours of the day • The traffic modeling projections listed above include the effects of the Freeway Tunnel Alternative improvements in addition to the effects of the TSM/TDM Alternative improvements associated with the Freeway Tunnel Alternative.	
Visual and Aesthetics	No temporary effects to visual and aesthetics.	• Moderate to moderately high visual impacts due to construction activities	• Moderate to moderately high visual impacts due to construction activities	• Moderate to moderately high visual impacts due to construction activities	• Moderately low to moderate visual impacts due to construction activities	• **V-7: Short-Term Visual Effects**: During final design, Metro (TSM/TDM, BRT, and LRT Alternatives) and Caltrans (Freeway Tunnel Alternative) will identify land uses adjacent to construction areas that may be sensitive to views of construction, staging, and materials storage areas. The final design will include features to minimize views of those areas. Metro and Caltrans will require the Construction Contractor to implement and maintain these features throughout the construction period.
	No permanent effects to visual and aesthetics.	• Minor physical changes or visible impacts to the environment • A minimal increase in lighting in existing business and residential areas • Limited changes in glare from changes in traffic control cycles and additional travel lanes • Approximately 7 noise barriers may result in a low to high visual impact	• Minor new shade and shadow effects at new bus stops and signage • Low permanent visual impacts on key views • Approximately 3 noise barriers may result in a moderate to moderately high visual impact. • In addition to the visual and aesthetic impacts associated with the BRT Alternative improvements, the visual and aesthetic impacts associated with the TSM/TDM Alternative improvements included in the BRT Alternative would also occur	• Moderately low to moderate permanent visual impacts on key views • TSM/TDM Alternative noise barriers may result in a moderate to high visual impact • Low permanent impacts related to light, glare, and shade and shadows • In addition to the visual and aesthetic impacts associated with the LRT Alternative improvements, the visual and aesthetic impacts associated with the TSM/TDM Alternative improvements included in the LRT Alternative would also occur.	• Moderately low to moderate visual impacts on key views • Minimal vehicle headlight glare from new non-tunnel segments built below the existing grade level • Minimal shade and shadow impacts • Approximately 4 to 6 noise barriers may result in moderate to high visual impacts • In addition to the visual and aesthetic impacts associated with the Freeway Tunnel Alternative improvements, the visual and aesthetic impacts associated with the TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative would also occur.	• **V-1: Vividness (applies to the LRT and Freeway Tunnel Alternatives):** Metro (LRT Alternative) and Caltrans (Freeway Tunnel Alternative) will address effects of the Build Alternatives related to a reduction in the vividness of views based on a number of measures in the final design. (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-2: Intactness (applies to the LRT and Freeway Tunnel Alternatives):** Metro (LRT Alternative) and Caltrans (Freeway Tunnel Alternative) will address effects of the Build Alternatives related to a reduction in the intactness of views based on a number of measures in the

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
						final design. (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-3: Unity (applies to the LRT and Freeway Tunnel Alternatives)**: Metro (LRT Alternative) and Caltrans (Freeway Tunnel Alternative) will address effects of the Build Alternatives related to a reduction in the unity of views based on a number of measures in the final design. (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-4: Walls with Aesthetic Treatments:** The final designs of sound walls and retaining walls adjacent to identified viewer groups or within sensitive Key Views within State-owned right of way and for the Freeway Tunnel Alternative will be based on Caltrans Highway Design Manual standards and consideration of community input. Metro design standards will be used for the TSM/TDM, BRT, and LRT Alternatives. • **V-5: Built Structures (applies to the LRT Alternative)**: Metro (LRT Alternative) will design the project structures to blend with or enhance the surrounding areas. (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **V-6: Landscaping (applies to the LRT and Freeway Tunnel Alternatives):** Metro (LRT Alternative) and Caltrans (Freeway Tunnel Alternative) will address different levels of visual impacts related to walls and berms and for screening views of project features during final design. (Not Applicable to TSM/TDM Alternative -Preferred Alternative)
Cultural Resources	No effects to cultural resources.	The TSM/TDM Alternative would potentially result in impacts to previously undocumented cultural materials or human remains.	The BRT Alternative would potentially result in impacts to previously undocumented cultural materials or human remains.	The LRT Alternative would potentially result in impacts to previously undocumented cultural materials or human remains.	The Freeway Tunnel Alternative would potentially result in impacts to previously undocumented cultural materials or human remains.	The following measures are applicable to all four Build Alternatives: • **CUL-15:** Public Outreach • **CUL-16:** Discovery of Cultural Resources • **CUL-17:** Discovery of Human Remains • **CUL-18:** Construction Worker Training

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Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
	No effects on historic properties	• No Effect on one historic property: San Marino Municipal Building; • No Adverse Effect on eight historic properties: Rialto Theatre, Fair Hope Building, Markham Place Historic District, Neighborhood Church/Sequoyah School, Ambassador West Cultural Landscape Historic District, Ambassador College Dining Hall, Ambassador Auditorium Performing Arts Center, and Route 66; • Adverse Effect on one historic property: the Arroyo Seco Parkway Historic District.	• No Effect on one historic property: the Bekins Storage Company Roof Sign; • No Adverse Effect on eight historic properties: Golden Gate Theater, Saint Alphonsus Church, South Pasadena Middle School, Community Facilities Planners Building, War Memorial Building, Raymond Hill Waiting Station, Glenarm Building and Electric Fountain (counted as one historic property), and Route 66; • Conditional No Adverse Effect on eight historic properties: Dr. Henry K. Kawamoto Office Building, Jardin del Encanto and Cascades Park, Rialto Theatre, Fair Hope Building, Oaklawn Historic District, Oaklawn Bridge and Waiting Station (counted as one historic property), the Old Pasadena Historic District, and the Horatio Rust Site; • Adverse Effect on one historic property due to the TSM/TDM component of the BRT Alternative: the Arroyo Seco Parkway Historic District.	• No Effect on one historic property: the Horatio Rust Site; • No Adverse Effect on 14 historic properties: Edward R. Roybal Comprehensive Health Center, 4777 East Cesar E. Chavez Avenue, 2020 Fremont Avenue, South Pasadena Middle School, Community Facilities Planners Building, Fair Hope Building, Oaklawn Historic District, Oaklawn Bridge and Waiting Station, War Memorial Building, Raymond Hill Waiting Station, Glenarm Building and Electric Fountain, Hospital Veterinary, and Route 66; • Conditional No Adverse Effect on four historic properties: Rialto Theatre, 100 North Fremont Avenue, the Raymond Florist Historic District, and the Otsungna Village Site; • Adverse Effect on one historic property: Maravilla Handball Court and El Centro Grocery (counted as one historic property); • Adverse Effect on one historic property due to the TSM/TDM component of the LRT Alternative: the Arroyo Seco Parkway Historic District.	• No Effect on 33 historic properties; • No Adverse Effect on the following seven historic properties: Pasadena Avenue Historic District, Hurlbut Street Fire Station No. 5, Reverend Hiram Hill/Alonzo Beal House, Ambassador West Cultural Landscape Historic District, Ambassador College Dining Hall, Ambassador Auditorium Performing Arts Center, and the Colorado Street Auto Row; • Conditional No Adverse Effect on the following seven historic properties: 801 South Pasadena Avenue, Tompkins House, Page House, Miss Markham House, Caroline Walkley/Alice and Robert Wood House (dual-bore only), and 206-216 West California Boulevard, and Old Pasadena Historic District; • Adverse Effect on the following four properties: Markham Place Historic District, Caroline Walkley House and Small Apartment (counted as one historic property), Driscoll House, and Neighborhood Church/Sequoyah School; • Adverse Effect on one historic property due to the TSM/TDM component of the Freeway Tunnel Alternative: the Arroyo Seco Parkway Historic District.	**TSM/TDM Alternative** • Arroyo Seco Parkway Historic District – **CUL-1:** Pre-Construction Surveys – **CUL-2:** Arroyo Seco Parkway Historic District – Rehabilitation Plan – **CUL-12:** Property Specific Protection Plans – **CUL-13:** Post-Construction Building Surveys **BRT Alternative** • Arroyo Seco Parkway Historic District (see TSM/TDM above) – **CUL-1:** Pre-Construction Surveys – **CUL-3:** Jardin Del Encanto and Cascades Park – Rehabilitation Plan – **CUL-13:** Post-Construction Building Surveys • Dr. Henry K. Kawamoto Office Building, Old Pasadena Historic District, Rialto Theatre, Fair Hope Building, Oaklawn Bridge and Waiting Station, Oaklawn Historic District, and Substation No. 2 PERC – **CUL-1:** Pre-Construction Surveys – **CUL-6:** Vibratory Effects of Demolition – **CUL-13:** Post-Construction Building Surveys • Horatio Rust Site – **CUL-14:** Post-Review Discovery and Monitoring Plan **LRT Alternative** • Arroyo Seco Parkway Historic District (see TSM/TDM above) • Raymond Florist Historic District – **CUL-1:** Pre-Construction Surveys – **CUL-4:** Settlement Monitoring Plan – **CUL-5:** Rehabilitation Plans (Settlement) – **CUL-7:** Vibration Management and Monitoring Plan (Raymond Floristic Historic District) – **CUL-8:** Rehabilitation Plan (Raymond Florist Historic District) – **CUL-13:** Post-Construction Building Surveys • Rialto Theatre and 100 North Fremont Avenue – **CUL-1:** Pre-Construction Surveys – **CUL-11:** Groundborne Noise Effects (100 North Fremont and Rialto Theatre) – **CUL-13:** Post-Construction Building Surveys

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Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
						• Maravilla Handball Court and El Centro Grocery – **CUL-1:** Pre-Construction Surveys – **CUL-9:** Indirect Visual Effects (Maravilla Handball Court and El Centro Grocery) – **CUL-12:** Property-Specific Protection Plans – **CUL-13:** Post-Construction Building Surveys • Otsungna Village Site – **CUL-14:** Post Review Discovery and Monitoring Plan **Freeway Tunnel Alternative (Tunnel Segment)** • Arroyo Seco Parkway Historic District (see TSM/TDM above) • Old Pasadena Historic District – **CUL-1:** Pre-Construction Surveys – **CUL-10:** Indirect Visual Effects (Old Pasadena Historic District) – **CUL-13:** Post-Construction Building Surveys • 801 South Pasadena, Tompkins House, Page House, Miss Markham House, Caroline Walkley/Alice and Robert Wood House, and 206-216 West California Boulevard – **CUL-1:** Pre-Construction Surveys – **CUL-4:** Settlement Monitoring Plan – **CUL-5:** Rehabilitation Plans (Settlement) – **CUL-13:** Post-Construction Building Surveys • Markham Place Historic District, Caroline Walkley House and Small Apartment, Driscoll House, and Neighborhood Church/Sequoyah School – **CUL-1:** Pre-Construction Surveys – **CUL-4:** Settlement Monitoring Plan – **CUL-5:** Rehabilitation Plans (Settlement) – **CUL-12:** Property-Specific Protection Plans – **CUL-13:** Post-Construction Building Surveys

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
Hydrology and Floodplains	No temporary effects to hydrology and floodplains.	No improvements would result in construction activities or encroachment within floodplains.	No improvements would result in any construction activities or encroachment within floodplains.	No improvements would result in any construction activities or encroachment within floodplains.	• Temporary construction impacts and potential erosion from clearing of land and vegetation.	No avoidance, minimization, and/or mitigation measures are required.
	No permanent effects to hydrology and floodplains.	No permanent effects to hydrology and floodplains	No permanent effects to hydrology and floodplains	No permanent effects to hydrology and floodplains	• No permanent impacts on floodplain values. • A nominal reduction of the floodplain boundaries of the Dorchester Channel and Laguna Regulating Basin, which would not result in an increase in the water surface elevation in the Laguna Regulating Basin and would result in only a minor increase in water surface elevation in Dorchester Channel (dual-bore design variation only).	
Water Quality and Storm Water Runoff	No temporary water quality and storm runoff effects.	• Temporary disturbance of approximately 21 ac of soil during construction	• Temporary disturbance of approximately 35 ac of soil during construction • The BRT Alternative would also include construction and operation impacts similar to the TSM/TDM Alternative.	• Temporary disturbance of approximately 33 ac of soil during construction • Construction of the TSM/TDM component of the LRT Alternative would disturb a total of approximately 11 ac of soil. Therefore, the total disturbed soil area during construction of the LRT Alternative would be approximately 44 ac. • Groundwater de-watering during construction	• Temporary disturbance of approximately 81 ac and 93 ac of soil, respectively, for the single-bore and dual-bore tunnel design variations during construction • Construction of the TSM/TDM component of the Freeway Tunnel Alternative would disturb a total of approximately 9 ac of soil. Therefore, the total disturbed soil area during construction of the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would be approximately 90 ac and 102 ac, respectively. • Groundwater de-watering during construction	• **WQ-1: National Pollutant Discharge Elimination:** Compliance with the provisions of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) Order No. 2009-0009-DWQ. • **WQ-2: Dewatering:** Compliance with the requirements of Order No. R4-2013-0095 (NPDES No. CAG994004) for construction site dewatering. • **WQ-3: Groundwater Monitoring (applies to the LRT and Freeway Tunnel Alternatives):** A comprehensive investigation to establish a baseline for groundwater levels and quality (chemistry) in the areas in which tunneling or excavations would occur. (Not Applicable to TSM/TDM Alternative -Preferred Alternative) • **WQ-4: Improvements in State-Owned Right of Way (applies to the Freeway Tunnel Alternative):** Compliance with the provisions of the NPDES Permit, Statewide Storm Water Permit, Waste Discharge Requirements (WDRs). (Not Applicable to TSM/TDM Alternative - Preferred Alternative) • **WQ-5: Improvements Outside State-Owned Right of Way (applies to the TSM/TDM, BRT, and LRT Alternatives):** Compliance with the Standard Urban Storm Water Mitigation Plan (SUSMP) prepared for the Los Angeles Regional Water Quality Control Board WDRs for Municipal Separate Storm Sewer System Order No. R4-2012-0175 • **WQ-6: Improvements in State-Owned Right of Way (applies to the Freeway Tunnel Alternative):** A Caltrans-approved Design Pollution Prevention BMPs will be prepared. (Not Applicable

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						to TSM/TDM Alternative -Preferred Alternative) • **WQ-7: Improvements in State-Owned Right of Way (applies to the Freeway Tunnel Alternative):** Caltrans-approved Treatment BMPs will be prepared and implemented. (Not Applicable to TSM/TDM Alternative -Preferred Alternative)
	No permanent water quality and storm runoff effects.	• A permanent increase in impervious surface area of approximately 3.8 ac • Treatment of 76% of newly created or replaced impervious surface area storm water runoff within State-owned ROW	• A permanent increase in impervious surface area of approximately 1.2 ac • Treatment of 575% and 114%, respectively, of the new impervious surface area within and outside State-owned ROW. • The total net increase in impervious surface area would be approximately 3.8 ac for the TSM/TDM component of the BRT Alternative. Therefore, the total net increase in impervious surface area for the BRT Alternative would be approximately 5 ac.	• A permanent increase in impervious surface area of approximately 16.5 ac • Treatment of 31% of the new impervious surface area within State-owned ROW and 47% of the newly created or replaced impervious surface area outside State-owned ROW. • The total net increase in impervious surface area would be approximately 2.2 ac for the TSM/TDM component of the LRT Alternative. Therefore, the total net increase in impervious surface area for the LRT Alternative would be approximately 18.7 ac.	• A permanent increase in impervious surface area of approximately 1.7 ac and 13.5 ac, respectively, for the single-bore and dual-bore design variations • Treatment of 5,350% and 705%, respectively, of the net new impervious surface area for the single-bore and dual-bore design variations • The total net increase in impervious surface area would be approximately 1.1 ac for the TSM/TDM component of the single-bore and dual-bore design variations of the Freeway Tunnel Alternative. Therefore, the total net increase in impervious surface area would be approximately 2.8 ac and 14.6 ac, respectively.	No avoidance, minimization and/or mitigation measures are required.
Geology, Soils, Seismic, and Topography	No temporary geology and soils effects.	• Minor grading activities with no modification of existing topography • Low potential to encounter naturally occurring oil or gas during construction • Potential to experience fault rupture or seismically-induced ground motion, liquefaction, and/or landslides • Low potential for soil settlement, collapse, and expansion • Improvements in a Liquefaction Hazard Zone • Moderate erosion of surficial soils • Improvements that cross the active Raymond and potentially San Rafael Faults • Improvements in a potential dam inundation area	• Minor grading activities with no modification of existing topography • Low potential to encounter naturally occurring oil or gas during construction • Potential to experience fault rupture or seismically-induced ground motion, liquefaction, and landslides • Low potential for soil settlement, collapse, and expansion • Improvements in a Landslide Hazard Zone • Moderate erosion of surficial soils • An alignment that crosses the active Raymond and potentially active San Rafael Faults	• Soil excavation and tunneling • Low to moderate potential to encounter naturally occurring oil or gas during construction • Potential to experience fault rupture or seismically-induced ground motion, liquefaction, and landslides • Low potential for soil settlement, collapse, expansion, and lateral spreading • Improvements in a Liquefaction Hazard Zone and a Landslide Hazard Zone • Moderate erosion of surficial soils • An alignment that crosses the active Raymond and potentially active San Rafael Faults • Improvements in a potential dam inundation area • Slope instability • Potential for ground settlement and differential settlement immediately above and adjacent to the bored tunnel portion	• Soil excavation and tunneling • Low to moderate potential to encounter naturally occurring oil or gas during construction • Potential to experience fault rupture or seismically-induced ground motion, liquefaction, and landslides • Low potential for soil settlement, collapse, expansion, and lateral spreading • Improvements in a Liquefaction Hazard Zone and a Landslide Hazard Zone • Moderate erosion of surficial soils • An alignment that crosses the active Raymond and potentially active San Rafael and Eagle Rock Faults • Improvements in a potential dam inundation area • Slope instability • Potential for ground settlement and differential settlement immediately above and adjacent to the bored tunnel portion	• **GEO-1: Final Geotechnical/Baseline Report:** A comprehensive geologic and geotechnical investigation will be conducted and design-level geotechnical/baseline reports will be prepared. • **GEO-2: Quality Assurance/Quality Control Plan:** The Resident Engineer will maintain a quality assurance/ quality control plan during construction. Comprehensive real-time monitoring with geotechnical tunnel data management software and implementation of an observational approach to construction management will be implemented during construction of the LRT or Freeway Tunnel Alternatives. • **GEO-3: Tunnel Design (applies to the LRT and Freeway Tunnel Alternatives):** Project Engineer will make sure that measures to prevent effects from tunnel construction and operation are included in the comprehensive geologic and geotechnical investigation and the design-level geotechnical/baseline report and the project design and specifications. (Not Applicable to TSM/TDM Alternative -Preferred Alternative)

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Summary of Alternatives and Impacts

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						• **GEO-4: Tunnel Construction (applies to the LRT and Freeway Tunnel Alternatives):** It is expected that bored tunnels for either the LRT or Freeway Tunnel Alternative would be constructed using a tunnel boring machine (TBM). During construction, the Project Engineer will select a pre-qualified contractor with experience with large, pressurized-face TBMs. (Not Applicable to TSM/TDM Alternative -Preferred Alternative)
Paleontology	No temporary paleontological resource effects. All impacts are considered permanent	No temporary paleontological resource effects. All impacts are considered permanent	No temporary paleontological resource effects. All impacts are considered permanent	No temporary paleontological resource effects. All impacts are considered permanent	No temporary paleontological resource effects. All impacts are considered permanent	No measures required.
	No permanent paleontological effects	• Minor ground disturbance in areas with high sensitivity for paleontological resources. • During excavation and grading, fossils would be able to be recovered	• Minor ground disturbance in areas with high sensitivity for paleontological resources. • During excavation and grading, fossils would be able to be recovered	• Improvements located in areas with high sensitivity for paleontological resources • The potential for fossil recovery during tunnel excavation will depend on the type of tunnel boring machine used	• Located in area with high sensitivity for paleontological resources • The potential for fossil recovery during tunnel excavation will depend on the type of tunnel boring machine used	• **PAL-1: Paleontological Mitigation Plan and Paleontological Resources Impact Mitigation Program:** A PMP or PRIMP is required that addresses monitoring and treatment of fossils.
Hazardous Waste and Materials	No temporary or permanent hazardous waste effects	• Four properties with known hazardous waste contamination are located adjacent to or within the TSM/TDM Alternative • Widening and/or demolition of bridges may encounter asbestos-containing materials	• Three properties with known hazardous waste contamination are located adjacent to the BRT Alternative • No bridge widening/demolition proposed	• Four properties with known hazardous waste contamination are located adjacent to or within the LRT Alternative • No bridge widening/demolition proposed • Bored tunnel will be water and gas tight, and the intrusion of hazardous materials/gas into the tunnel is not expected	• Two properties with known hazardous waste contamination are located adjacent to the Freeway Tunnel Alternative • Widening and/or demolition of existing bridges may encounter asbestos-containing materials • Bored tunnel will be water and gas tight and the intrusion of hazardous materials/gas into the tunnel is not expected	• **HW-1: Striping and Pavement Markings:** Sampling, handling, treatment and disposal of striping and pavement markings will be conducted in accordance with applicable local, State and federal regulations. • **HW-2: Transformers (applies to the TSM/TDM, BRT, and LRT Alternatives):** Transformer removal, required, removed and disposed of in accordance with applicable State regulations. • **HW-3: Lead Compliance Plan:** A Lead Compliance Plan in accordance with applicable regulations that will address the presence of aerially deposited lead (ADL) in the soils within the project area and the health and safety of construction workers. • **HW-4: Aerially-Deposited Lead Investigation:** Sampling, handling, treatment and disposal ADL will be conducted consistent with applicable local, State and federal regulations and requirements. • **HW-5: Demolition of Structures and Bridges:** Structures planned for demolition within the project area will be assessed for the possible presence of asbestos-containing materials (ACM), lead-based paint (LBP), and equipment containing chlorofluorocarbons (CFCs). • **HW-6**: **SCAQMD Rule 1403:** Compliance with SCAQMD Rule 1403 during demolition of bridges and structures. • **HW-7: Phase II Site Investigations:**

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Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
						Phase II Site Investigations will be conducted to determine if special handling, treatment, or disposal provisions associated with hazardous wastes will be required for the project. • **HW-8: Soils Adjacent to the Railroad ROW (applies to the TSM/TDM Alternative):** Soils adjacent to railroad ROW will be sampled to determine whether they require special handling and disposal. • **HW-9: Tunnel Construction Activities (applies to the LRT and Freeway Tunnel Alternatives):** Tunnel spoils will be tested prior to removal off-site and disposed of at an appropriate landfill or designated site. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **HW-10 Unknown Hazards (applies to all four Build Alternatives):**Excavation and demolition activities will be monitored and if unknown hazards encountered, characterization, treatment and disposal will be consistent with federal and state regulations. • **WQ-2**: Dewatering • **GEO-1:** Final Geotechnical/Baseline Report
Air Quality	No temporary construction air quality effects	• Short-term air quality impacts from construction emissions	• Short-term air quality impacts from construction emissions • Although the BRT Alternative includes some of the TSM/TDM Alternative improvements, the construction schedule for the TSM/TDM improvements would not overlap with the construction schedule for the BRT Alternative, therefore, the emissions would not be additive.	• Short-term air quality impacts from construction emissions • Although the LRT Alternative includes some of the TSM/TDM Alternative improvements, the construction schedule for the TSM/TDM improvements would not overlap with the construction schedule for the LRT Alternative, therefore, the emissions would not be additive.	• Short-term air quality impacts from construction emissions • Although the Freeway Tunnel Alternative includes some of the TSM/TDM Alternative improvements, the construction schedule for the TSM/TDM improvements would not overlap with the construction schedule for the single-bore design variation, therefore, the emissions would not be additive.	• **AQ-1: Fugitive Dust**: Compliance with South Coast Air Quality Management District Rule 403. • **AQ-2: Equipment and Vehicle Emissions**: During all site preparation, grading, excavation, and construction, Construction Contractor required to reduce vehicle and equipment emissions through various measures. • **AQ-3: Diesel Fuel Emissions and Sensitive Receptors:** Construction Contractor to implement measures to reduce diesel fuel emissions near sensitive receptors. • **AQ-4: Caltrans Standard Specifications for Construction (applies to the Freeway Tunnel Alternative)**: Comply with Caltrans Standard Specifications for Construction (Sections 14-9.03 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plant Emissions]). (Not Applicable to TSM/TDM Alternative – Preferred Alternative)

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						• **AQ-5: Metro Green Construction Policy (applies to the TSM/TDM, BRT, and LRT Alternatives)**: Metro will require the Construction Contractors to comply with its "Green Construction Policy" (adopted 2011, or more current).
	The 2020 and 2035 regional air quality emissions under the No Build Alternative are projected to be higher than existing emissions levels.	• 2020 PM_{10} emissions higher than the 2020 No Build Alternative emissions • Criteria pollutant emissions higher than the 2035 No Build Alternative emissions, with the exception of ROGs and NO_X • 2035 diesel PM plus diesel exhaust organic gas emissions higher than the 2035 No Build Alternative emissions • The TSM/TDM Alternative is exempt under 40 CFR 93.126 from conformity requirements.	• Criteria pollutant emissions higher than the 2035 No Build Alternative emissions, with the exception of ROGs and NO_X • 2035 diesel PM plus diesel exhaust organic gas emissions higher than the 2035 No Build Alternative emissions • The operational air quality analysis for the BRT Alternative includes the effects of the TSM/TDM Alternative improvements that would be included in the BRT Alternative	• Criteria pollutant emissions higher than the 2035 No Build Alternative emissions with the exception of ROGs and NO_X • 2035 diesel PM plus diesel exhaust organic gas emissions higher than the 2035 No Build Alternative emissions • The operational air quality analysis for the LRT Alternative includes the effects of the TSM/TDM Alternative improvements that would be included in the LRT Alternative	**Single-Bore** • PM_{10} and $PM_{2.5}$ emissions higher than the 2025 and 2035 No Build Alternative emissions • Highest 24-hour and annual $PM_{2.5}$ and annual PM_{10} concentrations higher than the No Build Alternative • Diesel PM emissions lower than the 2025 and 2035 No Build Alternative emissions The operational air quality analysis for the Freeway Tunnel Alternative includes the effects of the TSM/TDM Alternative improvements.	--
Noise	No temporary noise effects	• Less than perceptible temporary noise impacts from construction traffic and activity	• Less than perceptible temporary noise from construction traffic and activity • Due to the distance between the TSM/TDM Alternative improvements and the other Build Alternatives, construction-related impacts are not expected to compound should they be constructed simultaneously	• Less than perceptible temporary noise impacts from construction traffic and activity • Short-term ground-borne noise and vibration effects from tunnel boring construction activity • Due to the distance between the TSM/TDM Alternative improvements and the other Build Alternatives, construction-related impacts are not expected to compound should they be constructed simultaneously	• Less than perceptible temporary noise impacts from construction traffic and activity • Short-term ground-borne noise and vibration effects from tunnel boring construction activity • Due to the distance between the TSM/TDM Alternative improvements and the other Build Alternatives, construction-related impacts are not expected to compound should they be constructed simultaneously.	• **N-1: Construction in State ROW (applies to the Freeway Tunnel Alternative)**: Within State-owned ROWs noise will be controlled in conformance with Caltrans Standard Specifications Section 14-8.02, "Noise Control." (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **N-2: Construction Outside State ROW (applies to the TSM/TDM, BRT, and LRT Alternatives):** During construction outside State-owned ROWs, compliance with the hours of operation, the allowable noise levels at specified distances from construction activities, and other noise reduction/avoidance requirements in the applicable jurisdiction's Municipal Code and/or Noise Ordinance will be required. • **N-3: Tunnel Boring Machine (applies to the LRT and Freeway Tunnel Alternatives):** Metro (LRT Alternative) or Caltrans (Freeway Tunnel Alternative), as appropriate, will require the Construction Contractor to maintain machinery in good working order during all tunnel boring activities. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **N-4: Supply and Muck Trains (applies to the LRT and Freeway Tunnel Alternatives):** The Metro (LRT Alternative) or Caltrans (Freeway Tunnel Alternative) Project Engineer will include specific minimization measures in the Plans, Specifications,

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						and Estimates (PS&E) if supply or muck trains are used to remove spoils. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **N-5: Ground-Borne Noise and Vibration:** For the TSM/TDM and BRT Alternatives, Caltrans or Metro will not allow the Construction Contractor to use pile driving or other activities that generate high levels of vibration during the construction of the TSM/TDM or BRT Alternatives. Caltrans and Metro will require the Construction Contractor to carry out construction activities for the LRT and Freeway Tunnel Alternatives in compliance with applicable federal, State and local noise and vibration guidance. (Not Applicable to TSM/TDM Alternative – Preferred Alternative)
	No permanent noise effects	• Noise levels at approximately 27 receptor locations that would approach or exceed the NAC as applicable to the land uses at each sensitive receptor location • Seven noise barriers were found to be reasonable and feasible	• Operational long-term traffic noise impacts • Noise levels at approximately 129 receptor locations that would approach or exceed Noise Abatement Criteria • Noise levels at approximately 9 receptor locations that would approach or exceed the NAC as applicable to the land uses at each receptor location • Three modeled noise barriers were found to be reasonable and feasible • Five noise barriers in the TSM/TDM Alternative would also be included in the BRT Alternative	• Long-term ground-borne noise during operation • Noise barriers ranging in height from 4.0 to 9.5 feet will be placed at the edge of the track and a noise barrier will be placed along the perimeter of the LRT maintenance yard • Approximately 12 receptors will experience a moderate impact while approximately 5 receptors will experience a severe noise impact as defined by FTA noise criteria. • It is expected that along with the LRT Alternative, the TSM/TDM Alternative components will be constructed except improvements T-1. Therefore, five barriers identified for the TSM/TDM improvements are recommended • Ground-borne vibration impacts to approximately 450 residential buildings and 1 commercial office building	• Operational long-term traffic noise impacts associated with traffic noise • The noise levels at approximately 66 receptor locations for the single-bore design variation and approximately 75 receptor locations for the dual-bore design variation would approach or exceed the NAC as applicable to the land uses at each sensitive receptor location • Six modeled noise barriers were found to be reasonable and feasible • Five noise barriers in the TSM/TDM Alternative would also be included in the Freeway Tunnel Alternative	• **N-6: Grifols Vibration Study**: For the TSM/TDM Alternative, Caltrans or Metro will not allow the Construction Contractor to use pile driving or other activities that generate high levels of vibration during the construction of the TSM/TDM Alternative. During PS&E for the Freeway Tunnel Alternative, the Caltrans Project Engineer will prepare a site-specific evaluation of potential airborne dust due to vibration associated with freeway tunnel construction at the Grifols facility. The analysis will use more detailed engineering and soil conditions developed during final design. The Caltrans Project Engineer will include the results of the evaluation, and any specific measures to ensure that vibration from the Project does not affect the clean room's compliance with the International Organization for Standardization (ISO) standards for airborne dust in clean rooms, if found to affect clean room compliance with ISO airborne dust standards, will be incorporated into the PS&E. During PS&E for the LRT Alternative, the Metro Project Engineer will prepare a site-specific evaluation of potential airborne dust due to vibration associated with the construction of the LRT Alternative at the Grifols facility. The analysis will use more detailed engineering and soil conditions. The Metro Project Engineer will include the results of the

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						evaluation, and any specific measures to address vibration, if found to affect clean room operation, shall be incorporated into the PS&E. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **N-7: Vibration Isolation Systems (applies to the LRT Alternative):** The Metro Project Engineer, during final design of the LRT Alternative, will conduct additional field testing and analysis for the specific identification of ground-borne noise impacts and will incorporate the vibration isolation system or systems to comply with FTA ground-borne noise level criteria. The vibration isolation systems could be utilized. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **N-8: Abatement:** Based on the studies completed to date, Metro/Caltrans intends to incorporate noise abatement in the form of soundwalls listed as reasonable in Table 3.14.34 (refer to Appendix N), depending on the selected alternative. During final design, Metro/Caltrans will make the final decision on noise abatement to be included in the selected Build Alternative, based on the final design of the proposed project and the public involvement process. If during final design, conditions have substantially changed, noise abatement at some of the locations noted above may not be reasonable/feasible. Metro/Caltrans will incorporate the final noise abatement in the final project design and specifications.
	–	• Noise levels at approximately 70 receptor locations that would approach or exceed the Noise Abatement Criteria as applicable to the land uses at each sensitive receptor location • Five noise barriers were found to be reasonable and feasible	• Operational long-term traffic noise impacts • Noise levels at approximately 129 receptor locations that would approach or exceed Noise Abatement Criteria as applicable to the land uses at each receptor location • Three noise barriers were found to be reasonable and feasible for the BRT Alternative • Five noise barriers in the TSM/TDM Alternative would also be included in the BRT Alternative	• Long-term ground-borne noise during operation • Ground-borne vibration impacts to approximately 450 residential buildings and 1 commercial office building • With the daily operations of the light rail trains, prior to mitigation, approximately 12 receptors will experience a moderate impact while approximately 5 receptors will experience a severe noise impact as defined by Federal Transit Authority noise criteria. • Five noise barriers in the TSM/TDM Alternative would also be included in the LRT Alternative	• Operational long-term traffic noise impacts associated with traffic noise • The noise levels at approximately 66 receptor locations for the single-bore design variation and approximately 75 receptor locations for the dual-bore design variation would approach or exceed the Noise Abatement Criteria as applicable to the land uses at each sensitive receptor location • Four and six noise barriers were found to be reasonable and feasible for the single-bore and dual-bore design variations, respectively. • Five noise barriers in the TSM/TDM Alternative would also be included in the Freeway Tunnel Alternative	• Noise barriers as noted by alternative.

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Energy	There are no temporary energy impacts.	• Construction would require approximately 33,600 billion BTUs	• Construction would require approximately 55,300 billion BTUs	• Construction would require approximately 422,000 billion BTUs	• Construction would require approximately 523,000 billion BTUs (single bore) and 926,000 billion BTUs (dual bore)	• **E-1: Construction Efficiency Plan**: As part of the Plans, Specifications, and Estimates phase, the Project Engineer will prepare a construction efficiency plan.
	--	• Maintenance-related energy consumption would increase approximately 0.3% in the study area compared to the 2035 baseline condition (No Build Alternative) • Operational energy consumption in the study area would result in no change from the 2035 baseline condition (No Build Alternative)	• Maintenance-related energy consumption would increase approximately 0.3% in the study area compared to the 2035 baseline condition (No Build Alternative) • Operational energy consumption in the study area would result in no change from the 2035 baseline condition (No Build Alternative)	• Maintenance-related energy consumption would increase approximately 0.2% in the study area compared to the 2035 baseline condition (No Build Alternative) • Operational energy consumption in the study area would result in an approximately 0.7% increase from the 2035 baseline condition (No Build Alternative)	For the single-bore design variation: • Maintenance-related energy consumption would increase ranging from 0.6 to 1.6% in the study area compared to the 2035 baseline condition (No Build Alternative) • Operational energy consumption in the study area would result in an approximately 0.7 to 1.0% decrease (single bore) and from the 2035 baseline condition (No Build Alternative) For the dual-bore design variation: • Maintenance-related energy consumption would increase ranging from 0.6 to 1.6% in the study area compared to the 2035 No Build Alternative. • Operational energy consumption in the study area would result in no change compared to the 2035 No Build Alternative.	No measures required.
Natural Communities	No temporary or permanent impacts to natural communities.	• No temporary or permanent impacts on sensitive natural communities • Temporary impacts to non-sensitive plant communities (0.3 acre of nonnative grassland and 0.5 acre of disturbed/developed) • Permanent impacts to non-sensitive plant communities (less than 0.1 acre of nonnative woodlands and 0.7 acre of disturbed/developed)	• No temporary or permanent impacts on sensitive natural communities • Temporary impacts to non-sensitive plant communities (0.6 acre of disturbed/developed) • Permanent impacts to non-sensitive plant communities (1.9 acres of nonnative grassland and 123.8 acres of disturbed/developed)	• No temporary or permanent impacts on sensitive natural communities • Temporary impacts to non-sensitive plant communities (2.1 acres of nonnative grassland, 8.0 acres of nonnative woodland, and 29.7 acres of disturbed/developed) • Permanent impacts to non-sensitive plant communities (12.6 acres of nonnative grassland, 3.9 acres of nonnative woodland, and 93.6 acres of disturbed/developed)	• The single-bore and dual-bore design variations would each result in permanent impacts to approximately 1.09 acres of wetland complex and would potentially result in indirect temporary impacts to nearby riparian or riverine habitats. • The single-bore design variation would result in temporary impacts to non-sensitive plant communities (2.9 acres of nonnative grassland, less than 0.1 acre of nonnative woodland, and 53.4 acres of disturbed/developed) • The dual-bore design variation would result in temporary impacts to non-sensitive plant communities (2.2 acres of nonnative grassland, 1.1 acres of nonnative woodland, and 51.7 acres of disturbed/developed) • The single-bore design variation would result in permanent impacts to non-sensitive plant communities (25.2 acres of nonnative grassland, 31.6 acres of nonnative woodland, and 244.9 acres of disturbed/developed) • The dual-bore design variation would result in permanent impacts to non-sensitive plant communities (25.2 acres of nonnative grassland, 32.4 acres of nonnative woodland, and 244.9 acres of	• **NC-1 – Riparian/Riverine Habitat Protection (applies to the Freeway Tunnel Alternative):** Environmentally Sensitive Area (ESA) fencing or other marker will be installed around any riparian or riverine habitats to be preserved. No grading or fill activities or structures will be authorized in marked areas. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **NC-2 – Construction Plan (applies to the Freeway Tunnel Alternative):** Nonsensitive upland habitat areas will be designated for equipment maintenance, staging, fueling, and other related activities. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **NC-3 – Compliance Monitoring (applies to the Freeway Tunnel Alternative):** The Construction Contractor will be required to have a qualified biologist monitor during construction in the vicinity of riparian and riverine areas. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **WQ-1 – National Pollutant Discharge Elimination:** Compliance with the provisions of the NPDES General Permit for Storm Water Discharges Associated

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Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
					disturbed/developed)	with Construction and Land Disturbance Activities (Construction General Permit) Order No. 2009-0009-DWQ. • **IS-1 –** Weed Abatement Program • **WET**-1: Obtain United States Army Corps of Engineers Section 404 Dredge and Fill Permit • **WET**-2: Obtain CDFW Streambed Alteration Agreement • **WET**-3: Obtain RWQCB Section 401 Water Quality Certification
Wetlands and Other Waters	No temporary or permanent impacts to wetlands and other resources	No temporary or permanent impacts to wetlands or other waters.	No temporary or permanent impacts to wetlands or other waters.	No temporary or permanent impacts to wetlands or other waters.	• The single-bore design variation would result in approximately 0.02 acre of temporary impacts to non-wetland waters under United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board jurisdiction. • The dual-bore design variation would result in approximately 0.2 acre of temporary impacts to non-wetland waters under United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board jurisdiction. • The single-bore design variation would result in approximately 0.06 acre of permanent non-wetland water impacts under United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board jurisdiction to the Laguna Channel • The dual-bore design variation would result in approximately 0.5 acre of permanent non-wetland water impacts under United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board jurisdiction to the Laguna Channel • The permanent impacts on the Laguna Channel would not impact the Arroyo Seco	• **WET-1 –** Obtain United States Army Corps of Engineers Section 404 Dredge and Fill Permit (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **WET-2 –** Obtain CDFW Streambed Alteration Agreement (applies to the Freeway Tunnel Alternative) (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **WET-3 –** Obtain RWQCB Section 401 Water Quality Certification (applies to the Freeway Tunnel Alternative) (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **NC-1:** Riparian/Riverine Habitat Protection (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **NC-2:** Construction Plan (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **NC-3:** Compliance Monitoring (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **WQ-1:** National Pollutant Discharge Elimination • **WQ**-2: Dewatering • **WQ**-3: Groundwater Monitoring (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **WQ**-4: Improvements in State-Owned ROW (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **WQ**-5: Improvements Outside State-Owned ROW • **WQ**-6: Improvements in State-Owned ROW (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **IS**-1: Weed Abatement Program
Plant Species	No temporary or permanent impacts to plant species	No temporary or permanent direct or indirect impacts to plant species (Parish's gooseberry, slender mariposa-lily, and Coulter's goldfields)	No temporary direct or indirect impacts to plant species (Parish's gooseberry, slender mariposa-lily, and Coulter's goldfields) The BRT Alternative would potentially result in removal of approximately 136 trees	• No temporary or permanent direct or indirect impacts on Parish's gooseberry and slender mariposa-lily • Temporary impacts to approximately 8 trees within the State right of way not protected by a local ordinance	• No temporary or permanent direct or indirect impacts to plant species (Parish's gooseberry, slender mariposa-lily, and Coulter's goldfields) • Temporary impacts to approximately 36 trees in the City of Pasadena that are	• **PS-1 – Coulter's Goldfields (applies to the LRT Alternative):** Should the LRT Alternative be selected and documentation of the planting efforts of the population of Coulter's goldfields in the Biological Study Area (BSA) be

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
			protected by local tree ordinances.	• Temporary indirect impacts and exacerbate existing indirect permanent edge effects on a Coulter's goldfields population within approximately 250 feet of the permanent impact area for the LRT Alternative • Removal of approximately 21 trees protected by various local tree ordinances	protected by the City's Trees and Tree Protection Ordinance • Potential permanent impacts to the Coulter's goldfields within the permanent impact area of the single-bore and dual-bore design variations • Potential permanent impacts to a Southern California black walnut tree that is approximately 4 feet outside the permanent impact area for the Freeway Tunnel Alternative • The single-bore and dual-bore design variations would result in removal of approximately 84 trees protected by local tree ordinances	unavailable, effects of the LRT Alternative on the Coulter's goldfields population will be addressed. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **PS-2 – Coulter's Goldfields (applies to the Freeway Tunnel Alternative):** Should the Freeway Tunnel Alternative be selected and documentation of the planting efforts of the population of Coulter's goldfields in the BSA be unavailable, the effects of the Freeway Tunnel Alternative on the Coulter's goldfields population will be addressed. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **PS-3 – Southern California Black Walnut (applies to the Freeway Tunnel Alternative):** Implement measures to address the project effects on the Southern California black walnut. (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **PS-4 – Trees Protected by City and/or County Ordinances:** Avoid/minimize impacts to trees where feasible. If not feasible, obtain appropriate tree removal permits.
Animal Species	No temporary or permanent impacts to threatened and endangered species	• Temporary and permanent adverse impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake • Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc. if nighttime construction activities take place • Temporary indirect impacts through habitat loss if special-status bats begin using bridges (including the Garfield Avenue Bridge) proposed for demolition or widening as roosting habitat • Temporary and permanent impacts to a limited amount of nonnative grasslands that may support milkweed plants required for monarch butterfly breeding and is suitable habitat for western spadefoot toad and San Bernardino ring-necked snake	• Temporary and permanent adverse impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake • Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc. if nighttime construction activities take place • Permanent impacts to a limited amount of nonnative grasslands that may support milkweed plants required for monarch butterfly breeding, and is suitable habitat for western Spadefoot toad and San Bernardino ring-necked snake	• Temporary and permanent adverse impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake • Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc. if nighttime construction activities take place • Indirect temporary impacts to riparian obligate bird species as a result of the proximity of potential nonbreeding habitat in the riparian areas due to project construction activities • Temporary impacts through habitat loss if special-status species bat populations begin using bridges proposed for removal as roosting habitat • Temporary and permanent impacts to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies	• Temporary and permanent adverse impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake • Indirect temporary and permanent impacts to foraging bats may occur from noise, lighting, vibration, dust, etc. if nighttime construction activities take place • Indirect temporary impacts to riparian obligate bird species as a result of the proximity of potential nonbreeding habitat in the riparian areas due to project construction activities • Temporary and permanent impacts to a limited amount of nonnative grasslands that may support milkweed plants required for monarch butterfly breeding and is suitable habitat for western spadefoot toad and San Bernardino ring-necked snake • Temporary and permanent impacts to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies • Temporary impacts through habitat loss if special-status species bat populations begin using bridges proposed for removal	• **AS-1 – Bats:** Due to the presence of marginally suitable roosting habitat, avoidance and minimization efforts will be implemented. • **AS-2 – Monarch Butterfly:** Avoidance and minimization measures in areas of potentially suitable habitat for winter roosting aggregations of monarch butterfly and the species' egg, caterpillar, and pupal stages will be implemented. • **AS-3 – Amphibians and Reptiles:** Avoidance and minimization measures in areas of potentially suitable habitat for coast range newt, western spadefoot, two-striped garter snake, western pond turtle, San Bernardino ring-necked snake, and South Coast garter snake species will be implemented. • **AS-4 – Other Special-Status Bird Avoidance and Minimization Measures:** Avoidance and minimization efforts for birds protected under California Fish and Game Code Sections 3503 and 3503.5, and the Migratory Bird Treaty Act (MBTA) will be implemented.

TABLE 2.15:
Summary of Alternatives and Impacts

Project Description and Environmental Topics	No Build Alternative	TSM/TDM Alternative (PREFERRED ALTERNATIVE)	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative	Avoidance, Minimization, and Mitigation Measures
					as roosting habitat	
Threatened and Endangered Species	No temporary impacts to threatened and endangered species	Potential temporary indirect impacts through habitat loss to Townsend's big-eared bats if they are discovered using bridges proposed for widening as roosting habitat and indirect temporary impacts to foraging bats may occur from if nighttime construction activities take place.	Determined to have no direct or indirect temporary impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	Potential impacts are limited indirect temporary impacts to listed riparian obligate bird species as a result of the proximity of potential nonbreeding habitat in the riparian areas due to project construction activities	Potential impacts are limited indirect temporary impacts to listed riparian obligate bird species as a result of the proximity of potential nonbreeding habitat in the riparian areas due to project construction activities	• **NC-1 –** Riparian/Riverine Habitat Protection (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **NC-2 –** Construction Plan (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **NC-3 –** Compliance Monitoring (Not Applicable to TSM/TDM Alternative – Preferred Alternative) • **AS-1 –** Bats
	No permanent impacts to threatened and endangered species	Determined to have no direct or indirect permanent impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	Determined to have no direct or indirect permanent impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	Determined to have no direct or indirect permanent impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	Determined to have no direct or indirect permanent impacts on federally listed threatened or endangered species, to not result in take of State-listed threatened or endangered species, and to have a preliminary no effect on threatened and endangered species.	No avoidance, minimization, and/or mitigation measures are required.
Invasive Species	No impacts to invasive species	Potentially result in the spread of permanent invasive species through construction activities.	Potentially result in the permanent spread of invasive species through construction activities.	Potentially result in the permanent spread of invasive species through construction activities.	Potentially result in the permanent spread of invasive species through construction activities.	• **IS-1: Weed Abatement Program**
Cumulative Impacts	The No Build Alternative does not include any of the improvements in the SR 710 North Project Build Alternatives and, therefore, would not result in the cumulative impacts related to visual/aesthetics and animal species that could occur under the Build Alternatives.	**Visual/Aesthetics:** No cumulative impact. **Animal Species:** Potential to contribute to a cumulative impact on nesting or breeding birds under the MBTA.	**Visual/Aesthetics:** No cumulative impact. **Animal Species:** Potential to contribute to a cumulative impact on nesting or breeding birds under the MBTA.	**Visual/Aesthetics:** Potential to contribute to a cumulative impact for the Eastside Phase II Transit Corridor Project. **Animal Species:** Potential to contribute to a cumulative impact on nesting or breeding birds under the MBTA.	**Visual/Aesthetics:** No cumulative impact. **Animal Species:** Potential to contribute to a cumulative impact on nesting or breeding birds under the MBTA.	No measures beyond the project-specific measures listed above.

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2.4 Identification of a Preferred Alternative

2.4.1 Rationale for Identifying Preferred Alternative

The TSM/TDM Alternative has been identified as the Preferred Alternative. This final determination is based on the engineering and environmental technical analysis, the project's impact on the environment, and the comments and concerns expressed during the public review period.

This Final EIR/EIS was prepared to address all public comments and incorporate any refinements made to the project design, environmental setting and impacts that have been identified since the Draft EIR/EIS and Focused RDEIR/SDEIS was completed.

After comparing and weighing the benefits and impacts of the study alternatives summarized in Table ES-1 of the Final EIR/EIS; reviewing the comments received during the public circulation of the Draft EIR/EIS and Focused RDEIR/SDEIS; and completing technical studies and performance evaluations for each of the alternatives, the Freeway Tunnel Alternative with Single Bore Tunnel design variation was determined to provide operational benefits. However, with the lack of funding and the lack of community consensus, the Single Bore Tunnel Alternative, estimated at $3.15 billion, cannot be accomplished successfully within a reasonable period of time to achieve all aspects of the project purpose and need.

The TSM/TDM Alternative would attain the purpose and need of the project, as discussed in Section 1.2 of this Final EIR/EIS and would improve local traffic operations, mobility and accessibility and enhance modal choice while accommodating planned growth within the study area and minimizing environmental impacts. The TSM/TDM Alternative would provide direct benefits for traffic circulation on local arterials and some benefit to the regional freeway and transit networks resulting from the following improvements:

- Signal optimization
- Local street and intersection improvements
- Transit service improvements
- Bus service enhancements
- Bicycle facility improvements

The TSM/TDM Alternative consists of relatively small capital cost investments with low impacts that include operational improvements and strategies that increase the efficiency and capacity of the existing transportation system, while reducing the effects of localized bottlenecks and chokepoints. The TSM component of this alternative includes Intelligent Transportation Systems (ITS), local street and intersection improvements and Active Traffic Management (ATM) throughout the study area. The TDM component of the alternative includes expanded bus service, bus service improvements and bicycle facility improvements throughout the study area. The TSM/TDM Alternative also encourages automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system.

The TSM/TDM Alternative has the fewest number of freeway segments that would be adversely affected and is tied with the BRT Alternative for the lowest number of total intersections and freeway segments adversely affected.[1]

Please note the following list of additional factors for supporting the identification of the Preferred Alternative is not in order of importance and does not represent all of the benefits or impacts associated with the Preferred Alternative.

- **Community Impact Factors**
  - The Preferred Alternative is generally consistent with the Pasadena, Rosemead, San Gabriel, San Marino, and South Pasadena General Plans and most of the local jurisdictions' Specific Plans as discussed in Section 3.1.2 of the Final EIR/EIS.
  - The Preferred Alternative would have the lowest overall adverse effects related to property acquisitions and it would not displace any residents or residential land uses.
  - The Preferred Alternative would have the least number of historic resource impacts when compared to all of the other build alternatives.
- **Local Traffic Circulation Factors**
  - The Preferred Alternative includes signal optimization on corridors with signal coordination hardware already installed as a part of LA County's Traffic Signal Synchronization Program (TSSP). The corridors include Del Mar Avenue, Rosemead Boulevard, Temple City Boulevard, Santa Anita Avenue, Fair Oaks Avenue, Fremont Avenue, and Peck Road.
    - The Intelligent Transportation Systems (ITS) improvements (traffic signal upgrades and synchronization, transit signal prioritization, changeable message signs and detection systems) provide incremental benefits that are independent of any capital transportation improvements.
  - The Preferred Alternative includes local street and intersection improvements within the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, and San Marino.
    - Intersection improvements will reduce delay at individual intersections regardless of other local or regional transportation projects.
  - The Preferred Alternative includes transit service improvements by enhanced bus headways between 10 and 30 minutes during the peak hour and between 15 and 60 minutes during the off-peak period. Some of the bus service enhancements almost double existing bus service.
    - The expanded bus service can be implemented incrementally to provide increased transit service for existing and future users.
  - The Preferred Alternative includes bicycle facility improvements that consist of on-street Class III bicycle facilities that support access to transit facilities throughout the study area; in addition to expanded bicycle parking facilities at existing Metro Gold Line stations.

[1] Depending on the design and operational variation, the Tunnel Alternative could have 2 fewer total intersections and freeway segments adversely impacted or could have up to 16 more total intersections and freeway segments adversely impacted.

  - The expanded bicycle network will enhance access to both local destinations and the regional transit system.

- **Natural Resource Factors**
  - The Preferred Alternative does not impact any State jurisdictional wetlands or any Federal or Regional jurisdictional drainages.
- **Economic and Fiscal Factors**
  - The construction cost estimate for the Preferred Alternative is approximately $105 million and can be funded utilizing existing resources, unlike the single bore freeway tunnel that is estimated to cost approximately $3.15 billion and subject to local fund restrictions. (Use of Measure M funds to construct a 710 tunnel is prohibited.)
  - Available funding for the Preferred Alternative includes local Measure R funds.
  - A process is underway for community consensus to be achieved for the expenditure of $105 million from Measure R funds for the preferred alternative.

For the above reasons, the Preferred Alternative has also been identified as the Environmentally Superior Alternative (pursuant to CEQA).

2.5 Alternatives Considered but Eliminated from Further Discussion Prior to Draft EIR/EIS

2.5.1 Alternative Screening

During the preliminary studies for the SR 710 North Project, a wide range of possible transportation alternatives were evaluated. Alternatives were identified based on past studies and comments received from stakeholders, including elected officials, city and agency staff, and the community. The resulting options were evaluated and refined through a sequential screening process (including preliminary, initial, and secondary screenings) to identify the alternatives that best meet the Need and Purpose of the study. The screening process was detailed in the *Alternatives Analysis Report* (December 2012) and is summarized below.

- **Preliminary Screening:** An unscreened set of alternatives was identified during project initiation through a process that included a review of prior studies and public input received during the "710 Conversations" scoping process conducted by Metro and Caltrans in 2011. From this large set of alternatives, the preliminary screening step led to the identification of the preliminary set of alternatives, consisting of 42 alternatives representing a reasonable range of modes and alignments. Criteria used for the preliminary screening included the potential to accommodate regional north-south travel, reduce local street congestion, minimize community impacts, minimize the potential to encounter contaminated soil and groundwater, and accommodate ridership potential (for relevant modes). Within each travel mode, alternatives were evaluated against each other, and the most promising alternatives from each mode were selected to be included in the preliminary set of alternatives.
- **Initial Screening:** The initial screening evaluated the preliminary set of alternatives based on eight project objectives. In general, the initial screening relied on available data and schematic representations of each alternative. To find the best performing alternatives within each mode in the initial screening, the performance of each alternative was compared only to that of other

alternatives of the same mode. This evaluation step resulted in the identification of the initial set of alternatives (consisting of 12 alternatives and representing each mode from the preliminary set of alternatives) which were carried forward for a secondary screening.

- **Secondary Screening:** In the secondary screening step of the alternatives analysis phase, the initial set of alternatives were studied and evaluated using detailed performance measures reflecting the eight project objectives. Additional engineering and environmental evaluation of each alternative was conducted based on travel demand and ridership forecasting specific to each alternative and the conceptual-level engineering plans. One alternative in each mode that performed best on the secondary screening was brought forward for further study in this EIR/EIS.

As stated above, 12 alternatives were identified and studied as part of the secondary screening in the *Alternatives Analysis Report* (December 2012). The 12 alternatives included the No Build Alternative, the TSM/TDM Alternative, 2 BRT alternatives (BRT-1 and BRT-6), 2 LRT alternatives (LRT-4A and LRT-6), 4 freeway alternatives (F-2, F-5, F-6, and F-7), and 2 highway alternatives (H-2 and H-6). In addition, one BRT design variation (BRT-6A) and two LRT design variations (LRT-4B and LRT-4D) were analyzed. Alternatives BRT-1, BRT-6A, LRT-4B, LRT-4D, LRT-6, F-2, F-5, F-6, H-2, and H-6 were considered but withdrawn from further environmental study as stand-alone alternatives, and are described below. The remaining alternatives (No Build, TSM/TDM, BRT-6, LRT-4A/B, and F-7) were refined and carried forward for further study in this EIR/EIS.

2.5.1.1 Alternative BRT-1

Alternative BRT-1 would provide BRT service between Los Angeles Union Station and the Jet Propulsion Laboratory (JPL) in La Cañada Flintridge.

Among the BRT alternatives evaluated in the *Alternatives Analysis Report* (December 2012), the measures for the objectives related to transportation system performance were similar to one another and did not clearly favor one alternative over the others. However, Alternative BRT-1 would require ROW acquisition and would also have a greater potential impact on sensitive habitat. Therefore, Alternative BRT-1 was dropped from further consideration.

2.5.1.2 Alternative BRT-6A

Alternative BRT-6A is a design variation of Alternative BRT-6 but with a different terminal loop than Alternative BRT-6. Instead of traveling both eastbound and westbound on Colorado Boulevard, Alternative BRT-6A would travel only eastbound on Colorado Boulevard and then return westbound on California Boulevard after stopping at Pasadena City College and Caltech.

Among the BRT alternatives evaluated in the *Alternatives Analysis Report* (December 2012), the measures for the objectives related to transportation system performance were similar to one another and did not clearly favor one alternative over the others. Therefore, Alternative BRT-6A was dropped from further consideration.

2.5.1.3 Alternative LRT-4B

Alternative LRT-4B was developed as a design variation of Alternative LRT-4A to reduce the length of the bored tunnel section. Alternative LRT-4B would originate and end at the same locations as Alternative LRT-4A. However, instead of entering a tunnel near the SR 710 terminus at Valley Boulevard, it would remain elevated along Mission Road and Palm Avenue in Alhambra, before entering a tunnel near Main Street. Alternative LRT-4B would have greater construction impacts compared to Alternative LRT-4A because of the location of the tunnel portal in a residential area, far from any freeway access. In addition, the tight curve from Mission Road to Palm Avenue would have resulted in lower design speeds, reducing the operating efficiency and attractiveness of the system to potential riders. Therefore, Alternative LRT-4A was dropped from further consideration.

2.5.1.4 Alternative LRT-4D

Alternative LRT-4D was developed as a design variation of Alternative LRT-4A to eliminate the bored tunnel section and use only cut-and-cover tunnel techniques. Alternative LRT-4D would originate at an underground station beneath Beverly Boulevard, near the existing Atlantic Station on the Metro Gold Line, and end at an underground station beneath the existing Fillmore Station on the Metro Gold Line.

Among the LRT alternatives evaluated in the *Alternatives Analysis Report* (December 2012), the measures for the objectives related to transportation system performance were similar to one another. However, on the measures for the objectives related to environmental and other concerns, Alternative LRT-4D would have greater property impacts compared to Alternatives LRT-4A and LRT-4B. Therefore, Alternative LRT-4D was dropped from further consideration.

2.5.1.5 Alternative LRT-6

Alternative LRT-6 would connect the existing Atlantic and Fillmore stations on the Metro Gold Line. Alternative LRT-6 would begin at an aerial station on Atlantic Boulevard near Pomona Boulevard and terminate with a new, elevated station above the existing Fillmore Station on the Metro Gold Line. The alternative would consist of at-grade and aerial segments.

Among the LRT alternatives evaluated in the *Alternatives Analysis Report* (December 2012), the measures for the objectives related to transportation system performance were similar to one another. However, on the measures for the objectives related to environmental and other concerns, Alternative LRT-6 was clearly inferior to Alternative LRT-4A/B. Alternative LRT-6 would require the acquisition of hundreds of properties, impact more historic period properties, and impact more community facilities. Therefore, Alternative LRT-6 was dropped from further consideration.

2.5.1.6 Alternative F-2

Alternative F-2 would originate at the existing SR 710 stub north of I-10 and connect to SR 2 between the Verdugo Road and SR 134 interchanges. The alternative would be an eight-lane freeway primarily constructed in two bored tunnels. Each tunnel would be dedicated to either northbound or southbound travel, with two lanes on each of two levels in each tunnel.

Among the freeway alternatives, Alternative F-7 was superior to Alternative F-2 on the measures for the objectives related to transportation system performance. In addition, Alternative F-2 would require over 300 property acquisitions. Therefore, Alternative F-2 was dropped from further consideration.

2.5.1.7 Alternative F-5

Alternative F-5 would also originate at the existing SR 710 stub north of I-10, similar to Alternative F-2, and connect to SR 134 near the Colorado Boulevard interchange. Alternative F-5 would also be an eight-lane freeway with two bored tunnels for directional travel similar to Alternative F-2. Alternative F-2 would provide access to the SR 134/SR 710 interchange both to and from SR 134 for both eastbound and westbound travel and interchange access to Valley Boulevard.

Among the freeway alternatives, Alternative F-7 was superior to Alternative F-5 on the measures for the objectives related to transportation system performance. In addition, Alternative F-5 would require over 200 property acquisitions. Therefore, Alternative F-5 was dropped from further consideration.

2.5.1.8 Alternative F-6

Alternative F-6 would also originate at the existing SR 710 stub north of I-10, but would consist of a combination of surface and depressed freeway segments, ultimately connecting to the existing SR 710 stub south of the I-210/SR 134 interchanges in Pasadena. Generally, Alternative F-6 would follow a very similar alignment to the "Meridian Variation" approved in the ROD in 1998. Ramps would provide access to the freeway from Valley Boulevard, Mission Road/Alhambra Avenue, Huntington Drive, and Del Mar Boulevard. Senate Bill 416, which was signed into law in 2014, mandated that Alternative F-6 no longer be deemed a feasible alternative.

Among the freeway alternatives, Alternative F-6 performed well on measures for the objectives related to transportation system performance. However, Alternative F-6 would have required over 400 property acquisitions in addition to properties that Caltrans already owns. Alternative F-6 would have also impacted more historic period properties and community facilities than Alternative F-7. Therefore, Alternative F-6 was dropped from further consideration.

2.5.1.9 Alternative H-2

Alternative H-2 would begin at the existing SR 710 stub north of I-10 and connect SR 710 directly to Concord Avenue. SR 710 would come to an end at Valley Boulevard and transition to a major arterial that would travel over Valley Boulevard, the UPRR tracks, and Mission Road/Alhambra Avenue to Concord Avenue. The alignment would ultimately end near the intersection of San Rafael Avenue and Linda Vista Avenue.

None of the highway alternatives evaluated in the *Alternatives Analysis Report* (December 2012) performed well on the measures for objectives related to transportation system performance. They also performed poorly on the measures for objectives related to environmental and other concerns. Alternative H-2 would require over 600 property acquisitions. Therefore, Alternative H-2 was dropped from further consideration.

2.5.1.10 Alternative H-6

Alternative H-6 would also begin at the existing SR 710 stub north of I-10 and connect SR 710 directly to Sheffield Avenue. SR 710 would come to an end at Valley Boulevard and transition to a major arterial that would travel over Valley Boulevard, the UPRR tracks, and Mission Road/Alhambra Avenue to Sheffield Avenue. The alignment would then continue to Huntington Drive, to Fair Oaks Avenue, to Columbia Street, and then to Pasadena Avenue. Just north of the intersection of Pasadena Avenue and Bellefontaine Street, the roadway would split into a northbound segment along Pasadena Avenue and a southbound segment along St. John Avenue. The improvements in both directions would end near Del Mar Boulevard.

None of the highway alternatives evaluated in the *Alternatives Analysis Report* (December 2012) performed well on the measures for objectives related to transportation system performance. They also performed poorly on the measures for objectives related to environmental and other concerns. Alternative H-6 would require approximately 200 property acquisitions. In addition, Alternative H-2 would have the greatest potential impact to historic resources and designated historic districts/ buildings. Therefore, Alternative H-6 was dropped from further consideration.

2.5.2 Alternatives Withdrawn after the Alternatives Analysis

2.5.2.1 LRT Design Variations for the Southern Segment

Based on stakeholder feedback, two LRT design variations for constructing the LRT alignment within a tunnel in the southern portion of the alignment were evaluated, one under Mednik Avenue and one connecting to the Atlantic Station near Beverly Boulevard. Besides the additional expense of constructing a tunnel, launching the TBMs for either of these alignments would involve substantial ROW acquisition and traffic impacts. In addition, the tunnel configurations pose substantial design challenges due to the grade change around Corporate Center Drive, which would require substantial excavation of the adjacent hill. Therefore, a tunnel along the southern portion of the LRT alignment was dropped from further consideration.

2.5.2.2 Combined LRT/BRT Alternative

A combined LRT/BRT Alternative would include both an LRT alignment and a BRT alignment, providing both LRT and BRT transit service options in the corridor. While the alignments of the BRT and LRT are not identical, they serve similar markets. This alternative concept was withdrawn from further consideration because the two transit services would compete for the same customers. The analysis of the LRT and BRT Alternatives conducted individually for each service indicated that some of the new ridership would be drawn from existing transit services (especially bus). A new LRT or BRT service would provide transit mode and route choice options for existing transit customers. Because they compete for the same customers, a combined LRT/BRT Alternative would result in fewer transit trips than the sum of the two services individually. The capital and operational costs would be the sum of the two alternatives.

2.6 Permits and Approvals Needed

Depending on the Alternative, some or all of the permits, reviews, and approvals listed in Table 2.16 would be required for project construction and operation. The permits, reviews, and approvals identified in Table 2.16 apply to all Build Alternatives unless noted otherwise.

TABLE 2.16:
Permits, Reviews, and Approvals Required for Project Construction

Agency	Permit/Approval	Timing	Does it apply to the Build Alternative? (• indicates the permit or approval would likely be required)			
			TSM/TDM (PREFERRED ALTERNATIVE)	BRT	LRT	Freeway Tunnel
FEDERAL AGENCIES						
Federal Highway Administration (FHWA)	Approval for Modified Access Report to the Interstate System	Obtained prior to project approval.				●
	Major Project Operational Independence and Non-Concurrent Construction Determination	Obtained prior to Final EIR/EIS.				●
	Cost Estimate Review (only for FHWA projects over $500 million)	Obtained prior to Final EIR/EIS.				●
	Draft Project Management Plan	Obtained prior to Final EIR/EIS.				●
	Final Project Management Plan	Obtained no later than 90 days after approval of the Record of Decision.				●
Federal Transit Administration (FTA)	New Starts Application Approval	Obtained prior to Final EIR/EIS.			●	
	Full Funding Grant Agreement	Obtained prior to completion of final design.			●	
	Small Starts Application Approval	Obtained prior to Final EIR/EIS.		●		
United States Army Corps of Engineers (USACE)	Section 404 Permit for filling or dredging waters of the United States	Obtained during final design.				●
STATE AGENCIES						
California Department of Fish and Wildlife (CDFW)	1602 Agreement for Streambed Alteration	Obtained during final design.				●
State Water Resources Control Board (SWRCB)	Section 402 NPDES Permit (Construction Activity)	Obtained during final design.	●	●	●	●
	Section 402 NPDES Permit (Caltrans NPDES Permit)	Obtained during final design.				●
	Section 402 NPDES Permit (Industrial Activities)	Obtained during final design.	●	●	●	
State Historic Preservation Officer (SHPO)	Concurrence with the determinations of eligibility	Received on February 26, 2015 and November 9, 2017	●	●	●	●
	Concurrence on the Finding of Adverse Effects	Received on May 3, 2018	●	●	●	●
	Memorandum of Agreement	Executed on October 18, 2018				
California Division of Occupational Safety and Health (Cal/OSHA)	Approval of construction permit	Obtained prior to construction.	●	●	●	●
Department of Toxic Substances Control (DTSC)l	Permits for disposal, treatment, and/or handling of hazardous materials encountered during excavation activities.	Obtained during final design.	●	●	●	●

TABLE 2.16:
Permits, Reviews, and Approvals Required for Project Construction

Agency	Permit/Approval	Timing	Does it apply to the Build Alternative? (• indicates the permit or approval would likely be required)			
			TSM/TDM (PREFERRED ALTERNATIVE)	BRT	LRT	Freeway Tunnel
California Public Utilities Commission	Compliance with California Public Utilities Code Sections 1201 et al (CPUC authority to construct rail crossings)	Obtained during final design.			●	
	Compliance with California Public Utilities Code Sections 2111, 2122, and 99152 (rail transit safety)	Obtained during final design.			●	
	Compliance with CPUC Rules of Practice and Procedure (Formal Application process for construction or modification of a public rail crossing)	Obtained during final design.			●	
	Compliance with CPUC General Orders (GOs) including but limited to: GO 26-D, 72-B, 75-D, 88-B, 95, 118, 128, 143-B, and 164-D	Obtained during final design.			●	
	Compliance with the California Manual on Uniform Traffic Control Devices (2014) for railroad and light rail transit grade crossings	Obtained during final design.			●	
	Compliance with federal regulations including: Title 49 Code of Federal Regulations (CFR) Parts 213, 214, 236, and 37	Obtained during final design.			●	
REGIONAL AND/OR LOCAL AGENCIES AND UTILITIES						
County of Los Angeles Department of Public Works (LADPW)	Approval of encroachment permits	Prior to any construction that would affect LADPW facilities	●	●	●	●
	Approvals to relocate, protect-in-place, or remove LADPW facilities	Prior to any construction that would affect LADPW facilities	●	●	●	●
Regional Water Quality Control Board (RWQCB)	Section 401 Water Quality certification	Obtained during final design.				●
	Section 402 NPDES (Groundwater Dewatering)	Obtained during final design.	●	●	●	●
	Approval of waste discharge requirements	Obtained during final design.	●	●	●	●
	Approval of encroachment permits	Obtained during final design.	●	●	●	●
Cities of Alhambra, Los Angeles, Pasadena, and South Pasadena	Modifications to existing freeway agreements	Obtained prior to construction.				●
County of Los Angeles and the Cities of Alhambra, Los Angeles, Monterey Park, Pasadena , Rosemead, San Gabriel, San Marino, and South Pasadena	Approval of encroachment permits, street construction permits, street closures, detours, and associated improvements in the public ROW	Obtained prior to construction.	●	●	●	●

TABLE 2.16:
Permits, Reviews, and Approvals Required for Project Construction

Agency	Permit/Approval	Timing	Does it apply to the Build Alternative? (• indicates the permit or approval would likely be required)			
			TSM/TDM (PREFERRED ALTERNATIVE)	BRT	LRT	Freeway Tunnel
Cities of Alhambra, Los Angeles, and Pasadena; County of Los Angeles Sanitation District; and County of Los Angeles Flood Control District	Approvals for discharges into drainage and sewer systems required under MS4 Permits related to groundwater dewatering, if groundwater contamination is present	Obtained prior to construction.			●	●
County of Los Angeles, and the Cities of Alhambra, Los Angeles, Monterey Park, Pasadena, and South Pasadena	Demolition permits	Obtained prior to demolition.	●	●	●	
City of Monterey Park	Section 4(f) consultation for Cascades Park	Obtained prior to the Final EIR/EIS.		●		
	Park Preservation Act consultation for Cascades Park	Obtained prior to the Final EIR/EIS.		●		
Utility Providers (electrical, water, storm drain, telecommunications, sanitary sewer, natural gas)	Approvals to relocate, protect in-place, or remove utility facilities	Prior to any construction activities that would affect utility facilities.	●	●	●	●
	Approval of encroachment permits	Prior to any construction activities that would affect utility facilities.	●	●	●	●
	Approval of connections to existing utility facilities	Prior to initiation of construction			●	●
	Approval of connections to existing utility facilities	Prior to initiation of operations			●	●
Union Pacific Railroad Company (UPRR)	Memorandum of Understanding and a Construction and Maintenance Agreement with the railroad	Prior to any construction within, above, or below railroad ROW.	●		●	●
Southern California Regional Rail Authority (SCRRA)	Approval of ROW encroachment permits	Prior to any construction above SCRRA railroad ROW.			●	●

3. Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Chapter 3 describes the existing affected environment in the study area for the State Route 710 (SR 710) North Project. The affected environment is the base environmental condition on which environmental effects of the Build Alternatives are evaluated.

The sections in Chapter 3 include the regulatory setting applicable to the environmental topic, the methodology of impact analysis, a description of the affected environment, environmental effects resulting from the No Build and Build Alternatives, and measures to avoid, minimize, or mitigate adverse impacts of the Build Alternatives. Tables and figures are included throughout Chapter 3 to support the impact analyses.

The California Environmental Quality Act (CEQA) Analysis is contained in Chapter 4. The environmental conditions existing in 2011, when the Notice of Preparation (NOP) was issued, served as the baseline for impact analysis evaluated in this environmental document.

The National Environmental Policy Act (NEPA) uses the terms impact, effect, and consequences synonymously. For an action to affect the environment it must have a causal relationship with the environment. NEPA distinguishes three types of causal impacts: direct, indirect, and cumulative, as follows:

- **Direct Impact:** A direct impact or effect is caused by the proposed action and occurs at the same time and place (40 Code of Federal Regulations [CFR] 1508.8).
- **Indirect Impact:** An indirect impact or effect is caused by the action and occurs later in time or farther removed in distance, but is still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, as well as related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8).
- **Cumulative Impact:** A cumulative impact or effect is an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Section 1508.7).

Sections 3.1 through 3.25 in this Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) analyze the permanent and temporary direct and indirect impacts of the No Build and Build Alternatives. The evaluation of the potential effects of the No Build and Build Alternatives provided in this chapter was conducted by comparing the proposed alternatives to the baseline conditions. For most environmental topics, the baseline used in the impact evaluation is the existing conditions in the study area. For several environmental topics (traffic, air quality, noise, and energy), the evaluation focuses on a baseline using future No Build conditions (2035 Build Out and/or 2020/2025 Opening Year) because those comparisons provide for the most appropriate consideration of effects. The contribution of the Build Alternatives to cumulative effects is analyzed in Section 3.25 in this Final EIR/EIS. Sections 3.1 through 3.25 cover the following topics:

- 3.1 Land Use
- 3.2 Growth
- 3.3 Community Impacts
- 3.4 Utilities/Emergency Services
- 3.5 Traffic and Transportation/Pedestrian and Bicycle Facilities
- 3.6 Visual/Aesthetics
- 3.7 Cultural Resources
- 3.8 Hydrology and Floodplain
- 3.9 Water Quality and Storm Water Runoff
- 3.10 Geology/Soils/Seismic/Topography
- 3.11 Paleontology
- 3.12 Hazardous Waste/Materials
- 3.13 Air Quality
- 3.14 Noise and Vibration
- 3.15 Energy
- 3.16 Natural Communities
- 3.17 Wetlands and Other Waters
- 3.18 Plant Species
- 3.19 Animal Species
- 3.20 Threatened and Endangered Species
- 3.21 Invasive Species
- 3.22 Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity
- 3.23 Irreversible and Irretrievable Commitments of Resources That Would be Involved in the Proposed Project
- 3.24 Construction Impacts
- 3.25 Cumulative Impacts

As part of the scoping and environmental analyses carried out for the project, the following environmental issues were considered but no adverse impacts were identified. As a result, there is no further discussion regarding these resources in this document:

- **Farmlands and Timberlands:** There are no timberlands or prime, unique, or soils of local significance for farmlands in the study area.
- **Wild and Scenic Rivers:** There are no rivers listed in the National Inventory of Wild and Scenic Rivers in the study area.
- **Coastal Zone:** The study area is not located in the Coastal Zone.

HUMAN ENVIRONMENT

3.1 Land Use

The potential for the proposed project to result in impacts related to land use is provided in this section based on analyses in the *Community Impact Assessment* (CIA) (2014), the *Draft Relocation Impact Report* (DRIR) (2014), and the *Final Relocation Impact Report* (FRIR) (2018).

3.1.1 Existing and Future Land Uses

3.1.1.1 Affected Environment

The study area for existing and General Plan land uses that could potentially be directly affected by the proposed project was defined as the 9 cities, 3 neighborhoods, and 3 unincorporated communities in which physical improvements in the Build Alternatives would be constructed. A larger area was also considered in these analyses so as to evaluate a broader area's potential to be affected by the project. That larger study area extends across 20 cities, 7 neighborhoods, and 8 unincorporated communities in Los Angeles County.

Existing Land Uses

The land use study area and the existing land uses in the study area by jurisdiction are shown on Figure 3.1-1. The existing land uses in the study area described by jurisdiction in Table 3.1.1 include a wide range of residential, commercial, public, and institutional uses. (Please note that the tables and figures cited in this section are provided following the last page of text in this section.)

Planned Land Uses

Figure 3.1-2 shows the General Plan land use designations by jurisdiction in the study area. The General Plan land uses in the study area (which are summarized in Table 3.1.1) include a wide range of residential, commercial, public, and institutional uses.

Development Trends

Planned and approved transportation and land development projects in the study area are listed in Table 3.25.1 and are shown on Figure 3.25-1 in Section 3.25, Cumulative Impacts. Section 3.2, Growth, provides a detailed discussion of forecasted growth in Los Angeles County and the cities in the study area. As described in Section 3.2, the cities and communities in the study area are forecasted to experience various rates of growth in population, households, and employment between 2008 and 2035. In general, the study area includes cities and communities that are largely built out as well as cities and communities with vacant land and opportunities for infill development.

3.1.1.2 Environmental Consequences

Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the State Route 710 (SR 710) North Project Build Alternatives. As a result, the No Build Alternative would not result in short-term effects related to existing or General Plan land uses and short-term losses of parking associated with improvements in the Build Alternatives.

Build Alternatives

The acquisition data presented in this section of the report is based on the information presented in the Draft Relocation Impact Report (DRIR) (2014), which analyzed right-of-way (ROW) impacts to residential and nonresidential properties on all alternative alignments, and the Final Relocation Impact Report (FRIR) (2018), which focused on the impacts of the Preferred Alternative (see more detailed information in Section 3.3.2, Relocation and Real Property Acquisition).

All the Build Alternatives would result in direct, temporary, construction-related effects on existing land uses, including business and neighborhood disruptions during construction that may include disruption of local traffic patterns, access to homes and businesses, and increased traffic congestion, noise, vibration, and dust. Temporary land use impacts would also include the use of privately owned properties for temporary construction easements (TCEs). At the completion of construction, land used for TCEs would be returned to its original condition after construction. As a result, the TCEs are not expected to adversely affect existing or planned land uses on those parcels. The TCEs anticipated to be required during construction of the Build Alternatives and the short-term parking impacts that would occur during construction of the Build Alternatives are described below.

TSM/TDM Alternative

The TCEs required during construction of the Transportation System Management/ Transportation Demand Management (TSM/TDM) Alternative are shown on Figure 3.3-9 in Appendix L. The TSM/TDM Alternative would require TCEs on approximately 16 parcels in Alhambra, El Sereno, Pasadena, San Gabriel, and South Pasadena as indicated in the FRIR (2018). The TSM/TDM Alternative would not result in short-term impacts to on- or off-street parking.

BRT Alternative

The TCEs required during construction of the Bus Rapid Transit (BRT) Alternative are shown on Figure 3.3-10 in Appendix L. The BRT Alternative would require TCEs on approximately 36 parcels in Alhambra, East Los Angeles, Monterey Park, Pasadena, and South Pasadena. The BRT Alternative would not result in short-term impacts to on- or off-street parking.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to Interstate 10 [I-10]). Therefore, construction of the BRT Alternative would also require the same TCEs as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would require TCEs on approximately 52 parcels and would not result in short-term impacts to on- or off-street parking. None of the short-term impacts related to land use anticipated to occur during construction of the BRT Alternative would be adverse.

LRT Alternative

The TCEs required during construction of the Light Rail Transit (LRT) Alternative are shown on Figure 3.3-11 in Appendix L. The LRT Alternative would require TCEs on approximately 13 parcels in Alhambra, El Sereno, and Monterey Park.

Construction of the LRT Alternative improvements would result in the temporary loss of approximately 240 parking spaces in East Los Angeles, Monterey Park, Pasadena, and South Pasadena. These include approximately 128 on-street parking spaces along Mednik Avenue in East Los Angeles, approximately 26 on-street parking spaces along Floral Drive in Monterey Park and East Los Angeles, approximately 30 on-street parking spaces along Huntington Drive and Fair Oaks Avenue in the vicinity of the Huntington Station site in South Pasadena, approximately 30 on-street parking spaces in the vicinity of the South Pasadena Station site in South Pasadena, and approximately 26 on-street parking spaces on Raymond Avenue in the vicinity of the Fillmore Station site in Pasadena. Once construction is completed, each of the approximately 240 parking spaces would be restored and available for use during all hours.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, construction of the LRT Alternative would also require most of the same TCEs as the TSM/TDM Alternative, but would not require TCEs on approximately 3 parcels in Alhambra and El Sereno.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would require TCEs on approximately 26 parcels and would result in the temporary loss of approximately 240 on-street parking spaces. None of the short-term impacts related to land use and parking anticipated to occur during construction of the LRT Alternative would be adverse.

Freeway Tunnel Alternative

The TCEs required during construction of the single-bore and dual-bore design variations of the Freeway Tunnel Alternative are shown on Figures 3.3-12 and 3.3-13, respectively, in Appendix L. The single-bore design variation would require TCEs on approximately 52 parcels in Alhambra, El Sereno, and Pasadena, and the dual-bore design variation would require TCEs on approximately 47 parcels in Alhambra, El Sereno, and Pasadena.

Construction of both design variations of the Freeway Tunnel Alternative would result in the temporary loss of approximately 17 parking spaces on the Green Street Bridge over SR 710 in the City of Pasadena while that bridge is being reconstructed. Once the bridge reconstruction is complete, each of the approximately 17 parking spaces would be restored and available for use during all hours.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue extension between Del Mar Boulevard and California Boulevard). Therefore, construction of the Freeway Tunnel Alternative would also require most of the same TCEs as the TSM/TDM Alternative, but would not require TCEs on approximately 5 parcels in Alhambra, El Sereno, and Pasadena.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the single- and dual-bore design variations of the Freeway Tunnel Alternative would require TCEs on approximately 63 and 58 parcels, respectively. In addition, both design variations would result in the temporary loss of approximately 17 on-street parking spaces. None of the short-term impacts related to land use and parking anticipated to occur during construction of the Freeway Tunnel Alternative would be adverse.

Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in long-term effects related to General Plan land uses, included permanent easements, right of way (ROW) acquisition, and parking losses associated with improvements in the Build Alternatives.

Build Alternatives

Some of the Build Alternatives would require one or more types of permanent easements. Aerial easements would be required to accommodate elevated structures or overhead utility lines above a property. Surface easements would be required to accommodate structural foundations on a property. Subsurface easements would be required to accommodate underground utility lines or other underground structures not related to tunnels beneath a property. Tunnel easements would be required to accommodate tunnel structures beneath a property.

Each Build Alternative would result in the permanent acquisition and conversion of land currently planned for non-transportation uses into transportation uses, which would result in inconsistencies with land use designations in local jurisdictions' General Plans. If a Build Alternative is selected for implementation, those inconsistencies would exist until the applicable local General Plans are amended to reflect the use of the affected land for transportation improvements in the selected Build Alternative. Neither Metro nor Caltrans has land use planning authority, and neither has authority to require local jurisdictions to amend their General Plans. Therefore, it will be the decision of the affected local jurisdictions on how and when to address the identified General Plan land use inconsistencies. However, because it is generally desirable that the General Plans be consistent with existing conditions, Metro and Caltrans may request that the applicable local jurisdictions amend their General Plans to reflect the permanent use of land for the improvements included in the selected Build Alternative. The effects of the Build Alternatives related to permanent easements, General Plan land uses, and consistency with adopted plans are discussed in the following sections.

TSM/TDM Alternative

As shown on Figure 3.3-9 (provided in Appendix L), the TSM/TDM Alternative would require two permanent aerial easements related to bridge construction over the Union Pacific Railroad (UPRR) tracks near Mission Road in El Sereno and Alhambra. These easements would not interfere with or otherwise adversely affect the land uses below them.

The TSM/TDM Alternative would not result in changes to existing land use patterns along any of the roads where the physical improvements in this Alternative would be constructed because this Alternative would require only very minor permanent land acquisition that would not be expected to change the land uses in the adjacent areas.

Figure 3.3-9 (provided in Appendix L) also shows the ROW that would be permanently acquired for the TSM/TDM Alternative. Table 3.1.2 shows that approximately 0.6 ac of

General Plan designated land uses would be permanently converted to transportation uses under the TSM/TDM Alternative. The General Plan designated land uses that would be converted to transportation uses include small amounts of mixed urban, commercial/office, multifamily residential, public facilities, and single-family residential uses. As a result of the permanent acquisition of that land, the TSM/TDM Alternative would result in inconsistencies with the General Plan land use designations on the affected parcels in the Cities of Alhambra, Los Angeles, Pasadena, Rosemead, San Gabriel, and South Pasadena, and Los Angeles County. These General Plan inconsistencies would not result in any Adverse Effects on residents or facility users.

The TSM/TDM Alternative would result in two types of permanent on-street parking losses. Due to short-term parking restrictions, some parking spaces would be lost during weekday morning (between 7:00 a.m. and 9:00 a.m.) and afternoon (between 4:00 p.m. and 6:00 p.m.) peak periods. Other parking spaces would be lost permanently. Although the TSM/TDM Alternative would result in the permanent loss of approximately 26 on-street parking spaces in Alhambra during the weekday morning and afternoon peak periods and the permanent loss of approximately 220 on-street parking spaces in Alhambra, San Gabriel, San Marino, and South Pasadena during all hours, the remaining parking supply during the peak and non-peak periods would be greater than the existing parking demand in the vicinity of the parking losses.

BRT Alternative

The improvements in the BRT Alternative would not require any permanent easements.

The BRT Alternative would not result in changes to existing land use patterns along the roads in the jurisdictions in which physical improvements would be constructed because the BRT Alternative would require only very minor land acquisition that would not be expected to change the land uses in the adjacent areas.

Figure 3.3-10 (provided in Appendix L) shows the ROW that would be acquired for the BRT Alternative. As shown in Table 3.1.2, the BRT Alternative would permanently convert approximately 0.3 ac of General Plan designated commercial/office, mixed use, and multifamily residential uses to transportation uses. As a result of the permanent acquisition of that land, the BRT Alternative would result in inconsistencies with the land use designations in the Cities of Alhambra, Monterey Park, Pasadena, and South Pasadena, and the County of Los Angeles General Plans. These General Plan inconsistencies would not result in any Adverse Effects on residents or facility users.

Under the BRT Alternative, some on-street parking spaces would be lost during the weekday morning (between 7:00 a.m. and 9:00 a.m.) and afternoon (between 4:00 p.m. and 6:00 p.m.) peak periods due to short-term parking restrictions. Other parking spaces would be permanently lost. Although the BRT Alternative would result in the permanent loss of approximately 1,029 on-street parking spaces in Alhambra, East Los Angeles, Monterey Park, Pasadena, and South Pasadena during the weekday morning and afternoon peak periods and the permanent loss of approximately 114 on-street parking spaces in Alhambra, East Los Angeles, Monterey Park, Pasadena, and South Pasadena during all hours, the remaining parking supply during the peak and non-peak periods would be greater than the existing parking demand in the vicinity of the parking losses.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, operation of the BRT Alternative would also result in the permanent conversion of the same number of acres of General Plan designated land uses to transportation uses (approximately 0.6 ac) as the TSM/TDM Alternative. The operation of the BRT Alternative would also result in the permanent loss of the same number of on-street parking spaces during the weekday morning and afternoon peak periods (approximately 26 spaces) and during all hours (approximately 220 spaces) as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would result in the permanent conversion of approximately 0.9 ac of General Plan designated land uses to transportation uses, and the permanent loss of approximately 1,055 on-street parking spaces during the weekday morning and afternoon peak periods and approximately 334 on-street parking spaces during all hours. None of the long-term impacts related to land use and parking anticipated to occur during operation of the BRT Alternative would be adverse.

LRT Alternative

Figure 3.3-11 (provided in Appendix L) shows that the LRT Alternative would require permanent tunnel easements beneath approximately 183 parcels in Alhambra, El Sereno, Pasadena, and South Pasadena. The LRT Alternative would also require permanent aerial easements above approximately 12 parcels in East Los Angeles and Monterey Park, and permanent subsurface easements beneath approximately 1 parcel in Alhambra. None of these easements would interfere with or otherwise adversely affect the land uses above or below them.

The LRT Alternative would result in changes to existing land use patterns in the vicinity of the seven proposed light rail stations. Figure 3.3-11 in Appendix L also shows that all the ROW that would be acquired for the LRT Alternative would be in the station areas. Existing land uses on parcels that would be acquired would be replaced with light rail station entrances, platforms, power substations, parking areas, and other facilities associated with the LRT facilities. In addition, the Mednik Station includes space for retail and restaurant development under the aerial tracks and a station on the west side of Mednik Avenue, between Gleason Street and 3rd Street.

As shown in Table 3.1.2, the LRT Alternative would permanently convert approximately 18.0 ac of General Plan designated commercial/office, local parks, open space, and recreation, mixed commercial and industrial, multifamily residential, and public facility uses to transportation uses. As a result of the permanent acquisition of that land, the LRT Alternative would result in inconsistencies with the land use designations in the General Plans for the Cities of Alhambra, Los Angeles, Monterey Park, Pasadena, and South Pasadena, and the County of Los Angeles. These General Plan inconsistencies would not result in any Adverse Effects on residents or facility users.

The LRT Alternative improvements would result in the permanent loss of approximately four on-street parking spaces in the vicinity of the Huntington Station in the City of South Pasadena. Off-street parking provided at the Alhambra, Floral, Huntington, and South

Pasadena Stations is anticipated to exceed the projected demand for parking at each respective station. As such, no parking overflow from the proposed LRT stations is anticipated to occur in the vicinity of these stations. Parking will be provided for the restaurant and retail components of the Mednik Station to meet the anticipated demand of those uses. The adjacent on-street parking supply in the vicinity of the Mednik Station would be available in the event of on-site parking overflow.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, operation of the LRT Alternative would also result in the permanent conversion of the same number of acres of General Plan designated land uses to transportation uses (approximately 0.6 ac) as the TSM/TDM Alternative. The operation of the LRT Alternative would also result in the permanent loss of the same number of on-street parking spaces during the weekday morning and afternoon peak periods (approximately 26 spaces) as the TSM/TDM Alternative, but would only result in the permanent loss of approximately 85 on-street parking spaces during all hours.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would result in the permanent conversion of approximately 19.06 ac of General Plan designated land uses to transportation uses, and the permanent loss of approximately 26 on-street parking spaces during the weekday morning and afternoon peak periods and approximately 89 on-street parking spaces during all hours. None of the long-term impacts related to land use and parking anticipated to occur during operation of the LRT Alternative would be adverse.

Freeway Tunnel Alternative

Figure 3.3-12 (provided in Appendix L) shows that the single-bore design variation of the Freeway Tunnel Alternative would require permanent tunnel easements under approximately 324 parcels in El Sereno, Pasadena, and South Pasadena. The single-bore design variation would also require permanent footing easements on approximately 3 parcels in Alhambra and El Sereno and permanent subsurface easements for uses other than the tunnel (e.g., utility relocations) beneath approximately 32 parcels in Alhambra, El Sereno, and Pasadena. Permanent maintenance easements would be required to permit ongoing inspection and maintenance of the transportation improvement on 1 parcel in Alhambra.

Figure 3.3-13 (provided in Appendix L) shows that the dual-bore design variation of the Freeway Tunnel Alternative would require permanent tunnel easements under approximately 563 parcels in El Sereno, Pasadena, and South Pasadena. The dual-bore design variation would also require permanent subsurface easements for uses other than the tunnel (e.g., utility relocations) under approximately 41 parcels in Alhambra, El Sereno, and Pasadena. The dual-bore design variation would also require permanent footing easements on approximately 3 parcels in Alhambra and El Sereno. Permanent maintenance easements would be required to permit ongoing inspection and maintenance of the transportation improvements on 2 parcels in El Sereno and 1 parcel in Alhambra.

None of the permanent easements required under Freeway Tunnel Alternative design variations would interfere with or otherwise adversely affect the land uses above or below them.

The single-bore and dual-bore design variations of the Freeway Tunnel Alternative would not result in changes to existing land use patterns along any roads in the jurisdictions in which physical improvements would be constructed. This is because the Freeway Tunnel Alternative would require only minor land acquisition that would not be expected to change the land uses in the adjacent areas. As shown in Table 3.1.2 and on Figure 3.3-12 (provided in Appendix L), the ROW that would be acquired for the single-bore design variation of the Freeway Tunnel Alternative would permanently convert approximately 1.5 ac of land designated in General Plans for commercial/office, mixed urban, and public facility uses to transportation uses. Table 3.1.2 and Figure 3.3-13 (provided in Appendix L) show that the ROW that would be acquired for the dual-bore design variation of the Freeway Tunnel Alternative would permanently convert approximately 1.5 ac of land designated in General Plans for commercial/office, mixed urban, and public facility uses to transportation uses.

As a result of the permanent acquisition of land, the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would result in inconsistencies with the land use designations in the General Plans for the Cities of Alhambra and Los Angeles. These General Plan inconsistencies would not result in any Adverse Effects on residents or facility users.

The single-bore and dual-bore design variations of the Freeway Tunnel Alternative would not result in the permanent loss of any on-street parking spaces.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue extension between Del Mar Boulevard and California Boulevard). Therefore, operation of the Freeway Tunnel Alternative would also result in the permanent conversion of most of the same General Plan designated land uses to transportation uses as the TSM/TDM Alternative; however, neither design variation would result in the permanent conversion of 0.2 ac of General Plan designated land uses in Pasadena. The operation of the Freeway Tunnel Alternative would also result in the permanent loss of the same number of on-street parking spaces during the weekday morning and afternoon peak periods (approximately 26 spaces) as the TSM/TDM Alternative, but would only result in the permanent loss of approximately 85 on-street parking spaces during all hours.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the Freeway Tunnel Alternative would result in the permanent conversion of approximately 1.8 ac of General Plan designated land uses to transportation uses, and the permanent loss of approximately 26 on-street parking spaces during the weekday morning and afternoon peak periods and approximately 85 on-street parking spaces during all hours. None of the long-term impacts related to land use and parking anticipated to occur during operation of the Freeway Tunnel Alternative would be adverse.

3.1.1.3 Avoidance, Minimization, and/or Mitigation Measures

General Plan amendments would be required as a result of the incorporation of nontransportation General Plan-designated land into transportation facilities included in the Build Alternatives to ensure consistency with land uses as designated in the local General Plans. Measure LU-1, below, would mitigate the land use effects of the Build Alternatives by making the local General Plans consistent with the improvements in the selected Alternative.

Measure LU-1	**General Plans (applies to all four Build Alternatives):** The Build Alternatives would result in inconsistencies with local jurisdictions' General Plans and/or other local land use plans. If a Build Alternative is selected for implementation, the Los Angeles County Metropolitan Transportation Authority (for the TSM/TDM, BRT, and LRT Alternatives) and the California Department of Transportation (for the Freeway Tunnel Alternative) will request the applicable local jurisdictions to amend their General Plans and/or other local land use plans after the acquisition of land for the selected alternative to reflect the improvements in that Build Alternative.

3.1.2 Consistency with State, Regional, and Local Plans

3.1.2.1 Affected Environment

Regional Plans

The Southern California Association of Governments (SCAG) is the Metropolitan Planning Organization for Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial Counties. SCAG is mandated by the federal government to develop regional plans for transportation, growth management, hazardous waste management, and air quality.

The 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (SCAG 2012) is a comprehensive 20-year transportation plan that provides a vision for the future of the multimodal transportation system in the SCAG region and how that vision can be achieved. The 2012 RTP/SCS identifies major challenges and potential opportunities associated with growth, transportation finances, the future of airports in the region, and impending transportation system deficiencies that could result from growth projections for the region.

The following goals adopted by SCAG in the 2012 RTP/SCS are relevant to the SR 710 North Project:

- **Goal 2:** Maximize mobility and accessibility for all people and goods in the region.
- **Goal 3:** Ensure travel safety and reliability for all people and goods in the region.
- **Goal 4:** Preserve and ensure a sustainable regional transportation system.
- **Goal 5:** Maximize the productivity of our transportation system
- **Goal 6:** Protect the environment and health of residents by improving air quality and encouraging active transportation (non-motorized transportation such as bicycling and walking).

The Federal Clean Air Act requires all states to develop a general plan to attain and maintain the National Ambient Air Quality Standards (NAAQS) as well as a specific plan to attain the NAAQS for each area designated nonattainment for an NAAQS. These plans, known as State Implementation Plans (SIPs), are developed by state and local air quality management agencies and submitted to the United States Environmental Protection Agency (EPA) for approval. Federal law also requires that all federally funded projects and regionally significant projects (regardless of funding) must be listed in a Federal Transportation Improvement Program (FTIP). SCAG is responsible for preparing the FTIP for the region every 2 years.

The proposed project is listed in the 2016 financially constrained RTP/SCS which was approved by SCAG on April 7, 2016. FHWA and FTA made a regional conformity determination finding on December 16, 2016. The project is also included in the financially constrained 2017 FTIP, Amendment 17-19, which was approved on May 25, 2018 by FHWA and FTA.

The current project description in the 2016 RTP is inconsistent with the Preferred Alternative (Project ID: 1M0101 SR-710 NORTH PROJECT STUDY ALTERNATIVES (ALIGNMENT TBD)). As with other projects included within the Project List, when the SR-710 North Study EIR/EIS process is complete, the 2016 RTP/SCS will be updated to reflect the Preferred Alternative as identified in this Final EIR/EIS and would be consistent with the proposed RTP amendment. The TSM/TDM Alternative is consistent with the current 2017 FTIP.

Local Plans

The General Plans of the County of Los Angeles and each of the cities in the study area in which project improvements would be located were reviewed to understand the development trends, land use-related goals, and specific plan policies of those that could be affected by the project alternatives. The General Plan Land Use designations for the study area are shown on Figure 3.1-2 and the General Plan land uses are described in Table 3.1.1.

Although some of the cities and communities in the study area contain vacant land and/or opportunities for infill development, the majority of the study area consists of cities and communities with limited development opportunities. The following provides an overview of the study area local jurisdictions' General Plans, Specific Plans, and Community Plans that contain goals, objectives, and/or policies related to transportation improvements relevant to the proposed project (the specific language of all relevant goals, objectives, and/or policies is provided in Table 3.1.3):

- **City of Alhambra General Plan (1987), Circulation and Noise Element (1986):** The City of Alhambra Circulation Element contains 1 goal, 2 objectives, and 6 policies relevant to the SR 710 North Project. The Noise Element contains 1 goal and 1 policy relevant to the SR 710 North Project.
- **Valley Boulevard Corridor Specific Plan (1990, City of Alhambra):** The Valley Boulevard Corridor Specific Plan area encompasses approximately 130 acres (ac) along the entire length of Valley Boulevard in the City of Alhambra. This Specific Plan contains 3 program goals and 3 programs that are relevant to the SR 710 North Project.
- **City of Los Angeles General Plan (2014), Transportation Element (1997):** The City of Los Angeles General Plan Transportation Element contains 2 objectives and 12 policies relevant to the SR 710 North Project.
- **Northeast Los Angeles Community Plan (1999, City of Los Angeles):** The Northeast Los Angeles Community Plan area encompasses approximately 15,000 ac in northeastern Los Angeles, including several neighborhoods in the study area (Cypress Park, Eagle Rock, El Sereno, Glassell Park, Highland Park, and Lincoln Heights). This Community Plan contains 2 goals, 3 objectives, and 3 policies that are relevant to the SR 710 North Project.
- **County of Los Angeles General Plan (1980), Urban Form Policy and Transportation Policy (1980):** The County of Los Angeles General Plan Urban Form Policy contains 1 policy relevant to the SR 710 North Project. The Transportation Policy contains 4 policies relevant to the SR 710 North Project.
- **East Los Angeles Community Plan (1988, County of Los Angeles):** This Community Plan contains 1 goal and 1 policy that are relevant to the SR 710 North Project.
- **City of Irwindale General Plan Community Development Element (2008):** The City of Irwindale General Plan Development Element contains 1 issue area and 1 policy that are relevant to the SR 710 North Project.

- **City of Monterey Park General Plan Circulation Element (2001):** The City of Monterey Park General Plan Circulation Element contains 4 goals and 11 policies that are relevant to the SR 710 North Project.
- **City of Pasadena General Plan (2004), Mobility Element (2004), Land Use Element (2004), and Noise Element (2002):** The City of Pasadena General Plan Mobility Element contains 3 objectives and 9 policies, the Land Use Element contains 5 objectives and 9 policies, and the Noise Element contains 1 objective and 2 policies relevant to the SR 710 North Project.
- **Central District Specific Plan (2004, City of Pasadena):** The Central District Specific Plan area is generally bound by SR 710 on the west, Interstate 210 (I-210) on the north, one to two blocks east of Lake Avenue on the east, and the southern boundary is roughly defined by California Boulevard plus Arroyo Boulevard from State Route 110 (SR 110) to downtown. This Specific Plan contains 1 guiding principle and 2 objectives that are relevant to the SR 710 North Project.
- **East Colorado Boulevard Specific Plan (2003, City of Pasadena):** The East Colorado Boulevard Specific Plan area covers an area approximately 3 miles (mi) long, including most of the parcels with frontage on East Colorado Boulevard between Catalina Avenue and Sycamore Avenue. This Specific Plan contains 1 goal that is relevant to the SR 710 North Project.
- **South Fair Oaks Specific Plan (2002, City of Pasadena):** The South Fair Oaks Specific Plan area is generally located along the Fair Oaks Avenue and Raymond Avenue corridors between California Boulevard and State Street, and extends west to Pasadena Avenue between California Boulevard and Bellefontaine Street. This Specific Plan contains 2 goals that are relevant to the SR 710 North Project.
- **West Gateway Specific Plan (1998, City of Pasadena):** The West Gateway Specific Plan consists of the Vista Del Arroyo, Orange Grove/Colorado, and South De Lacey Corridor Sub-Areas. The Orange Grove/Colorado Sub-Area is bound by State Route 134 (SR 134) on the north, St. John Avenue on the east, Del Mar Boulevard on the south, and Orange Grove Boulevard on the west. The South De Lacey Corridor Sub-Area is bound by Green Street on the north, Fair Oaks Avenue on the east, Del Mar Boulevard on the south, and Pasadena Avenue on the west. This Specific Plan contains 2 guiding principles that are relevant to the SR 710 North Project.
- **City of Rosemead General Plan (2010), Circulation Element (2010), Resource Management Element (2010), and Noise Element (2008):** The City of Rosemead General Plan Circulation Element contains one goal and three policies, the Resource Management Element contains one goal and three policies, and the Noise Element contains one goal and one policy relevant to the SR 710 North Project.
- **City of San Gabriel General Plan, Mobility Chapter, Environmental Resources Chapter, and Community Design Chapter (2004):** The City of San Gabriel General Plan Mobility Chapter contains 3 goals and 8 targets, the Environmental Resources Chapter contains 1 goal and 1 target, and the Community Design Chapter contains 1 goal and 1 target that are relevant to the SR 710 North Project.
- **Valley Vision: Valley Boulevard Neighborhoods Sustainability Plan (2013, City of San Gabriel):** The Valley Boulevard Neighborhoods Sustainability Plan contains one transit improvement policy and one bicycle improvement policy relevant to the SR 710 North Project.
- **City of San Marino General Plan (2003), Circulation Element (1995):** The City of San Marino General Plan Circulation Element contains 6 goals that are relevant to the SR 710 North Project.

- **City of South Pasadena General Plan (2001), Circulation and Accessibility Element (2001), and Land Use and Community Design Element (1998):** The City of South Pasadena General Plan Circulation and Accessibility Element contains 3 goals, 5 policies, and 1 policy statement, and the Land Use and Community Design Element contains 3 goals and 6 policies that are relevant to the SR 710 North Project.
- **Mission Street Specific Plan (1996, City of South Pasadena):** The Mission Street Specific Plan is divided into the Core Area (between Fremont Avenue and Prospect Avenue and within easy walking distance of the Gold Line station) and the West Area (west of Prospect Avenue). This Specific Plan contains 1 intention that is relevant to the SR 710 North Project.

3.1.2.2 Environmental Consequences

No Build Alternative

Table 3.1.3 provides an analysis of the consistency/inconsistency of each alternative included in the SR 710 North Project with the relevant goals, objectives, and/or policies contained in the RTP/SCS and the General Plans, Specific Plans, and Community Plans adopted by the cities and communities in the study area in which one or more improvements included in the SR 710 North Project Build Alternatives are proposed. Each SR 710 North Project Build Alternative is analyzed against the relevant goals, objectives, and/or policies included in the plan documents adopted by the local jurisdictions in which improvements in that alternative are proposed. Where a potential inconsistency between an alternative and a relevant goal, objective, or policy has been identified in Table 3.1.3, a brief description of the reason for the inconsistency is provided.

The No Build Alternative would be generally consistent with the local jurisdictions' General Plans and Specific Plans because it would include projects/planned transportation improvements that would improve mobility in Los Angeles County in a manner that would be consistent with the policies, goals, and objectives included in those plans.

As shown in Table 3.1.3, the No Build Alternative would be inconsistent with specific individual policies and program goals in the City of Alhambra, Los Angeles County, and City of Monterey Park General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan because it does not provide for the extension of SR 710, promote the completion of gaps in freeways, provide for multimodal use of the freeway system, or maintain acceptable level of service (LOS) standards for some intersections in the study area.

The No Build Alternative also would not include the construction of a tunnel extension of SR 710 North with 4 toll lanes in each direction as described in the RTP/SCS and the FTIP. Therefore, the No Build Alternative would not be consistent with these regional plans related to improvements in the SR 710 corridor.

Build Alternatives

TSM/TDM Alternative

The TSM/TDM Alternative would be generally consistent with the Pasadena, Rosemead, San Gabriel, San Marino, and South Pasadena General Plans and most of the local jurisdictions' Specific Plans because it would provide transportation improvements consistent with the policies, goals, and objectives included in those plans. However, as shown in Table 3.1.3, the TSM/TDM Alternative would be inconsistent with specific individual policies and program goals in the City of Alhambra, City of Los Angeles, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan. To resolve these inconsistencies, Metro and Caltrans would request these jurisdictions to amend their land use plans to provide consistency between the TSM/TDM Alternative improvements and those plans.

The proposed project is listed in the 2016 financially constrained RTP/SCS which was approved by SCAG on April 7, 2016. FHWA and FTA made a regional conformity determination finding on December 16, 2016. The project is also included in the financially constrained 2017 FTIP Amendment 17-19, which was approved on May 25, 2018 by FHWA and FTA.

The current project description in the 2016 RTP is inconsistent with the Preferred Alternative (Project ID: 1M0101 SR-710 NORTH PROJECT STUDY ALTERNATIVES (ALIGNMENT TBD)). As with other projects included within the Project List, when the SR-710 North Study EIR/EIS process is complete, the 2016 RTP/SCS will be updated to reflect the Preferred Alternative as identified in this Final EIR/EIS and would be consistent with the proposed RTP amendment. The TSM/TDM Alternative is consistent with the current 2017 FTIP.

BRT Alternative

The BRT Alternative would be generally consistent with the Pasadena and South Pasadena General Plans and most of the local jurisdictions' Specific Plans because it would provide transportation improvements consistent with the policies, goals, and objectives included in those plans. However, as shown in Table 3.1.3, the BRT Alternative would be inconsistent with individual policies, objectives, and program goals in the City of Alhambra, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan. To resolve these inconsistencies, Metro and Caltrans would request these local jurisdictions to amend their land use plans to provide consistency between the BRT Alternative improvements and those plans.

As discussed earlier, the current project description included in the SCAG 2016 financially constrained RTP/SCS and financially constrained 2017 FTIP, Amendment 17-19, is: SR-710 NORTH PROJECT STUDY ALTERNATIVES (ALIGNMENT TBD). The BRT Alternative is not consistent with the scope of the design concept for the project in the 2016 RTP/SCS and 2017 FTIP. Therefore, should the BRT Alternative be selected, the RTP and FTIP would have to be amended.

Although the BRT Alternative is not included in the scope of the 2016 RTP/SCS and 2017 FTIP, this alternative is consistent with all relevant RTP/SCS regional transportation goals as shown in Table 3.1.3.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The plan consistency analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of the BRT Alternative.

LRT Alternative

The LRT Alternative would be generally consistent with the Pasadena and South Pasadena General Plans and most of the local jurisdictions' Specific Plans because it would provide transportation improvements consistent with the policies, goals, and objectives included in those plans. However, as shown in Table 3.1.3, the LRT Alternative would be inconsistent with specific individual policies, objectives, and program goals in the City of Alhambra, City of Los Angeles, City of Monterey Park, and Los Angeles County General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan. To resolve these inconsistencies, Metro and Caltrans would request these local jurisdictions to amend their land use plans to provide consistency between the LRT Alternative improvements and those plans.

The current project description included in the SCAG 2016 financially constrained RTP/SCS and financially constrained 2017 FTIP, Amendment 17-19, is: SR-710 NORTH PROJECT STUDY ALTERNATIVES (ALIGNMENT TBD). The LRT Alternative is not consistent with the scope of the design concept for the project in the SCAG 2016 RTP/SCS and 2017 FTIP. Therefore, should the LRT Alternative be selected, the RTP and FTIP would have to be amended.

Although the LRT Alternative is not included in the scope of the 2016 RTP/SCS and 2017 FTIP, this alternative is consistent with all relevant RTP/SCS regional transportation goals as shown in Table 3.1.3.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). The plan consistency analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of the LRT Alternative.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative would be generally consistent with the General Plans of the Cities of Los Angeles and Pasadena and most of the local jurisdictions' Specific Plans because it would provide transportation improvements consistent with the policies, goals, and objectives included in those plans. However, as shown in Table 3.1.3, the Freeway Tunnel Alternative would be inconsistent with specific individual policies, objectives, and program goals in the City of Alhambra and City of South Pasadena General Plans, the City of Alhambra Valley Boulevard Corridor Specific Plan, and the City of Los Angeles Northeast Los Angeles Community Plan. To resolve these inconsistencies, Metro and Caltrans would request these local jurisdictions to amend their land use plans to provide consistency between the Freeway Tunnel Alternative improvements and those plans.

The current project description included in the SCAG 2016 financially constrained RTP/SCS and financially constrained 2017 FTIP, Amendment 17-19, is: SR-710 NORTH PROJECT STUDY ALTERNATIVES (ALIGNMENT TBD). The Freeway Tunnel Alternative is not consistent with the scope of the design concept for the project in the 2016 RTP/SCS and 2017 FTIP. Therefore, should the Freeway Tunnel Alternative be selected, the RTP and FTIP would have to be amended.

Although the Freeway Tunnel Alternative is not included in the scope of the 2016 RTP/SCS and 2017 FTIP, as shown in Table 3.1.3, each of the operational and design variations included in the Freeway Tunnel Alternative is consistent with all relevant RTP/SCS regional transportation goals.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue extension between Del Mar Boulevard and

California Boulevard). The plan consistency analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of the Freeway Tunnel Alternative.

3.1.2.3 Avoidance, Minimization, and Mitigation Measures.

Measure LU-1, above, would address the inconsistency between the Build Alternatives and the local jurisdictions' General Plans and other local land use plans.

Measure LU-2	**Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and Federal Transportation Improvement Program (FTIP) (applies to the TSM/TDM, Bus Rapid Transit [BRT], and Light Rail Transit [LRT] Alternatives or any Freeway Tunnel Alternative other than the Freeway Tunnel Alternative with the dual-bore tunnel design and tolled operational variation):** The Los Angeles County Metropolitan Transportation Authority will coordinate with the Southern California Association of Governments on needed amendments to the next cycle of the RTP/SCS and FTIP to reflect the selected project.

3.1.3 Parks and Recreation Facilities, and Section 4(f) and 6(f) Resources

3.1.3.1 Regulatory Setting

The proposed project will affect facilities that are protected by the Public Park Preservation Act. The Public Park Preservation Act prohibits local and state agencies from acquiring any property which is in use as a public park at the time of acquisition unless the acquiring agency pays sufficient compensation or land, or both, to enable the operator of the park to replace the park land and any park facilities on that land.

3.1.3.2 Affected Environment

Table 3.1.4 describes parks, recreation resources, and bikeways within 0.5 mi of the alignments of the Build Alternatives by jurisdiction. Figures 3.3-2, 3.3-4, 3.3-6, and 3.3-8 (in Appendix L) show parks and recreation resources within 0.5 mi of the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives, respectively. As shown in Table 3.1.4, the resources include publicly and privately owned/operated parks, golf courses, bikeways, and recreation centers and facilities.

Section 5401(a) of the Public Park Preservation Act of 1971 (California Public Resources Code [PRC] Sections 5400-5409) states that:

> "No city, city and county, county, public district, or agency of the state, including any division, department or agency of the state government, or public utility, shall acquire (by purchase, exchange, condemnation, or otherwise) any real property, which property is in use as a public park at the time of such acquisition, for the purpose of utilizing such property for any non-park purpose, unless the acquiring entity pays or transfers to the legislative body of the entity operating the park sufficient compensation or land, or both, as required by the provisions of this chapter to enable the operating entity to replace the park land and the facilities thereon."

The acquisition of land from the publicly owned parks listed in Table 3.1.4 for the Build Alternatives would be subject to the requirements for compensation for the acquisition of that land under the Public Park Preservation Act.

3.1.3.3 Environmental Consequences

Temporary Impacts on Parks, Recreation Resources, and Bikeways

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. It is possible that the construction of improvements in the No Build Alternative could result in adverse short-term air quality, noise, and traffic/access effects on parks, recreation resources, and bikeways in the study area. Those effects would be analyzed and mitigated, if needed, as part of a separate environmental review process as each of those projects/improvements is advanced for implementation.

Build Alternatives

Based on their distance from the nearest construction of any improvements in the Build Alternatives and the presence of intervening land uses, none of the parks, recreation resources, and bikeways that are more than 500 ft from the physical improvements in the Build Alternatives would experience temporary air quality, noise, traffic/access, or parking effects during construction of the Build Alternatives. No TCEs would be required at any resources more than 500 ft from the physical improvements in the Build Alternative. The analysis in the following sections focuses on the potential for temporary impacts on parks, recreation resources, and bikeways within 500 ft of improvements in the Build Alternatives.

TSM/TDM Alternative

Parks, recreation facilities, and bikeways within 500 ft of the improvements in the TSM/TDM Alternative would potentially be subject to temporary impacts during construction as follows:

- **Short-Term Air Quality Effects:** The following resources could experience short-term air quality effects, noise level increases, and traffic/access effects during construction of the TSM/TDM Alternative:
  - Richard Alatorre Park
  - Eagle Rock Recreation Center
  - El Sereno Arroyo Playground
  - Singer Park
  - War Memorial Park
- **Short-Term Air Quality and Traffic/Access Effects:** In addition, Allendale Park could experience short-term air quality effects and traffic/access effects during construction that would be temporary in nature and would cease on completion of the project construction.
- **Short-Term Noise Traffic/Access Effects:** Gateway Plaza Park could experience short-term noise level increases and traffic/access effects during construction.

Construction of the TSM/TDM Alternative would not require the use of land from any parks, recreation resources, or bikeways for TCEs and would not impact parking at any of those resources. In some cases, on-street bikeways in the vicinity of the TSM/TDM Alternative improvements may need to be temporarily rerouted around construction zones. Detoured on-street bikeways would be restored to their original conditions on completion of construction, and no Adverse Effects are anticipated.

BRT Alternative

Parks, recreation resources, and bikeways within 500 ft of the physical improvements in the BRT Alternative could be subject to temporary use of land for TCEs and air quality, noise, traffic/access, and parking impacts as follows:

- **Use of Land for a TCE:** The BRT Alternative would use approximately 0.02 ac of land from Cascades Park for use as a TCE.
- **Short-Term Air Quality, Noise, and Traffic/Access Effects:** The following resources could experience short-term air quality effects, noise level increases, and traffic/access effects during construction of the BRT Alternative improvements:
  - Atlantic Avenue Park
  - Cascades Park
  - Central Park
  - War Memorial Park
  - Young Men's Christian Association (YMCA) South Pasadena/San Marino

  In some cases, on-street bikeways in the vicinity of the BRT Alternative improvements may need to be temporarily rerouted around construction zones. Detoured on-street bikeways would be restored to their original conditions on completion of construction, and no Adverse Effects are anticipated.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, construction of the BRT Alternative would also result in similar short-term air quality effects, noise level increases, and traffic/access effects on the same parks and recreational resources as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would result in short-term air quality effects at 10 parks and recreational resources, short-term noise level increases at 10 parks and recreational resources, and short-term traffic/access effects at 11 parks and recreational resources. None of the short-term impacts related to parks and recreational resources anticipated to occur during construction of the BRT Alternative would be adverse.

LRT Alternative

Because the bored tunnel section of the LRT line would be constructed underground, that segment of the LRT Alternative would not result in temporary construction air quality, noise, traffic/access, or parking effects on parks, recreation resources, and bikeways and would not require any TCEs from those resources.

Parks, recreation resources, and bikeways within 500 ft of the physical improvements in the LRT Alternative that would be constructed at or above the ground surface, including LRT station excavation sites, would be subject to the following short-term air quality, noise, and traffic/access impacts:

- **Short-Term Air Quality Effects:** During construction of the LRT Alternative improvements, the Belvedere Community Regional Park and Casa Maravilla Service Center could experience short-term air quality effects.
- **Short-Term Noise Effects:** Belvedere Community Regional Park and El Sereno Arroyo Playground could experience short-term noise level increases during construction that would be temporary in nature and would cease on completion of the project construction.
- **Short-Term Traffic/Access Effects:** During construction of the LRT Alternative improvements, the Belvedere Community Regional Park and El Sereno Arroyo Playground could experience short-term traffic/access effects.

  In some cases, on-street bikeways in the vicinity of the LRT Alternative improvements may need to be temporarily rerouted around construction zones. Detoured on-street bikeways would be restored to their original condition on completion of construction, and no Adverse Effects are anticipated.

The construction of the LRT Alternative would not require any TCEs at parks, recreation resources, or bikeways.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, construction of the LRT Alternative would also result in similar short-term air quality effects, noise level increases, and traffic/access effects on most of the same parks and recreational resources as the TSM/TDM Alternative; however, the short-term noise level increases and traffic/access effects on the El Sereno Arroyo Playground would occur for a longer duration under the LRT Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would result in short-term air quality effects at 8 parks and recreational resources, short-term noise level increases at 7 parks and recreational resources, and short-term traffic/access effects at 8 parks and recreational resources. None of the short-term impacts related to parks and recreational resources anticipated to occur during construction of the LRT Alternative would be adverse.

Freeway Tunnel Alternative

Because construction of the bored tunnel segment of both design variations of the Freeway Tunnel Alternative would occur underground, the bored tunnel segment would not result in temporary construction air quality, noise, traffic/access, or parking effects or require any TCEs at any parks, recreation resources, or bikeways.

Parks, recreation resources, and bikeways within 500 ft of the improvements that would be constructed at or above the ground surface under either design variation of the Freeway Tunnel Alternative would be subject to short-term impacts related to air quality, noise, and traffic/access. Because the improvements in the single-bore and dual-bore design variations would be constructed in generally the same areas, both design variations would potentially impact the same resources as follows:

- **Short-Term Air Quality Effects:** During construction of the Freeway Tunnel Alternative improvements, Singer Park could experience short-term air quality effects.
- **Short-Term Noise Effects:** Singer Park could experience short-term noise level increases during construction that would be temporary in nature and would cease on completion of the construction of the project.
- **Short-Term Traffic/Access Effects:** Singer Park could experience short-term traffic/ access effects during construction.

  In some cases, on-street bikeways in the vicinity of the Freeway Tunnel Alternative improvements may need to be temporarily rerouted around construction zones. Detoured on-street bikeways would be restored to their original condition on completion of construction, and no Adverse Effects are anticipated.

The construction of the Freeway Tunnel Alternative would not require the use of land for TCEs from any parks, recreation resources, or bikeways, and would not result in parking effects on those resources.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). Therefore, construction of the Freeway Tunnel Alternative would also result in similar short-term air quality effects, noise level increases, and traffic/access effects on most of the same parks and recreational resources as the TSM/TDM Alternative; however, the short-term air quality effects, noise level increases, and traffic/access effects on Singer Park and El Sereno Arroyo Playground would occur for a longer duration under the Freeway Tunnel Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the Freeway Tunnel Alternative would result in short-term air quality effects at 6 parks and recreational resources, short-term noise level increases at 6 parks and recreational resources, and short-term traffic/access effects at 7 parks and recreational resources. None of the short-term impacts related to parks and recreational resources anticipated to occur during construction of the Freeway Tunnel Alternative would be adverse.

Permanent Impacts on Parks, Recreation Resources, and Bikeways

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. It is possible that the operation of improvements in the No Build Alternative could result in permanent adverse air quality, noise, and traffic/access effects on parks, recreation resources, and bikeways in the study area. Those effects would be analyzed and mitigated, if needed, as part of a separate environmental review process as each of those projects/improvements is advanced for implementation.

Build Alternatives

Based on their distance from the operation of the nearest improvements in the Build Alternatives and the presence of intervening land uses, none of the parks, recreation resources, and bikeways that are more than 500 ft from those improvements would experience long-term operational air quality, noise, traffic/access, or parking effects under the Build Alternatives. The analysis in the following sections focuses on the potential for permanent impacts on parks, recreation resources, and bikeways within 500 ft of improvements under the Build Alternatives.

TSM/TDM Alternative

Parks, recreation facilities, and bikeways within 500 ft of the physical improvements under the TSM/TDM Alternative would potentially be subject to permanent noise impacts as follows:

- **Long-Term Noise Effects:** The following parks could experience permanent noise level increases during operation of the TSM/TDM Alternative, but the 2035 with-project noise levels would be below the 67 A-weighted decibels (dBA) Noise Abatement Criteria (NAC) for those land uses:
  - Gateway Plaza Park
  - Richard Alatorre Park
  - Eagle Rock Recreation Center
  - El Sereno Arroyo Playground
  - Singer Park
  - War Memorial Park

The operation of the TSM/TDM Alternative would not result in permanent adverse impacts on parks, recreation resources, or bikeways related to permanent acquisition of land, permanent easements, air quality, traffic/access, and parking.

BRT Alternative

Parks, recreation resources, and bikeways within 500 ft of the physical improvements in the BRT Alternative could be subject to permanent impacts related to the use of land from the resources and noise as follows:

- **Permanent Acquisition of Land:** The BRT Alternative would require the permanent acquisition of approximately 0.011 ac of land from Cascades Park. The land that would be permanently acquired from Cascades Park is protected by the Public Park Preservation Act and, as a result, sufficient compensation or land, or both, must be provided to the City of Monterey Park during the property acquisitions process for this alternative.
- **Long-Term Noise Effects:** The following parks and recreation resources could experience permanent noise level increases during operation of the BRT Alternative that would be barely perceptible to the human ear. As a result, those noise level increases would not adversely affect the ability of those parks to continue to serve the communities.
  - Atlantic Avenue Park
  - Cascades Park
  - War Memorial Park
  - YMCA South Pasadena/San Marino

The operation of the BRT Alternative improvements would not result in any permanent easements or access/traffic, parking, and air quality impacts at the parks, recreation resources, and bikeways within 500 ft of the alignment of the BRT Alternative.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, operation of the BRT Alternative would also result in similar permanent noise level increases on the same parks and recreational resources as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would result in permanent noise level increases at 9 parks and recreational resources which would be below the 67-A weighted decibels or would be barely perceptible to the human ear and the permanent acquisition of approximately 0.011 ac of land from Cascades Park. None of the permanent impacts related to parks and recreational resources anticipated to occur during operation of the BRT Alternative would be adverse.

LRT Alternative

Because the operation of the bored tunnel segment of the LRT line would occur underground, this segment of the LRT Alternative would not result in long-term operational air quality, noise, traffic/access, or parking effects on parks, recreation resources, or bikeways.

Parks, recreation resources, and bikeways within 500 ft of the at- and above-grade improvements in the LRT Alternative could be subject to permanent noise impacts as follows:

- **Long-Term Noise Effects:** Based on the distance of the El Sereno Arroyo Playground from the nearest LRT Alternative stations and operations and the maintenance facility, and the presence of intervening land uses, this playground would not experience long-term operation noise effects under the LRT Alternative.

The operation of the LRT Alternative improvements would not require the acquisition of land or permanent easements at or result in air quality, traffic/access, or parking impacts at the parks, recreation resources, and bikeways within 500 ft of the alignment of the LRT Alternative.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, operation of the LRT Alternative would also result in similar permanent noise level increases on most of the same parks and recreational resources as the TSM/TDM Alternative; however, the permanent noise level increases at El Sereno Arroyo Playground would be different under the LRT Alternative. Unlike the TSM/TDM Alternative, which would result in barely perceptible permanent noise level increases associated with traffic on other Road Improvement T-1 at the El Sereno Arroyo Playground, the LRT Alternative would result in sporadic noise impacts at El Sereno Arroyo Playground due to maintenance activities at the nearby LRT maintenance yard; however, an 8 ft wall would be provided around the perimeter of the LRT maintenance yard to reduce these impacts.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would result in permanent noise level increases at 6 parks and recreational resources. None of the permanent impacts related to parks and recreational resources anticipated to occur during operation of the LRT Alternative would be adverse.

Freeway Tunnel Alternative

Because the operation of the bored tunnel segment of both design variations of the Freeway Tunnel Alternative would occur underground, the bored tunnel segment would not result in any long-term operational air quality, noise, traffic/access, or parking effects on parks, recreation resources, and bikeways.

The operation of the Freeway Tunnel Alternative would not result in long-term air quality, noise, traffic/access, or parking impacts at parks, recreation resources, and bikeways within 500 ft of improvements that would be constructed at or above the ground surface under either design variation of the Freeway Tunnel Alternative and would not require the permanent acquisition of land from or permanent easements at any of those resources.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue extension between Del Mar Boulevard and California Boulevard). Therefore, operation of the Freeway Tunnel Alternative would also result in similar permanent noise level increases on most of the same parks and recreational resources as the TSM/TDM Alternative; however, the permanent noise level increases at Singer Park and El Sereno Arroyo Playground would be lower under the Freeway Tunnel Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would result in permanent noise level increases at 4 parks and recreational resources. None of the permanent impacts related to parks and recreational resources anticipated to occur during operation of the Freeway Tunnel Alternative would be adverse.

Temporary Occupancy and Permanent Incorporation of Section 4(f) and 6(f) Resources

The potential for the SR 710 project to temporarily occupy or permanently incorporate land at Section 4(f) parks, recreational or wildlife refuges and 6(f) resources is evaluated in detail in Appendix B. Appendix B discusses in detail publicly owned parks and recreation resources located within 0.5 mi of improvements in the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives that were considered in the evaluation of potential Adverse Effects under Section 4(f) and 6(f).

3.1.3.4 Avoidance, Minimization, and/or Mitigation Measures

Measures for Parks and Recreational Facilities

Measure Parks-1 Compliance with the Public Park Preservation Act (California Public Resources Code Sections 5400–5409) (applies to the Bus Rapid Transit [BRT] Alternative only): As part of the right of way acquisition process for the BRT Alternative, the Los Angeles County Metropolitan Transportation Authority (Metro) Division of Right of Way personnel will coordinate with the City of Monterey Park to provide compensation for the permanent acquisition of land from Cascades Park as required under the Public Park Preservation Act. In the event that funds from FHWA are used for improvements in the BRT Alternative, Caltrans will participate in the negotiations with the City of Monterey Park and the process for the acquisition of land from Cascades Park.

Short-Term Air Quality

All four Build Alternatives have the potential to result in short-term air quality impacts at parks, recreation resources, and bikeways in the vicinity of project construction areas. The measures addressing short-term air quality impacts during construction provided later in Section 3.13, Air Quality, would avoid and/or minimize the potential short-term air quality impacts during construction on parks, recreation resources, and bikeways. Those measures include compliance with Caltrans Standard Specification Sections 10 and 18 (Dust Control), the SCAQMD rules for control of air emissions (equipment and dust) during construction, and Caltrans Standard Specification Section 39.3.06 for asphalt concrete plant emissions; development and implementation of a Construction Emissions Mitigation Plan; and compliance with local jurisdictions' requirements for emission controls during construction.

Short-Term Noise

All four Build Alternatives have the potential to result in short-term noise impacts at parks, recreation resources, and bikeways in the vicinity of project construction areas. The measures addressing short-term noise impacts during construction provided later in Section 3.14, Noise, would substantially reduce the potential short-term noise impacts during construction on parks, recreation resources, and bikeways. Those measures require compliance with Caltrans Standard Specifications Section 14-08.02, "Noise Control," and Standard Special Provisions (SSP) S5-310, and with local jurisdictions' Noise Ordinances.

Short-Term Traffic and Access

All four Build Alternatives have the potential to result in short-term traffic and access impacts at parks, recreation resources, and bikeways in the vicinity of project construction areas. A measure requiring the preparation and implementation of a TMP to address those impacts is provided later in Section 3.5, Traffic and Transportation/Pedestrian and Bicycle Facilities. The purpose of the TMP is to maintain traffic safety during construction, including safety for construction workers, pedestrians, bicyclists, and vehicular traffic; effectively maintain an acceptable level of traffic flow throughout the transportation system during construction; minimize traffic delays and facilitate reduction of overall duration of construction activities; and minimize detours and impacts to vehicular traffic, including emergency services providers, school bus and transit operators, pedestrians, and bicyclists. Measure T-1, provided in Section 3.5, requiring the TMP would substantially reduce the potential short-term traffic and access during construction on parks, recreation resources, and bikeways.

TABLE 3.1.1:
Existing and General Plan Land Uses by Jurisdiction

Existing Land Uses	General Plan Land Uses
City of Alhambra (refer to Sheets 8 and 9 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Alhambra is in the south-central part of the study area and covers approximately 7.6 sq mi. Residential uses occupy approximately 68 percent of the land in the City, followed by commercial and service uses (10 percent). Approximately 33.1 ac (1 percent) of land in the City are vacant.	Of the 33.1 ac of vacant land in Alhambra, approximately 12 ac are designated for single-family residential uses, 8 ac for industrial uses, 4 ac for commercial/office uses, and 8.8 ac for a variety of uses (i.e., local parks, open space, and recreation, multifamily residential, mixed urban, and public facility uses).
City of Arcadia (refer to Sheets 4, 7, 9, and 10 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Arcadia is in the northeast part of the study area and covers approximately 11 sq mi. Residential uses occupy approximately 65 percent of the land in the City, followed by public uses (8 percent) and open space and recreation uses (8 percent). Approximately 199 ac (3 percent) of land in the City are vacant.	Of the 199.1 ac of vacant land in Arcadia, approximately 131.7 ac are designated for single-family residential uses, 37.8 ac for industrial uses, 12.8 ac for commercial/office uses, and the remaining 16.8 ac for a variety of uses (i.e., local parks, open pace, and recreation, mixed commercial and industrial, mixed urban, multifamily residential, and transportation).
City of Commerce (refer to Sheets 11 and 13 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Commerce is in the southwest part of the study area and covers approximately 6.6 sq mi. Industrial uses occupy approximately 59 percent of the land in the City, followed by transportation and utilities uses (15 percent). Approximately 76.5 ac (2 percent) of land in the City are vacant.	Of the 76.5 ac of vacant land in Commerce, approximately 42 ac are designated for industrial uses, 13.6 ac for commercial/office uses, 8 ac for mixed commercial and industrial uses, and 13 ac for a variety of uses (mixed urban, multifamily residential, public facilities, single-family residential, and transportation).
City of Duarte (refer to Sheets 4 and 7 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Duarte is in the northeast part of the study area and covers approximately 6.7 sq mi. Other uses occupy approximately 50 percent of the land in the City, followed by residential uses (22 percent). The majority of the acreage of other uses is land in the Angeles National Forest. Approximately 522 ac (13 percent) of land in the City are vacant, the majority of which are undevelopable hillsides.	Of the 522 ac of vacant land in Duarte, approximately 413.3 ac are designated for local parks, open space, and recreation uses, 60.3 ac for single-family residential uses, 15.2 ac for public facility uses, and 33.2 ac for a variety of uses (commercial/office, educational institutions, mixed commercial and industrial, mixed urban, multifamily residential, and transportation).
City of El Monte (refer to Sheets 9, 10, and 12 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of El Monte is in the southeast part of the study area and covers approximately 9.6 sq mi. Residential uses occupy approximately 58 percent of the land in the City, followed by commercial and services uses (11 percent) and industrial uses (11 percent). Approximately 195.0 ac (4 percent) of land in the City are vacant.	Of the 195 ac of vacant land in El Monte, approximately 40 ac are designated for multifamily residential uses, 39.7 ac for industrial uses, 39 ac for single-family residential uses, and 76 ac for a variety of uses (commercial/office, local parks and recreation, mixed urban, public facilities, and transportation).
City of Glendale (refer to Sheets 1, 2, 5, and 6 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Glendale is in the northwest part of the study area and covers approximately 30.6 sq mi. Residential uses occupy approximately 41 percent of the land in the City, followed by public uses (25 percent). The majority of public use land consists of open space in the San Rafael Hills and Verdugo Mountains. Approximately 3,526 ac (21 percent) of land in the City are vacant, most of which are undevelopable hillsides in the San Rafael Hills and Verdugo Mountains.	Of the 3,525 ac of vacant land in Glendale, approximately 2,235 ac are designated for local parks, open space, and recreation uses, 1,226 ac for single-family residential uses, 28 ac for commercial and office uses, and 37 ac for a variety of uses (cemeteries, mixed urban, multifamily residential and public facilities).

TABLE 3.1.1:
Existing and General Plan Land Uses by Jurisdiction

Existing Land Uses	General Plan Land Uses
City of Irwindale (refer to Sheets 7 and 10 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Irwindale is in the northeast part of the study area and covers approximately 9.5 sq mi. Industrial uses occupy approximately 34 percent of the land in the City, followed by public uses (31 percent). Approximately 1,368.6 ac (24 percent) of land in the City are vacant, most of which are quarries or undevelopable flood control basins.	Of the 1,386.7 ac of vacant land in Irwindale, approximately 963 ac are designated for mixed commercial and industrial uses, 406 ac for public facility uses, 12 ac for commercial/office uses, and 6 ac for single-family residential and industrial uses.
City of La Cañada Flintridge (refer to Sheets 1, 2, and 3 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of La Cañada Flintridge is in the northwest part of the study area and covers approximately 8.6 sq mi. Residential uses occupy comprising approximately 60 percent of the land in the City, followed by public uses (14 percent). Approximately 790 ac (17 percent) of land in the City is vacant, the majority of which are undevelopable hillsides.	Of the 790 ac of vacant land in La Cañada Flintridge, approximately 612.8 ac are designated for single-family residential uses, 157.6 ac for local parks, open space, and recreation uses, 5.4 ac for multifamily residential uses, and 4.6 ac for a variety of uses (mixed urban, commercial/office, educational institutions, public facilities, and transportation).
City of Los Angeles (includes the neighborhoods of Arroyo Seco, Cypress Park, Eagle Rock, El Sereno, Glassell Park, Highland Park, and Lincoln Heights) (refer to Sheets 5, 6, 8 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
Arroyo Seco. The Arroyo Seco neighborhood is in the west central part of the study area and covers approximately 3.5 sq mi. As shown on Figure 3.1-1 (Sheets 5 and 8), residential uses occupy approximately 53 percent of the land in this neighborhood and approximately 338 ac (17 percent) of the land in this neighborhood are vacant.	General Plan land use designations for the Arroyo Seco neighborhood in the City of Los Angeles are shown on Figure 3.1-2 (Sheets 5 and 8). Of the 338 ac of vacant land in the Arroyo Seco neighborhood, 309 ac are designated for single-family residential uses, 22 ac for local parks, open space, and recreation uses, 5 ac for multifamily residential uses, and 2 ac for other uses (commercial/office, public facilities, and transportation).
Cypress Park. The Cypress Park neighborhood is in the southwest part of the study area and covers approximately 1.3 sq mi. As shown on Figure 3.1-1 (Sheet 8), residential uses occupy approximately 47 percent of the land in this neighborhood, followed by transportation and utilities uses (22 percent). Approximately 54 ac (8 percent) of the land in this neighborhood are vacant.	General Plan land use designations for the Cypress Park neighborhood in the City of Los Angeles are shown on Figure 3.1-2 (Sheet 8). Of the 54 ac of vacant land in the Cypress Park neighborhood, 44 ac are designated for single-family residential uses, 4 ac for industrial uses, 4 ac for local parks, open space, and recreation uses, and 2 ac for other uses (commercial/office, mixed commercial and industrial, multifamily residential, and public facilities).
Eagle Rock. The Eagle Rock neighborhood is in the western part of the study area and covers approximately 4.1 sq mi. As shown on Figure 3.1-1 (Sheet 5), residential uses occupy approximately 67 percent of the land in this neighborhood. Approximately 206.7 ac (11 percent) of the land in this neighborhood are vacant, the majority of which are undevelopable hillsides.	General Plan land use designations for the Eagle Rock neighborhood in the City of Los Angeles are shown on Figure 3.1-2 (Sheet 5). Of the 214 ac of vacant land in the Eagle Rock neighborhood, 109 ac are designated for single-family residential uses, 96 ac for local parks, open space, and recreation uses, 3.6 ac for public facilities, and 5 ac for other uses (multifamily residential, commercial/office, and industrial).
El Sereno. The El Sereno neighborhood is in the southwest part of the study area and covers approximately 4.9 sq mi. As shown on Figure 3.1-1 (Sheet 8), residential uses occupy approximately 52 percent of the land in this neighborhood, followed by public uses (15 percent). Approximately 386 ac (16 percent) of the land in the neighborhood are vacant, the majority of which are undevelopable hillsides.	General Plan land use designations for the El Sereno neighborhood in the City of Los Angeles are shown on Figure 3.1-2 (Sheet 8). Of the 386 ac of vacant land in El Sereno, approximately 268 ac are designated for single-family residential uses, 83 ac for local parks, open space, and recreation uses, 13 ac for industrial uses, and 22 ac for other uses (commercial/office, multifamily residential, and public facilities).
Glassell Park. The Glassell Park neighborhood is in the	General Plan land use designations for the Glassell Park

TABLE 3.1.1:
Existing and General Plan Land Uses by Jurisdiction

Existing Land Uses	General Plan Land Uses
west part of the study area and covers approximately 7.6 sq mi. As shown on Figure 3.1-1 (Sheets 5 and 8), residential uses occupy approximately 50 percent of the land in this neighborhood, followed by public uses (18 percent). Approximately 140 ac (11 percent) of the land in this neighborhood are vacant.	neighborhood in the City of Los Angeles are shown on Figure 3.1-2 (Sheets 5 and 8). Of the 140 ac of vacant land in Glassell Park, approximately 101 ac are designated for single-family residential uses, 16 ac for public facilities, 7 ac for multifamily residential uses, and 16 ac for other uses (commercial/office, industrial, and local parks, open space, and recreation).
Highland Park. The Highland Park neighborhood is in the west part of the study area and covers approximately 4.2 sq mi. As shown on Figure 3.1-1 (Sheets 5, 6, and 8), residential uses occupy approximately 62 percent of the land in this neighborhood, followed by public uses (15 percent). Approximately 92.6 ac (4 percent) of the land in this neighborhood are vacant.	General Plan land use designations for the Highland Park neighborhood in the City of Los Angeles are shown on Figure 3.1-2 (Sheets 5, 6, and 8). Of the 108 ac of vacant land in Highland Park, approximately 77.1 ac are designated for single-family residential uses, 13.1 ac for local parks, open pace, and recreation uses, 11.5 ac for multifamily residential uses, and 6 ac for other uses (public facilities and commercial/office).
Lincoln Heights. The Lincoln Heights neighborhood is in the southwest part of the study area and covers approximately 3.1 sq mi. As shown on Figure 3.1-1 (Sheet 8), residential uses occupy approximately 30 percent of the land in this neighborhood, followed by public uses (21 percent). Approximately 159 ac (10 percent) of the land in this neighborhood are vacant, the majority of which are undevelopable hillsides.	General Plan land use designations for the Lincoln Heights neighborhood in the City of Los Angeles are shown on Figure 3.1-2 (Sheet 8). Of the 173 ac of vacant land in Lincoln Heights, approximately 128 ac are designated for single-family residential uses, 20.5 ac for industrial uses, 9.3 ac for multifamily residential uses, and 15.2 ac for other uses (commercial/office, local parks, open space, and recreation, mixed commercial and industrial, and public facilities).
City of Monrovia (refer to Sheets 4, 7, and 10 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Monrovia is in the northeast part of the study area and covers approximately 13.6 sq mi. Public uses occupy approximately 31 percent of the land in the City, followed by residential uses (23 percent). The majority of the public, other, and vacant lands in the City are open space in the San Gabriel Mountains foothills. Approximately 1,350 ac (17 percent) of land in the City are vacant, the majority of which are undevelopable hillsides in the foothills of the San Gabriel Mountains.	Of the approximately 1,442 ac of vacant land in Monrovia, 1,009 ac are designated for local parks, open space, and recreation uses, 340.4 ac for single-family residential uses, 61 ac for mixed urban uses, and 31.7 ac for other uses (commercial/office, industrial, mixed commercial, multifamily residential, public facilities, and transportation).
City of Montebello (refer to Sheets 11, 12, and 13 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Montebello is in the south part of the study area and covers approximately 8.5 sq mi. Residential uses occupy approximately 43 percent of the land in the City, followed by industrial uses (16 percent). Approximately 401 ac (9 percent) of the land in the City are vacant, the majority of which are land that was formerly used for oil production.	Of the approximately 401 ac of vacant land in Montebello, 282.4 ac are designated for single-family residential uses, 44 ac are for public facility uses, 27.5 ac for commercial/office uses, and 47 ac for other uses (industrial, local parks, open space, and recreation, multifamily residential, and transportation).
City of Monterey Park (refer to Sheets 8, 9, 11, and 12 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Monterey Park is in the southern part of the study area and covers approximately 7.7 sq mi. Residential uses occupy approximately 62 percent of the land in the City, followed by public uses (14 percent). Approximately 229.9 ac (6 percent) of the land in the City are vacant.	Of the approximately 230 ac of vacant land in Monterey Park, 80 ac are designated for local parks, open space, and recreation uses, 69 ac for commercial/office uses, 36 ac for mixed commercial and industrial uses, and 44 ac for other uses (single-family residential, multifamily residential, public facilities, and mixed urban).
City of Pasadena (refer to Sheets 1, 2, 3, 5, and 6 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Pasadena is in the north-central part of the	Of the 537.5 ac of vacant land in Pasadena, approximately

TABLE 3.1.1:
Existing and General Plan Land Uses by Jurisdiction

Existing Land Uses	General Plan Land Uses
study area and covers approximately 23.1 sq mi. Residential uses occupy approximately 57 percent of the land in the City, followed by public uses (17 percent). Approximately 537.5 ac (5 percent) of the land in the City are vacant, the majority of which are undevelopable hillsides.	338 ac are designated for single-family residential uses, 138 ac for local parks, open space, and recreation uses, 34 ac for mixed urban uses, and 28 ac for other uses (multifamily residential, commercial/office, public facilities, and transportation uses).
City of Rosemead (refer to Sheets 9 and 12 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Rosemead is in the southeast part of the study area and covers approximately 5.2 sq mi. Residential uses occupy approximately 63 percent of the land in the City, followed by commercial and service uses (11 percent). Approximately 62.7 ac (2 percent) of the land in the City are vacant.	Of the 62.7 ac of vacant land in Rosemead, approximately 20 ac are designated for public facility uses, 20 ac for mixed urban uses, 11 ac for single-family residential uses, and 12 ac for other uses (multifamily residential, local parks, open space, and recreation, industrial, commercial/office, and mixed commercial and industrial).
City of San Gabriel (refer to Sheets 6 and 9 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of San Gabriel is in the south-central part of the study area and covers approximately 4.1 sq mi. Residential uses occupy approximately 69 percent of the land in the City, followed by commercial and service uses (9 percent). Approximately 46.4 ac (2 percent) of the land in the City are vacant.	Of the 46.4 ac of vacant land in San Gabriel, approximately 21 ac are designated for public facility uses, 14 ac for commercial/office uses, 5 ac for multifamily residential uses, and 6 ac for other uses (transportation, single-family residential, local parks, open space, and recreation, industrial, and commercial/office).
City of San Marino (refer to Sheets 6 and 9 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of San Marino is in the north-central part of the study area and covers approximately 3.8 sq mi. Residential uses occupy approximately 80 percent of the land in the City, followed by public uses (17 percent). Approximately 11.8 ac (1 percent) of land in the City are vacant.	Of the 11.8 ac of vacant land in San Marino, 10.8 ac are designated for single-family residential uses, 0.5 ac for commercial/office uses, and 0.5 ac for public facility uses.
City of Sierra Madre (refer to Sheets 3, 4, 6, and 7 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Sierra Madre is in the north part of the study area and covers approximately 3 sq mi. Residential uses occupy approximately 56 percent of the land in the City, followed by public uses (19 percent). The majority of the public land in the City is open space land in the foothills of the San Gabriel Mountains. Approximately 231.4 ac (14 percent) of land in the City are vacant, the majority of which are undevelopable hillsides.	Of the 231.5 ac of vacant land in Sierra Madre, 213 ac are designated for single-family residential uses, 12.7 ac for local parks, open space, and recreation uses, 2.7 ac for multifamily residential uses, and 2.7 ac for other uses (for mixed urban, industrial, and commercial/office).
City of South El Monte (refer to Sheets 9 and 12 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of South El Monte is in the southeast part of the study area and covers approximately 3 sq mi. Industrial uses occupy approximately 44 percent of the land in the City, followed by residential uses (34 percent). Approximately 66.3 ac (4 percent) of land in the City are vacant.	Of the 66.3 ac of vacant land in El Monte, approximately 36.4 ac are designated for commercial/office uses, 13.4 ac for industrial uses, 8.7 ac for mixed commercial and industrial uses, and 80.6 ac for other uses (mixed urban, multifamily residential, public facilities, and single-family).

TABLE 3.1.1:
Existing and General Plan Land Uses by Jurisdiction

Existing Land Uses	General Plan Land Uses
City of South Pasadena (refer to Sheets 8 and 9 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of South Pasadena is in the central part of the study area and covers approximately 3.4 sq mi. Residential uses occupy approximately 79 percent of the land in the City, followed by commercial and service uses (7 percent). Approximately 47.7 ac (3 percent) of land in the City are vacant.	Of the 47.7 ac of vacant land in South Pasadena, approximately 33 ac are designated for single-family residential uses, 7 ac for multifamily residential uses, 5 ac for local parks, open space, and recreation uses, and 3 ac for other uses (public facilities, multifamily residential, and mixed urban).
City of Temple City (refer to Sheets 6, 7, and 9 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
The City of Temple City is in the east-central part of the study area and covers approximately 4.0 sq mi. Residential uses occupy approximately 84 percent of the land in the City, followed by commercial and services uses (5 percent) and public uses (5 percent). Approximately 16.5 ac (1 percent) of land in the City are vacant.	Of the 16.5 ac of vacant land in Temple City, approximately 6 ac are designated for single-family residential uses, 6 ac for commercial/office uses, 2.6 ac for industrial uses, and 1.9 ac for other uses (public facilities and multifamily residential).
Los Angeles County (unincorporated communities of Altadena, East Los Angeles, East Pasadena, East San Gabriel, La Crescenta-Montrose, Mayflower Village, North El Monte, and San Pasqual) (refer to Sheets 1, 2, 3, 6, 7, 8, 9, and 11 in Figures 3.1-1 and 3.1-2 for existing and General Plan land uses, respectively)	
Altadena. The unincorporated community of Altadena is in the north part of the study area and covers approximately 8.7 sq mi. As shown on Figure 3.1-1 (Sheets 1, 2, and 3), residential uses occupy approximately 69 percent of the land in this community, followed by public uses (7 percent). Approximately 521 ac (11 percent) of the land in Altadena are vacant, the majority of which are undevelopable hillsides.	General Plan land use designations for Altadena in the County of Los Angeles are shown on Figure 3.1-2 (Sheets 1, 2, and 3). Of the 521 ac of vacant land in Altadena, 427 ac are designated for single-family residential uses, 70 ac for local parks, open space, and recreation uses, 15 ac for public facilities, and 9 ac for other uses (cemeteries, commercial/office, industrial, and mixed urban).
East Los Angeles. The unincorporated community of East Los Angeles is in the southwest part of the study area and covers approximately 7.5 sq mi. As shown on Figure 3.1-1 (Sheets 8 and 11), residential uses occupy approximately 62 percent of the land in this community, followed by public uses (14 percent). Approximately 123.3 ac (3 percent) of the land in East Los Angeles are vacant.	General Plan land use designations for East Los Angeles in the County of Los Angeles are shown on Figure 3.1-2 (Sheets 8 and 11). Of the 123.3 ac of vacant land in East Los Angeles, approximately 36 ac are designated for multifamily residential uses, 29 ac for single-family residential uses, 28 ac for public facilities, and 30 ac for other uses (mixed commercial and industrial, mixed urban, industrial, and commercial/office).
La Crescenta-Montrose. The unincorporated community of La Crescenta-Montrose is in the northwest part of the study area and covers approximately 3.4 sq mi. As shown on Figure 3.1-1 (Sheets 1 and 2), residential uses occupy approximately 68 percent of the land in this community, followed by public uses (10 percent). Approximately 312 ac (17 percent) of land in the community are vacant, the majority of which are undevelopable hillsides.	General Plan land use designations for La Crescenta-Montrose in the County of Los Angeles are shown on Figure 3.1-2 (Sheets 1 and 2). Of the 312.3 ac of vacant land in La Crescenta-Montrose, approximately 291 ac are designated for single-family residential uses, 15 ac for local parks, open space, and recreation uses, 3.9 ac for multifamily residential uses, and 1.9 ac for other uses (public facilities and commercial/office).
East Pasadena, East San Gabriel, Mayflower Village, North El Monte, and San Pasqual. The unincorporated community of East Pasadena is in the north-central part of the study area and covers approximately 1.3 sq mi. The unincorporated community of East San Gabriel is in the north-central part of the study area and covers approximately 1.6 sq mi. The unincorporated community of Mayflower Village is in the northeast part of the study area and covers approximately 0.7 sq mi. The unincorporated community of North El Monte is in the east-central part of the study area and covers	General Plan land use designations for these unincorporated communities in the County of Los Angeles are shown on Figure 3.1-2 (Sheets 6, 7, and 9). Of the 72.4 ac of vacant land in East Pasadena, East San Gabriel, Mayflower Village, North El Monte, and San Pasqual, approximately 32 ac are designated for public facilities, 32 ac for single-family residential uses, 7.5 ac for local parks, open space, and recreation uses, and 0.9 ac for other uses (multifamily residential, commercial/office, and mixed urban).

TABLE 3.1.1:
Existing and General Plan Land Uses by Jurisdiction

Existing Land Uses	General Plan Land Uses
approximately 0.4 sq mi. The unincorporated community of San Pasqual is in the north-central part of the study area and covers approximately 0.3 sq mi. As shown on Figure 3.1-1 (Sheet 6, 7, and 9), residential uses are the primary land uses in East Pasadena, East San Gabriel, Mayflower Village, North El Monte, and San Pasqual, comprising 87 percent of the land in these unincorporated areas, followed by commercial and service uses (3 percent). Approximately 72.4 ac (3 percent) of the land in the unincorporated communities of East Pasadena, East San Gabriel, Mayflower Village, North El Monte, and San Pasqual are vacant.	

Source: *Community Impact Assessment* (2014).

TABLE 3.1.2:
Use of General Plan Designated Land Uses by the Build Alternatives

Alternative	General Plan Designated Land Uses (acres)						
	Commercial/ Office	Mixed Commercial and Industrial	Mixed Urban	Multifamily Residential	Public Facilities	Single-Family Residential	Total
TSM/TDM	0.1	–	0.4	0.02	0.0	0	**0.6**
BRT	0.2	–	0.1	0.04	–	–	**0.3**
LRT	8.5	3.7	2.0	0.0	3.8	–	**18.0**
Freeway Tunnel (Single-Bore Design Variation)	0.1	–	0.3	–	1.1	–	**1.5**
Freeway Tunnel (Dual-Bore Design Variation)	0.1	–	0.3	–	1.1[1]	–	**1.5**

Source: *Community Impact Assessment* (2014).
Note: Values are shown with two decimal places except where three decimals were necessary to provide a value.
[1] Partial acquisition of 0.6 acre would not result in land use impacts because the City of Los Angeles General Plan does not designate any land uses on the part of the parcel that would be acquired.

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TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
ALHAMBRA LAND USE PLAN CONSISTENCY				
General Plan Circulation Element				
Goal 3.1: To provide a balanced transportation system for the safe and efficient movement of people, goods, and services.				
Objective 4.1.1: Maintain Level of Service D as the minimum desired operating level of all City streets.				
Inconsistent. While the TSM/TDM Alternative would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, the TSM/TDM Alternative would result in LOS deterioration to unacceptable levels at 3 study intersections in Alhambra during the AM peak hour (Fremont Avenue/Mission Road, SR 710 NB Off-Ramp/Valley Boulevard, and Marengo Avenue/Valley Boulevard) and 4 study intersections in Alhambra during the PM peak hour (Atlantic Boulevard/Main Street, Atlantic Boulevard/Mission Road, Fremont Avenue/Mission Road, and SR 710 NB Off-Ramp/Valley Boulevard) in 2035 as compared to the No Build Alternative. However, two of the study intersections (Atlantic Boulevard/Mission Road and Fremont Avenue/ Mission Road) would also experience unacceptable LOS during the PM peak hour under the No Build Alternative. Nevertheless, because the TSM/TDM Alternative would not maintain LOS D at all streets in the City of Alhambra, the TSM/TDM Alternative would be inconsistent with Objective 4.1.1.	**Inconsistent.** While the BRT Alternative would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, the BRT Alternative would result in LOS deterioration to unacceptable levels at 2 study intersections in Alhambra during the AM peak hour (Fremont Avenue/Mission Road and SR 710 NB Off-Ramp/Valley Boulevard) and 2 study intersections in Alhambra during the PM peak hour (Atlantic Boulevard/Mission Road and Fremont Avenue/Mission Road) in 2035 as compared to the No Build Alternative. However, both of the study intersections that would experience unacceptable LOS during the PM peak hour would also experience unacceptable LOS under the No Build Alternative. Nevertheless, because the BRT Alternative would not maintain LOS D at all streets in the City of Alhambra, the BRT Alternative would be inconsistent with Objective 4.1.1.	**Inconsistent.** While the LRT Alternative would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, the LRT Alternative would result in LOS deterioration to unacceptable levels at 3 study intersections in Alhambra during the AM peak hour (Fremont Avenue/Mission Road, SR 710 NB Off-Ramp/Valley Boulevard, and Garfield Avenue/Norwood Place) and 2 study intersections in Alhambra during the PM peak hour (Fremont Avenue/Mission Road and SR 710 NB Off-Ramp/Valley Boulevard) in 2035 as compared to the No Build Alternative. However, 1 of the study intersections that would experience unacceptable LOS during the PM peak hour (Fremont Avenue/Mission Road) would also experience unacceptable LOS under the No Build Alternative. Nevertheless, because the LRT Alternative would not maintain LOS D at all streets in the City of Alhambra, the LRT Alternative would be inconsistent with Objective 4.1.1.	**Inconsistent.** While the single-bore design variation of the Freeway Tunnel Alternative with tolls and trucks (the operational variation that would result in the largest traffic volume increases under the single-bore design variation) would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, this operational variation would result in LOS deterioration to unacceptable levels at 1 study intersection in Alhambra during the AM peak hour (Fremont Avenue/Norwood Place) in 2035 as compared to the No Build Alternative. However, this study intersection would also experience unacceptable LOS during the AM peak hour under the No Build Alternative. While the dual-bore design variation of the Freeway Tunnel Alternative without tolls (the operational variation that would result in the largest traffic volume increases under the dual-bore design variation) would also result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, this operational variation would result in LOS deterioration to unacceptable levels at 2 study intersections in Alhambra during the AM peak hour (Fremont Avenue/Norwood Avenue and Garfield Avenue/Norwood Place) in 2035 as compared to the No Build Alternative. However, 1 of these study intersections (Fremont Avenue/Norwood Avenue) would also experience unacceptable LOS during the AM peak hour under the No Build Alternative. Nevertheless, because neither design variation of the Freeway Tunnel Alternative would maintain LOS D at all streets in the City of Alhambra, neither design variation of the Freeway Tunnel Alternative would be consistent with Objective 4.1.1.	**Inconsistent.** While the No Build Alternative would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, the No Build Alternative would result in LOS deterioration to unacceptable levels at 3 study intersections in Alhambra during the AM peak hour (Atlantic Boulevard/Glendon Way, Fremont Avenue/Norwood Avenue, and Garfield Avenue/Mission Road) and 6 study intersections in Alhambra during the PM peak hour (Atlantic Boulevard/Mission Road, Atlantic Boulevard/Valley Boulevard, Fremont Avenue/Mission Road, Fremont Avenue/Norwood Avenue, Garfield/Mission Road, and SR 710 NB Off-Ramp/Valley Boulevard) in 2035. Because the No Build Alternative would not maintain LOS D at all streets in the City of Alhambra, the No Build Alternative would be inconsistent with Objective 4.1.1.
Policy 4.1.6: Continue the programs for upgrading street lighting and traffic control devices including traffic signs and traffic signals.				
Consistent. The TSM/TDM Alternative would install changeable message signs at key locations in the study area to provide real-time travel time and other traffic data to the public. Therefore, the TSM/TDM Alternative would be consistent with Policy 4.1.6.	**Consistent.** The BRT Alternative would include the same active traffic management components as the TSM/TDM Alternative including changeable message signs at key locations in the study area to provide real-time travel time and other traffic information to the public. Therefore, the BRT Alternative would be consistent with Policy 4.1.6.	**Consistent.** The LRT Alternative would include the active traffic management components in the TSM/TDM Alternative including changeable message signs at key locations in the study area to provide real-time travel time and other traffic data to the public. Therefore, the LRT Alternative would be consistent with Policy 4.1.6.	**Consistent.** The Freeway Tunnel Alternative would include the active traffic management components in the TSM/TDM Alternative including changeable message signs at key locations in the study area to provide real-time travel time and other traffic data to the public. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.1.6.	**Consistent.** The No Build Alternative includes traffic signal synchronization projects included in the SCAG 2012 RTP/SCS and regional traffic plans. Therefore, the No Build Alternative would be consistent with Policy 4.1.6.
Objective 4.2.1: Maintain Level of Service D as the minimum operating level desired at all arterial highway intersections.				
Inconsistent. While the TSM/TDM Alternative would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, the TSM/TDM Alternative would result in LOS deterioration to unacceptable levels at 3 study intersections in Alhambra during the AM peak hour (Fremont Avenue/Mission Road, SR 710 NB Off-Ramp/Valley Boulevard, and Marengo Avenue/Valley Boulevard) and 4 study intersections in Alhambra during the PM peak hour (Atlantic Boulevard/Main Street, Atlantic Boulevard/Mission Road, Fremont Avenue/Mission Road, and SR 710 NB Off-Ramp/Valley Boulevard) in 2035 as compared to the No Build Alternative. However, 2 of the study intersections (Atlantic	**Inconsistent.** While the BRT Alternative would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, the BRT Alternative would result in LOS deterioration to unacceptable levels at 2 study intersections in Alhambra during the AM peak hour (Fremont Avenue/Mission Road and SR 710 NB Off-Ramp/Valley Boulevard) and 2 study intersections in Alhambra during the PM peak hour (Atlantic Boulevard/Mission Road and Fremont Avenue/Mission Road) in 2035 as compared to the No Build Alternative. However, both of the study intersections that would experience unacceptable LOS during the PM peak hour would also experience	**Inconsistent.** While the LRT Alternative would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, the LRT Alternative would result in LOS deterioration to unacceptable levels at 3 study intersections in the Alhambra during the AM peak hour (Fremont Avenue/Mission Road, SR 710 NB Off-Ramp/Valley Boulevard, and Garfield Avenue/Norwood Place) and 2 study intersections in Alhambra during the PM peak hour (Fremont Avenue/Mission Road and SR 710 NB Off-Ramp/Valley Boulevard) in 2035 as compared to the No Build Alternative. However, 1 of the study intersections that would experience unacceptable LOS during the PM peak hour (Fremont	**Inconsistent.** While the single-bore design variation of the Freeway Tunnel Alternative with tolls and trucks (the operational variation that would result in the largest traffic volume increases under the single-bore design variation) would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, this operational variation would result in LOS deterioration to unacceptable levels at 1 study intersection in Alhambra during the AM peak hour (Fremont Avenue/Norwood Place) in 2035 as compared to the No Build Alternative. However, this study intersection would also experience unacceptable LOS during the AM peak hour under the No Build Alternative.	**Inconsistent.** While the No Build Alternative would result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, the No Build Alternative would result in LOS deterioration to unacceptable levels at 3 study intersections in Alhambra during the AM peak hour (Atlantic Boulevard/Glendon Way, Fremont Avenue/Norwood Avenue, and Garfield Avenue/Mission Road) and 6 study intersections in Alhambra during the PM peak hour (Atlantic Boulevard/Mission Road, Atlantic Boulevard/Valley Boulevard, Fremont Avenue/Mission Road, Fremont Avenue/Norwood Avenue, Garfield/Mission Road, and SR 710 NB Off-Ramp/Valley Boulevard) in 2035. Because the No

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Boulevard/Mission Road and Fremont Avenue/Mission Road) would also experience unacceptable LOS during the PM peak hour under the No Build Alternative. Nevertheless, because the TSM/TDM Alternative would not maintain LOS D at all intersections in the City of Alhambra, the TSM/TDM Alternative would be inconsistent with Objective 4.2.1.	unacceptable LOS under the No Build Alternative. Nevertheless, because the BRT Alternative would not maintain LOS D at all intersections in the City of Alhambra, the BRT Alternative would be inconsistent with Objective 4.2.1.	Avenue/Mission Road) would also experience unacceptable LOS under the No Build Alternative. Nevertheless, because the LRT Alternative would not maintain LOS D at all intersections in the City of Alhambra, the LRT Alternative would be inconsistent with Objective 4.2.1.	While the dual-bore design variation of the Freeway Tunnel Alternative without tolls (the operational variation that would result in the largest traffic volume increases under the dual-bore design variation) would also result in acceptable LOS at most of the 20 study area intersections in the City of Alhambra in 2035, this operational variation would result in LOS deterioration to unacceptable levels at 2 study intersections in Alhambra during the AM peak hour (Fremont Avenue/Norwood Avenue and Garfield Avenue/Norwood Place) in 2035 as compared to the No Build Alternative. However, 1 of these study intersections (Fremont Avenue/Norwood Avenue) would also experience unacceptable LOS during the AM peak hour under the No Build Alternative. Nevertheless, because neither design variation of the Freeway Tunnel Alternative would maintain LOS D at all intersections in the City of Alhambra, neither design variation of the Freeway Tunnel Alternative would be consistent with Objective 4.2.1.	Build Alternative would not maintain LOS D at all intersections in the City of Alhambra, the No Build Alternative would be inconsistent with Objective 4.1.1.
Policy 4.2.3: Continue to seek State and Federal funding in order to augment existing programs designed to improve operation of the traffic signal system.				
Consistent. The TSM/TDM Alternative was developed based on input from the TAC, which is composed of officials from State and local government entities. If selected, the TSM/TDM Alternative would need to be added to the FTIP to be eligible for federal funding. State and local funding sources are anticipated to be used to finance the improvements included in the TSM/TDM Alternative. Therefore, the TSM/TDM Alternative would be consistent with Policy 4.2.3	**Consistent.** The BRT Alternative was developed based on input from the TAC, which is composed of officials from State and local government entities. If selected, the BRT Alternative would need to be added to the FTIP to be eligible for federal funding. State and local funding sources are anticipated to be used to finance the improvements in the TSM/TDM Alternative and, potentially, the BRT Alternative. Therefore, the BRT Alternative would be consistent with Policy 4.2.3.	**Consistent.** The LRT Alternative was developed based on input from the TAC, which is composed of officials from State and local government entities. If selected, the LRT Alternative would need to be added to the FTIP to be eligible for federal funding. State and local funding sources are anticipated to be used to finance the TSM/TDM Alternative improvements included in the LRT Alternative. Therefore, the LRT Alternative would be consistent with Policy 4.2.3.	**Consistent.** The Freeway Tunnel Alternative was developed based on input from the TAC, which is composed of officials from State and local government entities. If selected, the Freeway Tunnel Alternative would need to be added to the FTIP to be eligible for federal funding. State and local funding sources are anticipated to be used to finance the improvements in the TSM/TDM Alternative, which are included in the Freeway Tunnel Alternative. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.2.3.	**Consistent.** The No Build Alternative includes projects and programs included in the SCAG 2012 RTP/SCS and the FTIP for the SCAG region. Therefore, the projects in the No Build Alternative would be eligible for state and federal funding and the No Build Alternative would be consistent with Policy 4.2.3.
Policy 4.4.1: Encourage the completion of the Long Beach Freeway extension.				
Inconsistent. The TSM/TDM, BRT, and LRT Alternatives would not extend the Long Beach Freeway (i.e., I-710/SR-710) from its current terminus at Valley Boulevard north to Pasadena. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 4.4.1.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not extend the Long Beach Freeway (i.e., I-710/SR-710) from its current terminus at Valley Boulevard north to Pasadena. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 4.4.1.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not extend the Long Beach Freeway (i.e., I-710/SR-710) from its current terminus at Valley Boulevard north to Pasadena. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 4.4.1.	**Consistent.** The Freeway Tunnel Alternative would extend the Long Beach Freeway (i.e., I-710/SR-710) from its current terminus at Valley Boulevard north to Pasadena. Therefore the Freeway Tunnel Alternative would be consistent with Policy 4.4.1.	**Inconsistent.** The No Build Alternative would not extend the Long Beach Freeway (I-710/SR-710) from its current terminus at Valley Boulevard to Pasadena. Therefore, the No Build Alterative would not be consistent with Policy 4.4.1.
Policy 4.5.1: Cooperate with the County of Los Angeles Transportation Commission and the Southern California Rapid Transit District in efforts to improve transit service for City residents of all ages.				
Consistent. The TSM/TDM Alternative was developed by Caltrans and Metro (the successor agency to the County of Los Angeles Transportation Commission and the Southern California Rapid Transit District) and includes expanded bus service and bus service improvements. Therefore, the TSM/TDM Alternative would be consistent with Policy 4.5.1.	**Consistent.** The BRT Alternative was developed by Caltrans and Metro (the successor agency to the County of Los Angeles Transportation Commission and the Southern California Rapid Transit District) and includes expanded bus service, bus service improvements, and the development of a new BRT route through Alhambra. Therefore, the BRT Alternative would be consistent with Policy 4.5.1.	**Consistent.** The LRT Alternative was developed by Metro (the successor agency to the County of Los Angeles Transportation Commission and the Southern California Rapid Transit District) and includes expanded bus service, bus service improvements, and the development of a new light rail line through the City of Alhambra. Therefore, the LRT Alternative would be consistent with Policy 4.5.1.	**Consistent.** The Freeway Tunnel Alternative was developed by Caltrans and Metro (the successor agency to the County of Los Angeles Transportation Commission and the Southern California Rapid Transit District) and includes expanded bus service and bus service improvements. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.5.1.	**Consistent. The** No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, the SCAG 2012 RTP/SCS, and the Metro 2009 LRTP with input from Metro, the successor agency to the County of Los Angeles Transportation Commission and the Southern California Rapid Transit District. Therefore, the No Build Alternative would be consistent with Policy 4.5.1.
Policy 4.5.6: Examine the feasibility and encourage the development of viable transportation alternatives such as light rail transit and paratransit[1] systems to service the needs of the transit dependent and attract those currently using the automobile mode in order to improve circulation and reduce air and noise pollution.				
Consistent. The TSM/TDM Alternative would improve circulation and reduce air and noise pollution by increasing the efficiency of multiple modes of transportation. Transportation alternatives would be improved through the inclusion of pedestrian, bicycle, intersection, intelligent transportation systems, and local street improvements as well as more bus service options. The TSM/TDM Alternative would be consistent with Policy 4.5.6.	**Consistent.** The BRT Alternative will improve the availability of transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, increasing service levels, and reducing the number of stops along the alignment of the BRT Alternative. Therefore, the BRT Alternative would be consistent with Policy 4.5.6.	**Consistent.** The LRT Alternative proposes a new light rail line in the study area. Therefore, the LRT Alternative would be consistent with Policy 4.5.6.	**Consistent.** The Freeway Tunnel Alternative would improve circulation and reduce air and noise pollution by increasing the efficiency of multiple modes of transportation. Transportation alternatives would be improved through the inclusion of pedestrian, bicycle, intersection, intelligent transportation systems, local street improvements, and more bus service options. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.5.6.	**Consistent.** The No Build Alternative includes projects and programs included in the Metro 2009 LRTP and the SCAG 2012 RTP/SCS. Therefore, the No Build Alternative would be consistent with Policy 4.5.6.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 4.5.7: Encourage the interconnection of alternative transportation systems within the existing City circulation network.				
Consistent. The TSM/TDM Alternative strategies include facilitating higher vehicle occupancy, reducing peak-hour trips, reducing the use of motor vehicles, and encouraging ridesharing and transit use. The TSM/TDM Alternative would reduce traffic congestion by expanding transportation options. Therefore, the TSM/TDM Alternative would be consistent with Policy 4.5.7.	**Consistent.** The BRT Alternative would incorporate high-speed, high-frequency bus service through Alhambra with a combination of new, dedicated, and existing bus lanes and mixed-flow traffic lanes with increased bus service levels and limited stop bus services for longer distance commuters. Therefore, the BRT Alternative would be consistent with Policy 4.5.7.	**Consistent.** The LRT Alternative proposes a new light rail line, two bus feeder routes, and increased frequencies and/or spans of service on existing bus routes in the study area to maximize the interconnection of alternative transportation systems in the City of Alhambra. Therefore, the LRT Alternative would be consistent with Policy 4.5.7.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements to enhance the interconnection of alternative transportation systems. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.5.7.	**Consistent.** The No Build Alternative includes projects and programs included in the Metro 2009 LRTP and SCAG 2012 RTP/SCS. Therefore, the No Build Alternative would be consistent with Policy 4.5.7.
General Plan Noise Element				
Goal 3.2: To protect and maintain those areas having acceptable noise environments.				
Policy 4.1.2: Insure the inclusion of noise mitigation measures in the design of new roadway projects in Alhambra.				
N/A. The TSM/TDM Alternative does not include the design of new roadways in the City of Alhambra. This Alternative involves traffic improvements to existing roadways and intersections. Therefore, Policy 4.1.2 is not applicable to the TSM/TDM Alternative	**Consistent.** If determined to be required based on the findings of the *Noise Study Report* (LSA 2014), the BRT Alternative would include mitigation for project noise effects consistent with applicable local and/or Caltrans, as appropriate, noise regulations and guidance. Therefore, the BRT Alternative would be consistent with Policy 4.1.2.	**Consistent.** If determined to be required based on the findings of the *Noise Study Report* (LSA 2014), the LRT Alternative would include mitigation for project noise effects consistent with applicable local noise regulations and guidance. Therefore, the LRT Alternative would be consistent with Policy 4.1.2.	**Consistent.** If determined to be required based on the findings of the *Noise Study Report* (LSA 2014), the Freeway Tunnel Alternative would include mitigation for project noise effects consistent with applicable local noise regulations and guidance. Therefore the Freeway Tunnel Alternative would be consistent with Policy 4.1.2.	**Consistent.** If projects in the No Build Alternative exceed applicable noise standards, noise attenuation would be considered under CEQA and/or NEPA, as applicable to each project. Therefore, the No Build Alternative would be consistent with Policy 4.1.2.
Valley Boulevard Corridor Specific Plan (City of Alhambra)				
Program Goal: Strive to provide vehicular circulation on all roadways within the Specific Plan area at level of service "D" or better (as defined by the National Research Council, Highway Capacity Manual).				
Inconsistent. While the TSM/TDM Alternative would result in acceptable LOS at most of the 4 study area intersections in the Valley Boulevard Corridor Specific Plan area in 2035, the TSM/TDM Alternative would result in LOS deterioration to unacceptable levels at 1 study intersection in the Valley Boulevard Corridor Specific Plan area during the AM peak hour (Marengo Avenue/Valley Boulevard) in 2035 as compared to the No Build Alternative. Because the TSM/TDM Alternative would not maintain LOS D at all streets in the Valley Boulevard Corridor Specific Plan area, the TSM/TDM Alternative would be inconsistent with this program goal.	**Inconsistent.** While the TSM/TDM Alternative would result in acceptable LOS at most of the four study area intersections in the Valley Boulevard Corridor Specific Plan area in 2035, the TSM/TDM Alternative would result in LOS deterioration to unacceptable levels at one study intersection in the Valley Boulevard Corridor Specific Plan area during the AM peak hour (Marengo Avenue/Valley Boulevard) in 2035 as compared to the No Build Alternative. Because the TSM/TDM Alternative would not maintain LOS D at all streets in the Valley Boulevard Corridor Specific Plan area, the TSM/TDM Alternative would be inconsistent with this program goal.	**Consistent.** The BRT Alternative would result in LOS D at all three study intersections in the Valley Boulevard Corridor Specific Plan area during the AM and PM peak hours in 2035 as compared to existing conditions. Therefore, the BRT Alternative would be consistent with this program goal.	**Inconsistent.** While the single-bore design variation of the Freeway Tunnel Alternative with tolls and trucks (the operational variation that would result in the largest traffic volume increases under the single-bore design variation) would result in acceptable LOS at most of the 4 study area intersections in the Valley Boulevard Corridor Specific Plan area in 2035, this operational variation would result in LOS deterioration to unacceptable levels at 1 study intersection in the Valley Boulevard Corridor Specific Plan area during the AM peak hour (Marengo Avenue/Valley Boulevard) in 2035 as compared to the No Build Alternative. Because the single-bore design variation of the Freeway Tunnel Alternative would not maintain LOS D at all streets in the Valley Boulevard Corridor Specific Plan area, it would be inconsistent with this program goal. **Consistent.** The dual-bore design variation of the Freeway Tunnel Alternative without tolls (the operational variation that would result in the largest traffic volume increases under the dual-bore design variation) would result in acceptable LOS at all 4 study area intersections in the Valley Boulevard Corridor Specific Plan area in 2035 as compared to the No Build Alternative. Therefore, the dual-bore design variation of the Freeway Tunnel Alternative would be consistent with this program goal.	**Inconsistent.** While the No Build Alternative would result in acceptable LOS at most of the 4 study area intersections in the Valley Boulevard Corridor Specific Plan area in 2035, the No Build Alternative would result in LOS deterioration to unacceptable levels at 1 study intersection in the Valley Boulevard Corridor Specific Plan area during the PM peak hour (Atlantic Boulevard/Valley Boulevard) in 2035. Because the No Build Alternative would not maintain LOS D at all intersections in the Valley Boulevard Corridor Specific Plan area, the No Build Alternative would be inconsistent with this program goal.
Program Goal: Develop a circulation system which promotes energy efficiency and improves air quality.				
Consistent. The TSM/TDM Alternative is designed to maximize the efficiency of the existing infrastructure by improving capacity without increasing the number of through lanes. Therefore, the TSM/TDM Alternative would be consistent with this program goal.	**Consistent.** The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, dedicated, and existing bus lanes to increase ridership and reduce dependency on automobiles. Therefore, the BRT Alternative would be consistent with this program goal	**Consistent.** The LRT Alternative includes a new light rail line and the TSM/TDM Alternative improvements, which would promote energy efficiency and contribute to improved air quality. Therefore, the LRT Alternative would be consistent with this program goal.	**Consistent.** The Freeway Tunnel Alternative includes air scrubbers, a ventilation system with exhaust fans at each portal, an exhaust duct along the entire length of the tunnel, and jet fans in the traffic area of the tunnel to improve air quality. Therefore, the Freeway Tunnel Alternative would be consistent with this program goal.	**Consistent.** The No Build Alternative includes projects and programs included in the Metro 2009 LRTP and the SCAG 2012 RTP/SCS. However, none of those projects and programs would be in the Valley Boulevard Corridor Specific Plan area. Therefore, the No Build Alternative would be consistent with this program goal.
Program Goal: Improve access and minimize the impacts to land uses adjoining Valley Boulevard and the other arterials within the Specific Plan area.				
Consistent. The TSM/TDM Alternative would improve Fremont Avenue, Garfield Avenue, and Atlantic Boulevard in the vicinity of the Valley Boulevard Corridor Specific Plan area by increasing the efficiency of these existing arterials without increasing the number of through lanes, thereby	**Consistent.** The BRT Alternative would include high-speed, high-frequency bus service on Atlantic Boulevard within the Valley Boulevard Corridor Specific Plan area through a combination of new, dedicated, and existing bus lanes that would improve transit access in the Specific Plan area. The	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, which would improve Fremont Avenue, Garfield Avenue, and Atlantic Boulevard in the vicinity of the Valley Boulevard Corridor Specific Plan area by increasing the efficiency of these existing arterials without	**Consistent.** The Freeway Tunnel Alternative would include the TSM/TDM Alternative improvements, which would improve Fremont Avenue, Garfield Avenue, and Atlantic Boulevard in the vicinity of the Valley Boulevard Corridor Specific Plan area by increasing the efficiency of these	**Not Applicable.** The No Build Alternative would not improve Valley Boulevard or other arterials in the Valley Boulevard Corridor Specific Plan area. Therefore, this program goal is not applicable to the No Build Alternative.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
minimizing impacts on adjacent land uses. Although the TSM/TDM Alternative improvements would restrict left-turn movements into and out of several properties along Atlantic Boulevard and Garfield Avenue in the Specific Plan area, these improvements would reduce traffic congestion in the area without requiring additional ROW. Therefore, the TSM/TDM Alternative would be consistent with this program goal.	BRT Alternative would require the partial acquisition of several parcels on the east side of Atlantic Boulevard in the vicinity of Valley Boulevard to construct the dedicated bus lanes; however, land use impacts would be minimized. Therefore, the BRT Alternative would be consistent with this program goal.	increasing the number of through lanes, thereby minimizing impacts on adjacent land uses. Although these improvements would restrict left-turn movements into and out of several properties along Atlantic Boulevard and Garfield Avenue in the Specific Plan area, these improvements would reduce traffic congestion in the area without requiring additional ROW. Therefore, the LRT Alternative would be consistent with this program goal.	existing arterials without increasing the number of through lanes, thereby minimizing impacts on adjacent land uses. Although these improvements would restrict left-turn movements into and out of several properties along Atlantic Boulevard and Garfield Avenue in the Specific Plan area, these improvements would reduce traffic congestion in the area without requiring additional ROW. Therefore, the Freeway Tunnel Alternative would be consistent with this program goal	
Program Goal: Support the extension of I-710 Freeway and pursue operational and capacity improvements for I-710 Freeway.				
Inconsistent. The TSM/TDM, BRT, and LRT Alternatives would not extend or pursue operational capacity improvements on I-710/SR-710. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with this program goal.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not extend or pursue operational capacity improvements on I-710/SR-710. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with this program goal.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not extend or pursue operational capacity improvements on I-710/SR-710. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with this program goal.	**Consistent.** The Freeway Tunnel Alternative would support the extension of I-710 and operational capacity improvements to I-710 because it proposes the extension of SR 710 between I-10 and I-210. Therefore, the Freeway Tunnel Alternative would be consistent with this program goal.	**Inconsistent.** The No Build Alternative would not extend I-710/SR-710 or pursue operational capacity improvements for the I-710/SR-710 Freeway. Therefore, the No Build Alternative would not be consistent with this program goal.
Program Goal: Participate in federal, state, and county programs to expand the use of ridesharing, vanpooling, and other TDM measures developed to reduce congestion within Alhambra and on the regional circulation system.				
Consistent. The TSM/TDM Alternative includes strategies and improvements to increase the efficiency and capacity of the existing transportation system. Therefore, the TSM/TDM Alternative would be consistent with this program goal.	**Consistent.** The BRT Alternative includes the BRT trunk line arterial street and station improvements, frequent bus services, new bus feeder services, and enhanced connectivity. Therefore, the BRT Alternative would be consistent with this program goal	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements and would be supportive of alternative transportation modes, including shared ride modes. Therefore, the LRT Alternative would be consistent with this program goal.	**Consistent.** The Freeway Tunnel Alternative would provide enhancements to maximize the efficiency and capacity of the existing transportation system, including the TSM/TDM Alternative improvements. Therefore, the Freeway Tunnel Alternative would be consistent with this program goal.	**Consistent.** The No Build Alternative includes projects and programs included in the Metro 2009 LRTP and the SCAG 2012 RTP/SCS. Therefore, the No Build Alternative would be consistent with this program goal.
Program Goal: Support regional transit system improvement projects that would serve Valley Boulevard and the City.				
Consistent. The TSM/TDM Alternative would improve the efficiency of multiple modes of transportation through the provision of pedestrian, bicycle, intersection, intelligent transportation systems, and local street improvements, as well as more bus service options, including services intersecting Valley Boulevard. Therefore, the TSM/TDM Alternative would be consistent with this program goal.	**Consistent.** The BRT Alternative would improve the availability of viable transportation alternatives on Valley Boulevard by implementing new dedicated bus lanes for longer distance commuters and adding more buses with fewer stops. Therefore, the BRT Alternative would be consistent with this program goal.	**Consistent.** The LRT Alternative proposes a new light rail line that would serve transit service to Valley Boulevard and the City of Alhambra, and which would increase connections with and access to the overall regional transportation system. Therefore, the LRT Alternative would be consistent with this program goal.	**Consistent.** The Freeway Tunnel Alternative would improve the efficiency of multiple modes of transportation through the provision of pedestrian, bicycle, intersection, intelligent transportation systems, and local street improvements, as well as more bus service options, including services intersecting Valley Boulevard. Therefore, the Freeway Tunnel Alternative would be consistent with this program goal.	**Consistent.** The No Build Alternative includes projects and programs included in the Metro 2009 LRTP and SCAG 2012 RTP/SCS that would improve the regional transit system. However, none of these projects and programs would be in this Specific Plan area. Therefore, the No Build Alternative would be consistent with this program goal.
EAST LOS ANGELES, LOS ANGELES COUNTY LAND USE PLAN CONSISTENCY				
Los Angeles County General Plan Urban Form Element				
Policy 34: Promote the development of an improved public transportation system to link regional centers.				
Consistent. The TSM/TDM Alternative was developed by Caltrans and Metro to reduce peak-hour trips, reduce the use of motor vehicles, and encourage ridesharing and transit use to improve mobility in the study area. The TSM/TDM Alternative focuses on reducing traffic congestion by increasing the use of mass transit and other alternatives to the private automobile. Therefore, the TSM/TDM Alternative would be consistent with Policy 34.	**Consistent.** The BRT Alternative includes high-speed, high-frequency bus service through the unincorporated community of East Lost Angeles with a combination of new, dedicated, and existing bus lane and mixed-flow traffic lanes for longer distance commuters, and more buses with fewer stops. Therefore, the BRT Alternative would be consistent with Policy 34.	**Consistent.** The LRT Alternative proposes a new light rail line, two bus feeder routes, and increased frequencies and/or spans of service on existing bus routes in the study area to maximize the interconnection of alternative transportation systems in the County of Los Angeles. Therefore, the LRT Alternative would be consistent with Policy 34.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in unincorporated Los Angeles County; therefore, Policy 34 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes projects and programs included in the Metro 2009 LRTP and SCAG 2012 RTP/SCS. Therefore, the No Build Alternative would be consistent with Policy 34.
Los Angeles County General Plan Transportation Element				
Policy 48: Emphasize development of an improved public transportation system that will support urban revitalization.				
Consistent. The TSM/TDM Alternative would improve circulation by increasing the efficiency of multiple modes of transportation. Transportation alternatives would be improved based on inclusion of pedestrian, bicycle, intersection, intelligent transportation systems, local street improvements, and increased bus service. Therefore, the TSM/TDM Alternative would be consistent with Policy 48.	**Consistent.** The BRT Alternative would improve the availability of transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, and adding more buses with fewer stops. The BRT Alternative would be consistent with Policy 48.	**Consistent.** The LRT Alternative includes a new light rail line. Therefore the LRT Alternative would be consistent with Policy 48.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in unincorporated Los Angeles County; therefore, Policy 48 would not be applicable to the Freeway Tunnel Alternative	**Consistent.** The No Build Alternative includes projects and programs included in the Metro 2009 LRTP and SCAG 2012 RTP. Therefore, the No Build Alternative would be consistent with Policy 48.
Policy 50: Support the development of a transportation system that will make a positive contribution to the improvement of air quality.				
Consistent. The TSM/TDM Alternative would improve circulation and reduce air pollution by increasing the efficiency of multiple modes of transportation. Transportation alternatives would be improved based on inclusion of pedestrian, bicycle, intersection, intelligent	**Consistent.** The BRT Alternative will improve the availability of viable transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, and adding more buses with fewer stops. The BRT Alternative would be consistent with Policy 50.	**Consistent.** The LRT Alternative includes a new light rail line. Therefore, the LRT Alternative would be consistent with Policy 50.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in unincorporated Los Angeles County; therefore, Policy 50 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes projects and programs included in the Metro 2009 LRTP and SCAG 2012 RTP/SCS resulting in improvements to air quality. Therefore, the No Build Alternative would be consistent with Policy 50.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
transportation systems, local street improvements, and more bus service options. The TSM/TDM Alternative would be consistent with Policy 50.				
Policy 51: Promote the completion of gaps or missing segments in partially completed freeways.				
Inconsistent. The TSM/TDM, BRT, and LRT Alternatives would not promote the completion of gaps or missing segments in partially completed freeways. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 51.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not promote the completion of gaps or missing segments in partially completed freeways. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 51.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not promote the completion of gaps or missing segments in partially completed freeways. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 51.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in unincorporated Los Angeles County; therefore, Policy 51 would not be applicable to the Freeway Tunnel Alternative.	**Inconsistent.** The No Build Alternative would not complete gaps or missing segments of partially completed freeways, including I-710/SR-710. Therefore, the No Build Alternative would not be consistent with Policy 51.
Policy 52: Provide for more efficient multimodal use of the current freeway system.				
Inconsistent. The TSM/TDM, BRT, and LRT Alternatives would not provide for more efficient multimodal use of the current freeway system. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 52.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not provide for more efficient multimodal use of the current freeway system. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 52.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not provide for more efficient multimodal use of the current freeway system. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 52.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in unincorporated Los Angeles County; therefore, Policy 52 would not be applicable to the Freeway Tunnel Alternative	**Inconsistent.** The No Build Alternative would not provide for more efficient multimodal use of the existing freeway system. Therefore, the No Build Alternative would not be consistent with Policy 52.
East Los Angeles Community Plan				
Physical Environment Goal: To improve local transit and circulation.				
Circulation and Transportation Policy: Improve the local public transit to more closely serve the needs of the people.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in East Los Angeles; therefore, the Circulation and Transportation Policy would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative would improve the availability of local public transit in East Los Angeles. Therefore, the BRT Alternative would be consistent with the Circulation and Transportation Policy.	**Consistent.** The LRT Alternative would increase the availability of public transit (light rail and bus) in the unincorporated community of East Los Angeles. Therefore, the LRT Alternative would be consistent with the Circulation and Transportation Policy.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in East Los Angeles; therefore, the Circulation and Transportation Policy would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes the projects and programs included in the Metro 2009 LRTP and SCAG 2012 RTP/SCS. Therefore, the No Build Alternative would be consistent with the Circulation and Transportation Policy.
CITY OF LOS ANGELES GENERAL PLAN				
Transportation Element				
Objective 2: Mitigate the impacts of traffic growth, reduce congestion, and improve air quality by implementing a comprehensive program of multimodal strategies that encompass physical and operational improvements as well as demand management.				
Policy 2.2: Cooperate with regional agencies to establish region wide Transportation Demand Management (TDM) programs to achieve regional trip reductions and/or increased vehicle occupancy.				
Consistent. The TSM/TDM Alternative includes TDM strategies to facilitate higher vehicle occupancy or reduction in traffic congestion by expanding the traveler's transportation options in terms of travel mode, travel time, travel route, travel costs, and the quality and convenience of the travel experience. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including TDM strategies to facilitate higher vehicle occupancy or reduction in traffic congestion by expanding the travelers' transportation options in terms of travel mode, time, route, and costs, and the quality and convenience of the travel experience. Therefore, the BRT Alternative would be consistent with Policy 2.2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including TDM strategies to facilitate higher vehicle occupancy or reduction in traffic congestion by expanding the travelers' transportation options in terms of travel mode, time, route, and costs, and the quality and convenience of the travel experience. Therefore, the LRT Alternative would be consistent with Policy 2.2.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements including TDM strategies to facilitate higher vehicle occupancy and or reduce traffic congestion by expanding travelers' transportation options in terms of travel mode, time, route, costs, and the quality and convenience of the travel experience. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.2.	**Consistent.** None of the improvements included in the No Build Alternative, which includes projects/planned improvements through 2035 that are included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, would establish region-wide TDM programs to achieve regional trip reductions and/or increased vehicle occupancy. However, because none of the improvements included in the No Build Alternative would preclude the establishment of regional TDM programs, the No Build Alternative would be consistent with Policy 2.2.
Policy 2.5: Provide bicycle access in or near mixed use corridors, neighborhood districts, and community centers that affords easy accessibility to many non-work purpose destinations.				
Consistent. The TSM/TDM Alternative includes strategies to improve existing bicycle facilities including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.5.	**Consistent.** The BRT Alternative includes TSM/TDM Alternative strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area, and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative would be consistent with Policy 2.5.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including strategies to improve existing bicycle facilities that include the provision of on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations. The LRT Alternative would provide bicycle parking facilities at each station along the new light rail line. Therefore, the LRT Alternative would be consistent with Policy 2.5.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area, and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.5.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote active transportation. Therefore, the No Build Alternative would be consistent with Policy 2.5.
Policy 2.14: Promote the increase of bus service along high-demand routes and corridors in order to reduce bus overcrowding.				
Consistent. The TSM/TDM Alternative includes strategies to expand and improve bus service throughout the study area. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.14.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including strategies to expand and improve bus service throughout the study area. Therefore, the BRT Alternative would be consistent with Policy 2.14.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including strategies to expand and improve bus service throughout the study area. Therefore, the LRT Alternative would be consistent with Policy 2.14.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include strategies to expand and improve bus service throughout the study area. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.14.	**Consistent. Consistent.** While not specifically mentioned as a specific project within planning documents, improvements to heavily traveled bus routes would be addressed by Metro as part of their routine operations planning process. Therefore, the No Build Alternative would be consistent with Policy 2.14.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 2.16: Promote the expansion of express and local bus service in priority corridors not served by the funded rail system, so as to reduce congestion along congested corridors.				
Consistent. The TSM/TDM Alternative includes strategies to expand and improve bus service throughout the study area. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.16.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including strategies to expand and improve bus service throughout the study area. Therefore, the BRT Alternative would be consistent with Policy 2.16.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including strategies to expand and improve bus service throughout the study area. Therefore, the LRT Alternative would be consistent with Policy 2.16.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include strategies to expand and improve bus service throughout the study area. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.16.	**Consistent.** While not specifically mentioned as a specific project within planning documents, the expansion of express and local bus service in priority corridors would be addressed by Metro as part of their routine operations planning process. Therefore, the No Build Alternative would be consistent with Policy 2.16.
Policy 2.22: Establish priority corridors for Transportation System Management (TSM) improvements, including Automated Traffic Surveillance and Control (ATSAC) systems, Smart Corridors, and other strategies.				
Consistent. The TSM/TDM Alternative includes TSM strategies to improve local street and intersections throughout the study area and active traffic management technology. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.22.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including TSM strategies to improve local streets and intersections throughout the study area and active traffic management technology. Therefore, the BRT Alternative would be consistent with Policy 2.22.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including TSM strategies to improve local streets and intersections throughout the study area and active traffic management technology. Therefore, the LRT Alternative would be consistent with Policy 2.22.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, including TSM strategies to improve local streets and intersections throughout the study area and active traffic management technology. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.22.	**Consistent.** None of the improvements included in the No Build Alternative, which include projects/planned improvements through 2035 that are included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, would install TSM improvements in the City of Los Angeles. However, because none of the improvements included in the No Build Alternative would preclude the City's efforts to establish priority corridors for TSM improvements, the No Build Alternative would be consistent with Policy 2.22.
Policy 2.26: Maximize arterial street peak hour capacity through removal of curb parking during peak hours where such removal creates an additional travel and /or bus lane.				
Consistent. The TSM/TDM Alternative includes strategies to increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.26.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including strategies to increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Therefore, the LRT Alternative would be consistent with Policy 2.26.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including strategies to increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Therefore, the LRT Alternative would be consistent with Policy 2.26.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include strategies to increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.26.	**Consistent.** None of the improvements included in the No Build Alternative, which include projects/planned improvements through 2035 that are included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, would maximize arterial street peak-hour capacity in the City of Los Angeles by removing curb parking during peak hours in locations where such removal would create an additional travel and /or bus lane. However, because none of the improvements included in the No Build Alternative would preclude the City's efforts to maximize arterial street peak-hour capacity by removing curb parking during peak hours, the No Build Alternative would be consistent with Policy 2.26.
Policy 2.29: Consider highway infrastructure investments primarily along severely congested corridors.				
Consistent. The TSM/TDM Alternative consists of strategies and improvements to increase efficiency and capacity for all modes in the transportation system by improving capacity and reducing congestion throughout the study area. Therefore, the TSM/TDM Alternative is consistent with Policy 2.29.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including strategies to increase efficiency and capacity for all modes in the transportation system by improving capacity and reducing congestion throughout the study area. Therefore, the BRT Alternative is consistent with Policy 2.29.	**Consistent.** The LRT Alternative includes strategies and improvements to increase efficiency and capacity for all modes in the transportation system by improving capacity and reducing congestion throughout the study area. Therefore, the LRT Alternative would be consistent with Policy 2.29.	**Consistent.** The Freeway Tunnel Alternative includes strategies and improvements to increase efficiency and capacity for all modes in the transportation system by improving capacity and reducing congestion throughout the study area. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.29.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include highway infrastructure investments along severely congested corridors. Therefore, the No Build Alternative would be consistent with Policy 2.29.
Policy 2.33: Continue incremental completion of the Highways and Freeways system, as shown in Maps A1 and A2–A6 [i.e., the planned Highways and Freeways Maps in the City of Los Angeles General Plan Transportation Element], and as may be periodically modified by the designation of pedestrian priority street segments and transit priority streets.				
Inconsistent. The TSM/TDM Alternative would include local street and intersection improvements in the neighborhoods of Eagle Rock and El Sereno. Although most of these improvements would be consistent with General Plan Highways and Freeways System Maps, the TSM/TDM Alternative would not complete I-710/SR-710 between El Sereno and Pasadena, which is shown on Map A5, and would construct a new connector road between Valley Boulevard and Mission Road, which is not shown on Map A5. Therefore, the TSM/TDM Alternative would not be consistent with Policy 2.33.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which include local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park, and completion of SR 710 between El Sereno and the City of Pasadena. These improvements would be consistent with the General Plan Highways and Freeways System Maps. Therefore, the BRT Alternative would be consistent with Policy 2.33.	**Inconsistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, which include local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. Although most of these improvements would be consistent with the General Plan Highways and Freeways System Maps, the LRT Alternative would not complete I-710/SR-710 between El Sereno and Pasadena, which is shown on Map A5, and would construct a new connector road between Valley Boulevard and Mission Road, which is not shown on Map A5. Therefore, the LRT Alternative would not be consistent with Policy 2.33.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park, and completion of SR 710 between El Sereno and the City of Pasadena. These improvements would be consistent with the General Plan Highways and Freeways System Maps. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.33.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and the Metro 2009 LRTP, that include the replacement of the existing Riverside Drive Bridge over the Los Angeles River and Riverside Drive Viaduct/Grade Separation Structure with an integrated two-lane standard-curvature bridge and grade separation structure as well as other improvements consistent with the planned Highways and Freeways Maps in the City of Los Angeles General Plan Transportation Element. Therefore, the No Build Alternative would be consistent with Policy 2.33.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 2.34: Consider the construction of new highway segments and strategic roadway widening only after the implementation of appropriate Demand Management and System Management measures.				
Consistent. The TSM/TDM Alternative includes implementation of appropriate TSM and TDM measures throughout the study area. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.34.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including the implementation of appropriate TSM and TDM improvements throughout the study area. Therefore, the BRT Alternative would be consistent with Policy 2.34.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including the implementation of appropriate TSM and TDM improvements throughout the study area. Therefore, the LRT Alternative would be consistent with Policy 2.34.	**Consistent.** The Freeway Tunnel Alternative includes implementation of TSM and TDM measures throughout the study area. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.34.	**Consistent. Consistent.** None of the improvements included in the No Build Alternative, which include projects/planned improvements through 2035 that are included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, would implement appropriate TDM and TSM measures in the City of Los Angeles. However, because none of the improvements included in the No Build Alternative would preclude the City from implementing appropriate TDM and TSM measures, the No Build Alternative would be consistent with Policy 2.34.
Objective 10: Make the street system accessible, safe, and convenient for bicycle, pedestrian, and school children travel.				
Policy 10.1: Implement the updated and revised 1996 City Bicycle Plan				
Consistent. The TSM/TDM Alternative includes bicycle facility improvements, but would not implement the 1996 City Bicycle Plan. However, because the improvements in the TSM/TDM Alternative would not preclude the City from implementing the 1996 City Bicycle Plan, the TSM/TDM Alternative would be consistent with Policy 10.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which include bicycle facility improvements, but would not implement the 1996 City Bicycle Plan. However, because the improvements in the TSM/TDM Alternative would not preclude the City from implementing the 1996 City Bicycle Plan, the BRT Alternative would be consistent with Policy 10.1.	**Consistent.** The LRT Alternative includes bicycle facility improvements, but would not implement the 1996 City Bicycle Plan. Because the LRT Alternative improvements would not preclude the City of Los Angeles from implementing the 1996 City Bicycle Plan and, it would be consistent with Policy 10.1.	**Consistent.** The Freeway Tunnel Alternative includes bicycle facility improvements, but would not implement the 1996 City Bicycle Plan. However, because the Freeway Tunnel Alternative would not preclude the City of Los Angeles from implementing the 1996 City Bicycle Plan, it would be consistent with Policy 10.1.	**Consistent.** None of the improvements included in the No Build Alternative, which include projects/planned improvements through 2035 that are included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, would implement the 1996 City Bicycle Plan. However, because none of the improvements included in the No Build Alternative would preclude the City from implementing the 1996 City Bicycle Plan, the No Build Alternative would be consistent with Policy 10.1
Policy 10.2: Continue completion of the Highways and Freeways system utilizing the cross sections presented in Chapter VI of this element [i.e., the Street Designations and Standards chapter of the City of Los Angeles General Plan Transportation Element], which provide for wider sidewalks/parkways along arterial streets, and link implementation of streetscape guidelines to street widening projects.				
Consistent. The TSM/TDM Alternative would include local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. All such improvements would be consistent with the cross sections presented in the Street Designations and Standards chapter of the City of Los Angeles General Plan Transportation Element. Therefore, the TSM/TDM Alternative would be consistent with Policy 10.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. Those improvements would be designed and constructed consistent with the cross sections in the Street Designation and Standards Chapter of the City of Los Angeles General Plan Transportation Element. Therefore, the BRT Alternative would be consistent with Policy 10.2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. Those improvements would be designed and constructed consistent with the cross sections in the Street Designation and Standards Chapter of the City of Los Angeles General Plan Transportation Element. Therefore, the LRT Alternative would be consistent with Policy 10.2.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. The Freeway Tunnel Alternative would also complete SR 710 between El Sereno and the City of Pasadena. These improvements would be designed and constructed consistent with the cross sections in the Street Designations and Standards Chapter of the City of Los Angeles General Plan Transportation Element and/or Caltrans design standards, as appropriate. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 10.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include the replacement of the existing Riverside Drive Bridge over the Los Angeles River and Riverside Drive Viaduct/Grade Separation Structure with an integrated two-lane standard-curvature bridge and grade separation structure as well as other improvements consistent with the planned Highways and Freeways Maps in the City of Los Angeles General Plan Transportation Element. All such improvements would be consistent with the cross sections presented in the Street Designations and Standards Chapter of the City of Los Angeles General Plan Transportation Element. Therefore, the No Build Alternative would be consistent with Policy 10.2.
Policy 10.5: Ensure that sidewalks along all designated major and secondary highways are maintained at a minimum ten (10)-foot width pending full dedication and improvement of these streets to the standards set forth in this Element.				
Consistent. The TSM/TDM Alternative would include local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. All such improvements would provide or maintain sidewalk widths consistent with Policy 10.5. Therefore, the TSM/TDM Alternative would be consistent with Policy 10.5.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements including local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. Those improvements would provide or maintain sidewalk widths consistent with Policy 10.5. Therefore, the BRT Alternative would be consistent with Policy 10.5	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements including local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. Those improvements would provide or maintain sidewalk widths consistent with Policy 10.5. Therefore, the LRT Alternative would be consistent with Policy 10.5	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include local street and intersection improvements in the neighborhoods of Eagle Rock, El Sereno, and Glassell Park. Those improvements would provide or maintain sidewalk widths consistent with Policy 10.5. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 10.5.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include improvements to designated major and secondary highways in the City of Los Angeles. All such improvements would provide or maintain sidewalk widths consistent with Policy 10.5. Therefore, the No Build Alternative would be consistent with Policy 10.5.
NORTHEAST LOS ANGELES COMMUNITY PLAN				
Goal 10: A system of freeways, highways and streets that provides a circulation system which supports existing, approved, and planned land uses while maintaining a desired level of service at all intersections.				
Objective 10-1: To comply with Citywide performance standards for acceptable levels of service and ensure that necessary road access and street improvements are provided to accommodate traffic generated by all new development.				
Inconsistent. While the TSM/TDM Alternative would result in acceptable LOS at most of the 21 study area intersections in the Northeast Los Angeles Community Plan area in 2035, the TSM/TDM Alternative would result in LOS deterioration to unacceptable levels at 2 study intersections in the	**Inconsistent.** While the BRT Alternative would result in acceptable LOS at most of the 21 study area intersections in the Northeast Los Angeles Community Plan area in 2035, the BRT Alternative would result in LOS deterioration to unacceptable levels at 1 study intersection in the Northeast	**Inconsistent.** While the LRT Alternative would result in acceptable LOS at most of the 21 study area intersections in the Northeast Los Angeles Community Plan area in 2035, the LRT Alternative would result in LOS deterioration to unacceptable levels at 2 study intersections in the Northeast	**Inconsistent.** While the single-bore design variation of the Freeway Tunnel Alternative with tolls and trucks (the operational variation that would result in the largest traffic volume increases under the single-bore design variation) would result in acceptable LOS at most of the 21 study area	**Inconsistent.** While the No Build Alternative would result in acceptable LOS at most of the 21 study area intersections in the Northeast Los Angeles Community Plan area in 2035, the No Build Alternative would result in LOS deterioration to unacceptable levels at 3 study intersections in the Northeast

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Northeast Los Angeles Community Plan area during the AM peak hour (Huntington Drive/Monterey Road and Concord Avenue/Alhambra Avenue) and 3 study intersections in the Northeast Los Angeles Community Plan area during the PM peak hour (Broadway/Colorado Boulevard, Eagle Rock Boulevard/Verdugo Road/Avenue 40, and Concord Avenue/Alhambra Avenue) in 2035 as compared to the No Build Alternative. However, 1 of these study intersections (Broadway/Colorado Boulevard) would also experience unacceptable LOS during the AM peak hour and 2 of these study intersections (Broadway/Colorado Boulevard and Concord Avenue/Alhambra Avenue) would also experience unacceptable LOS during the PM peak hour under the No Build Alternative. Nevertheless, because the TSM/TDM Alternative would not maintain LOS D at all intersections in the Northeast Los Angeles Community Plan area, the TSM/TDM Alternative would be inconsistent with Objective 10-1.	Los Angeles Community Plan area during the AM peak hour (Huntington Drive/Monterey Road) and 2 study intersections in the Northeast Los Angeles Community Plan area during the PM peak hour (Broadway/Colorado Boulevard and Concord Avenue/Alhambra Avenue) in 2035 as compared to the No Build Alternative. However, both study intersections that would experience unacceptable LOS during the PM peak hour would also experience unacceptable LOS during the PM peak hour under the No Build Alternative. Nevertheless, because the BRT Alternative would not maintain LOS D at all intersections in the Northeast Los Angeles Community Plan area, the BRT Alternative would be inconsistent with Objective 10-1.	Los Angeles Community Plan area during the AM peak hour (Huntington Drive/Monterey Road and Pasadena Avenue/Broadway) and 2 study intersections in the Northeast Los Angeles Community Plan area during the PM peak hour (Broadway/Colorado Boulevard and Concord Avenue/Alhambra Avenue) in 2035 as compared to the No Build Alternative. However, 1 of these study intersections (Huntington Drive/Monterey Road) would also experience unacceptable LOS during the AM peak hour and 2 of these study intersections (Broadway/Colorado Boulevard and Concord Avenue/Alhambra Avenue) would also experience unacceptable LOS during the PM peak hour under the No Build Alternative. Nevertheless, because the LRT Alternative would not maintain LOS D at all intersections in the Northeast Los Angeles Community Plan area, the LRT Alternative would be inconsistent with Objective 10-1.	intersections in the Northeast Los Angeles Community Plan area in 2035, this operational variation would result in LOS deterioration to unacceptable levels at 1 study intersection in the Northeast Los Angeles Community Plan area during the PM peak hour (Broadway/Colorado Boulevard) in 2035 as compared to the No Build Alternative. However, this study intersection would also experience unacceptable LOS during the PM peak hour under the No Build Alternative. Nevertheless, because the single-bore design variation of the Freeway Tunnel Alternative would not maintain LOS D at all intersections in the Northeast Los Angeles Community Plan area, it would be inconsistent with Objective 10-1. While the dual-bore design variation of the Freeway Tunnel Alternative without tolls (the operational variation that would result in the largest traffic volume increases under the dual-bore design variation) would result in acceptable LOS at most of the 21 study area intersections in the Northeast Los Angeles Community Plan area in 2035, this operational variation would result in LOS deterioration to unacceptable levels at 1 study intersection in the Northeast Los Angeles Community Plan area during the AM peak hour (Figueroa Street/Avenue 26) and 1 study intersection in the Northeast Los Angeles Community Plan area during the PM peak hour (Broadway/Colorado Boulevard) in 2035 as compared to the No Build Alternative. However, the study intersection that would experience unacceptable LOS during the PM peak hour would also experience unacceptable LOS under the No Build Alternative. Nevertheless, because the dual-bore design variation of the Freeway Tunnel Alternative would not maintain LOS D at all intersections in the Northeast Los Angeles Community Plan area, it would be inconsistent with Objective 10-1.	Los Angeles Community Plan area during the AM peak hour (Concord Avenue/Alhambra Avenue, Daly Street/Broadway, and Pasadena Avenue/Broadway) and 4 study intersections in the Northeast Los Angeles Community Plan area during the PM peak hour (Broadway/Colorado Boulevard, Concord Avenue/Alhambra Avenue, Eastern Avenue/Huntington Drive, and Figueroa Street/SR 134 WB Ramps) in 2035. Because the No Build Alternative would not maintain LOS D at all intersections in the Northeast Los Angeles Community Plan area, the No Build Alternative would be inconsistent with Objective 10-1.
Goal 11: Develop a public transportation system that improves mobility with convenient alternatives to automobile travel.				
Objective 11-1: To encourage improved local and express bus service throughout the community and bus routes that connect with freeways and rail facilities.				
Consistent. The TSM/TDM Alternative includes strategies to expand and improve existing bus service throughout the study area, including Northeast Los Angeles. Therefore, the TSM/TDM Alternative would be consistent with Objective 11-1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which include strategies to expand and improve existing bus services throughout the study area, including Northeast Los Angeles. Therefore, the BRT Alternative would be consistent with Objective 11-1.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including strategies to expand and improve existing bus services throughout the study area, including Northeast Los Angeles. Therefore, the LRT Alternative would be consistent with Objective 11-1.	**Consistent. T**he Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include strategies to expand and improve existing bus services throughout the study area, including Northeast Los Angeles. Therefore, the Freeway Tunnel Alternative would be consistent with Objective 11-1.	**Consistent.** While not specifically mentioned as a specific project within planning documents, improvements to local and express bus routes and bus routes that connect with freeways and rail facilities would be addressed by Metro as part of their routine operations planning process. Therefore, the No Build Alternative would be consistent with Objective 11-1.
Policy 11-1.1: Coordinate with the Metropolitan Transit Authority (MTA) to improve local bus service to and within the Northeast Los Angeles plan area.				
Consistent. The TSM/TDM Alternative was developed by Caltrans and Metro to expand and improve existing bus services throughout the study area, including Northeast Los Angeles. Therefore, the TSM/TDM Alternative would be consistent with Policy 11-1.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which were developed by Caltrans and Metro to expand and improve existing bus services throughout the study area, including Northeast Los Angeles. Therefore, the BRT Alternative would be consistent with Policy 11-1.1.	**Consistent.** The LRT Alternative was developed by Metro to include expanding and improving existing bus services throughout the study area, including Northeast Los Angeles. Therefore, the LRT Alternative would be consistent with Policy 11-1.1.	**Consistent.** The Freeway Tunnel Alternative was developed by Caltrans and Metro to expand and improve existing bus services throughout the study area, including Northeast Los Angeles. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 11-1.1.	**Consistent.** While not specifically mentioned as a specific project within planning documents, improvements to local bus service to and within the Northeast Los Angeles plan area would be addressed by Metro as part of their routine operations planning process. Therefore, the No Build Alternative would be consistent with Policy 11-1.1.
Policy 11-1.2: Encourage the expansion, wherever feasible, of programs aimed at enhancing the mobility of senior citizens, disabled persons, and the transit-dependent population.				
Consistent. The TSM/TDM Alternative includes strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options for those who do not drive. Therefore, the TSM/TDM Alternative would be consistent with Policy 11-1.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements including strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options for those who do not drive. Therefore, the BRT Alternative would be consistent with Policy 11-1.2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements including strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options for those who do not drive. Therefore, the LRT Alternative would be consistent with Policy 11-1.2.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options for those who do not drive. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 11-1.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote optimum mobility. Therefore, the No Build Alternative would be consistent with Policy 11-1.2.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Objective 11-2: To increase the works trips and non-work trips made on public transit.				
Consistent. The TSM/TDM Alternative includes strategies to reduce the use of motor vehicles and encourage public transit use. Therefore, the TSM/TDM Alternative would be consistent with Objective 11-2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including strategies to reduce the use of motor vehicles and encourage public transit use. Therefore, the BRT Alternative would be consistent with Objective 11-2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including strategies to reduce the use of motor vehicles and encourage public transit use. The LRT Alternative includes a new light rail line with a station at Cal State LA in El Sereno. Therefore, the LRT Alternative would be consistent with Objective 11-2.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include strategies to reduce the use of motor vehicles and encourage public transit use. Therefore, the Freeway Tunnel Alternative would be consistent with Objective 11-2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote optimum mobility. Therefore, the No Build Alternative would be consistent with Objective 11-2.
Policy 11-2.2: Encourage the provision of safe, attractive, and clearly identifiable transit stops with user-friendly design amenities.				
Consistent. The TSM/TDM Alternative includes strategies to expand and improve bus service throughout the study area in part to reduce congestion. All new transit stops will be appropriately designed. Therefore, the TSM/TDM Alternative would be consistent with Policy 11-2.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including strategies to expand and improve bus service throughout the study area. Therefore, the BRT Alternative would be consistent with Policy 11-2.2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including strategies to expand and improve bus service throughout the study area. The LRT Alternative includes a new LRT line, with a station provided at Cal State LA in El Sereno. All new transit stops would be designed to be user friendly. Therefore, the LRT Alternative would be consistent with Policy 11-2.2.	**Consistent.** The Freeway Tunnel Alternative includes strategies to expand and improve bus service throughout the study area. All new transit stops will be designed to be user friendly. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 11-2.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include new transit stops. All new transit stops would be appropriately designed. Therefore, the No Build Alternative would be consistent with Policy 11-2.2.
MONTEREY PARK LAND USE PLAN CONSISTENCY				
General Plan Circulation Element				
Goal 1.0: Ensure easy, convenient access from Monterey Park to the Pomona Freeway (SR 60), Long Beach Freeway (I-710), and San Bernardino Freeway (I-10), while minimizing freeway impacts on the local street system.				
Policy 1.1: Support efforts of the California Department of Transportation to improve traffic flow on the freeway system and thereby reduce impacts on the City's arterial roadway network.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 1.1 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative would not interfere with the City of Monterey Park's support of Caltrans' efforts to improve traffic flow on the freeway system. Therefore, the BRT Alternative would be consistent with Policy 1.1.	**Consistent.** The LRT Alternative would not interfere with the City of Monterey Park's support of Caltrans' efforts to improve traffic flow on the freeway system. Therefore, the LRT Alternative would be consistent with Policy 1.1.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 1.1 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative would not interfere with the City's support of Caltrans' efforts to improve traffic flow on the freeway system. Therefore, the No Build Alternative would consistent with Policy 1.1.
Policy 1.2: Participate actively in efforts to lobby elected officials and state and federal legislatures for completion of the Long Beach Freeway (Interstate 710).				
Inconsistent. The TSM/TDM, BRT, and LRT Alternatives would not extend the Long Beach Freeway (i.e., I-710/ SR-710) from its current terminus at Valley Boulevard northward to Pasadena. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 1.2.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not extend the Long Beach Freeway (i.e., I-710/ SR-710) from its current terminus at Valley Boulevard northward to Pasadena. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 1.2.	**Inconsistent.** The TSM/TDM, BRT, and LRT Alternatives would not extend the Long Beach Freeway (i.e., I-710/ SR-710) from its current terminus at Valley Boulevard northward to Pasadena. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not be consistent with Policy 1.2.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 1.2 would not be applicable to the Freeway Tunnel Alternative.	**Inconsistent.** The No Build Alternative would not extend the Long Beach Freeway (I-710/SR-710) from its current terminus at Valley Boulevard north to Pasadena. Therefore, the No Build Alternative would not be consistent with Policy 1.2.
Policy 1.3: Support efforts of Los Angeles County Metropolitan Transportation Authority and other transportation agencies to increase use of mass transit and other alternatives to the private automobile as a way to reduce traffic loads on the freeways.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 1.3 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes enhanced bus service and active TSM/TDM transportation improvements that would provide alternatives to private automobiles. Therefore, the BRT Alternative would be consistent with the support efforts described in Policy 1.3.	**Consistent.** The LRT Alternative includes active TSM/TDM transportation improvements that would provide alternative transportation modes. Therefore, the LRT Alternative would be consistent with the support efforts described in Policy 1.3.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 1.3 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote optimum regional mobility. Therefore, the No Build Alternative would be consistent with the support efforts described in Policy 1.3.
Goal 2.0: Provide a local street system that accommodates current and future traffic volumes.				
Policy 2.1: Implement all circulation improvements pursuant to the Master Circulation Plan shown in Figure C-2 and described in Table C-2.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 2.1 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes TSM/TDM Alternative improvements that would give priority to identified circulation improvements in the City of Monterey Park. Therefore, the BRT Alternative would be consistent with Policy 2.1.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements that would give priority to identified circulation improvements in the City of Monterey Park. Therefore, the LRT Alternative would be consistent with Policy 2.1.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 2.1 would not be applicable to the Freeway Tunnel Alternative	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote optimum regional mobility. These include improvements prioritized in the City of Monterey Park General Plan Circulation Element. Therefore, the No Build Alternative would be consistent with Policy 2.1.
Policy 2.5: Implement intelligent transportation system technologies to improve traffic flow.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 2.5 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes transportation system technologies and therefore would be consistent with Policy 2.5.	**Consistent.** The LRT Alternative includes intelligent transportation system technologies. Therefore, the LRT Alternative would be consistent with Policy 2.5.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 2.5 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include transportation system technologies. Therefore, the No Build Alternative would be consistent with Policy 2.5.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 2.7: Work with regional agencies to pursue innovative strategies for monitoring traffic volumes.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 2.7 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes active traffic management technology, including arterial speed data collection and arterial changeable message signs. Therefore, the BRT Alternative would be consistent with Policy 2.7.	**Consistent.** The LRT Alternative includes active traffic management technology, including arterial speed data collection and changeable message signs. Therefore, the LRT Alternative would be consistent with Policy 2.7.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 2.7 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include ATM technology, which includes arterial speed data collection and arterial CMS. Therefore, the No Build Alternative would be consistent with Policy 2.7.
Goal 4.0: Make public transportation convenient, safe, and responsive to changing transit demands.				
Policy 4.4: Link local bus service to other transit centers in adjacent communities, including MetroLink stations and planned Eastside Corridor light rail or similar stations.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 4.4 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes enhanced bus services. Therefore, the BRT Alternative would be consistent with Policy 4.4.	**Consistent.** The LRT Alternative includes strategies to expand and improve existing bus services, including increased links to existing Metro light rail stations and the new stations along the new light rail line included in the LRT Alternative. Therefore, the LRT Alternative would be consistent with Policy 4.4.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 4.4 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes enhancements to regional bus service as part of the enhanced mobility planning in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Policy 4.4.
Policy 4.5: Work with the Los Angeles County Metropolitan Transportation Authority to establish bus routes and stops at appropriate locations throughout the City to adequately serve retail, employment, and other public gathering areas.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 4.5 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes enhanced bus services. Therefore, the BRT Alternative would be consistent with Policy 4.	**Consistent.** The LRT Alternative includes strategies to expand and improve existing bus services, including increased links to existing Metro light rail stations and the new stations along the new light rail line included in the LRT Alternative. Therefore, the LRT Alternative would be consistent with Policy 4.5.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 4.5 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes enhancements to regional bus service as part of the enhanced mobility planning in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Policy 4.5.
Policy 4.8: Continue to work with transit service providers to identify short- and long-term mobility needs in Monterey Park, and to ensure that those needs are met.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 4.8 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements that were developed by Caltrans and Metro. Therefore, the BRT Alternative would be consistent with Policy 4.8.	**Consistent.** The LRT Alternative was developed by Metro to address short- and long-term mobility needs in the study area. Therefore, the LRT Alternative would be consistent with Policy 4.8.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 4.8 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes enhancements addressing long- and short-term transit goals as part of the enhanced mobility planning in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Policy 4.8.
Goal 5.0: Create and maintain a connected system of bicycle routes and pedestrian facilities that meets the need of City residents.				
Policy 5.1: Provide a citywide Class II and Class III bicycle path system consistent with Figure C-4.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 5.1 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which include improved bicycle facilities and a new Class III bicycle facility. Therefore, the BRT Alternative would be consistent with Policy 5.1.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, which include improved bicycle facilities and a new Class III bicycle facility. Therefore, the LRT Alternative would be consistent with Policy 5.1.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 5.1 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes bicycle facility improvements as part of the enhanced mobility planning in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Policy 5.1.
Policy 5.3: Coordinate with the Los Angeles County Metropolitan Transportation Authority to improve City bicycle routes within the Los Angeles County bicycle route system. In particular, encourage linkages at light rail and other transit stations.				
N/A. The TSM/TDM Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 5.3 would not be applicable to the TSM/TDM Alternative.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including improved bicycle facilities. Therefore, the BRT Alternative would be consistent with Policy 5.3.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including improved bicycle facilities at existing and new light rail stations in the study area. Therefore, the LRT Alternative would be consistent with Policy 5.3.	**N/A.** The Freeway Tunnel Alternative would not construct any physical improvements in the City of Monterey Park; therefore, Policy 5.3 would not be applicable to the Freeway Tunnel Alternative.	**Consistent.** The No Build Alternative includes bicycle facility improvements as part of the enhanced mobility planning in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Policy 5.3.
PASADENA LAND USE PLAN CONSISTENCY ANALYSIS				
General Plan Mobility Element				
Objective 3.2.1: Promote a Livable and Economically Strong Community				
Policy 1.5: Promote ease of access to local and regional transportation services by developing identifiable corridors and appropriate signage to accommodate travel within the City and to/from destinations outside the City.				
Consistent. The TSM/TDM Alternative includes active traffic management technology that would provide arterial changeable message signs at key locations in the study area to make real-time travel time and other traffic data available to the public. Therefore, the TSM/TDM Alternative would be consistent with Policy 1.5.	**Consistent.** The BRT Alternative includes the active traffic management technology in the TSM/TDM Alternative, and would install changeable message signs at key locations in the study area to provide real-time travel time and other traffic data to the public. Therefore, the BRT Alternative would be consistent with Policy 1.5.	**Consistent.** The LRT Alternative includes the active traffic management technology in the TSM/TDM Alternative, and would install changeable message signs at key locations in the study area to provide real-time travel time and other traffic data to the public. Therefore, the LRT Alternative would be consistent with Policy 1.5.	**Consistent.** The Freeway Tunnel Alternative includes the active traffic management technology in the TSM/TDM Alternative, and would install changeable message signs at key locations in the study area to provide real-time travel time and other traffic data to the public. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1.5.	**Consistent.** Improvements in the No Build Alternative in the City of Pasadena would be implemented by the City and include identification of corridors and signage as the City desires. These could apply to projects/planned improvements through 2035 that are included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Policy 1.5.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 1.8: Continue programs to implement both transportation improvements and automobile demand reduction programs that mitigate the impacts of new development.				
Consistent. The TSM/TDM Alternative includes strategies to facilitate higher vehicle occupancy, reduce peak-hour trips and the use of motor vehicles, improve bicycle facilities, and encourage ridesharing and transit use. The TSM/TDM Alternative focuses on reducing traffic congestion by increasing the use of mass transit and other alternatives to the private automobile. All the proposed improvements are based on future growth projections provided by SCAG. Therefore, the TSM/TDM Alternative would be consistent with Policy 1.8.	**Consistent.** The BRT Alternative includes the BRT trunk line arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connecting bus services. The BRT Alternative includes the TSM/TDM Alternative strategies and improvements to increase the efficiency and capacity of existing and planned transit. All the proposed improvements are based on future growth projections provided by SCAG. Therefore, the BRT Alternative would be consistent with Policy 1.8.	**Consistent.** The LRT Alternative includes a new light rail line and the TSM/TDM Alternative improvements, which would support alternative transportation modes available to residents, employees, and visitors to new developments in the City of Pasadena. The improvements in the LRT Alternative are based on future growth projections provided by SCAG. Therefore, the LRT Alternative would be consistent with Policy 1.8.	**Consistent.** The Freeway Tunnel Alternative would implement transportation improvements through either a single-bore or dual-bore tunnel. The Freeway Tunnel Alternative would also consist of TSM/TDM Alternative strategies to increase the efficiency and capacity of existing and planned transit. All proposed improvements are based on future growth projections provided by SCAG. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1.8.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote transit use. All proposed improvements are based on future growth projections provided by SCAG. Therefore, the No Build Alternative would be consistent with Policy 1.8.
Policy 1.10: Promote user safety in design and development of new transportation projects and services.				
Consistent. The TSM/TDM Alternative would promote user safety in the design and development of new transportation projects and services. Therefore, the TSM/TDM Alternative would be consistent with Policy 1.10.	**Consistent.** The BRT Alternative would promote user safety in the design and development of the new transportation facilities and systems included in the BRT Alternative. Therefore, the BRT Alternative would be consistent with Policy 1.10.	**Consistent.** The LRT Alternative would promote user safety in the design and development of the improvements included in the LRT Alternative. Therefore, the LRT Alternative would be consistent with Policy 1.10.	**Consistent.** Both the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would include the following tunnel support systems: emergency evacuation for pedestrians and vehicles; air scrubbers; a ventilation system consisting of exhaust fans at each portal, an exhaust duct along the entire length of the tunnel, and jet fans in the traffic area of the tunnel; fire detection and suppression systems; communications and surveillance systems; and 24-hour monitoring. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1.10.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote transit use. Therefore, the No Build Alternative would be consistent with Policy 1.10.
Policy 1.18: Support the sustaining of recent improvements in air quality and achieve further significant progress in such improvements to meet State and Federal mandates.				
Consistent. The TSM/TDM Alternative would reduce air pollution by increasing the availability and efficiency of multiple modes of transportation based on improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the TSM/TDM Alternative would be consistent with Policy 1.18.	**Consistent.** The BRT Alternative includes strategies to improve the availability of viable transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, adding more buses, and including bus stop enhancements. The BRT Alternative would reduce air pollution by increasing the efficiency of bus services. The BRT Alternative includes the active traffic management and local street and intersection improvements in the TSM/TDM Alternative. Therefore, the BRT Alternative would be consistent with Policy 1.18.	**Consistent.** The LRT Alternative includes a new light rail line that would be powered by electricity, similar to the existing Metro light rail lines. The LRT Alternative would contribute to improved air quality by increasing the availability and efficiency of multiple modes of transportation. Therefore, the LRT Alternative would be consistent with Policy 1.18.	**Consistent.** The Freeway Tunnel Alternative also consists of TSM/TDM Alternative strategies to increase efficiency and capacity for all modes of transportation with lower capital cost investments and/or lower potential impacts, including regional air quality. In addition, the increased traffic throughput raises the efficiency of the freeway system, resulting in an air quality benefit. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1.18.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include goals for improving regional air quality. Therefore, the No Build Alternative would be consistent with Policy 1.18.
Policy 1.21: Pursue funding opportunities to implement programs and projects that contribute to the City's overall transportation vision of achieving a livable community where people can circulate without cars.				
Consistent. The TSM/TDM Alternative was developed based on input from the TAC. If selected, the TSM/TDM Alternative would need to be added to the FTIP to be eligible for federal funding. State and local funding sources are anticipated to be used to finance the transportation improvements included in the TSM/TDM Alternative. The TSM/TDM Alternative would not interfere with the City pursuit of funding opportunities for other automobile reduction strategies. Therefore, the TSM/TDM Alternative would be consistent with Policy 1.21.	**Consistent.** The BRT Alternative was developed based on input from the TAC. If selected, the BRT Alternative would need to be added to the FTIP. State and local funding sources are anticipated to be used to finance the transportation improvements in the BRT Alternative and the TSM/TDM Alternative improvements included in the BRT Alternative. The BRT Alternative would not interfere with the City of Pasadena's pursuit of funding opportunities for other automobile reduction strategies. Therefore, the BRT Alternative would be consistent with Policy 1.21.	**Consistent.** The LRT Alternative was developed based on input from the TAC. If selected, the LRT Alternative would need to be added to the FTIP to be eligible for federal funding. State and local funding sources are anticipated to be used to finance the TSM/TDM Alternative improvements included in the LRT Alternative. The LRT Alternative would not interfere with the City of Pasadena's pursuit of funding opportunities for other automobile reduction strategies. Therefore, the LRT Alternative would be consistent with Policy 1.21.	**Consistent.** The Freeway Tunnel Alternative was developed based on input from the Project's TAC. If selected, the Freeway Tunnel Alternative would need to be added to the FTIP to be eligible for federal funding. State and local funding sources are anticipated to be used to finance the TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative. The Freeway Tunnel Alternative would not interfere with the City of Pasadena's pursuit of funding opportunities for other automobile reduction strategies. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1.21.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. The City can pursue federal funding for these projects, some of which are aimed at reduction of trips by automobile. Therefore, the No Build Alternative would be consistent with Policy 1.21.
Objective 3.2.2: Encourage Non-Auto Travel				
Policy 2.4: Encourage the construction of safe, clean, and attractive transit stops by including consideration of such improvements along with bicycle facilities and pedestrian amenities in the City's project review process.				
Consistent. The TSM/TDM Alternative includes strategies to encourage transit use through expanded bus service and improved bicycle parking facilities at existing Metro Gold Line Stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.4	**Consistent.** The BRT Alternative includes TSM/TDM strategies to encourage transit use through expanded bus services and improved bicycle parking facilities at existing Metro Gold Line Stations. Therefore, the BRT Alternative would be consistent with Policy 2.4.	**Consistent.** The LRT Alternative includes a new light rail line and improved/expanded bus services to increase accessibility to public transportation services throughout the study area. Therefore, the LRT Alternative would be consistent with Policy 2.4.	**Consistent.** The Freeway Tunnel Alternative includes improved/expanded bus services and improved bicycle parking facilities at existing Metro Gold Line Stations to increase accessibility to public transportation services throughout the study area. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.4.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that encourage transit use. Therefore, the No Build Alternative would be consistent with Policy 2.4.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 2.8: Develop and maintain a comprehensive and integrated system of bikeways and increase bicycle racks at major destinations to promote bicycle riding for commuting and recreation.				
Consistent. The TSM/TDM Alternative includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations, to promote bicycle riding for commuting and recreation. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.8.	**Consistent.** The BRT Alternative includes TSM/TDM strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations, to promote bicycle riding for commuting and recreation. Therefore, the BRT Alternative would be consistent with Policy 2.8.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including strategies to improve existing bicycle facilities that include the provision of on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations and at the new stations on the new light rail line, to promote bicycle riding for commuting and recreation. Therefore, the LRT Alternative would be consistent with Policy 2.8.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations, to promote bicycle riding for commuting and recreation. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.8.	**Consistent.** The No Build Alternative includes projects/planned improvements, including bicycle facilities, through 2035 that are included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote bicycle riding for commuting and recreation. Therefore, the No Build Alternative would be consistent with Policy 2.8.
Objective 3.2.4: Manage Multimodal Corridors.				
Policy 4.13: Coordinate auto and bicycle parking management policies with other transportation and project review efforts such as transit enhancements and transportation demand management programs.				
Consistent. The TSM/TDM Alternative includes on-street Class III bicycle facilities and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 4.13.	**Consistent.** The BRT Alternative includes TSM/TDM strategies, including the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative is consistent with Policy 4.13.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including the expansion of bicycle parking facilities at existing Metro Gold Line stations and at the new stations along the new light rail line. Therefore, the LRT Alternative is consistent with Policy 4.13.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements including the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.13.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote the improvement of bicycle facilities, including bicycle parking. Therefore, the No Build Alternative would be consistent with Policy 4.13.
General Plan Land Use Element				
Objective 18: IMPROVED ENVIRONMENT: Improve the quality of the environment for Pasadena and the region.				
Policy 18.1: Air Quality: Improve the air quality in Pasadena and in the region.				
Consistent. The TSM/TDM Alternative consists of strategies to increase efficiency and capacity for all transportation modes with lower capital cost investments and/or lower potential impacts, including regional air quality. Therefore, the TSM/TDM Alternative would be consistent with Policy 18.1.	**Consistent.** The BRT Alternative will improve the availability of transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, and by adding more buses and including bus stop enhancements along TSM routes. These improvements would contribute to better air quality in the City of Pasadena and the region. Therefore, the BRT Alternative is consistent with Policy 18.1.	**Consistent.** The LRT Alternative includes a new light rail line and the TSM/TDM Alternative improvements, including improvements to local streets, intersections, and bicycle facilities. The LRT Alternative would contribute to improved air quality; therefore, the LRT Alternative is consistent with Policy 18.1.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include improvements to local streets, intersections, and bicycle facilities. The Freeway Tunnel Alternative would contribute to improved air quality and therefore would be consistent with Policy 18.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote improvements to regional air quality. Therefore, the No Build Alternative would be consistent with Policy 18.1.
Objective 20: LAND USE/TRANSPORTATION RELATIONSHIP: Promote the relationship of land use and transportation.				
Policy 20.1: Transit Accessibility: Increase accessibility to all public transportation services.				
Consistent. The TSM/TDM Alternative consists of strategies and improvements to increase efficiency and capacity for all transportation modes with lower capital cost investments and/or lower potential impacts. The TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the TSM/TDM Alternative would be consistent with Policy 20.1.	**Consistent.** The BRT Alternative includes BRT trunk line arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connection bus services to increase accessibility to all public transportation services. The BRT Alternative includes the ATM and local street and intersection improvements in the TSM/TDM Alternative. Therefore, the BRT Alternative is consistent with Policy 20.1.	**Consistent.** The LRT Alternative includes a new light rail line and the TSM/TDM Alternative improvements, which would increase accessibility to regional public transportation services. Therefore, the LRT Alternative is consistent with Policy 20.1.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which would increase accessibility to regional public transportation services. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 20.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS, and Metro 2009 LRTP, that promote accessibility to all public transportation services. Therefore, the No Build Alternative would be consistent with Policy 20.1.
Policy 20.2: Traffic Congestion: Reduce traffic congestion and protect residential neighborhoods from traffic impacts.				
Consistent. The TSM/TDM Alternative consists of strategies to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the TSM/TDM Alternative would be consistent to Policy 20.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative strategies designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the BRT Alternative is consistent to Policy 20.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative strategies designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the BRT Alternative is consistent to Policy 20.2.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements that would increase accessibility to regional public transportation services, which could reduce traffic impacts in residential areas. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 20.2	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote minimizing traffic impacts. Therefore, the No Build Alternative would be consistent with Policy 20.2.
Policy 20.3: Bicycles/Pedestrians: Promote the use of non-motorized modes of transportation, such as bicycles and walking within the City.				
Consistent. The TSM/TDM Alternative includes strategies to improve bicycle facilities including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 20.3.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative strategies to improve bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative is consistent with Policy 20.3.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements to improve bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the LRT Alternative is consistent with Policy 20.3.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area, and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 20.3.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote non-motorized modes of transportation. Therefore, the No Build Alternative would be consistent with Policy 20.3.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 20.4: Optimum Mobility: Promote mobility for those who do not drive, particularly seniors, youth and the disabled.				
Consistent. The TSM/TDM Alternative includes strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and improve transportation options. Therefore, the TSM/TDM Alternative would be consistent with Policy 20.4.	**Consistent.** The BRT Alternative includes BRT trunk line arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connection bus services to increase accessibility to public transportation services. The BRT Alternative includes the TSM/TDM Alternative strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and improve transportation options. Therefore, the BRT Alternative would be consistent with Policy 20.4.	**Consistent.** The LRT Alternative includes a new light rail line and increased/expanded bus services that would provide increased opportunities for ridesharing and transit use. Therefore, the LRT Alternative would be consistent with Policy 20.4.	**Consistent.** The Freeway Tunnel Alternative includes increased/expanded bus service that would provide increased opportunities for ridesharing and transit use. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 20.4.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote optimum mobility. Therefore, the No Build Alternative would be consistent with Policy 20.4.
Objective 21: CIRCULATION: Make Pasadena a city where there are effective and convenient alternatives to using cars.				
Policy 21.4: Availability: Increase the availability of public and private transit and encourage transit use through improving services, stations and connections.				
Consistent. The TSM/TDM Alternative includes strategies to expand travelers' transportation options in terms of travel mode, time, route, and costs. The TSM/TDM Alternative also includes strategies to reduce the use of motor vehicles, and provide increased opportunities for ridesharing and transit use. Therefore, the TSM/TDM Alternative would be consistent with Policy 21.4.	**Consistent.** The BRT Alternative includes BRT trunk line arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connection bus services to increase accessibility to public transportation services. The BRT Alternative includes the TSM/TDM Alternative strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and improve transportation options. Therefore, the BRT Alternative would be consistent with Policy 21.4.	**Consistent.** The LRT Alternative includes a new light rail line and the TSM/TDM Alternative strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and increase transportation options. Therefore, the LRT Alternative would be consistent with Policy 21.4.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and increase transportation options. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 21.4.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote transit use. Therefore, the No Build Alternative would be consistent with Policy 21.4.
Policy 21.10: Bicycles/Pedestrians: Promote the use of non-motorized modes of transportation, such as bicycles and walking within the City.				
Consistent. The TSM/TDM Alternative includes strategies to improve bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 21.10.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative strategies to improve bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative is consistent with Policy 21.10.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements to improve bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the LRT Alternative is consistent with Policy 21.10.	**Consistent. XXX** strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area, and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 21.10.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote non-motorized modes of transportation. Therefore, the No Build Alternative would be consistent with Policy 21.10.
Objective 23: MOBILITY ELEMENT: The Mobility Element shall support the development of transit-oriented and pedestrian oriented developments.				
Policy 23.3: Bicycle Parking: Provide bicycle-parking facilities throughout commercial areas, at transit stops and in developments which include offices.				
Consistent. The TSM/TDM Alternative includes strategies to expand bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 23.3.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative strategies to expand bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative would be consistent with Policy 23.3.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative strategies to expand bicycle parking facilities at existing Metro Gold Line stations. It would also provide bicycle facilities at the new stations along the new light rail line. Therefore, the LRT Alternative would be consistent with Policy 23.3.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative strategies to expand bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 23.3.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote bicycle facility improvements. Therefore, the No Build Alternative would be consistent with Policy 23.3.
General Plan Noise Element				
Objective 2: The City will work to reduce the effects of traffic-generated noise from major roadways on residential and other sensitive land uses.				
Policy 2c: The City will encourage the use of alternative transportation modes as stipulated in the Mobility Element (walking, bicycling, transit use, electric vehicles) to minimize traffic noise in the City.				
Consistent. The TSM/TDM Alternative includes strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options, in part to minimize traffic noise. Therefore, the TSM/TDM Alternative would be consistent with Policy 2c.	**Consistent.** The BRT Alternative would reduce noise pollution by improving the availability of viable transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, and by adding more buses and including bus stop enhancements along TSM routes. Therefore, the BRT Alternative would be consistent with Policy 2c.	**Consistent.** The LRT Alternative would reduce noise pollution by increasing the availability of alternative transportation modes in the study area. Therefore, the LRT Alternative would be consistent with Policy 2c.	**Consistent.** The Freeway Tunnel Alternative would reduce noise pollution by increasing the availability of alternative transportation modes in the study area. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2c.	**Consistent. T**he No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote alternative transportation modes and would thereby reduce traffic noise. Therefore, the No Build Alternative would be consistent with Policy 2c.
Policy 2d: The City will work with local and regional transit agencies and businesses to provide transportation services that reduce traffic and associated noise as stipulated in the Mobility Element.				
Consistent. The TSM/TDM Alternative was developed by Caltrans and Metro and includes expanding travelers' transportation options in terms of travel mode, time, route, and costs. The TSM/TDM Alternative also includes strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options in part to minimize traffic noise. Therefore, the TSM/TDM Alternative would be consistent with Policy 2d.	**Consistent.** The BRT Alternative was developed by Caltrans and Metro and includes strategies to improve the availability of public transportation alternatives and reduce traffic by implementing new dedicated bus lanes for longer distance commuters and adding more buses with fewer stops. Therefore, the BRT Alternative would be consistent with Policy 2d.	**Consistent.** The LRT Alternative was developed by Metro and includes strategies to improve the availability of public transportation alternatives, including a new light rail line in the study area. Therefore, the LRT Alternative would be consistent with Policy 2d.	**Consistent.** The Freeway Tunnel Alternative includes increased/expanded bus service, which would maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2d.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote alternative modes of transportation and would thereby reduce traffic noise. Therefore, the No Build Alternative would be consistent with Policy 2d.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
South Fair Oaks Specific Plan (City of Pasadena)				
Objective 1: By combining the intentions of the General plan with a community-based approach to preparing the Specific Plan, the following goals are established.				
Policy 1b: Mitigate related traffic impacts in the Specific Plan area and in adjacent residential neighborhoods.				
Consistent. The TSM/TDM Alternative would add a new on-ramp to SR 110 from State Street, which would provide more direct freeway access to the southern part of the South Fair Oaks Specific Plan area. The TSM/TDM Alternative also includes strategies to reduce the use of motor vehicles, improve bicycle facilities, and encourage transit use, and would expand bus service on two bus routes that serve the Specific Plan area (Metro Routes 256 and 762). Therefore, the TSM/TDM Alternative would be consistent with Policy 1b.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, including a new on-ramp to SR 110 from State Street, which would provide more direct freeway access to the southern part of the South Fair Oaks Specific Plan area. The BRT Alternative includes strategies to reduce the use of motor vehicles, improve bicycle facilities, and encourage transit use, and would expand bus service on Metro Route 256 and provide a new bus rapid transit service on Fair Oaks Avenue in the South Fair Oaks Specific Plan area. Therefore, the BRT Alternative would be consistent with Policy 1b	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including a new on-ramp to SR 110 from State Street that would provide more direct freeway access to the southern part of the South Fair Oaks Specific Plan area, improved bicycle facilities, increased/expanded bus service, and a new light rail line in the South Fair Oaks Specific Plan area that includes a new station adjacent to the existing Fillmore Gold Line Station. Therefore, the LRT Alternative would be consistent with Policy 1b.	**Consistent.** The Freeway Tunnel Alternative would improve circulation throughout the study area, including the South Fair Oaks Specific Plan area, by providing either a single-bore or dual-bore tunnel. The Freeway Tunnel Alternative would also include the roadway improvements included in the TSM/TDM Alternative that provide a new on-ramp to SR 110 from State Street (which would provide more direct freeway access to the southern portion of the South Fair Oaks Specific Plan area), improved bicycle facilities, and increased/expanded bus service. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1b.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote regional mitigation of traffic-related impacts. Therefore, the No Build Alternative would be consistent with Policy 1b.
East Colorado Boulevard Specific Plan (City of Pasadena)				
Objective 1: As guided by the Colorado Boulevard Today and Tomorrow document, "To improve the appearance, function, and urban ambience of East Colorado Boulevard," the goals for revitalizing East Colorado Boulevard remain consistent with guiding Pasadena policy. To that end this Specific Plan reinforces goals and objectives that serve to accomplish beautification and enhancement. The following is a summary of the overall goals for the Specific Plan area.				
Policy 1b: Extend public transit with convenient stops located through the planning area. Consider additional expansion to the existing ARTS bus system to serve East Colorado Boulevard.				
Consistent. The TSM/TDM Alternative would expand bus service (Metro Route 181 and Foothill Transit Route 187) on Colorado Boulevard in the East Colorado Boulevard Specific Plan area. Therefore, the TSM/TDM Alternative would be consistent with Policy 1b.	**Consistent.** The BRT Alternative would provide bus service improvements within the East Colorado Boulevard Specific Plan area by expanding bus service on Metro Route 181 and Foothill Transit Route 187 on Colorado Boulevard, providing a new bus rapid transit stop at Colorado Boulevard and Hill Avenue, and new local bus service between the Fillmore Gold Line Station in Downtown Pasadena and the El Monte Transit Station that would travel along Colorado Boulevard in the East Colorado Boulevard Specific Plan area. Therefore, the BRT Alternative would be consistent with Policy 1b.	**Consistent.** The LRT Alternative includes bus service improvements in the East Colorado Boulevard Specific Plan area by increasing service on Metro Route 181 and Foothill Transit Route 187 on Colorado Boulevard, and adding new local bus service between the Fillmore Gold Line Station in Downtown Pasadena and the El Monte Bus Station that would travel along Colorado Boulevard in the East Colorado Boulevard Specific Plan area. Therefore, the LRT Alternative would be consistent with Policy 1b.	**Consistent.** The Freeway Tunnel Alternative includes bus service improvements in the East Colorado Boulevard Specific Plan area by increasing service on Metro Route 181 and Foothill Transit Route 187 on Colorado Boulevard. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1b.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote public transit. Therefore, the No Build Alternative would be consistent with Policy 1b.
Central District Specific Plan (City of Pasadena)				
Objective 1: Pasadena will be a city where people can circulate without cars.				
Objective 22: Reduce auto dependency. Downtown will provide an integrated and balanced transportation system that will accommodate access by foot, bicycle, transit, and car.				
Consistent. The TSM/TDM Alternative includes strategies to expand travelers' transportation options in terms of travel mode, time, route, and costs. The TSM/TDM Alternative also includes strategies to reduce the use of motor vehicles, improve bicycle facilities, and encourage transit use, and would expand bus service on five bus routes that serve the Central District Specific Plan area (Metro Routes 181, 256, 267, and 762, and Foothill Transit Route 187). Therefore, the TSM/TDM Alternative would be consistent with Objective 22.	**Consistent.** The BRT Alternative would provide new bus rapid transit service on Fair Oaks Avenue, Del Mar Boulevard, Lake Avenue, and Colorado Boulevard, and would include frequent bus service, new bus feeder services, and enhanced connecting bus services in the Central District Specific Plan area to increase accessibility to public transportation services. The BRT Alternative includes the TSM/TDM Alternative strategies to reduce the use of motor vehicles, encourage transit use, and improve transportation options. Therefore, the BRT Alternative would be consistent with Objective 22.	**Consistent.** The LRT Alternative includes a new light rail line, more frequent bus service, new bus feeder services, and enhanced connecting bus services in the Central District Specific Plan area, which would increase accessibility to public transportation services in that area. The LRT Alternative also includes the TSM/TDM Alternative strategies to reduce the use of motor vehicles, encourage transit use, and improve transportation options. Therefore, the LRT Alternative would be consistent with Objective 22.	**Consistent.** The Freeway Tunnel Alternative includes more frequent bus service and enhanced connecting bus services in the Central District Specific Plan area, which would increase accessibility to public transportation services in that area. The Freeway Tunnel Alternative also includes the TSM/TDM Alternative strategies to reduce the use of motor vehicles, improve bicycle facilities, encourage transit use, and improve transportation options. Therefore, the Freeway Tunnel Alternative would be consistent with Objective 22.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote transit use. Therefore, the No Build Alternative would be consistent with Objective 22.
Objective 25: Promote transit use. Transit will be an available option for movement within and through Downtown, emphasizing improved transit connections between the activity centers of Downtown. Regional transit will be supported by transit-oriented development near light rail stations.				
Consistent. The TSM/TDM Alternative includes strategies to reduce traffic congestion by encouraging transit use and would expand bus service on five bus routes that serve the Central District Specific Plan area (Metro Routes 181, 256, 267, and 762, and Foothill Transit Route 187). Therefore, the TSM/TDM Alternative would be consistent with Objective 25.	**Consistent.** The BRT Alternative includes strategies to improve the availability of viable regional transportation alternatives by implementing a new BRT service for longer distance commuters and new local bus service at the Fillmore Gold Line Station in Downtown Pasadena, and expanding bus service on four bus routes that serve the Central District Specific Plan area (Metro Routes 181, 256, and 267, and Foothill Transit Route 187). Therefore, the BRT Alternative would be consistent with Objective 25.	**Consistent.** The LRT Alternative includes a new light rail line and new local bus service at the Fillmore Gold Line Station in Downtown Pasadena, and expanded bus service on five bus routes that serve the Central District Specific Plan area (Metro Routes 181, 256, 267, and 762, and Foothill Transit Route 187). Therefore, the LRT Alternative would be consistent with Objective 25.	**Consistent.** The Freeway Tunnel Alternative includes expanding bus service on five bus routes that serve the Central District Specific Plan area (Metro Routes 181, 256, 267, and 762, and Foothill Transit Route 187). Therefore, the Freeway Tunnel Alternative would be consistent with Objective 25.	**Consistent. T**he No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote transit use. Therefore, the No Build Alternative would be consistent with Objective 25.
West Gateway Specific Plan (City of Pasadena)				
General Plan Guiding Principle 5: Pasadena will be a city where people can circulate without cars.				
Guiding Principle 10: Plan traffic and parking patterns in order to minimize the negative effects on adjacent neighborhoods and existing businesses.				

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Consistent. The TSM/TDM Alternative would provide improvements to St. John Avenue in the West Gateway Specific Plan area that would improve traffic flow in the area and access to adjacent neighborhoods and businesses. Therefore, the TSM/TDM Alternative would be consistent with Guiding Principle 10.	**Consistent.** The BRT Alternative includes the improvements in the TSM/TDM Alternative, including improvements to St. John Avenue in the West Gateway Specific Plan area. These improvements would improve traffic flow in the area and improve access to adjacent neighborhoods and businesses. Therefore, the BRT Alternative would be consistent with Guiding Principle 10.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, including improvements to St. John Avenue in the West Gateway Specific Plan area, which would improve traffic flow in the area and access to adjacent neighborhoods and businesses. Therefore, the LRT Alternative would be consistent with Guiding Principle 10.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, including improvements to St. John Avenue in the West Gateway Specific Plan area, which would improve traffic flow in the area and access to adjacent neighborhoods and businesses. Therefore, the Freeway Tunnel Alternative would be consistent with Guiding Principle 10.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote transit use in order to mitigate regional traffic congestion. Therefore, the No Build Alternative would be consistent with Guiding Principle 10.
Guiding Principle 11: Encourage development that supports and capitalizes on transit opportunities, such as the proposed light rail station at Raymond Avenue and Del Mar Boulevard, the ARTS Circulator buses, and all other means of public transportation, including bicycles and pedestrians.				
Consistent. The TSM/TDM Alternative includes strategies to expand travelers' transportation options in terms of travel mode, time, route, and costs. The TSM/TDM Alternative also includes strategies to reduce the use of motor vehicles, improve bicycle facilities, and encourage transit use, and would expand bus service on four bus routes that serve the West Gateway Specific Plan area (Metro Routes 181, 256, 267, and 762). Therefore, the TSM/TDM Alternative would be consistent with Guiding Principle 11.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative strategies to expand the travelers' transportation options in terms of travel mode, time, route, and costs. The BRT Alternative includes strategies to reduce the use of motor vehicles, improve bicycle facilities, and encourage transit use, and would expand bus service on three bus routes that serve the West Gateway Specific Plan area (Metro Routes 181, 256, and 267). The BRT Alternative would also provide new bus rapid transit stops at Del Mar Boulevard and Fair Oaks Avenue, and new local bus service between the Fillmore Gold Line Station in Downtown Pasadena and the El Monte Transit Station. Therefore, the BRT Alternative would be consistent with Guiding Principle 11.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative strategies to expand travelers' transportation options in terms of travel mode, time, route, and costs. The LRT Alternative includes strategies to reduce the use of motor vehicles, improve bicycle facilities, and encourage transit use, and would expand bus service on three bus routes that serve the West Gateway Specific Plan area (Metro Routes 181, 256, and 267). The LRT Alternative includes a new light rail line and a new station at California Boulevard and Raymond Avenue, as well as new local bus service between the Fillmore Gold Line Station in Downtown Pasadena and the El Monte Transit Station, which would increase expand transit service in the vicinity of the West Gateway Specific Plan area. Therefore, the LRT Alternative would be consistent with Guiding Principle 11.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to expand travelers' transportation options in terms of travel method, time, route, and costs. The Freeway Tunnel Alternative includes strategies to reduce the use of motor vehicles, improve bicycle facilities, and encourage transit use, and would expand bus service on three bus routes that serve the West Gateway Specific Plan area (Metro Routes 181, 256, and 267). Therefore, the Freeway Tunnel Alternative would be consistent with Guiding Principle 11.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote transit opportunities. Therefore, the No Build Alternative would be consistent with Guiding Principle 11.
ROSEMEAD LAND USE PLAN CONSISTENCY ANALYSIS				
General Plan Circulation Element				
Goal 2: Development of infrastructure and service to support alternatives modes of travel.				
Policy 2.7: Promote the linking of local public transit routes with that of adjacent jurisdictions and other transit agencies.				
Consistent. The TSM/TDM Alternative would support the development of additional regional mass transportation facilities and services through improving bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.7.	**Consistent.** The BRT Alternative improvements include the TSM/TDM Alternative improvements that would support the development of additional regional mass transportation facilities and services through improving bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the BRT Alternative would be consistent with Policy 2.7.	**Consistent.** The LRT Alternative improvements include the TSM/TDM Alternative improvements that would support the development of additional regional mass transportation facilities and services through improving bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the LRT Alternative would be consistent with Policy 2.7.	**Consistent**. The Freeway Tunnel Alternative improvements include the TSM/TDM Alternative improvements that would support the development of additional regional mass transportation facilities and services through improving bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.7.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote regional public transportation. Therefore, the No Build Alternative would be consistent with Policy 2.7.
Policy 2.8: Include safe and convenient bicycle and pedestrian access in all transportation improvement projects. Ensure that non-motorized transportation systems are connected and not interrupted by impassable barriers, such as freeways and include amenities such as secure bicycle parking.				
Consistent. The TSM/TDM Alternative includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.8.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative would be consistent with Policy 2.8.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the LRT Alternative would be consistent with Policy 2.8.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.8.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote active transportation. Therefore, the No Build Alternative would be consistent with Policy 2.8.
General Plan Resource Management Element				
Goal 4: Effective contributions to regional efforts to improve air quality and conserve energy.				
Policy 4.1: Integrate air quality planning with City land use, economic development, and transportation planning efforts.				
Consistent. The TSM/TDM Alternative would help improve air quality in the study area by increasing the efficiency of multiple modes of transportation, including improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the TSM/TDM Alternative would be consistent with Policy 4.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements that would help improve air quality in the study area by increasing the efficiency of multiple modes of transportation, including improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the BRT Alternative would be consistent with Policy 4.1.	**Consistent**. The LRT Alternative includes the TSM/TDM Alternative improvements that would help improve air quality in the study area by increasing the efficiency of multiple modes of transportation, including improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the LRT Alternative would be consistent with Policy 4.1.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements that would help improve air quality in the study area by increasing the efficiency of multiple modes of transportation, including improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include goals for improving regional air quality. Therefore, the No Build Alternative would be consistent with Policy 4.1.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 4.2: Support programs that reduce air quality emissions related to vehicular travel.				
Consistent. The TSM/TDM Alternative would help improve air quality in the study area by increasing the efficiency of multiple modes of transportation, including improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the TSM/TDM Alternative would be consistent with Policy 4.2.	**Consistent**. The BRT Alternative includes the TSM/TDM Alternative improvements that would help improve air quality in the study area by increasing the efficiency of multiple modes of transportation, including improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the BRT Alternative would be consistent with Policy 4.2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements that would help improve air quality in the study area by increasing the efficiency of multiple modes of transportation, including improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the LRT Alternative would be consistent with Policy 4.2.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements that would help improve air quality in the study area by increasing the efficiency of multiple modes of transportation, including improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include goals for improving regional air quality. Therefore, the No Build Alternative would be consistent with Policy 4.2.
Policy 4.3: Support alternative transportation modes and technologies, and develop bike- and pedestrian-friendly neighborhoods and districts to reduce emissions associated with automobile use.				
Consistent. The TSM/TDM Alternative would focus on reducing the use of motor vehicles by promoting alternative travel modes through improving bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the TSM/TDM Alternative would be consistent with Policy 4.3.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements that would focus on reducing the use of motor vehicles by promoting alternative travel modes through improving bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the BRT Alternative would be consistent with Policy 4.3.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements that would focus on reducing the use of motor vehicles by promoting alternative travel modes through improving bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the LRT Alternative would be consistent with Policy 4.3	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements that would focus on reducing the use of motor vehicles by promoting alternative travel modes through improving bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 4.3	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote alternative modes of transportation. Therefore, the No Build Alternative would be consistent with Policy 4.3.
General Plan Noise Element				
Goal 2: Reduced noise impacts from transportation sources.				
Policy 2.1: Require consideration of noise impacts and mitigation in the design of new roadway projects and improvements to major or secondary arterials.				
Consistent. The TSM/TDM Alternative includes strategies to reduce adverse noise impacts of through traffic by increasing the use of mass transit and other alternatives to the private automobile. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies to reduce adverse noise impacts of through traffic by increasing the use of mass transit and other alternatives to the private automobile. Therefore, the BRT Alternative would be consistent with Policy 2.1.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies to reduce adverse noise impacts of through traffic by increasing the use of mass transit and other alternatives to the private automobile. Therefore, the LRT Alternative would be consistent with Policy 2.1.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies to reduce adverse noise impacts of through traffic by increasing the use of mass transit and other alternatives to the private automobile. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote solutions to reduce traffic congestion and impacts related to noise. Therefore, the No Build Alternative would be consistent with Policy 2.1.
General Plan Parks, Open Space, Greenbelt, and Public Art Element				
Goal 1: Provide high-quality parks, recreation, and open space facilities to meet the needs of all Rosemead residents.				
Policy 1.2: Develop pedestrian/bicycle trail systems in the City.				
Consistent. The TSM/TDM Alternative includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 1.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative would be consistent with Policy 1.2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the LRT Alternative would be consistent with Policy 1.2.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote alternative modes of transportation. Therefore, the No Build Alternative would be consistent with Policy 1.2.
SAN GABRIEL LAND USE PLAN CONSISTENCY ANALYSIS				
General Plan Mobility Chapter				
Goal 3.1: We will provide a safe, efficient and environmentally sensitive transportation system for the movement of people and goods.				
Target 3.1.1: Improve all arterial streets to standards depicted in the design classification and functional classifications. See Table 3-1 (Street Classifications) and Figure 3.1 (Existing Street Classification).				
Consistent. The improvements in the TSM/TDM Alternative would be designed consistent with applicable local design standards and requirements. Therefore, the TSM/TDM Alternative would be consistent with Target 3.1.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which would be designed consistent with applicable local design standards and requirements. Therefore, the BRT Alternative would be consistent with Target 3.1.1.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which would be designed consistent with applicable local design standards and requirements. Therefore, the LRT Alternative would be consistent with Target 3.1.1.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which would be designed consistent with applicable local design standards and requirements. Therefore, the Freeway Tunnel Alternative would be consistent with Target 3.1.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote regional alternative modes of transportation. The No Build Alternative would enhance local roadways and public transit; therefore, the No Build Alternative would be consistent with Target 3.1.1.
Target 3.1.2: Attain level of service "D" as the performance threshold at designated intersections (labeled "principle intersections") throughout the City. See Figure 3.2 (Existing Intersection Capacity Utilization).				
Consistent. The TSM/TDM Alternative would not substantially change traffic patterns or generate new traffic demand; therefore, the TSM/TDM Alternative would be consistent with Target 3.1.2	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which would not substantially change traffic patterns or generate new traffic demand; therefore, the BRT Alternative would be consistent with Target 3.1.2	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which would not substantially change traffic patterns or generate new traffic demand; therefore, the LRT Alternative would be consistent with Target 3.1.2	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which would not substantially change traffic patterns or generate new traffic demand; therefore, the Freeway Tunnel Alternative would be consistent with Target 3.1.2	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that are designed to improve the efficiency of local roads and public transit and to provide enhanced mobility for all users. Therefore, the No Build Alternative would be consistent with Target 3.1.2.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Target 3.1.3: Improve the City's interregional transportation capabilities (including arterials, freeway network, transit facilities, etc.).				
Consistent. The TSM/TDM Alternative would improve the City's interregional transportation capabilities based on improved bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the TSM/TDM Alternative would be consistent with Target 3.1.3.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which would improve the City's interregional transportation capabilities based on improved bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the BRT Alternative would be consistent with Target 3.1.3.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, which would improve the City's interregional transportation capabilities based on improved bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the LRT Alternative would be consistent with Target 3.1.3.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which would improve the City's interregional transportation capabilities based on improved bicycle facilities and bus services, and encouraging ridesharing and transit use. Therefore, the Freeway Tunnel Alternative would be consistent with Target 3.1.3.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include improvements to the regional transportation system, including arterials, freeways, and transit facilities. Therefore, the No Build Alternative would be consistent with Target 3.1.3.
Target 3.3.1: Promote expansion of regional and local transit service within two years. (Figure 3.6 Existing Bus Routes)				
Consistent. The TSM/TDM Alternative includes strategies to increase the availability of public and private transit and encourage transit use through improving bus services, stations, and connections. Therefore, the TSM/TDM Alternative would be consistent with Target 3.3.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies to increase the availability of public and private transit and encourage transit use through improving bus services, stations, and connections. Therefore, the BRT Alternative would be consistent with Target 3.3.1.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies to increase the availability of public and private transit and encourage transit use through improving bus services, stations, and connections. Therefore, the LRT Alternative would be consistent with Target 3.3.1.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies to increase the availability of public and private transit and encourage transit use through improving bus services, stations, and connections. Therefore, the Freeway Tunnel Alternative would be consistent with Target 3.3.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS, and Metro 2009 LRTP, that include improvements to regional and local transit service. Therefore, the No Build Alternative would be consistent with Target 3.3.1.
Target 3.3.3: Expand local bus service into and out of the Valley Blvd commercial/retail corridor within two years.				
Consistent. The TSM/TDM Alternative includes strategies to expand and improve bus service throughout the study area including along Valley Boulevard. Therefore, the TSM/TDM Alternative would be consistent with Target 3.3.3, although the increased service may not be provided within the time period set in this target.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies to expand and improve bus service throughout the study area including along Valley Boulevard. Therefore, the BRT Alternative would be consistent with Target 3.3.3, although the increased service may not be provided within the time period set in this target.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies to expand and improve bus service throughout the study area including along Valley Boulevard. Therefore, the LRT Alternative would be consistent with Target 3.3.3, although the increased service may not be provided within the time period set in this target.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies to expand and improve bus service throughout the study area including along Valley Boulevard. Therefore, the Freeway Tunnel Alternative would be consistent with Target 3.3.3, although the increased service may not be provided within the time period set in this target.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include improvements to regional and local transit service. Therefore, the No Build Alternative would be consistent with Target 3.3.3, but it is unclear as to whether the 2-year goal will be met.
Goal 3.5: Promote the use of bicycles for transportation.				
Target 3.5.1: Expand the citywide bikeway system. See figure 3-6.				
Consistent. The TSM/TDM Alternative includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Target 3.5.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative would be consistent with Target 3.5.1.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the LRT Alternative would be consistent with Target 3.5.1.	**Consistent. .** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Target 3.5.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote active transportation, including bicycling and walking. Therefore, the No Build Alternative would be consistent with Target 3.5.1.
Target 3.5.2: Promote the development of a regional bikeway system cooperation with State, County, and neighboring communities.				
Consistent. The TSM/TDM Alternative includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Target 3.5.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative would be consistent with Target 3.5.2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the LRT Alternative would be consistent with Target 3.5.2.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Target 3.5.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote active transportation, including bicycling and walking. Therefore, the No Build Alternative would be consistent with Target 3.5.2.
General Plan Environmental Resources Chapter				
Goal 8.6: Improve air quality within the City of San Gabriel.				
Target 8.6.2: Encourage the use of mass transit, carpooling, bicycling, and other alternative transportation options.				
Consistent. The TSM/TDM Alternative includes strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve alternative transportation options. Therefore, the TSM/TDM Alternative would be consistent with Target 8.6.2.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve alternative transportation options. Therefore, the BRT Alternative would be consistent with Target 8.6.2.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve alternative transportation options. Therefore, the LRT Alternative would be consistent with Target 8.6.2.	**Consistent. T**he Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve alternative transportation options. Therefore, the Freeway Tunnel Alternative would be consistent with Target 8.6.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote alternative modes of transportation. Therefore, the No Build Alternative would be consistent with Target 8.6.2.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
General Plan Community Design Chapter				
Goal 10.15: Establish engineering standards that reinforce good streetscape and good urban design.				
Target 10.15.1: Use transportation systems management tools, rather than new construction and widening, to meet transportation demands where possible.				
Consistent. The TSM/TDM Alternative includes TSM strategies; therefore, the TSM/TDM Alternative would be consistent with Target 10.15.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include TSM strategies; therefore, the BRT Alternative would be consistent with Target 10.15.1.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include TSM strategies; therefore, the LRT Alternative would be consistent with Target 10.15.1.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include TSM strategies; therefore, the Freeway Tunnel Alternative would be consistent with Target 10.15.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. The City may apply TSM tools to future projects at its own discretion. Therefore, the No Build Alternative would be consistent with Target 10.15.1.
Valley Vision: Valley Boulevard Neighborhoods Sustainability Plan				
Policy: The City will work with Metro and Montebello Bus to increase regularly scheduled service on major streets.				
Consistent: The TSM/TDM Alternative would expand bus service on Metro Routes 76 and 489 on Valley Boulevard; therefore, the TSM/TDM Alternative would be consistent with this policy.	**Consistent:** The BRT Alternative includes the TSM/TDM Alternative improvements that would expand bus service on Metro Routes 76 and 489 on Valley Boulevard; therefore, the BRT Alternative would be consistent with this policy.	**Consistent:** The LRT Alternative includes the TSM/TDM Alternative improvements that would expand bus service on Metro Routes 76 and 489 on Valley Boulevard; therefore, the LRT Alternative	**Consistent:** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements that would expand bus service on Metro Routes 76 and 489 on Valley Boulevard; therefore, the Freeway Tunnel Alternative would be consistent with this policy.	**Consistent:** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS Metro 2009 LRTP. The City may pursue increased regularly scheduled service on major streets at its own discretion. Therefore, the No Build Alternative would be consistent with this policy.
Policy: Recommendations include marked bicycle routes in residential areas that connect to commercial and community areas. Develop enhanced bicycle-oriented signage.				
Consistent: The TSM/TDM Alternative would add a new Class III bike lane to Del Mar Boulevard in the Specific Plan area; therefore, the TSM/TDM Alternative would be consistent with this policy.	**Consistent:** The BRT Alternative includes the TSM/TDM Alternative improvements which would add a new Class III bike lane to Del Mar Boulevard in the Specific Plan area; therefore, the BRT Alternative would be consistent with this policy.	**Consistent:** The LRT Alternative includes the TSM/TDM Alternative improvements which would add a new Class III bike lane to Del Mar Boulevard in the Specific Plan area; therefore, the LRT Alternative would be consistent with this policy.	**Consistent:** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which would add a new Class III bike lane to Del Mar Boulevard in the Specific Plan area; therefore, the Freeway Tunnel Alternative would be consistent with this policy.	**Consistent:** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. The City may apply pursue the addition of marked bicycle routes at its own discretion. Therefore, the No Build Alternative would be consistent with this policy.
SAN MARINO LAND USE PLAN CONSISTENCY ANALYSIS				
General Plan Circulation Element				
Goal 4: Provide a system of transportation thoroughfares which satisfies the travel demands of land uses in San Marino for the movement of people and goods in a balanced way, protecting the environment of the City.				
Consistent. The TSM/TDM Alternative includes strategies and improvements to increase efficiency and capacity for all transportation modes. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the TSM/TDM Alternative would be consistent with Goal 4.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all transportation modes. The TSM/TDM Alternative improvements are designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the BRT Alternative would be consistent with Goal 4.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all transportation modes. The TSM/TDM Alternative improvements are designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the LRT Alternative would be consistent with Goal 4.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all transportation modes. The TSM/TDM Alternative improvements are designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 4.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS, Measure R, and the funded part of the Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Goal 4.
Goal 6: Reduce the speed and volume of traffic on all major and secondary streets.				
Consistent. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. TSM/TDM strategies include focusing on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. Speeds on streets in San Marino will be set by the City. Therefore, the TSM/TDM Alternative would be consistent with Goal 6.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which are designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. TSM/TDM strategies include focusing on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. Speeds on streets in San Marino will be set by the City. Therefore, the BRT Alternative would be consistent with Goal 6.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, which are designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. TSM/TDM strategies include focusing on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. Speeds on streets in San Marino will be set by the City. Therefore, the LRT Alternative would be consistent with Goal 6.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which are designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. TSM/TDM strategies include focusing on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. Speeds on streets in San Marino will be set by the City. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 6.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS, Measure R, and the funded part of the Metro 2009 LRTP. Traffic speed limits are determined by the City. Therefore, the No Build Alternative would be consistent with Goal 6.
Goal 9: Support regional policies which will reduce the reliance upon the single-occupant automobile and eliminate unnecessary automobile trips, as well as reduce the need for parking.				
Consistent. The TSM/TDM Alternative strategies include facilitating higher vehicle occupancy and reducing traffic congestion by expanding travelers' transportation options in terms of travel mode, time, route, and costs, and the quality and convenience of the travel experience. Therefore, the TSM/TDM Alternative would be consistent with Goal 9.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include facilitating higher vehicle occupancy and reducing traffic congestion by expanding travelers' transportation options in terms of travel mode, time, route, and costs, and the quality and convenience of the travel experience. Therefore, the BRT Alternative would be consistent with Goal 9.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include facilitating higher vehicle occupancy and reducing traffic congestion by expanding travelers' transportation options in terms of travel mode, time, route, and costs, and the quality and convenience of the travel experience. Therefore, the LRT Alternative would be consistent with Goal 9.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include facilitating higher vehicle occupancy and reducing traffic congestion by expanding travelers' transportation options in terms of travel mode, time, route, and costs, and the quality and convenience of the travel experience. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 9.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS, Measure R, and the funded part of the Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Goal 9.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Goal 10: Support regional efforts to implement a comprehensive public transit program offering a range of alternatives to the automobile.				
Consistent. The TSM/TDM Alternative includes strategies and improvements to increase efficiency and capacity for all modes in the transportation system, including expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the TSM/TDM Alternative would be consistent with Goal 10.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system, including expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the BRT Alternative would be consistent with Goal 10.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system, including expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the LRT Alternative would be consistent with Goal 10.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system, including expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 10.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS, Measure R, and the funded part of the Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Goal 10.
Goal 12: Encourage the use of non-motorized transportation through the development of a system of pedestrian facilities (sidewalks) and bicycle routes with emphasis on safety and accessibility.				
Consistent. The TSM/TDM Alternative includes strategies and improvements to increase efficiency and capacity for all modes in the transportation system, including local street and intersection improvements, and bicycle facility improvements. Therefore, the TSM/TDM Alternative would be consistent with Goal 12.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system, including local street and intersection improvements, and bicycle facility improvements. Therefore, the BRT Alternative would be consistent with Goal 12.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system, including local street and intersection improvements, and bicycle facility improvements. Therefore, the LRT Alternative would be consistent with Goal 12.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system, including local street and intersection improvements, and bicycle facility improvements. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 12.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS, Measure R, and the funded part of the Metro 2009 LRTP. These improvements include alternative transportation modes. Therefore, the No Build Alternative would be consistent with Goal 12.
Goal 14: Accommodate the needs of San Marino residents and businesses for the movement of goods between their homes and businesses and the regional transportation network in a manner that protects the residential quality of neighborhoods.				
Consistent. The TSM/TDM Alternative includes strategies and improvements to increase efficiency and capacity for all modes in the transportation system. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the TSM/TDM Alternative would be consistent with Goal 14.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the BRT Alternative would be consistent with Goal 14.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the LRT Alternative would be consistent with Goal 14.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which include strategies and improvements to increase efficiency and capacity for all modes in the transportation system. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 14.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS, Measure R, and the funded part of the Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Goal 14.
SOUTH PASADENA LAND USE PLAN CONSISTENCY ANALYSIS				
General Plan Circulation and Accessibility Element				
No 710 Extension Policy: The City has consistently and unanimously opposed a second freeway for over 45 years and this position is reinforced by Proposition G-G, passed decisively by the voters of South Pasadena in November, 1986, and Resolution 6473 passed May 21, 1997.				
Consistent. The TSM/TDM Alternative would reduce traffic congestion without extending SR 710. Therefore, the TSM/TDM Alternative would be consistent with the No 710 Extension Policy.	**Consistent.** The BRT Alternative would reduce traffic congestion without extending SR 710. Therefore, the BRT Alternative would be consistent with the No 710 Extension Policy.	**Consistent.** The LRT Alternative would reduce traffic congestion without extending SR 710. Therefore, the LRT Alternative would be consistent with the No 710 Extension Policy.	**Inconsistent.** The Freeway Tunnel Alternative would extend I-710/SR-710 and therefore would be inconsistent with this policy.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote solutions to reduce traffic congestion without extending SR-710. Therefore, the No Build Alternative would be consistent with this general policy.
Goal 1: Provide convenient, efficient and safe mobility within the city.				
Policy 1.1: Seek innovative solutions to reduce adverse impacts of through traffic.				
Consistent. The TSM/TDM Alternative includes strategies to facilitate higher vehicle occupancy, reduce peak-hour trips, reduce the use of motor vehicles, improve bicycle facilities, and encourage ridesharing and transit use. The TSM/TDM Alternative focuses on reducing the effects of through traffic by increasing the use of mass transit and other alternatives to the private automobile. Therefore, the TSM/TDM Alternative would be consistent with Policy 1.1.	**Consistent.** The BRT Alternative includes strategies to improve the availability of viable transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, and adding more buses and including bus stop enhancements throughout the study area. The BRT Alternative includes strategies from the TSM/TDM Alternative, including the ATM and local street and intersection improvements. Therefore, the BRT Alternative would be consistent with Policy 1.1.	**Consistent.** The LRT Alternative includes a new light rail line with several stations in the City of South Pasadena. The LRT Alternative also includes TSM/TDM Alternative strategies, which include active transportation and local street and intersection improvements. Therefore, the LRT Alternative would be consistent with Policy 1.1.	**Consistent.** The design options for the Freeway Tunnel Alternative would improve circulation in the study area. The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 1.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote solutions to reduce traffic congestion. Therefore, the No Build Alternative would be consistent with Policy 1.1.
Goal 2: Encourage a full range of circulation strategies for overall reduction in vehicle trips.				
Policy 2.2: Develop and promote increased use of alternative modes of transportation, including but not limited to: walking, bicycling, ridesharing, transit, telecommuting, paratransit, and shuttles.				
Consistent. The TSM/TDM Alternative focuses on reducing the use of motor vehicles by promoting alternative modes of transportation through improving bicycle facilities and bus services, and providing increased opportunities for ridesharing and transit use. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.2.	**Consistent.** The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, dedicated, and existing bus lanes, and mixed-flow traffic lanes to key destinations between East Los Angeles and Pasadena. The BRT Alternative includes the active transportation improvements in the TSM/TDM Alternative. Therefore, the BRT Alternative would be consistent with Policy 2.2.	**Consistent.** The LRT Alternative includes a new light rail line, including stations along that line at Huntington Drive and Mission Street in South Pasadena. Therefore, the LRT Alternative would be consistent with Policy 2.2.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies focused on reducing the use of motor vehicles by promoting alternative modes of transportation through improving bicycle facilities and bus services, and providing increased opportunities for ridesharing and transit use. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote alternative modes of transportation. Therefore, the No Build Alternative would be consistent with Policy 2.2.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 2.4: Support the development of additional regional public (mass) transportation facilities and services.				
Consistent. The TSM/TDM Alternative supports the development of additional regional public (mass) transportation facilities and services through improving bicycle facilities and bus services, and providing increased opportunities for ridesharing and transit use. Therefore, the TSM/TDM Alternative would be consistent with Policy 2.4.	**Consistent.** The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, dedicated, and existing bus lanes, and mixed-flow traffic lanes to key destinations between the unincorporated community of East Los Angeles and the City of Pasadena. The BRT Alternative includes the regional public transportation improvements in the TSM/TDM Alternative. Therefore, the BRT Alternative would be consistent with Policy 2.4.	**Consistent.** The LRT Alternative includes a new light rail line, including stations along that line at Huntington Drive and Mission Street in South Pasadena. Therefore, the LRT Alternative would be consistent with Policy 2.4.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies focused on reducing the use of motor vehicles by promoting alternative modes of regional public transportation through improving bicycle facilities and bus services, and providing increased opportunities for ridesharing and transit use. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 2.4.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote regional public transportation. Therefore, the No Build Alternative would be consistent with Policy 2.4.
Goal 3: Encourage regional coordination of transportation improvement.				
Policy 3.1: Coordinate with applicable regional, state and federal agencies in the development of transportation improvements.				
Consistent. The TSM/TDM Alternative was developed by Caltrans and Metro to expand and improve travelers' transportation options in terms of travel mode, time, route, and costs. Therefore, the TSM/TDM Alternative would be consistent with Policy 3.1.	**Consistent.** The BRT Alternative was developed by Caltrans and Metro to improve the availability of public transportation services and reduce traffic by implementing new dedicated bus lanes for longer distance commuters and adding more buses with fewer stops. Therefore, the BRT Alternative would be consistent with Policy 3.1.	**Consistent.** The LRT Alternative was developed by Metro to improve the availability of public transportation and reduce traffic in the study area. Therefore, the LRT Alternative would be consistent with Policy 3.1.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements that were developed by Caltrans and Metro. Therefore, the Freeway Alternative would be consistent with Policy 3.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote agency coordination in the development of transportation improvements. Therefore, the No Build Alternative would be consistent with Policy 3.1.
Policy 3.3: Support the development of additional circulation routes through the City.				
Consistent. The TSM/TDM Alternative includes strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options in terms of travel mode, time, route, and costs. Therefore, the TSM/TDM Alternative would be consistent with Policy 3.3.	**Consistent.** The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, dedicated, and existing bus lanes, and mixed-flow traffic lanes to key destinations between the unincorporated community of East Los Angeles and the City of Pasadena. The BRT Alternative includes TSM/TDM strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and improve transportation options to develop additional circulation routes throughout the study area. Therefore, the BRT Alternative would be consistent with Policy 3.3.	**Consistent.** The LRT Alternative includes a new light rail line and the TSM/TDM Alternative strategies for reducing the use of motor vehicles, providing increased opportunities for ridesharing and transit use, and improving transportation options in the study area. Therefore, the LRT Alternative would be consistent with Policy 3.3.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and improve transportation options throughout the study area. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 3.3.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, which promote regional transportation. Therefore, the No Build Alternative would be consistent with Policy 3.3.
Land Use and Community Design Element				
Goal 3: To emphasize pedestrians over cars in portions of the city.				
Policy 3.5: Promote Mobility. Promote mobility for those who do not drive, particularly seniors, youth and disabled.				
Consistent. The TSM/TDM Alternative includes strategies to reduce the use of motor vehicles, encourage ridesharing and transit use, and improve transportation options for those who do not drive. Therefore, the TSM/TDM Alternative would be consistent with Policy 3.5.	**Consistent.** The BRT Alternative includes BRT trunk line arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connection bus services to increase accessibility to public transportation services. The BRT Alternative includes the TSM/TDM Alternative strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and improve transportation options for those who do not drive. Therefore, the BRT Alternative would be consistent with Policy 3.5.	**Consistent.** The LRT Alternative includes a new light rail line and the TSM/TDM Alternative strategies for reducing the use of motor vehicles, providing increased opportunities for ridesharing and transit use, and improving transportation options in the study area. Therefore, the LRT Alternative would be consistent with Policy 3.5.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to reduce the use of motor vehicles, provide increased opportunities for ridesharing and transit use, and improve transportation options for those who do not drive. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 3.5.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote optimum mobility. Therefore, the No Build Alternative would be consistent with Policy 3.5.
General Plan Noise Element				
Goal 6: To encourage the provision of and use of alternative modes of transit (bicycle, bus, and light-rail).				
Policy 6.1: Increase availability of public transit. Increase the availability of public and private transit and encourage transit use through improving services, stations and connections.				
Consistent. The TSM/TDM Alternative includes strategies to increase the availability of public and private transit and provides increased opportunities for transit use through improving bus services, stations, and connections. Therefore, the TSM/TDM Alternative would be consistent with Policy 6.1.	**Consistent.** The BRT Alternative includes BRT trunk line arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connection bus services to increase accessibility to public transportation services. The BRT Alternative includes the TSM/TDM Alternative strategies to increase the availability of public and private transit and provide increased opportunities for transit use through improving services, stations, and connections. Therefore, the BRT Alternative would be consistent with Policy 6.1.	**Consistent.** The LRT Alternative includes a new light rail line and the TSM/TDM Alternative strategies for increasing the availability of alternative transportation modes and opportunities for transit use through improved services, stations, and connections. Therefore, the LRT Alternative would be consistent with Policy 6.1.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to increase the availability of transit and provide increased opportunities for transit use through improving services, stations, and connections. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 6.1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote the availability of public transit. Therefore, the No Build Alternative would be consistent with Policy 6.1.

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
Policy 6.2: Promote a regional approach. Promote a regional approach to transportation services in cooperation with other Cities.				
Consistent. The TSM/TDM Alternative focuses on regional means of reducing the number of vehicle trips and miles traveled and increasing vehicle occupancy. The TSM/TDM Alternative also includes strategies to reduce the use of motor vehicles, provides increased opportunities for ridesharing and transit use, and improves transportation options to reduce congestion on local arterials. Therefore, the TSM/TDM Alternative would be consistent with Policy 6.2.	**Consistent.** The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, dedicated, and existing bus lanes, and mixed-flow traffic lanes to key destinations between the unincorporated community of East Los Angeles and the City of Pasadena. The BRT Alternative includes the TSM/TDM Alternative strategies to reduce the number of vehicle trips and vehicle miles traveled. Therefore, the BRT Alternative would be consistent with Policy 6.2.	**Consistent.** The LRT Alternative includes a new light rail line that would provide passenger rail services to key destinations between the unincorporated community of East Los Angeles and the City of Pasadena, including South Pasadena. The LRT Alternative includes regional strategies in the TSM/TDM Alternative to reduce vehicle trips and vehicle miles traveled. Therefore, the LRT Alternative would be consistent with Policy 6.2.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies focused on reducing the use of motor vehicles by promoting alternative modes of regional transportation through improving bicycle facilities and bus services, and providing increased opportunities for ridesharing and transit use. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 6.2.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote regional transportation services. Therefore, the No Build Alternative would be consistent with Policy 6.2.
Policy 6.5: Enhance pedestrian and bicycle amenities. Provide additional amenities such as street trees and furniture, supplemental lighting, widened walks, bikeways and narrowed vehicular right-of-ways to encourage non-vehicular usage.				
Consistent. The TSM/TDM Alternative includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 6.5.	**Consistent.** The BRT Alternative includes TSM/TDM strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative would be consistent with Policy 6.5.	**Consistent.** The LRT Alternative includes TSM/TDM strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area, the expansion of bicycle parking facilities at existing Metro Gold Line stations, and the provision of bicycle parking facilities at the new light rail stations. Therefore, the LRT Alternative would be consistent with Policy 6.5.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 6.5.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote active transportation. Therefore, the No Build Alternative would be consistent with Policy 6.5.
Policy 6.6: Promote bicycle paths. Street network system improvements shall endeavor to provide bicycle connection paths to transit-oriented development, commercial areas and transit stops.				
Consistent. The TSM/TDM Alternative includes strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the TSM/TDM Alternative would be consistent with Policy 6.6.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the BRT Alternative would be consistent with Policy 6.6.	**Consistent.** The LRT Alternative includes TSM/TDM Alternative strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area, the expansion of bicycle parking facilities at existing Metro Gold Line stations, and the provision of bicycle parking facilities at the new light rail stations. Therefore, the LRT Alternative would be consistent with Policy 6.6.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to improve existing bicycle facilities, including on-street Class III bicycle facilities that support access to transit facilities through the study area and the expansion of bicycle parking facilities at existing Metro Gold Line stations. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 6.6.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote active transportation. Therefore, the No Build Alternative would be consistent with Policy 6.6.
Goal 18: To conserve the air, water and energy resources about us as an exercise of responsible stewardship of the natural setting in which we live.				
Policy 18.1: Improve air quality. Improve the air quality in South Pasadena and the region.				
Consistent. The TSM/TDM Alternative would help improve air quality by increasing the efficiency of multiple modes of transportation based on improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the TSM/TDM Alternative would be consistent with Policy 18.1.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative strategies to improve the availability of transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, and adding more buses and including bus stop enhancements along TSM routes. The BRT Alternative would help improve the air quality in the study area by increasing the efficiency of bus services. The BRT Alternative includes the ATM and local street and intersection improvements in the TSM/TDM Alternative. Therefore, the BRT Alternative would be consistent with Policy 18.1.	**Consistent.** The LRT Alternative includes a new light rail line that would contribute to improved air quality in the study area by increasing the availability of LRT and increased bus services in the study area. The LRT Alternative includes the active transportation and local street and intersection improvements in the TSM/TDM Alternative. Therefore, the LRT Alternative would be consistent with Policy 18.1.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to increase efficiency and capacity for all transportation modes with lower capital cost investments and/or lower potential impacts, including regional air quality. Therefore, the Freeway Tunnel Alternative would be consistent with Policy 18.1	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that include goals for improving regional air quality. Therefore, the No Build Alternative would be consistent with Policy 18.1.
Mission Street Specific Plan (City of South Pasadena)				
Intent 1: Encourage and provide alternative means of access to the Gold Line station and Mission Street other than automobiles.				
Consistent. The TSM/TDM Alternative includes strategies to increase the availability of transit services and provide alternative means to access the Gold Line Station and Mission Street by encouraging transit use through improved bus services, stations, and connections. Therefore, the TSM/TDM Alternative would be consistent with Intent 1.	**Consistent.** The BRT Alternative would provide a new BRT service on Fair Oaks Avenue, with bus stops at Fair Oaks Avenue and Mission Street, to increase accessibility to public transportation services. The BRT Alternative includes the TSM/TDM Alternative strategies to reduce the use of motor vehicles, encourage transit use, and improve transportation options. Therefore, the BRT Alternative would be consistent with Intent 1.	**Consistent.** The LRT Alternative includes a new light rail line along Fair Oaks Avenue, with a station at Fair Oaks Avenue and Mission Street that would increase accessibility to public transportation services in that area. The LRT Alternative includes TSM/TDM Alternative strategies to increase the availability of transit and encourage transit use through improving services, stations, and connections. Therefore, the LRT Alternative would be consistent with Intent 1.	**Consistent.** The Freeway Tunnel Alternative includes TSM/TDM Alternative strategies to increase the availability of transit and encourage transit use through improving services, stations, and connections. Therefore, the Freeway Tunnel Alternative would be consistent with Intent 1.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP, that promote the availability of public transit. Therefore, the No Build Alternative would be consistent with Intent 1.
REGIONAL TRANSPORTATION PLAN/SUSTAINABLE COMMUNITIES STRATEGY (RTP/SCS)				
Goal 2: Maximize mobility and accessibility for all people and goods in the region.				
Consistent. The TSM/TDM Alternative consists of strategies to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. The	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which consist of strategies to maximize the efficiency of the existing transportation system	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, which consist of strategies to maximize the efficiency of the existing transportation system	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which consist of strategies to maximize the efficiency of the existing	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009

TABLE 3.1.3:
Consistency of SR 710 North Project Alternatives with Local and Regional Plans

Consistent?				
TSM/TDM Alternative	**BRT Alternative**	**LRT Alternative**	**Freeway Tunnel Alternative**	**No Build Alternative**
TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the TSM/TDM Alternative would be consistent with Goal 2.	by improving capacity and reducing congestion. The TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the BRT Alternative would be consistent with Goal 2.	by improving capacity and reducing congestion. The TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the LRT Alternative would be consistent with Goal 2.	transportation system by improving capacity and reducing congestion. The TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 2.	LRTP. Therefore, the No Build Alternative would be consistent with Goal 2.
Goal 3: Ensure travel safety and reliability for all people and goods in the region.				
Consistent. The TSM/TDM Alternative would promote user safety in the design and development of new transportation projects and services. Therefore, the TSM/TDM Alternative would be consistent with Goal 3.	**Consistent.** The BRT Alternative would promote user safety in the design and development of the new transportation facilities and systems included in the BRT Alternative. Therefore, the BRT Alternative would be consistent with Goal 3.	**Consistent.** The LRT Alternative would promote user safety in the design and development of the improvements included in the LRT Alternative. Therefore, the LRT Alternative would be consistent with Goal 3.	**Consistent.** Both the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would include the following tunnel support systems: emergency evacuation for pedestrians and vehicles; air scrubbers; a ventilation system consisting of exhaust fans at each portal, an exhaust duct along the entire length of the tunnel, and jet fans in the traffic area of the tunnel; fire detection and suppression systems; communications and surveillance systems; and 24-hour monitoring. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 3.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Goal 3.
Goal 4: Preserve and ensure a sustainable regional transportation system				
Consistent. The TSM/TDM Alternative consists of strategies to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. The TSM/TDM Alternative would reduce air pollution by increasing the availability and efficiency of multiple modes of transportation based on improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the TSM/TDM Alternative would be consistent with Goal 4.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements which would increase efficiency, decrease congestion, and improve air quality. Therefore, the BRT Alternative would be consistent with Goal 4.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements which would increase efficiency, decrease congestion, and improve air quality. Therefore, the LRT Alternative would be consistent with Goal 4.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements which would increase efficiency, decrease congestion, and improve air quality. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 4.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Goal 4..
Goal 5: Maximize the productivity of our transportation system				
Consistent. The TSM/TDM Alternative consists of strategies to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. The TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the TSM/TDM Alternative would be consistent with Goal 5.	**Consistent.** The BRT Alternative includes the TSM/TDM Alternative improvements, which consist of strategies to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. The TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the BRT Alternative would be consistent with Goal 5.	**Consistent.** The LRT Alternative includes the TSM/TDM Alternative improvements, which consist of strategies to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. The TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the LRT Alternative would be consistent with Goal 5.	**Consistent.** The Freeway Tunnel Alternative includes the TSM/TDM Alternative improvements, which consist of strategies to maximize the efficiency of the existing transportation system by improving capacity and reducing congestion. The TSM/TDM Alternative also includes expanded bus service, bus service improvements, and bicycle facility improvements. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 5.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Goal 5.
Goal 6: Protect the environment and health of residents by improving air quality and encouraging active transportation (non-motorized transportation, such as bicycling and walking).				
Consistent. The TSM/TDM Alternative would reduce air pollution by increasing the availability and efficiency of multiple modes of transportation based on improved pedestrian, bicycle, and bus facilities, and intersection and local street improvements. Therefore, the TSM/TDM Alternative would be consistent with Goal 6.	**Consistent.** The BRT Alternative includes strategies to improve the availability of viable transportation alternatives by implementing new dedicated bus lanes for longer distance commuters, adding more buses, and including bus stop enhancements. The BRT Alternative would reduce air pollution by increasing the efficiency of bus services. The BRT Alternative includes the active traffic management and local street and intersection improvements in the TSM/TDM Alternative. Therefore, the BRT Alternative would be consistent with Goal 6.	**Consistent.** The LRT Alternative includes strategies to improve the availability of viable transportation alternatives by implementing a light rail transit system. The LRT Alternative would reduce air pollution by encouraging non-motorized transportation. The LRT Alternative includes the traffic management and local street and intersection improvements in the TSM/TDM Alternative. Therefore, the LRT Alternative would be consistent with Goal 6.	**Consistent.** The Freeway Tunnel Alternative includes strategies to improve circulation in the study area in order to improve air quality by providing either a single-bore or dual-bore tunnel. The Freeway Tunnel Alternative includes the traffic management and local street and intersection improvements in the TSM/TDM Alternative. Therefore, the Freeway Tunnel Alternative would be consistent with Goal 6.	**Consistent.** The No Build Alternative includes projects/planned improvements through 2035 included in the FTIP, as listed in the SCAG 2012 RTP/SCS and Metro 2009 LRTP. Therefore, the No Build Alternative would be consistent with Goal 6.

Source: *Community Impact Assessment* (2014).
FTIP = Federal Transportation Improvement Program
LOS = level of service
LRTP = Long Range Transportation Plan
N/A = Not applicable
RTP/SCS = Regional Transportation Plan/Sustainable Communities Strategy
SCAG = Southern California Association of Governments
TAC = Technical Advisory Committee

TABLE 3.1.4:
Parks, Recreation Resources, and Bikeways within 0.5 Mile of the Build Alternatives by Jurisdiction

Name, Address, and Owner/Operator	Amenities
City of Alhambra	
Alhambra Park 500 North Palm Avenue City of Alhambra	This 15 ac park provides picnic tables with covered shelters, playground equipment, barbecues, tennis courts, volleyball courts, an outdoor basketball court, a meeting room, an activity room, a swimming pool, an open grass area, a band shell, and restrooms.
Alhambra Municipal Golf Course 630 South Almansor Street City of Alhambra	The 18-hole golf course includes a three-level lighted driving range, two chipping greens, a large putting green, and a practice bunker. It also includes a restaurant, a golf shop, and a banquet and conference center that has indoor and outdoor areas available for weddings, parties, and corporate events.
Almansor Park 800 South Almansor Street City of Alhambra	This 29.2 ac park includes an open grass area, picnic tables with covered shelters, playground equipment, barbecues, restrooms, ball fields, tennis courts, horseshoe pits, exercise par course, meeting room, activity room, gymnasium, outdoor basketball court, and jogging course.
Burke Heritage Park 1550 West Alhambra Road City of Alhambra	This 1.1 ac park has a xeriscape garden adjacent to the Alhambra Historical Society Museum, which includes a collection of memorabilia, period clothing, furnishings, and books.
Emery Park 2709 Mimosa Street City of Alhambra	This 0.7 ac park provides an open grass area, picnic tables, playground equipment, barbecues, restrooms, and an activity room and kitchen facility.
Gateway Plaza Park Northwest corner of West Valley Boulevard/South Fremont Avenue City of Alhambra	This 0.5 ac park welcomes visitors to the City with a Moorish-style arch that symbolizes Alhambra as the “Gateway to the San Gabriel Valley.” The park also includes landscaping and walkways.
Granada Park 2000 West Hellman Avenue City of Alhambra	This 17.3 ac park provides an open grass area, picnic tables with covered shelters, playground equipment, barbecues, restrooms, ball fields, tennis courts, a meeting room, a kitchen facility, and a heated swimming pool.
Moor Field 1008 South 8th Street City of Alhambra	This 20.3 ac field has large and small baseball/softball diamonds, a football/soccer field with bleachers, a running track, and restroom facilities.
YMCA West San Gabriel Valley 401 East Corto Street Privately operated	The facility has a pool and provides aquatic programs for all ages, a basketball program for youth, basketball courts, adult fitness programs, and a youth fitness program that provides kids yoga, mixed martial arts, and jazz/ballet classes.
City of Los Angeles (Eagle Rock Neighborhood)	
Eagle Rock Recreation Center 1100 Eagle Vista Drive City of Los Angeles	This 24.1 ac park provides an auditorium, barbecue pits, lighted and unlighted baseball diamonds, basketball courts (lighted/indoor, unlighted/outdoor), children’s play area, football field (unlighted), indoor gym, picnic tables, and tennis courts (unlighted).
Lanark/Shelby Mini Park Lanark Street and Shelby Place City of Los Angeles	This 0.4 ac park provides a children’s play area.
Richard Alatorre Park Figueroa and SR 134 City of Los Angeles	This 1.8 ac park provides picnic tables and walkways through a nature area.
Yosemite Recreation Center 1840 Yosemite Drive City of Los Angeles	This 5.1 ac center provides an auditorium, lighted outdoor basketball courts, a children’s play area, a community room, lighted handball courts, an indoor gym, an outdoor gym, picnic tables, and lighted tennis courts.

TABLE 3.1.4:
Parks, Recreation Resources, and Bikeways within 0.5 Mile of the Build Alternatives by Jurisdiction

Name, Address, and Owner/Operator	Amenities
Class II Bikeways • Eagle Rock Boulevard (between Westdale Avenue and York Boulevard) • York Boulevard (between Eagle Rock Boulevard and North Avenue 49) City of Los Angeles	Striped on-street bike lanes
Class III Bikeways • Alumni Avenue (between York Boulevard and Campus Drive) • Campus Drive (between Alumni Boulevard and North Avenue 49) • Colorado Boulevard (between SR 2 and Patrician Way) • Eagle Rock Boulevard (between Colorado Boulevard and Westdale Avenue) City of Los Angeles	Unstriped on-street bike lanes
County of Los Angeles (East Los Angeles Community)	
Atlantic Avenue Park 570 South Atlantic Boulevard Los Angeles County Department of Parks and Recreation	This 3.0 ac park provides a children's play area, men's and women's locker rooms, picnic and barbeque areas, a splash pad, and a swimming pool.
Belvedere Community Regional Park 4914 East Cesar E. Chavez Avenue Los Angeles County Department of Parks and Recreation	This 31.0 ac park provides baseball fields, basketball courts, a children's play area, a community room, a fitness zone, a gymnasium, picnic shelters, a skate park, soccer fields, a splash pad, a swimming pool, and tennis courts.
Boys and Girls Clubs of East Los Angeles 324 North McDonnell Avenue Boys and Girls Club (private, non-profit)	
Los Angeles County Community and Senior Services – Centro Maravilla Service Center 4716 East Cesar E. Chavez Avenue Los Angeles County Department of Parks and Recreation	This multipurpose center provides educational, social, and recreational activities including emergency food distribution, form completion, income tax assistance, a food bank, and flu shot clinic.
Class II Bikeways • North Herbert Avenue (between Medford Street and Whiteside Street) • City Terrace Drive (between North Alma Avenue and Marengo Street) • South Gerhart Avenue (between Via San Delarro Street and Pomona Boulevard) Los Angeles County Department of Parks and Recreation	Striped, on-street bikeways.
City of Los Angeles (El Sereno Neighborhood)	
El Sereno Arroyo Playground 5520 Concord Avenue City of Los Angeles	This 1.0 ac playground provides grassy hills, a playground area with equipment, a fitness zone for adults, walking paths, picnic tables, mosaics, decorative fencing, and a garden.
El Sereno North Park 4410 Garden Homes Avenue City of Los Angeles	This 4.2 ac park provides picnic tables with covered shelters, playground equipment, barbecues, ball fields, tennis courts, a meeting room, a kitchen facility, a heated swimming pool, an open grass area, and restroom facilities.
Class II Bikeways • Huntington Drive between Esmeralda Street and Maycrest Avenue • Via Marisol between Monterey Road and Lomitas Drive City of Los Angeles	Striped, on-street bikeways.

TABLE 3.1.4:
Parks, Recreation Resources, and Bikeways within 0.5 Mile of the Build Alternatives by Jurisdiction

Name, Address, and Owner/Operator	Amenities
City of Los Angeles (Glassell Park Neighborhood)	
Class II Bikeway • Eagle Rock Boulevard between York Boulevard and Division Street City of Los Angeles	Striped, on-street bikeway.
City of Irwindale (along the LRT and Freeway Tunnel Spoils Disposal Haul Routes)	
Santa Fe Dam Recreation Area 15501 East Arrow Highway Los Angeles County Department of Parks and Recreation	The Santa Fe Dam Recreational Area is an 836 ac facility with a 70 ac lake (Santa Fe Flood Control Basin) with year-round fishing and non-motorized watercraft usage. During the summer, the Recreation Area includes a 5 ac chlorinated swim beach and a children's water play area. The Recreation Area is home to many protected native plants and animals. It also includes bicycle, walking, and equestrian trails, a snack bar, organized youth camping, and a bait and tackle shop.
Class I Bikeway • San Gabriel River Trail City of Irwindale	Off-street bikeway.
City of Monterey Park	
Barnes Memorial Park and Community Center 350 South McPherrin Avenue City of Monterey Park	This 11.5 ac park features a community center, a basketball gym, a Memorial bowl, a sheltered picnic pavilion, an Olympic-size pool, a lighted softball field, tennis courts, and a children's play area.
Bella Vista Park 400 Pomona Boulevard City of Monterey Park	This 4.0 ac park features a softball field, a children's play area, outdoor basketball courts, picnic facilities, a lighted tennis court, and restrooms.
Cascades Park 700 South Atlantic Boulevard City of Monterey Park	This 2.0 ac park includes cascading waterfalls and passive turf areas.
Highlands Park 400 Casuda Canyon Drive City of Monterey Park	This 8.3 ac park adjacent to Monterey Highlands School features lighted tennis courts, a children's area, an open and shady space, and restrooms.
Monterey Park Golf Course 3600 West Ramona Boulevard Privately operated	The golf course has a 9-hole course with a two-level driving range, a club house with café, and a pro shop.
Pinetree Park 2167 Arriba Drive City of Monterey Park	This 0.5 ac neighborhood park includes a picnic table and a children's play area.
Sequoia Park 750 Ridgecrest Avenue City of Monterey Park	This 6.8 ac park includes a Japanese garden with a view deck, a softball field, a children's area, lighted tennis courts, an outdoor basketball court, restrooms, and picnic facilities.
City of Pasadena	
Allendale Park 1130 South Marengo Avenue City of Pasadena	This 2.9 ac park provides a lighted tennis court, a little league baseball field (with a soccer field overlay), athletic field lighting, playground equipment, bleachers, and restroom facilities.
Annandale Golf Club 1 North San Rafael Avenue Privately operated	This is an 18-hole golf course with a clubhouse.

TABLE 3.1.4:
Parks, Recreation Resources, and Bikeways within 0.5 Mile of the Build Alternatives by Jurisdiction

Name, Address, and Owner/Operator	Amenities
Brenner Park 235 Barthe Drive City of Pasadena	This 1.75 ac park provides a basketball court, picnic shelter, lighted ball field, playground equipment, restroom facilities, lighted tennis court, and an open area.
Brookside Park 360 North Arroyo Avenue City of Pasadena	This 62 ac park provides a fitness trail, five tennis courts, three baseball fields, two soccer overlays, a football overlay, an open area, playground equipment, athletic field and court lighting, bleacher seating, and restroom facilities.
Central Park 275 South Raymond Avenue City of Pasadena	This 9.2 ac park provides six horseshoe pits, two lawn bowling courts, an open area, playground equipment, walkway lighting, and restroom facilities.
Defenders Park Orange Grove Boulevard/Colorado Boulevard City of Pasadena	This 1.8 ac park provides a walkway, multiple monuments, and a limestone bench and wall recognizing the founders of Pasadena.
Grant Park 232 South Michigan Avenue City of Pasadena	This 2.7 ac park provides two volleyball courts, two tennis courts with lights, two basketball courts, two horseshoe pits, a baseball diamond, a picnic shelter, an open area, park play equipment, and restroom facilities.
Lower Arroyo Seco Park Arroyo Boulevard/Norwood Drive City of Pasadena	This 150 ac park contains a natural park area, a fly casting pond and clubhouse, an archery range and clubhouse, rubble walls that retain the slopes and define paths, multi-use trails, La Casita del Arroyo Community Center, Aids Memorial Grove, promontory outlooks such as the Bird Sanctuary, and various types of habitats for a variety of bird, insect, and small mammal species.
Memorial Park 85 East Holly Street City of Pasadena	This 5.25 ac park provides various memorials, an amphitheater, park play equipment, an open area, and restroom facilities.
Rose Bowl Aquatic Center 360 North Arroyo Boulevard Privately operated	This center provides two Olympic-size pools, one warm water pool, two hydrotherapy spas, diving platforms, six spring boards, an exercise and weight room, a clubhouse building with men's and women's locker rooms, a pro shop, a food and beverage center, and two conference rooms.
San Rafael Park Colorado Boulevard/Melrose Boulevard City of Pasadena	This 1.0 ac park provides play equipment and an open play area.
Singer Park California Boulevard/St. John Avenue City of Pasadena	This 2.9 ac park provides play equipment, an open area, and restroom facilities.
Tournament Park East California Boulevard and South Wilson Avenue California Institute of Technology	This 1.2 ac park provides a barbeque facility and picnic and playground areas.
Villa Parke Community Center 363 East Villa Street City of Pasadena	This center is in a 41,475 sf building on an 8.1 ac site. The center includes a large auditorium with a stage and storage area, a social/recreation room, weight and boxing rooms, and a gymnasium with showers and dressing rooms. Activities at the center include recreation activities for children, adults, and families.
Villa Park 363 East Villa Street City of Pasadena	This 11.9 ac park provides a basketball court, a baseball diamond, sport court lighting, bleacher seating, soccer and football overlays, park play equipment, an open area, and bathroom facilities.

TABLE 3.1.4:
Parks, Recreation Resources, and Bikeways within 0.5 Mile of the Build Alternatives by Jurisdiction

Name, Address, and Owner/Operator	Amenities
Class II Bikeways • Arroyo Boulevard between I-210 and Wotkyns Drive • Arroyo Boulevard between Seco Street and Holly Street • Corson Street between Pasadena Avenue and Altadena Drive • Glenarm Street between Marengo Avenue and Madison Avenue • Maple Street between Fair Oaks Avenue and Altadena Drive • Marengo Avenue between Glenarm Street and Del Mar Boulevard • Raymond Avenue between Orange Grove Boulevard and Montana Street • St. John Avenue between Walnut Street and Del Mar Boulevard • Wilson Avenue between California Boulevard and Cordova Street City of Pasadena	Striped, on-street bike lanes.
Class III Bikeways • Allen Avenue (between California Boulevard Washington Boulevard) • Arroyo Boulevard (between Grand Avenue and San Pasqual Avenue) • Arroyo Boulevard (between Holly Street and California Boulevard) • Bonnie Avenue (between Colorado Boulevard and Del Mar Boulevard) • California Boulevard (between Arroyo Boulevard and Grand Avenue) • California Boulevard (between Marengo Avenue and Allen Avenue) • Casitas Avenue (between Howard Street and Montana Street) • Cordova Street (between Arroyo Parkway and Hill Avenue) • Del Mar Boulevard (between Pasadena Avenue and Madre Street) • Glenarm Street (between Pasadena Avenue and Marengo Avenue) • Grand Avenue (between California Boulevard and Arroyo Boulevard) • Hill Avenue (Colorado Boulevard and Atchison Street) • Howard Street (between Arroyo Boulevard and Los Robles Avenue) • Lincoln Avenue (between Forest Avenue and Maple Street) • Linda Vista Avenue (between San Rafael Avenue and Highland Drive) • Los Robles Avenue (between Marengo Avenue and Woodbury Road) • Mountain Street (between Forest Avenue and Raymond Avenue) • Orange Grove Boulevard (between Raymond Avenue and Sierra Madre Villa Avenue) • Orange Grove Boulevard (between Walnut Street and Fair Oaks Avenue) • Raymond Avenue (between Orange Grove Boulevard and Maple Street) • Rosemont Drive (between Washington Boulevard and Seco Street) • San Pasqual Street (between Hill Avenue and Greenwood Avenue • Seco Street (between West Drive and Forest Avenue) • Sierra Bonita Avenue (between Colorado Boulevard and Villa Street)	Unstriped, on-street bike lanes.

TABLE 3.1.4:
Parks, Recreation Resources, and Bikeways within 0.5 Mile of the Build Alternatives by Jurisdiction

Name, Address, and Owner/Operator	Amenities
• Sierra Bonita Avenue (between Orlando Road and Del Mar Boulevard) • Villa Street (between Los Robles Avenue and Hill Avenue) • Washington Boulevard (between Arroyo Boulevard and Allen Avenue) • West Drive (between Seco Street and Washington Boulevard) • Wilson Avenue (between Cordova Street and Orange Grove Boulevard) City of Pasadena	
City of Rosemead	
Garvey Park and Splash Zone at Garvey Park 7933 Emerson Place City of Rosemead	This 12.1 ac park provides picnic shelters with barbecues, a gymnasium, restrooms, baseball/softball diamonds, two playgrounds, and lighted tennis courts. The Splash Zone at Garvey Park provides two large water slides, a splash play area, and a 2,500 sf lesson pool.
Rosemead Aquatic Center 9155 East Mission Drive City of Rosemead	This center provides a competitive pool with 13 competition lanes and water polo capabilities. The pool is available for recreational swimming.
Rosemead Park 4343 Encinita Avenue City of Rosemead	This 19.9 ac park provides a swimming pool, three playground areas, picnic shelters with barbecues, two lighted softball/baseball fields, restroom facilities, a 0.5 mi long trail, and an expansive open space area.
City of San Gabriel	
Asian Youth Center 100 West Clary Avenue Privately Operated	This center provides social services, educational instruction, and after school and summer programs for youths and families that live in the community. The center has a pool table and a gymnasium for recreational activities.
Marshall Park (Planned) 1817 South Jackson Avenue City of San Gabriel	This 2.0 ac park, which will be on the former Marshall School site, will include a walking/jogging path, multipurpose areas with game courts, synthetic turf and grass areas, playgrounds with shade structures, covered picnic areas, outdoor fitness equipment, seating areas, restrooms, and security lighting. Construction is expected to begin in late 2014 and be completed in 2015.
Plaza Park 428 South Mission Drive City of San Gabriel	This 0.7 ac beautiful tree-lined park provides a tranquil vista of the historic San Gabriel Mission.
Smith Park 232 West Broadway City of San Gabriel	This 6.1 ac park provides a tiny tot playground (6 years and under), children's playground (7 years and older), lighted basketball court, two lighted tennis courts, four lighted handball courts, three picnic areas, and an outdoor pool.
Vincent Lugo Park Wells and Ramona Streets City of San Gabriel	This 11.3 ac park includes a dry riverbed designed to drain to Alhambra Wash, pedestrian lighting, multipurpose trails along the wash and throughout the park, native landscaping, an athletic field/open space, an outdoor classroom, vehicular and pedestrian bridges, and preservation of La Laguna de San Gabriel.
Class III Bikeway • Junipero Serra Drive between Mission Road and South San Marino Avenue City of San Gabriel	Unstriped, on-street bike lanes.

TABLE 3.1.4:
Parks, Recreation Resources, and Bikeways within 0.5 Mile of the Build Alternatives by Jurisdiction

Name, Address, and Owner/Operator	Amenities
City of San Marino	
Huntington Library, Art Collections, and Botanical Gardens 1151 Oxford Road Privately Operated	This 207 ac property includes a garden with walking trails, various types of gardens, a pond, and open space areas.
Lacy Park 1485 Virginia Road City of San Marino	This 30 ac park provides a picnic area, two walking trails, tennis courts, and a rose garden.
City of South Pasadena	
Eddie Park and House 2017 Edgewood Drive City of South Pasadena	This 1.0 ac park provides a playground and an open grass area.
Garfield Park 1750 Mission Street City of South Pasadena	This 7.6 ac park provides tennis courts, a playground, and a garden area.
Library Park 1102 Oxley Street City of South Pasadena	This 3.2 ac park provides tennis courts, a half basketball court, a playground, and a baseball field.
Orange Grove Park and Recreation Building 815 Mission Street City of South Pasadena	This 2.5 ac park provides a lighted softball and soccer field, two lighted tennis courts, picnic tables, a small playground, drinking fountains, bleachers, and a bicycle rack.
War Memorial Park 435 Fair Oaks Avenue City of South Pasadena	The two-story War Memorial Building is a City of South Pasadena cultural heritage landmark on a 1.2 ac site. The building includes a large multipurpose room, smaller meeting rooms, and restrooms. The park includes a landscaped memorial garden and on-site parking.
YMCA South Pasadena/San Marino 1605 Garfield Avenue Privately operated	This facility provides a fitness center, an exercise studio, a cycling room, an indoor heated pool, a weight room, a child activity center, and multipurpose rooms.
Class II Bikeways • El Centro Street (between Pasadena Avenue and Orange Grove Avenue) • Marengo Avenue (between Mission Street and Alhambra Road) City of South Pasadena	Striped, on-street bike lanes.

Source 1: *Community Impact Assessment* (2014).
Source 2: Appendix B

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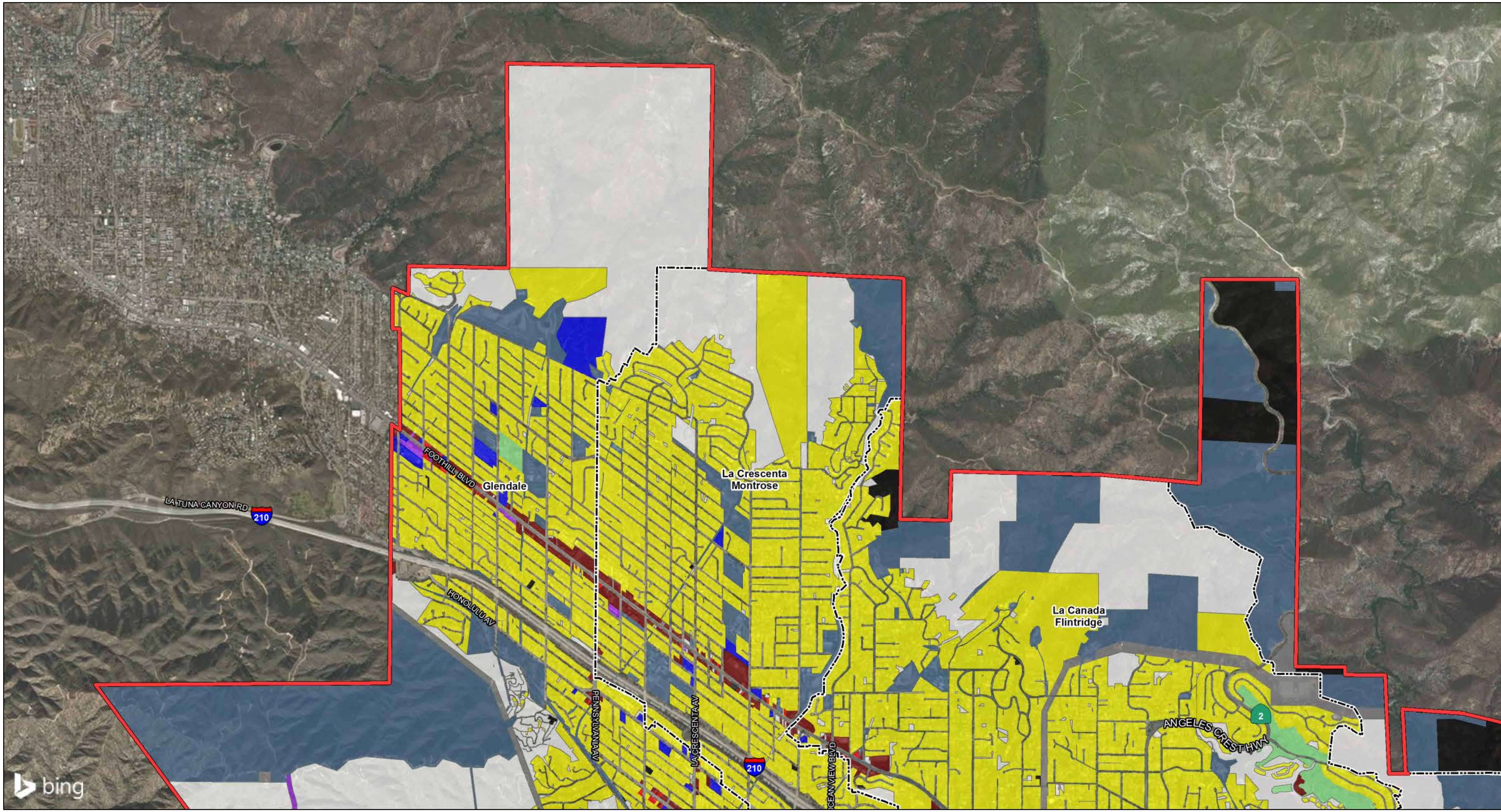

LEGEND

- Cities/Unincorporated Communities
- LA City Neighborhoods
- Land Use Study Area

Existing Land Use

- Residential
- Commercial and Services
- Mixed Commercial
- Industrial
- Institutional
- Public
- Transportation and Utilities
- Agricultural
- Mining and Extraction
- Open Space and Recreation
- Other
- Vacant

N

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FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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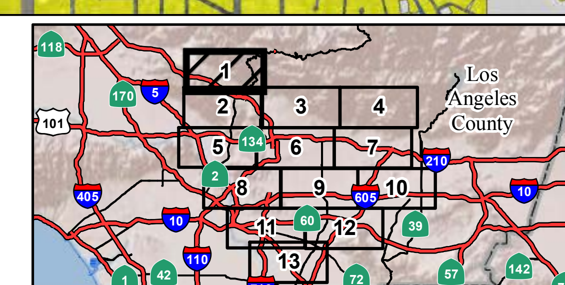

FIGURE 3.1-1

Sheet 1 of 13

SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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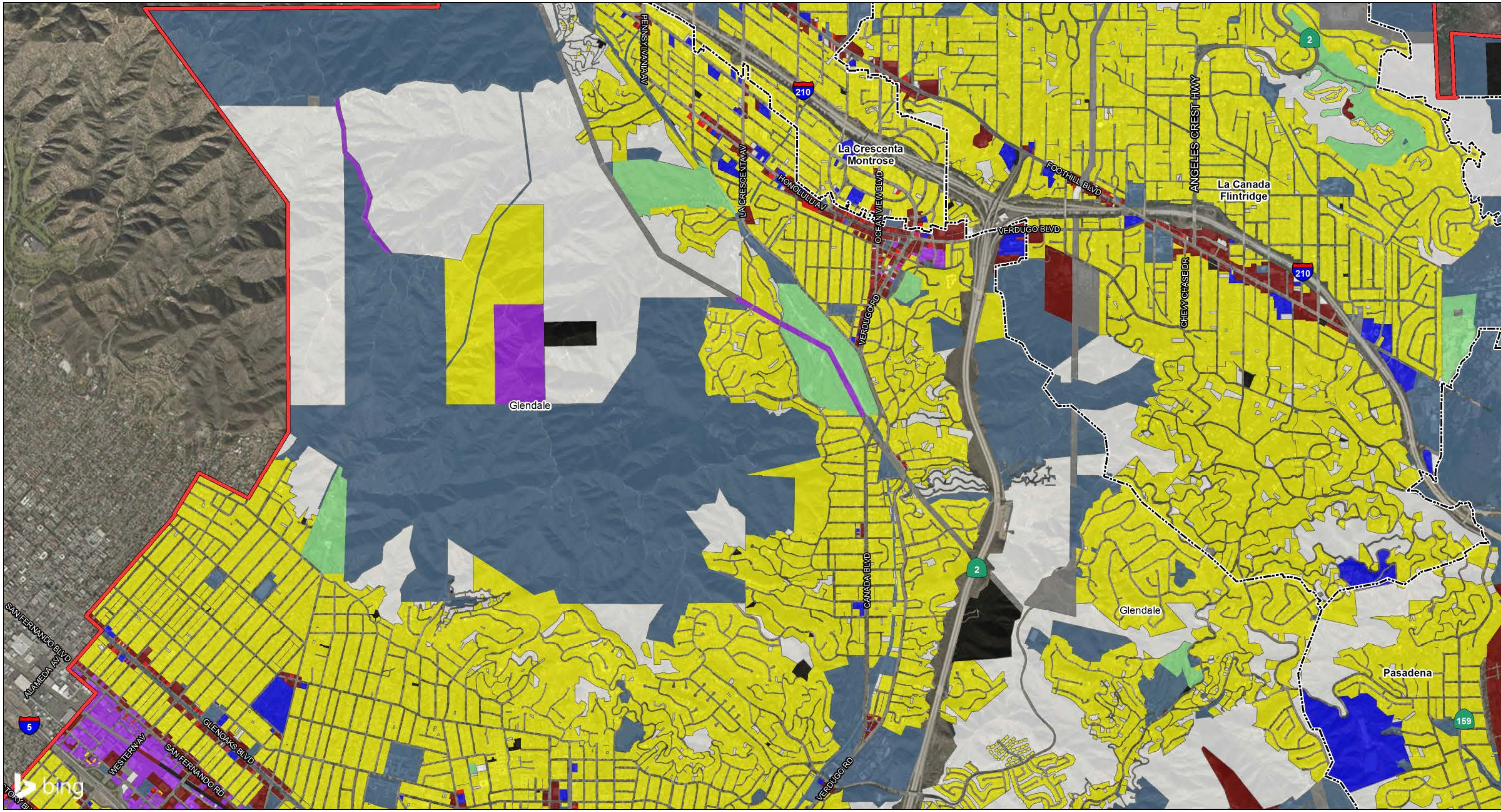

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

Existing Land Use
Residential
Commercial and Services
Mixed Commercial
Industrial
Institutional
Public
Transportation and Utilities
Agricultural
Mining and Extraction
Open Space and Recreation
Other
Vacant

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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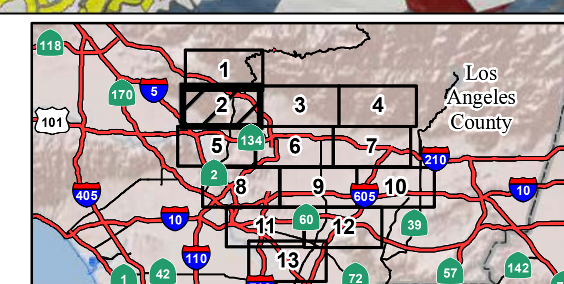

FIGURE 3.1-1

Sheet 2 of 13

SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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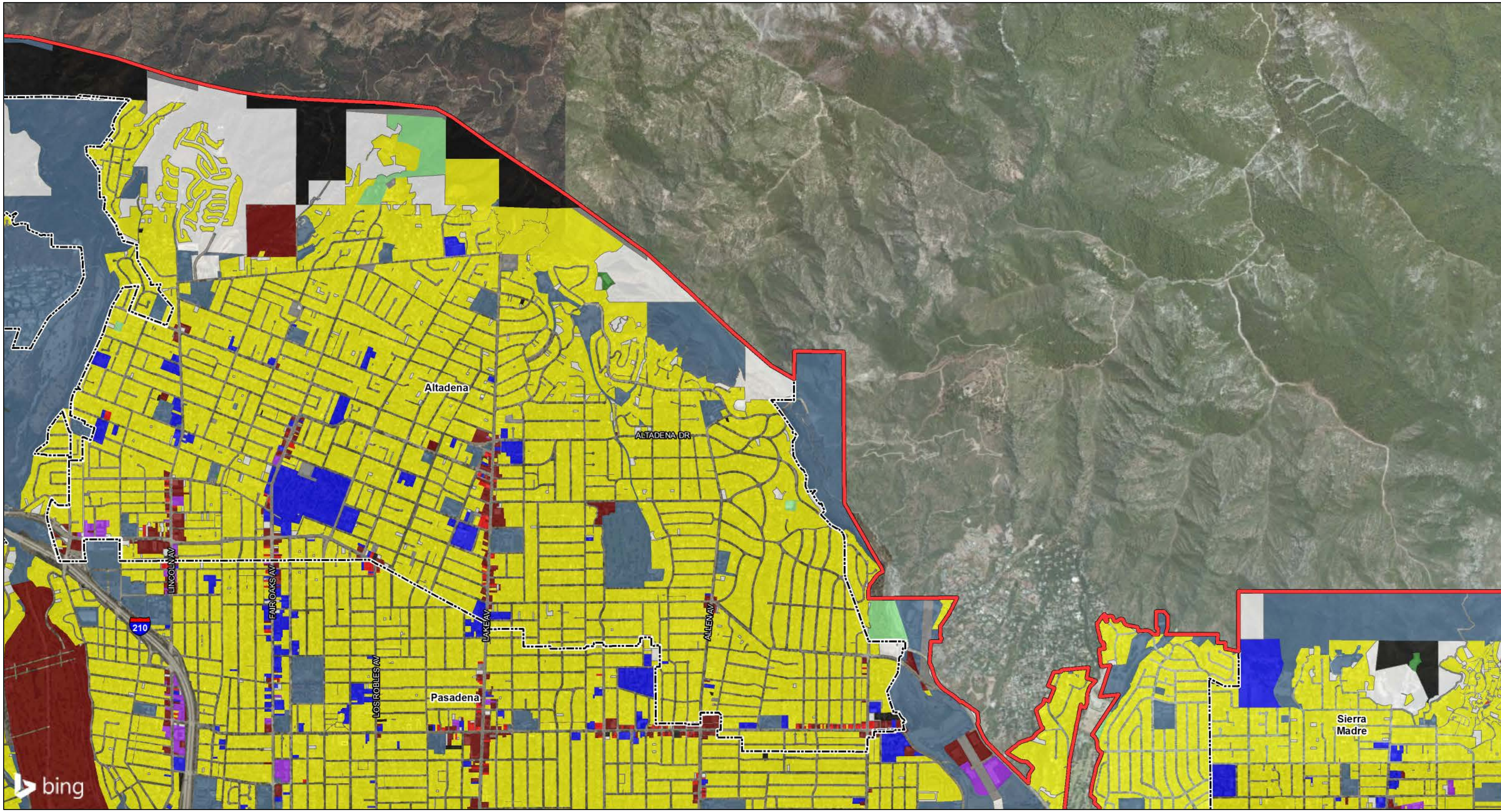

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

Existing Land Use
Residential
Commercial and Services
Mixed Commercial
Industrial
Institutional
Public
Transportation and Utilities
Agricultural
Mining and Extraction
Open Space and Recreation
Other
Vacant

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

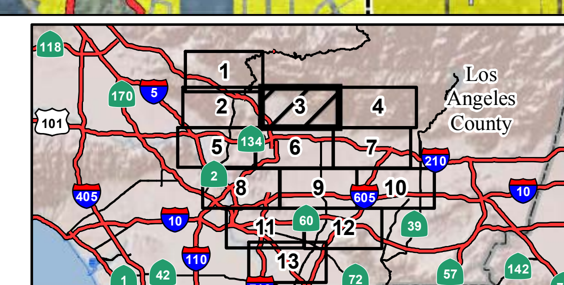

FIGURE 3.1-1

Sheet 3 of 13

SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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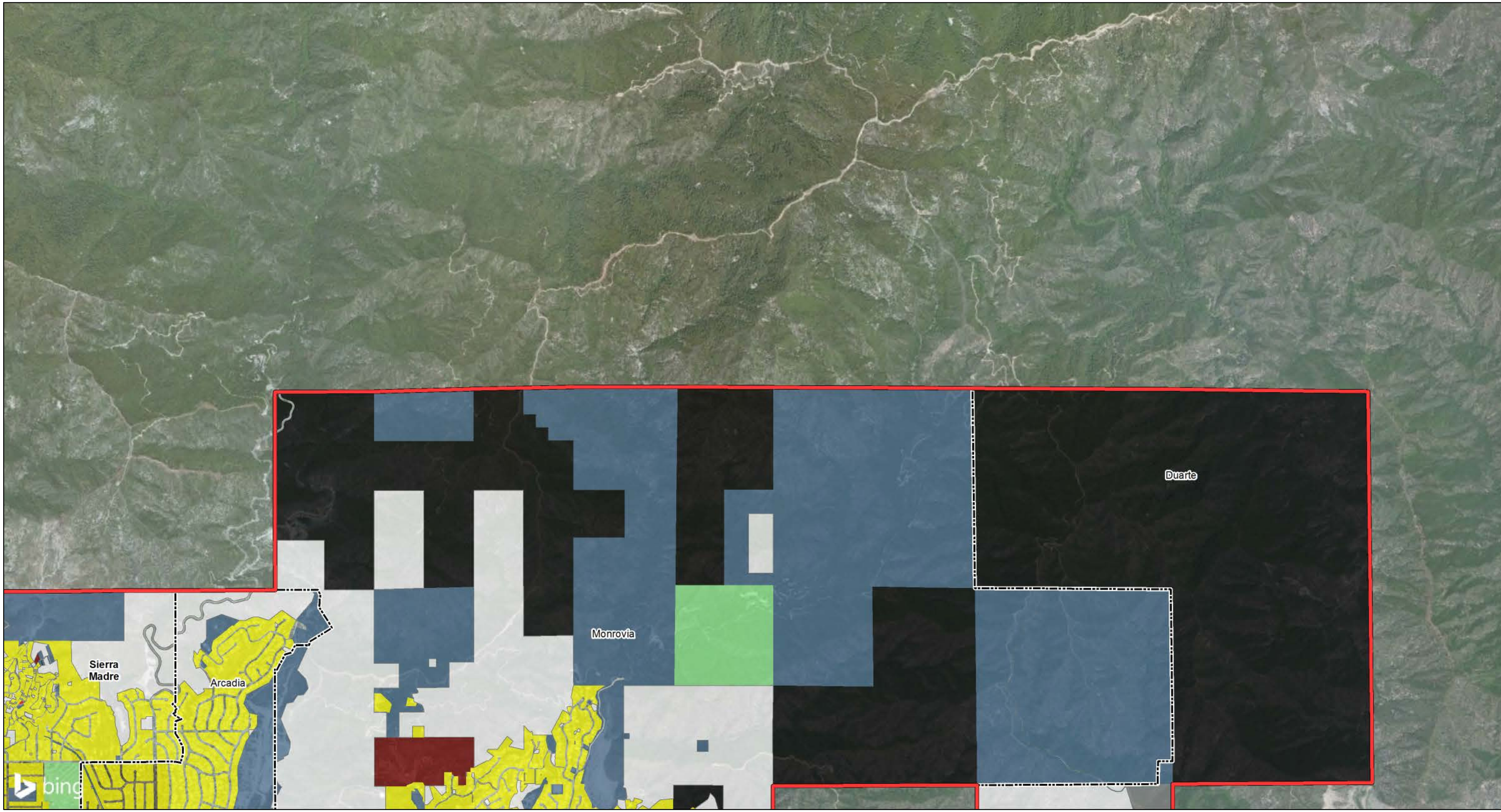

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

Existing Land Use
Residential
Commercial and Services
Mixed Commercial
Industrial
Institutional
Public
Transportation and Utilities
Agricultural
Mining and Extraction
Open Space and Recreation
Other
Vacant

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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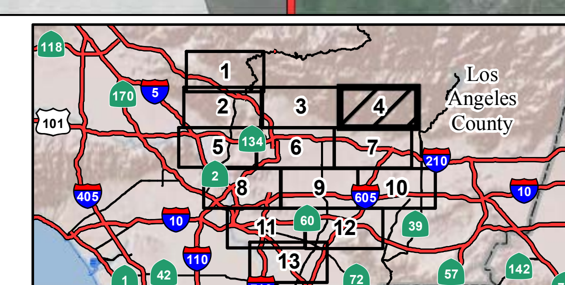

FIGURE 3.1-1

Sheet 4 of 13

SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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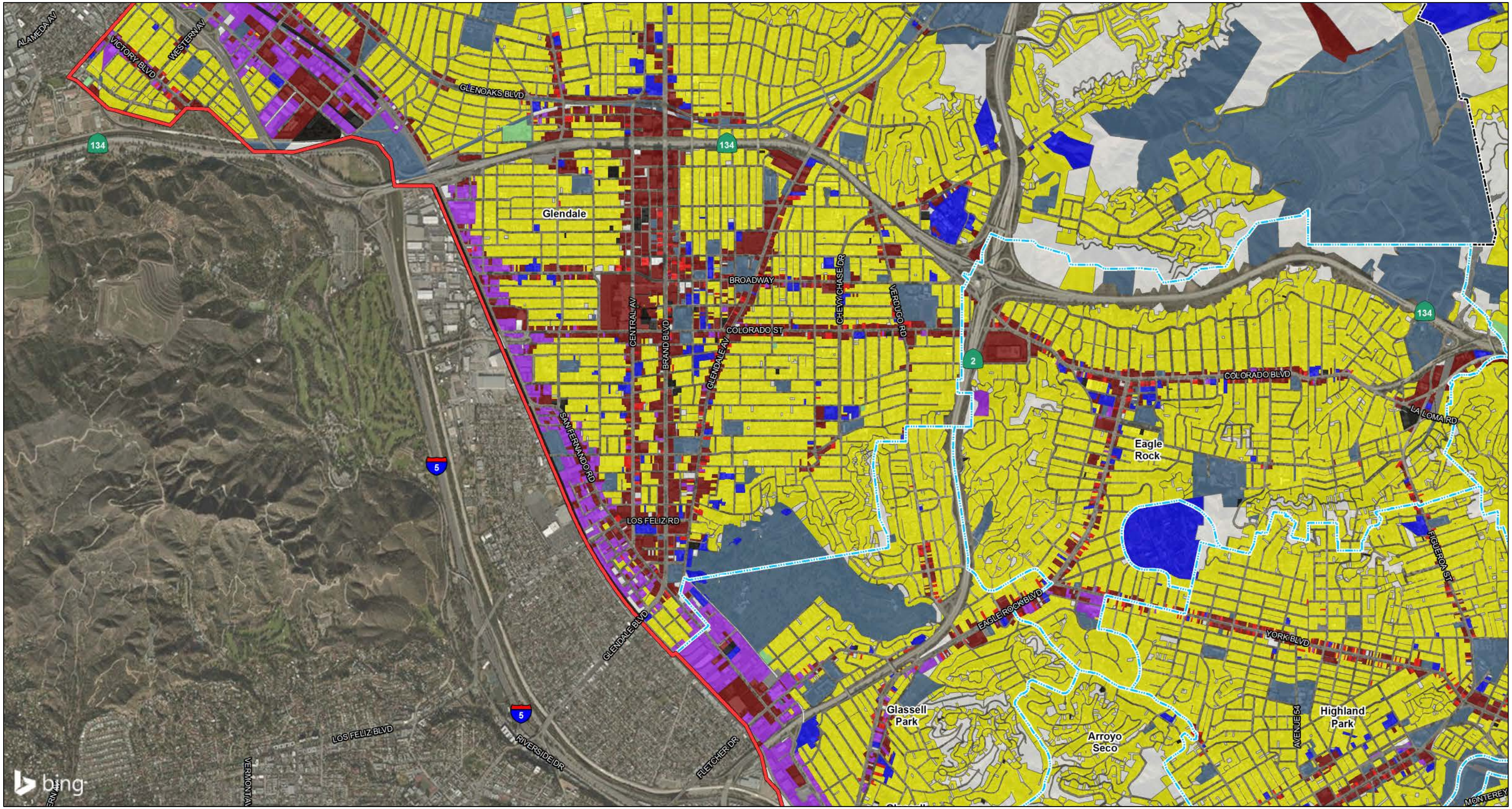

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

Existing Land Use
- Residential
- Commercial and Services
- Mixed Commercial
- Industrial
- Institutional
- Public
- Transportation and Utilities
- Agricultural
- Mining and Extraction
- Open Space and Recreation
- Other
- Vacant

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

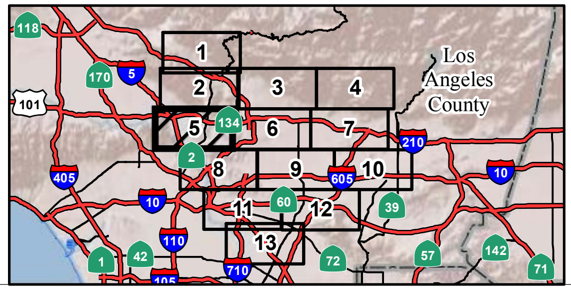

FIGURE 3.1-1

Sheet 5 of 13

SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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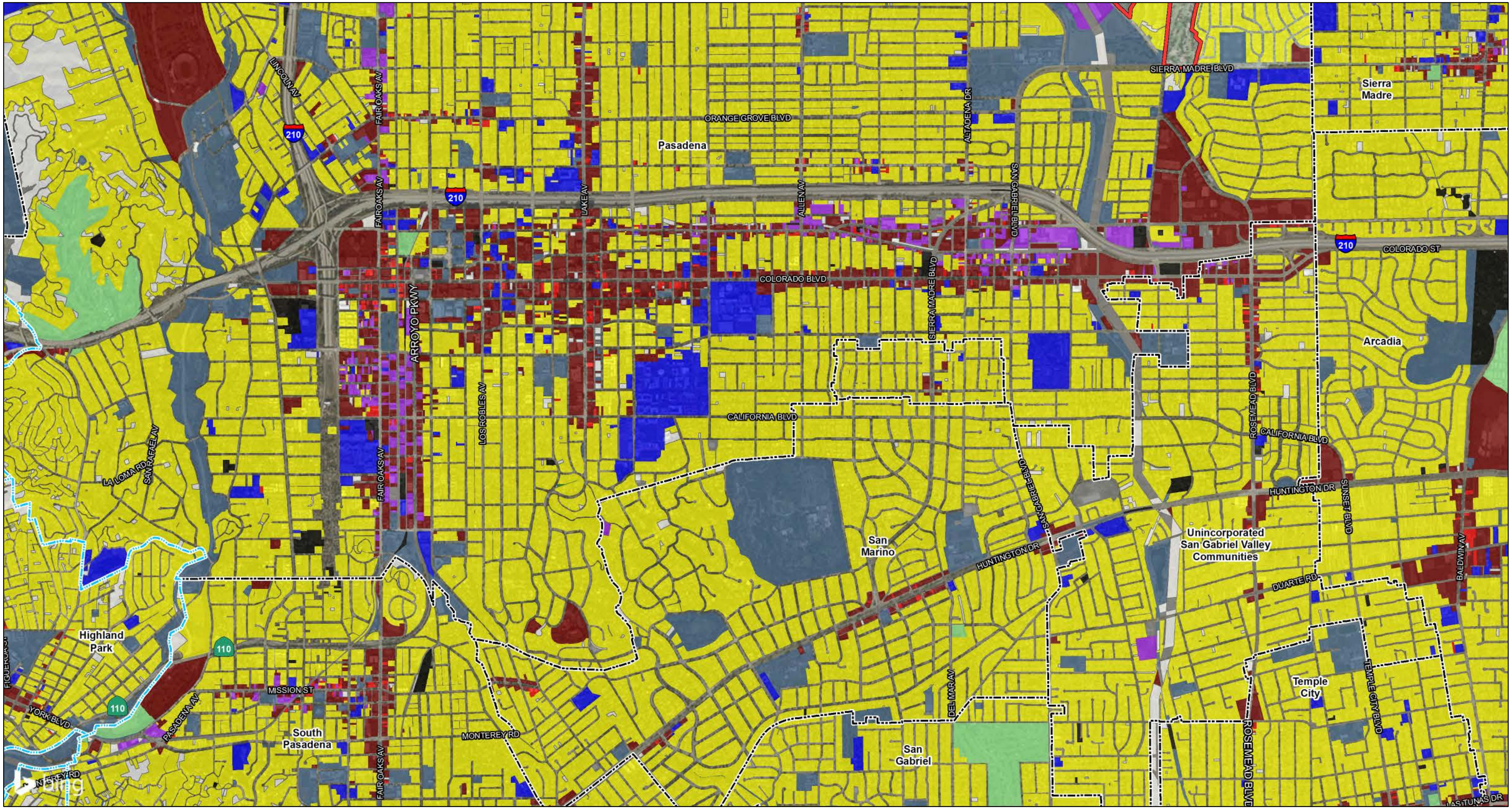

LEGEND

Cities/Unincorporated Communities

LA City Neighborhoods

Land Use Study Area

Existing Land Use

- Residential
- Commercial and Services
- Mixed Commercial
- Industrial
- Institutional
- Public
- Transportation and Utilities
- Agricultural
- Mining and Extraction
- Open Space and Recreation
- Other
- Vacant

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

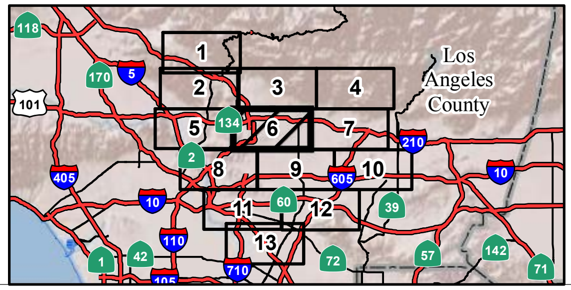

FIGURE 3.1-1

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SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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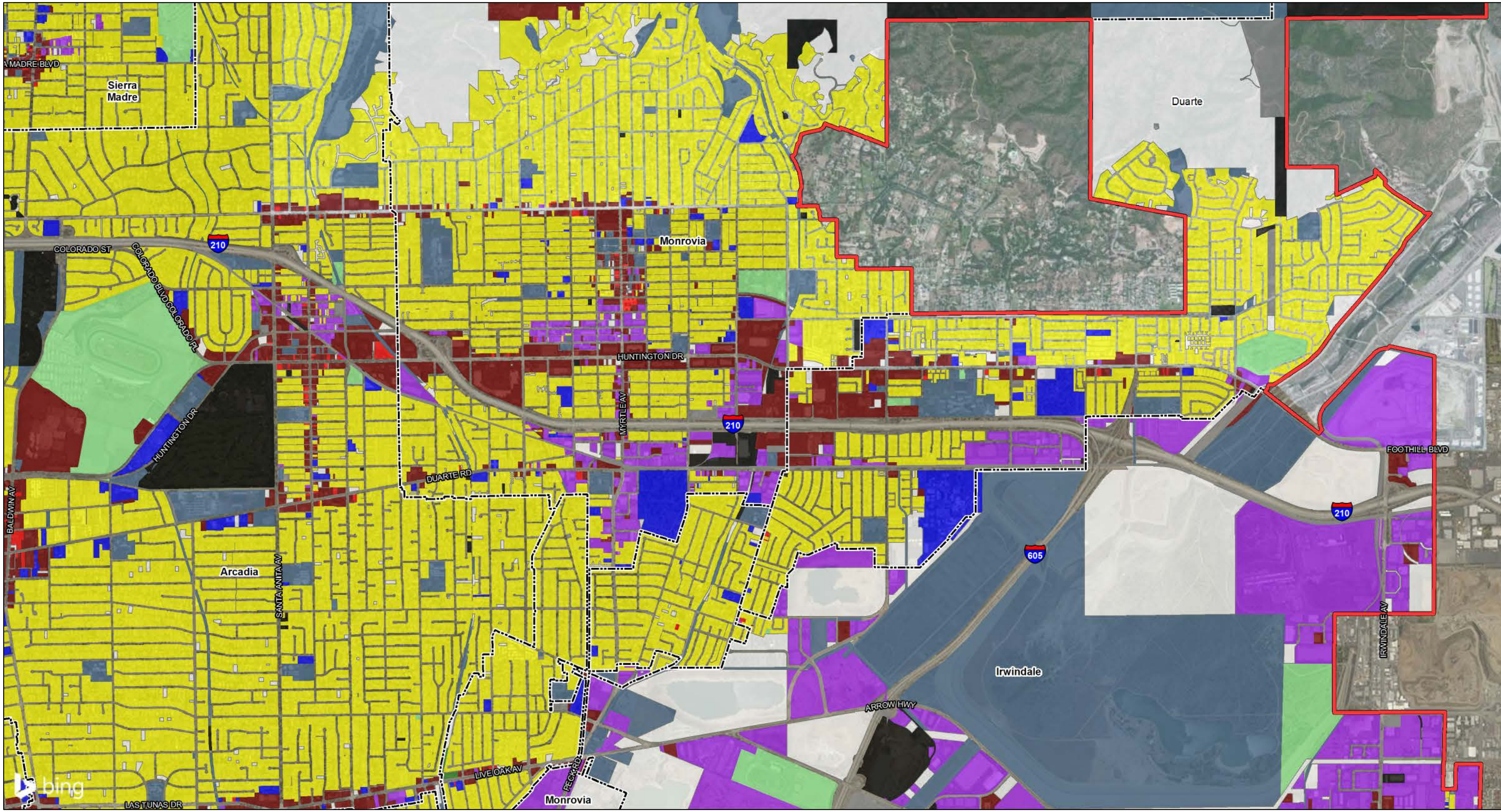

LEGEND

Cities/Unincorporated Communities	Existing Land Use	Institutional	Open Space and Recreation
LA City Neighborhoods	Residential	Public	Other
Land Use Study Area	Commercial and Services	Transportation and Utilities	Vacant
	Mixed Commercial	Agricultural	
	Industrial	Mining and Extraction	

N

0 1250 2500

FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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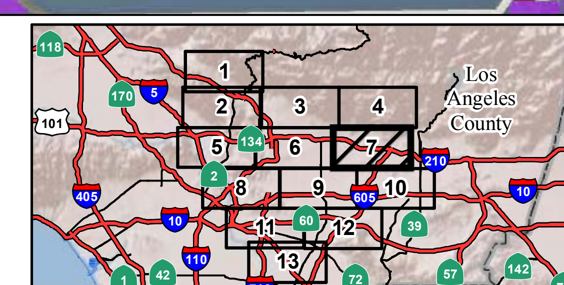

FIGURE 3.1-1

Sheet 7 of 13

SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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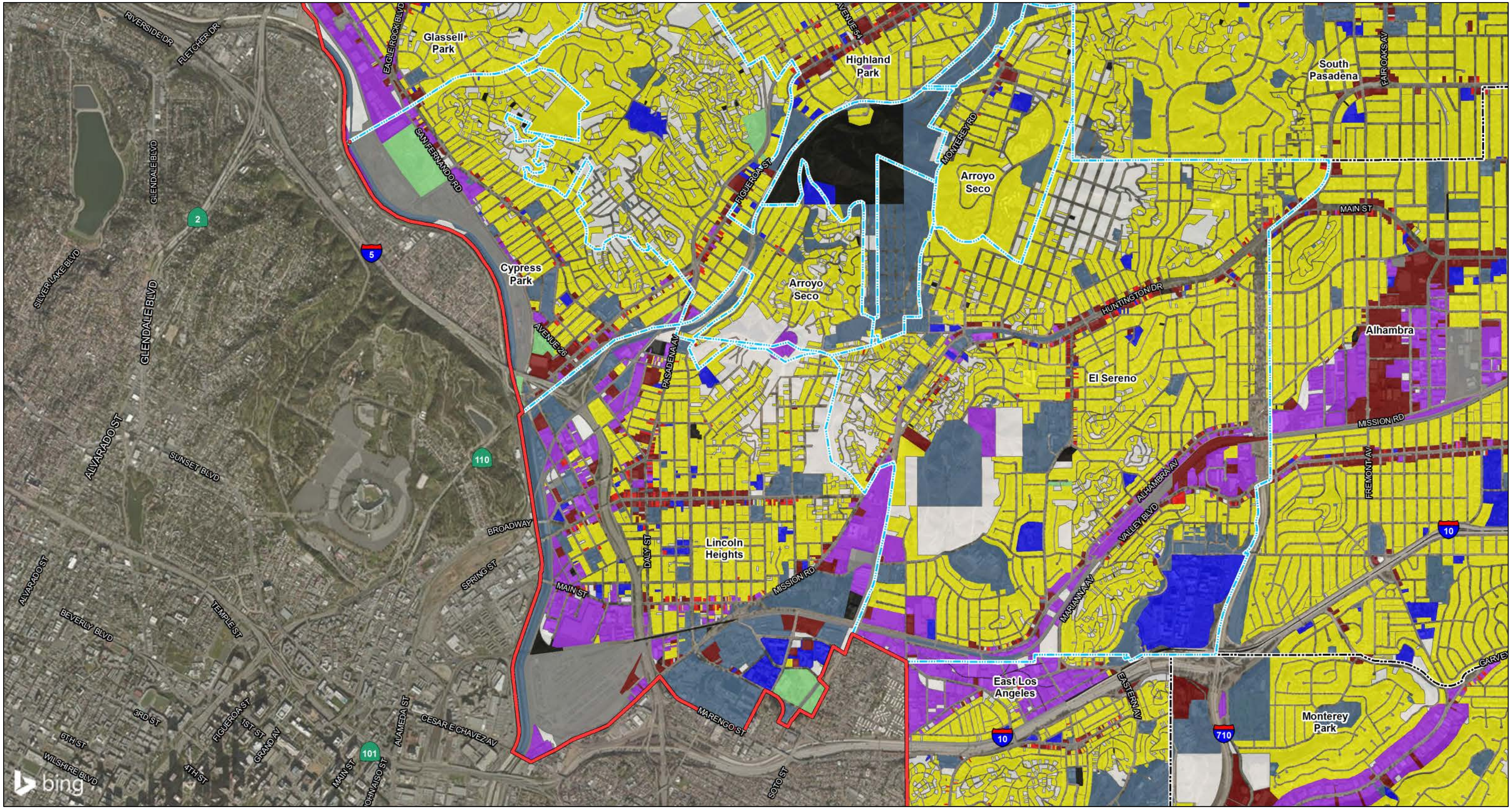

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

Existing Land Use
Residential
Commercial and Services
Mixed Commercial
Industrial
Institutional
Public
Transportation and Utilities
Agricultural
Mining and Extraction
Open Space and Recreation
Other
Vacant

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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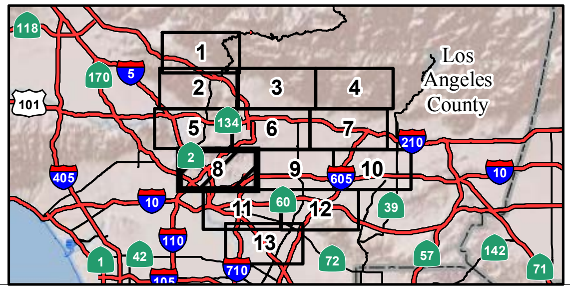

FIGURE 3.1-1

Sheet 8 of 13

SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)

EA 187900

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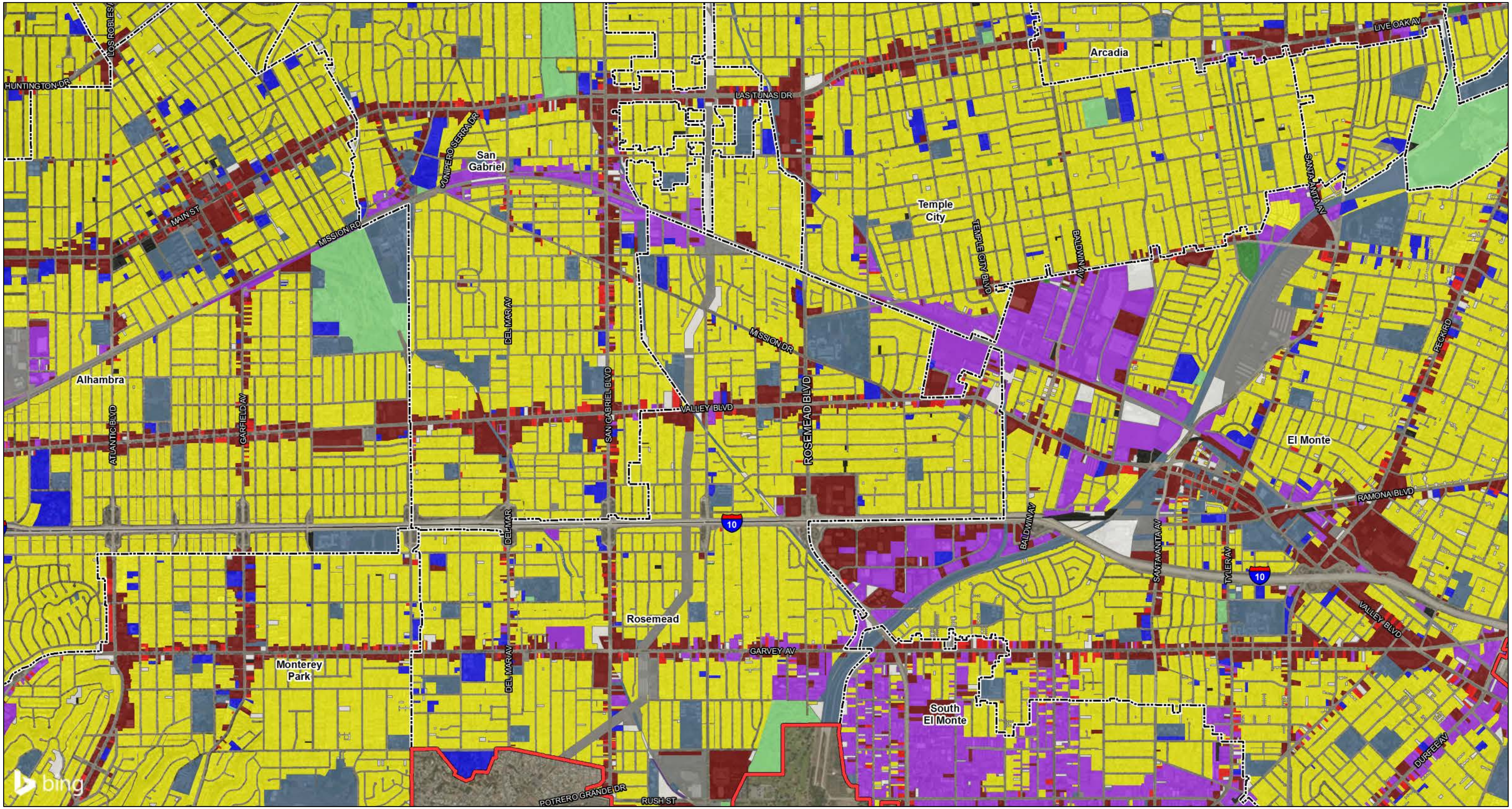

LEGEND

Cities/Unincorporated Communities

LA City Neighborhoods

Land Use Study Area

Existing Land Use

- Residential
- Commercial and Services
- Mixed Commercial
- Industrial
- Institutional
- Public
- Transportation and Utilities
- Agricultural
- Mining and Extraction
- Open Space and Recreation
- Other
- Vacant

N

0 1250 2500

FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

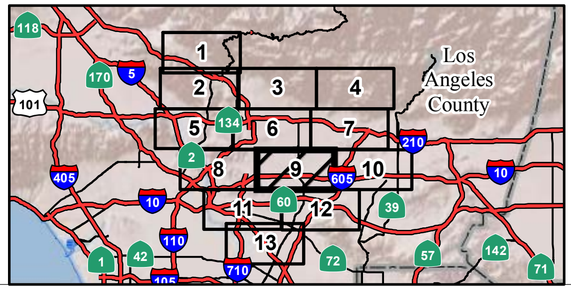

FIGURE 3.1-1

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SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)

EA 187900

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LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

Existing Land Use
Residential
Commercial and Services
Mixed Commercial
Industrial
Institutional
Public
Transportation and Utilities
Agricultural
Mining and Extraction
Open Space and Recreation
Other
Vacant

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

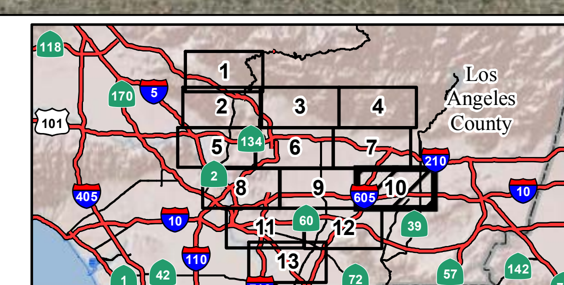

FIGURE 3.1-1

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SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
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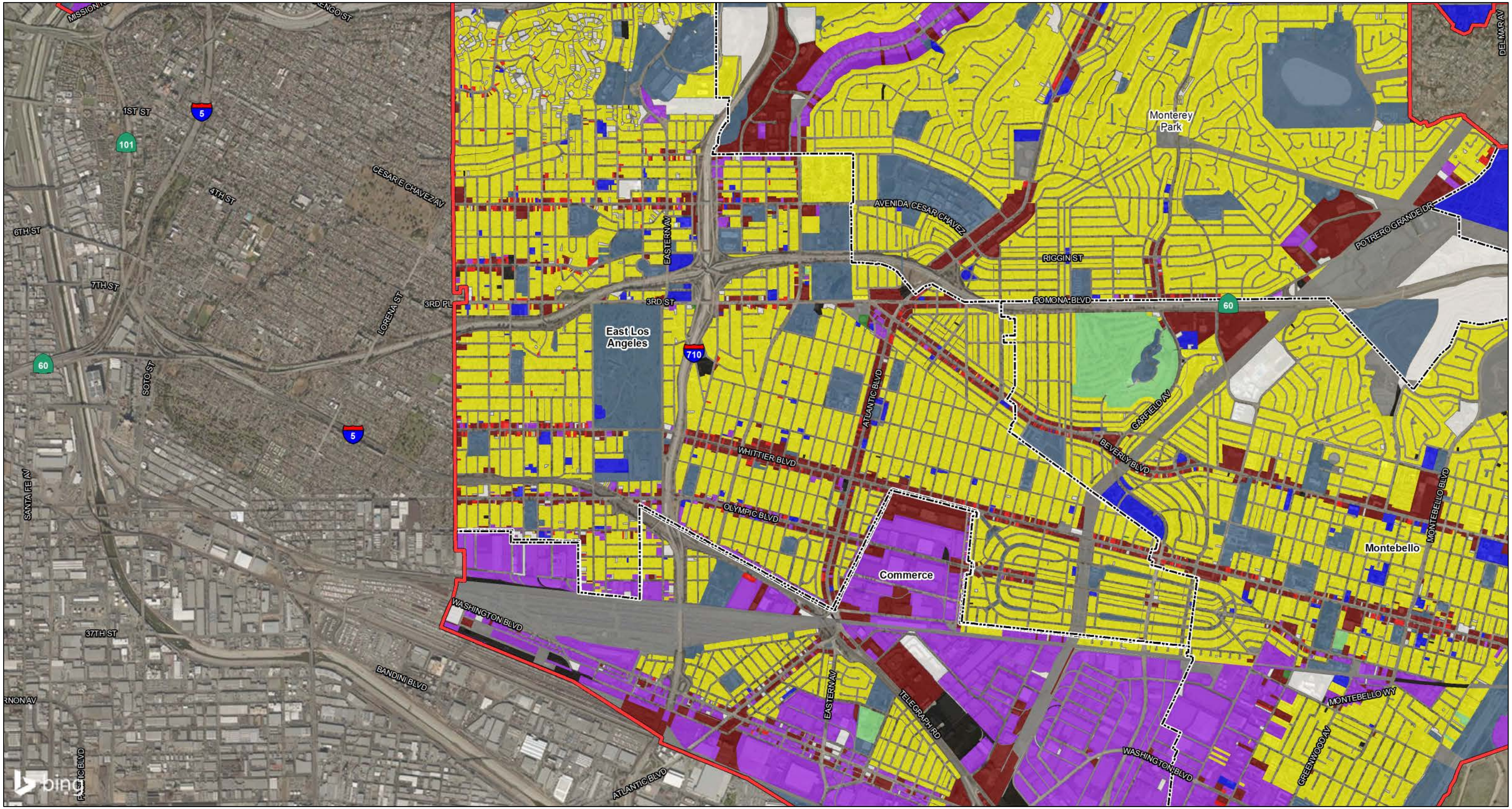

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

Existing Land Use
- Residential
- Commercial and Services
- Mixed Commercial
- Industrial
- Institutional
- Public
- Transportation and Utilities
- Agricultural
- Mining and Extraction
- Open Space and Recreation
- Other
- Vacant

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

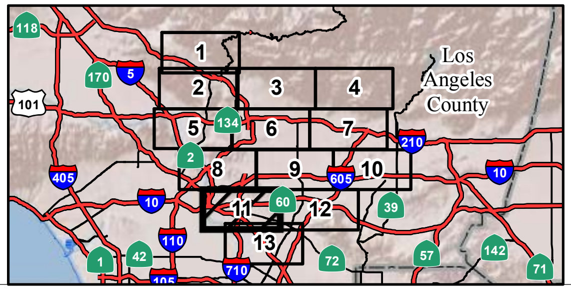

FIGURE 3.1-1

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SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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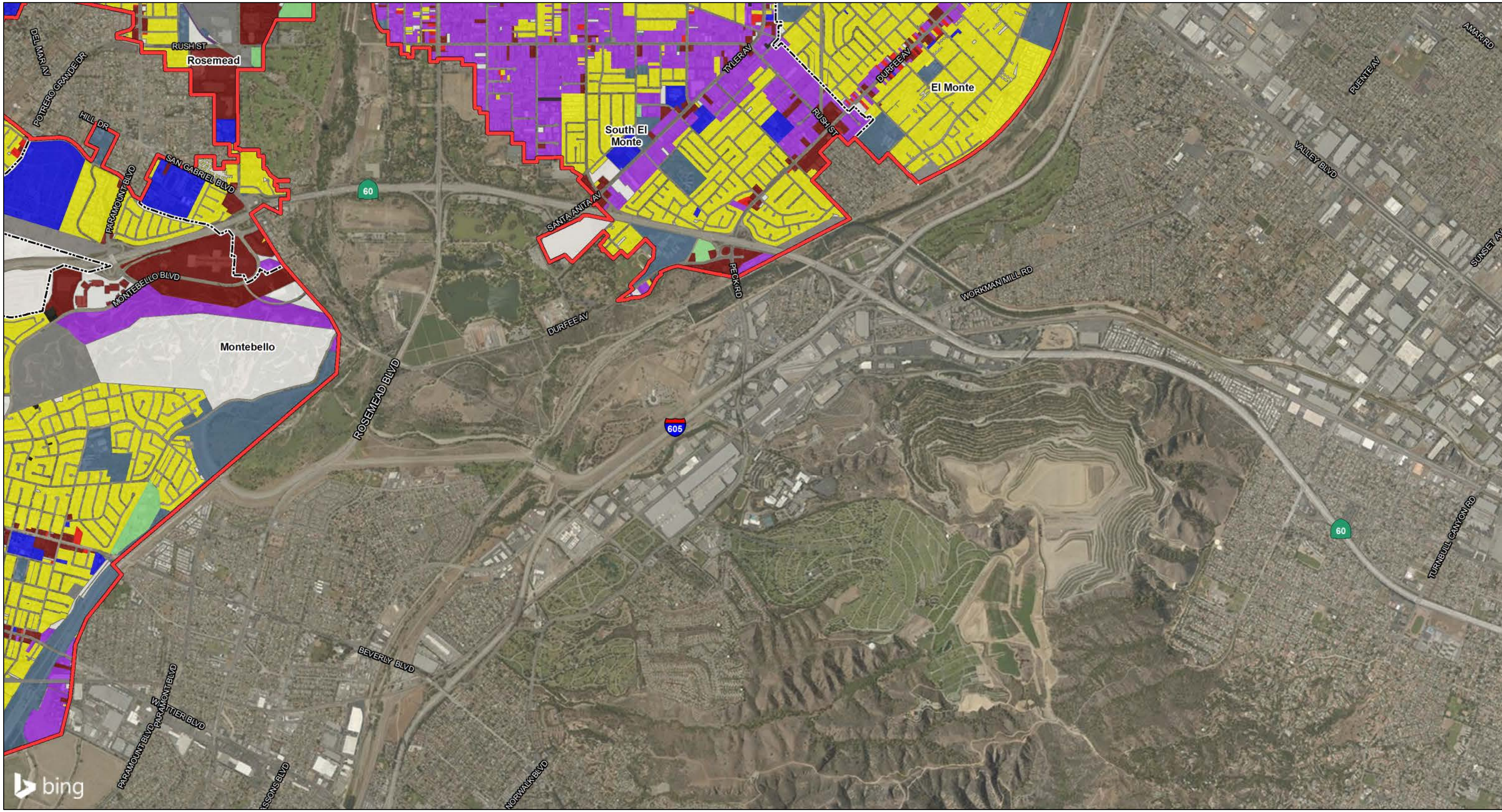

LEGEND

- Cities/Unincorporated Communities
- LA City Neighborhoods
- Land Use Study Area

Existing Land Use

- Residential
- Commercial and Services
- Mixed Commercial
- Industrial
- Institutional
- Public
- Transportation and Utilities
- Agricultural
- Mining and Extraction
- Open Space and Recreation
- Other
- Vacant

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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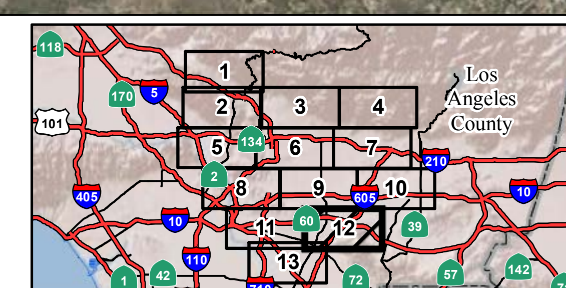

FIGURE 3.1-1

Sheet 12 of 13

SR 710 North Project

Existing Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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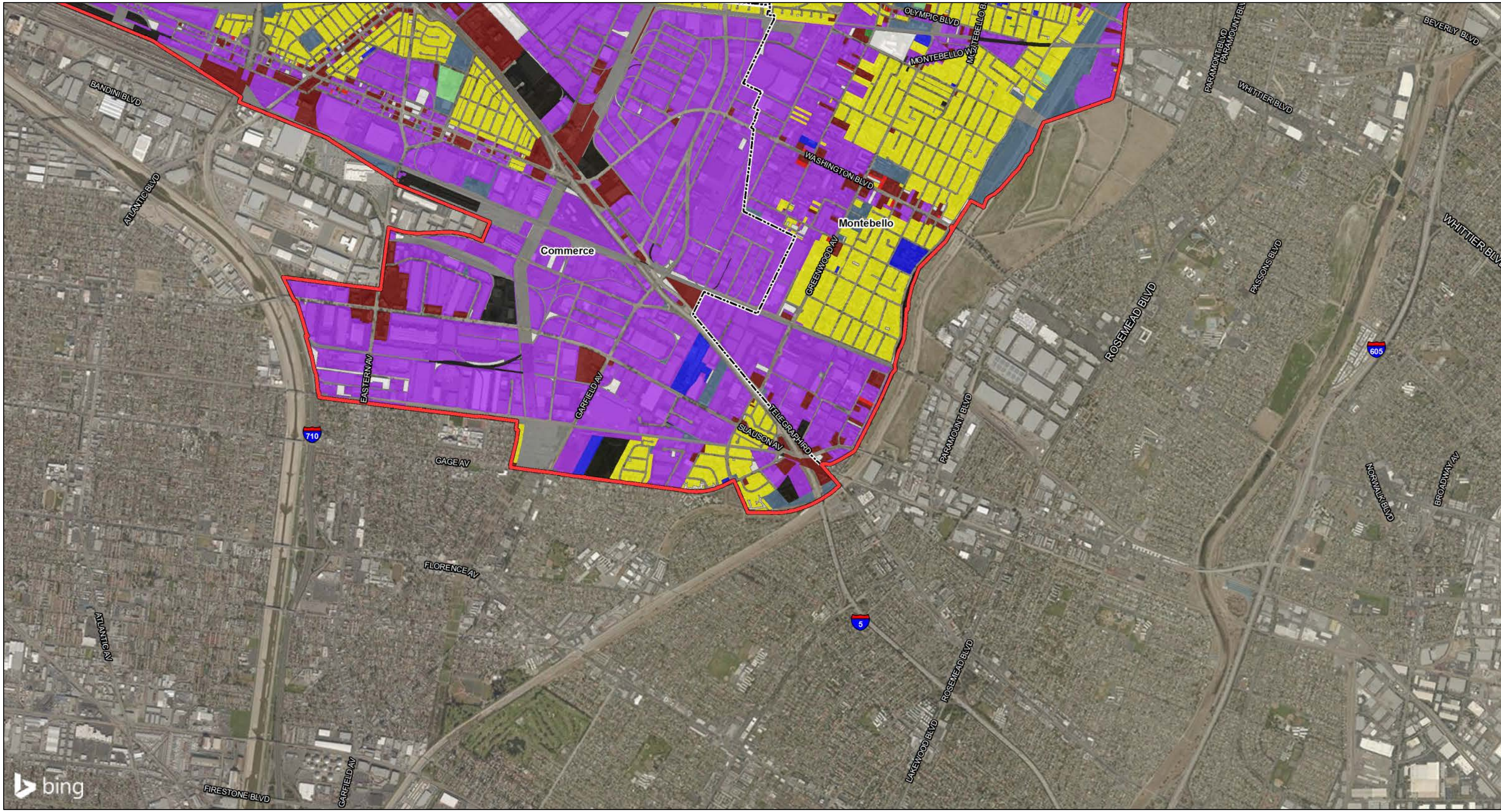

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

Existing Land Use
Residential
Commercial and Services
Mixed Commercial
Industrial
Institutional
Public
Transportation and Utilities
Agricultural
Mining and Extraction
Open Space and Recreation
Other
Vacant

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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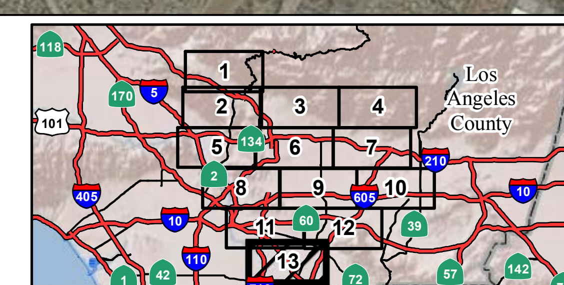

FIGURE 3.1-1
Sheet 13 of 13

SR 710 North Project
Existing Land Uses
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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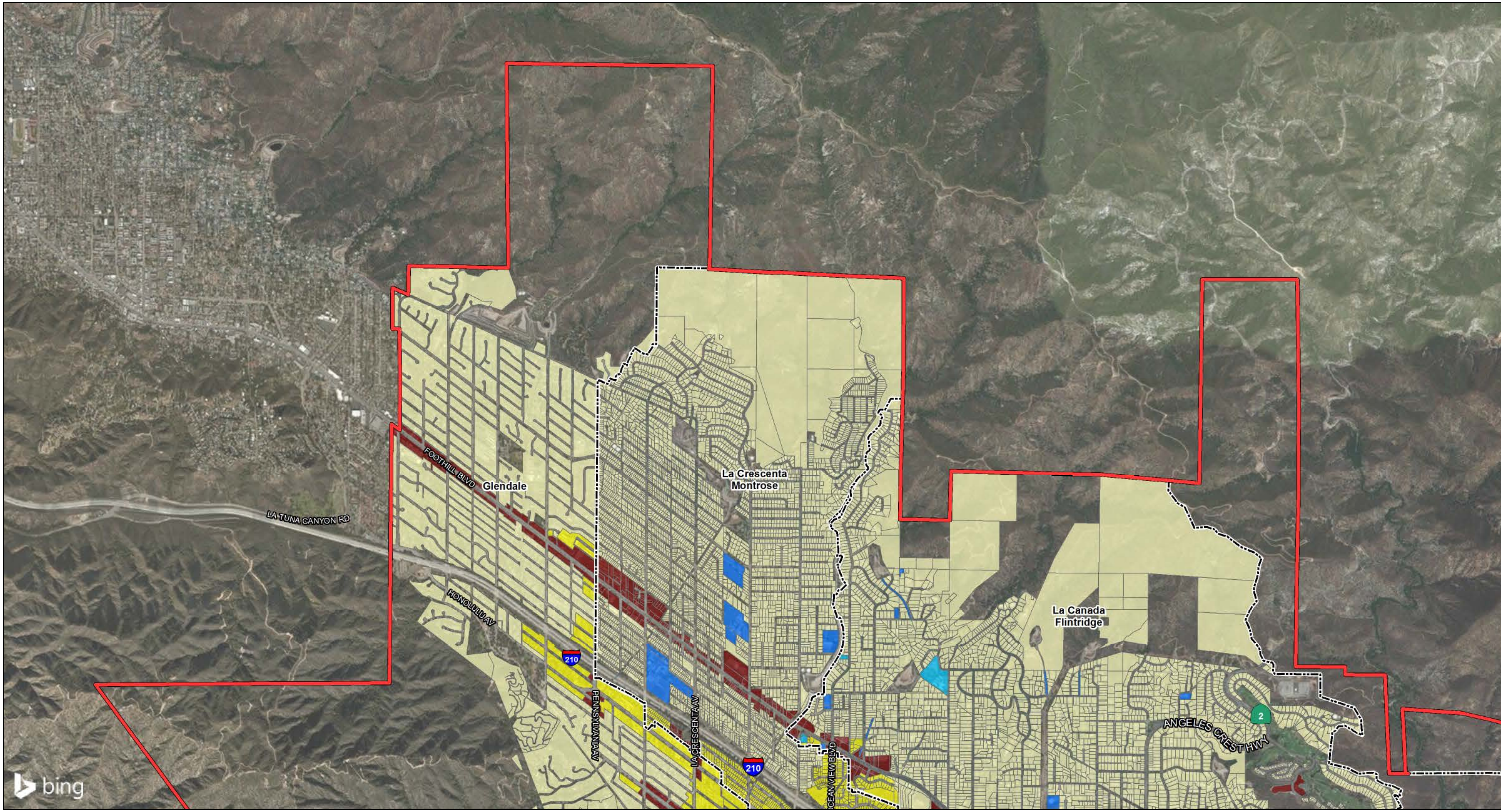

LEGEND

- Cities/Unincorporated Communities
- LA City Neighborhoods
- Land Use Study Area

General Plan Land Use

- Single Family Residential
- Multi-Family Residential
- Commercial/Office
- Mixed Commercial and Industrial
- Industrial
- Educational Institutions
- Public Facilities
- Mixed Urban
- Local Parks, Open Space, and Recreation
- Cemeteries
- Transportation

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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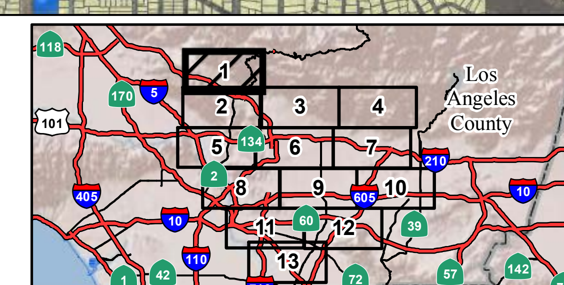

FIGURE 3.1-2

Sheet 1 of 13

SR 710 North Project

General Plan Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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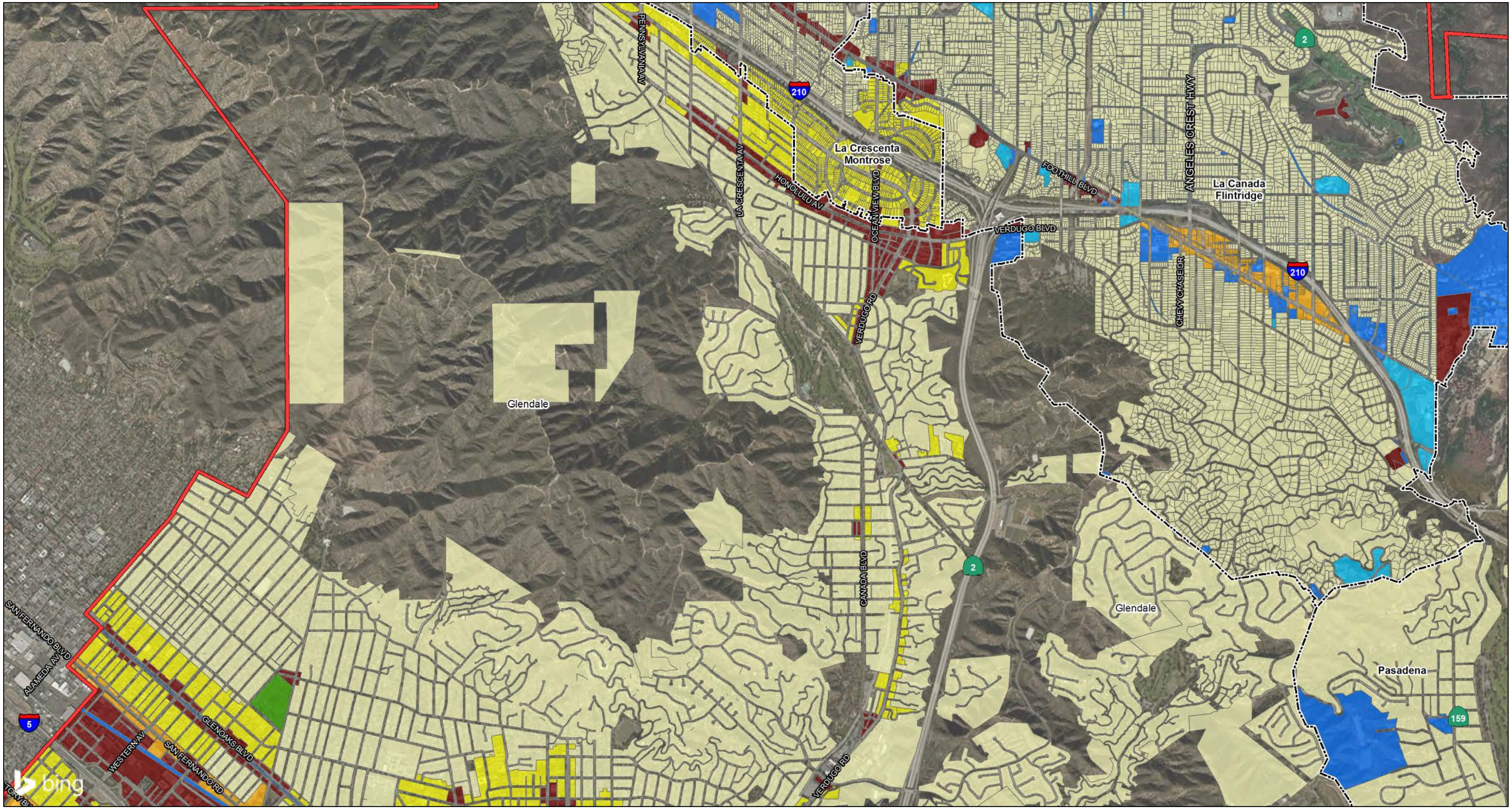

LEGEND

Cities/Unincorporated Communities	General Plan Land Use	Mixed Commercial and Industrial	Mixed Urban
LA City Neighborhoods	Single Family Residential	Industrial	Local Parks, Open Space, and Recreation
Land Use Study Area	Multi-Family Residential	Educational Institutions	Cemeteries
	Commercial/Office	Public Facilities	Transportation

N

0 1250 2500
FEET

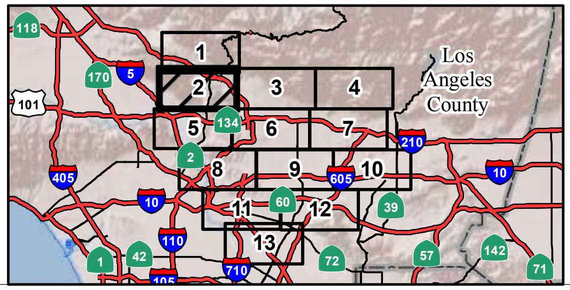

FIGURE 3.1-2

Sheet 2 of 13

SR 710 North Project

General Plan Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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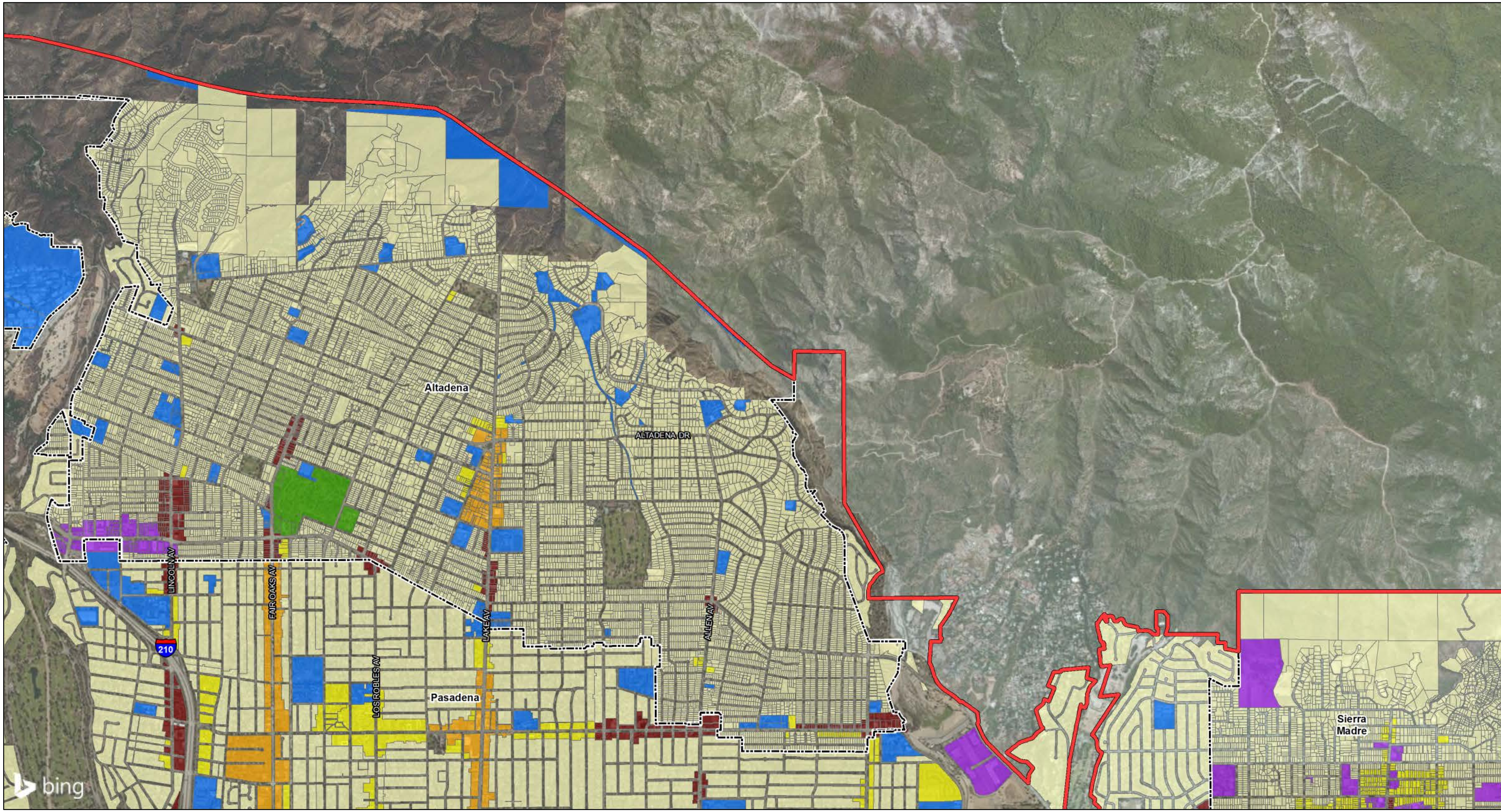

LEGEND

- Cities/Unincorporated Communities
- LA City Neighborhoods
- Land Use Study Area

General Plan Land Use

- Single Family Residential
- Multi-Family Residential
- Commercial/Office
- Mixed Commercial and Industrial
- Industrial
- Educational Institutions
- Public Facilities
- Mixed Urban
- Local Parks, Open Space, and Recreation
- Cemeteries
- Transportation

N

0 1250 2500

FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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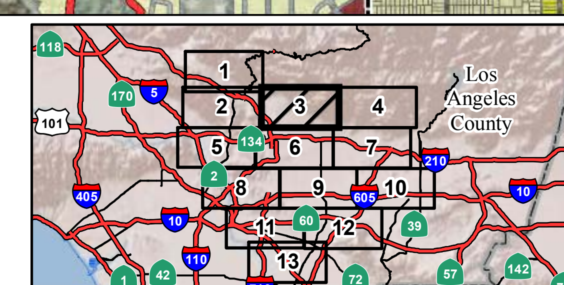

FIGURE 3.1-2

Sheet 3 of 13

SR 710 North Project

General Plan Land Uses

07-LA-710 (SR 710)
EA 187900
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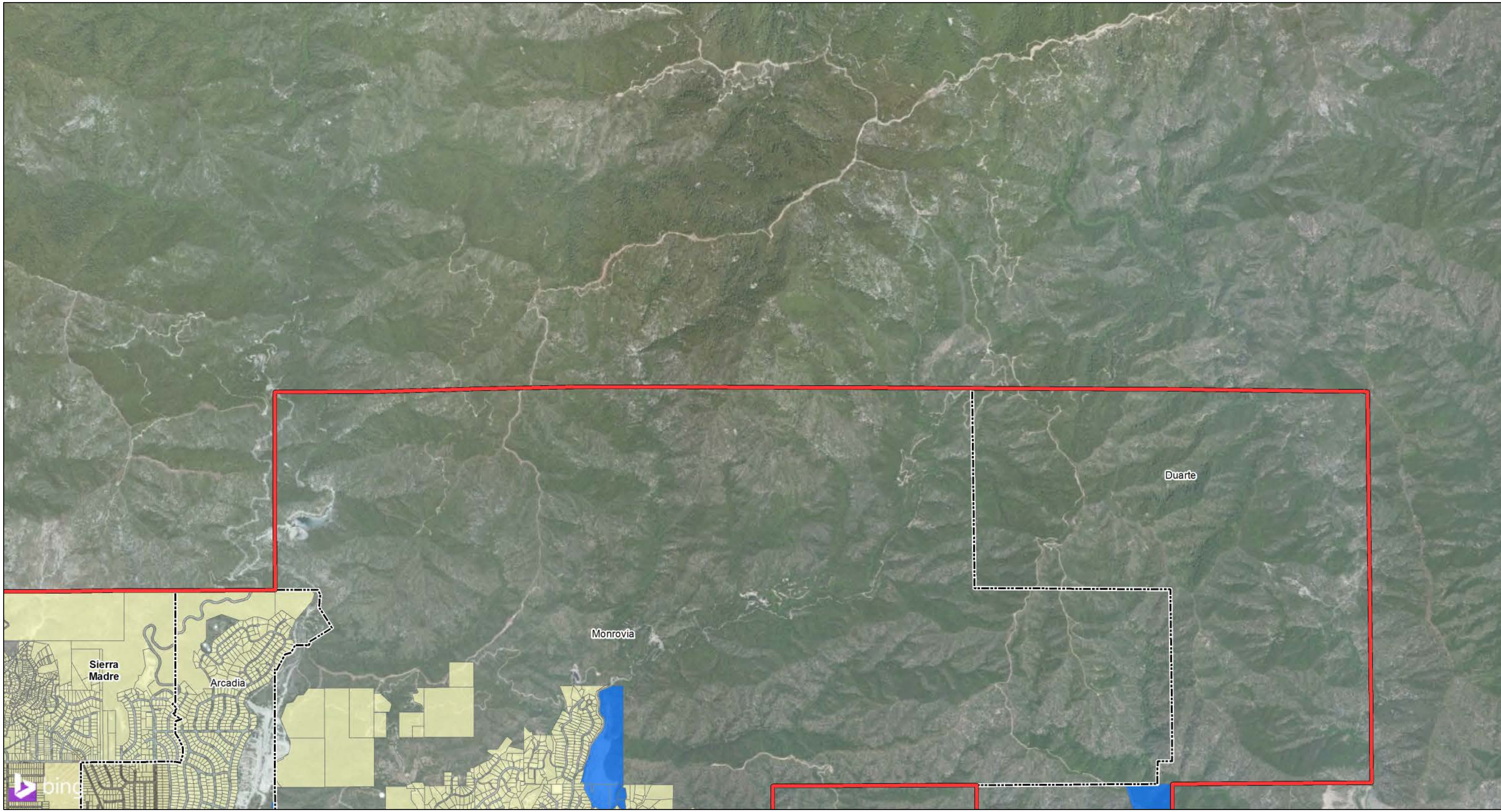

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

General Plan Land Use
Single Family Residential
Multi-Family Residential
Commercial/Office
Mixed Commercial and Industrial
Industrial
Educational Institutions
Public Facilities
Mixed Urban
Local Parks, Open Space, and Recreation
Cemeteries
Transportation

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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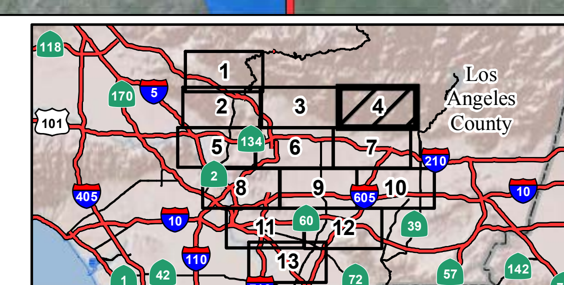

FIGURE 3.1-2

Sheet 4 of 13

SR 710 North Project
General Plan Land Uses
07-LA-710 (SR 710)
EA 187900
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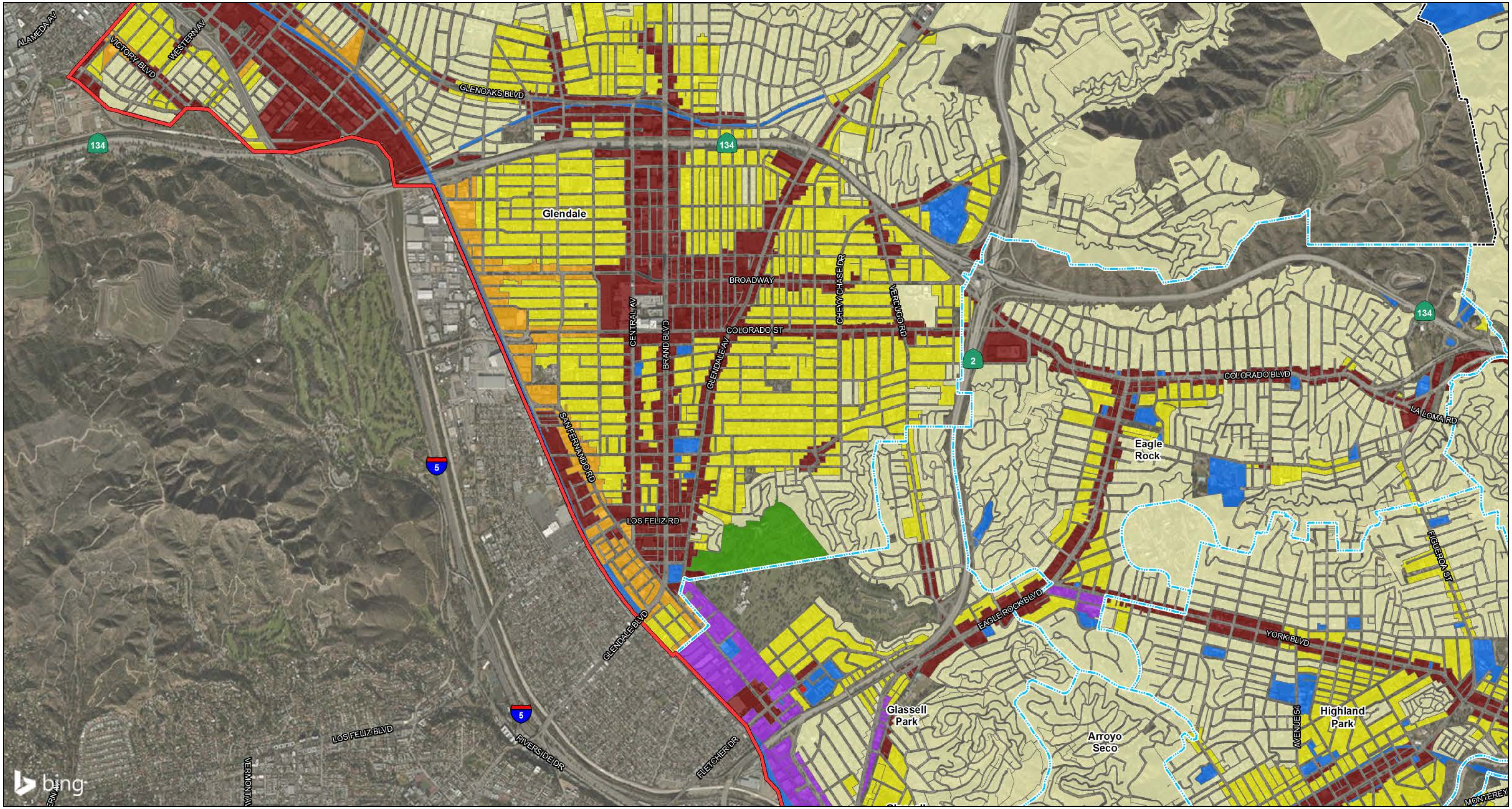

LEGEND

- Cities/Unincorporated Communities
- LA City Neighborhoods
- Land Use Study Area

General Plan Land Use

- Single Family Residential
- Multi-Family Residential
- Commercial/Office
- Mixed Commercial and Industrial
- Industrial
- Educational Institutions
- Public Facilities
- Mixed Urban
- Local Parks, Open Space, and Recreation
- Cemeteries
- Transportation

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

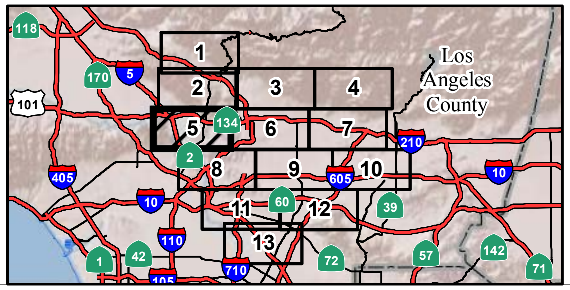

FIGURE 3.1-2
Sheet 5 of 13

SR 710 North Project
General Plan Land Uses
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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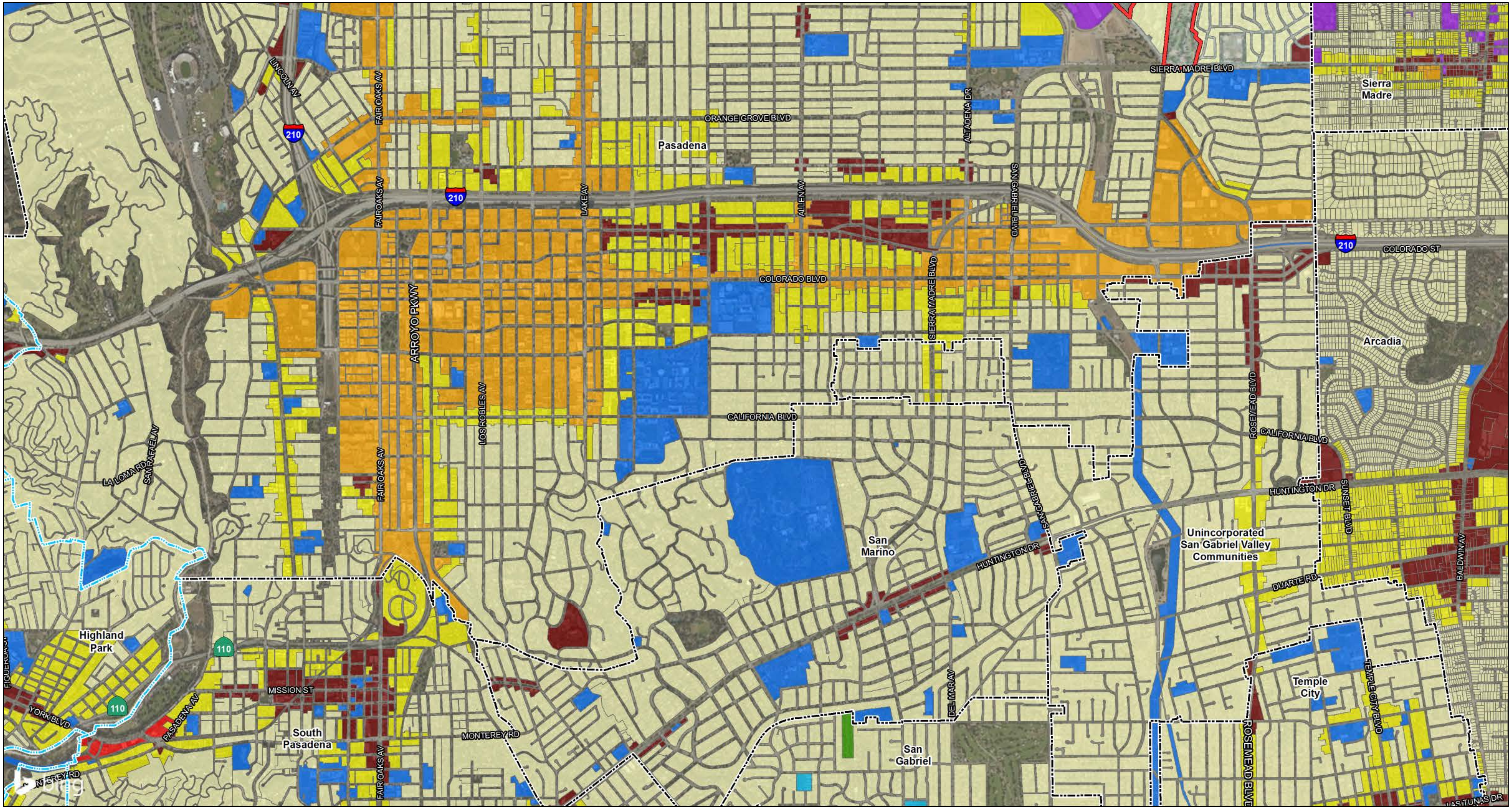

LEGEND

Cities/Unincorporated Communities

LA City Neighborhoods

Land Use Study Area

General Plan Land Use

Single Family Residential

Multi-Family Residential

Commercial/Office

Mixed Commercial and Industrial

Industrial

Educational Institutions

Public Facilities

Mixed Urban

Local Parks, Open Space, and Recreation

Cemeteries

Transportation

N

0 1250 2500

FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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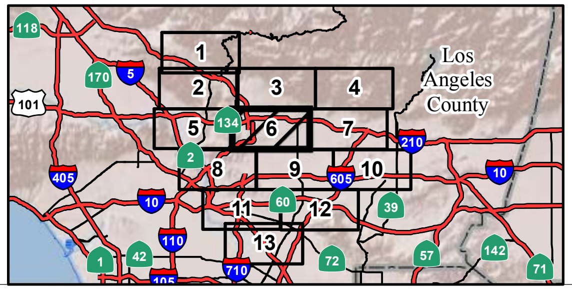

FIGURE 3.1-2

Sheet 6 of 13

SR 710 North Project

General Plan Land Uses

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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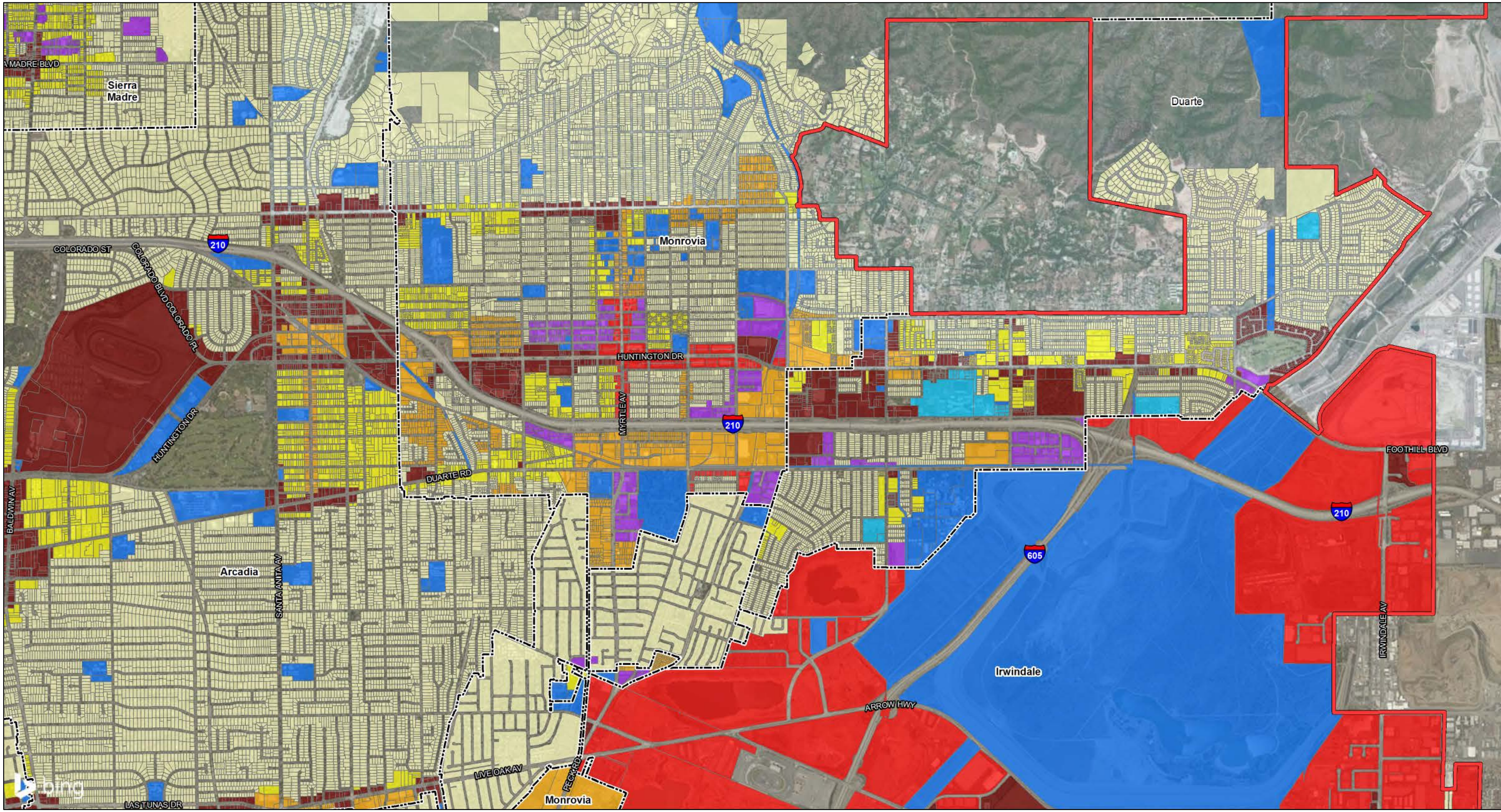

LEGEND

- Cities/Unincorporated Communities
- LA City Neighborhoods
- Land Use Study Area

General Plan Land Use

- Single Family Residential
- Multi-Family Residential
- Commercial/Office
- Mixed Commercial and Industrial
- Industrial
- Educational Institutions
- Public Facilities
- Mixed Urban
- Local Parks, Open Space, and Recreation
- Cemeteries
- Transportation

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

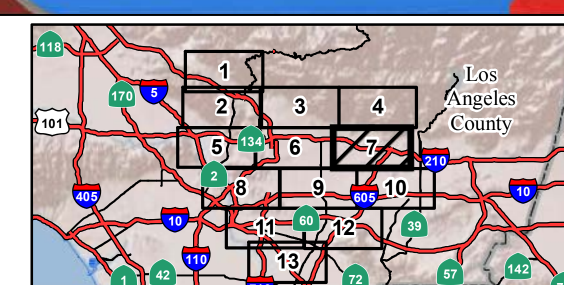

FIGURE 3.1-2

Sheet 7 of 13

SR 710 North Project

General Plan Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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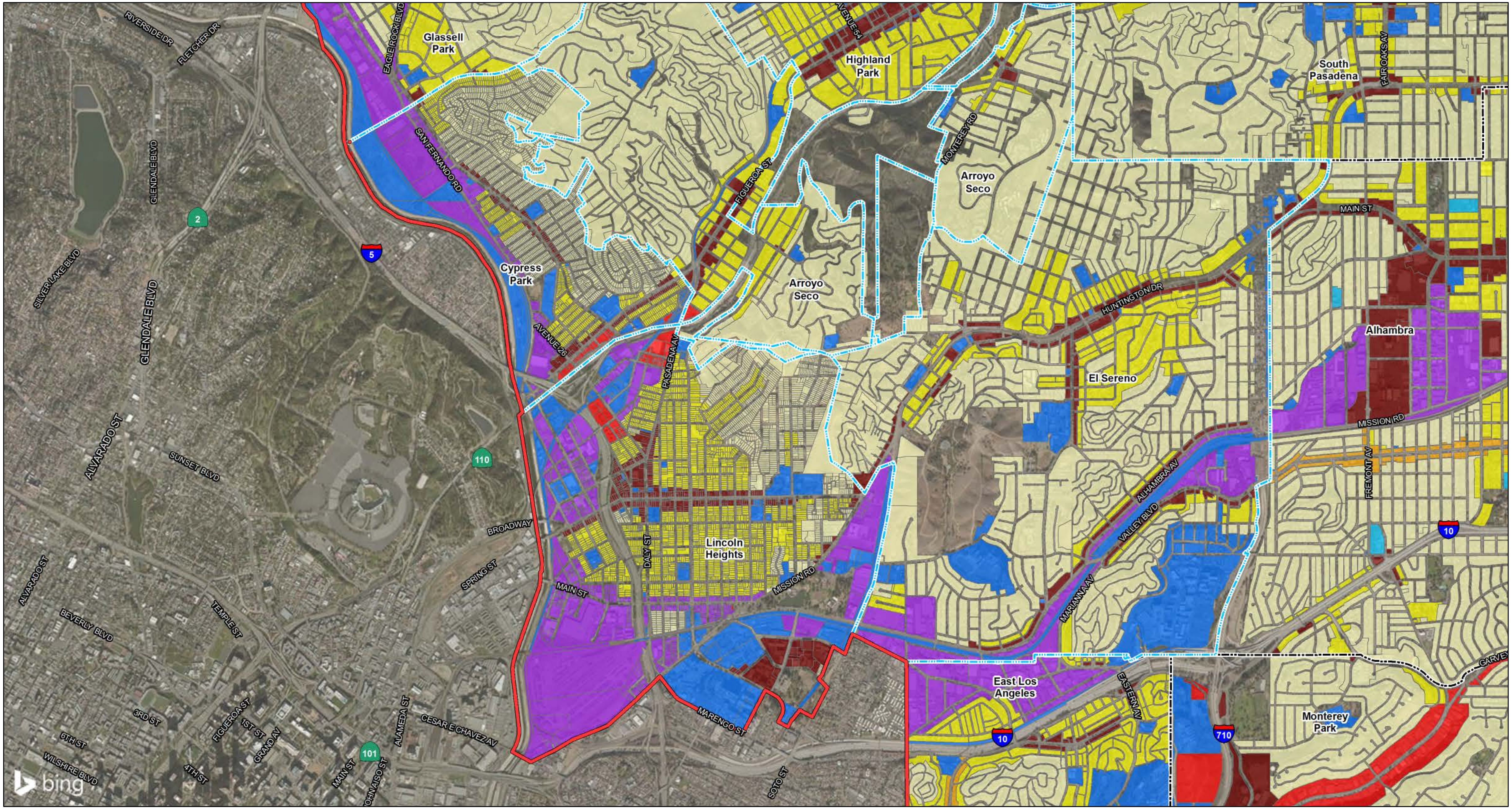

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

General Plan Land Use
Single Family Residential
Multi-Family Residential
Commercial/Office
Mixed Commercial and Industrial
Industrial
Educational Institutions
Public Facilities
Mixed Urban
Local Parks, Open Space, and Recreation
Cemeteries
Transportation

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

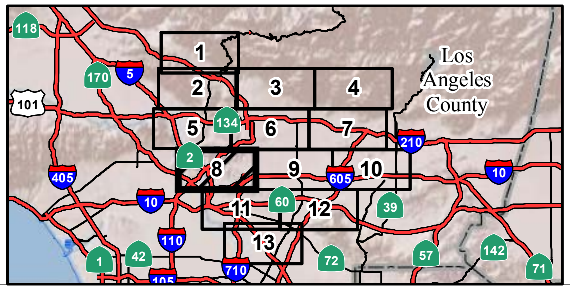

FIGURE 3.1-2

Sheet 8 of 13

SR 710 North Project

General Plan Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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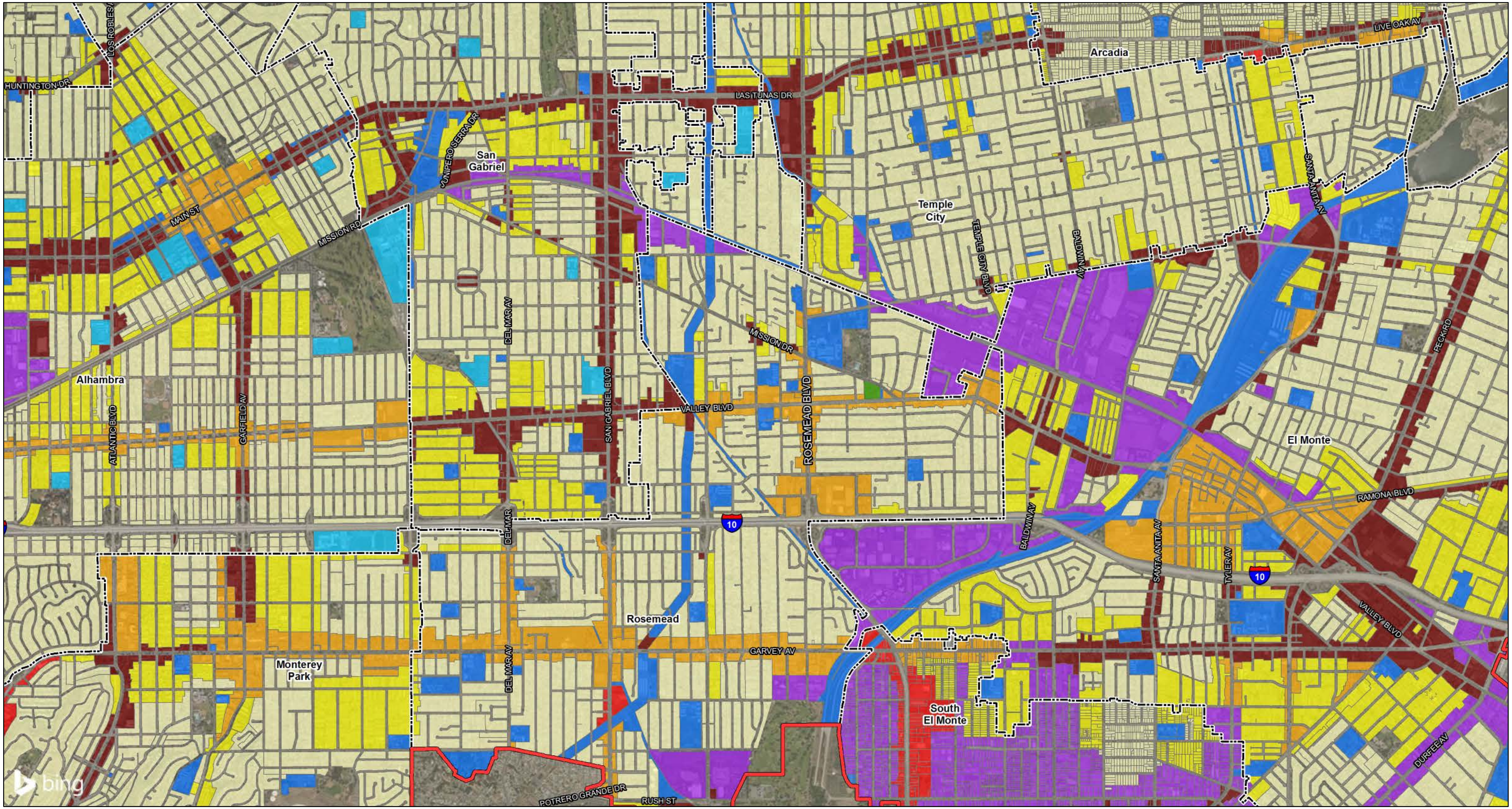

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

General Plan Land Use

- Single Family Residential
- Multi-Family Residential
- Commercial/Office
- Mixed Commercial and Industrial
- Industrial
- Educational Institutions
- Public Facilities
- Mixed Urban
- Local Parks, Open Space, and Recreation
- Cemeteries
- Transportation

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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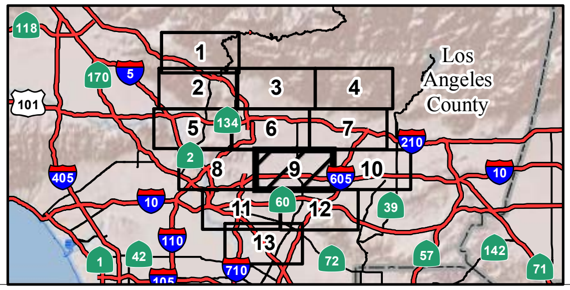

FIGURE 3.1-2

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SR 710 North Project

General Plan Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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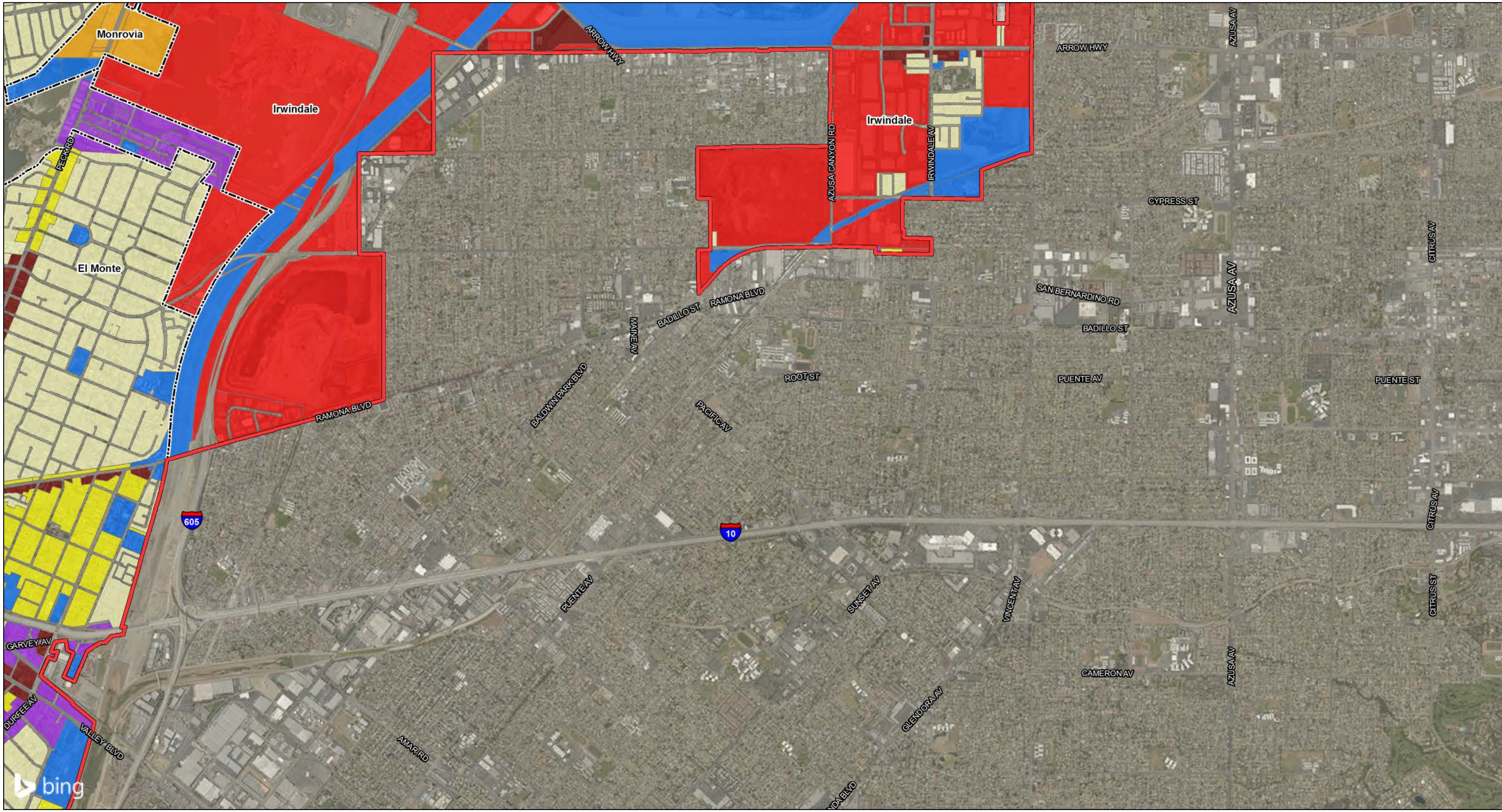

LEGEND

Cities/Unincorporated Communities	General Plan Land Use	Mixed Commercial and Industrial	Mixed Urban
LA City Neighborhoods	Single Family Residential	Industrial	Local Parks, Open Space, and Recreation
Land Use Study Area	Multi-Family Residential	Educational Institutions	Cemeteries
	Commercial/Office	Public Facilities	Transportation

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

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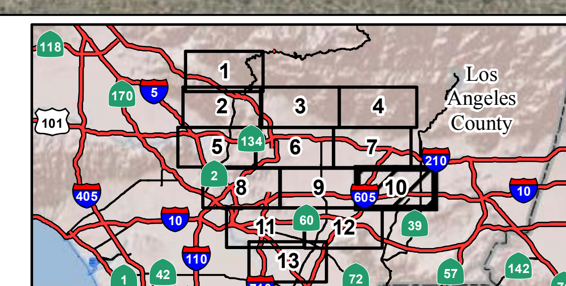

FIGURE 3.1-2
Sheet 10 of 13

SR 710 North Project
General Plan Land Uses
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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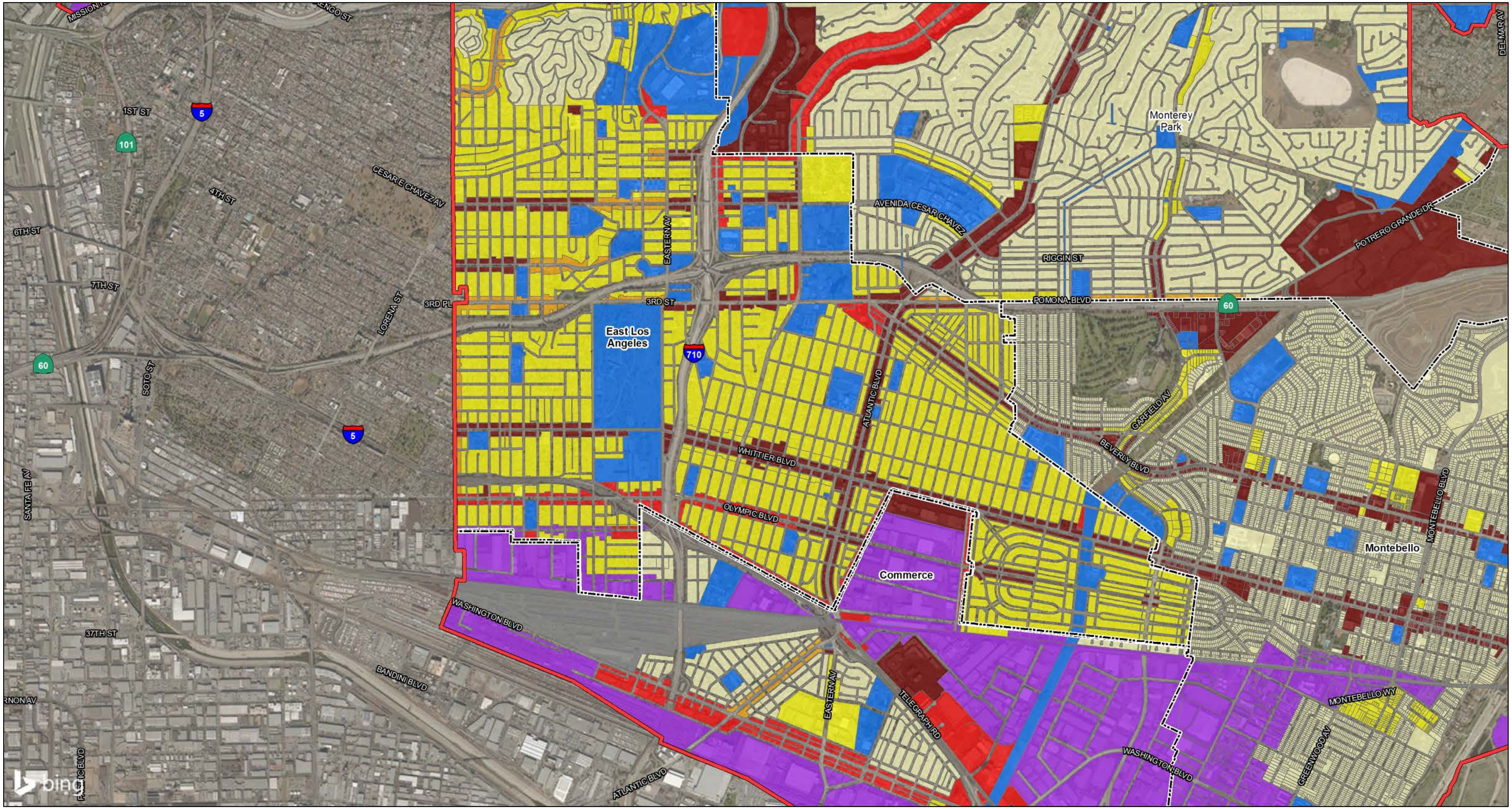

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

General Plan Land Use
Single Family Residential
Multi-Family Residential
Commercial/Office
Mixed Commercial and Industrial
Industrial
Educational Institutions
Public Facilities
Mixed Urban
Local Parks, Open Space, and Recreation
Cemeteries
Transportation

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

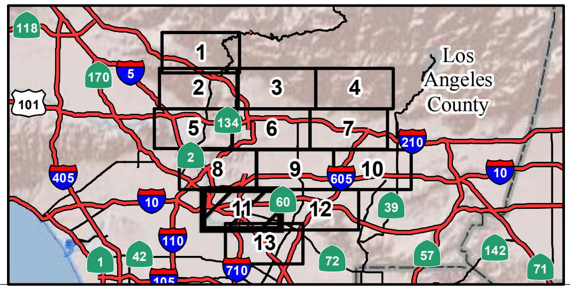

FIGURE 3.1-2
Sheet 11 of 13

SR 710 North Project
General Plan Land Uses
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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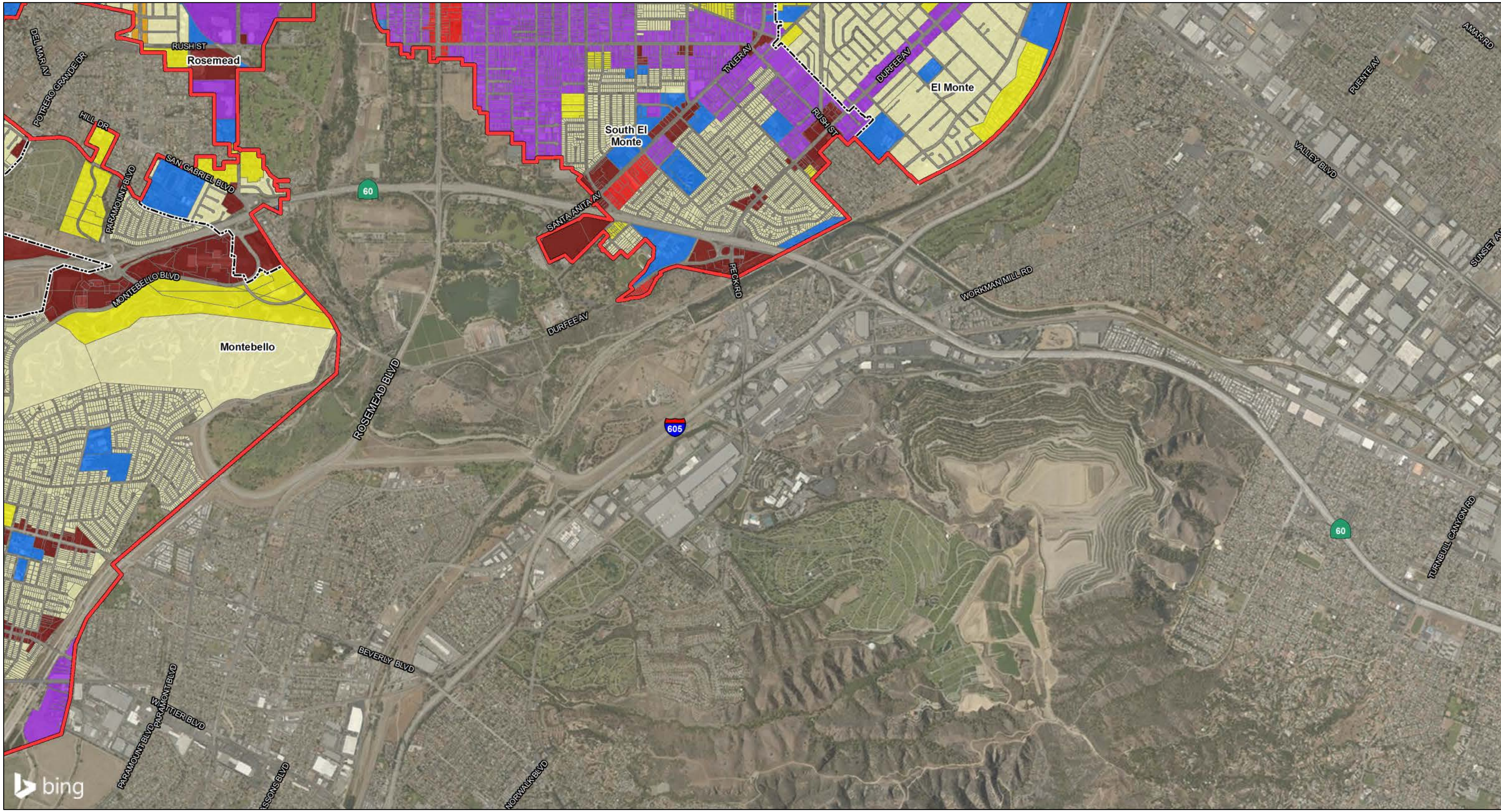

LEGEND

- Cities/Unincorporated Communities
- LA City Neighborhoods
- Land Use Study Area

General Plan Land Use

- Single Family Residential
- Multi-Family Residential
- Commercial/Office
- Mixed Commercial and Industrial
- Industrial
- Educational Institutions
- Public Facilities
- Mixed Urban
- Local Parks, Open Space, and Recreation
- Cemeteries
- Transportation

N

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)

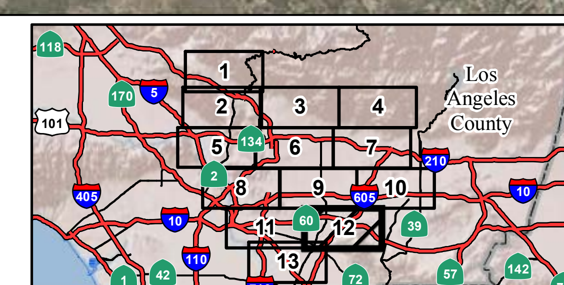

FIGURE 3.1-2

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SR 710 North Project

General Plan Land Uses

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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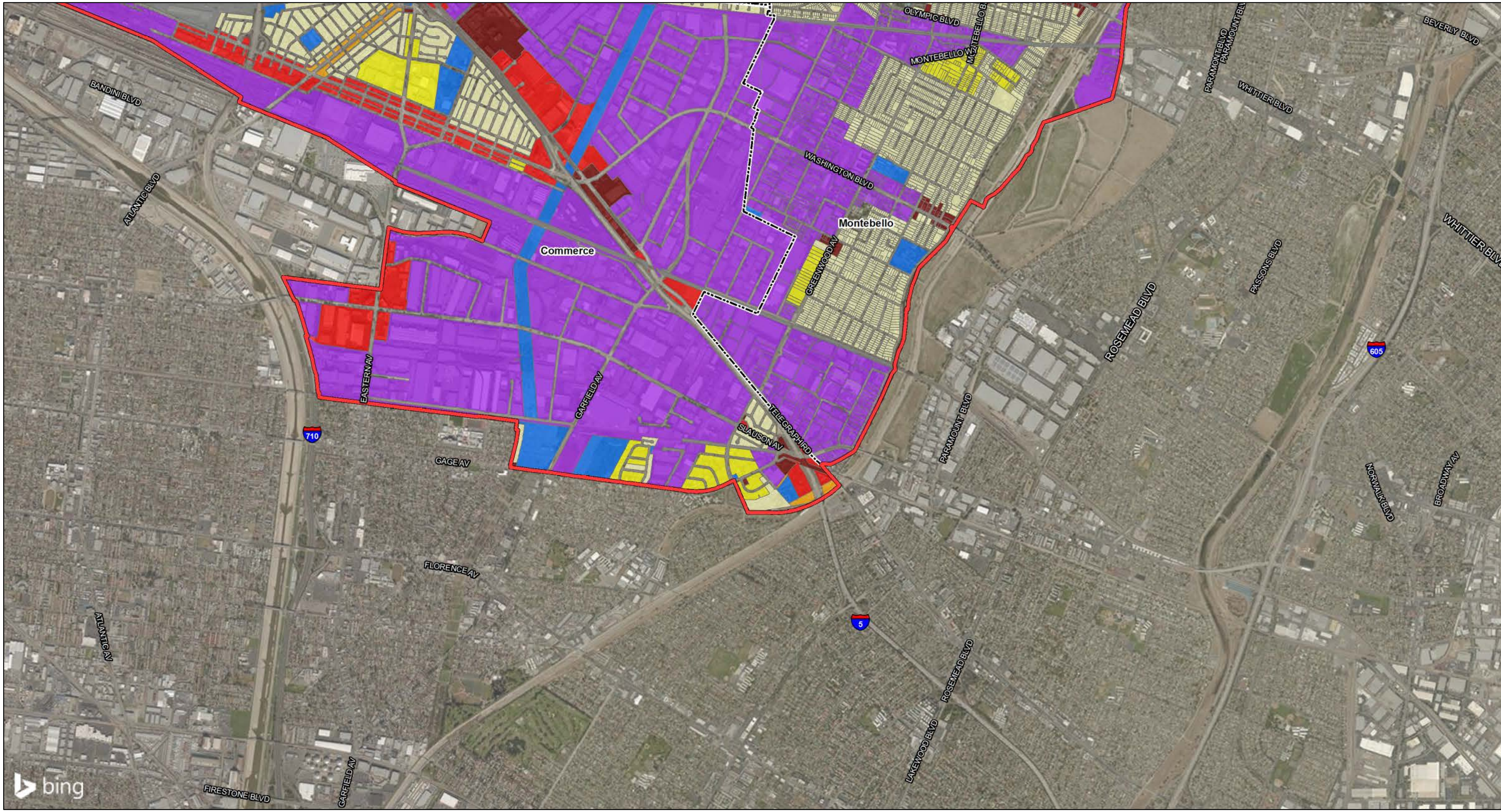

LEGEND

Cities/Unincorporated Communities
LA City Neighborhoods
Land Use Study Area

General Plan Land Use
Single Family Residential
Multi-Family Residential
Commercial/Office
Mixed Commercial and Industrial
Industrial
Educational Institutions
Public Facilities
Mixed Urban
Local Parks, Open Space, and Recreation
Cemeteries
Transportation

0 1250 2500
FEET

SOURCE: Microsoft (5/2010); LA County (2013); LSA (2013); SCAG (2008)
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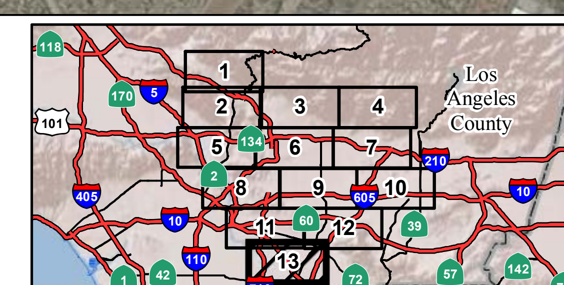

FIGURE 3.1-2
Sheet 13 of 13

SR 710 North Project
General Plan Land Uses
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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3.2 Growth

3.2.1 Regulatory Setting

The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with the National Environmental Policy Act (NEPA) of 1969, requires evaluation of the potential environmental effects of all proposed federal activities and programs. This provision includes a requirement to examine indirect effects, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) refer to these consequences as indirect impacts. Indirect impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project's potential to induce growth. The CEQA guidelines (Section 15126.2[d]) require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

3.2.2 Affected Environment

The growth impact analysis is based on the *Community Impact Assessment* (CIA) (2014). The Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan Growth Forecast was used to evaluate growth trends in population, housing, and employment.

3.2.2.1 Population, Housing, and Employment Growth Trends

Regional Level

While much of Los Angeles County is urbanized with limited development opportunities, SCAG anticipates population, housing, and employment growth to occur through 2035. Table 3.2.1 identifies the population, housing, and employment in 2008 and the increases that are likely to occur by 2020 and 2035. The SCAG projected growth rates from 2008 to 2035 are also identified within Table 3.2.1.

Local Level

Population

The SCAG growth projections show that the population is expected to increase in all cities and communities within the study area through 2035. The growth rate ranges from as low as 0.9 percent in Sierra Madre to as high as 42.9 percent in Irwindale. The areas that have higher percentages typically represent a greater availability of land for development or are reflective of a small increase in the number of persons where the 2008 population is relatively small. Table 3.2.1 identifies the changes in population, housing, and employment expected between 2008, 2020, and 2035. The growth rates projected by SCAG between 2008 and 2035 for the affected cities in the study area are also identified.

Households

As shown in Table 3.2.1, the SCAG growth projections show that the number of households is expected to increase for all cities and communities in the study area, except San Marino, through 2035. San Marino is expected to have no increases in households from 2008 through 2035.

TABLE 3.2.1:
Growth Trends in the Study Area by Jurisdiction

Demographic Characteristic	2008	2020	2035	Projected 2008–2035 Growth Rate
Los Angeles County				
Population	9,778,000	10,404,000	11,353,000	16.1%
Households	3,228,000	3,513,000	3,852,000	19.3%
Employment	4,340,000	4,558,000	4,827,000	11.2%
Unincorporated Communities in Los Angeles County (East Los Angeles, San Pasqual, Mayflower Village, East Pasadena, East San Gabriel, and North El Monte)				
Population	1,052,800	1,159,100	1,399,500	32.9%
Households	298,100	336,100	405,500	36.0%
Employment	237,000	266,100	318,100	34.2%
City of Alhambra				
Population	83,000	87,000	92,400	11.3%
Households	29,200	31,300	33,300	14.0%
Employment	29,600	31,000	32,500	9.8%
City of Arcadia				
Population	56,200	59,600	64,300	14.4%
Households	19,500	21,000	22,700	16.4%
Employment	26,700	28,100	29,500	10.5%
City of Commerce				
Population	12,800	12,900	13,000	1.6%
Households	3,400	3,400	3,500	2.9%
Employment	48,100	47,800	48,600	1.0%
City of Duarte				
Population	21,200	22,100	23,400	10.4%
Households	7,000	7,400	7,900	12.9%
Employment	6,700	7,000	7,300	9.0%
City of El Monte				
Population	113,400	124,300	140,100	23.5%
Households	27,800	30,400	33,300	19.8%
Employment	36,300	37,100	38,400	5.8%
City of Glendale				
Population	191,600	198,900	209,300	9.2%
Households	72,200	75,200	78,600	8.9%
Employment	93,600	98,200	103,000	10.0%
City of Irwindale				
Population	1,400	1,600	2,000	42.9%
Households	400	400	500	25.0%
Employment	13,400	11,500	12,300	-8.2%
City of La Cañada Flintridge				
Population	20,200	20,400	20,600	2.0%
Households	6,800	7,000	7,100	4.4%
Employment	9,500	10,200	10,300	8.4%
City of Los Angeles Neighborhoods (Arroyo Seco, Eagle Rock, El Sereno, Glassell Park, and Highland Park)				
Population	3,770,500	3,991,700	4,320,600	14.6%
Households	1,309,900	1,455,700	1,626,600	24.2%
Employment	1,735,200	1,817,700	1,906,800	9.9%
City of Monrovia				
Population	36,300	37,700	39,400	8.5%
Households	13,600	14,300	14,800	8.8%
Employment	17,700	18,300	19,100	7.9%
City of Montebello				
Population	62,500	66,400	66,400	6.2%
Households	19,000	20,500	20,500	7.9%
Employment	25,700	26,400	27,400	10.9%

TABLE 3.2.1:
Growth Trends in the Study Area by Jurisdiction

Demographic Characteristic	2008	2020	2035	Projected 2008–2035 Growth Rate
City of Monterey Park				
Population	60,100	67,900	77,700	29.3%
Households	19,900	20,900	21,700	9.0%
Employment	30,400	32,000	33,700	10.9%
City of Pasadena				
Population	135,300	143,400	152,500	12.7%
Households	54,500	58,400	61,400	12.7%
Employment	117,300	124,400	131,300	11.9%
City of Rosemead				
Population	53,600	55,500	58,100	8.4%
Households	14,200	15,000	15,800	11.3%
Employment	16,400	16,900	17,600	7.3%
City of San Gabriel				
Population	39,700	42,800	46,100	16.1%
Households	12,500	13,800	14,800	18.4%
Employment	14,200	15,000	15,700	10.6%
City of San Marino				
Population	13,100	13,200	13,300	1.5%
Households	4,300	4,300	4,300	0.0%
Employment	4,800	5,000	5,300	10.4%
City of Sierra Madre				
Population	10,900	10,900	11,000	0.9%
Households	4,800	4,900	5,000	4.2%
Employment	3,400	3,400	3,400	0.0%
City of South El Monte				
Population	20,100	20,800	21,800	8.5%
Households	4,600	4,800	5,000	8.7%
Employment	15,700	15,300	15,400	-1.9%
City of South Pasadena				
Population	25,600	25,900	26,300	2.7%
Households	10,500	10,600	10,800	2.9%
Employment	9,000	9,500	10,000	11.1%
City of Temple City				
Population	35,400	36,900	39,000	10.2%
Households	11,600	12,300	13,000	12.1%
Employment	6,700	7,000	7,300	9.0%

Source: *Community Impact Assessment* (2014).

Two cities within the study area, Commerce and South Pasadena, are forecast to have a 2.9 percent increase in households from 2008 to 2035. Household growth rates in the remaining cities and communities are forecast to range between 4.2 percent and 36.0 percent. Similar to the population forecasts, the areas that have higher percentages of increases in households typically represent a greater availability of land for development or are reflective of a small increase in the number of persons where the 2008 population is relatively small. Those cities and communities that are largely built out with little land available for development are forecast to experience lower household growth between 2008 and 2035.

Employment

As shown in Table 3.2.1, the SCAG growth projections show that employment is expected to increase for all cities and communities in the study area, except for Sierra Madre, South El Monte, and Irwindale, through 2035. The employment growth rates for Sierra Madre, South El Monte, and Irwindale are 0.0, -1.9, and -8.2 percent, respectively. This trend is reflective of the addition of housing and reduction of nonresidential uses in those cities. Similar to the population and household forecasts, lower employment growth forecasts in those cities and communities that are largely built out with little land available for development. The larger percentages typically represent a greater availability of land for development or are reflective of a small increase in the number of persons where the 2008 population is relatively small. In the case of Irwindale, much of the projected population growth can be attributed to the planned conversion of quarries to residential uses.

In summary, as shown in Table 3.2.1, cities and communities within the study area are forecast to experience various rates of growth in population, households, and employment between 2008 and 2035.

3.2.3 Environmental Consequences

3.2.3.1 No Build Alternative

The No Build Alternative does not include any of the improvements in the State Route 710 (SR 710) North Project Build Alternatives. As a result, the No Build Alternative would not result in growth-related effects potentially associated with the improvements in the Build Alternatives.

3.2.3.2 Build Alternatives

The study area includes cities and communities that are largely built out as well as cities and communities with vacant land and/or opportunities for infill development as reflected in the demographic forecasts in Table 3.2.1. As discussed in Section 3.1, Land Use, opportunities for growth in areas that are largely built out are typically very limited and, as a result, would not be expected to be substantially affected by any potential growth pressure associated with the proposed transportation improvements in the SR 710 Build Alternatives.

Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative

The TSM/TDM Alternative includes elements that would improve north-south travel in the study area. The design elements include Intelligent Transportation Systems (ITS), improvements to streets and intersections, active traffic management, expanded bus service, and bicycle facility improvements. Those improvements would also contribute to improved efficiency of the existing local roads and regional transportation network while also helping reduce congestion and improve mobility on local arterials. These changes would increase accessibility in and around the study area, but the TSM/TDM Alternative would not provide access to areas where there is currently no access. In summary, although the TSM/TDM Alternative would improve mobility and accessibility in the study area, the project improvements would not add new access to and/or from the area that would result in growth pressures in areas where such access does not presently exist. Since no new access to and/or from the area would be provided, there would be no impacts associated with the TSM/TDM Alternative creating access to currently inaccessible areas.

Growth in areas with vacant land or land available for infill development will typically be influenced by a number of factors. The improvements in the TSM/TDM Alternative, while contributing to reduced congestion and improved mobility in the overall transportation system, are not expected to substantially influence growth in the study area. This is because they are relatively modest and focused improvements that are intended to improve circulation at specific intersections or street segments but that would not be expected to increase system efficiency to a level that would substantially increase the overall capacity of the transportation system or the attractiveness of certain areas for development. As a result, it is unlikely that the improved mobility and accessibility resulting from the TSM/TDM Alternative improvements themselves would be sufficient to attract new development to an area not already proposed for development or to modify the type, location, or timing of development in those areas, and therefore would not result in growth-related effects. Since growth-related effects are unlikely, the TSM/TDM Alternative would not result in impacts related to influencing growth.

Bus Rapid Transit (BRT) Alternative

The dedicated bus lanes and increased transit services included in the BRT Alternative would improve north-south travel in the study area. The increased transit and dedicated bus lanes would also improve the efficiency of the local and regional transportation networks while reducing congestion and improving mobility on local arterials. These changes would increase accessibility in and around the study area, but the BRT Alternative would not provide access to areas where there is currently no access. In summary, although the BRT Alternative would improve mobility and accessibility in the study area, the project improvements would not add new access to and/or from the area that would result in growth pressures in areas where such access does not presently exist. Since no new access to and/or from the area would be provided, there would be no growth impacts associated with the BRT Alternative creating access to currently inaccessible areas.

The BRT Alternative proposes dedicated and mixed-flow bus lanes, bus stations, and increased bus service focused on a north-south corridor extending from south of State Route 60 (SR 60) to Pasadena. The improvements in the BRT Alternative, while providing an efficient alternative for the traveling public with substantial increases in transit services and the provision of dedicated bus stations along the route of the bus lanes, are not expected to substantially influence growth in the study area. This is because the transit service improvements in the BRT Alternative are focused on increasing the number of bus routes and the frequency of service on bus routes throughout the study area. The bus stations for the dedicated bus lanes would be modest facilities with shelters, buses, real-time transit information, and other typical passenger amenities. The stations would not be locations where large numbers of people would congregate or pass through. Further, 12 of the proposed 17 locations for BRT stations have been served by a limited-stop bus service similar to the BRT line proposed as part of the BRT Alternative (Metro Rapid Route 762) since June 2008. Although Metro Rapid Route 762 has been in operation for six years, that service has not resulted in new development (transit-oriented or non-transit-oriented) in the vicinity of the locations for the proposed BRT stations. As a result, the stations in the BRT Alternative would not increase the attractiveness of the areas around the bus stations for development. The new bus routes and increased service levels on bus routes in the area would provide a benefit for the traveling public that would be spread across many roadways within a number of cities in the study area. As a result, it is unlikely that the improved mobility and accessibility resulting from the BRT improvements themselves would be sufficient to attract new development to an area not already proposed for development or to modify the type, location, or timing of development in those areas, and therefore would not result in growth-related effects. Since growth-related effects are unlikely, the BRT Alternative would not result in impacts related to influencing growth.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). As described earlier, the TSM/TDM Alternative would not result in effects related to growth. Therefore, the TSM/TDM Alternative improvements included in the BRT Alternative would not result in growth effects.

Light Rail Transit (LRT) Alternative

The LRT Alternative includes elements such as light rail facilities, stations, and services as well as supporting bus services. These elements would improve north-south travel in the study area, improve efficiency of the local and regional transit networks, and reduce congestion and improve mobility on local arterials. These changes would increase accessibility in and around the study area, but the LRT Alternative would not provide access to areas where there is currently no access. In summary, although the LRT Alternative would improve mobility and accessibility in the study area, the project improvements would not add new access to and/or from the area that would result in growth pressures in areas where such access does not presently exist. Since no new access to and/or from the area would be provided, there would be no impacts associated with the LRT Alternative creating access to currently inaccessible areas.

The LRT Alternative proposes seven stations along the alignment of the light rail system. Four stations (Alhambra, Huntington, South Pasadena, and Fillmore Stations) would be underground along the tunnel segment and three stations (Mednik, Floral, and California State University, Los Angeles [Cal State LA] Stations) would be along the elevated segment. Four stations would include at-grade and/or structure parking: Floral Station, Alhambra Station, Huntington Station, and South Pasadena Station. Two stations (Mednik and Fillmore Stations) would interface with existing stations on the Los Angeles County Metropolitan Transportation Authority (Metro) Gold Line. New bus routes and increased service frequencies would also be provided to support travel to and from the new light rail stations. The Mednik Station includes space for retail and restaurant development under the aerial tracks and station on the west side of Mednik Avenue between Gleason Street and 3rd Street.

While the areas around light rail stations can be attractive locations for development because they enjoy improved access to the regional public transportation system, the proposed stations are located in areas that are generally already developed. Although the presence of those stations could result in some pressure for alternative land uses or increased densities in the areas around the stations, that type of development would be largely dependent on a number of factors other than the presence of the LRT Alternative stations. Those factors include the local and regional economic conditions, local support for those types of land uses in the areas around the stations, and the existing General Plan and zoning designations. As a result, it is unlikely that the improved mobility and accessibility resulting from the presence of the light rail stations themselves and the availability of both light rail service and increased bus services would be sufficient to attract new development to an area not already proposed for development or to modify the type, location, or timing of development in those areas, and the LRT Alternative would therefore not result in growth-related effects. Since growth-related effects are unlikely, the LRT Alternative would not result in impacts related to influencing growth.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). As described earlier, the TSM/TDM Alternative would not result in effects related to growth. Therefore, the TSM/TDM Alternative improvements included in the LRT Alternative would not result in growth effects.

Freeway Tunnel Alternative

The freeway tunnel facilities in the Freeway Tunnel Alternative would improve north-south travel in the study area and efficiency of the regional freeway network. The facilities would also improve mobility on local arterials by providing an alternative travel path to accommodate regional traffic volumes. These changes would increase accessibility in and around the study area, but the Freeway Tunnel Alternative would not provide access to areas where there is currently no access. In summary, although the Freeway Tunnel Alternative would improve mobility and accessibility in the study area, the project improvements would not add new access to and/or from the area that would result in growth pressures in areas where such access does not presently exist. Since no new access to and/or from the area would be provided, there would be no impacts associated with the Freeway Tunnel Alternative creating access to currently inaccessible areas.

The Freeway Tunnel Alternative proposes a freeway extending between the existing terminus of SR 710 on the south to the existing Interstate 210/State Route 134 (I-210/SR 134) interchange to the north. The majority of the alignment, from just south of Green Street south to Hellman Avenue in Alhambra, would be in a tunnel and would not be visible from the surface. As a result, that segment of the alignment would not provide opportunities for improved visibility for land uses in the adjacent areas. The at-grade segments at the northern and southern ends of the freeway tunnel(s) would connect with existing I-210/SR 134 on the north and SR 710 on the south. The areas around those two interchanges are largely developed with a variety of existing land uses and, as a result, there are no obvious opportunities in those areas to develop new land uses that would benefit from visibility associated with the existing and proposed freeway facilities in those areas. There would be no interchanges with local streets except at the existing partial interchange between SR 710 and Valley Boulevard. The Freeway Tunnel Alternative would not result in visibility from adjacent land uses along the majority of the alignment (the tunnel segment), there would be no new interchanges with local arterials that would provide increased visibility for adjacent land uses, and there would be no substantial increase in visibility of adjacent land uses in the vicinity of the existing interchanges. As a result, the Freeway Tunnel Alternative would not provide sufficient visibility or access improvements to attract new development to an area not already proposed for development or to modify the amount, type, location, or timing of development in those areas, and therefore would not result in growth-related effects. Since growth-related effects are unlikely, the Freeway Tunnel Alternative would not result in impacts related to influencing growth.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard). As described earlier, the TSM/TDM Alternative would not result in effects related to growth. Therefore, the TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative would not result in growth effects.

In summary, the four Build Alternatives are not anticipated to result in growth-related effects in the study area. Because the study area is largely built out and none of the Build Alternatives provides new access to undeveloped or underdeveloped areas, it would be speculative to conclude that the improved mobility and accessibility resulting from the Build Alternatives would result in new development in an area not already proposed for development or would modify the amount, type, location, or timing of development in those areas. As a result, reasonably foreseeable growth-related effects are not anticipated under the four Build Alternatives.

In summary, the Build Alternatives are not expected to influence the amount, type, timing, or location of growth in the study area and, therefore, would not result in adverse growth-related effects to any resources of concern.

3.2.4 Avoidance, Minimization, and/or Mitigation Measures

There are no growth-related effects associated with the Build Alternatives; therefore, no avoidance, minimization, and/or mitigation measures are required.

3.3 Community Impacts

3.3.1 Community Character and Cohesion

3.3.1.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, established that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). The Federal Highway Administration (FHWA) in its implementation of NEPA (23 USC 109[h]) directs that final decisions on projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

Under the California Environmental Quality Act (CEQA), an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

3.3.1.2 Affected Environment

The analysis of the potential for the proposed State Route 710 (SR 710) North Project to result in impacts related to community character and cohesion is described in this section. Technical studies used for this analysis were the *Community Impact Assessment* (CIA) (2014) and the *Draft Relocation Impact Report* (DRIR) (2014) and the Final Relocation Impact Report (FRIR) (2018), which focused on the impacts of the Preferred Alternative (see more detailed information in Section 3.3.2, Relocation and Real Property Acquisition).

The study area for community impacts is generally defined as the cities, communities, and neighborhoods in which physical improvements are proposed under the SR 710 North Project Build Alternatives. These are the Cities of Alhambra, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, and South Pasadena; the unincorporated communities of East Los Angeles, East Pasadena, East San Gabriel, Mayflower Village, North El Monte, and San Pasqual; and the neighborhoods of Eagle Rock, El Sereno, and Glassell Park in the City of Los Angeles. Although no physical improvements would be constructed in the City of Irwindale, two gravel quarries in Irwindale have been identified as potential receiving sites for the spoils generated by tunnel boring activities under the Light Rail Transit (LRT) and Freeway Tunnel Alternatives. Therefore, the community impacts study area also includes the City of Irwindale. Figure 3.1-1, provided earlier in Section 3.1, Land Use, shows locations of, and the existing land uses in, the study area cities, communities, and neighborhoods.

Community Cohesion Indicators

Community cohesion is the degree to which residents have a sense of belonging to their neighborhoods, a level of commitment to the community, and/or a strong attachment to neighbors, groups, and institutions usually as a result of continued association over time. Cohesion refers to the degree of interaction among the individuals, groups, and institutions that make up a community.

Demographic data compiled by the United States Census Bureau, including the 2010 Census and the 2007–2011 American Community Survey (ACS)[1] can be used to measure a community's level of cohesion. The following demographic indicators tend to correlate with a higher degree of community cohesion and were used to determine the degree of community cohesion in the census tracts within each city/community in the study area for which an expanded community profile was prepared:

- **Age:** In general, communities with a high percentage of elderly residents (65 years or older) tend to demonstrate a greater social commitment to their communities. This is because the elderly population, which includes retirees, often tends to be more active in the community because they have more time available for volunteering and participating in social organizations.
- **Ethnicity:** In general, homogeneity of the population contributes to higher levels of cohesion. Communities that are ethnically homogeneous often speak the same language, hold similar beliefs, and share a common culture, and are therefore more likely to engage in social interaction on a routine basis.
- **Household Size:** In general, communities with a high percentage of families with children are more cohesive than communities comprised of largely single people. This appears to be because children tend to establish friendships with other children in their communities. The social networks of children often lead to the establishment of friendships and affiliations among parents in the communities. Although the Census Bureau does not provide specific data regarding the number of children present in each household, it does provide data regarding the persons per household, which can serve as a proxy for households with children.
- **Housing Occupancy:** Communities with a high percentage of owner-occupied residences are typically more cohesive because their population tends to be less mobile. Because they have a financial stake in their communities, homeowners often take a greater interest in what is happening in their communities than renters do. This means they often have a stronger sense of belonging to their communities.
- **Housing Tenure:** Communities with a high percentage of long-term residents are typically more cohesive because a greater proportion of the population has had time to establish social networks and develop an identity with the community. The Census Bureau provides data regarding the year that each householder moved into their current housing unit. For this analysis, households that moved into their current residences in 1999 or earlier are considered long-term residents.
- **Transit-Dependent Population:** Communities with a high percentage of residents dependent on public transportation typically tend to be more cohesive than communities that are dependent on automobiles for transportation. This is because residents who walk or use public transportation for travel tend to engage in social interactions with each other more frequently than residents who travel by automobile. The transit-dependent population may include the disabled, the elderly, the young, low-income individuals, and households without vehicles available. Given that transit dependency can be attributed to a combination of factors, including age, income level, and ability to drive, transit-dependent populations are often difficult to identify based on Census data because these groups often overlap. In an effort to avoid double

[1] The ACS is an ongoing survey conducted by the Census Bureau that provides data every year, thereby giving communities current information they need to plan investments and services.

counting such populations, the transit-dependent population was calculated by taking the number of residents aged 15 and over (i.e., the approximate population legally old enough to drive), subtracting the number of persons living in group quarters (e.g., college residence halls, skilled nursing facilities, correctional facilities, and other group living environments where driving is not typically required), subtracting the number of vehicles (cars, trucks, vans) used for commuting, and then dividing the difference by the population aged 15 and over. This formula yields the approximate percentage of residents who are eligible to drive but do not commute via car, truck, or van.

The methodology for evaluating community cohesion involves comparing relevant census data sets for the communities in the study area to similar County-wide data to determine if the community and the census tracts within the County exhibit higher degrees of ethnic homogeneity, higher homeownership rates, larger household sizes, and higher percentages of transit-dependent, elderly, and long-term residents than the County overall. The following discussion presents the level of community cohesion measured in the census tracts in each city, community, and neighborhood in which physical improvements are proposed.

Race and Ethnicity

As shown in Table 3.3.1, racial minorities comprise a larger share of the population in the community impacts study area in eight cities and communities in the County of Los Angeles (Alhambra, 71.7 percent; East San Gabriel, 66.1 percent; Los Angeles, 50.2 percent; Monterey Park, 80.6 percent; North El Monte, 52.5 percent; Rosemead, 78.9 percent; San Gabriel, 74.6 percent; and San Marino, 58.7 percent) and three neighborhoods in the City of Los Angeles (Eagle Rock, 50.3 percent; El Sereno, 54.9 percent; and Glassell Park, 56.4 percent) than in the County overall (49.7 percent).

As described in the CIA, the racial demographics of the 175 census tracts in the community impacts study area vary, with racial minorities comprising between 21.8 percent and 92.2 percent of the populations in those census tracts. Of the 175 census tracts in the community impacts study area, 116 census tracts have a higher percentage of racial minorities than the County.

As shown in Table 3.3.1, Hispanics/Latinos comprise a larger share of the population in the community impacts study area in three cities and communities in the County of Los Angeles (East Los Angeles, 97.1 percent; Irwindale, 90.6 percent; and Los Angeles, 48.5 percent) and two neighborhoods in the City of Los Angeles (El Sereno, 81.7 percent; and Glassell Park, 58.9 percent) than in the County overall (47.7 percent). As described in the CIA, the percentages of Hispanic/Latino population in the 175 census tracts in the community impacts study area vary, with Hispanics/Latinos comprising between 4.9 percent and 99 percent of the population in those census tracts. Of the 175 census tracts in the community impacts study area, 68 census tracts have a higher percentage of Hispanics/Latinos than the County.

Housing Occupancy

As shown in Table 3.3.1, the percentage of owner-occupied residences in the community impacts study area is higher in 10 cities and communities in the County of Los Angeles (East Pasadena, 68.5 percent; East San Gabriel, 57.2 percent; Irwindale, 69.8 percent; Mayflower Village, 81.8 percent; Monterey Park, 55.4 percent; North El Monte, 75.4 percent; Rosemead, 48.9 percent; San Gabriel, 49.2 percent; San Marino, 91.4 percent; and San Pasqual, 58.6 percent) and 2 neighborhoods in the City of Los Angeles (Eagle Rock, 52.2 percent; and El Sereno, 49.8 percent) than in the County

TABLE 3.3.1:
Community Cohesion Indicators

Area	Racial Minority Population (Non-White)[1,5]	Hispanic/ Latino Population[2,5]	Owner-Occupied Residences[5]	Elderly Residents (>64 yrs old)[5]	Average Household Size (persons)[5]	Transit-Dependent Population[3,5]	Long-Term Residents (Moved in 1999 or Earlier)[4,5]
County							
Los Angeles	49.7%	47.7%	47.7%	10.9%	2.98	25.2%	39.6%
Cities in Los Angeles County							
Alhambra	***71.7%***	34.4%	40.8%	***14.3%***	2.82	***27.0%***	***39.8%***
Irwindale	41.4%	***90.6%***	***69.8%***	10.6%	***3.67***	21.0%	***58.1%***
Los Angeles	***50.2%***	***48.5%***	38.2%	10.5%	2.81	***29.7%***	37.1%
Monterey Park	***80.6%***	26.9%	***55.4%***	***19.3%***	***3.01***	***31.7%***	***47.6%***
Pasadena	44.2%	33.7%	45.0%	***13.5%***	2.42	20.1%	34.8%
Rosemead	***78.9%***	33.8%	***48.9%***	***13.0%***	***3.74***	***32.5%***	***45.1%***
San Gabriel	***74.6%***	25.7%	***49.2%***	***14.0%***	***3.13***	***27.8%***	***44.2%***
San Marino	***58.7%***	6.5%	***91.4%***	***17.6%***	***3.02***	4.8%	***60.6%***
South Pasadena	45.7%	18.6%	45.7%	***12.1%***	2.43	6.3%	***40.7%***
Neighborhoods in City of Los Angeles							
Eagle Rock	***50.3%***	41.1%	***52.2%***	***13.1%***	2.81	21.1%	***48.1%***
El Sereno	***54.9%***	***81.7%***	***49.8%***	10.5%	***3.58***	***34.8%***	***48.5%***
Glassell Park	***56.4%***	***58.9%***	38.9%	10.6%	***3.20***	***31.4%***	***46.0%***
Communities in Unincorporated Los Angeles County							
East Los Angeles	49.5%	***97.1%***	35.7%	8.6%	***4.09***	***45.7%***	***44.7%***
East Pasadena	48.2%	34.8%	***68.5%***	***15.6%***	2.92	12.7%	***53.2%***
East San Gabriel	***66.1%***	24.9%	***57.2%***	***13.6%***	2.90	20.8%	***48.3%***
Mayflower Village	46.9%	27.6%	***81.8%***	***13.7%***	2.89	7.4%	***53.6%***
North El Monte	***52.5%***	26.9%	***75.4%***	***16.4%***	2.93	15.3%	***51.8%***
San Pasqual	34.1%	17.7%	***58.6%***	***13.9%***	2.25	6.3%	***45.8%***

Source: United States Census Bureau, 2010 Census, Table DP-1.
Note: ***Italicized numbers in bold*** indicate the values are higher than the County average.
1 Includes individuals who identify themselves as Black/African American, Asian, Native Hawaiian/Pacific Islander, Native American/ Native Alaskan, Some Other Race, or two or more races.
2 Persons of Hispanic/Latino Origin may be of any race.
3 The transit-dependent population was calculated by taking the number of residents aged 15 and over (as reported in Table B01001 of the 2007–2011 ACS), subtracting the number of persons living in group quarters (as reported in Table B26001 of the 2007–2011 ACS), subtracting the number of vehicles available (as reported in Table B25046 of the 2007–2011 ACS), and then dividing the difference by the population aged 15 and over.
4 Includes those residents who moved into their current residence in 1999 or earlier (as reported in Table DP04 of the 2007–2011 ACS)
5 Numbers are subject to change based on the final alignment or design of the project alternatives.

overall (47.7 percent). As described in the CIA, between 5.2 percent and 93.1 percent of the residences in the 175 census tracts in the community impacts study area are owner-occupied, and 84 of the 175 census tracts have a higher percentage of owner-occupied residences than the County overall.

Elderly Residents

As shown in Table 3.3.1, the percentage of elderly residents in the community impacts study area is higher in 12 cities and communities in the County of Los Angeles (Alhambra, 14.3 percent; East Pasadena, 15.6 percent; East San Gabriel, 13.6 percent; Mayflower Village, 13.7 percent; Monterey Park, 19.3 percent; North El Monte, 16.4 percent; Pasadena, 13.5 percent; Rosemead, 13 percent; San Gabriel, 14 percent; San Marino, 17.6 percent; San Pasqual, 13.9 percent; and South Pasadena, 12.1 percent) and 1 neighborhood in the City of Los Angeles (Eagle Rock, 13.1 percent) than in the County overall (10.9 percent). As described in the CIA, the percentages of the elderly population in the 175 census tracts in the community impacts study area vary, with elderly residents comprising between 5.6 percent and 31.9 percent of the population in those census tracts. Of the 175 census tracts in the community impacts study area, 108 census tracts have a higher percentage of elderly residents than the County overall.

Household Size

As shown in Table 3.3.1, the average household size in the community impacts study area is higher in six cities and communities in the County of Los Angeles (East Los Angeles, 4.09; Irwindale, 3.67; Monterey Park, 3.01; Rosemead, 3.74; San Gabriel, 3.13; and San Marino, 3.02) and two neighborhoods in the City of Los Angeles (El Sereno, 3.58; and Glassell Park, 3.2) than in the County overall (2.98). As described in the CIA, the average household size ranges between 1.54 and 6.4 in the 175 census tracts in the community impacts study area, and 102 of the 175 census tracts have a higher average household size than the County overall.

Transit Dependency

As shown in Table 3.3.1, the percentage of transit-dependent residents in the community impacts study area is higher in six cities and communities in the County of Los Angeles (Alhambra, 27 percent; East Los Angeles, 45.7 percent; Los Angeles, 29.7 percent; Monterey Park, 31.7 percent; Rosemead, 32.5 percent; and San Gabriel, 27.8 percent) and two neighborhoods in the City of Los Angeles (El Sereno, 34.8 percent; and Glassell Park, 31.4 percent) than in the County overall (25.2 percent). As described in the CIA, between 0 and 57.4 percent of the population in the 175 census tracts in the community impacts study area is transit dependent, and 107 of the 175 census tracts have a higher transit-dependent population than the County overall.

Housing Tenure

According to the methodology for evaluating community cohesion levels, individuals who have lived in their current residences for more than 10 years are considered long-term residents. As shown in Table 3.3.1, long-term residents comprise a larger share of the population in the community impacts study area in 13 cities and communities in the County of Los Angeles (Alhambra, 39.8 percent; East Los Angeles, 44.7 percent; East Pasadena, 53.2 percent; East San Gabriel, 48.3 percent; Irwindale, 58.1 percent; Mayflower Village, 53.6 percent; Monterey Park, 47.6 percent; North El Monte, 51.8 percent; Rosemead, 45.1 percent; San Gabriel, 44.2 percent; San Marino, 60.6 percent; San Pasqual, 45.8 percent; and South Pasadena, 40.7 percent) and 3 neighborhoods in the City of Los Angeles (Eagle Rock, 48.1 percent; El Sereno, 48.5 percent; and Glassell Park, 46.0 percent) than in the County overall (39.6 percent). As described in the CIA, long-term residents comprise between 1.1 percent and 71.4 percent of the population in the 175 census tracts in the community impacts study area, and 120 of the 175 census tracts have a higher percentage of long-term residents than the County overall.

Summary

As described above, each of the cities, communities, and neighborhoods in the community impacts study area exhibits one or more community cohesion indicators in comparison to the overall County population. Twelve of the cities and communities in the County of Los Angeles demonstrated three or more community cohesion indicators compared to the County overall. All but one of the census tracts in the community impacts study area exhibit one or more community cohesion indicators compared to the County population. There were 153 census tracts that demonstrated three or more community cohesion indicators compared to the County. Based on these factors, the community impacts study area appears to exhibit a high degree of community cohesion.

Other Demographics

Employment

Table 3.3.2 provides information regarding the civilian labor force in the cities and communities in the community impacts study area, including the number of employed and unemployed persons and the unemployment rate, with comparisons to the County and State employment statistics. Table 3.3.2 also provides the number of primary jobs in the cities, neighborhoods, and communities in the community impacts study area. Unlike the civilian labor force data, which is based on an area's resident labor force, primary jobs relate to the number of jobs physically located in an area. The United States Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) Program defines a primary job as the job that earned an individual the most money.

TABLE 3.3.2:
Study Area Employment

Area	Employment Status[1]				
	Civilian Labor Force	Employed	Unemployed	Unemployment Rate	Primary Jobs[2]
State					
California	18,655,700	17,005,900	1,649,900	8.8%	N/A
County					
Los Angeles	4,996,600	4,486,400	510,200	10.2%	N/A
Cities in Los Angeles County					
Alhambra	46,400	42,300	4,100	8.8%	23,046
Irwindale	700	700	100	10.6%	20,099
Los Angeles	1,955,100	1,734,500	220,600	11.3%	1,492,099
Monterey Park	30,000	27,700	2,300	7.7%	25,296
Pasadena	77,700	71,600	6,000	7.8%	93,981
Rosemead	25,400	23,100	2,300	9.0%	22,940
San Gabriel	21,000	19,200	1,800	8.6%	10,991
San Marino	6,300	6,100	300	4.6%	3,108
South Pasadena	15,600	14,800	800	5.0%	6,090
Communities in Unincorporated Los Angeles County					
East Los Angeles	51,400	44,000	7,400	14.4%	19,758
East Pasadena	3,300	3,100	200	7.0%	3,522
East San Gabriel	8,400	7,800	500	6.3%	11,245
Mayflower Village	2,800	2,600	200	5.6%	451
North El Monte	2,200	2,100	100	3.5%	285
San Pasqual[3]	N/A	N/A	N/A	N/A	118

Source: Summarized from the *Community Impact Assessment* (2014).
Note: Civilian labor force, employed labor force, unemployed labor force, and unemployment rate in August 2013, as reported by the California Employment Development Department. Primary jobs in the second quarter of 2011, as reported by the U.S. Census Bureau's Longitudinal Employer Household Dynamics Program.
1 Numbers are subject to change based on the final alignment or design of the project alternatives.
2 The United States Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) Program defines a primary job as the job that earned an individual the most money.
3 The California Employment Development Department does not compile labor force data for San Pasqual.

As shown in Table 3.3.2, most of the cities and communities in the community impacts study area had a lower unemployment rate than the County in August 2013; however, three of the cities and communities (East Los Angeles, 14.4 percent; Irwindale, 10.6 percent; and Los Angeles 11.3 percent) had unemployment rates higher than the County overall (10.2 percent). In August 2013, unemployment rates in the community impacts study area ranged from 3.5 percent in North El Monte to 14.4 percent in East Los Angeles.

Table 3.3.2 also shows that, as of the second quarter of 2011, the number of primary jobs in the cities and communities in the community impacts study area varies substantially as some of the cities and communities are primarily residential (Mayflower Village, North El Monte, San Marino, and South Pasadena), while others (Irwindale, Los Angeles, Pasadena, and Rosemead) function as regional employment centers. The number of primary jobs in the community impacts study area ranged from 118 in San Pasqual to 1,492,099 in Los Angeles.

Income and Poverty Status

As described in the CIA, the median household income in the community impacts study area is lower in five cities and communities in the County of Los Angeles (Alhambra, $52,717; East Los Angeles, $37,271; Los Angeles, $50,028; Monterey Park, $51,736; and Rosemead, $47,964) and two neighborhoods in the City of Los Angeles (El Sereno, $44,368; and Glassell Park, $55,561) than in the County overall ($56,266). The median household income in the 175 census tracts in the community impacts study area ranges from $19,353 to $174,265, and 76 of the 175 census tracts have a lower median household income than the County overall.

The percentage of residents living below the poverty level in the community impacts study area is higher in two cities and communities (East Los Angeles, 25.3 percent; Los Angeles, 20.2 percent) than in the County overall (16.3 percent). The percentages of population living below the poverty level in the 175 census tracts in the community impacts study area vary, with these residents comprising between 0.7 percent and 38.0 percent of the population in those census tracts. Of the 175 census tracts in the community impacts study area, 64 census tracts have a higher percentage of residents living below the poverty level than the County overall.

Community Facilities

Table 3.3.3 lists the community facilities (i.e., libraries, city halls, courthouses, hospitals, places of worship, homeless shelters and service providers, public and private schools, and privately operated community centers and recreation facilities) within 0.5 mile (mi) of the Build Alternatives that were considered in the evaluation of potential effects to community facilities. Refer to Section 3.1, Land Use, for a list of public parks and recreational resources within 0.5 mi of the Build Alternatives, and to Section 3.4, Utilities/Emergency Services, for a list of police and fire facilities within 0.5 mi of the Build Alternatives.

3.3.1.3 Environmental Consequences

Temporary Impacts

No Build Alternative

The No Build Alternative does not include construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in adverse short-term community character and cohesion effects related to the use of privately owned property for temporary construction easements (TCEs) and short-term traffic effects potentially associated with the construction of the Build Alternatives. It is possible that the construction of improvements in the No Build Alternative could result in adverse short-term air quality, noise, and traffic/access effects in the study area. Those effects would be analyzed and mitigated, if needed, as part of a separate environmental review process as each of those projects/improvements is advanced for implementation.

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
City of Alhambra				
Alhambra Civic Center Library 101 South 1st Street	●	●	●	●
Alhambra City Hall 111 South 1st Street	●	●	●	●
Los Angeles County Superior Court Facility 15 West Commonwealth Avenue	●	●	●	●
Alhambra Hospital Medical Center (Private) 100 South Raymond Avenue			●	
Alhambra Lutheran Health Facility (Private) 2021 Carlos Street	●	●	●	●
Valley Convalescent Hospital (Private) 2339 West Valley Boulevard	●	●	●	●
Alhambra Christian Center 538 South Stoneman Avenue	●	●	●	●
Alhambra Community Gospel Church 328 West Commonwealth Avenue	●	●	●	●
Alhambra Foursquare Church 1495 Westminster Avenue	●	●	●	●
Alhambra Friends Church 1209 South 7th Street	●	●	●	●
Alhambra Seven Day Adventist Church 298 South Chapel Avenue	●	●	●	●
Alhambra True Light Presbyterian Church 20 West Commonwealth Avenue		●		
Bethany Church of Alhambra 77 North Olive Avenue		●		
Calvary Union Church 2536 West Grand Avenue	●	●	●	●
Carmel of Saint Teresa Convent 650 North Monterey Street	●	●	●	●
Church of Christ 1609 West Alhambra Road		●		
Church of Saint Simon and Jude 1488 South Marengo Avenue	●	●	●	●
Church of The Holy Trinity 412 North Garfield Avenue	●	●	●	●
First Baptist Church 137 South Atlantic Boulevard		●		
First Christian Church 268 South 5th Street	●	●	●	●
First Church of Christ Scientist 224 West Commonwealth Avenue		●		●
First Church of The Nazarene 1327 West Woodward Avenue		●		
First Taiwanese Presbyterian Church 60 West Commonwealth Avenue	●	●	●	●
Freeway Baptist Church 2535 Westminster Avenue	●	●	●	●
Garfield Avenue Baptist Church 923 South Garfield Avenue	●	●	●	●
Grace Lutheran Church 463 North Atlantic Boulevard		●		
Granada Park United Methodist Church 1850 West Hellman Avenue	●	●	●	●
Immanuel Baptist Church 2401 Florentina Avenue	●	●	●	●
Italian Christian Assembly Church 2859 West Valley Boulevard	●	●	●	●

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
Kingdom Hall of Jehovah's Witnesses 2310 West Main Street	●	●	●	●
Marengo Avenue Methodist Episcopal Church 1718 Acacia Street	●	●	●	●
Ramona Convent of The Holy Names 1562 West Glendon Way	●	●	●	●
Alhambra Christian Center and Second Baptist Church 538 South Stoneman Avenue	●	●	●	●
Temple Beth Torah 269 South Atlantic Boulevard		●		
The Church of Jesus Christ of Latter Day Saints 1212 South 8th Street	●	●	●	●
Unity Church 121 North 2nd Street	●	●	●	●
Westmont Baptist Church 3224 West Main Street			●	●
Alhambra High School (9th–12th) (Public) 101 South 2nd Street	●	●	●	●
Baldwin Elementary School (K–8th) (Public) 900 South Almansor Street	●	●	●	●
Century High School (9th–12th) (Public) 20 South Marengo Avenue		●		
Emery Park Elementary School (K–8th) (Public) 2821 West Commonwealth Avenue			●	●
Fremont Elementary School (K–8th) (Public) 2001 Elm Street	●	●	●	●
Garfield Elementary School (K–8th) (Public) 110 West McLean Street	●	●	●	●
Mark Keppel High School (9th–12th) (Public) 501 East Hellman Avenue	●	●	●	●
Marguerita Elementary School (K–8th) (Public) 1603 South Marguerita Avenue	●	●	●	●
Park Elementary School (K–8th) (Public) 301 North Marengo Avenue		●		
Ramona Elementary School (K–8th) (Public) 509 West Norwood Place	●	●	●	●
San Gabriel High School (9th–12th) (Public) 801 Ramona Street	●	●	●	●
William Northrup Elementary School (K–8th) (Public) 409 South Atlantic Boulevard		●		
All Souls Elementary (K–8th) (Private) 29 South Electric Avenue		●		
Emmaus Lutheran (Pre-K – 8th) (Private) 840 South Almansor Street Lutheran	●	●	●	●
Ramona Convent Secondary (Private 7th–12th) (Private) 1701 West Ramona Road	●	●	●	●
Sherman School (10th–12th) (Private) 1000 South Fremont Avenue, #29	●	●	●	●
St. Thomas More Catholic Elementary (Pre-K – 8th) (Private) 2510 South Fremont Avenue	●	●	●	●
YMCA West San Gabriel Valley (Private) 401 East Corto Street	●	●	●	●
Eagle Rock (Neighborhood in the City of Los Angeles)				
Eagle Rock Branch of the City of Los Angeles Public Library 5027 Casper Avenue	●	●	●	●
Eagle Rock Lutheran Church 5038 North Maywood Avenue	●	●	●	●
Eagle Rock Nazarene Church 2182 Fair Park Avenue	●	●	●	●

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
Eagle Rock Presbyterian Church 2182 Addison Way	●	●	●	●
Eagle Rock Seventh Day Adventist Church 2356 Merton Avenue	●	●	●	●
Gloria Baptist Church 2179 Yosemite Drive	●	●	●	●
Herrick Memorial Chapel 1600 Campus Road	●	●	●	●
Highland Park Seventh Day Adventist Church 5088 North Maywood Avenue	●	●	●	●
Pilgrim Holiness Church 1527 Hazelwood Avenue	●	●	●	●
Saint Barnabas Episcopal Church 5011 Caspar Avenue	●	●	●	●
Saint Dominic’s Church 2026 Merton Avenue	●	●	●	●
Celebrate Recovery Eagle Rock Seventh Day Adventist Church 2356 Morton Avenue	●	●	●	●
California Academy for Liberal Studies and Early College High School (9th–12th) (Public) 7350 North Figueroa Street	●	●	●	●
Delevan Drive Elementary School (K-6th) (Public) 168 West Avenue 42	●	●	●	●
Eagle Rock Elementary School (K-6th) (Public) 2057 Fair Park Avenue	●	●	●	●
Renaissance Arts Academy (6th–12th) (Public) 1800 Colorado Boulevard	●	●	●	●
Rockdale Elementary School (K–6th) (Public) 1303 Yosemite Drive	●	●	●	●
Toland Way Elementary School (K–6th) (Public) 4545 Toland Way	●	●	●	●
American Montessori Preschool & Elementary (K–8th) (Private) 4475 Eagle Rock Boulevard	●	●	●	●
Saint Dominic Elementary School (K-8th) Private) 2005 Merton Avenue	●	●	●	●
Occidental College (Private) 1600 Campus Drive	●	●	●	●
East Los Angeles (Unincorporated Los Angeles County)				
East Los Angeles Library 4837 East 3rd		●	●	
Los Angeles County Superior Court East Los Angeles Courthouse 214 South Fetterly Avenue		●	●	
Roybal Comprehensive Health Center 245 South Fetterly Avenue		●	●	
Armenian Pentecostal Church 1101 South Goodrich Boulevard		●		
Beverly Orthodox Presbyterian Church 347 South Woods Avenue		●	●	
Catholic Mission of Soledad Church 181 South Fetterly Avenue		●	●	
Chapel La Luz Assembleas De Dios 745 Belden Avenue		●		
Church of Divine Guidance 693 South La Verne Avenue		●		
Church of Our Lady of La Soledad 409 North McDonnell Avenue			●	
East Los Angeles Seventh Day Adventist Church 5618 Hubbard Street		●		

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
Eastmont Christian Church 5582 Hubbard Street		●		
El Camino Baptist Church 495 South Woods Avenue		●		
El Mesias Methodist Church 4538 East Cesar E. Chavez Avenue			●	
El Siloe Apostolic Church 726 South Ferris Avenue		●		
El Siloe Presbyterian Church 420 North Humphreys Avenue			●	
Iglesia Christiana 557 South Fetterly Avenue			●	
Primera Iglesia Bautista Del Sur 4878 East 6th Street		●		
Saint Alphonsus Catholic Church 541 Amalia Avenue		●		
Saint Pius X Catholic Center 4617 East 1st Street			●	
Saint Sarkis Armenian Apostolic Church 4976 Hubbard Street		●		
Bienestar East Los Angeles Office 5326 East Beverly Boulevard		●		
Our Lady of Solitude Church 4561 Cesar E. Chavez Avenue			●	
Door of Hope Community Center 1414 South Atlantic Boulevard		●		●
Alfonso Perez Special Education Center (Pre-K – 12th) (Public) 4540 Michigan Avenue			●	
Brooklyn Avenue Elementary School (K–8th) (Public) 4620 Cesar E. Chavez Avenue			●	
City Terrace Elementary School (K–5th) (Public) 4350 City Terrace Drive			●	●
David Wark Griffith Middle School (6th–8th) (Public) 4765 East 4th Street		●	●	
Fourth Street Elementary School (K–5th) (Public) 420 South Amalia Avenue		●		
Garfield High School (9th–12th) (Public) 5101 East 6th Street		●		
KIPP Raices Academy (K–4th) (Public) 668 South Atlantic Boulevard		●	●	
KIPP Academy of Innovation/Illuminar Academy/Sol Academy 4800 East Cesar E Chavez Avenue		●	●	
Media Arts High School (9th-12th) (Public) 5156 Whittier Boulevard		●		
Monterey Continuation High (9th–12th) (Public) 466 South Fraser Avenue		●		
Morris K. Hamasaki Elementary School (K–6th) (Public) 4865 East 1st Street		●		
Winter Gardens Elementary School (K–5th) (Public) 1277 South Clela Avenue		●		
Saint Alphonsus Elementary (K–9th) (Private) 552 South Amalia Avenue		●		
Soledad Enrichment Action (SEA), East Los Angeles Education Center (7th–12th) (Private) 4822 Gleason Street		●	●	
Bienvenidos – East Los Angeles Family Preservation (Public) 5257 East Beverly Boulevard		●		
Boys and Girls Clubs of East Los Angeles (Private) 324 North McDonnell Avenue			●	

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
Casa Maravilla Senior Center (Private) 4848 East Colonia De Las Rosas Casa Maravilla			●	
Eastmont Community Center (Private) 701 South Hoefner Avenue		●		
CSS – Centro Maravilla Service Center (Public) 4716 East Cesar E. Chavez Avenue			●	
El Sereno (Neighborhood in the City of Los Angeles)				
El Sereno Branch of the City of Los Angeles Public Library 5226 Huntington Drive South				●
Saints Roman Catholic Church 3438 Portola Avenue	●	●	●	●
El Sereno Church of the Nazarene 2609 Haven Street	●	●	●	●
El Sereno Community Presbyterian Church 5114 Oakland Street	●	●	●	●
El Sereno Foursquare Church 5046 Huntington Drive South	●	●	●	●
El Sereno Lutheran Church 3306 North Eastern Avenue	●	●	●	●
Kingdom Hall of Jehovah's Witness 3527 North Figueroa Street	●	●	●	●
Saint Bartholomew's Episcopal Church 4752 Huntington Drive South	●	●	●	●
Thirty-fifth Church of Christ Scientist 5171 Huntington Drive North				●
Anahuacalmecac University Preparatory High School/ Xinaxcalmecac Academy (K–6th) (Public) 4736 South Huntington Drive	●	●	●	●
Chavez Elementary School (K–6th) (Public) 5243 Oakland Street	●	●	●	●
El Sereno Elementary School (K–6th) (Public) 3838 Rosemead Avenue	●	●	●	●
El Sereno Middle School (6th–8th) (Public) 2839 North Eastern Avenue	●	●	●	●
Los Angeles County High School for the Arts (9th–12th) (Public) 5151 State University Drive	●	●	●	●
Sierra Park Elementary School (K–6th) (Public) 3170 Budau Avenue	●	●	●	●
Sierra Vista Elementary School (K–6th) (Public) 4342 Alpha Street	●	●	●	●
Stern Math and Science High School (9th–12th) (Public) 5151 State University Drive, Lot 7			●	●
All Saints Elementary School (K-8th) (Private) 3420 Portola Avenue	●	●	●	●
California State University Los Angeles (Cal State L.A.) (Public) 5151 State University Drive	●	●	●	●
Glassell Park (neighborhood in the City of Los Angeles)				
Occidental United Presbyterian Church 4390 York Boulevard	●	●	●	●
Montessori Children's World (K-2nd) (Private) 4371 Eagle Rock Boulevard	●	●	●	●
City of Monterey Park				
Monterey Park Bruggemeyer Library 318 South Ramona Avenue		●		
Los Angeles County Superior Court Juvenile Dependency Court 201 Centre Plaza Drive			●	
Garfield Medical Center 525 North Garfield Avenue	●	●	●	●

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
Monterey Park Hospital 900 South Atlantic Boulevard		●		
Christ Lutheran Church 417 North Garfield Avenue	●	●	●	●
Saint Stephen Catholic Church 320 West Garvey Avenue		●		
Bella Vista Elementary School (K–5th) (Public) 2410 Findlay Avenue		●		
Lane Elementary School (K–6th) (Public) 1500 Cesar Chavez Avenue		●		
Monterey Highlands Elementary School (K–6th) (Public) 400 Casuda Canyon Drive			●	
Repetto Elementary School (K–8th)(Public) 650 South Grandridge Avenue		●		
Ynez Elementary School (K–8th) (Public) 120 South Ynez Avenue		●		
Alpha-Shen, Inc. (K) (Private) 618 North Moore Avenue	●	●	●	●
Happy Day, Inc. (K) (Private) 507 North Chandler	●	●	●	●
Saint Stephen Martyr (K–9th) (Private) 119 South Ramona Avenue		●		
Saint Thomas Aquinas (K–9th) (Private) 1501 South Atlantic Boulevard		●		
East Los Angeles College (ELAC) 1301 Avenida Cesar Chavez		●		
Chinatown Service Center – Monterey Park Office (Private) 112 North Chandler Avenue, Suite 105		●		
Langley Senior Center (Public) 400 West Emerson Avenue				
Monterey Park Golf Course (Private) 3600 West Ramona Boulevard				
City of Pasadena				
Pasadena Public Library – Allendale Branch 1130 South Marengo Avenue		●	●	●
Pasadena Public Library - Central Library 285 East Walnut Street				●
Pasadena Public Library – Hill Avenue Branch 55 South Hill Avenue		●		
Pasadena Public Library – Villa Parke Branch 363 East Villa Street City of Pasadena				●
Los Angeles County Superior Court – Northeast District 300 East Walnut Street				●
Pasadena City Hall 100 North Garfield Avenue		●		●
United States Government Ninth Circuit Court of Appeals 125 South Grand Avenue	●	●	●	●
Huntington Memorial Hospital 100 West California		●	●	●
All Saints Episcopal Church 132 North Euclid Avenue				●
Calvary Baptist Church of Pasadena 1563 Colorado Boulevard		●		
First Church of Christ Scientist 84 South Oakland Avenue		●		●
First Congregational Church of Pasadena 466 East Walnut Street				●
Hill Avenue Grace Lutheran Church 41 North Hill Avenue		●		

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
Holliston United Methodist Church 1305 East Colorado Boulevard		●		
Knox Presbyterian Church 1387 East Del Mar Boulevard		●		
Marengo Avenue Community Church 240 Maple Street		●		●
Saint Andrews Roman Catholic Church 52 Corson Street		●		●
Saint Philip Roman Catholic Church 147 South Hill Avenue		●		
Trinity Lutheran Church 983 East Walnut Street		●		
Door of Hope 669 North Los Robles Avenue				●
Lake Avenue Community Foundation 712 East Villa Street				●
Meals On Wheels – Pasadena 54 North Oakland Avenue		●		●
New Revelations Baptist Church 855 North Orange Grove Boulevard				●
Saint Vincent De Paul/Saint Andrew's Catholic Church 140 Chestnut Street		●		
The Serra Project 1245 East Walnut Street		●		
Union Station – Adult Center 412 Raymond Avenue		●	●	●
Union Station's Shelter Intake – Passageways 1020 South Arroyo Parkway		●		
Villa 500 Community Outreach 500 East Villa Street				●
Blair High School (9th-12th) (Public) 1201 South Marengo Avenue	●	●	●	●
Madison Elementary School (K-5th) (Public) 515 Ashtabula Street				●
Roosevelt Elementary School (K-5th) (Public) 315 North Pasadena Avenue				●
Rose City High School (10th -12th) (Public) 351 Hudson Avenue		●		●
San Rafael Elementary School (K-5th) (Public) 1090 Nithsdale Road				●
Friends Western (2nd–7th) (Private) 524 East Orange Grove Boulevard				●
Grace Christian Academy (K–9th) (Private) 73 North Hill Avenue		●		
Lake Avenue Church School (Private) 393 North Lake Avenue		●		
Maranatha High School (9th–12th) (Private) 169 South St. John Avenue	●	●	●	●
Mayfield Junior School (K–9th) (Private) 405 South Euclid Avenue		●	●	
Mayfield Senior School (9th–12th) (Private) 500 Bellefontaine Street Private				●
New Horizon (K–9th) (Private) 651 North Orange Grove Boulevard				●
Pasadena Montessori (Pre-K – K) (Private) 280 South Los Robles Avenue		●		
Polytechnic (K–12th) (Private) 1030 East California Boulevard		●		

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
Sequoyah School (K-8th) (Private) 535 South Pasadena Avenue	●	●	●	●
Saint Andrew Elementary (Pre-K – 8th) (Private) 42 Chestnut Street				●
Saint Monica Academy (1st–12th) (Private) 301 North Orange Grove Boulevard				●
Saint Philip The Apostle (K–9th) (Private) 161 South Hill Avenue		●		
The Chandler (K–8th) (Private) 1005 Armada Drive				●
The Waverly School (Pre-K – 12th) (Private) 67 West Bellevue Drive	●	●	●	●
Westridge School for Girls (4th–12th) (Private) 324 Madeline Drive		●	●	●
California Institute of Technology (Private) 1200 East California Boulevard		●		
Fuller Theological Seminary (Private) 135 North Oakland Avenue		●		
Pasadena City College (Public) 1570 East Colorado Boulevard		●		
Armory Center For The Arts (Private) 145 North Raymond Avenue		●		●
El Centro De Accion Social (Private) 37 East Del Mar Boulevard	●	●	●	●
Pasadena Senior Center (Private) 85 East Holly Street		●		
Rose Bowl Aquatic Center (Private) 360 North Arroyo Boulevard				●
Salvation Army Corps Community Center-Pasadena (Private) 1000 East Walnut Street, Suite 102		●		
Arlington Garden 275 Arlington Drive	●	●	●	●
Pasadena Community Garden 721 Pasadena Avenue	●	●	●	●
Tournament Park (Private) East California Boulevard and South Wilson Avenue		●		
City of Rosemead				
Rosemead Branch of the Los Angeles County Public Library 8800 Valley Boulevard	●	●	●	●
Rosemead City Hall 8838 East Valley Boulevard	●	●	●	●
First Evangelical Church 8614 Marshall Street	●	●	●	●
Open Bible Church 7873 Hellman Avenue	●	●	●	●
Rosemead Christian Church 4043 Bartlett Avenue	●	●	●	●
Rosemead Foursquare Church 4470 Bartlett Avenue	●	●	●	●
Rosemead Korean Seventh Day Adventist Church 8985 Newby Avenue	●	●	●	●
Rosemead United Methodist Church 9057 Newby Avenue	●	●	●	●
Testimony of Christ Mission 8137 Hellman Avenue	●	●	●	●
Zion Lutheran Church 8 236 Hellman Avenue	●	●	●	●
Encinita Elementary School (7th -8th) (Public) 4515 North Encinita Avenue	●	●	●	●

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	BRT	LRT	Freeway Tunnel
Janson Elementary School (K- 6th) (Public) 4022 North Rosemead Boulevard	●	●	●	●
Muscatel Middle School (Pre-K-6th) (Public) 4201 North Ivar Avenue	●	●	●	●
Rosemead High School (9th-12th) (Public) 9063 East Mission Drive	●	●	●	●
Berean Christian School (8th-12th) (Private) 8618 Mission Drive	●	●	●	●
Rosemead Community Recreation Center (Public) 3936 North Muscatel Avenue	●	●	●	●
American Asian Pacific Ministries Inc. 4022 North Rosemead Boulevard	●	●	●	●
City of San Gabriel				
San Gabriel Library 500 South Del Mar Avenue	●	●	●	●
San Gabriel City Hall 425 South Mission Drive	●	●	●	●
Gideon Foursquare Church 264 East Mission Road	●	●	●	●
Mission San Gabriel Arcangel 470 South Mission Drive	●	●	●	●
Saint Anthony's Catholic Church 668 East Marshall Street	●	●	●	●
Saint Sava Serbian Orthodox Church 1690 South San Gabriel Boulevard	●	●	●	●
Unity Church of San Gabriel 673 Agostino Road	●	●	●	●
Del Mar High School (9th-12th) (Public) 312 South Del Mar Avenue	●	●	●	●
Dewey Elementary School (K-6th) (Public) 525 Dewey Avenue	●	●	●	●
Gabrielino High School (10th-12th) (Public) 1440 Lafayette Street	●	●	●	●
McKinley Elementary School (K-5th) (Public) 1425 Manley Drive	●	●	●	●
Child's World School (K) (Private) 1540 Manley Drive	●	●	●	●
Saint Anthony (Pre-K-8th) (Private) 1905 South San Gabriel Boulevard	●	●	●	●
San Gabriel Mission Elementary (Pre-K – 8th) (Private) 416 South Mission Drive	●	●	●	●
San Gabriel Mission High (9th-12th) (Private) 254 South Santa Anita Street	●	●	●	●
Asian Youth Center (Private) 100 West Clary Avenue	●	●	●	●
City of San Marino				
Crowell Public Library 1890 Huntington Drive	●	●	●	●
San Marino City Hall 2200 Huntington Drive	●	●	●	●
Saint Edmund's Episcopal Church 1175 South San Gabriel Boulevard	●	●	●	●
Saints Felicitas and Perpetua Church 1180 Palomar Road	●	●	●	●
San Marino Congregational Church 1434 Del Mar Avenue	●	●	●	●
Carver Elementary School (K-5th) (Public) 3100 Huntington Drive	●	●	●	●

TABLE 3.3.3:
Community Facilities within 0.5 Mile of the Build Alternatives

Name and Address of Community Facility	Facility Located within 0.5 Mile of a Build Alternative			
	TSM/TDM	**BRT**	**LRT**	**Freeway Tunnel**
Huntington Middle School (6th-8th) (Public) 1700 Huntington Drive	●	●	●	●
San Marino High School (9th-12th) (Public) 2701 Huntington Drive	●	●	●	●
Valentine Elementary School (K-5th) (Public) 1650 Huntington Drive	●	●	●	●
Saints Felicitas and Perpetua Elementary (K–9th) (Private) 2955 Huntington Drive Private	●	●	●	●
Southwestern Academy (6th–12th) (Private) 2800 Monterey Road	●	●	●	●
Huntington Library, Art Collections, and Botanical Gardens (Private) 1151 Oxford Road	●	●	●	●
San Marino Center (Public) 1800 Huntington Drive	●	●	●	●
San Marino Recreation Department (Stoneman School) (Public) 1560 Pasqualito Drive	●	●	●	●
City of South Pasadena				
South Pasadena Public Library 1100 Oxley Street		●	●	●
South Pasadena City Hall 1414 Mission Street		●	●	●
Calvary Presbyterian Church 1060 Fremont Avenue		●		●
Grace Brethren Church/South Pasadena Chinese Church 989 Exchange Lane		●	●	●
Holy Family Catholic Church 1367 Rollin Street		●	●	●
Oneonto Congregational Church 2058 Oak Street	●	●	●	●
Marengo Elementary School (K-5th) (Public) 1400 Marengo Avenue	●	●	●	●
Monterey Hills Elementary School (K-5th) (Public) 1624 Via Del Rey				●
South Pasadena High School (9th-12th) (Public) 1401 Fremont Avenue	●	●	●	●
South Pasadena Middle School (6th-8th) (Public) 1500 Fair Oaks Avenue	●	●	●	●
Almansor Academy (K–12th) (Private) 1955 Fremont Avenue	●	●	●	●
Holy Family School (K–9th) (Private) 1301 Rollin Street	●	●	●	●
Saint James Parish Day School (K) (Private) 1325 Monterey Road	●	●	●	●
South Pasadena Senior Center (Public) 1102 Oxley Street	●	●	●	●
YMCA South Pasadena/San Marino (Private) 1605 Garfield Avenue	●	●	●	●

Source: *Community Impact Assessment* (2014).
YMCA = Young Men's Christian Association

Build Alternatives

Based on their distance from the nearest construction of any improvements in the Build Alternatives and the presence of intervening land uses, none of the community facilities that are more than 500 feet (ft) from the physical improvements in the Build Alternatives would experience temporary air quality, noise, traffic/access, or parking effects during construction of the Build Alternatives. No TCEs would be required at any facilities more than 500 ft from the physical improvements in the Build Alternative. The analysis in the following sections focuses on the potential for temporary impacts on community facilities within 500 ft of improvements in the Build Alternatives.

Refer to Section 3.1, Land Use, and Section 3.4, Utilities/Emergency Services, for discussion regarding each Build Alternative's short-term effects on public parks and recreational resources and police and fire facilities within 0.5 mi of the Build Alternatives, respectively.

TSM/TDM Alternative

Lane restrictions during construction of the improvements in the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative may include lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours. In general, these improvements are minor, and no detours are anticipated to be needed. However, some travelers may choose alternate routes around the area to avoid construction activity and traffic delays.

There are 24 areas in Alhambra, Eagle Rock, El Sereno, Glassell Park, Pasadena, Rosemead, San Gabriel, San Marino, South Pasadena, and the Unincorporated San Gabriel Valley Communities where improvements under the TSM/TDM Alternative could result in temporary lane restrictions that may impact access and circulation. Construction activities associated with the improvements under the TSM/TDM Alternative would result in temporary delays for the traveling public and could result in minor disruptions to community and other events. The Transportation Management Plan (TMP) Data Sheet for the TSM/TDM Alternative, provided in the *Draft Project Report* (2014), identifies project features, including signing and other information to advise the traveling public about any upcoming detours, closures, or lane restrictions. The TSM/TDM Alternative is not anticipated to result in any temporary disruptions in access in the study area. Implementation of the TMP would minimize any potential impacts to access and minor disruptions to community and other events. Therefore, the TSM/TDM Alternative would not result in temporary adverse impacts on community cohesion in the cities, communities, or neighborhoods in the study area where these improvements are located.

Figure 3.3-1 shows the locations of community services and facilities within 0.5 mi of the improvements in the TSM/TDM Alternative. Figure 3.3-2 shows the locations of schools, parks, and recreation facilities within 0.5 mi of the improvements in the TSM/TDM Alternative. (Please note that the figures cited in this section are provided in Appendix L, Community Impacts Figures.)

Community facilities within 500 ft of the improvements in the TSM/TDM Alternative would potentially be subject to temporary adverse impacts during construction as described below.

- **Community Facilities that Could Experience Short-Term Air Quality, Noise, and Traffic/Access Effects:** The following community facilities could experience short-term air quality effects, noise level increases, and traffic/access effects during construction of the TSM/TDM Alternative improvements that would cease upon completion of project construction:

  - Fremont Elementary School (City of Alhambra)
  - California Academy for Liberal Studies and Early College High School (Eagle Rock neighborhood)
  - Occidental United Presbyterian Church and Montessori Children's World (Glassell Park neighborhood)
  - Maranatha High School and Sequoyah School (City of Pasadena)
  - Rosemead Korean Seventh Day Adventist Church, American Asian Pacific Ministries, and Rosemead High School (City of Rosemead)
  - San Gabriel Library, Saint Anthony's Catholic Church, and Saint Anthony School (City of San Gabriel)
  - Saint Edmund's Episcopal Church, Saints Felicitas and Perpetua Church, Carver Elementary School, Saints Felicitas and Perpetua Elementary School, and San Marino Recreation Department (City of San Marino)
  - Almansor Academy and Saint James Parish Day School (City of South Pasadena)

  In addition, Blair High School in the City of Pasadena could experience short-term air quality effects and noise level increases during construction of the TSM/TDM Alternatives.

- **Community Facilities that Could Experience Short-Term Traffic/Access Effects:** The following community facilities could also experience short-term traffic/access effects during construction in the vicinity of these facilities:
  - American Montessori Preschool & Elementary (Eagle Rock neighborhood)
  - San Marino City Hall (City of San Marino)
  - South Pasadena High School (City of South Pasadena)

Construction of the TSM/TDM Alternative would not require the use of land from any community facilities for TCEs and would not adversely impact parking at any community facilities.

As described above, the TSM/TDM Alternative would not result in short-term Adverse Effects on community character and cohesion.

BRT Alternative

Where widening or improvements are proposed along Atlantic Boulevard, Huntington Drive, and Fair Oaks Avenue in Alhambra, East Los Angeles, Monterey Park, and South Pasadena under the Bus Rapid Transit (BRT) Alternative, temporary lane restrictions (including lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours) would be required. Temporary ramp closures are also anticipated at the State Route 60 (SR 60) on-ramps to reconstruct parts of the ramps to widen and accommodate BRT service on Atlantic Boulevard. In general, these improvements are minor and would not result in major travel delays. However, some travelers may choose alternate routes around the area to avoid construction activity and traffic delays.

Construction activities associated with the improvements under the BRT Alternative would result in temporary delays for the traveling public and could result in minor disruptions to community and other events. The TMP Data Sheet for the BRT Alternative identifies project features, including signing and other information to advise the traveling public about any upcoming detours, closures, or lane restrictions. The BRT Alternative is not anticipated to result in any temporary disruptions in access in the study area. Implementation of the TMP would minimize any potential impacts to access and community events. Therefore, the BRT Alternative would not result in any temporary adverse impacts on community character and cohesion in the cities, communities, and neighborhoods in the study area.

Figure 3.3-3 in Appendix L shows the locations of community services and facilities within 0.5 mi of the improvements in the BRT Alternative. Figure 3.3-4 (also in Appendix L) shows the locations of schools, parks, and recreation facilities within 0.5 mi of the improvements in the BRT Alternative.

Community facilities within 500 ft of the improvements in the BRT Alternative would potentially be subject to temporary adverse impacts during construction as described below.

- **Community Facilities that Could Experience Short-Term Air Quality, Noise, and Traffic/Access Effects:** The following community facilities could experience short-term air quality effects, noise level increases, and traffic/access effects during construction of the BRT Alternative improvements that would cease upon completion of project construction:
  - First Baptist Church and William Northrup Elementary School (City of Alhambra)
  - KIPP Raices Academy and Media Arts High School (East Los Angeles)
  - Monterey Park Hospital and Saint Thomas Aquinas School (City of Monterey Park)
  - Huntington Memorial Hospital, Knox Presbyterian Church, Pasadena Montessori, and El Centro De Acción Social (City of Pasadena)
  - South Pasadena Middle School (City of South Pasadena)
- **Community Facilities that Could Experience Short-Term Air Quality Effects:** The following community facilities could experience short-term air quality effects and noise level increases during construction of the BRT Alternative improvements:
  - Saint Alphonsus Catholic Church and Saint Alphonsus Elementary School (East Los Angeles)
  - Happy Day, Inc. (City of Monterey Park)
  - Pasadena City College (City of Pasadena)
- **Community Facilities that Could Experience Short-Term Noise Effects:** In addition, the following community facilities could experience short-term noise level increases during construction that would be temporary in nature and would cease on completion of the project construction:
  - Fourth Street Elementary School and Garfield High School (East Los Angeles)
  - East Los Angeles College (City of Monterey Park)
  - Saint Philip Roman Catholic Church (City of Pasadena)
- **Community Facilities that Could Experience Short-Term Traffic/Access Effects:** The following community facilities could experience short-term traffic/access effects during construction that would be avoided and/or minimized based on implementation of the

TMP and maintenance of access to these facilities during construction in the vicinity of these facilities:

- Temple Beth Torah (City of Alhambra)
- Holliston United Methodist Church (City of Pasadena)

Construction of the BRT Alternative would not require the use of land from any community facilities for TCEs and would not adversely impact parking at any community facilities.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to Interstate 10 [I-10]). As a result, the BRT Alternative would also result in the same short-term construction effects on community character and cohesion as the other improvements in the TSM/TDM Alternative. In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would not result in short-term Adverse Effects on community character and cohesion.

LRT Alternative

Construction of the LRT Alternative would result in a number of short-term traffic effects on roads in the study area. None of the lane closures described below are anticipated to require signed detour routes; however, the road closures described below would require advance public and driver notification to use alternative routes.

Where the elevated alignment of the LRT would cross SR 60, Interstate 710 (I-710)/SR 710, or other roads, overnight closures would be required to accommodate the placement of concrete barriers adjacent to the median and the construction of falsework. Other than these overnight closures, the roads below the aerial LRT alignment would remain open during construction of the LRT Alternative. The falsework will be designed so there are no vertical clearance impairments for vehicles traveling under the falsework.

There are nine areas in Alhambra, East Los Angeles, El Sereno, Monterey Park, Pasadena, and South Pasadena where improvements under the LRT Alternative could result in temporary lane restrictions that may impact access and circulation. These areas are:

- **Mednik Avenue from First Street to Floral Drive in East Los Angeles:** Mednik Avenue would be reduced to one lane in each direction for construction of the median and the columns supporting the LRT alignment.
- **Floral Station Area in East Los Angeles and Monterey Park:** Floral Drive between Dangler Avenue and Mednik Avenue would be subject to temporary lane restrictions to accommodate the station construction.
- **Elevated LRT Alignment in I-710/SR 710 ROW in El Sereno and Monterey Park:** The outside southbound lane of I-710/SR 710 would be subject to occasional short-term closures to bring equipment/material on site.
- **Cal State LA Station Area in El Sereno:** Circle Drive would be the access route for construction equipment/materials and may be blocked occasionally as equipment is transported to and from the station area.

- **Valley Boulevard in El Sereno and Alhambra:** The eastbound lanes of Valley Boulevard would be temporarily shifted to the south to accommodate the construction of columns in the inside eastbound lane that would support falsework for the deck of the LRT bridge to the maintenance yard.
- **All Underground Stations** (i.e., four locations in Alhambra, Pasadena, and South Pasadena):
  - Utility relocations would require daytime lane and sidewalk closures on weekdays. In most cases, at most one lane and one sidewalk would be closed at the same time.
  - Drilling of piles to support the temporary roadway deck and the installation of the support excavation walls for the station would require daytime closures of one lane and possibly adjacent sidewalks. Cross streets may also be impacted (e.g., Mission Street at Fair Oaks Avenue, California Boulevard at Raymond Avenue, and the southbound right-turn lane from Fair Oaks Avenue to Huntington Drive).
  - Excavation of the first 10 to 15 ft of the station would be done without decking and would be conducted primarily in the evenings and on weekends, to the extent feasible.
  - The installation of the roadway deck could require multiple consecutive weekend (Friday night to Monday morning) full road closures. Cross streets may also be affected (e.g., Mission Street at Fair Oaks Avenue, California Boulevard at Raymond Avenue) may also be impacted as well as the southbound right-turn lane from Fair Oaks Avenue to Huntington Drive. The duration/sequencing of deck installation would be determined by engineering requirements and public input.

All underground stations, before construction of the tunnel segments (i.e., bored and cut-and-cover) and the underground station boxes for the LRT Alternative, would generate excess excavated soil and rock materials that cannot be reused within the project limits. That material is proposed to be disposed of at two former rock quarries (the Manning and Olive Pits) in the City of Irwindale. The preliminary routes for hauling spoils material generated during construction of the LRT Alternative include segments on Fair Oaks Avenue (from the South Pasadena and Fillmore Station sites) and Fremont Avenue (from the Huntington and Alhambra Station sites); on Arrow Highway and Live Oak Avenue (to/from Interstate 605 [I-605] at the disposal end of the haul trips), and Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit). The haul routes will be used only during construction of the LRT Alternative tunnel segments and underground station boxes. Any hazardous materials that are disturbed/removed during construction would be identified, characterized, treated, and disposed of in accordance with applicable local, State, and federal regulations and requirements. Hazardous materials would be disposed of during construction activities at a Class I or II disposal facility in conformance with applicable regulatory requirements.

The detours, delays, and/or haul trips would result in minor temporary disruptions to local pedestrian and vehicular traffic, which would result in minor temporary disruptions to access in the study area. In addition, the LRT Alternative could result in minor disruptions to community and other events. Therefore, the LRT Alternative would not result in any temporary adverse impacts on community character and cohesion in the cities, communities, and neighborhoods in the study area. Implementation of the TMP would minimize any potential impacts to access and community events.

Figure 3.3-5 in Appendix L shows the locations of community services and facilities within 0.5 mi of the improvements in the LRT Alternative. Figure 3.3-6 (also in Appendix L) shows the locations of schools, parks, and recreation facilities within 0.5 mi of the improvements in the LRT Alternative.

Because the bored tunnel section of the LRT line would be constructed underground, that segment of the LRT Alternative would not result in temporary construction air quality, noise, traffic/access, or parking effects on community facilities other than those related to the hauling of spoils from the station box excavation sites and would not require any TCEs from those resources.

Community facilities within 500 ft of the physical improvements in the LRT Alternative that would be constructed at or above the ground surface would be subject to the following short-term air quality, noise, and traffic/access impacts:

- **Use of Land from a Community Facility for a TCE:** The LRT Alternative would require the use of approximately 1.7 acre (ac) of vacant land on the California State University, Los Angeles (Cal State LA) campus for a TCE during construction of the LRT station at this University.
- **Community Facilities that Could Experience Short-Term Air Quality, Noise, and Traffic/Access Effects:** The following community facilities could experience short-term air quality effects, noise level increases, and traffic/access effects during construction of the LRT Alternative improvements:
  - Sherman School (City of Alhambra)
  - KIPP Academy of Innovation/Illuminar Academy/Sol Academy, Roybal Comprehensive Health Center, Catholic Mission of Soledad Church, Soledad Enrichment Action East, David Wark Griffith Middle School and Casa Maravilla (East Los Angeles)
  - Cal State LA (El Sereno neighborhood)
- **Community Facilities that Could Experience Short-Term Traffic/Access Effects:** In addition, the following community facilities could experience short-term traffic effects during construction:
  - East Los Angeles Courthouse and Morris K. Hamasaki Elementary School (East Los Angeles)
  - Huntington Memorial Hospital (City of Pasadena)
  - South Pasadena Middle School (City of South Pasadena)

The construction of the LRT Alternative would not result in parking effects on community facilities.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). As a result, the LRT Alternative would also result in most of the same short-term construction effects on community character and cohesion as the TSM/TDM Alternative; however, the LRT Alternative would result in traffic detours and delays for motorists on Valley Boulevard at SR 710 over a longer period of time than the TSM/TDM Alternative. In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would not result in short-term Adverse Effects on community character and cohesion.

Freeway Tunnel Alternative

Construction of the improvements in the vicinity of the north and south portals for the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would take place in several stages. The stages at the north and south tunnel portals would not necessarily coincide. Some construction stages would occur in phases to maintain traffic lanes. Prior to the estimated time of construction, coordination would take place to ensure that the proposed closures and/or detours would be coordinated with other transportation improvement projects in the area that may be impacted and that potential traffic impacts during the construction of this alternative are adequately addressed.

The single-bore design variation of the Freeway Tunnel Alternative would result in delays or detours at the following locations in the vicinity of the south and north tunnel portals:

- **South Tunnel Portal Vicinity**
  - **Delays**
    - Northbound/southbound SR 710 mainline lanes
    - Hellman Avenue Bridge over SR 710
    - Valley Boulevard at SR 710
    - Northbound SR 710 off-ramp to Valley Boulevard
    - Valley Boulevard on-ramp to southbound SR 710
  - **Detours**
    - Eastbound El Monte Busway ramp to northbound SR 710
    - Westbound I-10 connector to northbound SR 710
    - Southbound SR 710 connector to westbound I-10
    - Southbound SR 710 connector to eastbound I-10
    - Southbound SR 710 connector to westbound El Monte Busway
    - Northbound SR 710 off-ramp to Valley Boulevard
    - Valley Boulevard on-ramp to southbound SR 710
- **North Tunnel Portal Vicinity**
  - **Delays**
    - Southbound SR 710 mainline lanes
    - St. John Avenue between Del Mar Boulevard and California Boulevard
    - St. John Avenue between Green Street and Del Mar Boulevard
    - Northbound SR 710 mainline lanes
    - Southbound SR 710 off-ramp to St. John Avenue
    - Southbound SR 710 mainline lanes
    - Colorado Boulevard Bridge over SR 710
    - Union Street Bridge over SR 710

- **Detours**
  - Pasadena Avenue on-ramp to northbound SR 710
  - Eastbound State Route 134 (SR 134) connector to SR 710 and California Boulevard
  - Green Street Bridge over SR 710
  - Westbound Interstate 210 (I-210) connector to southbound SR 710
  - Southbound SR 710 south of St. John Avenue off-ramp
  - Northbound SR 710 on-ramp from Pasadena Avenue south of Del Mar Boulevard
  - Northbound SR 710 on-ramp from Del Mar Boulevard
  - Northbound SR 710 connector to westbound SR 134
  - Northbound SR 710 connector to eastbound I-210
  - Southbound SR 710 off-ramp to Del Mar Boulevard
  - Del Mar Boulevard Bridge over SR 710

The dual-bore design variation of the Freeway Tunnel Alternative would result in delays or detours at the same locations as the single-bore design variation, but would also result in delays or detours at the following locations in the vicinity of the south and north tunnel portals:

- **South Tunnel Portal Vicinity**
  - **Delays**
    - Westbound I-10 connector to southbound SR 710
  - **Detours**
    - Eastbound I-10 connector to northbound SR 710
    - Ramona Boulevard on-ramp to northbound SR 710

Construction activities associated with the improvements under both the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would result in temporary delays and detours for the traveling public and could result in disruptions to community and other events. The TMP Data Sheet for the Freeway Tunnel Alternative identifies project features, including signing and other information to advise the traveling public about any upcoming detours, closures, or lane restrictions. Implementation of the TMP would minimize any potential impacts to access and community events.

Construction activities associated with the bored and cut-and-cover tunnel segments of the Freeway Tunnel Alternative design variations would generate excess excavated soil and other material that cannot be reused within the project limits. That material is proposed to be disposed of at two identified former rock quarries (the Manning and Olive Pits) in the City of Irwindale. Additional spoil disposal sites may be identified and utilized if necessary. The preliminary route for hauling spoils material generated at the south tunnel portal during construction of the Freeway Tunnel Alternative includes a short segment on SR 710 south to I-10. The preliminary route at the disposal end of the trip includes Live Oak Avenue and Arrow Highway (to/from I-605 at the disposal end of the haul trips), and Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit). The haul routes will be used only during construction of the Freeway Tunnel Alternative. Any hazardous materials that are disturbed/removed during construction would be identified, characterized, treated, and disposed of in accordance with applicable local, State, and federal regulations and requirements. Hazardous materials would be disposed of during construction activities at a Class I or II disposal facility in conformance with applicable regulatory requirements.

At the north and south tunnel portals, haul trucks will enter SR 710 without traveling on local streets. The preliminary route at the disposal end of the trip under both design variations includes Live Oak Canyon and Arrow Highway (to/from I-605 at the disposal end of the haul trips), and Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit). The haul routes will be used only during construction of the Freeway Tunnel Alternative tunnel.

Because the detours and delays or haul trips would result in minor temporary disruptions to local pedestrian and vehicular traffic, neither Freeway Tunnel Alternative design variation is anticipated to result in temporary disruptions to access to the study area. Therefore, neither Freeway Tunnel Alternative design variation would result in temporary impacts on community character and cohesion in the cities, communities, or neighborhoods in the study area.

Figure 3.3-7 in Appendix L shows the locations of community services and facilities within 0.5 mi of the improvements in the Freeway Tunnel Alternative. Figure 3.3-8 (also in Appendix L) shows the locations of schools, parks, and recreation facilities within 0.5 mi of the improvements in the Freeway Tunnel Alternative.

Because construction of the bored tunnel segment of both the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would occur underground, the bored tunnel segment would not result in temporary construction air quality, noise, traffic/access, or parking effects or require any TCEs at any community facilities.

Community facilities within 500 ft of the improvements that would be constructed at or above the ground surface under either design variation of the Freeway Tunnel Alternative would be subject to short-term impacts related to air quality, noise, and traffic/access. Because the improvements in the single-bore and dual-bore design variations would be constructed in generally the same areas, both design variations would potentially impact the same resources as follows:

- **Use of Land from a Community Facility for a TCE:** The Freeway Tunnel Alternative would require the use of approximately 0.2 ac of land on the Cal State LA campus for a TCE during construction of the freeway improvements in this area.
- **Community Facilities that Could Experience Short-Term Air Quality, Noise, and Traffic/Access Effects:** The following community facilities could experience short-term air quality effects, noise level increases, and traffic/access effects during construction of the Freeway Tunnel Alternative improvements:
  - Cal State LA (El Sereno neighborhood)
  - Maranatha High School and Sequoyah School (City of Pasadena)
- **Community Facilities that Could Experience Short-Term Noise Effects:** In addition, the following community facilities could experience short-term noise level increases during

construction that would be temporary in nature and would cease on completion of the project construction:

- Roosevelt Elementary School, Friends Western School (City of Pasadena)

The construction of the Freeway Tunnel Alternative would not result in parking effects on community facilities.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). As a result, the Freeway Tunnel Alternative would also result in most of the same short-term construction effects on community character and cohesion as the TSM/TDM Alternative; however, the Freeway Tunnel Alternative would result in traffic detours and delays for motorists on Valley Boulevard at SR 710 over a longer period of time than the TSM/TDM Alternative. In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the Freeway Tunnel Alternative would not result in short-term Adverse Effects on community character and cohesion.

Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in permanent adverse impacts on community character and cohesion related to permanent easements and ROW acquisition, and changes in transportation connectivity and access potentially associated with the improvements in the Build Alternatives. It is possible that the operation of improvements in the No Build Alternative could result in permanent adverse air quality, noise, and traffic/access effects in the study area. Those effects would be analyzed and mitigated, if needed, as part of a separate environmental review process as each of those projects/improvements is advanced for implementation. As discussed in Section 1.2.2, Need for the Project, the communities in the study area are currently affected by the inability to efficiently move along the existing roadway network. Under the No Build Alternative, this congestion would increase, thereby exacerbating existing mobility conditions associated with out-of-direction traffic utilizing local arterials.

Build Alternatives

Based on their distance from the operation of the nearest improvements in the Build Alternatives and the presence of intervening land uses, none of the community facilities that are more than 500 ft from the improvements in the Build Alternatives would experience long-term operational air quality, noise, traffic/access, or parking effects under the Build Alternatives. The analysis in the following sections focuses on the potential for permanent impacts on community facilities within 500 ft of improvements in the Build Alternatives.

Refer to Sections 3.1, Land Use, and 3.4, Utilities/Emergency Services, for discussion regarding each Build Alternative’s long-term operational effects on public parks and recreational resources and police and fire facilities within 0.5 mi of the Build Alternatives, respectively.

TSM/TDM Alternative

The improvements in the TSM/TDM Alternative would result in minor permanent changes in access or circulation in the following eight areas in Alhambra, Eagle Rock, Pasadena, San Gabriel, and South Pasadena:

- **Atlantic Boulevard from Glendon Way to I-10 (Local Street Improvement L-3):** This improvement would modify access to properties along Atlantic Boulevard and the residential neighborhoods along Glendon Way and Norwood Place from Atlantic Boulevard in Alhambra.
- **Garfield Avenue from Valley Boulevard to Glendon Way (Local Street Improvement L-4):** This improvement would modify access to residential neighborhoods along Glendon Way and Norwood Place from Garfield Avenue in Alhambra.
- **West Broadway/Colorado Boulevard (Intersection Improvement I-1):** This improvement would modify access from eastbound Colorado Boulevard to Lockhaven Avenue in Eagle Rock.
- **St. John Avenue Extension between Del Mar Boulevard and California Boulevard (Other Road Improvement T-3):** This improvement would connect Waverly Drive, Bellevue Drive, and Palmetto Drive, which are currently cul-de-sacs, with the St. John Avenue extension in Pasadena.
- **Del Mar Avenue/Mission Road (Intersection Improvement I-19):** This improvement would modify access from westbound El Monte Street to Del Mar Avenue in San Gabriel.
- **Fremont Avenue from Huntington Drive to Alhambra Road (Local Street Improvement L-2a):** This improvement would modify access to properties along Fremont Avenue and the residential neighborhoods along Oneonta Knoll Street, Beech Street, Maple Street, and Elmpark Street in South Pasadena.
- **Fair Oaks Avenue from Grevelia Street to Monterey Road (Local Street Improvement L-8) and Fair Oaks Avenue/Monterey Road (Intersection Improvement I-8):** These improvements would modify access to properties along Fair Oaks Avenue and commercial uses along Oxley Street, El Centro Street, Mission Street, and Hope Street in South Pasadena.
- **State Route 110 (SR 110)/Fair Oaks Avenue Hook Ramps (Other Road Improvement T-2):** This improvement would modify access from northbound Fair Oaks Avenue to southbound SR 110 in South Pasadena/Pasadena.

The TSM/TDM Alternative would also enhance existing bus service by reducing headways on 20 bus routes that serve the study area. Transit riders using these bus routes would likely experience decreased travel times because buses would run more frequently and provide improved connections to other transit services (bus and light rail) along their routes.

The TSM/TDM Alternative would provide six new Class III bikeways in Alhambra, Arcadia, La Cañada Flintridge, Pasadena, Rosemead, San Gabriel, San Marino, South Pasadena, Temple City, and the Unincorporated San Gabriel Valley Communities. These bikeways would enhance connectivity to transit facilities and other bicycle facilities throughout the study area for cyclists.

The TSM/TDM Alternative improvements would result in minor changes in access or circulation; however, they would also provide the traveling public with modest improvements in mobility and increase the efficiency of the existing circulation system without dividing or otherwise adversely affecting the character of the communities in which they would be located.

Because the TSM/TDM Alternative would result in a minimal number of nonresidential displacements, including the displacement of one business, it would not affect the character or cohesion of the communities in which the TSM/TDM Alternative improvements would be located. Further, as described in the FRIR, there is an adequate supply of replacement properties available in the study area to relocate this displaced business. Therefore, it is anticipated that the displaced business could be relocated near its current location without disrupting the social fabric of the community in which it is located.

Due to the nature of the TSM/TDM Alternative improvements, some are not classified as Type I projects, as defined by the Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects (May 2011) which could potentially generate a permanent noise increase. The following community facilities are not located within 500 ft of any Type I Project, defined by the Caltrans Noise Protocol as the study area for that project and, therefore, would not experience a permanent noise increase due to the TSM/TDM Alternative improvements:

- Fremont Elementary School (City of Alhambra)
- California Academy for Liberal Studies and Early College High School (Eagle Rock neighborhood)
- Occidental United Presbyterian Church and Montessori Children's World (Glassell Park neighborhood)
- American Asian Pacific Ministries (City of Rosemead)
- San Gabriel Library, Saint Anthony's Catholic Church, Saint Anthony School (City of San Gabriel)
- Saint Edmund's Episcopal Church, Saints Felicitas and Perpetua Church, Carver Elementary School, Saints Felicitas and Perpetua Elementary School, and San Marino Recreation Department (City of San Marino)
- Saint James Parish Day School (City of South Pasadena)

Community facilities within 500 feet of the physical improvements in the TSM/TDM Alternative that are classified as Type I Projects and would potentially be subject to permanent noise impacts are as follows:

- Blair High School, Maranatha High School, and Sequoyah School (City of Pasadena)
- Rosemead Korean Seventh Day Adventist Church and Rosemead High School (City of Rosemead)
- Almansor Academy (City of South Pasadena)

Although most of the facilities within 500 feet of the Type I Projects included in the TSM/TDM Alternative are anticipated to experience a permanent noise level increase of less than 3 dB, which would be barely perceptible to the human ear, two of these facilities (Blair

High School and Maranatha High School in Pasadena) would experience a permanent noise level increase of 3 dB or greater. However, neither of these schools engage in noise-sensitive outdoor activities on a routine basis. Further, based on visual inspections of the exterior of these facilities and the warm climate in the portion of Los Angeles County in which these facilities are located, each of these facilities are likely to rely on air conditioning in lieu of opening windows for ventilation; therefore, the permanent noise level increases under the TSM/TDM Alternative would not adversely affect their ability to serve the community.

The operation of the TSM/TDM Alternative would not result in permanent adverse impacts on community facilities related to the permanent acquisition of land, permanent easements, air quality, traffic/access, and parking, and would not result in permanent Adverse Effects on community character and cohesion.

BRT Alternative

The BRT Alternative would enhance existing bus service by reducing headways on 20 bus routes that serve the study area and would replace the existing Metro Route 762 service in the study area with a limited stop, high-frequency bus service that would travel along a combination of new, dedicated, and existing bus lanes and mixed-flow traffic lanes. Under the BRT Alternative, transit riders using these bus routes would experience decreased travel times because buses would run more frequently and would improve connections to other transit service along their routes. The BRT Alternative would also provide a new bus feeder route between the Atlantic Boulevard Gold Line Station and the Commerce and Montebello Metrolink Stations, which would provide the study area with improved transit connections to the Orange County and Riverside Metrolink lines, and a new bus feeder route between downtown Pasadena and the El Monte Transit Station via Rosemead Boulevard and Colorado Boulevard, which would provide improved transit connections in the eastern San Gabriel Valley.

Because the BRT Alternative would not result in any displacements, it would not adversely affect the character or cohesion of the communities in which the BRT Alternative improvements would be located.

Community facilities within 500 ft of the physical improvements in the BRT Alternative could be subject to permanent impacts related to the use of land from community facilities and noise as follows:

- **Community Facilities that Could Experience Long-Term Noise Effects:** The following community facilities could experience permanent noise level increases during operation of the BRT Alternative.
  - Saint Alphonsus Catholic Church, Fourth Street Elementary School, Garfield High School, KIPP Raices Academy, and Saint Alphonsus Elementary School (East Los Angeles)
  - Monterey Park Hospital, Happy Day, Inc., and Saint Thomas Aquinas School (City of Monterey Park)
  - Huntington Memorial Hospital (City of Pasadena)
  - South Pasadena Middle School (City of South Pasadena)

Although one of these facilities (South Pasadena Middle School) is anticipated to experience a permanent noise level increase of 3 decibels (dB), most facilities are anticipated to experience a permanent noise level increase of less than 3 dB, which would be barely perceptible to the human ear. Because South Pasadena Middle School does not appear to engage in noise-sensitive outdoor activities on a routine basis and, based on a visual inspection of the exterior of its facilities and the warm climate in which it is located, is likely to rely on air conditioning instead of opening windows for ventilation, the permanent noise level increase anticipated to occur under the BRT Alternative would not adversely affect its ability to serve the community.

The operation of the BRT Alternative improvements would not result in permanent adverse impacts on community facilities related to permanent acquisitions of land, permanent easements, air quality, traffic/access, and parking.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). As a result, the BRT Alternative would also result in the same permanent effects on community character and cohesion as the other improvements in the TSM/TDM Alternative. In summary, with the TSM/TDM Alternative improvements described above, the BRT Alternative would not result in permanent Adverse Effects on community character and cohesion.

LRT Alternative

Under the LRT Alternative, high-frequency light rail service would be established along a direct route between East Los Angeles and Pasadena, which would benefit transit riders in northeast Los Angeles and the western San Gabriel Valley. Transit riders, particularly those who live or work near one of the LRT stations, would likely experience decreased travel times, especially on north-south trips, because transit services would operate more frequently and offer improved connections between destinations. The LRT Alternative would also provide two new bus feeder routes in the study area. The new bus feeder route between the Floral Station and the Commerce and Montebello Metrolink Stations would provide improved transit connections to the Orange County and Riverside Metrolink lines. The new bus feeder route between the Fillmore Station and the El Monte Bus Station via Rosemead Boulevard and Colorado Boulevard would provide improved transit connections to the eastern San Gabriel Valley.

Because the LRT Alternative would result in a minimal number of nonresidential displacements, it would not adversely affect the character or cohesion of most of the communities in which the LRT Alternative improvements would be located (i.e., Alhambra, El Sereno, Monterey Park, Pasadena, and South Pasadena). Further, as described in the FRIR, there is an adequate supply of replacement properties available in the study area in which to relocate the displaced businesses, although some may not be relocated near their existing sites.

Due to the nonessential nature of the services (i.e., embroidery, marketing, publishing, realty, and financial investment services) provided by the 20 businesses that would be displaced from Monterey Park under the LRT Alternative, local residents do not appear to rely on their services for their essential needs. Therefore, their displacement would not disrupt the social fabric of the City of Monterey Park.

Similarly, because all of the 9 businesses that would be displaced in the City of Pasadena under the LRT Alternative provide non-essential services (industrial uses and light manufacturing, auto repair, and offices), their displacement would not disrupt the social fabric of the City of Pasadena.

Although local residents appear to rely on many of the goods and services (beauty services, dry cleaning, insurance sales, banking, coffee shop, drug store, general merchandise, bookstore, pet supplies, and offices) provided by the 28 businesses that would be displaced from the South Pasadena and Huntington Station sites under the LRT Alternative on a day-to-day basis, many businesses in the vicinity of the South Pasadena and Huntington Station sites offer the same types of goods and services as the businesses that would be displaced under the LRT Alternative. Therefore, local residents would still be able to receive goods and services similar to those currently provided by the businesses that would be displaced. Further, based on the relatively low percentage of transit-dependent residents in the areas surrounding the South Pasadena and Huntington Station sites, most local residents would be able to drive to the new locations of those businesses that would be displaced from these station sites, if so desired. Therefore, the business displacements associated with the LRT Alternative would not disrupt the social fabric of the City of South Pasadena.

In the unincorporated community of East Los Angeles, the LRT Alternative would result in the displacement of 17 adjacent neighborhood-oriented businesses along Mednik Avenue just south of SR 60, which would disrupt the social fabric of the community in this area. Based on the currently available properties for relocation described in the DRIR, these businesses are not likely to be relocated in the immediate vicinity of their current locations. Due to the types of services these businesses offer (laundromat, drinking water, credit union, and restaurants), their location near the East Los Angeles Civic Center, and the high percentage of transit-dependent residents in the area, local residents are likely to rely on the services provided by these businesses on a day-to-day basis. Therefore, the displacement of these 17 neighborhood-oriented businesses would adversely affect the community character and cohesion of this part of East Los Angeles.

Compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) of 1970, as described in Measure CI-1 in Section 3.3.2.4, would reduce the impacts of the LRT Alternative on community character and cohesion related to property acquisition and the displacement and relocation of nonresidential uses. However, compliance with the Uniform Act would not fully minimize the impact to the social fabric of the community of East Los Angeles due to the displacement of the 17 neighborhood-oriented businesses from the Mednik Station site. Therefore, the LRT Alternative would result in unavoidable Adverse Effects on the community character and cohesion of East Los Angeles.

Under the LRT Alternative, Mednik Avenue would be permanently reduced to one lane in each direction between First Street and Floral Drive in East Los Angeles in order to accommodate the columns supporting the aerial improvements of the LRT alignment in the median of the street. A raised median constructed in the center of Mednik Avenue along this segment would modify the intersections of Mednik Avenue/Dozier Street and Mednik

Avenue/Fisher Street to establish right-turn only access into and out of Dozier Street and Fisher Street. Although this improvement would limit direct access between Mednik Avenue and the residential neighborhoods along Dozier Street and Fisher Street, the traveling public would still be able to make left turns to and from Mednik Avenue via Hammel Street and Cesar Chavez Avenue. In addition, the existing crosswalks on Mednik Avenue at Floral Drive, Hammel Street, Cesar Chavez Avenue, First Street, Civic Center Way, and Third Street would remain open during operation of the LRT Alternative. Because the proposed LRT line would be located on an elevated structure in East Los Angeles and Monterey Park and would not impede circulation in the area, the LRT Alternative would not create any new barriers in or physically divide an existing community.

Because the operation of the bored tunnel segment of the LRT line would occur underground, this segment of the LRT Alternative would not result in long-term operational air quality, noise, traffic/access, or parking effects on community facilities.

Community facilities within 500 ft of the at- and above-grade improvements in the LRT Alternative would be subject to land use and noise impacts as follows:

- **Community Facilities from Which Permanent Acquisition of Land May be Needed:**
  - The LRT Alternative would permanently acquire approximately 3 ac of vacant land on the Cal State LA campus for permanent incorporation into the LRT Alternative station at this University. Because this acquisition consists of vacant land that is not used by Cal State LA for academic or ancillary uses, the LRT Alternative is not anticipated to affect the university's ability to serve the community or the community cohesion of the surrounding area.
  - The LRT Alternative would also permanently acquire approximately 0.008 acres (or 343 square feet) of the KIPP Academy of Innovation/Illuminar Academy/Sol Academy in East Los Angeles campus for incorporation into a sidewalk at the southeast corner of Mednik and Cesar Chavez Avenues. Because this small acquisition consists of a landscaped area that is not used by the school for academic or ancillary uses, the LRT Alternative is not anticipated to affect the school's ability to serve the community or the community cohesion of the surrounding area.
- **Community Facilities Which Could Experience Long-Term Noise Effects:** The community facilities listed below would experience permanent noise level increases during operation of the LRT Alternative. However, due to implementation of the noise barriers as noise abatement , none of these facilities will experience a permanent noise level increase that would exceed noise level standards; therefore, the permanent noise level increases anticipated to occur at these facilities under the LRT Alternative would not adversely affect their ability to serve the community.
  - Kipp Academy of Innovation/Illuminar Academy/Sol Academy, Roybal Comprehensive Health Center, Catholic Mission of Soledad Church, Soledad Enrichment Action East Los Angeles Education Center, and Casa Maravilla (East Los Angeles)
  - Cal State LA (El Sereno neighborhood)

The operation of the LRT Alternative improvements would not require permanent easements or result in air quality, traffic/access, or parking impacts at the community facilities within 500 ft of the alignment of the LRT Alternative.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). As a result, the LRT Alternative would also result in the same permanent effects on community character and cohesion as the other improvements in the TSM/TDM Alternative. In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would result in permanent Adverse Effects on community character and cohesion related to the displacement of 17 neighborhood-oriented businesses in East Los Angeles.

Freeway Tunnel Alternative

Both design variations of the Freeway Tunnel Alternative would provide a new freeway facility extending between the existing terminus of SR 710 on the south to the existing I-210/SR 134 interchange to the north. There would be no interchanges with local streets except at the existing partial interchange between SR 710 and Valley Boulevard.

Because neither design variation of the Freeway Tunnel Alternative would provide interchanges or access locations between Valley Boulevard and I-210/SR 134, motorists in the study area along the alignment of that freeway segment would be unable to directly access the freeway from the local street network. However, some travelers currently using north-south local streets to traverse the study area would be expected to take alternative routes that would allow them to access the new freeway for those north-south trips. Both design variations of the Freeway Tunnel Alternative would result in the diversion of trips from the local arterial roadways in the study area to the freeway, which would result in reduced traffic congestion and travel delays and would benefit motorists in the region.

Both Freeway Tunnel Alternative design variations would also provide improvements to the off-ramp from northbound SR 710 to Valley Boulevard and the Valley Boulevard on-ramp to southbound SR 710 that would improve traffic operations and circulation in Alhambra and El Sereno without permanently modifying access to and from adjacent properties.

Because the single-bore and dual-bore Freeway Tunnel Alternative design variations would both result in a minimal number of nonresidential displacements, neither design variation would affect the character or cohesion of the communities in which the Freeway Tunnel Alternative improvements would be located. Further, as described in the FRIR, there is an adequate supply of replacement properties available in the study area in which to relocate the displaced businesses. Therefore, it is anticipated that the displaced businesses could be relocated near their current locations without much disruption to the social fabric of the communities in which they are located.

Because the operation of the bored tunnel segment of both design variations of the Freeway Tunnel Alternative would occur underground, the bored tunnel segment would not result in any long-term operational air quality, noise, traffic/access, or parking effects on community facilities and would not require the permanent acquisition of land from or permanent easements at any of those facilities.

Community facilities within 500 ft of the at-grade improvements in the Freeway Tunnel Alternative could be subject to adverse permanent impacts as follows:

- **Community Facility from Which Permanent Acquisition of Land May be Needed:** The Freeway Tunnel Alternative would permanently acquire approximately 1.0 ac of land on the Cal State LA campus for permanent incorporation into the freeway improvements in this area.
- **Community Facility at Which a Permanent Easement May be Needed:** The Freeway Tunnel Alternative would require an approximately 0.6 ac permanent easement on the Cal State LA campus to accommodate a footing for the freeway improvements in this area.
- **Community Facilities Which Could Experience Long-Term Noise Effects:** The following community facilities would experience permanent noise level increases during operation of either design variation of the Freeway Tunnel Alternative:
  - Cal State LA (El Sereno neighborhood)
  - Roosevelt Elementary School, Friends Western School, and Maranatha High School (City of Pasadena)

  Although most of these facilities are anticipated to experience a permanent noise level increase of less than 3 dB under either design variation, which would be barely perceptible to the human ear, two of these community facilities (Cal State LA and Maranatha High School) are anticipated to experience a permanent noise level increase of 3 dB or more under the dual-bore design variation. In addition, Cal State LA is anticipated to also experience a permanent noise level increase of 3 dB or more under the single-bore design variation. Neither the University nor the high school appear to engage in noise-sensitive outdoor activities on a routine basis (events held at the outdoor athletic facilities at these sites are not likely to be noise sensitive because they typically would produce their own noise). Further, based on a visual inspection of the exteriors of these facilities and the warm climate in the portion of Los Angeles County in which these facilities are located, the University and the high school are likely to rely on air conditioning in lieu of opening windows for ventilation; therefore, the permanent noise level increases anticipated to occur under either design variation of the Freeway Tunnel Alternative would not adversely affect their ability to serve the community.

The operation of the Freeway Tunnel Alternative improvements would not require permanent easements or result in air quality, traffic/access, or parking impacts at the community facilities within 500 ft of the alignment of the Freeway Tunnel Alternative.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). As a result, the Freeway Tunnel Alternative would also result in the same permanent effects on community character and cohesion as the other improvements in the TSM/TDM Alternative. In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the Freeway Tunnel Alternative would not result in permanent Adverse Effects on community character and cohesion.

3.3.1.4 Avoidance, Minimization, and/or Mitigation Measures

Measure CI-1 (provided later in Section 3.3.2.4) would address impacts on community character and cohesion related to property acquisition. (Applies to all four Build Alternatives.)

Measure T-1 (provided later in Section 3.5.4), which includes a TMP for the project, would address impacts on community character and cohesion related to access during construction. (Applies to all four Build Alternatives.)

Measures V-1 through V-7 (provided later in Section 3.6.4), would address impacts on community character and cohesion related to visual character and aesthetics. (Applies to all four Build Alternatives.)

Measures AQ-1 through AQ-3 (provided later in Section 3.13.4), would address impacts on community character and cohesion related to air quality. (Applies to all four Build Alternatives.)

Measures N-1 through N-5 (provided later in Section 3.14.4), would address impacts on community character and cohesion related to noise. (Applies to all four Build Alternatives.)

3.3.2 Relocations and Real Property Acquisition

3.3.2.1 Regulatory Setting

The Caltrans Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 Code of Federal Regulations (CFR) Part 24. The purpose of the RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. Please see Appendix D for a summary of the RAP.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 United States Code [USC] 2000d, et seq.). Please see Appendix C for a copy of the Caltrans Title VI Policy Statement.

3.3.2.2 Affected Environment

The information in this section is based on the CIA (2014) and the DRIR (2014) which analyzed right-of-way (ROW) impacts to residential and nonresidential properties on all alternative alignments, and the Final Relocation Impact Report (FRIR) (2018), which focused on the impacts of the Preferred Alternative.

The community impacts study area and the existing land uses in the study area by jurisdiction are shown on Figure 3.1-1. The existing land uses in the study area include a wide range of residential, commercial, industrial, public, and institutional uses.

3.3.2.3 Environmental Consequences

Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in the need for TCEs.

Build Alternatives

TSM/TDM Alternative

Construction of the TSM/TDM Alternative would require TCEs. The locations of the TCEs required for the TSM/TDM Alternative are shown on Figure 3.3-9 in Appendix L. Refer to Section 3.1.1.2 for additional information regarding these TCEs and their potential effects on existing and planned land uses. The TSM/TDM Alternative would not result in temporary Adverse Effects related to relocations and real property acquisitions.

BRT Alternative

Construction of the BRT Alternative would require TCEs. The locations of the TCEs required for the BRT Alternative are shown on Figure 3.3-10 in Appendix L. Refer to Section 3.1.1.2 for additional information regarding these TCEs and their potential Adverse Effects on existing and planned land uses.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, construction of the BRT Alternative would also require TCEs on the same parcels as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would require TCEs on approximately 52 parcels. The BRT Alternative would not result in temporary Adverse Effects related to relocations and real property acquisitions.

LRT Alternative

Construction of the LRT Alternative would require TCEs. The locations of the TCEs required for the LRT Alternative are shown on Figure 3.3-11 in Appendix L. Refer to Section 3.1.1.2 for additional information regarding these TCEs and their potential effects on existing and planned land uses.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, construction of the LRT Alternative would also require TCEs on most of the same parcels as the TSM/TDM Alternative, but would not require TCEs on approximately three parcels in Alhambra and El Sereno.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would require TCEs on approximately 26 parcels. The LRT Alternative would not result in temporary Adverse Effects related to relocations and real property acquisitions.

Freeway Tunnel Alternative

Construction of both design variations of the Freeway Tunnel Alternative would require TCEs. The locations of the TCEs required for the single-bore and dual-bore design variations of the Freeway Tunnel Alternative are shown on Figures 3.3-12 and 3.3-13, respectively, in Appendix L. Refer to Section 3.1.1.2 for additional information regarding these TCEs and their potential effects on existing and planned land uses.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). Therefore, construction of the Freeway Tunnel Alternative would also require TCEs on most of the same parcels as the TSM/TDM Alternative, but would not require TCEs on approximately five parcels in Alhambra, El Sereno, and Pasadena.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would require TCEs on approximately 63 and 58 parcels, respectively. The Freeway Tunnel Alternative would not result in temporary Adverse Effects related to relocations and real property acquisitions.

Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in the permanent acquisition of ROW or displacement of businesses and jobs potentially associated with the improvements in the Build Alternatives.

Build Alternatives

TSM/TDM Alternative

The TSM/TDM Alternative would require the acquisition of property for public ROW. The locations of the full and partial parcel acquisitions required for the TSM/TDM Alternative are shown on Figure 3.3-9 in Appendix L. The parcels proposed to be acquired for this alternative are occupied or planned for nonresidential uses. No residential uses or residents would be displaced by the TSM/TDM Alternative.

Table 3.3.4 provides information regarding parcel acquisitions associated with each of the improvements included in the TSM/TDM Alternative, including the Assessor's Parcel Numbers (APNs) and street addresses of the parcels where acquisitions would be required; the existing land uses on those parcels; and the city, community, or neighborhood in which they are located. In addition, Table 3.3.4 provides information about the type of acquisition (partial or full) and the approximate square footage required from each parcel for each acquisition. Table 3.3.4 provides information about the number of businesses and employees that could be potentially displaced by each parcel acquisition required under the TSM/TDM Alternative.

As shown in Table 3.3.4, the TSM/TDM Alternative would result in the full acquisition of approximately 1 parcel in Pasadena and the partial acquisition of approximately 30 parcels in Alhambra, Eagle Rock, Pasadena, Rosemead, San Gabriel, and South Pasadena, none of which would result in the displacement of businesses or employees. The TSM/TDM Alternative would also result in the displacement of one business with a lease on a State-owned parcel in El Sereno and the displacement of approximately six employees at that business. This parcel (parcel number 18497) is currently leased for privately operated commercial use. For the TSM/TDM Alternative, that lease would be allowed to expire or be terminated, as appropriate, so that this parcel can be used for transportation purposes.

TABLE 3.3.4:
Parcel Acquisitions Required for the TSM/TDM Alternative

Improvement No.	APN	Street Address	Community	Existing Land Use	Parcel Qty	Type	Area (sf)	Residents Displaced	Employees Displaced	Businesses Displaced
I-16	5344029021	511 S. Garfield Ave.	Alhambra	Commercial	1	Partial	815	–	0	0
I-16	5344029029	501 S. Garfield Ave.	Alhambra	Commercial	1	Partial	206	–	0	0
				Alhambra Subtotal	***2***	***Partial***	***1,021***	***0***	***0***	***0***
					-	***Full***	–	–	–	–
L-1	5708002803	N/A	Eagle Rock	Transportation/Utilities	1	Partial	600	–	0	0
				Eagle Rock Subtotal	***1***	***Partial***	***600***	***0***	***0***	***0***
					-	***Full***	–	–	–	–
T-3	5713031069	N/A	Pasadena	Vacant	1	Full	8,020	–	0	0
T-3	5713037051 5713037054 5713037057 5713037060 5713037063 5713037066 5713037069 5713037072 5713037073 5713037074 5713037075 5713037076 5713037077 5713037078	265 W. California Blvd. (Nos. 1, 3, 5, 7, 9, 11, 13, 2, 4, 6, 8, 10, 12, and 14)	Pasadena	Residential	14	Partial	30	0	–	–
				Pasadena Subtotal	***14***	***Partial***	***30***	***0***	***0***	***0***
					1	***Full***	***8,020***	***0***	***0***	***0***
L-5	5390012063	8960 Valley Blvd.	Rosemead	Commercial	1	Partial	–	–	0	0
L-5	5391012043	8951 Valley Blvd.	Rosemead	Commercial	1	Partial	–	–	0	0
L-5	5391015050	4134 Rosemead Blvd.	Rosemead	Commercial	1	Partial	40	–	0	0
				Rosemead Subtotal	***3***	***Partial***	***107***	***0***	***0***	***0***
					–	***Full***	–	–	–	–
I-19	5361002902	N/A	San Gabriel	Public	1	Partial	1,111	–	0	0
I-19	5368017014	N/A	San Gabriel	Vacant	1	Partial	46	–	0	0
I-19	5368017015	702 S. Del Mar Ave.	San Gabriel	Commercial	1	Partial	896	–	0	0
				San Gabriel Subtotal	***3***	***Partial***	***2,053***	***0***	***0***	***0***
					–	***Full***	–	–	–	–
I-9	5315005066	1137 Fremont Ave.	South Pasadena	Residential	1	Partial	76	0	–	–
I-9	5315005067	1141 Fremont Ave.	South Pasadena	Residential	1	Partial	46	0	–	–
I-9	5319002032	1401 Monterey Rd.	South Pasadena	Residential	1	Partial	243	0	–	–
I-13, I-14, I-15	5321015018	1713 Garfield Ave.	South Pasadena	Vacant	1	Partial	117	–	–	–
I-13, I-14, I-15	5321015020	2140 Huntington Dr.	South Pasadena	Commercial	1	Partial	610	–	–	–

TABLE 3.3.4:
Parcel Acquisitions Required for the TSM/TDM Alternative

Improvement No.	APN	Street Address	Community	Existing Land Use	Parcel Qty	Type	Area (sf)	Residents Displaced	Employees Displaced	Businesses Displaced
I-13, I-14, I-15	5321019009	2185 Huntington Dr.	South Pasadena	Commercial	1	Partial	712	–	–	–
I-13, I-14, I-15	5321019022	1745 Garfield Ave.	South Pasadena	Commercial	1	Partial	873	–	–	–
South Pasadena Subtotal					***7***	***Partial***	***2,677***	***0***	***0***	***0***
					–	***Full***	***–***	***–***	***–***	***–***
GRAND TOTAL					***30***	***Partial***	***6,488***	***0***	***0***	***0***
					1	***Full***	***8,020***	***0***	***0***	***0***

Source: *Community Impact Assessment* (2014).
Note: All property acquisitions described above are approximate and subject to further refinement during final design.
– = Not Applicable
APN = Assessor's Parcel Number
N/A = Not Available

BRT Alternative

The BRT Alternative would require the permanent acquisition of property for public ROW. The BRT Alternative would not require the full acquisition of any parcels. The locations of the partial parcel acquisitions required for the BRT Alternative are shown on Figure 3.3-10 in Appendix L. The parcels proposed to be acquired for the BRT Alternative are occupied or planned for nonresidential uses. No residential uses or residents would be displaced by the BRT Alternative.

Table 3.3.5 provides information regarding partial parcel acquisitions required under the BRT Alternative, including the APNs and street addresses of those parcels where acquisitions would be required; the existing land uses on those parcels; and the city, community, or neighborhood in which they are located. Table 3.3.5 also provides information about the approximate square footage required from each parcel for each partial acquisition.

As shown in Table 3.3.5, the BRT Alternative would result in the partial acquisitions of approximately 45 parcels in Alhambra, East Los Angeles, Monterey Park, Pasadena, and South Pasadena. None of these partial parcel acquisitions would result in the displacement of businesses or employees.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, the BRT Alternative would also require the same permanent effects related to relocations and real property acquisitions (partial acquisition of approximately 30 parcels, full acquisition of approximately 1 parcel, and the displacement of approximately 1 business) as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would require the partial acquisition of approximately 75 parcels, the full acquisition of approximately 1 parcel, and the displacement of approximately 1 business. The BRT Alternative would not result in permanent Adverse Effects related to relocations and real property acquisitions.

LRT Alternative

The LRT Alternative would require the permanent acquisition of property for public ROW. The locations of the full and partial parcel acquisitions required under the LRT Alternative are shown on Figure 3.3-11 in Appendix L. The parcels proposed to be acquired for the LRT Alternative are occupied or planned for nonresidential uses. No residential uses and no residents would be displaced by the LRT Alternative.

Table 3.3.6 provides information regarding parcel acquisitions required under the LRT Alternative, including the APNs and street addresses of those parcels where acquisitions would be required; the existing land uses on those parcels; and the city, community, or neighborhood in which they are located. In addition, this table provides information about the type of acquisition (partial or full) and the approximate square footage required from each parcel for each acquisition. Table 3.3.6 also provides information about the numbers of residents, businesses, and employees that could potentially be displaced by each parcel acquisition required under the LRT Alternative.

TABLE 3.3.5:
Property Acquisitions Required for the BRT Alternative

APN	Street Address	Community	Existing Land Use	Parcel Qty	Area (sf)	Residents Displaced	Employees Displaced	Businesses Displaced
5338033023	707 W. Main St.	Alhambra	Commercial	1	79	–	0	0
5350013001	700 S. Atlantic Blvd.	Alhambra	Commercial	1	462	–	0	0
5350013004	704 S. Atlantic Blvd.	Alhambra	Commercial	1	415	–	0	0
5350013006	800 S. Atlantic Blvd.	Alhambra	Residential	1	184	0	–	–
5350013007	804 S. Atlantic Blvd.	Alhambra	Residential	1	134	0	–	–
5350016037	1224 S. Atlantic Blvd.	Alhambra	Commercial	1	975	–	0	0
5350016038	1013 W. Valley Blvd.	Alhambra	Commercial	1	1,292	–	0	0
5350016040	1220 S. Atlantic Blvd.	Alhambra	Commercial	1	23	–	0	0
5350020018	801 S. Atlantic Blvd.	Alhambra	Residential	1	221	0	–	–
5350020019	805 S. Atlantic Blvd. No. 1	Alhambra	Residential	1	95	0	–	–
5350020020	809 S. Atlantic Blvd.	Alhambra	Residential	1	6	0	–	–
5350020032	701 S. Atlantic Blvd.	Alhambra	Commercial	1	1,584	–	0	0
5357001001	1000 W. Valley Blvd.	Alhambra	Commercial	1	489	–	0	0
			Alhambra Subtotal	***13***	***5,959***	***0***	***0***	***0***
6341001017	318 S. Atlantic Blvd.	East Los Angeles	Commercial	1	213	–	0	0
6341001038	300 S. Atlantic Blvd.	East Los Angeles	Commercial	1	878	–	0	0
			East Los Angeles Subtotal	***2***	***1,091***	***0***	***0***	***0***
5256003034	795 W. Garvey Ave.	Monterey Park	Commercial	1	1,279	–	0	0
5256003035	771 W. Garvey Ave.	Monterey Park	Commercial	1	586	–	0	0
5257001042	740 W. Garvey Ave.	Monterey Park	Commercial	1	25	–	0	0
5257001085	780 W. Garvey Ave.	Monterey Park	Commercial	1	916	–	0	0
5261014026	808 E. Garvey Ave.	Monterey Park	Vacant	1	97	–	0	0
			Monterey Park Subtotal	***5***	***2,913***	***0***	***0***	***0***
5713028024	321 S. Fair Oaks Ave.	Pasadena	Commercial	1	269	–	0	0
5720002001	10 Pico St.	Pasadena	Commercial	1	26	–	0	0
			Pasadena Subtotal	***2***	***295***	***0***	***0***	***0***
5318004022	718 Fair Oaks Ave.	South Pasadena	Commercial	1	26	–	0	0
5318004024	606 Fair Oaks Ave.	South Pasadena	Commercial	1	1,195	–	0	0
5318015036	900 Fair Oaks Ave.	South Pasadena	Commercial	1	332	–	0	0
5319002034	1213 N. Fair Oaks Ave.	South Pasadena	Commercial	1	142	–	0	0
5319006025	1540 Laurel St.	South Pasadena	Residential	1	90	0	0	0
5319007036 5319007037 5319007038 5319007039 5319007040 5319007041 5319007042 5319007043 5319007044 5319007045 5319007046 5319007047	1520 Spruce St. (Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12)	South Pasadena	Residential	12	31	–	–	–
5320005023	1414 Fair Oaks Ave.	South Pasadena	Commercial	1	70	–	0	0
5320007020	1600 Fair Oaks Ave.	South Pasadena	Residential	1	30	0	–	–
5321015018	1713 Garfield Ave.	South Pasadena	Vacant	1	117	–	0	0
5321015020	2140 Huntington Dr.	South Pasadena	Commercial	1	610	–	0	0
5321019009	2185 Huntington Dr.	South Pasadena	Commercial	1	467	–	0	0
5321019022	1745 Garfield Ave.	South Pasadena	Commercial	1	642	–	0	0
			South Pasadena Subtotal	***23***	***3,726***	***0***	***0***	***0***
			GRAND TOTAL	***45***	***13,974***	***0***	***0***	***0***

Source: *Community Impact Assessment* (2014).
Note: All property acquisitions described above are approximate and subject to further refinement during final design.
– = Not Applicable
APN = Assessor's Parcel Number

TABLE 3.3.6:
Property Acquisitions Required for the LRT Alternative

APN	Street Address	Community	Existing Land Use	Parcel Qty	Type	Area (sf)	Residents Displaced	Employees Displaced	Businesses Displaced
5342005914	2500 W. Commonwealth Ave.	Alhambra	Commercial	1	Full	123,192	–	30	1
5351001021	3201 W. Valley Blvd.	Alhambra	Commercial	1	Partial	282	–	0	0
			Alhambra Subtotal	***1***	***Partial***	***282***	–	***0***	***0***
				1	***Full***	***123,192***	–	***30***	***1***
5235017046	617 N. Mednik Ave.	East Los Angeles	Commercial	1	Partial	25	–	0	0
5250024034	155 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	5,701	–	20	2
5250024035	149 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	5,701	–	20	2
5250024044	201 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	8,544	–	20	3
5250024045	N/A	East Los Angeles	Commercial	1	Full	2,852	–	0	0
5250024048	131 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	11,397	–	15	5
5250024049	147 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	5,696	–	0	0
5250024050	143 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	2,847	–	10	0
5250024051	141 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	2,846	–	10	0
5250025030	207 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	2,851	–	10	0
5250025033	N/A	East Los Angeles	Commercial	1	Full	2,778	–	0	0
5250025034	N/A	East Los Angeles	Commercial	1	Full	2,812	–	10	1
5250025035	211 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	5,708	–	10	1
5250025036	211 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	5,715	–	0	0
5250025037	249 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	5,134	–	20	2
5250025038	249 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	5,451	–	0	0
5250025039	223 S. Mednik Ave.	East Los Angeles	Commercial	1	Full	17,184	–	20	1
5251008907	4919 E. Cesar E. Chavez Ave.	East Los Angeles	Residential	1	Partial	457	0	–	–
5251009906	4800 E. Cesar E. Chavez Ave.	East Los Angeles	Public	1	Partial	343	–	0	0
			East Los Angeles Subtotal	***3***	***Partial***	***825***	***0***	***0***	***0***
				16	***Full***	***93,217***	–	***165***	***17***
5223034908	2110 Lansdown Ave.	El Sereno	Institutional	1	Partial	131,766	–	0	0
			El Sereno Subtotal	***1***	***Partial***	***131,766***	–	***0***	***0***
				-	***Full***	–	–	–	–
5225031018	101 Lincoln Way	Monterey Park	Commercial	1	Partial	601	–	0	0
5225031913	N/A	Monterey Park	Public	1	Partial	1,532	–	0	0
5225031916	4500 E. City Hall Dr.	Monterey Park	Public	1	Partial	32,379	–	0	0
5237024033 5237024034 5237024035 5237024036 5237024037 5237024038 5237024039 5237024040	1455 Monterey Pass Rd. (Suite Nos. 110, 109, 108, 107, 106, 105, 104, 103, 102, 101, 210, 209, 208, 207, 206, 205, 204, 203, 202, and 201)	Monterey Park	Commercial	20	Full	69,361	–	50	20

TABLE 3.3.6:
Property Acquisitions Required for the LRT Alternative

APN	Street Address	Community	Existing Land Use	Parcel Qty	Type	Area (sf)	Residents Displaced	Employees Displaced	Businesses Displaced
5237024041 5237024042 5237024043 5237024044 5237024045 5237024046 5237024047 5237024048 5237024049 5237024050 5237024051 5237024052									
5237024056	2530 Corporate Pl.	Monterey Park	Commercial	1	Partial	32,058	–	0	0
			Monterey Park Subtotal	***4***	***Partial***	***66,570***	–	***0***	***0***
				20	***Full***	***69,361***	–	***50***	***20***
5720009011	750 S. Raymond Ave.	Pasadena	Commercial	1	Partial	93	–	0	0
5720010008	700 S. Raymond Ave.	Pasadena	Industrial	1	Full	37,361	–	55	6
5720010009	N/A	Pasadena	Commercial	1	Full	2,690	–	0	0
5720011008	N/A	Pasadena	Industrial	1	Full	11,244	–	5	1
5720011013	686 S. Raymond Ave.	Pasadena	Industrial	1	Full	14,137	–	0	0
5720011014	686 S. Raymond Ave.	Pasadena	Industrial	1	Full	6,749	–	5	1
5720011016	N/A	Pasadena	Industrial	1	Full	14,997	–	40	1
			Pasadena Subtotal	***1***	***Partial***	***93***	–	***0***	***0***
				6	***Full***	***87,178***	–	***105***	***9***
5318015003	1014 Fair Oaks Ave.	South Pasadena	Commercial	1	Full	3,862	–	8	1
5318015004	1008 Fair Oaks Ave.	South Pasadena	Commercial	1	Full	11,547	–	32	4
5318015005	1000 Fair Oaks Ave.	South Pasadena	Commercial	1	Full	7,643	–	0	0
5318015006	1000 Fair Oaks Ave.	South Pasadena	Commercial	1	Full	9,160	–	40	2
5318015007	1001 Brent Ave.	South Pasadena	Commercial	1	Full	8,411	–	0	0
5318015008	1005 Brent Ave.	South Pasadena	Commercial	1	Full	8,412	–	0	0
5318015009	1009 Brent Ave.	South Pasadena	Commercial	1	Full	7,723	–	0	0
5318015017	900 Fair Oaks Ave.	South Pasadena	Commercial	1	Full	26,838	–	0	0
5318015036	900 Fair Oaks Ave.	South Pasadena	Commercial	1	Full	37,197	–	80	3
5319008008	1510 Huntington Dr.	South Pasadena	Commercial	1	Full	12,465	–	35	3
5319008009	1811 Fair Oaks Ave.	South Pasadena	Commercial	1	Partial	483	–	0	0
5319009003	N/A	South Pasadena	Commercial	1	Full	3,181	–	0	0
5319009004	1431 Huntington Dr.	South Pasadena	Commercial	1	Full	8,714	–	10	1
5319009005	1439 Huntington Dr.	South Pasadena	Commercial	1	Full	8,714	–	20	3

TABLE 3.3.6:
Property Acquisitions Required for the LRT Alternative

APN	Street Address	Community	Existing Land Use	Parcel Qty	Type	Area (sf)	Residents Displaced	Employees Displaced	Businesses Displaced
5319009033	1445 Huntington Dr.	South Pasadena	Commercial	1	Full	12,285	–	40	10
5319009037	1401 Huntington Dr.	South Pasadena	Commercial	1	Full	53,464	–	40	1
South Pasadena Subtotal				***1***	***Partial***	***483***	–	***0***	***0***
				15	***Full***	***219,616***	–	***305***	***28***
GRAND TOTAL				***11***	***Partial***	**200,014**	***0***	***0***	***0***
				58	***Full***	***592,564***	–	***655***	***75***

Source: *Community Impact Assessment* (2014).
Note: All property acquisitions described above are approximate and subject to further refinement during final design.
– = Not Applicable
APN = Assessor's Parcel Number
N/A = Not Available

As shown in Table 3.3.6, the LRT Alternative would result in the full acquisition of approximately 58 parcels in Alhambra, East Los Angeles, Monterey Park, Pasadena, and South Pasadena, and the partial acquisition of approximately 11 parcels in Alhambra, East Los Angeles, El Sereno, Monterey Park, Pasadena, and South Pasadena. Table 3.3.6 shows that these acquisitions would require the relocation of approximately 75 businesses, resulting in the displacement of approximately 655 employees. In addition, the LRT Alternative would result in the displacement of 1 business with a lease on a State-owned parcel in El Sereno and the displacement of approximately 30 employees at that business. This parcel (parcel number 24135) is currently leased for privately operated commercial use. For the LRT Alternative, that lease would be allowed to expire or be terminated, as appropriate, so that this parcel can be used for transportation purposes.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, the LRT Alternative would also include most of the same permanent effects related to relocations and real property acquisitions (partial acquisition of approximately 30 parcels and full acquisition of approximately 1 parcel) as the TSM/TDM Alternative, but would not result in the displacement of approximately 1 business from El Sereno.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would require the partial acquisition of approximately 41 parcels, the full acquisition of approximately 59 parcels, and the displacement of approximately 76 businesses. The LRT Alternative would not result in permanent Adverse Effects related to relocations and real property acquisitions.

Freeway Tunnel Alternative

The single-bore and dual-bore design variations of the Freeway Tunnel Alternative would both require the permanent acquisition of property for public ROW. The locations of the full and partial parcel acquisitions required under the single-bore and dual-bore design variations are shown on Figures 3.3-12 and 3.3-13, respectively, in Appendix L. The parcels proposed to be acquired for the Freeway Tunnel Alternative are occupied or planned for nonresidential uses. No residential uses or residents would be displaced by either design variation of the Freeway Tunnel Alternative.

Tables 3.3.7 and 3.3.8 provide information regarding the parcel acquisitions required under the single-bore and dual-bore design variations of the Freeway Tunnel Alternative, respectively, including the APN and street address of those parcels where acquisition would be required; the existing land uses on those parcels; and the city, community, or neighborhood in which they are located. In addition, these tables provide information about the type of acquisition (partial or full) and the approximate square footage required from each parcel for each acquisition. Tables 3.3.7 and 3.3.8 also provide information about the number of residents, businesses, and employees that could potentially be displaced by each parcel acquisition required under the single-bore and dual-bore design variations of the Freeway Tunnel Alternative, respectively. Tables 3.3.7 and 3.3.8 show that both design variations would require the relocation of 1 business, resulting in the displacement of 5 employees. In addition, both design variations would result in the relocation of 1 business from a State-owned parcel in El Sereno and the displacement of approximately 30 employees at that business. This parcel (Parcel No. 24135) is currently leased for privately

TABLE 3.3.7:
Property Acquisitions Required for the Freeway Tunnel Alternative Single-Bore Design Variation

APN	Street Address	Community	Existing Land Use	Parcel Qty	Type	Area (sf)	Residents Displaced	Employees Displaced	Businesses Displaced
5351017042	3200 W. Valley Blvd.	Alhambra	Commercial	1	Full	11,901	–	5	1
Alhambra Subtotal				*–*	***Partial***	*–*	*–*	*–*	*–*
				1	***Full***	***11,901***	*–*	***5***	***1***
5221013038	5530 Valley Blvd.	El Sereno	Commercial	1	Partial	4,337	–	0	0
5221014913	Highbury Ave.	El Sereno	Public	1	Partial	45,894	–	0	0
El Sereno Subtotal				***2***	***Partial***	***50,251***	*–*	***0***	***0***
				–	***Full***	*–*	*–*	*–*	*–*
GRAND TOTAL				***2***	***Partial***	***50,251***	*–*	***0***	***0***
				1	***Full***	***11,901***	*–*	***5***	***1***

Source: *Community Impact Assessment* (2014).
Note: All property acquisitions described above are approximate and subject to further refinement during final design.
– = Not Applicable
APN = Assessor's Parcel Number

TABLE 3.3.8:
Property Acquisitions Required for the Freeway Tunnel Alternative Dual-Bore Design Variation

APN	Street Address	Community	Existing Land Use	Parcel Qty	Type	Area (sf)	Residents Displaced	Employees Displaced	Businesses Displaced
5351017042	3200 W. Valley Blvd.	Alhambra	Commercial	1	Full	11,901	–	5	1
Alhambra Subtotal				*–*	***Partial***	*–*	*–*	*–*	*–*
				1	***Full***	***11,901***	*–*	***5***	***1***
5221013038	5530 Valley Blvd.	El Sereno	Commercial	1	Partial	4,337	–	0	0
5221014913	Highbury Ave.	El Sereno	Public	1	Partial	45,893	–	0	0
5223034908	2110 Lansdowne Ave.	El Sereno	Public	1	Partial	27,434	–	0	0
El Sereno Subtotal				***3***	***Partial***	***77,664***	*–*	***0***	***0***
				–	***Full***	*–*	*–*	*–*	*–*
GRAND TOTAL				***3***	***Partial***	***77,664***	*–*	***0***	***0***
				1	***Full***	***11,901***	*–*	***5***	***1***

Source: *Community Impact Assessment* (2014).
Note: All property acquisitions described above are approximate and subject to further refinement during final design.
– = Not Applicable
APN = Assessor's Parcel Number

operated commercial use. For the Freeway Tunnel Alternative, that lease would be allowed to expire or be terminated, as appropriate, so that this parcel can be used for transportation purposes.

As shown in Tables 3.3.7 and 3.3.8, both Freeway Tunnel Alternative design variations would require one full parcel acquisition in Alhambra, which would result in the relocation of 1 business and the displacement of 5 employees. The single-bore and dual-bore design variations would result in 2 partial parcel acquisitions and 3 partial parcel acquisitions, respectively, in El Sereno. Both design variations of the Freeway Tunnel Alternative would result in the displacement of 1 business with a lease on a State-owned parcel in El Sereno and the displacement of 30 employees. This parcel (parcel number 24135) is currently leased for privately operated commercial use. Under both design variations of the Freeway Tunnel Alternative, that lease would be allowed to expire or be terminated, as appropriate, so that this parcel can be used for transportation purposes.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to

Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). Therefore, both design variations of the Freeway Tunnel Alternative would also include most of the same permanent effects related to relocations and real property acquisitions (partial acquisition of approximately 16 parcels) as the TSM/TDM Alternative, but would not result in the partial acquisition of approximately 14 parcels, the full acquisition of approximately 1 parcel in Pasadena, and the displacement of approximately 1 business from El Sereno.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, both design variations of the Freeway Tunnel Alternative would require the partial acquisition of approximately 18 parcels, the full acquisition of approximately 1 parcel, and the displacement of approximately 1 business. The Freeway Tunnel Alternative would not result in permanent Adverse Effects related to relocations and real property acquisitions.

3.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

As discussed above, all four Build Alternatives would require the permanent acquisition of full and/or partial parcels of privately owned land to accommodate the improvements in those Build Alternatives. The following measure addresses the requirements regarding the acquisition of property:

Measure CI-1 **Property Acquisition (applies to all four Build Alternatives):** All acquisition of property for improvements in the Build Alternatives by the Los Angeles County Metropolitan Transportation Authority (for the Transportation System Management/Transportation Demand Management, Bus Rapid Transit, and Light Rail Transit Alternatives) or the California Department of Transportation (for the Freeway Tunnel Alternative), including any federally funded improvements, will be conducted in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) of 1970 as amended. The Uniform Act establishes minimum standards for federally funded programs and projects that require the acquisition of real property (real estate) or the displacement of persons from their homes, businesses, or farms. The Uniform Act's protections and assistance apply to the acquisition, rehabilitation, or demolition of real property for federal or federally funded projects. (Please refer to Appendix D, Summary of Relocation Benefits, for more detail.)

3.3.3 Economic Impacts

3.3.3.1 Affected Environment

The information in this section is based on the CIA (2014), the DRIR (2014), FRIR (2017) and the *Economic and Fiscal Impacts Evaluation* (2014).

The community impacts study area and the existing land uses in the study area by jurisdiction are shown on Figure 3.1-1. The existing land uses in the study area include a wide range of residential, commercial, industrial, public, and institutional uses.

Property Tax Base

Property taxes are levied on the assessed value of privately owned property. Property taxes generated in the community impacts study area are collected by the County and apportioned to the applicable jurisdiction and other taxing agencies in which the property is located. The base property tax rate in the State of California is 1.0 percent of the assessed property value, while the total property tax rate, which includes additional debt service, varies by jurisdiction. The amount of property tax revenue allocated to each local jurisdiction also varies. Table 3.3.9 provides a summary of the property tax revenue collected in the County overall and in each incorporated city in the community impacts study area in Fiscal Year (FY) 2012–2013.

TABLE 3.3.9:
Property Tax Collections and Taxable Sales

Jurisdiction	Property Tax Revenue[1,2]	Taxable Sales[3]
Alhambra	$8,341,422	$1,091,042,000
Irwindale	$203,456	$325,195,000
City of Los Angeles	$1,023,599,790	$37,857,643,000
County of Los Angeles	$11,000,000,000	$126,440,737,000
Monterey Park	$7,229,949	$395,472,000
Pasadena	$39,145,573	$2,724,178,000
Rosemead	$1,999,608	$356,686,000
San Gabriel	$3,950,911	$323,810,000
San Marino	$10,858,770	$34,112,000
South Pasadena	$8,291,794	$155,594,000

Source: *Community Impact Assessment* (2014).
[1] Fiscal Year 2012–2013.
[2] Numbers are subject to change based on the final alignment or design of the project alternatives.
[3] 2011.

Sales Tax Base

Sales taxes are levied on taxable sales generated in each jurisdiction. Effective April 1, 2013, the sales tax rate in the County and in each incorporated city in the study area is 9.0 percent, 0.75 percent of which is allocated to the local jurisdiction in which the taxable transaction occurred for public services. Table 3.3.9 provides the taxable sales in the County overall and in each incorporated city in the community impacts study area in 2011.

3.3.3.2 Environmental Consequences

Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in the creation of construction jobs or the generation of employment earnings.

Build Alternatives

TSM/TDM Alternative

Construction of the TSM/TDM Alternative is estimated to result in approximately 1,400 person-year jobs, which would generate a total of approximately $64.7 million (in 2010 dollars) in employment earnings.

BRT Alternative

Construction of the BRT Alternative is estimated to result in approximately 3,100 person-year jobs, which would generate a total of approximately $148.6 million (in 2010 dollars) in employment earnings.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The economic benefit analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of the BRT Alternative.

LRT Alternative

Construction of the LRT Alternative is estimated to result in approximately 31,500 person-year jobs, which would generate a total of approximately $1.5 billion (in 2010 dollars) in employment earnings.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). The economic benefit analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of the LRT Alternative.

Freeway Tunnel Alternative

Construction of the Freeway Tunnel Alternative single-bore design variation is estimated to result in approximately 41,100 person-year jobs for the operational variation that includes trucks and tolls and the operational variation that includes trucks, tolls, and express buses, which would generate a total of approximately $1.9 billion (in 2010 dollars) in employment earnings under either operational variation.

Construction of the Freeway Tunnel Alternative dual-bore design variation is estimated to result in approximately 73,700 person-year jobs for the operational variation that includes trucks and tolls and the operational variation that includes trucks but no tolls. Either operational variation would generate a total of approximately $3.5 billion (in 2010 dollars) in employment earnings.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). The economic benefit analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of both design variations of the Freeway Tunnel Alternative.

Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in the creation of permanent jobs, long-term property or sales tax losses, or displacement of businesses and jobs potentially associated with the improvements in the Build Alternatives.

Build Alternatives

TSM/TDM Alternative

The TSM/TDM Alternative would result in property tax revenue losses for the Cities of Alhambra, Pasadena, Rosemead, San Gabriel, and South Pasadena. Table 3.3.10 shows the estimated loss in annual property tax revenue for each of the jurisdictions where property acquisition would occur under the TSM/TDM Alternative along with the percentage of the property tax revenue collected and distributed to each jurisdiction's General Fund in FY 2012–2013. The parcel acquisitions under the TSM/TDM Alternative would result in a total loss of a total estimated $1,000 in annual property tax revenue for the affected jurisdictions. As shown in Table 3.3.10, the TSM/TDM Alternative would result in the loss of less than 0.01 percent of the property tax revenue collected and distributed to the respective General Funds of the Cities of Alhambra, Pasadena, Rosemead, San Gabriel, and South Pasadena in FY 2012–2013.

TABLE 3.3.10:
Property Tax Losses for the TSM/TDM Alternative

Jurisdiction	Assessed Value of Acquisitions[1]	Estimated Property Tax Loss to Jurisdiction[1]	Estimated Percent of Property Tax Loss as a Percentage of the General Fund Property Tax Revenue[1]
Alhambra	$11,712	$13	<0.01%
Pasadena	$409,498	$694	<0.01%
Rosemead	$3,646	$2	<0.01%
San Gabriel	$59,310	$58	<0.01%
South Pasadena	$103,578	$233	<0.01%
Total Estimated Property Tax Loss	–	***$1,000***	–

Source: Community Impact Assessment (2014).
[1] Numbers are subject to change based on the final alignment or design of the project alternatives.

As described earlier, the TSM/TDM Alternative would result in the relocation of approximately 1 business in the El Sereno neighborhood in the City of Los Angeles, resulting in the displacement of approximately 6 jobs, or approximately 0.6 percent of El Sereno's primary jobs in 2011. This business is assumed to generate sales tax. As discussed in the FRIR, there is an adequate supply of replacement properties available in the study area in which to relocate this displaced business. If this business were to relocate outside the City of Los Angeles, the potential sales tax loss for the City of Los Angeles would be an estimated $1,939 per year, or less than 0.01 percent of the total sales tax revenue distributed to the City of Los Angeles General Fund in 2011.

Operation and maintenance of the improvements in the TSM/TDM Alternative is estimated to cost $15.9 million per year (in 2010 dollars). Operation and maintenance of the improvements and bus service enhancements included in the TSM/TDM Alternative are estimated to result in 300 person-year jobs, which would generate approximately $10.5 million per year (in 2010 dollars) in employment earnings over the long term.

BRT Alternative

The BRT Alternative would result in property tax revenue losses for the Cities of Alhambra, Los Angeles, Monterey Park, Pasadena, Rosemead, San Gabriel, South Pasadena, and the County of Los Angeles (i.e., the unincorporated community of East Los Angeles). Table 3.3.11 shows the estimated loss in annual property tax revenue for each jurisdiction where

TABLE 3.3.11:
Property Tax Losses for the BRT Alternative

Jurisdiction	Assessed Value of Acquisitions[1]	Estimated Property Tax Loss to Jurisdiction[1]	Estimated Percent of Property Tax Loss as a Percentage of the General Fund Property Tax Revenue[1]
Alhambra	$215,883	$242	<0.01%
County of Los Angeles[2]	$69,804	$156	<0.01%
Monterey Park	$249,320	$298	<0.01%
Pasadena	$431,857	$732	<0.01%
Rosemead	$3,646	$2	<0.01%
San Gabriel	$59,310	$58	<0.01%
South Pasadena	$277,171	$623	<0.01%
Total Estimated Property Tax Loss	–	***$2,111***	–

Source: *Community Impact Assessment* (2014).
Note: Analysis includes property tax losses associated with the TSM/TDM Alternative improvements included in the BRT Alternative.
1 Numbers are subject to change based on the final alignment or design of the project alternatives.
2 Property tax losses associated with acquisitions in the unincorporated community of East Los Angeles in the County of Los Angeles.

property acquisition would occur under the BRT Alternative along with the percentage of the property tax revenue collected and distributed to each jurisdiction's General Fund in FY 2012–2013. The parcel acquisitions under the BRT Alternative would result in a total loss of an estimated $2,111 in annual property tax revenue. As shown in Table 3.3.11, the BRT Alternative would result in the loss of less than 0.01 percent of the property tax revenue collected and distributed to the General Funds in the Cities of Alhambra, Los Angeles, Monterey Park, Pasadena, Rosemead, San Gabriel, South Pasadena, and the County of Los Angeles (i.e., the part generated in the unincorporated community of East Los Angeles) in FY 2012–2013. Because the BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10), the BRT Alternative would also result in the relocation of the same business that would be relocated under the TSM/TDM Alternative and the same potential loss of the same amount of annual sales tax revenue to the City of Los Angeles General Fund (approximately $1,939) as the TSM/TDM Alternative.

In addition to the long-term operating expenses for road and transit improvements in the TSM/TDM Alternative that are also included in the BRT Alternative, the majority of the additional operating expenses for the BRT Alternative improvements would be for regular ongoing maintenance and repair of the designated corridor used by the bus service and for the increased bus services provided in this Build Alternative. It is anticipated that ongoing road maintenance and repair activities would be conducted as part of the local jurisdictions' existing maintenance and repair of public street improvements in their jurisdictions.

Because the lanes used for the bus service in the BRT Alternative would be within existing public ROW, additional public works or other local jurisdiction staff and expanded maintenance or repair activities are not expected to be required to maintain those improvements.

The BRT Alternative includes substantial increases in transit service routes and frequencies, particularly in the dedicated bus lanes and on streets intersecting with those bus lanes. The increases in transit service routes and frequencies would result in the need for additional buses, drivers, maintenance, and management personnel, and overall increased operating and maintenance costs.

Operation and maintenance of the improvements in the BRT Alternative is estimated to cost $29.7 million per year (in 2010 dollars). Operation and maintenance of the improvements and bus services in the BRT Alternative are estimated to result in 600 person-year jobs, which would generate a total of $19.6 million (in 2010 dollars) per year in employment earnings over the life of the improvements.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The economic impact analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of the BRT Alternative.

LRT Alternative

The LRT Alternative would result in property tax revenue losses for the Cities of Alhambra, Monterey Park, Pasadena, Rosemead, San Gabriel, South Pasadena, and the County of Los Angeles (i.e., the unincorporated community of East Los Angeles). Table 3.3.12 shows the estimated loss in annual property tax revenue for each jurisdiction where property acquisition would occur under the LRT Alternative along with the percentage of the property tax revenue collected and distributed to each jurisdiction's General Fund in FY 2012–2013. The parcel acquisitions under the LRT Alternative would result in a total estimated loss of $50,885 in annual property tax revenue.

TABLE 3.3.12:
Property Tax Losses for the LRT Alternative

Jurisdiction	Assessed Value of Acquisitions[1]	Estimated Property Tax Loss to Jurisdiction[1]	Estimated Percent of Property Tax Loss as a Percentage of the General Fund Property Tax Revenue[1]
Alhambra	$18,763	$21	<0.01%
County of Los Angeles[2]	$3,912,032	$8,730	<0.01%
Monterey Park	$1,107,584	$1,204	0.02%
Pasadena	$4,480,714	$7,590	0.02%
Rosemead	$3,646	$2	<0.01%
San Gabriel	$59,310	$58	<0.01%
South Pasadena	$14,818,661	$33,280	0.4%
Total Estimated Property Tax Loss	**–**	***$50,885***	**–**

Source: *Community Impact Assessment* (2014).
Note: Analysis includes property tax losses associated with the TSM/TDM Alternative improvements included in the LRT Alternative.
[1] Numbers are subject to change based on the final alignment or design of the project alternatives.
[2] Property tax losses associated with acquisitions in the unincorporated community of East Los Angeles in the County of Los Angeles.

As described earlier, the LRT Alternative would result in the relocation of 76 businesses in the Cities of Alhambra, Monterey Park, Pasadena, and South Pasadena, and the unincorporated community of East Los Angeles, resulting in the displacement of 685 jobs. Table 3.3.13 shows the estimated number of jobs that could be displaced by the LRT Alternative in the jurisdictions in which property acquisitions would occur under the LRT Alternative along with the percentage of each affected jurisdiction's primary jobs that could be displaced as a result of the LRT Alternative.

TABLE 3.3.13:
Employment Impacts for the LRT Alternative

Jurisdiction	Relocated Jobs[1]	2011 Primary Jobs[1]	Relocated Jobs as Percentage of 2011 Primary Jobs[1]
Alhambra	30	23,046	0.13%
East Los Angeles[2]	165	19,758	0.83%
El Sereno[3]	30	5,453	0.11%
Monterey Park	50	25,296	0.20%
Pasadena	105	93,981	0.11%
South Pasadena	305	6,090	5.01%
TOTAL	***685***	–	–

Source: *Community Impact Assessment* (2014).
Note: Analysis includes employment impacts associated with the TSM/TDM Alternative improvements included in the LRT Alternative.
[1] Numbers are subject to change based on the final alignment or design of the project alternatives.
[2] East Los Angeles is an unincorporated community in the County of Los Angeles.
[3] El Sereno is a neighborhood in the City of Los Angeles.

Sixteen of the 76 businesses that would be displaced by the LRT Alternative generate sales tax. As discussed in the DRIR, there is an adequate supply of replacement properties available in the study area in which to relocate these displaced businesses. If these businesses were to relocate outside the jurisdictions in which they are currently located, these jurisdictions would experience losses in sales tax revenues.

Table 3.3.14 shows the estimated loss in annual sales tax revenue for each jurisdiction where the displacement of sales tax-generating businesses would occur under the LRT Alternative along with the percentage of the total sales tax revenue distributed to each jurisdiction's General Fund in 2011 that would be lost as a result of the LRT Alternative.

TABLE 3.3.14:
Sales Tax Losses for the LRT Alternative

Jurisdiction	Relocated Sales Tax-Generating Businesses[1]	Estimated Potential Annual Sales Tax Loss to Jurisdiction[1]	Estimated Sales Tax Loss as a Percentage of Sales Tax Revenue[1]
Alhambra	1	$35,325	0.4%
County of Los Angeles[2]	8	$24,377	<0.01%
South Pasadena	7	$15,723	1.3%
Total Estimated Potential Annual Sales Tax Loss	***16***	***$75,425***	–

Source: *Community Impact Assessment* (2014).
Note: Analysis includes sales tax losses associated with the TSM/TDM Alternative improvements included in the LRT Alternative.
[1] Numbers are subject to change based on the final alignment or design of the project alternatives.
[2] Sales tax losses associated with the displacement of sales tax-generating businesses in the unincorporated community of East Los Angeles in the County of Los Angeles.

In addition to the long-term operating expenses for road and transit improvements in the TSM/TDM Alternative that are also included in the LRT Alternative, the majority of the additional operating expenses for the LRT Alternative improvements will be for regular ongoing operation, maintenance, and repair of the light rail tracks, structures, cars, and stations, and staff (including drivers, maintenance, and management personnel). It is anticipated that the operation and maintenance of those improvements would be conducted as part of Metro's ongoing operation and maintenance activities for the overall existing light rail system. Because the LRT Alternative would increase the total track, rail cars, and service in Metro's overall light rail system, this would be expected to result in an increase in the operating costs for the overall light rail system.

The LRT Alternative also includes a substantial increase in bus transit routes and frequencies serving the stations along the LRT Alternative alignment, which would result in the need for additional buses; drivers, maintenance, and management personnel; and overall increased operating and maintenance costs.

Operation and maintenance of the improvements in the LRT Alternative is estimated to cost $69.0 million per year (in 2010 dollars). The operation and maintenance of the improvements and LRT service included in the LRT Alternative are estimated to result in 1,300 person-year jobs, which would generate a total of $45.4 million (in 2010 dollars) per year in employment earnings over the life of the improvements.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). The economic impact analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of the LRT Alternative.

Measure T-1 (provided later in Section 3.5.4) requires the preparation and implementation of a Transportation Management Plan during construction. As noted in Measure T-1, "The TMP will include specific strategies to address short-term, project-related construction effects on traffic, bicyclists, pedestrians, and area residents and businesses. Table 3.5.19 lists the types of TMP strategies that would be applicable to the individual Build Alternatives. The TMP for the Preferred Alternative will include, but not be limited to, those strategies."

As a result, the TMP would provide strategies to minimize Adverse Effects of the project construction on businesses near project construction areas.

Freeway Tunnel Alternative

Both design variations of the Freeway Tunnel Alternative would result in property tax revenue losses for the Cities of Alhambra, Los Angeles, Rosemead, San Gabriel, and South Pasadena. Table 3.3.15 shows the estimated loss in annual property tax revenue for each jurisdiction where property acquisitions would occur under both design variations of the Freeway Tunnel Alternative along with the percentage of the property tax revenue collected and distributed to each jurisdiction's General Fund in FY 2012–2013. The parcel acquisitions under both design variations of the Freeway Tunnel Alternative would result in a total estimated loss of $1,042 in annual property tax revenue.

TABLE 3.3.15:
Property Tax Losses for the Freeway Tunnel Alternative (Single-Bore and Dual-Bore Design Variations)

Jurisdiction	Assessed Value of Acquisitions[1]	Estimated Property Tax Loss to Jurisdiction[1]	Estimated Percent of Property Tax Loss as a Percentage of the General Fund Property Tax Revenue[1]
Alhambra	$598,988	$673	<0.01%
City of Los Angeles[2]	$32,774	$76	<0.01%
Rosemead	$3,646	$2	<0.01%
San Gabriel	$59,310	$58	<0.01%
South Pasadena	$103,578	$233	<0.01%
Total Estimated Property Tax Loss	-	***$1,042***	-

Source: *Community Impact Assessment* (2014).
Note: Analysis includes property tax losses associated with the TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative.
1 Numbers are subject to change based on the final alignment or design of the project alternatives.
2 Property tax losses associated with acquisitions in the El Sereno neighborhood in the City of Los Angeles.

Table 3.3.16 shows the estimated number of jobs that could be displaced as a result of both design variations of the Freeway Tunnel Alternative in each jurisdiction in which property acquisitions would occur, along with the percentage of each affected jurisdiction's primary jobs that could be displaced.

TABLE 3.3.16:
Employment Impacts for the Freeway Tunnel Alternative (Single-Bore and Dual-Bore Design Variations)

Jurisdiction	Relocated Jobs[1]	2011 Primary Jobs[1]	Relocated Jobs as Percentage of 2011 Primary Jobs[1]
Alhambra	5	23,046	0.02%
El Sereno[2]	30	5,453	0.55%
TOTAL	***35***	**–**	**–**

Source: *Community Impact Assessment* (2014).
Note: Analysis includes employment impacts associated with the TSM/TDM Alternative improvements included in the LRT Alternative.
1 Numbers are subject to change based on the final alignment or design of the project alternatives.
2 El Sereno is a neighborhood in the City of Los Angeles.

Neither of the two businesses displaced under the Freeway Tunnel Alternative design variations generates sales tax. Therefore, their displacement would not result in the loss of sales tax revenue for the Cities of Alhambra and Los Angeles.

In addition to the long-term operating expenses for road and transit improvements in the TSM/TDM Alternative that are included in the Freeway Tunnel Alternative, the majority of the additional operating expenses for the improvements included in both Freeway Tunnel Alternative design variations will be for personnel, equipment, and facilities to support the operation, maintenance, and repair of the new freeway facilities. It is anticipated that the operation and maintenance of those improvements would be conducted as part of the ongoing Caltrans operation and maintenance activities for the freeway system in Los Angeles County. Because the Freeway Tunnel Alternative would increase the freeway facilities (e.g., travel lanes, freeway-to-freeway interchanges, shoulders, medians, signing, and lighting) in the overall freeway system, this Build Alternative would result in a modest increase in Caltrans freeway-related operating costs. If the freeway facility is tolled, that option would result in increased staffing and facility-related operations costs that would be partially offset by the collected tolls.

Both design variations of the Freeway Tunnel Alternative also include a substantial increase in bus transit service related to the TSM/TDM improvements, which would result in the need for additional buses; drivers, maintenance, and management personnel; and overall increased operating and maintenance costs.

Operation and maintenance of the improvements in the Freeway Tunnel Alternative single-bore design variation is estimated to cost $43.5 million per year for the operational variation that includes trucks and tolls or $48.8 million for the operational variation that includes trucks, tolls, and express buses (all estimates in 2010 dollars). Operation and maintenance of the improvements in the Freeway Tunnel Alternative single-bore design variation are estimated to result in 800 person-year jobs for the operational variation that includes trucks and tolls or 900 person-year jobs for the operational variation that includes trucks, tolls, and express buses, which would generate a total of $28.6 million or $32.1 million (in 2010 dollars), respectively, per year in employment earnings.

Operation and maintenance of the improvements in the Freeway Tunnel Alternative dual-bore design variation is estimated to cost $62.6 million per year for the operational variation that includes tolls or $50.9 million for the operational variation that excludes tolls (all estimates in 2010 dollars). Operation and maintenance of the improvements in the Freeway Tunnel Alternative dual-bore design variation are estimated to result in 1,200 person-year jobs for the operational variation that includes tolls or 1,000 person-year jobs for the operational variation that excludes tolls, which would generate a total of $41.2 million or $33.5 million (in 2010 dollars), respectively, per year in employment earnings.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). The economic impact analysis presented above reflects the inclusion of these TSM/TDM Alternative improvements as part of both design variations of the Freeway Tunnel Alternative.

3.3.4 Environmental Justice

3.3.4.1 Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed by President William J. Clinton on February 11, 1994. EO 12898 directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and Adverse Effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines, which for 2013 was $23,550 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. Caltrans' commitment to upholding the mandates of Title VI is demonstrated by its Title VI Policy Statement, signed by the Director, which can be found in Appendix C of this document.

3.3.4.2 Affected Environment

The study area for the consideration of Adverse Effects on environmental justice populations was defined as the census tracts for the cities, communities, and neighborhoods used to assess the project effects on community character and cohesion.

This environmental justice analysis applies the following methodology to identify minority and low-income populations that are meaningfully larger than those populations in Los Angeles County:

- Census tracts are considered to have minority populations if the percentage of minority residents within them is more than 10 percentage points higher than the County average (i.e., 59.7 percent or higher for racial minorities and 57.7 percent or higher for Hispanics/Latinos).
- Census tracts are considered to have low-income populations if the percentage of residents within them who are living below the Census Bureau's defined poverty threshold is more than 5 percentage points higher than the County average (i.e., 21.3 percent or higher).

The environmental justice analysis was conducted using demographic information from the 2010 United States Census at the census tract level for the study area cities and Los Angeles County, and data from the 2007–2011 ACS. The following three populations were considered in assessing whether the SR 710 North Project alternatives would result in disproportionate adverse impacts to environmental justice populations and whether those alternatives would result in benefits for those populations:

- **Racial Minority Population:** Defined as individuals who identify themselves as Black/African-American, Asian, Native Hawaiian/Pacific Islander, Native American/Native Alaskan, Some Other Race, or two or more races. As described in the methodology above, for this environmental justice analysis, a study area census tract is considered to have a racial minority population if the aggregated percentage of racial minority residents within it is 59.7 percent or higher.
- **Hispanic/Latino Population:** Defined as persons of Hispanic/Latino origin, a descriptor of ethnic origin who may be of any race. As described in the methodology above, for this environmental justice analysis, a study area census tract is considered to have a Hispanic/Latino population if the percentage of Hispanic/Latino residents within it is 57.7 percent or higher.
- **Low-Income Population:** As described above, low-income populations are those persons living below the poverty level as defined as the Census Bureau's poverty threshold of $23,836 for a family of four. As described in the methodology above, for this environmental justice analysis, a study area census tract is considered to have a low-income population if the percentage of persons living below the poverty level in it is 21.3 percent or higher.

The demographic data for the environmental justice populations described above are shown on Figures 3.3-14 through 3.3-17 in Appendix L. Because the study area is very large and the improvements in the individual Build Alternatives are located throughout the study area, the demographic data by census tract for the environmental justice populations are described in this section by Build Alternative.

Figures 3.3-14 through 3.3-17 (which are provided in Appendix L) also show the locations of the improvements in the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives, respectively, with the census tracts in which they are located by environmental justice population. The census tracts shown in grey on these figures are census tracts in which the percentages of racial minority, Hispanic/Latino, and low-income populations are meaningfully greater than the averages for the County. As shown on those figures, many census tracts have more than one environmental justice population that is meaningfully larger than the average for the County.

Census Tracts Containing or Adjacent to TSM/TDM Alternative Improvements

The improvements in the TSM/TDM Alternative would be located in census tracts in six cities (Alhambra, Pasadena, Rosemead, San Gabriel, San Marino, and South Pasadena), two neighborhoods (Eagle Rock and El Sereno) in the City of Los Angeles, and one unincorporated community (the Unincorporated San Gabriel Valley Communities) in the County of Los Angeles. As shown on Figure 3.3-14 in Appendix L, 10 of the 24 mapped TSM/TDM Alternative improvements occur in or adjacent to one or more census tracts with environmental justice populations, as follows:

- As shown on Sheet 1 of Figure 3.3-14 (Appendix L), 14 TSM/TDM Alternative improvements occur in or adjacent to 20 census tracts with racial minority populations that are meaningfully larger than the County average (i.e., 11 census tracts in Alhambra, 2 in Rosemead, 4 in San Gabriel, 1 in San Marino, 1 in Eagle Rock, and 1 in the Unincorporated San Gabriel Valley Communities).

- As shown on Sheet 2 of Figure 3.3-14 (Appendix L), 2 TSM/TDM Alternative improvements occur in or adjacent to 5 census tracts in El Sereno with Hispanic/Latino populations that are meaningfully larger than the County average.
- As shown on Sheet 3 of Figure 3.3-14 (Appendix L), 2 TSM/TDM Alternative improvements occur in or adjacent to 4 census tracts with low-income populations that are meaningfully larger than the County average (i.e., 1 census tract in Alhambra, and 3 in El Sereno).

Sheet 4 of Figure 3.3-14 (Appendix L) shows the locations of the improvements in the TSM/TDM Alternative and all the census tracts with one or more environmental justice populations. Fourteen of the TSM/TDM Alternative improvements are completely outside census tracts with one or more environmental justice populations, and three improvements are partially in or adjacent to census tracts with at least one environmental justice population. Eleven of the TSM/TDM Alternative improvements are entirely in census tracts with one or more environmental justice populations.

Census Tracts Containing or Adjacent to BRT Alternative Improvements

In addition to the affected census tracts for the TSM/TDM Alternatives, the BRT route in the BRT Alternative would be located in census tracts in five cities (Alhambra, Monterey Park, Pasadena, San Marino, and South Pasadena) and one unincorporated community (East Los Angeles). As shown on Figure 3.3-15 in Appendix L, the BRT Alternative improvements occur within or adjacent to census tracts with environmental justice populations, as follows:

- As shown on Sheet 1 of Figure 3.3-15 (Appendix L), most of the southern half of the alignment of the proposed BRT route is in or adjacent to 15 census tracts with racial minority populations that are meaningfully larger than the County average (i.e., 9 census tracts in Alhambra, and 6 in Monterey Park).
- As shown on Sheet 1 of Figure 3.3-15 (Appendix L), the southern quarter of the alignment of the proposed BRT route is in or adjacent to 5 census tracts with Hispanic/Latino populations that are meaningfully larger than the County average (i.e., 1 census tract in Monterey Park, and 4 in East Los Angeles).
- As shown on Sheet 2 of Figure 3.3-15 (Appendix L), approximately one-tenth of the alignment of the proposed BRT route is within or adjacent to 4 census tracts with low-income populations that are meaningfully larger than the County average (i.e., 2 census tracts in Alhambra, 1 in Monterey Park, and 1 in East Los Angeles).

Sheet 2 of Figure 3.3-15 (Appendix L) shows the locations of the physical improvements in the BRT Alternative, including the stations, and all the census tracts with one or more environmental justice populations. Nearly two-thirds of the alignment of the proposed BRT route and 6 of the 17 bus stations in the BRT Alternative are in census tracts with at least one environmental justice population.

Census Tracts Containing or Adjacent to LRT Alternative Improvements

In addition to the affected census tracts for the TSM/TDM Alternatives, the alignment of the LRT Alternative would be located in census tracts in four cities (Alhambra, Monterey Park, Pasadena, and South Pasadena), one neighborhood (El Sereno) in the City of Los Angeles, and one unincorporated community (East Los Angeles). As shown on Figure 3.3-16 in Appendix L, the alignment of the LRT Alternative would occur within or adjacent to census tracts with environmental justice populations, as follows:

- As shown on Sheet 1 of Figure 3.3-16 (Appendix L), approximately one-half of the alignment of the LRT Alternative (including both tunnel and aerial segments) and 4 LRT stations are within or adjacent to 5 census tracts with racial minority populations that are meaningfully larger than the County average (i.e., 3 census tracts in Alhambra, and 2 in Monterey Park).
- As shown on Sheet 1 of Figure 3.3-16 (Appendix L), approximately one-third of the alignment of the LRT Alternative (including both tunnel and aerial segments) and 3 LRT stations are within or adjacent to 5 census tracts with Hispanic/Latino populations that are meaningfully larger than the County average (i.e., 1 census tract in Alhambra, 2 in El Sereno, and 2 in East Los Angeles).
- As shown on Sheet 2 of Figure 3.3-16 (Appendix L), approximately one-tenth of the alignment of the LRT Alternative aerial segments and 2 LRT stations are within or adjacent to 2 census tracts in East Los Angeles with low-income populations that are meaningfully larger than the County average.

Sheet 2 of Figure 3.3-16 shows the alignment of the LRT Alternative, the locations of the LRT stations, and the census tracts with one or more environmental justice populations. Nearly two-thirds of the LRT Alternative alignment and 4 of the 7 LRT stations are in or immediately adjacent to census tracts with at least one environmental justice population.

Census Tracts Containing or Adjacent to the Freeway Tunnel Alternative Improvements

In addition to the affected census tracts for the TSM/TDM Alternatives, the improvements in the Freeway Tunnel Alternative would be located in census tracts in four cities (Alhambra, Monterey Park, Pasadena, and South Pasadena), one neighborhood (El Sereno) in the City of Los Angeles, and one unincorporated community (East Los Angeles). As shown on Figure 3.3-17 in Appendix L, the Freeway Tunnel Alternative improvements (both freeway and tunnel segments) occur within or adjacent to census tracts with environmental justice populations, as follows:

- As shown on Sheet 1 of Figure 3.3-17 (Appendix L), parts of both the northern and southern freeway (non-tunnel) segments in the Freeway Tunnel Alternative are in or adjacent to 5 census tracts with racial minority populations that are meaningfully larger than the County average (i.e., 3 census tracts in Alhambra, 1 in Monterey Park, and 1 in Pasadena).
- Parts of the northern and southern freeway segments and approximately one-third of the tunnel alignment in the Freeway Tunnel Alternative are in or adjacent to 8 census tracts with Hispanic/Latino populations that are meaningfully larger than the County average (i.e., 2 census tracts in Pasadena, 4 in El Sereno, and 2 in East Los Angeles).
- Parts of the northern and southern freeway segments and approximately one-tenth of the tunnel alignment in the Freeway Tunnel Alternative are within or adjacent to 6 census tracts with low-income populations that are meaningfully larger than the County average (i.e., 3 census tracts in Pasadena, 1 in El Sereno, and 2 in East Los Angeles).

Sheet 2 of Figure 3.3-17 in Appendix L shows the locations of the freeway and tunnel segments of the Freeway Tunnel Alternative and census tracts with one or more environmental justice populations. The entire freeway segment at the southern end of the alignment (at and north of the I-10 interchange), nearly half of the tunnel alignment, and approximately half of the freeway segment at the northern end of the alignment (south of and at the I-210 interchange) are within or immediately adjacent to census tracts with at least one environmental justice population.

3.3.4.3 Environmental Consequences

Temporary Impacts

No Build Alternative

The No Build Alternative does not include construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in adverse short-term effects on environmental justice populations.

Build Alternatives

The construction of the improvements in the Build Alternatives would require the temporary use of small areas of privately owned land for use as TCEs but would not displace any existing land uses. Any land used temporarily for a TCE would be returned to its original condition after construction. As a result, the construction of the Build Alternatives would not result in temporary adverse impacts on environmental justice populations related to the temporary use of land for TCEs.

Construction of the Build Alternatives could result in adverse short-term traffic, air quality, and noise effects on populations in the vicinity of active construction areas. As shown on Figures 3.3-14 through 3.3-17 (in Appendix L), the majority of the improvements in all the Build Alternatives would be within or adjacent to census tracts occupied by one or more of the three environmental justice populations. The potential adverse short-term construction effects in the vicinity of project improvements, on both environmental and non-environmental justice populations, are described in the following sections.

Site preparation, grading, and construction activities for the Build Alternative improvements would generate air emissions from worker commutes, operation of construction equipment, and soil disturbance during grading and excavation. Those emissions may extend beyond the boundaries of the construction areas. Worker commutes, materials and waste transport, and site preparation, grading, and construction activities would also generate noise that would extend beyond the boundaries of the construction areas. As a result, residents and other persons in the vicinity of active construction areas could experience adverse short-term air quality and noise effects from the operation of construction equipment and other construction-related activities. The short-term air quality and noise effects and the length of time those effects would occur would vary by Build Alternative and the specific improvements being constructed at a specific location. For example, grading and excavation would be limited to relatively small areas for relatively short periods of time for most of the TSM/TDM Alternative improvements but would cover larger areas and require longer construction periods for the LRT and Freeway Tunnel Alternatives.

Depending on the Build Alternative, the construction of project improvements will likely require the temporary closures of lanes, road segments, bridges, freeway ramps, and/or restrictions on turn movements to accommodate the construction activities and the staging of construction equipment and materials. As a result, travelers in the vicinity of project-related construction activities may experience short-term delays traveling near, around, and through areas near construction activities or detours around certain construction activities.

As shown on Figures 3.3-14 through 3.3-17 in Appendix L, the improvements in the Build Alternatives are proposed across the study area and are located within or adjacent to a large number of census tracts with environmental justice populations. As a result, environmental justice populations, as well as other populations in those areas, would experience short-term adverse air, noise, and traffic impacts during construction of the project improvements.

In summary, environmental justice populations across the study area would experience short-term adverse air quality, noise, and traffic impacts. Non-environmental justice populations in the study area would also experience those adverse short-term effects during construction of the project improvements. Moving the improvements in the Build Alternatives to other locations to avoid adverse short-term construction effects in and near census tracts with one or more environmental justice populations would result in those improvements being located where they would not provide comparable improvements to the circulation system. However, those short-term Adverse Effects on all populations, including environmental justice populations, can be substantially reduced through implementation of the Avoidance, Minimization, and/or Abatement Measures discussed in Sections 3.5, Traffic/Transportation, 3.13, Air Quality, and 3.14, Noise and Vibration. With implementation of the measures described above, the construction of the Build Alternatives would not result in adverse impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the Adverse Effects experienced by non-environmental justice populations.

Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in permanent Adverse Effects on environmental justice populations. However, because the No Build Alternative would not provide any improvements to the transit, transportation, and circulation systems, it would not provide the benefits to the traveling public (including environmental justice populations) that would occur under the Build Alternatives.

Based on the above discussion and analysis, the No Build Alternative will not cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. No further environmental justice analysis is required.

Build Alternatives

TSM/TDM Alternative

As shown on Sheet 4 of Figure 3.3-14 in Appendix L, 10 of the TSM/TDM Alternative improvements are within or adjacent to census tracts with at least one environmental justice population, and nearly half of the census tracts in the study area contain one or more environmental justice populations. As described earlier in Section 3.2.2.3, the improvements in the TSM/TDM Alternative would require permanent acquisition of partial parcels of privately owned land but would not result in the displacement of any residential or non-residential uses on privately owned parcels. The TSM/TDM Alternative would result in the displacement of one business on a parcel owned by the State. Because all permanent acquisition of land for the TSM/TDM Alternative would comply with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) and Title VI of the Civil Rights Act of 1964 (Title VI), the TSM/TDM Alternative would not result in permanent adverse impacts to environmental justice or non-environmental justice populations related to the permanent acquisition of privately owned land.

The improvements in the TSM/TDM Alternative are relatively modest, focused improvements that are intended to improve circulation at specific intersections or street segments but would not be expected to increase system efficiency to a level that would substantially increase the overall capacity of the transportation system. The increased system efficiency provided by those improvements would benefit the traveling public, including environmental justice and non-environmental justice populations, using both private vehicles and public transit.

Moving the improvements in the TSM/TDM Alternatives to other locations to avoid permanent land acquisition in and near census tracts with one or more environmental justice populations would result in those improvements being located where they would not provide comparable improvements to the circulation system and would likely not avoid all these types of Adverse Effects on environmental justice populations. However, because those long-term Adverse Effects of the TSM/TDM Alternative on all populations, including environmental justice populations, can be substantially reduced, the operation of the TSM/TDM Alternative would not result in adverse impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the Adverse Effects experienced by non-environmental justice populations.

Based on the above discussion and analysis, the TSM/TDM Alternative will not cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. No further environmental justice analysis is required.

BRT Alternative

In addition to the improvements in the TSM/TDM Alternative, the BRT Alternative will provide dedicated and mixed-flow bus lanes, bus stations, and increased bus service focused on a north-south corridor extending from south of SR 60 to Pasadena. As described earlier in Section 3.2.2.3, the improvements in the BRT Alternative would result in the permanent partial acquisition of parcels of privately owned land but would not require the permanent full acquisition of any privately owned parcels of land and would not result in the displacement of any residential or non-residential uses. All permanent acquisition of land for the BRT Alternative would comply with the requirements of the Uniform Act and Title VI. As a result, the BRT Alternative would not result in permanent adverse impacts on environmental justice populations or non-environmental justice populations related to the permanent acquisition of privately owned land.

The BRT Alternative would provide an efficient alternative for the traveling public with substantial increases in transit services and the provision of bus stations along the BRT route. As shown on Sheet 2 of Figure 3.3-15 in Appendix L, nearly two-thirds of the BRT route included in the BRT Alternative and six of the BRT stations would be located in or immediately adjacent to census tracts with one or more environmental justice populations. Based on the locations of the environmental justice populations along the BRT route and in the vicinity of the BRT stations, and the availability of substantially increased bus services in the study area, the improvements in the BRT Alternative that would provide improved transit services and facilities in the study area as well as the TSM/TDM Alternative improvements (which are also provided in the BRT Alternative) will benefit both environmental justice and non-environmental justice populations.

Moving the improvements in the BRT Alternative to other roads to avoid permanent land acquisition in and near census tracts with one or more environmental justice populations along the alignment of the BRT Alternative could result in those improvements being located where they would not provide comparable improvements to the circulation system and would likely not avoid all these types of Adverse Effects on environmental justice populations. However, because the long-term Adverse Effects of the BRT Alternative on all populations (including environmental justice populations) can be substantially reduced, the operation of the BRT Alternative would not result in adverse impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the Adverse Effects experienced by non-environmental justice populations.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). As a result, the BRT Alternative would also result in most of the same permanent effects as the TSM/TDM Alternative. Even with the inclusion of the TSM/TDM Alternative improvements described above, the operation of the BRT Alternative would not result in adverse impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the Adverse Effects experienced by non-environmental justice populations.

Based on the above discussion and analysis, the BRT Alternative will not cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. No further environmental justice analysis is required.

LRT Alternative

In addition to the improvements in the TSM/TDM Alternative, the LRT Alternative proposes seven stations along the LRT Alternative alignment. New bus routes and increased bus service frequencies would also be provided to support travel to and from the new light rail stations. As described earlier in Section 3.2.2.3, the improvements in the LRT Alternative would result in the permanent acquisition of partial parcels of privately owned land but would not require the full acquisition of any privately owned parcels of land that are used for residential uses and would not result in the displacement of any residential uses or residents. The LRT Alternative would require the full and partial acquisitions of parcels occupied by non-residential uses and, as a result, would displace businesses and employees. Although the LRT Alternative would result in business and employee displacements in three cities (Alhambra, Pasadena, and South Pasadena), one unincorporated community (East Los Angeles), and one neighborhood (El Sereno) in the study area, due to the types of businesses that would be displaced, their current locations, and the low percentage of transit-dependent residents in the areas surrounding these businesses, the displacement of most of these businesses would not disrupt the social fabric of the cities, communities, and neighborhoods in which they are located.

In unincorporated East Los Angeles, the LRT Alternative would result in the displacement of 17 neighborhood-oriented businesses along Mednik Avenue just south of SR 60, which would disrupt the social fabric of the community in this area. Although these businesses would receive relocation assistance under the Uniform Act, based on the currently available properties for relocation described in the FRIR, they are not likely to be relocated in the immediate vicinity of their current locations. Due to the types of services these businesses offer (i.e., laundromat, drinking water, credit union, and restaurants), their location near the East Los Angeles Civic Center, and the high percentage of transit-dependent residents in the area, local residents are likely to rely on the services provided by these businesses on a day-to-day basis. Therefore, as described in Section 3.3.1.3, their displacement would adversely affect the community character and cohesion of this part of East Los Angeles, which contains substantial environmental justice populations (the populations of Census Tracts 5304 and 5305 adjacent to the proposed Mednik Station in East Los Angeles are approximately 77 and 98 percent Hispanic/Latino, respectively, and approximately 22 and 36 percent low-income, respectively). Although the LRT Alternative would adversely affect the community character and cohesion of East Los Angeles, the property acquisition and displacement under the LRT Alternative would result in permanent Adverse Effects on all the populations in this part of East Los Angeles, including both environmental justice and non-environmental justice populations.

In the long term, the improvements in the LRT Alternative would provide an efficient choice for the traveling public with substantial increases in transit services and the provision of a new light rail line in the study area, including connections to existing light rail lines and services. As shown on Sheet 2 of Figure 3.3-16 in Appendix L, nearly two-thirds of the alignment of the LRT Alternative and four of the seven stations would be located in or immediately adjacent to census tracts with one or more environmental justice populations. Based on the locations of the environmental justice populations along the alignment of the LRT Alternative and/or in the vicinity of the LRT stations and the availability of substantially increased bus services in the study area, the rail improvements in the LRT Alternative and the other transit TSM/TDM Alternative improvements (which are also provided in the LRT Alternative) will benefit both the environmental justice populations (especially low-income transit riders like those in the vicinity of the businesses that would be displaced from East Los Angeles) and non-environmental justice populations in this part of East Los Angeles.

Moving the alignment of the LRT line and stations in the LRT Alternative to other locations to avoid permanent land acquisition in and near census tracts with one or more environmental justice populations along the current alignment of the LRT Alternative could result in those improvements being located where they would not provide comparable improvements to the circulation system and would likely not avoid all these types of effects on environmental justice populations.

The LRT Alternative would result in the following off-setting benefits to environmental justice populations in East Los Angeles:

- The Mednik Station would provide new restaurant/retail space to offset the loss of the 17 businesses displaced from the existing shopping center at the station site. The 16 retail spaces at the Mednik Station would be approximately the same size as those displaced by the LRT Alternative. Therefore, it's possible that similar types of businesses as those displaced would be able to locate at the Mednik Station. The Mednik Station would also provide vendor kiosk space.
- The LRT Alternative would provide a new Class II bike lane on Mednik Avenue between First Street and Floral Drive, which would provide a safe, efficient route for cyclists to access the East Los Angeles Civic Center, a key destination in the area.

- The LRT Alternative would enhance transit accessibility in East Los Angeles, thus providing a benefit to transit-dependent populations who live, work, and/or shop in the area. Improving transit accessibility would also increase economic opportunities in the area by better connecting it to the rest of the region.
- The LRT Alternative would provide an attractive pedestrian plaza as well as expanded outdoor dining areas at the Mednik Station site. The existing shopping center on the station site provides several small outdoor dining areas, but does not have a pedestrian plaza.
- The LRT Alternative would improve the aesthetics of Mednik Avenue between Third Street and SR 60 by providing landscaping in the area that today is primarily concrete sidewalk and enhancing the median of Mednik Avenue and the frontage of the Mednik Station site. The LRT Alternative would also provide a small landscaped plaza at the corner of Third and Mednik that is currently occupied by an existing retail building.

In summary, after taking offsetting benefits into account, the LRT Alternative would not result in Adverse Effects that would be appreciably more severe or greater in magnitude on environmental justice populations than on non-environmental justice populations.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). As a result, the LRT Alternative would also result in most of the same permanent effects as the TSM/TDM Alternative. Even with the inclusion of the TSM/TDM Alternative improvements described above, the operation of the LRT Alternative would not result in adverse impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the Adverse Effects experienced by non-environmental justice populations.

Based on the above discussion and analysis, the LRT Alternative will not cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. No further environmental justice analysis is required.

Freeway Tunnel Alternative

In addition to the improvements in the TSM/TDM Alternative, the Freeway Tunnel Alternative proposes a freeway extending from the existing terminus of SR 710 north to the existing I-210/SR 134 interchange to the north. The at-grade freeway segments on the northern and southern ends of the project segment of SR 710 would connect with the existing I-210/SR 134 interchange to the north and SR 710 to the south. There would be no interchanges with local streets except at the existing partial interchange between SR 710 and Valley Boulevard. The majority of the alignment of the Freeway Tunnel Alternative would be in a tunnel and therefore would not result in adverse physical impacts on environmental justice or non-environmental justice populations.

As described earlier in Section 3.2.2.3, the improvements on the freeway segment at the southern end of the Freeway Tunnel Alternative would require the acquisition of privately owned land used for residential uses but would not result in the displacement of any existing residential uses or residents. The Freeway Tunnel Alternative would require the full and partial parcel acquisitions occupied by non-residential uses and would displace businesses and employees. All permanent acquisition of land for the Freeway Tunnel Alternative, including the relocation of displaced businesses, would comply with the requirements of the Uniform Act and Title VI. As a result, the Freeway Tunnel Alternative would not result in permanent adverse impacts on environmental justice populations or non-environmental justice populations related to the permanent acquisition of privately owned land.

As shown on Sheet 2 of Figure 3.3-17 in Appendix L, all of the freeway segment at the southern end (north of and at the I-10 interchange), nearly half of the tunnel alignment, and approximately half of the freeway segment at the northern end of the alignment (south of and at the I-210 interchange) are in or immediately adjacent to census tracts with at least one environmental justice population. Because the Freeway Tunnel Alternative would not provide interchanges or access locations between Valley Boulevard and I-210/SR 134, motorists in the study area along the alignment of that freeway segment would not be able to directly access the freeway from the local street network. However, some travelers currently using north-south local streets to traverse the study area would be expected to take alternative routes that would allow them to access the new freeway for those north-south trips. Environmental justice and other populations would indirectly benefit as a result of reduced traffic on local streets in the study area. In addition, the TSM/TDM Alternative improvements provided in the Freeway Tunnel Alternative would benefit both environmental justice and non-environmental justice populations in the study area.

Under existing conditions, motorists (and public transit riders) are able to travel in a north-south direction between East Los Angeles and Pasadena along the local streets. As such, should one of the operational variations that include vehicle tolling be implemented, some motorists (both environmental justice and non-environmental justice populations) may choose not to use the freeway tunnel included in the Freeway Tunnel Alternative, but would still have travel options for reaching their destinations. Because motorists and public transit riders would still be able to travel between East Los Angeles and Pasadena without using the tunnel, the operational variations that include vehicle tolling would not result in Adverse Effects on environmental justice populations that would not be borne by non-environmental justice populations.

Moving the alignment of the Freeway Tunnel Alternative to another location to avoid permanent land acquisition in and near census tracts with one or more environmental justice populations along the current alignment of the Freeway Tunnel Alternative could result in the need to relocate the interchanges at I-10 and I-210, which would substantially increase the amount of land needed to accommodate the improvements in this Build Alternative. Realigning the Freeway Tunnel Alternative could also result in greater adverse impacts in census tracts with one or more environmental justice populations. However, because the long-term Adverse Effects of the Freeway Tunnel Alternative on all populations, including environmental justice populations, can be substantially reduced, the operation of the Freeway Tunnel Alternative would not result in adverse impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the Adverse Effects experienced by non-environmental justice populations.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and

California Boulevard). As a result, the Freeway Tunnel Alternative would also result in most of the same permanent effects as the TSM/TDM Alternative. Even with the inclusion of the TSM/TDM Alternative improvements described above, the operation of the Freeway Tunnel Alternative would not result in adverse impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the Adverse Effects experienced by non-environmental justice populations.

Based on the above discussion and analysis, the Freeway Tunnel Alternative will not cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. No further environmental justice analysis is required.

3.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

The engineering and environmental studies for the SR 710 North Project included an extensive ongoing community outreach program that began in 2011 with the SR 710 Conversation Series meetings, which were intended to provide broad overviews of key steps in the project process. Each meeting was offered in a number of cities and communities in the overall study area, including the cities and communities with substantial environmental justice populations. Attendance at these meetings was open to members of the general public and other interested parties. In addition to English, materials for all meetings were provided in Spanish and Mandarin Chinese.

As part of the CEQA and NEPA scoping process, formal scoping meetings were held in Alhambra, El Sereno, Glendale, Highland Park, La Cañada Flintridge, Pasadena, San Gabriel, and South Pasadena. The formal scoping meetings included a project overview presentation followed by public comments, which were transcribed by a court reporter. Spanish, Chinese, and Armenian translators were available. In order to improve access to the scoping process, a virtual scoping meeting was made available to the general public at Metro's website for the SR 710 North Project (metro.net/sr710conversations).

Outreach efforts also included All Communities Convening (ACC) information sessions and open house meetings for interested members of the general public. The ACC information sessions and open house meetings were held periodically and intended to provide updated information on the project engineering and environmental planning tasks, and the project schedule.

Two community informational meetings were held in East Los Angeles in August and October 2013 for the purpose of providing general information related to the Build Alternatives under consideration, alternatives withdrawn from consideration, and topics to be evaluated in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS). Attendees were provided the opportunity to provide verbal and written comments at the meetings.

In addition to the meetings and public information/comment opportunities described above, Metro used a Facebook page (https://www.facebook.com/SR710Study), a Twitter account (https://twitter.com/sr710study), and a project-specific page on their website (http://www.metro.net/projects/sr-710-conversations/) for the SR 710 North Project to provide updated project information to all interested parties. These electronic information sources are updated as appropriate to ensure that current project-related information is available.

Additional information regarding community outreach efforts undertaken in support of the SR 710 North Project is provided in Section 5.3.3, Community Outreach and Information Meetings.

Compliance with the Uniform Act, as described in Measure CI-1, provided earlier in Section 3.3.2.4, would reduce the impacts of the four Build Alternatives on low-income and minority populations related to property acquisition and the displacement and relocation of nonresidential uses.

Avoidance, minimization, and mitigation measures described elsewhere in this EIR/EIS (land use, air quality, visual, noise, etc.) would reduce Adverse Effects on all affected populations, including low-income and minority populations.

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3.4 Utilities/Emergency Services

3.4.1 Affected Environment

The information in this section is based on the *Community Impact Assessment* (CIA) (2014). The study area for utilities and emergency services is the cities that would be directly affected by the Build Alternatives.

3.4.1.1 Emergency Services

Fire Protection

The following fire departments provide fire protection services within the study area. The fire stations discussed below are shown previously on Figures 3.3-1, 3.3-3, 3.3-5, and 3.3-7 in Section 3.3, Community Impacts. The figures cited here are provided in Appendix L, Community Impacts Figures.

Alhambra Fire Department

The Alhambra Fire Department provides fire and emergency medical response, fire prevention, hazardous materials spill response, and hazardous material regulatory enforcement services within the City of Alhambra. Table 3.4.1 provides a list of the station numbers and addresses of the Alhambra Fire Department fire stations in the City of Alhambra that are within 0.5 mile (mi) of one or more of the Build Alternatives.

TABLE 3.4.1:
Alhambra Fire Department Stations Within 0.5 Mile of Build Alternatives

Fire Station	Address
Fire Station No. 71	301 North 1st Street
Fire Station No. 72	1215 South 6th Street
Fire Station No. 73	2200 West Main Street
Fire Station No. 74	2505 West Norwood Place

Source: *Community Impact Assessment* (2014).

Los Angeles Fire Department

The Los Angeles Fire Department provides fire and emergency medical response, fire prevention, hazardous materials spill response, and hazardous material regulatory enforcement to the City of Los Angeles, including the neighborhoods of Eagle Rock, Glassell Park, and El Sereno. Table 3.4.2 lists the fire stations located within 0.5 mi of one or more of the Build Alternatives.

TABLE 3.4.2:
Los Angeles Fire Department Stations Within 0.5 Mile of Build Alternatives

Fire Station	Address	Neighborhood Served
Fire Station No. 42	2021 Colorado Boulevard	Eagle Rock
Fire Station No. 55	4455 East York Boulevard	Eagle Rock
Fire Station No. 47	4575 Huntington Drive South	El Sereno

Source: *Community Impact Assessment* (2014).

Glassell Park is served by Fire Station No. 50, located at 3036 Fletcher Drive. However, this station is not within 0.5 mi of any of the Build Alternatives.

Los Angeles County Fire Department

The Los Angeles County Fire Department provides fire and emergency medical response, fire prevention, hazardous materials spill response, and hazardous material regulatory enforcement services within the unincorporated community of East Los Angeles, the City of Irwindale, the Unincorporated San Gabriel Valley Communities, and the City of Rosemead. Two fire stations staffed by the Los Angeles County Fire Department are within 0.5 mi of one or more of the Build Alternatives. Fire Station No. 1, which is located at 1108 North Eastern Avenue, serves the unincorporated community of East Los Angeles. Fire Station No. 42, which is located at 9319 East Valley Boulevard, serves the City of Rosemead.

The City of Irwindale is served by Fire Station No. 48, which is located at 15546 East Arrow Highway. The Unincorporated San Gabriel Valley Communities are served by Fire Station No. 5, which is located at 7225 North Rosemead Boulevard in East San Gabriel. However, these stations are not within 0.5 mi of any of the Build Alternatives.

Monterey Park Fire Department

The Monterey Park Fire Department provides fire and emergency medical response, fire prevention, hazardous materials spill response, and hazardous material regulatory enforcement services within the City of Monterey Park. One of the fire stations staffed by the Monterey Park Fire Department, Fire Station No. 61 (which is located at 350 West Newmark Avenue), is within 0.5 mi of one or more of the Build Alternatives.

Pasadena Fire Department

The Pasadena Fire Department provides fire and emergency medical response, fire prevention, hazardous materials spill response, urban search and rescue, and hazardous material regulatory enforcement services within the City of Pasadena. Table 3.4.3 provides a list of the station numbers, addresses, and operators of the fire stations in the City of Pasadena that are within 0.5 mi of one or more of the Build Alternatives.

TABLE 3.4.3:
Pasadena Fire Department Stations Within 0.5 Mile of Build Alternatives

Name	Address
Fire Station No. 31	135 South Fair Oaks Avenue
Fire Station No. 33	515 North Lake Avenue
Fire Station No. 34	1360 East Del Mar Boulevard
Fire Station No. 39	50 Avenue 64

Source: *Community Impact Assessment* (2014).

San Gabriel Fire Department

The San Gabriel Fire Department provides fire protection, urban search and rescue, paramedic ambulance service, paramedic assessment engines, fire prevention inspections, public education, emergency preparedness planning, fire investigation, code enforcement, Community Emergency Response Team training, and other services based on community needs within the City of San Gabriel. One of the fire stations staffed by the San Gabriel Fire Department, Fire Station No. 51 (which is located at 1303 South Del Mar Avenue), is within 0.5 mi of one or more of the Build Alternatives.

San Marino Fire Department

The San Marino Fire Department provides fire and emergency medical response, fire prevention, life safety inspections, community education, and emergency preparedness within the City of San Marino. The San Marino Fire Station is located at 2200 Huntington Drive, which is within 0.5 mi of one or more of the Build Alternatives.

South Pasadena Fire Department

The South Pasadena Fire Department provides fire and emergency medical response, fire prevention, hazardous materials spill response, and hazardous material regulatory enforcement services within the City of South Pasadena. The South Pasadena Fire Station is located at 817 Mound Avenue, which is within 0.5 mi of one or more of the Build Alternatives.

Law Enforcement

The following police departments provide law enforcement and patrol services within the study area. The police stations discussed below are shown previously on Figures 3.3-1, 3.3-3, 3.3-5, and 3.3-7 in Section 3.3, Community Impacts. The figures cited here are provided in Appendix L, Community Impacts Figures.

Alhambra Police Department

The City of Alhambra is served by its own police department, the Alhambra Police Department, which is made up of four divisions: the Administration Division, the Investigations Division, the Crime Prevention Division, and the Field Services Division. The Alhambra Police Department operates out of the Alhambra Police Station at 211 South 1st Street, which is within 0.5 mi of one or more of the Build Alternatives.

Los Angeles Police Department

Police protection services in the City of Los Angeles, including the neighborhoods of Eagle Rock, El Sereno, and Glassell Park, are provided by the Los Angeles Police Department. There are no Los Angeles Police Department stations within 0.5 mi of any of the Build Alternatives. The Northeast Community Police Station in Glassell Park, located at 3353 San Fernando Road, serves the neighborhoods of Eagle Rock and Glassell Park. The Hollenbeck Community Police Station in Boyle Heights serves the neighborhood of El Sereno. The Los Angeles Police Department does not operate any police stations within El Sereno or Eagle Rock.

Los Angeles County Sheriff's Department

The unincorporated community of East Los Angeles, the City of Rosemead, and the Unincorporated San Gabriel Valley Communities are served by the Los Angeles County Sheriff's Department, which is made up of four divisions: Custody Operations, Patrol and Detective Operations, Countywide Services, and Administrative & Professional Standards. In addition, the Los Angeles County Sheriff's Department patrols the Los Angeles County Metropolitan Transportation Authority (Metro) buses, trains, and transit facilities and Metrolink trains. East Los Angeles is served by the East Los Angeles Sheriff's Station at 5019 East 3rd Street, which is within 0.5 mi of one or more of the Build Alternatives. Rosemead and the Unincorporated San Gabriel Valley Communities are served by the Los Angeles County Sheriff's Department Temple Station at 8838 Las Tunas Drive in Temple City, which is not within 0.5 mi of the Build Alternatives. Although police protection services in Monterey Park are provided by the Monterey Park Police Department, the Los Angeles County Sheriff's Department Headquarters is located at 4700 Ramona Boulevard in Monterey Park, which is within 0.5 mi of one or more of the Build Alternatives.

Monterey Park Police Department

The City of Monterey Park is served by its own police department, the Monterey Park Police Department. The Monterey Park Police Department operates out of the Monterey Park Police Station at 320 West Newmark Avenue, which is not within 0.5 mi of one or more of the Build Alternatives.

Pasadena Police Department

The City of Pasadena is served by its own police department, the Pasadena Police Department, which is made up of three divisions: Criminal Investigations, Strategic Services, and Field Operations. The Pasadena Police Department operates out of the Pasadena Police Station at 207 North Garfield Avenue, which is within 0.5 mi of one or more of the Build Alternatives.

Irwindale Police Department

The City of Irwindale is served by its own police department, the Irwindale Police Department. The Irwindale Police Department operates out of the Irwindale Police Station at 5050 North Irwindale Avenue, which is not within 0.5 mi of the Build Alternatives.

San Gabriel Police Department

The City of San Gabriel is served by its own police department, the San Gabriel Police Department. The San Gabriel Police Department operates out of the San Gabriel Police Station at 620 South Del Mar Avenue, which is within 0.5 mi of one or more of the Build Alternatives.

San Marino Police Department

The City of San Marino is served by its own police department, the San Marino Police Department. The San Marino Police Department operates out of the San Marino Police Station at 2200 Huntington Drive, which is within 0.5 mi of one or more of the Build Alternatives.

South Pasadena Police Department

The City of South Pasadena is served by its own police department, the South Pasadena Police Department, which is made up of three divisions: Support Services, Field Operations, and Investigations. The South Pasadena Police Department operates out of the South Pasadena Police Station at 1422 Mission Street, which is within 0.5 mi of one or more of the Build Alternatives.

3.4.1.2 Utilities Companies and Types of Facilities

Within the study area, local utility facilities are critical to municipalities and include power distribution systems, gas distribution pipelines, telephone systems, cable television systems, water distribution mains, sanitary sewer mains, and telecommunication systems. Service providers in the study area are shown in Table 3.4.4.

TABLE 3.4.4:
Utility Service Providers

City	Cable/TV	Electricity	Gas	Sewer	Solid Waste	Telephone	Water
Alhambra	Charter Communications	Southern California Edison	Southern California Gas Company	Alhambra Utilities Department	Allied Waste Services	Multiple Providers	Metropolitan Water District Alhambra Utilities Department
Eagle Rock	Multiple Providers	City of Los Angeles Department of Water and Power		City of Los Angeles, Department of Public Works, Bureau of Sanitation	City of Los Angeles, Department of Public Works, Bureau of Sanitation	Multiple Providers	City of Los Angeles, Department of Water and Power
East Los Angeles	Multiple Providers	Southern California Edison		Los Angeles County Sanitation Districts	Belvedere Garbage Disposal District	Multiple Providers	California Water Service Company
El Sereno	Multiple Providers	City of Los Angeles Department of Water and Power		City of Los Angeles, Department of Public Works, Bureau of Sanitation	City of Los Angeles, Department of Public Works, Bureau of Sanitation	Multiple Providers	City of Los Angeles, Department of Water and Power
Glassell Park	Multiple Providers	City of Los Angeles Department of Water and Power		City of Los Angeles, Department of Public Works, Bureau of Sanitation	City of Los Angeles, Department of Public Works, Bureau of Sanitation	Multiple Providers	City of Los Angeles, Department of Water and Power
Irwindale	Charter Communications	Southern California Edison		Consolidated Sewer Maintenance District of Los Angeles County	Athens Disposal	Verizon	Azusa Light and Water Golden State Water Company Monrovia Water Division San Gabriel Valley Water Company Valley County Water District
Monterey Park	Multiple Providers	Southern California Edison		City of Monterey Park, Department of Public Works	Athens Disposal	Multiple Providers	City of Monterey Park, Water Utility Division
Pasadena	Multiple Providers	City of Pasadena Department of Water and Power		City of Pasadena, Department of Public Works	City of Pasadena, Department of Public Works	Multiple Providers	City of Pasadena, Department of Water and Power
Rosemead	Charter Communications	Southern California Edison		Consolidated Sewer Maintenance District of Los Angeles County	Consolidated Disposal Services	AT&T	Adams Ranch Mutual Water Company Amarillo Mutual Water California American Water Company Golden State Water San Gabriel Valley Water San Gabriel County Water District
San Gabriel	Charter Communications	Southern California Edison		City of San Gabriel, Department of Public Works	Athens Disposal	AT&T SBC	San Gabriel County Water District California American Water Company Sunnyslope Water Company San Gabriel Valley Water Company Southern California Water Company
San Marino	Time Warner Communications	Southern California Edison		City of San Marino, Department of Public Works	Athens Disposal	AT&T	California American Water Company
South Pasadena	Multiple Providers	Southern California Edison		City of South Pasadena, Department of Public Works	Athens Disposal	Multiple Providers	Global Water
Unincorporated San Gabriel Valley Communities	Multiple Providers	Southern California Edison		Consolidated Sewer Maintenance District of Los Angeles County	City of Los Angeles, Department of Public Works	Multiple Providers	California American Water Company East Pasadena Water Company Pasadena Water and Power Sunny Slope Water Golden State Water Company

Source: *Community Impact Assessment* (2014).

3.4.2 Environmental Consequences

3.4.2.1 Temporary Impacts

Emergency Services

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the State Route 710 (SR 710) North Project Build Alternatives. As a result, the No Build Alternative would not result in effects related to emergency services associated with improvements in the Build Alternatives.

TSM/TDM Alternative

During construction of the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative improvements, some impairment to the delivery of emergency services, including fire and police response times, may occur as a result of the lane restrictions proposed as part of this alternative. Improvements under the TSM/TDM Alternative could result in temporary lane restrictions that may impact access and circulation at the following 25 areas in Alhambra, Eagle Rock, El Sereno, Glassell Park, Pasadena, Rosemead, San Gabriel, San Marino, South Pasadena, and the Unincorporated San Gabriel Valley Communities:

- Fremont Avenue from Mission Road to Valley Boulevard (L-2c Improvements)
- Atlantic Boulevard from Glendon Way to Interstate 10 (I-10) (L-3 Improvements)
- Garfield Avenue from Valley Boulevard to Glendon Way (L-4 Improvements)
- Garfield Avenue/Mission Road (I-16 Improvements)
- Hellman Avenue/Fremont Avenue (I-44 Improvements)
- Valley Boulevard to Mission Road Connector Road (T-1 Improvements)
- Huntington Drive/Garfield Avenue, Huntington Drive/Atlantic Boulevard, and Atlantic Boulevard/Garfield Avenue (I-13, I-14, I-15 Improvements)
- Figueroa Street from State Route 134 (SR 134) to Colorado Boulevard (L-1 Improvements)
- West Broadway/Colorado Boulevard (I-1 Improvements)
- Eagle Rock Boulevard/Colorado Boulevard (I-45 Improvements)
- Eagle Rock Boulevard/York Boulevard (I-2 Improvements)
- Eastern Avenue/Huntington Drive (I-3 Improvements)
- St. John Avenue Extension between Del Mar Boulevard and California Boulevard (T-3 Improvements)
- State Route 110 (SR 110)/Fair Oaks Avenue Hook Ramps (T-2 Improvements)
- Rosemead Boulevard from Lower Azusa Road to Marshall Street (L-5 Improvements)
- Del Mar Avenue/Mission Road (I-19 Improvements)
- San Gabriel Boulevard/Marshall Street (I-22 Improvements)
- Del Mar Avenue/Valley Boulevard (I-43 Improvements)
- Huntington Drive/Oak Knoll Avenue (I-24 Improvements)
- Huntington Drive/Sierra Madre Boulevard (I-25 Improvements)
- San Gabriel Boulevard/Huntington Drive (I-18 Improvements)
- Fremont Avenue from Huntington Drive to Alhambra Road (L-2a Improvements)
- Fair Oaks Avenue from Grevelia Street to Monterey Road, Fair Oaks Avenue/Monterey Road (L-8 and I-8 Improvements)

- Fremont Avenue/Monterey Road (I-9 Improvements)
- Huntington Drive/Fair Oaks Avenue, Fremont Avenue/Huntington Drive (I-10 and I-11 Improvements)

Construction activities associated with the improvements under the TSM/TDM Alternative would result in delays for the traveling public. Emergency service providers, including the local fire and police departments, could experience these travel delays when traveling to/from emergency scenes while lane restrictions are in effect. The following fire and police stations are located within 500 feet (ft) of the TSM/TDM Alternative improvements; therefore, emergency vehicles assigned to these stations could experience travel delays:

- Alhambra Fire Department Fire Station No. 74
- Los Angeles Fire Department Fire Station Nos. 42 and 55
- San Gabriel Police Station
- San Marino Police Station
- San Marino Fire Station
- South Pasadena Police Station
- South Pasadena Fire Station

BRT Alternative

During construction of the Bus Rapid Transit (BRT) Alternative improvements, some impairment to the delivery of emergency services, including fire and police response times, may occur as a result of the lane restrictions along Atlantic Boulevard, Huntington Drive, and Fair Oaks Avenue in Alhambra, East Los Angeles, Monterey Park, Pasadena, and South Pasadena and ramp closures at the State Route 60 (SR 60) on-ramps from Atlantic Boulevard.

Construction activities associated with the improvements under the BRT Alternative would result in delays for the traveling public. Emergency service providers, including the local fire and police departments and the California Highway Patrol, could experience these travel delays when traveling to/from emergency scenes while lane restrictions or ramp closures are in effect.

The following fire and police stations are located within 500 ft of the BRT Alternative improvements; therefore, emergency vehicles assigned to these stations could experience travel delays:

- Pasadena Fire Department Fire Station Nos. 31 and 34
- South Pasadena Police Station
- South Pasadena Fire Station

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, construction of the BRT Alternative would also require similar temporary lane restrictions and would result in similar emergency response service impairments as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would require temporary lane restrictions that would result in temporary impairments to emergency response services affecting 7 fire stations and 3 police stations in the study area. None of the short-term impacts related to emergency response services anticipated to occur during construction of the BRT Alternative would be adverse.

LRT Alternative

During construction of the Light Rail Transit (LRT) Alternative improvements, some impairment to the delivery of emergency services, including fire and police response times, may occur as a result of the overnight closures on SR 60, Interstate 710 (I-710), and other roadways to accommodate the placement of concrete barriers adjacent to the median and the construction of falsework. In addition, there are nine areas in Alhambra, East Los Angeles, El Sereno, Monterey Park, Pasadena, and South Pasadena where improvements under the LRT Alternative could result in temporary lane restrictions that may impact access and circulation and impair the delivery of emergency services. These areas are:

- Mednik Avenue from 1st Street to Floral Drive in East Los Angeles;
- Floral Station area in East Los Angeles and Monterey Park;
- Elevated LRT Alignment in I-710 right of way (ROW) in El Sereno and Monterey Park;
- California State University, Los Angeles (Cal State LA) Station area in El Sereno;
- Valley Boulevard in El Sereno and Alhambra; and
- All four underground stations (i.e., two locations in South Pasadena, one in Alhambra, and one in Pasadena).

Construction activities associated with the improvements under the LRT Alternative would result in delays for the traveling public. Emergency service providers, including the local fire and police departments and the California Highway Patrol, could experience these travel delays when traveling to/from emergency scenes while lane restrictions or ramp closures are in effect. The following fire and police stations are located within 500 ft of the LRT Alternative improvements; therefore, emergency vehicles assigned to these stations could experience travel delays:

- Los Angeles County Sheriff's Department Headquarters
- South Pasadena Police Station
- South Pasadena Fire Station

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, construction of the LRT Alternative would also require similar temporary lane restrictions and would result in similar emergency response service impairments as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would require temporary lane restrictions that would result in temporary impairments to emergency response services affecting 5 fire stations and 4 police stations in the study area. None of the short-term impacts related to emergency response services anticipated to occur during construction of the LRT Alternative would be adverse.

Freeway Tunnel Alternative

During construction of the Freeway Tunnel Alternative improvements, some impairment to the delivery of emergency services, including fire and police response times, may occur as a result of lane restrictions.

As shown in Table 3.4.5, the single-bore design variation of the Freeway Tunnel Alternative would result in delays at 5 locations and detours in 7 locations in Alhambra, El Sereno, and Monterey Park in the vicinity of the south tunnel portal, as well as delays at 8 locations and detours in 11 locations in Pasadena in the vicinity of the north tunnel portal.

TABLE 3.4.5:
Construction Delays and Detours for the Freeway Tunnel Alternative

Area Where Construction Activities Would Occur	City/Community/Neighborhood	Single-Bore Design Variation		Dual-Bore Design Variation	
		Delay	Detour	Delay	Detour
South Portal					
NB/SB SR 710 mainline lanes	Alhambra/El Sereno/Monterey Park	●		●	
EB El Monte Busway ramp to NB SR 710	Alhambra/El Sereno/Monterey Park		●		●
WB I-10 connector to NB SR 710	Alhambra/El Sereno/Monterey Park		●		●
EB I-10 connector to NB I-710	Alhambra/El Sereno/Monterey Park				●
Ramona Blvd. on-ramp to NB I-710	Alhambra/El Sereno/Monterey Park				●
SB SR 710 connector to WB I-10	Alhambra/El Sereno/Monterey Park		●		●
SB SR 710 connector to EB I-10	Alhambra/El Sereno/Monterey Park		●		●
SB SR 710 connector to WB El Monte Busway	Alhambra/El Sereno/Monterey Park		●		●
WB I-10 connector to SB I-710	Alhambra/El Sereno/Monterey Park			●	
Hellman Ave. Bridge over SR 710	Alhambra/El Sereno	●		●	
Valley Blvd. at SR 710	Alhambra/El Sereno	●		●	
NB SR 710 off-ramp to Valley Blvd.	Alhambra/El Sereno	●	●		●
Valley Blvd. on-ramp to SB SR 710	Alhambra/El Sereno	●	●		●
North Portal					
SB SR 710 mainline lanes	Pasadena	●		●	
St. John Ave. between Del Mar Blvd. and California Blvd.	Pasadena	●		●	
St. John Ave. between Green St. and Del Mar Blvd.	Pasadena	●		●	
Green St. Bridge over SR 710	Pasadena		●		●
NB SR 710 mainline lanes	Pasadena	●		●	
Pasadena Ave. on-ramp to NB SR 710	Pasadena		●		●
EB SR 134 connector to SB SR 710 and California Blvd.	Pasadena		●		●
Colorado Blvd. Bridge over SR 710	Pasadena	●		●	
Union St. Bridge over SR 710	Pasadena	●		●	
SB SR 710 off-ramp to St. John Ave.	Pasadena	●		●	
WB I-210 connector to SB SR 710	Pasadena		●		●
SB SR 710 mainline lanes	Pasadena	●		●	
SB SR 710 south of St. John Ave. off-ramp	Pasadena		●		●
NB SR 710 on-ramp from Pasadena Ave. south of Del Mar Blvd.	Pasadena		●		●
NB SR 710 on-ramp from Del Mar Blvd.	Pasadena		●		●
NB SR 710 connector to WB SR 134	Pasadena		●		●
NB SR 710 connector to EB I-210	Pasadena		●		●
SB SR 710 off-ramp to Del Mar Blvd.	Pasadena		●		●
Del Mar Blvd. Bridge over SR 710	Pasadena		●		●

Source: *Community Impact Assessment* (2014).
NB = Northbound
SB = Southbound
WB = Westbound

As shown in Table 3.4.5, the dual-bore design variation of the Freeway Tunnel Alternative would result in delays at 4 locations and detours in 9 locations in Alhambra, El Sereno, and Monterey Park in the vicinity of the south tunnel portal, as well as delays at 8 locations and detours in 11 locations in Pasadena in the vicinity of the north tunnel portal.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). Therefore, construction of the Freeway Tunnel Alternative would also require similar temporary lane restrictions and would result in similar emergency service response service impairments as the TSM/TDM Alternative.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, both design variations of the Freeway Tunnel Alternative would require temporary lane restrictions that would result in temporary impairments to emergency response services affecting 5 fire stations and 3 police stations in the study area. None of the short-term impacts related to emergency response services anticipated to occur during construction of the Freeway Tunnel Alternative would be adverse.

Utilities

Utilities identified within the project disturbance limits of the Build Alternatives (which are listed later in Tables 3.4.6 through 3.4.10) are based on the *Draft Project Report* (2014). It should be noted that there may be currently unidentified/unknown utilities in the project area or that new utility facilities may be constructed in the area prior to the construction of any of the improvements included in the SR 710 North Project Build Alternatives. As a result, during final design, the Project Engineer will prepare an updated utility survey for the area within the disturbance limits of the selected Build Alternative.

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any Adverse Effects related to utility service providers associated with improvements in the Build Alternatives.

TSM/TDM Alternative

The TSM/TDM Alternative would affect various underground and overhead utilities, some of which would require relocation. Where feasible, those utilities that are possible to protect in-place will be protected in-place. Utilities that have the potential to be affected during construction of the TSM/TDM Alternative are listed in Table 3.4.6 by utility provider and by the city, community, or neighborhood in which they are located.

As shown in Table 3.4.6, the TSM/TDM Alternative would require the relocation of electric utilities in Alhambra, Eagle Rock, El Sereno, Rosemead, San Gabriel, and South Pasadena; the relocation of telecommunication facilities in Alhambra, Eagle Rock, El Sereno, Pasadena, Rosemead, San Gabriel, and South Pasadena; and the protection in place of water and sewer utilities in Alhambra. The utility relocations described in Table 3.4.6 may result in temporary service disruptions to some utility users in the vicinity of those relocations. None of the short-term utility impacts anticipated to occur during construction of the TSM/TDM Alternative would be adverse.

TABLE 3.4.6:
Potential Effects on Utilities During Construction of the TSM/TDM Alternative

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection in Place)
Alhambra Utilities Department	Alhambra	4” CIP Water	Will be protected in place during construction
		12” VCP Sewer (abandoned)	Will be protected in place during construction
		8” VCP	Will be protected in place during construction
		12” Unknown (abandoned)	Will be protected in place during construction
AT&T	Alhambra	2 Overhead Telecom	Will be relocated with power pole
	Eagle Rock	1 Overhead Telecom	Will be relocated with power pole
	El Sereno	1 Overhead Telecom	Will be relocated with power pole
	Pasadena	1 Overhead Telecom	Will be relocated with another pole
	Rosemead	12 Overhead Telecom	Will be relocated with power pole
	San Gabriel	2 Power Poles	Will be relocated to fit within proposed sidewalk
		4 Overhead Telecom	Will be relocated with power pole
	South Pasadena	2 Overhead Telecom	Will be relocated with power pole
Los Angeles Department of Water and Power	Eagle Rock	1 Power Pole	Will be relocated to fit within proposed sidewalk
		1 Overhead Electric	Will be relocated with power pole
	El Sereno	2 Power Poles	Will be relocated to fit within proposed sidewalk
		2 Overhead Electric	Will be relocated with power pole
Metropolitan Water District	Alhambra	60” Water	Will be protected in place during construction
City of Pasadena Power Department	Pasadena	3 Power Poles	Will be relocated to fit within proposed sidewalk
		3 Overhead Electric	Will be relocated with power pole
Southern California Edison	Alhambra	4 Power Poles	Will be relocated to fit within proposed sidewalk
		4 Overhead Electric	Will be relocated with power pole
	Rosemead	4 Power Poles	Will be relocated to fit within proposed sidewalk
		11 Overhead Electric	Will be relocated with power pole
	San Gabriel	2 Power Poles	Will be relocated to fit within proposed sidewalk
		2 Overhead Electric	Will be relocated with power pole
	South Pasadena	1 Power Pole	Will be relocated to fit within proposed sidewalk
		1 Overhead Electric	Will be relocated with power pole
Time Warner Cable	Alhambra	1 Overhead Telecom	Will be relocated with power pole

Source: *Community Impact Assessment* (2014).
CIP = cast-iron pipe
VCP = vitrified clay pipe

BRT Alternative

The BRT Alternative would affect various underground and overhead utilities, some of which would require relocation. Where feasible, those utilities that are possible to protect in-place will be protected in-place. Utilities that have the potential to be affected during construction of the BRT Alternative are listed in Table 3.4.7 by utility provider and by the city, community, or neighborhood in which they are located.

As shown in Table 3.4.7, the BRT Alternative would require the relocation of telecommunications and electric utilities in Alhambra, East Los Angeles, Monterey Park, and South Pasadena. The utility relocations described in Table 3.4.7 may result in temporary service disruptions to some utility users in the vicinity of those relocations.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, construction of the BRT Alternative would also result in most of the same impacts on utilities as the TSM/TDM Alternative described earlier, with the exception of those utility relocations associated with Local Street Improvement L-8 and the reversible lane component of Local Street Improvement L-3.

TABLE 3.4.7:
Potential Effects on Utilities During Construction of the BRT Alternative

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection in Place)
AT&T	Alhambra	1 Overhead Telecom	Will be relocated with pole
	East Los Angeles	1 Overhead Fiber	Will be relocated with pole
	East Los Angeles	4 Overhead Telecom	Will be relocated with pole
	Monterey Park	2 Overhead Telecoms	Will be relocated with pole
	South Pasadena	2 Overhead Telecoms	Will be relocated with pole
Southern California Edison	Alhambra	3 Power Poles	Will be relocated to fit within proposed sidewalk
	Alhambra	1 Overhead Electric	Will be relocated with pole
	East Los Angeles	9 Power Poles	Will be relocated to fit within proposed sidewalk
	East Los Angeles	5 Overhead Electric	Will be relocated with pole
	Monterey Park	3 Power Poles	Will be relocated to fit within proposed sidewalk
	Monterey Park	2 Overhead Electric	Will be relocated with pole
	South Pasadena	2 Power Poles	Will be relocated to fit within proposed sidewalk
	South Pasadena	2 Overhead Electric	Will be relocated with pole
Time Warner Cable	South Pasadena	2 Overhead Telecom	Will be relocated with pole
Verizon Wireless	East Los Angeles	1 Overhead Telecom	Will be relocated with pole
XO Communication	East Los Angeles	1 Overhead Telecom	Will be relocated with pole

Source: *Community Impact Assessment* (2014).

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the BRT Alternative would require the relocation of telecommunications and electric utilities in Alhambra, Eagle Rock, East Los Angeles, El Sereno, Monterey Park, Rosemead, San Gabriel, and South Pasadena; the relocation of telecommunication facilities in Pasadena; and the protection in-place of water and sewer utilities in Alhambra. None of the short-term utility impacts anticipated to occur during construction of the BRT Alternative would be adverse.

LRT Alternative

The LRT Alternative would affect various underground and overhead utilities, some of which would require relocation. Where feasible, those utilities that are possible to protect in-place will be protected in-place. Utilities that have the potential to be affected during construction of the LRT Alternative are listed in Table 3.4.8 by utility provider and by the city, community, or neighborhood in which they are located.

As shown in Table 3.4.8, the LRT Alternative would require the relocation or protection in place of electric, water, sewer, cable, telecommunications, and gas utilities in Alhambra, East Los Angeles, El Sereno, Monterey Park, Pasadena, and South Pasadena. The utility relocations described in Table 3.4.8 may result in temporary service disruptions to some utility users in the vicinity of those relocations.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, construction of the LRT Alternative would also result in the same impacts on utilities as the TSM/TDM Alternative described earlier, with the exception of those utility relocations associated with Other Road Improvement T-1.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, the LRT Alternative would require the relocation or protection in-place of electric, water, sewer, cable, telecommunications, and gas utilities in Alhambra, Eagle Rock, East Los Angeles, El Sereno, Monterey Park, Pasadena, Rosemead, San Gabriel, and South Pasadena. None of the short-term utility impacts anticipated to occur during construction of the LRT Alternative would be adverse.

TABLE 3.4.8:
Potential Effects on Utilities During Construction of the LRT Alternative

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection in Place)
AT&T	Alhambra	2″ Telephone Conduit	Will be relocated east of Fremont Avenue and may require an easement
	El Sereno	14″ Telephone Conduit	Will be protected in place during construction
	Monterey Park	7″ Telephone Conduit	Will be relocated south of Corporate Center Drive
	Pasadena	1–4″ Telephone Conduit	Will be relocated east or west of Raymond Avenue and may require an easement
California Water Service	East Los Angeles	8″ Water Line	Will be relocated east or west of proposed bent along Mednik Avenue
	East Los Angeles	2″ Water Line (2 locations)	Will be relocated north or south of proposed bent
Charter Communications	Pasadena	1–4″ TV Conduit	Will be relocated north or south of Fillmore Street and may require an easement
City of Alhambra	Alhambra	15″ Sewer	Will be relocated east or west of Fremont Avenue and may require an easement
	Alhambra	8″ Water	Will be relocated east or west of Fremont Avenue and may require an easement
	Alhambra	12″ Water	Will be relocated east or west of Fremont Avenue and may require an easement
City of Los Angeles – Bureau of Sanitation	El Sereno	8″ Sewer (abandoned) (1 location)	Will be protected in place during construction
	El Sereno	8″ Sewer (3 locations)	Will be protected in place during construction
City of Monterey Park	Monterey Park	10″ VCP Sewer	Will be protected in place during construction
City of Pasadena	Pasadena	16″ Sewer	Will be relocated east or west of Raymond Avenue and may require an easement
	Pasadena	24″ Sewer	Will be relocated east or west of Raymond Avenue and may require an easement
	Pasadena	8″ Sewer	Will be relocated north or south of Fillmore Street and may require an easement
City of Pasadena – Power Department	Pasadena	Underground Electric Line (2 locations)	Will be relocated east or west of Raymond Avenue and may require an easement
	Pasadena	Underground Electric Line (2 locations)	Will be relocated north of Fillmore Street and may require an easement
City of Pasadena – Water Department	Pasadena	4″ Water	Will be protected in place during construction
	Pasadena	16″ Water	Will be relocated east of Raymond Avenue and may require an easement
	Pasadena	6″ Water	Will be relocated north or south of Fillmore Street and may require an easement
City of South Pasadena	South Pasadena	8″ Water (3 locations)	Will be relocated east or west of Fair Oaks Avenue
	South Pasadena	8″ Sewer	Will be protected in place during construction
	South Pasadena	6″ Water	Will be relocated north or south of Mission Street, and may require an easement
	South Pasadena	6″ Water	Will be relocated north or south of Spruce Street
	South Pasadena	16″ Sewer	Will be protected in place during construction
	South Pasadena	4″ Water	Will be relocated west of Fair Oaks Avenue and may require an easement
	South Pasadena	4″ Water	Will be relocated east or west of Fair Oaks Avenue
	South Pasadena	8″ Sewer	Will be relocated east or west of Fair Oaks Avenue and may require an easement
	South Pasadena	6″ Water	Will be relocated west of Fair Oaks Avenue and may require an easement
Crown Castle	South Pasadena	Fiber-Optic	Will be relocated west of Fair Oaks Avenue and may require an easement
	South Pasadena	Fiber-Optic	Will be protected in place during construction
	South Pasadena	Fiber-Optic	Will be relocated west of Mission Street and may require an easement
Los Angeles County Sanitation Districts	East Los Angeles	8″ sewer	Will be protected in place during construction
	East Los Angeles	8″ sewer	Will be relocated north or south of proposed bent along Fisher Street

TABLE 3.4.8:
Potential Effects on Utilities During Construction of the LRT Alternative

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection in Place)
Los Angeles Department of Water and Power	El Sereno	2 Overhead Electric Lines	Will be relocated with pole
	El Sereno	3 Power Poles	Will be relocated north or south of Valley Boulevard to fit within proposed bridge
	El Sereno	4″ Water	Will be protected in place during construction
	El Sereno	8″ Water	Will be protected in place during construction
Level 3 Communications	Pasadena	(2) 4-1.5″ Fiber-Optic	Will be relocated north of Fillmore Street and may require an easement
	Pasadena	(2) 4-1.5″ Fiber-Optic	Will be protected in place during construction
Southern California Edison	Alhambra	Underground Street Light	Will be relocated east of Fremont Avenue and may require an easement
	Alhambra	Underground Conduit	Will be protected in place during construction
Southern California Gas Company	Alhambra	2″ Natural Gas Line	Will be relocated east of Fremont Avenue and may require an easement
	East Los Angeles	4″ Natural Gas Line	Will be relocated east or west of proposed bent along Mednik Avenue
	East Los Angeles	4″ Natural Gas Line	Will be relocated north or south of proposed bent along Dozier Street
	El Sereno	4″ Natural Gas Line (abandoned)	Will be relocated east or west of Charnwood Avenue
	El Sereno	4″ Natural Gas Line	Will be protected in place during construction
	El Sereno	3″ Natural Gas Line	Will be protected in place during construction
	South Pasadena	6″ Natural Gas Line	Will be protected in place during construction
	South Pasadena	3″ Natural Gas Line	Will be relocated west of Fair Oaks Avenue and may require an easement
	Pasadena	12″ Natural Gas Line	Will be relocated east or west of Raymond Avenue and may require an easement
Verizon Wireless	East Los Angeles	4″ Fiber-Optic Conduit	Will be relocated east or west of proposed bent along Mednik Avenue

Source: *Community Impact Assessment* (2014).
VCP = vitrified clay pipe

Freeway Tunnel Alternative

Both design variations of the Freeway Tunnel Alternative would affect various underground and overhead utilities, some of which would require removal or relocation. Where feasible, those utilities that are possible to protect in-place will be protected in-place. Utilities that have the potential to be affected during construction of the single-bore and dual-bore design variations of the Freeway Tunnel Alternative are listed in Tables 3.4.9 and 3.4.10, respectively, by utility provider and by the city, community, or neighborhood in which they are located.

As shown in Table 3.4.9, the single-bore design variation of the Freeway Tunnel Alternative would require the relocation or protection in-place of electric, water, sewer, telecommunications, and natural gas utilities in Alhambra, El Sereno, and Pasadena. The single-bore design variation would also require the relocation or protection in-place of streetlights in El Sereno and Pasadena. The utility relocations described in Table 3.4.9 may result in temporary service disruptions to some utility users in the vicinity of those relocations.

TABLE 3.4.9:
Potential Effects on Utilities During Construction of the Freeway Tunnel Alternative Single-Bore Design Variation

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection in Place)
AT&T	El Sereno	Buried Cable	Will be relocated east or west of SR 710
	El Sereno	3″ Crossover (2 locations)	Will be relocated east or west of SR 710
	El Sereno	Conduit (2 locations)	Will be relocated east or west of SR 710
	El Sereno	2.5″ Crossover	Will be relocated east or west of SR 710
	El Sereno	4-3.5″ Duct	Will be relocated east or west of SR 710
	El Sereno	12″, 8″	Will be protected in place during construction
	El Sereno	4 Overhead Telephone Lines	Will be relocated outside of Valley Boulevard
	El Sereno	Overhead Telephone Line	Will be relocated east or west of SR 710
	Pasadena	1 Paper Pipe	Will be relocated east or west of SR 710
	Pasadena	27 Duct	Will be relocated outside of Green Street
	Pasadena	12-4″	Will be relocated outside of Colorado Street
	Pasadena	Underground Telephone Line	Will be relocated east or west of SR 710
	Pasadena	Underground Telephone Line (3 locations)	Will be relocated outside of I 210
Caltrans	El Sereno	Electric Conduit (8 locations)	Will be relocated east or west of SR 710
	El Sereno	Electric Conduit	Will be relocated outside of ramp to Valley Boulevard
	Pasadena	Street Light (3 locations)	Will be relocated east or west of SR 710
City of Alhambra	Alhambra	8″ Sewer	Will be relocated to temporary bridge for utilities
City of Los Angeles – Bureau of Sanitation	El Sereno	8″ Clay Pipe (Casing)	Will be relocated
	El Sereno	8″ VCP Sewer (abandoned)	Will be relocated
	El Sereno	12″ VCP Sewer	Will be relocated
	El Sereno	8″ Sewer (3 locations)	Will be protected in place during construction
	El Sereno	8″ Sewer (4 locations) (abandoned)	Will be protected in place during construction
	El Sereno	8″ VCP Sewer	Will be relocated east or west of SR 710
	El Sereno	12″ to 8″ Sewer	Will be protected in place during construction
	El Sereno	12″ Sewer	Will be protected in place during construction
Los Angeles Department of Water and Power	El Sereno	Underground Electric Conduit (2 locations)	Will be relocated to temporary bridge for utilities
	El Sereno	Underground Electric Conduit	Will be protected in place during construction
	El Sereno	Overhead Electric Line (4 locations)	Will be relocated outside of Valley Boulevard
	El Sereno	Street light (3 locations)	Will be protected in place during construction
	El Sereno	Overhead Electric Line	Will be relocated outside of southbound SR 710
	El Sereno	Overhead Electric Line	Will be relocated west of SR 710
	El Sereno	Power Pole	Will be relocated outside Valley Boulevard
	El Sereno	Power Pole	Will be relocated
	El Sereno	8″ Water Line (abandoned)	Will be relocated to temporary bridge for utilities
	El Sereno	6″ CIP Water	Will be relocated
	El Sereno	4″ CIP Water	Will be relocated
	El Sereno	8″ Water Line (3 locations)	Will be protected in place during construction
Level 3 Communications	Pasadena	4-1.50″ HDPE in 12″ Black Steel Pipe Casing	Will be relocated outside of Colorado Boulevard
Metropolitan Water District of Southern California	El Sereno	60″ Water Line (2 locations)	Will be relocated
City of Pasadena	Pasadena	8″ Sewer (2 locations)	Will be relocated to temporary bridge for utilities
	Pasadena	12″ Sewer	Will be relocated to temporary bridge for utilities
	Pasadena	9″ VCP Sewer	Will be relocated outside of Del Mar Boulevard
	Pasadena	8″ VCP Sewer	Will be relocated outside of St. John Avenue
	Pasadena	8″ Sewer	Will be relocated outside of St. John Avenue
	Pasadena	8″ VCP Sewer	Will be relocated outside of Green Street
	Pasadena	8″ VCP Sewer	Will be relocated outside of Colorado Boulevard

TABLE 3.4.9:
Potential Effects on Utilities During Construction of the Freeway Tunnel Alternative Single-Bore Design Variation

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection in Place)
City of Pasadena Power Department	Pasadena	Overhead Electric Line (2 locations)	Will be relocated to fit proposed St. John Avenue
	Pasadena	Underground Electric Line (2 locations)	Will be relocated to temporary bridge for utilities
	Pasadena	Overhead Electric Line	Will be relocated outside of I 210 on-ramp
	Pasadena	Street Light	Will be relocated outside of Del Mar Boulevard
	Pasadena	4-4″	Will be relocated outside of Del Mar Boulevard
	Pasadena	Street Light	Will be relocated outside of St. John Avenue
	Pasadena	4-3.5″ VT	Will be relocated outside of St. John Avenue
	Pasadena	Street Light (2 locations)	Will be relocated outside of Green Street
	Pasadena	Underground Electric Line (2 locations)	Will be relocated east or west of SR 710, outside of work area
	Pasadena	6-3.5″	Will be relocated outside of Green Street
	Pasadena	Street Light	Will be relocated outside of Colorado Boulevard
	Pasadena	7-3.5″	Will be relocated outside of Colorado Boulevard
	Pasadena	Street Lights (2 locations)	Will be relocated outside of Union Street
	Pasadena	Power Pole	Will be relocated east or west of southbound I-210
	Pasadena	Underground Electric Line	Will be relocated east or west of southbound I 210
City of Pasadena Water Department	Pasadena	6″ CIP Water Line	Will be relocated outside of Del Mar Boulevard
	Pasadena	8″ CIP Water Line	Will be protected in place during construction
	Pasadena	12″ CIP Water Line	Will be relocated east or west of St. John Avenue
	Pasadena	16″ STL Water Line	Will be relocated outside of Green Street
	Pasadena	12″ STL Water Line	Will be relocated outside of Green Street
	Pasadena	10″ CIP Water	Will be relocated outside of Colorado Boulevard
	Pasadena	12″ CIP Water	Will be relocated outside of Colorado Boulevard
Southern California Gas Company	El Sereno	2″ Natural Gas Line	Will be protected in place
	El Sereno	4″ Natural Gas Line	Will be relocated to temporary bridge for utilities
	El Sereno	3″ to 4″ Natural Gas Line	Will be protected in place during construction
	El Sereno	2″ Natural Gas Line	Will be protected in place during construction
	Pasadena	6″ M w/10″ Casing Natural Gas Line	Will be relocated outside of Colorado Boulevard
	Pasadena	2″ Natural Gas Line	Will be relocated outside of St. John Avenue

Source: *Community Impact Assessment* (2014).
CIP = cast-iron pipe
HDPE = high-density polyethylene
MH = manhole
NB = Northbound
SB = Southbound
STL = Steel
VCP = vitrified clay pipe
VP = vitrified pipe
VT = vitrified tile

TABLE 3.4.10:
Potential Effects on Utilities During Construction of the Freeway Tunnel Alternative Dual-Bore Design Variation

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection in Place)
AT&T	El Sereno	3″ Crossovers (2 locations)	Will be relocated east or west of SR 710
	El Sereno	2.5″ Crossover	Will be relocated east or west of SR 710
	El Sereno	Buried Cable	Will be relocated east or west of SR 710
	El Sereno	4-3.5″ Telephone Duct	Will be relocated to temporary bridge for utilities
	El Sereno	Underground Telephone Line	Will be relocated outside of SR 710
	El Sereno	12″, 8″	Will be protected in place during construction
	El Sereno	Overhead Telephone Lines (4 locations)	Will be relocated north or south of Valley Boulevard
	El Sereno	Overhead Telephone Line	Will be relocated outside of SR 710
	Monterey Park/ El Sereno	(1.5″–1.4″) Telephone Duct (5 locations)	Will be relocated west of southbound SR 710
	Pasadena	Pipe	Will be relocated to temporary bridge for utilities
	Pasadena	27 Duct	Will be relocated outside of Green Street
	Pasadena	Underground Telephone Lines (2 locations)	Will be relocated outside of SR 710
	Pasadena	Underground Telephone Lines (3 locations)	Will be relocated west of southbound I-210
Caltrans	El Sereno	Street Light	Will be relocated west of southbound SR 710
	El Sereno	1″–2″ Conduit	Will be relocated to southbound SR 710 on-ramp
	El Sereno	Conduits (14 locations)	Will be relocated east or west of SR 710
	El Sereno	Conduit	Will be relocated west of Valley Boulevard ramp
	Pasadena	Street Light (3 locations)	Will be relocated east of or outside of SR 710
City of Alhambra	Alhambra	8″ Sewer	Will be relocated to temporary bridge for utilities
City of Los Angeles, Bureau of Sanitation	El Sereno	8″ Clay Pipe Sewer	Will be relocated east or west of SR 710, outside of work area
	El Sereno	8″ VCP Sewer (abandoned)	Will be relocated
	El Sereno	12″ VCP Sewer	Will be relocated
	El Sereno	8″ Sewer (3 locations)	Will be protected in place during construction
	El Sereno	12″ VCP to 8″ VCP Sewer	Will be protected in place during construction
	El Sereno	8″ Sewer	Will be relocated
	El Sereno	8″ (4 locations) (abandoned)	Will be protected in place during construction
	El Sereno	12″ Sewer	Will be protected in place during construction
City of Pasadena	Pasadena	8″ Sewer (2 locations)	Will be relocated to temporary bridge for utilities
	Pasadena	12″ Sewer	Will be relocated to temporary bridge for utilities
	Pasadena	9″ VCP	Will be relocated outside of Del Mar Boulevard
	Pasadena	8″ VCP	Will be relocated outside of St. John Avenue
	Pasadena	8″ Sewer	Will be relocated outside of St. John Avenue
	Pasadena	8″ VCP Sewer	Will be relocated outside of Green Street
City of Pasadena Power Department	Pasadena	Overhead Electric Line	Will be relocated to fit proposed St. John Avenue
	Pasadena	Underground Electric Line (2 locations)	Will be relocated to temporary bridge for utilities
	Pasadena	Overhead Electric Line	Will be relocated
	Pasadena	Street Light	Will be relocated outside of Del Mar Boulevard
	Pasadena	4-4″	Will be relocated outside of Del Mar Boulevard
	Pasadena	Street Light	Will be relocated outside of St. John Avenue
	Pasadena	4-3.5″ VT	Will be relocated outside of St. John Avenue
	Pasadena	Overhead Electric Line	Will be relocated outside of St. John Avenue
	Pasadena	Underground Electric Line	Will be relocated outside of work area
	Pasadena	Street Lights (2 locations)	Will be relocated outside of Green Street
	Pasadena	6-3.5″	Will be relocated outside of Green Street
	Pasadena	Power Pole	Will be relocated with power pole
	Pasadena	Street Light (2 locations)	Will be relocated outside of work area
City of Pasadena Water Department	Pasadena	8″ Water	Will be protected in place during construction
	Pasadena	6″ CIP Water Line	Will be relocated outside of Del Mar Boulevard
	Pasadena	12″ CIP Water Line	Will be relocated outside of St. John Avenue
	Pasadena	16″ STL Water	Will be relocated outside of Green Street
	Pasadena	12″ STL Water	Will be relocated outside of Green Street

TABLE 3.4.10:
Potential Effects on Utilities During Construction of the Freeway Tunnel Alternative Dual-Bore Design Variation

Utility Provider	City/Community	Description of Facility	Project Effect (Relocation or Protection in Place)
Los Angeles Department of Water and Power	El Sereno	Underground Electric Line (2 locations)	Will be relocated to temporary bridge for utilities
	El Sereno	Overhead Electric Line	Will be relocated west of southbound SR 710
	El Sereno	Underground Electric Line	Will be protected in place during construction
	El Sereno	Overhead Electric Line (5 locations)	Will be relocated outside of Valley Boulevard
	El Sereno	Power Pole	Will be relocated
	El Sereno	Street Light (3 locations)	Will be protected in place during construction
	El Sereno	Overhead Electric Line	Will be relocated outside of southbound SR 710
	El Sereno	8″ Water Line (abandoned)	Will be relocated outside of Hellman Avenue
	El Sereno	6″ CIP Water Line	Will be relocated
	El Sereno	4″ CIP Water Line	Will be relocated
	El Sereno	8″ Water Line (3 locations)	Will be protected in place during construction
Metropolitan Water District of Southern California	El Sereno	60″ Water Line (2 locations)	Will be relocated
Southern California Gas Company	El Sereno	4″ Natural Gas Line	Will be relocated north or south of Hellman Avenue, outside of work area
	El Sereno	2″ Natural Gas Line	Will be protected in place during construction
	El Sereno	3″ to 4″ Natural Gas Line	Will be protected in place during construction
	El Sereno	2″ Natural Gas Line	Will be protected in place during construction
	Pasadena	2″ Natural Gas Line	Will be relocated outside of St. John Avenue

Source: *Community Impact Assessment* (2014).
CIP = cast iron pipe
HDPE = high-density polyethylene
NB = Northbound
VCP = vitrified clay pipe
VT = vitrified tile

As shown in Table 3.4.10, the dual-bore design variation of the Freeway Tunnel Alternative would require the relocation or protection in-place of electric, water, sewer, cable, telecommunications, and natural gas utilities in Alhambra, El Sereno, Monterey Park, and Pasadena. The dual-bore design variation would also require the relocation or protection in-place of streetlights in El Sereno and Pasadena. The utility relocations described in Table 3.4.10 may result in temporary service disruptions to some utility users in the vicinity of those relocations.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). Therefore, construction of the Freeway Tunnel Alternative would also result in most of the same impacts on utilities as the TSM/TDM Alternative described earlier, with the exception of those utility relocations associated with Other Road Improvements T-1 and T-3.

In summary, with the inclusion of the TSM/TDM Alternative improvements described above, both design variations of the Freeway Tunnel Alternative would require the relocation or protection in-place of electric, water, sewer, cable, telecommunications, and gas utilities in Alhambra, Eagle Rock, El Sereno, Pasadena, Rosemead, San Gabriel, and South Pasadena, and the relocation or protection in-place of streetlights in El Sereno and Pasadena. In addition, the dual-bore design variation of the Freeway Tunnel Alternative would require the relocation of telecommunications facilities in Monterey Park. None of the short-term utility impacts anticipated to occur during construction of the Freeway Tunnel Alternative would be adverse.

Permanent Impacts

No Build Alternative

As described in Section 3.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, even with the implementation of planned transportation improvements in the No Build Alternative other than the SR 710 North Project improvements, increasing travel demands would exceed freeway system capacity, and traffic operations on the already congested freeway and arterial roadway network in the study area would continue to decline. Further, although the No Build Alternative would relieve traffic congestion at some intersections in the study area, travel delays would increase at 124 intersections in the study area during the morning peak hour and 128 intersections during the afternoon peak hour. Emergency response times are likely to deteriorate within the study area because traffic congestion and travel times would increase; however, the No Build Alternative is not anticipated to result in Adverse Effects related to the provision of emergency services.

Build Alternatives

In the long term, operation of the Build Alternatives would not impact access to/from the driveways of any of the emergency service facilities near such improvements. As a result, the Build Alternatives would not result in adverse long-term traffic and transportation impacts at emergency service facilities. The elements included in the Build Alternatives could help to reduce congestion in the future and consequently reduce response times of emergency vehicles.

As described earlier, the improvements proposed for the Build Alternatives would require the relocation or protection in place of existing utility facilities within the footprints of those improvements. The operation of the Build Alternatives would not result in additional effects to those utility facilities. Therefore, no permanent adverse impacts would occur for the Build Alternatives related to utilities.

3.4.3 Avoidance, Minimization, and/or Mitigation Measures

Measure T-1, provided later in Section 3.5, Transportation and Traffic/Pedestrian and Bicycle Facilities, addresses short term adverse transportation impacts during construction of the Build Alternatives, including potential delays for emergency service providers. Measure T-1 requires the preparation of a Transportation Management Plan (TMP) during final design, including coordination of the development of the TMP with emergency services providers. The TMP would be implemented during project construction. Please refer to Section 3.5 for the detailed language of Measure T-1. Measure T-1 would apply to all four Build Alternatives.

All four Build Alternatives will require the relocation, protection in place, and/or removal of utility facilities within the construction limits. Agencies and other parties potentially affecting utility facilities during construction of their projects are required to coordinate any such activities with the applicable utility provider to minimize the risk of disruption of services and damage to the facilities, to ensure advance notification of any temporary service disruptions to the public, and to protect the safety of the construction workers and the general public. As a result, because any modifications to utility facilities under the Build Alternatives are already required to be coordinated with the applicable utility provider, no specific measure is required to address this potential effect of the Build Alternatives.

As noted earlier in this section, during final design, the Project Engineer will prepare an updated utility survey to update information on known utility facilities as well as previously unidentified/ unknown or new utility facilities within the disturbance limits of the selected Build Alternative.

3.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

3.5.1 Regulatory Setting

Caltrans, as assigned by the Federal Highway Administration (FHWA), directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 Code of Federal Regulations [CFR] 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to Federal-aid projects, including Transportation Enhancement Activities.

3.5.2 Affected Environment

The information regarding existing traffic and transportation conditions in the study area and the analyses of the potential effects of the State Route 710 (SR 710) North Project are provided in the *Transportation Technical Report* (2014) and are summarized in the following sections.

Traffic operations analysis was conducted on a defined set of freeway segments and intersections for evaluation. The traffic operations analysis area is larger than the general EIR/EIS study area described in Chapter 1. Figure 3.5-1 is an illustration of the traffic operations analysis area (outlined in blue) and the EIR/EIS study area (in white).

3.5.2.1 Methodology

This section describes the performance measures for assessing potential changes in the transportation system under the SR 710 North Project alternatives and the criteria that were used to identify Adverse Effects of the Build Alternatives at intersections and on freeway segments.

The existing and future traffic conditions for the No Build and Build Alternatives were analyzed using travel forecast data based on the following specific performance measures:

- **System Performance Measures:**
  - **Total Vehicular Travel Distance:** This performance measure considers the changes in total vehicle (automobile and truck) miles traveled for each alternative. For these analyses, vehicle miles traveled (VMT) is calculated separately for the AM peak period (6:00 a.m. to 9:00 a.m.), PM peak period (3:00 p.m. to 7:00 p.m.), and daily trips. The reported performance measures are the sum of the AM peak-period and PM peak-period VMT, the daily VMT in the study area, and the daily VMT in the region.

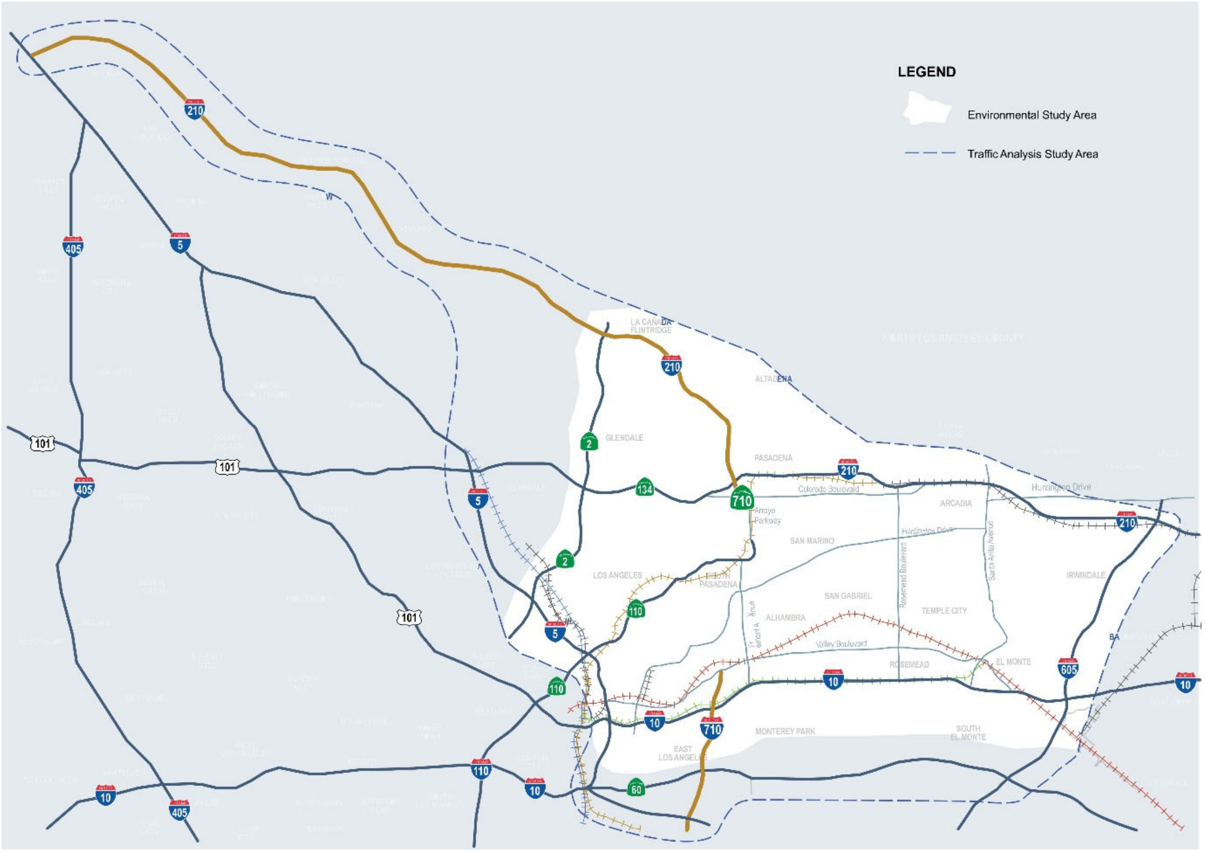

Figure 3.5-1: Traffic Operations Analysis Area

- **Total Vehicular Travel Time:** This performance measure considers the changes in total vehicle (automobile and truck) hours traveled by alternative. For these analyses, vehicle hours traveled (VHT) is calculated separately for the AM peak period (6:00 a.m. to 9:00 a.m.), PM peak period (3:00 p.m. to 7:00 p.m.), and daily trips. The reported performance measures are the sum of the AM peak-period and PM peak-period VHT, the daily VHT in the study area, and the daily VHT in the region.
- **Daily Person Throughput:** This performance measure quantifies the total north-south travel (daily vehicular and transit person trips) crossing a specific east-west screenline. For these analyses, that screenline extended east-west across the study area as shown earlier on Figure 1-3 in Chapter 1.0, Proposed Project. The daily person throughput is a measure of all person trips crossing the screenline (vehicular and transit person trips).
- **Employment Accessibility:** This performance measure quantifies the number of jobs accessible to residents in the study area within 29.4 minutes of 12 origin areas (Alhambra, Arcadia, California State University, Los Angeles (Cal State LA), Eagle Rock, El Monte Transit Center, Glendale, La Cañada Flintridge Town Center, Pasadena Memorial Park, South Pasadena, San Marino, San Gabriel, and Temple City), summarized for drive-alone and shared-ride vehicles. The 29.4-minute value was selected for this performance measure because that is the average travel time to work for workers 16 and older in Los Angeles County, based on the 2010 American Community Survey by the United States Census Bureau (http://factfinder2.census.gov). The employment accessibility performance measure

is reported as the total percent increase of accessible jobs for a Build Alternative over the No Build Alternative.

- **Highway Performance Measures:**
  - **Volume Served:** This performance measure is defined as regional north-south vehicular throughput served on the freeway and arterial systems. Vehicle throughput was measured separately for the arterial and freeway systems. The measurements were calculated as the daily volume of vehicles that cross the east-west screenline as shown on Figure 1-3. These two performance measures provide an indication of how well the road system is working for regional and local trips.
  - **Traffic Diversion to Local Arterials:** This performance measure calculates the volume of traffic that uses arterial roads instead of the freeway system due to congestion or lack of freeway connectivity. The traffic diversion to local arterials performance measure uses model outputs to calculate VMT on the arterial system in the study area.
  - **Use of Local Arterials for Long Trips:** This performance measure is based on a calculation of the use of local arterials for long trips and captures the percentage of vehicle trips that have both origins and destinations outside the study area. These trips represent cut-through travel on the arterial system that would be best served by the freeway system.
  - **Travel Time Improvement:** This performance measure identifies the number of regional trips in the No Build Alternative that would experience positive travel time benefits compared to the Build Alternatives. These trips would not necessarily use the improvements provided in the Build Alternatives but would benefit from congestion reductions in those alternatives. This performance measure is based on the number of trips with a travel time savings of more than 2.5 minutes.
- **Transit Performance Measures:**
  - **New Transit Trips:** A new transit rider is defined as a person who elects to use transit services and who would have otherwise used a different mode for travel (most likely a personal vehicle). An increase in new transit ridership could be the result of multiple factors, including increases in transit service, reduced transfer times, or new services that are available. New transit ridership was calculated as the change in daily linked transit trips compared with the No Build Alternative.
  - **Transit Mode Share:** This performance measure was calculated as a ratio of transit trips to total person trips. A higher mode share for transit indicates an increase in transit trips and transit ridership. Transit mode share was calculated for daily trips in the study area, as an indicator of how attractive the transit system is compared to other modes of travel.
  - **North-South Transit Throughput:** This performance measure represents the total volume of transit person trips across the east-west screenline described in Chapter 1.
  - **Transit Accessibility:** Improvements in transit service can be assessed as an increase in transit accessibility. Transit accessibility was measured as the percentage of the study area population and employment located within 0.25 mile (mi) of a transit stop with high-frequency service, defined as peak service headways less than 15 minutes. The calculations for population and employment are calculated independently, and the average of the two was reported as the transit accessibility percentage.

3.5.2.2 Criteria for Identifying Adverse Effects

Methodology

To determine locations with potential Adverse Effects, traffic analyses were conducted to assess levels of service (LOS) at intersections and on freeway segments in the study area. Those analyses were used to compare conditions under the No Build and Build Alternatives using the criteria described in this section.

The traffic analysis was based on the 2012 RTP/SCS model, which was the current regional model for traffic analysis when the evaluation was conducted. After the traffic analysis was completed, the 2016 RTP/SCS was approved and released, with the analysis based on the corresponding 2016 model. The traffic analysis was not updated to use the 2016 RTP/SCS model, consistent with standard practice.

The SCAG 2012 and 2016 RTP models were compared. While the horizon years are different (2035 for the 2012 model and 2040 for the 2016 model), the demographic data used as the core of the models is very similar. Horizon year total population in the SCAG region is the same in both models (22.1 million), and the total households and total employment are only slightly higher in the 2016 forecast model. Therefore, the core forecasts would remain largely unchanged with the 2016 RTP model as a base.

Intersection Operations

Delay factors from the *Highway Capacity Manual 2010* (HCM) (Transportation Research Board 2010) were used to determine the LOS at intersections in the study area. LOS ranges from LOS A to LOS F, which are generally defined as free flowing to at or over capacity. LOS is determined using the amount of delay vehicles experience clearing an intersection. The seconds of delay for signalized and unsignalized intersections and the LOS associated with each range of delay are shown in Table 3.5.1. (Please note that the tables cited in this section are provided following the last page of text in this section.) LOS was used to assess the effects of the No Build and Build Alternatives on the performance of intersections in the study area.

Freeway Operations

The traffic operations analysis for freeway segments was performed using the methodologies in the HCM, including assessments of existing and future LOS for the AM and PM peak hours for merge, diverge, weave, and basic sections. Each freeway segment in the study area was analyzed as a basic segment (without considering the effects of merging/diverging from and to ramps or weaving). Each basic segment was also analyzed as a merge, diverge, and/or weave segment. The merge, diverge, and weave analyses were considered whenever a segment starts with an on-ramp or ends with an off-ramp. A segment can be merge/diverge (either or both) or weaving, but not both. The type of segment depends on the configuration of on- and off-ramps and auxiliary lanes.

The HCM freeway and ramp analysis procedures calculate density based on traffic volumes, number of lanes, length of deceleration/acceleration lanes, types of and distance from downstream/upstream ramps, and free-flow speed at each freeway segment and ramp (merge/diverge) junction. The HCM weaving segment analysis procedure calculates density based on traffic volumes (weaving and non-weaving), number of lanes, weaving segment length, number of maneuver lanes, and freeway free-flow speed.

The density calculated at each freeway segment, weaving segment, and ramp junction was assigned an LOS ranging from A to F. LOS F occurs when the total demand exceeds the capacity of the segment. The LOS criteria defined in HCM are shown in Table 3.5.2 for freeway segments, weaving segments, and ramp-freeway junctions, with density expressed in passenger cars per mile per lane (pc/mi/ln).

Criteria

LOS is the standard measure that is used to identify potentially adverse transportation effects. LOS was used to compare the traffic performance of alternatives against the performance of the No Build Alternative. Because LOS has a quantitative basis, specific criteria must be defined so that Adverse Effects can be identified. Following coordination with Caltrans and the Los Angeles County Metropolitan Transportation Authority (Metro) during the preparation of the *Transportation Technical Report*, the criteria described below were developed for intersections and freeway segments to identify locations with Adverse Effects.

There would be an Adverse Effect at an intersection if either of the following occurs:

- If the intersection is projected to operate at LOS E under a Build Alternative and the increase in delay over the No Build Alternative is 5 seconds or more, or
- If the intersection is projected to operate at LOS F under a Build Alternative and the increase in delay over the No Build Alternative is 2 seconds or more.

There would be an Adverse Effect on a freeway segment if the following occurs:

- The freeway segment is projected to operate at LOS F under a Build Alternative and the increase in traffic demand compared to the No Build Alternative is 2 percent or more. (Traffic demand is the number of vehicles that want to use a road segment which may be higher than the actual volume if demand is greater than capacity.)

LOS A through F for freeway segments and signalized intersections are graphically depicted on Figures 1-6 and 1-9, respectively, in Chapter 1, Proposed Project.

3.5.2.3 Existing Year (2012) Conditions

Existing Year (2012) System Performance

The Existing Year (2012) study area travel data were analyzed based on the system performance measures described earlier. Table 3.5.3 summarizes the system performance measures for the Existing Year (2012) conditions.

Existing Year (2012) Highway Performance

Table 3.5.3 summarizes the highway performance measures for the Existing Year (2012).

Existing Year (2012) Transit Performance

Table 3.5.3 summarizes the transit performance measures for the Existing Year (2012).

Existing Year (2012) Pedestrian and Bicycle Volume Conditions

Sidewalks and painted/designated crosswalks are provided throughout the SR-710 North Project area. The condition of the sidewalks varies. In addition, some sidewalks may not currently be ADA compliant. Table 3.1.8, provided earlier in Section 3.1, Land Use, describes the existing bicycle facilities in the study area cities.

Pedestrian and bicycle volume counts were collected on weekdays from March through July 2013. Those observations were made at the same time as the vehicular turning movement counts during both the AM and PM peak-hour periods (3 hours each period). The counts included all 156 intersections considered in the traffic impact analysis. Those data were reported for each intersection separately for pedestrians and bicyclists. For pedestrians, each leg (crosswalk) was counted. For bicyclists, the count included bicyclists using the crosswalk or traveling perpendicular to the leg in the travel lanes or in a bike lane.

Pedestrian Volumes

To determine the potential for the effects on pedestrians in the study area, the existing conditions were evaluated by considering the traffic operations analysis at the study area intersections and comparing those intersections with increases in delay to the pedestrian volumes. The field observations showed there was an average of approximately 45 pedestrians/hour in the AM peak hours, and 56 pedestrians/hour in the PM peak hours. The highest-volume pedestrian intersections were at Daly Street/Broadway in Los Angeles (374 pedestrians/hour), Los Robles Avenue/Colorado Boulevard in Pasadena (338 pedestrians/hour), and Atlantic Boulevard/Whittier Boulevard in East Los Angeles (330 pedestrians/hour).

Bicycle Volumes

The field observations of bicycle volumes showed there was an average of approximately 9 bicyclists/hour in the AM peak hours and 13 bicyclists/hour in the PM peak hours. The highest-volume bicycle intersections were at Atlantic Boulevard/Pomona Boulevard in Los Angeles (40 bicycles/hour), Baldwin Avenue/Valley Boulevard in El Monte (39 bicycles/hour), and Fair Oaks Avenue/Orange Grove Boulevard in Pasadena (also 39 bicycles/hour).

Existing Year (2012) Parking Conditions

On-Street Parking

Data on existing parking supply, occupancy, and restrictions were collected for on-street parking in the vicinity of physical improvements in the Build Alternatives that could potentially affect on-street parking. Parking supply was defined to be the existing parking inventory (both marked parking spaces and measured gray curb). Parking occupancy identified the use of the existing parking supply, or the number of spaces occupied at peak periods. Data on existing parking restrictions were collected to identify locations in the study area where parking was restricted, allowed (metered or unmetered), time limited, or prohibited.

Off-Street Parking

There are a variety of land uses in the study area, including commercial, industrial, residential, recreational, and institutional uses. As mandated by local zoning codes, these uses provide off-street parking facilities (i.e., off-street parking lots and structures) that are separate from on-street parking. Those off-street parking facilities were not assumed to be potential replacements for on-street parking impacted by the Build Alternatives and, therefore, were not included in the overall parking supply availability considered in the study area.

3.5.3 Environmental Consequences

3.5.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in short-term traffic operations, bicycle and pedestrian facilities, and parking effects associated with improvements in the Build Alternatives.

Build Alternatives

TSM/TDM Alternative

Construction of the improvements in the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative would require lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours. In general, these restrictions would be relatively minor, and no detours are anticipated to be needed. However, some travelers may choose alternate routes around the area to avoid construction activity and traffic delays. There are 24 individual locations in Alhambra, Eagle Rock, El Sereno, Glassell Park, Pasadena, Rosemead, San Gabriel, San Marino, South Pasadena, and the Unincorporated San Gabriel Valley Communities where construction of improvements in the TSM/TDM Alternative could result in temporary lane restrictions that may affect access and circulation. Construction activities associated with the improvements in the TSM/TDM Alternative would result in delays for the traveling public. The Transportation Management Plan (TMP) Data Sheet for the TSM/TDM Alternative provided in the *Draft Project Report* (2014) identifies project features, including signing and other methods to advise the traveling public about upcoming detours, closures, or lane restrictions.

Construction of the TSM/TDM Alternative would involve only minor street work (e.g., restriping or changes to curbs) and would be temporary and short in duration. The temporary loss of some on-street parking spaces during minor street work construction would only result in very limited impacts to on-street parking availability for short periods of time.

Construction activities associated with the improvements under the TSM/TDM Alternative would result in delays for the traveling public. The TMP Data Sheet for the TSM/TDM Alternative identifies project features, including signage and other methods, to advise the traveling public about upcoming detours, closures, or lane restrictions. Refer to Measure T-1 later in this section, which provides additional information regarding the TMP that will be developed during final design and based on the Preliminary TMP Data Sheet for the TSM/TDM Alternative (included in the *Draft Project Report*).

BRT Alternative

Because the Bus Rapid Transit (BRT) Alternative would include the improvements included in the TSM/TDM Alternative (except for Local Street Improvement L-8 [Fair Oaks Avenue from Grevelia Street to Monterey Road], the reversible lane component of Local Street Improvement L-3 [Atlantic Boulevard from Glendon Way to I-10], and the enhancements to Bus Route 762), the BRT Alternative would result in similar temporary lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours associated with the TSM/TDM Alternative improvements. Construction of the BRT Alternative improvements would involve only minor street work (e.g., restriping or changes to curbs) and would be short in duration. In addition, where widening or improvements are proposed along Atlantic Boulevard, Huntington Drive, and Fair Oaks Avenue in Alhambra, East Los Angeles, Monterey Park, and South Pasadena under the BRT Alternative, temporary lane restrictions would be required, including lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours. In general, these improvements are minor, and no detours are anticipated. However, some travelers may choose alternate routes around the area to avoid construction activity and traffic delays.

The temporary loss of some on-street parking spaces during construction of the BRT Alternative, including the improvements in the TSM/TDM Alternative, would only result in a very limited effect on on-street parking availability.

Construction activities associated with the improvements under the BRT Alternative, including the improvements in the TSM/TDM Alternative, would result in delays for the traveling public. The TMP Data Sheet for the BRT Alternative identifies project features, including signage and other methods, to advise the traveling public about upcoming detours, closures, or lane restrictions. Refer to Measure T-1 later in this section, which provides additional information regarding the TMP.

LRT Alternative

Because the Light Rail Transit (LRT) Alternative would include the improvements included in the TSM/TDM Alternative (except for Other Road Improvement T-1 [Valley Boulevard to Mission Road Connector Road] because it would conflict with the LRT Alternative maintenance yard near Mission Road), the LRT Alternative would result in similar temporary lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours associated with the TSM/TDM Alternative improvements.

Construction of the LRT Alternative improvements would result in a number of short-term traffic effects on roads in the study area. Although none of the road closures are anticipated to require signed detour routes, the weekend full road closures would require public and driver notification to use alternative routes.

For example, where the elevated alignment of the LRT would cross State Route 60 (SR 60), Interstate 710 (I-710), or other roads, overnight closures would be required to accommodate the placement of concrete barriers adjacent to the median and the construction of falsework. Other than these overnight closures, the roads below the aerial LRT alignment would remain open during construction of the LRT Alternative. The falsework will be designed so there are no vertical clearance impairments for vehicles traveling under the falsework.

Construction of the improvements in the LRT Alternative could result in temporary lane restrictions that may affect access and circulation in the following areas:

- Mednik Avenue from First Street to Floral Drive in East Los Angeles would be reduced to one lane in each direction for construction of the median and the columns supporting the LRT alignment.
- Floral Drive in the Floral Station area in East Los Angeles and Monterey Park between Dangler Avenue and Mednik Avenue would be subject to temporary lane restrictions to accommodate the station construction.
- The outside southbound lane of I-710 in the State-owned right of way (ROW) in El Sereno and Monterey Park would be subject to occasional short-term closures to bring equipment/ material on site during construction of the elevated LRT facility in this area.
- Circle Drive at the Cal State LA Station area in El Sereno would be the access route for construction equipment/materials and workers and may be blocked occasionally as equipment is transported to and from the station area.

- The eastbound lanes of Valley Boulevard in El Sereno and Alhambra would be temporarily shifted to the south to accommodate the construction of columns in the inside eastbound lane to support falsework for the deck of the LRT bridge to the maintenance yard.
- For the underground stations in Alhambra, Pasadena, and South Pasadena:
  - Daytime closures of one or more lanes and possibly adjacent sidewalks may be required to accommodate utility relocations.
  - Drilling of piles to support the temporary road deck above the underground station box excavation sites would require daytime closures of one or more lanes and possibly adjacent sidewalks. Cross streets may also be impacted (e.g., Mission Street at Fair Oaks Avenue, California Boulevard at Raymond Avenue, and the southbound right-turn lane from Fair Oaks Avenue to Huntington Drive).
  - The installation and removal of the temporary road deck above the underground station box excavation sites would require weekend full road closures. Cross streets (e.g., Mission Street at Fair Oaks Avenue, California Boulevard at Raymond Avenue) as well as the southbound right-turn lane from Fair Oaks Avenue to Huntington Drive may also be affected.

Construction of the tunnel segments (i.e., bored and cut-and-cover) and the underground station boxes for the LRT Alternative would generate excess excavated soil and rock materials that cannot be reused within the project limits. That material (spoils) is proposed to be disposed of at two former rock quarries (the Manning and Olive Pits) in the City of Irwindale. As shown on Figure 2-5, the preliminary routes for hauling spoils material from the station sites include segments on Fair Oaks Avenue (from the South Pasadena and Fillmore Station sites) and Fremont Avenue (from the Huntington and Alhambra Station sites), on Arrow Highway and Live Oak Avenue (to/from Interstate 605 [I-605] at the disposal end of the haul trips), and on Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit). Those haul routes will be used only during construction of the LRT Alternative underground station boxes. Vehicles hauling material from the tunnel excavation will enter southbound SR 710 at Valley Boulevard and will use I-10 to I-605 to the local streets to access the disposal sites. Approximately 180 daily truck trips will be needed to haul soil disposal for LRT Alternative tunnel construction.

Table 3.5.4 shows the estimated number of daily haul trips (inbound and outbound) associated with the transportation of material excavated from the LRT Alternative tunnel bores and station box sites along various roadway segments along the preliminary LRT Alternative haul routes. The table also shows the existing daily traffic volumes (average daily traffic [ADT]) on those roadway segments. Each of the arterials along the preliminary haul routes (Fair Oaks Avenue and Fremont Avenue) is designated in local general plans as a truck route.

The haul trips associated with the LRT Alternative would represent minor increases in the overall traffic volumes on the arterial roadway and freeway segments along the preliminary haul routes. The increase in daily traffic volume due to the haul trips would be less than 1 percent of overall traffic volume.

Construction activities for the LRT Alternative improvements would include the construction of the LRT stations, parking structures, columns, and reconfiguration of roads. Temporary parking losses would occur throughout the duration of the LRT construction phase. To determine the potential effects of the LRT Alternative on on-street parking during construction, the overall parking supply within the construction footprint was collected. The construction footprint was defined as the area of impact encompassed by the construction of the stations and corresponding station components. Table 3.5.5 provides a summary of the total parking supply for the LRT Alternative and the temporary parking losses during construction. All but 4 of the 240 affected on-street parking spaces are expected to be restored and available for normal use after construction. The LRT Alternative would also include the very limited temporary losses of some on-street parking spaces during minor construction work for the TSM/TDM Alternative improvements that are included in the LRT Alternative.

The bored tunnel section of the LRT Alternative alignment would be constructed underground and would not result in temporary construction-related traffic or access effects. Before underground construction starts, the tunnel boring machine (TBM) components would be delivered to the portals. These deliveries are expected to occur at night and will not affect peak period traffic.

Some of the construction activities associated with the improvements under the LRT Alternative, including improvements in the TSM/TDM Alternative, would result in delays for the traveling public. The Preliminary TMP Data Sheet for the LRT Alternative identifies project features, including signage and other methods, to advise the traveling public about upcoming detours, closures, or lane restrictions. Refer to Measure T-1 later in this section, which provides additional information regarding the TMP.

Freeway Tunnel Alternative

Because the Freeway Tunnel Alternative would include the improvements included in the TSM/TDM Alternative (except Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) and Other Road Improvement T-3 (St. John Extension between Del Mar Boulevard and California Boulevards), the Freeway Tunnel Alternative would result in similar temporary lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours associated with the TSM/TDM Alternative improvements.

Construction of the improvements in the vicinity of the north and south portals for both design variations of the Freeway Tunnel Alternative would occur in stages. To maintain traffic lanes to the extent possible, the stages of construction at the north and south tunnel portals would not necessarily coincide. Prior to construction, coordination would take place to ensure that needed proposed road closures and/or detours would be coordinated with the applicable local jurisdictions and with the construction of other road projects in the area.

As shown earlier in Table 3.4.5, the single-bore design variation of the Freeway Tunnel Alternative would result in delays at approximately 5 locations and detours in approximately 7 locations in Alhambra, El Sereno, and Monterey Park in the vicinity of the south tunnel portal. In the vicinity of the north tunnel portal, the single-bore design variation would result in delays at approximately 8 locations and detours in approximately 11 locations in Pasadena.

As shown earlier in Table 3.4.5, the dual-bore design variation of the Freeway Tunnel Alternative would result in delays at approximately 4 locations and detours in approximately 9 locations in Alhambra, El Sereno, and Monterey Park in the vicinity of the south portal. In the vicinity of the north tunnel portal, the dual-bore design variation would result in delays at approximately 8 locations and detours in approximately 11 locations in Pasadena.

Construction of the improvements under these two design variations of the Freeway Tunnel Alternative would result in delays and detours for the traveling public. The TMP Data Sheets for the Freeway Tunnel Alternative identify project features, including signage and other information, to advise the traveling public about upcoming detours, closures, or lane restrictions.

Construction of the single-bore Freeway Tunnel Alternative is anticipated to require temporary closures of the following freeway on- and off-ramps, which may inconvenience the traveling public. The following ramps are anticipated to require closures on weekdays/weeknights:

- **Northbound SR 710**
  - Eastbound El Monte Busway on-ramp
  - Westbound Interstate 10 (I-10) on-ramp
  - Westbound State Route 134 (SR 134) off-ramp
  - Eastbound Interstate 210 (I-210) off-ramp
  - Valley Boulevard off-ramp
- **Southbound SR 710**
  - Ramona Boulevard on-ramp
  - Westbound I-10 off-ramp
  - Eastbound I-10 off-ramp
  - Westbound El Monte Busway off-ramp
  - St. John Avenue off-ramp
  - Eastbound SR 134 on-ramp
  - Valley Boulevard on-ramp
- **Westbound I-210**
  - California Boulevard/SR 710 off-ramp

Construction of the dual-bore Freeway Tunnel Alternative is anticipated to require temporary closures of the following freeway on- and off-ramps, which may inconvenience the traveling public. The following ramps are anticipated to require closures on weekdays/weeknights:

- **Northbound SR 710**
  - Eastbound El Monte Busway on-ramp
  - Westbound I-10 on-ramp
  - Westbound SR 134 off-ramp
  - Eastbound I-210 off-ramp
  - Valley Boulevard off-ramp
- **Southbound SR 710**
  - Westbound I-10 off-ramp
  - Westbound I-10 off-ramp
  - Westbound El Monte Busway off-ramp
  - St. John Avenue off-ramp
  - Valley Boulevard on-ramp
- **Westbound I-210**
  - California Boulevard/SR 710 off-ramp

– SR 710 off-ramp

Construction of the bored and cut-and cover tunnel segments of both design variations of the Freeway Tunnel Alternative would generate excess excavated soil and other materials that cannot be reused within the project limits. That material (spoils) is proposed to be disposed of at two former rock quarries (the Manning and Olive Pits) in Irwindale. As shown on Figure 2-9, the preliminary route for hauling spoils material generated at the south tunnel portal includes a short segment on SR 710 south to I-10. At the north tunnel portal, haul trucks will enter SR 710 without traveling on local streets. The preliminary route at the disposal end of the trip under both design variations includes Live Oak Canyon and Arrow Highway (to/from I-605 at the disposal end of the haul trips), and Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit). Because the dual-bore design variation would require the excavation of approximately twice as much soil as the single-bore design variation, the dual-bore design variation would result in approximately twice as many haul trips (approximately 620 haul trips per day) as the single-bore design variation (approximately 380 haul trips per day). But because the travel routes would be the same, those haul trips would not result in traffic or access effects.

Table 3.5.6 shows the existing daily traffic volumes and estimated number of daily haul trips (inbound and outbound) associated with the transportation of material excavated from the tunnel bores under the dual-bore design variation of the Freeway Tunnel Alternative. (This variation was used because it would result in the greatest number of haul trips.) The haul trips associated with the Freeway Tunnel Alternative would result in minor increases in the overall traffic volumes on the arterial roadway and freeway segments along the preliminary haul routes. Increase in daily traffic volume due to haul trips would be less than 1 percent of overall traffic volume. Those truck trips would represent less than 1.5 percent of the daily traffic on those facilities.

Because the minor detours, the delays, and the haul trips would not result in substantial temporary disruptions to pedestrian and vehicular traffic, the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would not result in substantial temporary disruptions to access to the study area.

Because construction of the bored tunnel segment of both design variations of the Freeway Tunnel Alternative would occur underground, the bored tunnel segment would not result in temporary traffic or access effects. Before underground construction starts, the TBM components would be delivered to the portals. These deliveries are expected to occur at night and will not affect peak period traffic.

The Freeway Tunnel Alternative would include construction on, and the temporary closure of, bridge sections with on-street parking. Construction of the Freeway Tunnel Alternative would only affect on-street parking on the Green Street Bridge section. Table 3.5.7 summarizes the total available supply of on-street parking and the permanent parking loss during construction. At the completion of construction, all that affected parking will be restored and available for normal use. The Freeway Tunnel Alternative would also include the very limited temporary losses of on-street parking spaces during minor construction work for the TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative.

Some of the construction activities associated with the improvements under the Freeway Tunnel Alternative, including improvements in the TSM/TDM Alternative, would result in delays for the traveling public. The Preliminary TMP Data Sheet for the Freeway Tunnel Alternative identifies project features, including signage and other methods, to advise the traveling public about upcoming detours, closures, or lane restrictions. Refer to Measure T-1 later in this section, which provides additional information regarding the TMP.

Temporary Impacts on Pedestrian and Bicycle Facilities

Construction of the Build Alternatives may require temporary closures of sidewalks, crosswalks, and bicycle facilities to protect the safety of pedestrians, bicyclists, and construction workers. As a result, pedestrian and bicycle access routes would be temporarily disrupted during construction. Many sidewalks on the local streets in the vicinity of and/or crossed by improvements in the Build Alternatives are ADA compliant. Because local streets, sidewalks, and crosswalks would be closed temporarily during construction of the Build Alternatives, ADA accessibility would also be affected during those closures.

3.5.3.2 Permanent Impacts

The baselines used for the traffic evaluation are existing conditions and the No Build conditions in the 2020/2025 Opening Years and the 2035 Build Out Year. Comparison of the Build Alternatives to the 2020/2025 and 2035 No Build condition, as well as existing conditions, is appropriate because traffic effects are considered for the projected future conditions. For long-term planning on their facilities, Caltrans uses a 20-year planning horizon and sizes their facilities based on travel demand projections, which is consistent with standard FHWA practice for transportation project planning. This approach ensures that the improvements will meet the need for the project in the future, as well as in the opening year.

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in permanent effects (either beneficial or adverse) related to traffic operations, bicycle and pedestrian facilities, or on-street parking associated with improvements in the Build Alternatives. The traffic forecasting for the No Build Alternative includes projects/planned improvements through 2035 that are included in the Federal Transportation Improvement Program (FTIP), as listed in the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan (RTP)/Sustainable Communities Strategy(SCS), Measure R, and the funded part of Los Angeles County Metropolitan Transportation Authority’s (Metro’s) 2009 Long-Range Transportation Plan (LRTP).

Section 1.2.2.1, Capacity, Transportation Demand, and Safety, provides detailed information on the performance of the freeways in the study area for both existing conditions and future No Build Alternative conditions. As shown in Table 1.1, total daily miles traveled, total daily hours traveled, and daily persons traveling across the east-west screenline (refer to Figure 1-3) will all increase substantially in both the study area and the region from 2012 to 2020/2025 and 2035 under the No Build Alternative. Table 1.6 shows substantially increased freeway volumes in 2035 with the No Build Alternative. Even with the implementation of planned transportation improvements in the No Build Alternative other than the SR 710 North Project improvements, increasing travel demands would exceed freeway system capacity, and traffic operations on the already congested freeway network in the study area would continue to decline.

Build Alternatives: Opening Year (2020/2025)

Opening Year (2020/2025) System Performance by Alternative

Table 3.5.8 summarizes the Opening Year system performance results by alternative. The Opening Year is defined as 2020 for the TSM/TDM and BRT Alternatives, and as 2025 for the LRT and Freeway Tunnel Alternatives. Two different Opening Years were studied because the TSM/TDM and BRT Alternatives can be constructed more quickly than the LRT and Freeway Tunnel Alternatives and therefore have an earlier opening year than the other two Build Alternatives. As shown in Table 3.5.8, Opening Year 2020 data are provided for the No Build Alternative to allow for comparison to the performance of the TSM/TDM and BRT Alternatives, and Opening Year 2025 data are provided to allow comparison of the performance of the No Build Alternative with the LRT and Freeway Tunnel Alternatives.

The traffic modeling described in the analyses in this section for the BRT Alternative included the effects of the improvements included in the BRT Alternative and the effects of the TSM/TDM Alternative improvements included in the BRT Alternative. The traffic modeling for the LRT Alternative included the effects of the improvements included in the LRT Alternative and the effects of the TSM/TDM Alternative improvements included in the LRT Alternative. The traffic modeling for the Freeway Tunnel Alternative included the effects of the improvements included in the Freeway Tunnel Alternative and the effects of the TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative.

The performance of the No Build Alternative and the Build Alternatives for each of the system performance measures are as follows:

- **Total Vehicular Travel Distance:** Daily and combined AM and PM peak-period VMT in the study area are summarized by alternative in Table 3.5.8. The combined AM and PM peak-period results encompass the time periods in which the majority of the congestion in the study area is occurring. As expected, the change in VMT is largest in the dual-bore design variation of the Freeway Tunnel Alternative because that alternative provides the most additional capacity and the largest difference in mobility.

  Although the TSM/TDM, BRT, and LRT Alternatives would improve mobility compared to the No Build Alternative, they result in much lower increases in VMT compared to the Freeway Tunnel Alternative and its design and operational variations. As shown in Table 3.5.8, the single-bore express bus operational variation of the Freeway Tunnel Alternative would result in a small reduction in VMT, and the other single-bore operational variations would result in increased VMT compared to the No Build Alternative.

  The largest increase in the total AM and PM peak-period VMT in the study area occurs with the dual-bore design variation of the Freeway Tunnel Alternative, which increases VMT by 185,000 vehicle-miles (approximately 1.5 percent) compared to the No Build Alternative. The single-bore design variation increases VMT by 85,000 vehicle-miles (approximately 0.6 percent) compared to the No Build Alternative. These changes are directly related to the increases in supply in the study area. The study area VMT changes for the TSM/TDM, BRT, and LRT Alternatives are negligible compared to the No Build Alternative.

- **Total Vehicular Travel Time:** As shown in Table 3.5.8, the total study area VHT show that all the dual-bore operational variations of the Freeway Tunnel Alternative save approximately the same amount of travel time in the study area, although the single-bore express bus operational variation provides the most reduction in VHT. The BRT and LRT Alternatives result in reduced VHT because they move trips from personal vehicles to transit vehicles. The VHT reductions for the Freeway Tunnel Alternative and its design and operational variations are a result of the average speed for all vehicles under that alternative. The combination of mode changes and highway improvements in the TSM/TDM Alternative only slightly improve VHT compared to the No Build Alternative.

- **Daily Person Throughput:** As shown in Table 3.5.8, the dual-bore design variation of the Freeway Tunnel Alternative results in the largest increases in total north-south person throughput compared to the other Build Alternatives and the No Build Alternative. The single-bore design variation of the Freeway Tunnel Alternative would result in less total north-south person throughput than the dual-bore design variation, but more than the other Build Alternatives. The total north-south person throughput of the TSM/TDM, BRT, and LRT Alternatives would increase only slightly compared to the No Build Alternative.
- **Employment Accessibility:** This measure is based on the travel time between selected locations and not on the number of trips. As shown in Table 3.5.8, the single-bore operational variations of the Freeway Tunnel Alternative would result in the highest increase in job accessibility as a result of the increased mobility and speed provided by the tolled tunnel. The dual-bore operational variations would provide almost the same increase in job accessibility as the single-bore operational variations. The differences in accessibility for the single- and dual-bore operational variations are related to the increased capacity of the dual-bore tunnels, and are offset by the volume-reducing tolls in the single-bore operational variations. The BRT and TSM/ TDM Alternatives would also increase job accessibility compared to the No Build Alternative. The LRT Alternative would result in the lowest increase in job accessibility of all the Build Alternatives.

Opening Year (2020/2025) Highway Performance by Alternative

Table 3.5.8 summarizes the highway performance measures for each alternative in its Opening Year. The performance of the No Build Alternative and the Build Alternatives for each of the highway performance measures are as follows:

- **Volume Served:** Table 3.5.8 summarizes the total volumes of vehicles passing the east-west screenline on freeways and arterials. As shown, the dual-bore variation of the Freeway Tunnel Alternative results in the most total vehicles crossing the screenline and using the freeway due to improvements in regional mobility while reducing the volume on arterials (increasing accessibility). Compared to the No Build Alternative, the TSM/TDM, BRT, and LRT Alternatives would slightly increase the traffic volumes on arterials in the study area. In addition, the TSM/TDM and BRT Alternatives would result in traffic volumes on freeways similar to the No Build Alternative, and the LRT Alternative would slightly increase volumes on freeways compared to the No Build Alternative.
- **Traffic Diversion to Local Arterials:** As shown on Table 3.5.8, the Freeway Tunnel Alternative and its design and operational variations would all substantially reduce the total VMT on arterials by moving those trips to freeways. The TSM/TDM, BRT, and LRT Alternatives would also reduce VMT on area arterials but not as much as the Freeway Tunnel Alternative.
- **Use of Local Arterials for Long Trips:** Table 3.5.8 shows that the Freeway Tunnel Alternatives would substantially reduce the number of long trips using arterials in the study area compared to the No Build Alternative. Consistent with other performance measures,

the dual-bore operational variations show a larger decrease in cut-through traffic than the single-bore operational variations due to the additional capacity and larger number of vehicles using the dual-bore tunnel versus the single-bore tunnel. The TSM/TDM, BRT, and LRT Alternatives would have little effect on the percentages of long-distance trips using arterials compared to the No Build Alternative.

- **Travel Time Improvement:** Table 3.5.8 shows that the single-bore design variation results in the highest percentages of trips through the study area with time savings greater than 2.5 minutes. This is because the travel time savings do not factor in the cost of tolls, which in the single-bore operational variations function to keep the tunnel operating at a higher speed than in the untolled and low-toll dual-bore operational variations. The TSM/TDM, BRT, and LRT Alternatives would have no effect on highway travel time savings compared to the No Build Alternative. The TSM/TDM, BRT, and LRT Alternatives would have an effect on specific markets, but the travel time savings for those markets would be small compared to the number of auto trips. As a result, the TSM/TDM, BRT, and LRT Alternatives would provide limited to no changes in highway performance measures.

Opening Year (2020/2025) Transit Performance by Alternative

Table 3.5.8 summarizes the transit performance measures for each alternative's Opening Year. The performance of the No Build Alternative and the Build Alternatives for each of the transit performance measures are as follows:

- **New Transit Trips:** This performance measure captures only new linked transit trips, not existing transit trips that are moving from one transit mode to another transit mode. Table 3.5.8 shows the changes in the number of daily linked transit trips in the Build Alternatives. As shown, the LRT and BRT Alternatives would result in the largest increases in the number of linked transit trips than the other Build Alternatives.
- **Transit Mode Share:** As shown in Table 3.5.8, the daily transit mode share in the study area would be nearly the same for all the Build Alternatives and the No Build Alternative. This is largely because many of the transit users in the LRT and BRT Alternatives would shift from other transit modes, and the transit users in the Freeway Tunnel Alternative are largely based on transit users in the TSM/TDM Alternative improvements, which are included in the Freeway Tunnel Alternative.
- **North-South Transit Throughput:** As shown in Table 3.5.8, the LRT and BRT Alternatives would have the largest effect on daily transit person trips crossing the east-west screenline. The Freeway Tunnel Alternative would increase transit person trips slightly more than the TSM/TDM Alternative alone, mostly due to the change in travel patterns in the region caused by the availability of the freeway tunnel and also potentially as a result of increased travel speeds on bus transit routes, resulting in reduced attraction of transit riders to an improved transit service.
- **Transit Accessibility:** As shown in Table 3.5.8, more than 80 percent of the study area would have access to high-frequency transit service under the No Build Alternative. The transit accessibility would be the same for most of the Build Alternatives and the No Build Alternative, the exception being the LRT Alternative, which would increase the accessibility by approximately 0.1 percent. This measure shows that a majority of the study area (more than 80 percent) would have access to high-frequency transit service under the No Build Alternative.

Opening Year (2020/2025) Truck Conditions by Alternative

Opening Year (2020/2025) heavy-duty truck conditions in the study area were analyzed for the Build Alternative and are summarized in Table 3.5.9. The performance measure was to calculate the number of truck VMT on freeways and arterials, summarized by lane miles. Comparing freeway and arterial truck traffic shows changes in the patterns of truck trips. Calculating truck VMT per lane mile shows the intensity of truck travel on roads.

The truck VMT for the TSM/TDM, BRT, and LRT Alternatives in Opening Year (2020) is the same as for the No Build Alternative. For the Freeway Tunnel Alternative (Opening Year 2025), the arterial system truck intensity decreases for all alternatives (up to 9 percent), and the freeway system truck intensity is either the same as or lower than the No Build Alternative, depending on the Freeway Tunnel Alternative design variation.

Opening Year (2020/2025) Pedestrian and Bicycle Conditions

Each of the Build Alternatives would provide the following improvements, which would benefit pedestrians and bicyclists but which could also potentially result in direct and/or indirect effects on pedestrian and bicycle facilities and the users of those facilities:

- **Potential Effects of the TSM/TDM Alternative on Pedestrian and Bicycle Facilities**
  - On arterials and at intersections, the TSM/TDM Alternative improvements would accommodate pedestrians and will comply with ADA requirements.
  - Class III bikeways will be accommodated, but Class I and Class II bike lanes would not be accommodated due to limited lane widths.
  - On St. John Avenue from California Boulevard to Del Mar Boulevard, the proposed improvements would be within State-owned excess ROW (freeway mainline only) and would provide for pedestrian access.
  - At the Valley Boulevard connector road and Other Road Improvement T-2 hook ramps, the proposed improvements within the State-owned ROW (freeway mainline and off-ramps) would not provide pedestrian or bikeway access beyond what is currently allowed for emergency access in the Highway Design Manual (HDM) and Caltrans Standard Plans.
- **Potential Effects of the BRT Alternative on Pedestrian and Bicycle Facilities:** In addition to the effects of the TSM/TDM Alternative on pedestrian and bicycle facilities and conditions in 2025 described above, the BRT Alternative would result in the following additional effects related to pedestrian and bicycle facilities and conditions in 2025:
  - Bicyclists would be allowed to ride in the peak-period bus lanes at all times. Proper signage would be provided. During the AM and PM peak periods, bicycles would share the bus lane with buses and right-turning vehicles near intersections or at driveways. Outside of peak hours, bicyclists may need to share the outside general traffic lane with other vehicular traffic. Limited conflict areas between buses and bicycles would occur at bus stop locations, where bus drivers would need to be alert for the presence of bike traffic.
  - ADA-compliant curb ramps and sidewalks would be provided where street modifications are proposed in the BRT Alternative.

  - ADA-compliant tree grates at tree wells would be provided at locations where BRT Alternative improvements are made.
  - Bike racks and/or lockers would be provided at the BRT stations if they can be accommodated within the public ROW and would be coordinated with the applicable local jurisdiction.
  - The BRT Alternative would result in improved connectivity to the Metro Gold Line and many other points of interest along the BRT Alternative alignment for pedestrians and bicyclists.
  - In areas with the bus lanes, the BRT Alternative would reduce sidewalk widths to a minimum of 8 feet (ft) at bus stops and a minimum of 6 ft elsewhere.
  - The bus lanes on Atlantic Boulevard, Huntington Drive, and Fair Oaks Avenue would increase the lengths of pedestrian crosswalks at many locations.

- **Potential Effects of the LRT Alternative on Pedestrian and Bicycle Facilities:** In addition to the effects of the TSM/TDM Alternative on pedestrian and bicycle facilities and conditions in 2025 described above (except for the effects associated with Other Road Improvement T-1 in the TSM/TDM Alternative, which would not be constructed with the LRT Alternative), the LRT Alternative would result in the following additional effects on pedestrian and bicycle facilities and conditions in 2025:
  - Mednik Avenue would be restriped between First Street and Floral Drive to provide a new Class II bicycle lane.
  - The SR 710 northbound off-ramp would be realigned to be adjacent to the southbound on-ramp, thereby reducing the two existing intersections to one.
  - New ADA-compliant sidewalks would be provided on the north and south sides of Valley Boulevard between the existing SR 710 northbound off-ramp (to be removed) and the southbound on-ramp. There is currently no sidewalk on the north side and a non-ADA-compliant sidewalk on the south side.
  - A pedestrian plaza would be constructed between the proposed underground Fillmore Station and the existing at-grade Fillmore Station.
  - A new sidewalk would be provided on Circle Drive that connects the Cal State LA Station to the existing El Monte Busway/Metrolink Station.

- **Potential Effects of the Freeway Tunnel Alternative on Pedestrian and Bicycle Facilities:** In addition to the effects of the TSM/TDM Alternative on pedestrian and bicycle facilities and conditions in 2025 described above (except for the effects associated with Other Road Improvement T-1 and Other Road Improvement T-3 in the TSM/TDM Alternative, which would not be constructed with the Freeway Tunnel Alternative), the Freeway Tunnel Alternative would also result in the following effects on pedestrian and bicycle facilities and conditions in 2025:
  - The St. John Avenue extension would require realignment of St. John Avenue and widening of that street at Del Mar Boulevard, which would result in a slightly wider pedestrian crossing on the north side of Del Mar Boulevard, adding a pedestrian crossing on the south side of Del Mar Boulevard, and adding a new sidewalk on the west side of the St. John Avenue extension from Del Mar Boulevard to California Boulevard.

The existing bike path along St. John Avenue may be extended from Del Mar Boulevard to California Boulevard.

- The existing sidewalk on the west side of Pasadena Avenue between Green Street and Colorado Boulevard would be moved farther west to accommodate a new lane from the northbound Pasadena Avenue off-ramp.
- The existing crosswalk along the north and south sides of Green Street and across Pasadena Avenue would be lengthened as a result of the new lane from the northbound Pasadena Avenue off-ramp.
- For the dual-bore design variation only, the existing crosswalk on the north and south sides of Green Street at St. John Avenue would be lengthened to accommodate a southbound SR 710 on-ramp from St. John Avenue.
- For the dual-bore design variation only, the existing crosswalk on the south side of Colorado Boulevard at St. John Avenue would be lengthened to accommodate a new lane.
- A new sidewalk would be provided on westbound Valley Boulevard between the SR 710 northbound off-ramp and the SR 710 southbound on-ramp at Valley Boulevard.

Opening Year (2020/2025) Parking Conditions

- **Potential Effects of the TSM/TDM Alternative on On-Street Parking:** Table 3.5.10 summarizes the available supply of on-street parking that could potentially be affected by the TSM/TDM Alternative improvements. As shown, there are currently approximately 441 available on street parking spaces in those areas.

  The operation of the TSM/TDM Alternative would result in permanent losses of on-street parking during peak periods (anticipated to be weekday mornings between 7:00 AM and 9:00 AM and evenings between 4:00 PM and 6:00 PM) as well as all hours of the day. Table 3.5.10 indicates that the TSM/TDM Alternative would result in approximately 26 spaces permanently lost during the weekday AM and PM peak periods and approximately 220 spaces permanently lost during all hours of the day. Approximately 195 on-street parking spaces would remain available during the weekday AM and PM peak periods and approximately 221 would be available during all hours.

- **Potential Effects of the BRT Alternative on On-Street Parking:** Table 3.5.11 summarizes the available supply of on-street parking along the alignment of the BRT Alternative between stations. As shown, there are currently 2,019 on-street parking spaces available in those areas.

  The operation of the BRT Alternative would result in permanent losses to on-street parking that would either be limited to permanent weekday AM and PM peak period (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) losses due to operation of the BRT within existing on-street parking lanes or to permanent losses during all hours of the day due to presence of a station or operation of a dedicated BRT lane. As shown in Table 3.5.11, of the total parking supply of 2,019 spaces, approximately 1,029 spaces would be permanently lost during operation of the BRT Alternative during the weekday AM and PM peak periods and approximately 114 spaces would be permanently lost due to placement of a bus shelter or operation of the BRT Alternative in an exclusive configuration, for a total permanent loss of approximately 1,143 on-street parking spaces.

The improvements in the TSM/TDM Alternative listed in Table 3.5.10 would also be included in the BRT Alternative. As a result, in addition to the permanent parking effects of the BRT Alternative between stations shown in Table 3.5.11, the BRT Alternative would also result in the permanent parking effects described earlier for the TSM/TDM Alternative improvements and shown in Table 3.5.10. The BRT Alternative would result in a total weekday AM and PM peak-period parking loss of 1,055 parking spaces and a total permanent loss of 334 parking spaces (totals of effects under the TSM/TDM and BRT Alternatives from Tables 3.5.10 and 3.5.11, respectively).

- **Potential Effects of the LRT Alternative on On-Street Parking:** Table 3.5.12 summarizes the total parking supply for the LRT Alternative. As noted in Table 3.5.5, the construction of the LRT Alternative would result in a permanent loss of four on-street parking spaces. The permanent losses of parking that would occur as a result of the LRT Alternative would include the permanent losses of parking during the peak periods as well as the all-day parking losses described above and summarized in Table 3.5.10 as a result of the improvements in the TSM/TDM Alternative.

  The LRT Alternative would not include Other Road Improvement T-1 in the TSM/TDM Alternative. As a result, the LRT Alternative would not include the permanent loss of 135 parking spaces that would occur as part of that improvement. As a result, the total permanent parking loss of the TSM/TDM Alternative improvements included in the LRT Alternative would be 85 parking spaces. The LRT Alternative would result in a total permanent loss of 89 parking spaces (totals of effects under the TSM/TDM Alternative [85 spaces] and LRT Alternative [4 spaces] from Tables 3.5.10 and 3.5.5, respectively).

  Table 3.5.12 summarizes the parking supply and demand at the four LRT stations (Floral, Alhambra, Huntington, and South Pasadena Stations) where off-street parking will be provided. The parking demand at these stations was based on 2035 park-and-ride model projections. As shown in Table 3.5.12, the parking provided at these four stations would exceed the projected demand.

- **Potential Effects of the Freeway Tunnel Alternative:** As shown in Table 3.5.7, the operation of the Freeway Tunnel Alternative would not result in the permanent loss of any on-street parking spaces. However, the Freeway Tunnel Alternative would include the permanent losses of parking during the peak periods as well as the all-day parking losses described above and summarized in Table 3.5.10 as a result of the improvements in the TSM/TDM Alternative.

  The Freeway Tunnel Alternative would not include Other Road Improvement T-1 in the TSM/TDM Alternative. As a result, the Freeway Tunnel Alternative would not include the permanent loss of 135 parking spaces that would occur as part of that improvement. As a result, the total permanent parking loss of the TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative would be 85 parking spaces. The Freeway Tunnel Alternative would result in a total permanent loss of 85 parking spaces (totals of effects under the TSM/TDM (85 spaces) and Freeway Tunnel (0 spaces) Alternatives from Tables 3.5.10 and 3.5.7, respectively).

Build Alternatives Horizon Year (2035)

Horizon Year (2035) System Performance by Alternative

Table 3.5.13 summarizes the Horizon Year (2035) system performance results by alternative. The performance of the No Build Alternative and the Build Alternatives for each of the system performance measures are summarized in Table 3.5.13 and discussed as follows:

- **Total Vehicular Travel Distance:** Table 3.5.13 summarizes the daily and combined AM and PM peak-period VMT in the study area in the Horizon Year (2035). As shown in Table 3.5.13, the greatest changes in total daily VMT and total AM and PM peak-period VMT compared to the No Build Alternative would occur with the dual-bore operational variations of the Freeway Tunnel Alternative. Those operational variations provide the most additional capacity and the largest differences in mobility of all the Build Alternatives. The dual-bore operational variations of the Freeway Tunnel Alternative would increase the combined AM and PM peak period VMT by 210,000 miles (an increase of approximately 2.0 percent) compared to the No Build Alternative. The single-bore operational variations of the Freeway Tunnel Alternative would increase the combined AM and PM peak period VMT by 110,000 miles (1.0 percent) compared to the No Build Alternative. Those VMT increases are a result of the increases in supply of transportation facilities and capacity in the study area. The TSM/TDM, BRT, and LRT Alternatives would result in only minor increases in VMT compared to the No Build Alternative.
- **Total Vehicular Travel Time:** The total daily and total combined AM and PM peak-period Horizon Year (2035) VHT are summarized in Table 3.5.13. The dual-bore operational variations of the Freeway Tunnel Alternative result in the greatest reduction in study area VHT compared to the No Build Alternative. The dual-bore operational variations of the Freeway Tunnel Alternative would reduce the combined AM and PM peak-period study area VHT by 7,000 hours (approximately 2.5 percent). The single-bore operational variations of the Freeway Tunnel Alternative would result in a 4,000 hour (approximately 1.4 percent) reduction in total peak-period study area VHT. The TSM/TDM, BRT, and LRT Alternatives would result in either no change or very minor changes in the total study area and total AM and PM peak-period VHT compared to the No Build Alternative.
- **Daily Person Throughput:** Table 3.5.13 shows the total daily person trips at the east-west screenline. As shown, the dual-bore operational variations of the Freeway Tunnel Alternative would result in the greatest increase in the total north-south person throughput across that screenline. The single-bore variations of the Freeway Tunnel Alternative would result in approximately half the increase in person trip throughput as the dual-bore operational variations. The TSM/TDM, BRT, and LRT Alternatives would result in only minor increases in daily person trips at the east-west screenline.
- **Employment Accessibility:** Table 3.5.13 summarizes the number of jobs accessible within 29.4 minutes in the Horizon Year (2035) for the No Build Alternative and the Build Alternatives. This measure is not based on the number of trips but rather on the travel time between selected locations. As shown in Table 3.5.13, the Build Alternatives would result in increases in job accessibility of between 20,000 and 65,000 jobs compared to the No Build Alternative. The single-bore operational variations of the Freeway Tunnel Alternative would result in the highest increase in job accessibility due to the increased mobility and speed provided by the tolled tunnel. The dual-bore operational variations of the Freeway Tunnel Alternative would be slightly less than under the single-bore operational variations. The

differences in the number of jobs under the single- and dual-bore operational variations of the Freeway Tunnel Alternative are consistent with the finding that the increased capacity of the dual-bore design variation is offset by the volume-reducing tolls in the single-bore operational variations. The TSM/TDM, BRT, and LRT Alternatives would also increase job accessibility but at lower rates than the Freeway Tunnel Alternative.

Horizon Year (2035) Highway Performance by Alternative

Table 3.5.13 summarizes the Horizon Year (2035) highway performance results by alternative. The performance of the No Build Alternative and the Build Alternatives for each of the highway performance measures are as follows:

- **Volume Served:** Table 3.5.13 shows the total daily vehicle volumes crossing the east-west screenline on freeways and arterials. As shown in Table 3.5.13, compared to the No Build Alternative, the dual-bore operational variations of the Freeway Tunnel Alternative would result in the greatest increase in daily vehicle volumes on freeways at the screenline, followed by the single-bore operational variations. The single- and dual-bore design variations of the Freeway Tunnel Alternative would also result in the greatest reduction in daily vehicle volumes crossing the screenline on arterials. The TSM/TDM, BRT, and LRT Alternatives would result in modest increases in daily vehicle volumes crossing the screenline on arterials and minor decreases in daily vehicle volumes crossing the screenline on freeways. This is consistent with the additional freeway capacity provided by the single- and dual-bore design variations of the Freeway Tunnel Alternative.
- **Traffic Diversion to Local Arterials:** Table 3.5.13 shows that the overall daily VMT on arterials in the study area would be reduced under all the Build Alternatives compared to the No Build Alternative. The single- and dual-bore design variations in the Freeway Tunnel Alternative would reduce the total VMT on arterials by shifting trips to freeways. The dual-bore design variation would result in the greatest diversion of VMT from arterials, and the single-bore operational variations of the Freeway Tunnel Alternative would result in about half the diversion in VMT on arterials as the dual-bore operational variations. The TSM/TDM and BRT Alternatives would result in only a minor or no change in VMT diverted from arterials compared to the No Build Alternative. The LRT Alternative would result in a modest increase in the VMT on arterials in the study area compared to the No Build Alternative.
- **Use of Local Arterials for Long Trips:** Table 3.5.13 shows that the Freeway Tunnel Alternative would reduce the number of long trips using arterials in the study area compared to the No Build Alternative. The Freeway Tunnel Alternative would reduce the number of longer-distance trips from the arterials, increasing mobility for those trips that have moved to higher-capacity roads like freeways. The Freeway Tunnel Alternative would also improve accessibility for local trips. Consistent with other performance measures, the dual-bore operational variations of the Freeway Tunnel Alternative show a lower amount of cut-through traffic (7.3 to 7.8 percent) than the single-bore operational variations (10.3 to 10.6 percent) due to the additional capacity in the dual-bore design variation. The TSM/TDM, BRT, and LRT Alternatives would result in modest increases in the percentage of long-distance trips using arterials in the study area (14.0 to 14.3 percent) compared to the No Build Alternative.

  As shown in Table 3.5.13, the Freeway Tunnel Alternative and its design variations (7.3 to 10.6 percent) would result in less use of local arterials for long trips. The No Build Alternative would result in greater use of local arterials for long trips (13.7 percent). The

TSM/TDM, BRT and LRT Alternatives (14.3, 14.2, and 14.0 percent, respectively) would result in slightly more use of local arterials for long trips than the No Build Alternative.

- **Travel Time Improvement:** Table 3.5.13 shows that the single-bore operational variations of the Freeway Tunnel Alternative would result in the highest percentages of trips through the area with time savings greater than 2.5 minutes, at 13 percent each for all three single-bore operational variations. The Freeway Tunnel Alternative would provide direct benefit to highway travel time savings by adding direct and indirect capacity for many trips. The single-bore design variation would have a higher percentage of travel time savings for trips in this corridor because the travel time savings do not factor into the cost of tolls, which in the single-bore operational variations function to keep the tunnel operating at a higher speed than the untolled and low-toll dual-bore operational variations. The dual-bore operational variations of the Freeway Tunnel Alternative would result in more modest travel time savings, at 7 to 10 percent. The TSM/TDM and BRT Alternatives would result in no travel time savings, and the LRT Alternative would result in approximately 3 percent in travel time savings through the area compared to the No Build Alternative. The TSM/TDM, BRT, and LRT Alternatives would have an effect on travel time savings in specific markets, but the travel time savings in those markets would be small compared to the total number of vehicle trips in the area.

  For the Freeway Tunnel Alternative variations, the biggest component of the changes in highway performance is the volume of traffic in the tunnel. Table 3.5.14 is a summary of the peak hour and daily volume projections for 2035 for the six design and operational variations.

Horizon Year (2035) Transit Performance by Alternative

Table 3.5.13 summarizes the Horizon Year (2035) transit performance results by alternative. The performance of the No Build Alternative and the Build Alternatives for each of the transit performance measures are as follows:

- **New Transit Trips:** Table 3.5.13 shows that all the Build Alternatives would result in growth in new daily linked regional transit trips. As shown, the LRT Alternative would have the greatest number of new linked transit trips, followed by the BRT and TSM/TDM Alternatives. The majority of new transit trips in the Freeway Tunnel Alternative are associated with the TSM/TDM Alternative improvements that are included in the Freeway Tunnel Alternative. The single-bore express bus operational variation does not increase new linked transit trips as much as the single-bore tolled operational variation but more than the single-bore tolled/no trucks operational variation. The single-bore express bus operational variation likely draws much of its ridership from existing transit trips, which would not be reflected in the new transit trips performance measure.
- **Transit Mode Share:** Table 3.5.13 shows the daily transit mode share in the study area. As shown, the Build Alternatives would result in either no change from the 4.2 percent transit mode share in the No Build Alternative or an increase of only 0.1 percent compared to the No Build Alternative. This is in part because many of the transit users in the LRT and BRT Alternatives come from other transit modes.
- **North-South Transit Throughput:** Table 3.5.13 shows the daily transit person trips crossing the east-west screenline. As shown in Table 3.5.13, the LRT and BRT Alternatives would result in the highest daily transit person trips of the Build Alternatives and No Build

Alternative. The TSM/TDM and Freeway Tunnel Alternatives would result in only minor increases in the daily transit person trips crossing the screenline compared to the No Build Alternative. The changes in daily transit person trips in the Freeway Tunnel Alternative would be largely based on the changes associated with the improvements in the TSM/TDM Alternative, which are included in the Freeway Tunnel Alternative.

- **Transit Accessibility:** Table 3.5.13 shows the percent of the study area population within 0.25 mi of a high-frequency transit service. As shown, the Build Alternatives would result in no change or only a 0.1 percent increase in transit accessibility in the study area compared to the No Build Alternative. This measure shows that a majority of the study area (more than 80 percent) will have access to high-frequency transit service in the Horizon Year (2035).

Horizon Year (2035) Truck Conditions by Alternative

Horizon Year (2035) heavy-duty truck conditions in the study area were analyzed for each Build Alternative and are summarized in Table 3.5.9. The performance measure was to calculate the number of truck VMT on freeways and arterials, summarized by lane miles. Comparing freeway and arterial truck traffic shows changes in the patterns of truck trips. Calculating truck VMT per lane mile shows the intensity of truck travel on roads.

The truck VMT for the TSM/TDM, BRT, and LRT Alternatives in the Horizon Year (2035) is the same as for the No Build Alternative as shown in Table 3.5.9. For the Freeway Tunnel Alternative (Horizon Year 2035), the arterial system truck intensity generally decreases for all design and operational variations) (up to 17 percent), and the freeway system truck intensity is either the same as or lower than the No Build Alternative, depending on the design and operational variation. As a result, the Build Alternatives would either not change or would not appreciably change the truck VMT in 2035 compared to the No Build Alternative.

Horizon Year (2035) Traffic Operations Performance and Identification of Adverse Effects at Intersections and on Freeway Segments by Alternative

The potential for the Build Alternatives to affect intersections and freeway segments is based on the LOS criteria described earlier in Section 3.5.2.2 and shown in detail in Tables 3.5.15 and 3.5.16, respectively. Those tables describe the impacts of the Build Alternatives on intersections and freeway segments. The affected intersections shown in Table 3.5.15 for the BRT Alternative include the effects of the improvements included in the BRT Alternative and the effects of the TSM/TDM Alternative improvements included in the BRT Alternative. The affected freeway segments shown in Table 3.5.16 for the BRT Alternative include the effects of the improvements included in the BRT Alternative and the effects of the TSM/TDM Alternative improvements included in the BRT Alternative. The affected intersections and freeway segments for the LRT and Freeway Tunnel Alternatives also include the improvements in the TSM/TDM Alternative included in those two alternatives.

In addition, as discussed later, those tables describe potential improvements to address the Adverse Effects of the Build Alternatives on intersections and freeways. The tolled Freeway Tunnel Alternative operational variations assume that a fully automated system using transponders or other automated technology would be used for toll collection, and that toll collections would not result in any delays to traffic flow.

As listed in Tables 3.5.15 and 3.5.16, in the Horizon Year (2035):

- The TSM/TDM Alternative would result in Adverse Effects at 18 intersections and on 8 freeway segments;
- The BRT Alternative would result in Adverse Effects at 13 intersections and on 13 freeway segments;
- The LRT Alternative would result in Adverse Effects at 13 intersections and on 17 freeway segments;
- The Freeway Tunnel Alternative with the single-bore operational variation with tolls would result in Adverse Effects at 9 intersections and on 18 freeway segments;
- The Freeway Tunnel Alternative with the single-bore operational variation with tolls and no trucks would result in Adverse Effects at 8 intersections and on 18 freeway segments;
- The Freeway Tunnel Alternative with the single-bore operational variation with tolls and express bus would result in Adverse Effects at 6 intersections and on 19 freeway segments;
- The Freeway Tunnel Alternative with the dual-bore operational variation with no tolls would result in Adverse Effects at 11 intersections and on 31 freeway segments;
- The Freeway Tunnel Alternative with the dual-bore operational variation with no tolls and no trucks would result in Adverse Effects at 9 intersections and on 30 freeway segments; and
- The Freeway Tunnel Alternative with the dual-bore operational variation with tolls would result in Adverse Effects at 11 intersections and on 28 freeway segments.

Impacts on Pedestrians and Bicyclists

The potential for Adverse Effects on pedestrians was evaluated by considering the traffic operations analysis at the intersections described earlier and comparing those intersections with increases in delay to the pedestrian volumes. The intersections with the highest increases in delay with the Build Alternatives and the highest pedestrian volumes were identified. The 10 intersections with the highest combinations of delay increases and pedestrian volumes are listed in Table 3.5.17 for each Build Alternative.

The potential for Adverse Effects on bicyclists was evaluated by considering the traffic operations analysis at the intersections described earlier and comparing those intersections with increases in delay to the bicycle volumes. The intersections with the highest increases in delay with the Build Alternatives and the highest bicycle volumes were identified. The 10 intersections with the highest combinations of delay increases and bicycle volumes are listed in Table 3.5.18 for each Build Alternative.

The inclusion of an intersection in Tables 3.5.17 and 3.5.18 does not necessarily mean that there would be an impact on pedestrians or bicyclists. Higher delays generally mean that speeds are reduced, which may increase safety for pedestrians and bicyclists.

Summary

The traffic forecasts show increased mobility under all the Build Alternatives compared to the No Build Alternative, with Opening Year (2020/2025) and Horizon Year (2035) results generally following the same patterns. Overall, the travel forecasting results show that the alternatives with the largest change in transportation supply (capacity) show the greatest benefits in regional mobility and accessibility. The Opening Year (2020/2025) and Horizon Year (2035) results generally follow the same patterns.

Increased mobility is shown in the performance measures that calculate daily person trips crossing the east-west screenline; the daily person trips increase under all Build Alternatives in both the Opening and Horizon Years, which would be expected when transit and/or highway capacity is added to the transportation system. Even with the increase in VMT, VHT is reduced which means that mobility is improved, congestion is decreased, and reliability is improved.

The traffic forecasts indicate the TSM/TDM, BRT, and LRT Alternatives would have virtually no effect on highway system performance. The improvements in the transit system under those alternatives would provide benefits to specific markets, but the size of those markets (approximately 4.2 to 4.3 percent of total trips) is not sufficient to result in a large change in the highway performance measures. Similarly, the Freeway Tunnel Alternative and its design and operational variations would not generally affect the overall transit performance measures.

3.5.4 Avoidance, Minimization, and/or Mitigation Measures

3.5.4.1 Measures for Short-Term Impacts

The following measures will address short-term traffic impacts during construction of the Build Alternatives.

Measure T-1

Transportation Management Plan (applies to all four Build Alternatives): Preliminary Transportation Management Plan (TMP) Data Sheets were prepared for each Build Alternative and are included in the *Draft Project Report* (2014). Once the preferred alternative is identified, the Project Engineer will prepare a revised TMP Data Sheet and the Final TMP during final design. The objectives of the TMP will be to:

- Maintain traffic safety during construction;
- Effectively maintain an acceptable level of traffic flow throughout the transportation system during construction;
- Minimize traffic delays and facilitate reduction of duration of construction activities;
- Minimize detours and impacts to pedestrians and bicyclists;
- Foster public awareness of the project and related impacts; and
- Achieve public acceptance of construction of the project and the Final TMP measures.

The TMP will address all aspects of transportation effects of all construction activities on vehicular, pedestrian, and bicycle access and mobility, including: temporary lane, sidewalk, and ramp closures; detours; increases in traffic volumes (including regular traffic and construction traffic, construction equipment, materials delivery vehicles, waste/haul vehicles, and employee commutes); and potential effects on emergency services (e.g., fire, police, ambulances), transit services, bicyclists, and pedestrians). The development of the TMP will be closely coordinated with the California Department of Transportation (Caltrans), the Los Angeles County Metropolitan Transportation Authority (Metro), local jurisdictions (cities and the county), and other potentially affected parties (such as, but not limited to school bus and transit operators and police, fire, and emergency services providers and community organizations). The TMP will identify specific TMP strategies, the party/parties responsible for implementing those strategies, the agencies and parties the TMP strategies will be coordinated with, and the timing of the implementation of those strategies.

The TMP will include specific strategies to address short-term, project-related construction effects on traffic, bicyclists, pedestrians, and area residents and businesses. Table 3.5.19 lists the types of TMP strategies that would be applicable to the individual Build Alternatives. The TMP for the Preferred Alternative will include, but not be limited to, those strategies.

Ramp Closure Plans will be prepared by a qualified traffic engineer during final design for each on- and/or off-ramp proposed to be closed temporarily for 10 or more days during construction of the Freeway Tunnel Alternative. The ramp closure plans will be implemented by the Resident Engineer during construction. *(This TMP component applies to the Freeway Tunnel Alternative only.)*

The Resident Engineer will require the Construction Contractor to implement the strategies in the TMP prior to, during, and after construction activities, as required in the TMP.

Measure T-2 **Pedestrian and Bicycle Facility Closures (applies to all four Build Alternatives):** When sidewalks, crosswalks, and/or bicycle facilities are temporarily closed during construction, pedestrian and bicycle detours will be developed and clearly signed prior to closing the locations.

3.5.4.2 Measures for Permanent Adverse Effects to Intersections and Freeway Segments

Tables 3.5.15 and 3.5.16 identify the locations where each of the Build Alternatives would affect intersections and freeway segments and describe potential improvements to mitigate the traffic impacts at those intersections and freeway segments. Those tables also identify those improvements that are recommended for implementation in the Build Alternatives and those that are not recommended, including the reasons why certain improvements are not recommended for implementation. Those reasons include increased ROW acquisition, the need for aerial easements over the Union Pacific Railroad tracks, provision of only nominal traffic relief, and/or additional impacts to bridge structures, among others. The numbers of intersections and freeway segments projected to experience effects under each of the Build Alternatives in 2035 and the number of measures recommended for implementation at those affected intersections and freeway segments are summarized in Table 3.5.20.

TABLE 3.5.1:
Level of Service Criteria for Average Delays at Intersections

Signalized Intersections (seconds of delay per vehicle)	Unsignalized Intersections (seconds of delay per vehicle)	Level of Service
< 10.0	< 10.0	A
> 10.0 to < 20.0	> 10.0 to < 15.0	B
> 20.0 to < 35.0	> 15.0 to < 25.0	C
> 35.0 to < 55.0	> 25.0 to < 35.0	D
> 55.0 to < 80.0	> 35.0 to < 50.0	E
> 80.0	> 50.0	F

Source: *Transportation Technical Report* (2014).

TABLE 3.5.2:
Level of Service Criteria for Basic, Weaving, and Merge/Diverge Segments

LOS	Density (passenger cars/mile/lane)
Merge/Diverge Basic Segments	
A	0–11
B	> 11–18
C	> 18–26
D	> 26–35
E	> 35–45
F	> 45
Weaving, Diverge, and Merge Segments	
A	≤ 10
B	> 10–20
C	> 20–28
D	> 28–35
E	> 35
F	Demand exceeds capacity

Source: *Transportation Technical Report* (2014).

TABLE 3.5.3:
Existing Year (2012) System, Highway, and Transit Performance

Performance Measure	Existing Year (2012)
SYSTEM PERFORMANCE	
Total Vehicular Travel Distance	
Total Daily VMT in the Study Area	24,150,000 miles
Total of the Sum of the AM and PM Peak-Period VMT in the Study Area	9,980,000 miles
Total Daily VMT in the Region	391,890,000 miles
Total Vehicular Travel Time	
Total Daily VHT in the Study Area	660,000 hours
Total of the Sum of the AM and PM Peak-Period VHT in the Study Area	275,000 hours
Total Daily VHT in the Region	9,740,000 hours
Daily Person Throughput	
Total North-South Person Travel Crossing the East-West Screenline in Autos and on Transit	3,029,000 persons
Employment Accessibility	
Number of Accessible Jobs Within 29.4 Minutes of 12 Origins	1,798,000 jobs
HIGHWAY PERFORMANCE	
Volume Served	
Total North-South Vehicular Traffic Crossing the East-West Screenline (vehicles)	835,000 arterials 1,036,000 freeways
Traffic Diversion to Local Arterials	
Total Daily VMT on the Arterial System in the Study Area	7,645,000 miles
Use of Local Arterials for Long Trips (cut-through travel)	
Percent of Study Area Trips with Origins and Destinations Outside the Study Area	12.4%
Travel Time Improvement	
Total Number of Trips with a Travel Time Savings of More Than 2.5 Minutes Compared to No Build	Not Applicable[1]
TRANSIT PERFORMANCE	
New Transit Trips	
Change in Total Daily Linked Transit Trips in the Southern California Association of Governments Region	Not Applicable
Transit Mode Share	
Percent of Total Daily Person Trips That Use Transit	3.5%
North-South Transit Throughput	
Total Daily North-South Person Trips Crossing the East-West Screenline Using Transit Services	150,000 person trips
Transit Accessibility	
Percent of Study Area and Population and Employment Located Within 0.25 Mile of a Transit Stop with High-Frequency Service	80.8%

Source: *Transportation Technical Report* (2014).
1 Not applicable because there is no existing No Build scenario.
VHT = vehicle hours traveled
VMT = vehicle miles traveled

TABLE 3.5.4:
LRT Alternative Haul Trips Versus Existing ADT Along Haul Routes

Roadway Segment	Existing ADT[1]	Haul Trips/Day	Percentage Increase in ADT
SR 710 between Valley Boulevard and I-10	45,000	366[2]	0.8
I-10 between SR 710 and Fremont Avenue	214,000	366[2]	0.2
Fremont Avenue between Huntington Drive and Concord Avenue	30,300	48[3]	0.2
Fremont Avenue between Concord Avenue and I-10	30,500	98[4]	0.3
I-10 between Fremont Avenue and I-605	204,000	464[5]	0.2
I-605 between I-10 and Live Oak Avenue	160,000	464[5]	0.3
Fair Oaks Avenue between Mission Street and Fillmore Street	30,300	60[6]	0.2
Fair Oaks Avenue between Fillmore Street and California Boulevard	30,100	116[7]	0.4
California Boulevard between Fair Oaks Avenue and Pasadena Avenue	25,300	58[8]	0.2
Pasadena Avenue between California Boulevard and SR 710 North on-ramp	24,300	58[8]	0.2
SR 710 between Del Mar Boulevard and I-210	66,000	116[7]	0.2
I-210 between SR 710 and I-605	239,000	116[7]	0.05
I-605 between I-210 and Arrow Highway	148,000	116[7]	0.1
Del Mar Boulevard between St. John Avenue and Fair Oaks Avenue	13,000	58[9]	0.4
Fair Oaks Avenue between California Boulevard and Del Mar Boulevard	20,000	58[9]	0.3

Source: Caltrans 2014 Traffic Count Book for freeway segment traffic volumes; SCAG Model for Year 2012 for arterial segment traffic volumes; CH2M HILL, 2016.

1 Reflects the existing ADT on the portion of this roadway segment that currently experiences the lowest traffic volume.

2 Includes approximately 183 outbound and 183 inbound haul trips related to LRT tunnel boring activities.

3 Includes approximately 24 outbound and 24 inbound haul trips related to excavation of the station box for the Huntington Station.

4 Includes approximately 24 outbound and 24 inbound haul trips related to excavation of the station box for the Huntington Station and 25 outbound and 25 inbound haul trips related to excavation of the station box for the Alhambra Station.

5 Includes approximately 183 outbound and 183 inbound haul trips related to LRT tunnel boring activities, 24 outbound and 24 inbound haul trips related to excavation of the station box for the Huntington Station, and 25 outbound and 25 inbound haul trips related to excavation of the station box for the Alhambra Station.

6 Includes approximately 30 outbound and 30 inbound haul trips related to excavation of the station box for the South Pasadena Station.

7 Includes approximately 30 outbound and 30 inbound haul trips related to excavation of the station box for the South Pasadena Station and 28 outbound and 28 inbound haul trips related to excavation of the station box for the Fillmore Station.

8 Includes approximately 30 outbound haul trips related to excavation of the station box for the South Pasadena Station and 28 outbound haul trips related to excavation of the station box for the Fillmore Station.

9 Includes approximately 30 inbound haul trips related to excavation of the station box for the South Pasadena Station and 28 inbound haul trips related to excavation of the station box for the Fillmore station.

ADT = average daily trips

TABLE 3.5.5:
LRT Alternative Parking Loss Summary (Construction)

Side of the Street	Street	Limits[1]		Parking Summary[2]		
		From	To	Supply[3]	Temporary Parking Loss During Construction[4]	Permanent Parking Loss After Construction[5]
Mednik Segment						
East	Mednik Avenue	3rd Street	Floral Drive	48	48	0
West	Mednik Avenue	3rd Street	Floral Drive	80	80	0
			Mednik Segment Subtotals	***128***	***128***	***0***
Floral Segment						
North	Floral Drive	Mednik Avenue	Dangler Avenue	6	6	0
South	Floral Drive	Mednik Avenue	Dangler Avenue	20	20	0
			Floral Segment Subtotals	***26***	***26***	***0***
California State University, Los Angeles Segment						
East	Circle Drive	Campus Road	Cal State LA Station	0	0	0
West	Circle Drive	Campus Road	Cal State LA Station	0	0	0
			California State University, Los Angeles Segment Subtotals	***0***	***0***	***0***
Alhambra Segment						
East	Fremont Avenue	Concord Avenue	Orange Avenue	0	0	0
West	Fremont Avenue	Concord Avenue	Orange Avenue	0	0	0
			Alhambra Segment Subtotals	***0***	***0***	***0***
Huntington Segment						
East/North	Fair Oaks Avenue/ Huntington Drive	Huntington Drive	Laurel Street	14	14	0
West/South	Fair Oaks Avenue/ Huntington Drive	Huntington Drive	Laurel Street	20	16	4
			Huntington Segment Subtotals	***34***	***30***	***4***
South Pasadena Segment						
East	Fair Oaks Avenue	Hope Street	El Centro Street	16	16	0
West	Fair Oaks Avenue	Hope Street	El Centro Street	14	14	0
			South Pasadena Segment Subtotals	***30***	***30***	***0***
Fillmore Segment						
East	Raymond Avenue	Fillmore Street	Pico Street	14	14	0
West	Raymond Avenue	Fillmore Street	Pico Street	12	12	0
			Fillmore Segment Subtotals	***26***	***26***	***0***
			TOTALS	**244**	**240**	**4**

Source: *Transportation Technical Report* (2014).

1 Limits are defined as the area of impact: area encompassed by construction of the station and corresponding station components. Streets identified to be closest boundaries of the area of impact.

2 The LRT Alternative parking summary is based on construction of the project. Activities during operation of the LRT would have negligible effects on parking.

3 Parking supply numbers reflect on-street parking within the defined limits (if on-street parking is unmarked, the distance of available curb was measured).

4 Permanent parking loss due to construction of proposed LRT stations. Parking affected by construction assumed to be restored after completion of project.

5 Permanent parking loss due to final reconfiguration of roadway for construction of median and columns or placement of station.

TABLE 3.5.6:
Freeway Tunnel Alternative Dual-Bore Design Variation Haul Trips versus Existing ADT Along Haul Routes

Roadway Segment	Existing ADT[1]	Haul Trips/Day[2]	Percentage Increase in ADT
SR 710 between Del Mar Boulevard and I-210	66,000	620[3]	0.9
I-210 between SR 710 and I-605	239,000	620[3]	0.3
I-605 between I-210 and Arrow Highway	148,000	620[3]	0.4
SR 710 between Valley Boulevard and I-10	45,000	620[4]	1.4
I-10 between SR 710 and I-605	204,000	620[4]	0.3
I-605 between I-10 and Live Oak Avenue	160,000	620[4]	0.4

Source: Caltrans 2014 Traffic Count Book for freeway segment traffic volumes; SCAG Model for Year 2012 for arterial segment traffic volumes; CH2M HILL, 2016.
1 Reflects the existing ADT on the portion of this roadway segment that currently experiences the lowest traffic volume.
2 Reflects construction of the dual-bore design variation, the Freeway Tunnel design variation that would result in the greatest number of haul trips.
3 Includes approximately 310 outbound and 310 inbound haul trips related to tunnel boring activities at the north tunnel portal.
4 Includes approximately 310 outbound and 310 inbound haul trips related to tunnel boring activities at the south tunnel portal.
ADT = average daily trips

TABLE 3.5.7:
Freeway Tunnel Alternative Parking Loss Summary (Construction)

Side of the Street	Street	Limits		Parking Summary[1]		
		From	To	Supply[2]	Temporary Parking Loss During Construction[3]	Permanent Parking Loss After Construction[4]
Union Street Bridge						
North	Union Street	St. John Avenue	Pasadena Avenue	20	0	0
South	Union Street	St. John Avenue	Pasadena Avenue	0	0	0
			Union Street Bridge Subtotals	***20***	***0***	***0***
Colorado Boulevard Bridge						
North	Colorado Boulevard	St. John Avenue	Pasadena Avenue	14	0	0
South	Colorado Boulevard	St. John Avenue	Pasadena Avenue	16	0	0
			Colorado Boulevard Bridge Subtotals	***30***	***0***	***0***
Green Street Bridge						
North	Green Street	St. John Avenue	Pasadena Avenue	17	17	0
South	Green Street	St. John Avenue	Pasadena Avenue	0	0	0
			Green Street Bridge Subtotals	***17***	***17***	***0***
			TOTALS	**67**	**17**	**0**

Source: *Transportation Technical Report* (2014).
1 The Freeway Tunnel Alternative parking summary is based on construction of the project. Activities during operation of the Freeway Tunnel Alternative would have negligible effects on parking.
2 Parking supply numbers for Freeway Tunnel Alternative reflect on-street parking numbers on each affected bridge.
3 Permanent parking losses during construction of on each bridge section. Parking losses during construction are assumed to be restored after completion of the project.
4 Permanent parking loss remaining after construction of the Freeway Tunnel Alternative.

TABLE 3.5.8:
Opening Year (2020/2025) System, Highway, and Transit Performance by Alternative

Performance Measure	Opening Year 2020			Opening Year 2025							
						Freeway Tunnel Alternative					
						Single-Bore Design Variation			Dual-Bore Design Variation		
	No Build	TSM/TDM	BRT	No Build	LRT	Toll	Toll, No Trucks	Toll, Express Bus	No Toll	No Toll, No Trucks	Toll
SYSTEM PERFORMANCE											
Total Vehicular Travel Distance											
Study Area											
Daily VMT	24,275,000	24,290,000	24,270,000	24,560,000	24,560,000	24,680,000	24,700,000	24,690,000	24,900,000	24,940,000	24,920,000
Combined AM and PM Peak-Period VMT	10,025,000	10,035,000	10,025,000	10,120,000	10,130,000	10,205,000	10,205,000	10,115,000	10,295,000	10,305,000	10,300,000
Regional Area											
Daily VMT	422,010,000	421,940,000	421,900,000	438,440,000	438,345,000	438,350,000	438,435,000	438,665,000	438,750,000	438,710,000	438,770,000
Combined AM and PM Peak-Period VMT	172,760,000	172,775,000	172,760,000	178,530,000	178,555,000	178,665,000	178,645,000	178,425,000	178,760,000	178,735,000	178,765,000
Total Vehicular Travel Time											
Study Area											
Daily VHT	667,000	661,000	661,000	681,000	677,000	663,000	663,000	663,000	658,000	658,000	659,000
Combined AM and PM Peak-Period VHT	279,000	277,000	276,000	283,000	282,000	278,000	278,000	274,000	276,000	275,000	276,000
Regional Area											
Daily VHT	10,473,000	10,458,000	10,457,000	10,997,000	10,990,000	10,964,000	10,968,000	10,973,000	10,966,000	10,962,000	10,967,000
Combined AM and PM Peak-Period VHT	4,375,000	4,368,000	4,368,000	4,570,000	4,568,000	4,565,000	4,564,000	4,552,000	4,561,000	4,560,000	4,562,000
Daily Person Throughput											
Daily Person Trips on East-West Screenline for Autos and Transit	3,090,000	3,099,000	3,101,000	3,133,000	3,144,000	3,180,000	3,180,000	3,185,000	3,210,000	3,210,000	3,215,000
Employment Accessibility											
Jobs Accessible within 29.4 Minutes	1,945,000	1,995,000	1,995,000	1,980,000	2,015,000	2,065,000	2,065,000	2,080,000	2,050,000	2,055,000	2,060,000
HIGHWAY PERFORMANCE											
Volume Served											
Daily Volume of Vehicles Crossing East-West Screenline											
On Arterials	853,000	864,000	863,000	864,000	871,000	822,000	823,000	823,000	773,000	776,000	785,000
On Freeways	1,015,000	1,013,000	1,013,000	1,023,000	1,022,000	1,095,000	1,096,000	1,096,000	1,164,000	1,165,000	1,157,000
Traffic Diversion to Local Arterials											
Daily Study Area VMT on Arterials	7,810,000	7,800,000	7,790,000	7,945,000	7,945,000	7,650,000	7,655,000	7,655,000	7,365,000	7,380,000	7,425,000
Use of Local Arterials for Long Trips											
PM Peak Period Percent Cut-Through	14.2%	14.3%	14.3%	13.9%	14.1%	10.4%	10.4%	10.2%	7.3%	7.4%	7.8%
Travel Time Improvement											
Percent of AM and PM Peak-Period Trips More Than 2.5 Minutes Faster Than No Build	0%	0%	0%	0%	0%	10%	11%	12%	5%	7%	8%
TRANSIT PERFORMANCE											
New Transit Trips											
Change in Total Daily Linked Transit Trips in the Southern California Association of Governments Region (compared to the 2020 baseline of 1,626,000 linked transit	Not Applicable	9,450	13,550	Not Applicable	13,950	10,550	9,050	10,150	8,800	10,150	9,750

TABLE 3.5.8:
Opening Year (2020/2025) System, Highway, and Transit Performance by Alternative

Performance Measure	Opening Year 2020			Opening Year 2025							
						Freeway Tunnel Alternative					
						Single-Bore Design Variation			Dual-Bore Design Variation		
	No Build	TSM/TDM	BRT	No Build	LRT	Toll	Toll, No Trucks	Toll, Express Bus	No Toll	No Toll, No Trucks	Toll
trips and the 2025 baseline of 1,699,000 linked transit trips)											
Transit Mode Share											
Study Area Mode Share Percent	3.9%	4.0%	4.1%	3.9%	4.1%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
North-South Transit Throughput											
Daily Person Trips Crossing East-West Screenline	172,000	175,000	179,000	183,000	188,000	187,000	186,000	187,000	185,000	186,000	187,000
Transit Accessibility											
Percent of Study Area Population and Employment within 0.25 Mile of High-Frequency Service	80.3%	80.3%	80.3%	80.3%	80.4%	80.3%	80.3%	80.3%	80.3%	80.3%	80.3%

Source: *Transportation Technical Report* (2014).
VHT = vehicle hours traveled
VMT = vehicle miles traveled

TABLE 3.5.9:
Opening Year (2020/2025) and Horizon Year (2035) Truck Performance by Alternative

Performance Measure	No Build	TSM/TDM	BRT	LRT	Freeway Tunnel Alternative					
					Single-Bore Design Variation			Dual-Bore Design Variation		
					Toll	Toll, No Trucks	Toll, Express Bus	No Toll	No Toll, No Trucks	Toll
Opening Year 2020 (for the TSM/TDM and BRT Alternatives)										
Daily Truck VMT per Lane Mile of Freeway	2,300	2,300	2,300	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Daily Truck VMT per Lane Mile of Arterials and Collectors	100	100	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Opening Year 2025 (for the LRT and Freeway Tunnel Alternatives)										
Daily Truck VMT per Lane Mile of Freeway	2,500	N/A	N/A	2,500	2,500	2,400	2,500	2,500	2,400	2,400
Daily Truck VMT per Lane Mile of Arterials and Collectors	105	N/A	N/A	105	95	105	95	95	100	95
Horizon Year 2035 (for all Build Alternatives)										
Daily Truck VMT per Lane Mile of Freeway	2,800	2,800	2,800	2,800	2,800	2,700	2,800	2,700	2,600	2,700
Daily Truck VMT per Lane Mile of Arterials and Collectors	115	115	115	115	105	115	105	95	105	105

Source: *Transportation Technical Report* (2014).
Note: The truck-related information provided in this table refers to heavy-duty trucks as defined in the Southern California Association of Governments 2012 Regional Transportation Plan travel demand model.
N/A = Not Applicable
VMT = vehicle miles traveled

TABLE 3.5.10:
TSM/TDM Alternative Parking Space Summary (Operations)

ID	Street	Limits		City	Parking Space Summary[1]				
		From	To		Parking Supply[3]	Weekday AM and PM Peak Period Parking Loss[4]	Permanent Parking Loss[5]	Remaining Parking during AM and PM Peak Periods[6]	Remaining Parking for All Non-Peak Period Hours[7]
Roadway Segments[2]									
L-2A	Fremont Avenue	Huntington	Alhambra	South Pasadena	55	0	8	47	47
L-4	Garfield Avenue	Valley	Glendon	Alhambra	26	26	0	0	26
				Roadway Segment Subtotals	***81***	***26***	***8***	***47***	***73***
Intersections[2]									
I-11	Fremont Avenue/Huntington Drive	South Pasadena			7	0	4	3	3
I-16	Garfield Avenue/Mission Road	Alhambra			12	0	2	10	10
I-19	Mission Road/Del Mar Avenue	San Gabriel			28	0	17	11	11
I-22	San Gabriel Boulevard/Marshall Street	San Gabriel			21	0	1	20	20
I-24	Huntington Drive/Oak Knoll	San Marino			24	0	11	13	13
I-25	Huntington Drive/Sierra Madre	San Marino			66	0	29	37	37
				Intersection Subtotals	***158***	***0***	***64***	***94***	***94***
Special Projects[2]									
T-1	710 Connector/Valley Boulevard/Mission Road[8]	Los Angeles/Alhambra			149	0	135	14	14
T-2	SR 110 Hook Ramps/Fair Oaks/State Street	South Pasadena			53	0	13	40	40
				Special Projects Subtotals	***202***	***0***	***148***	***54***	***54***
				TOTALS	**441**	**26**	**220**	**195**	**221**

Source: *Transportation Technical Report* (2014).

1 The TSM/TDM Alternative parking summary is based on build out (operations) of the project. Construction activities associated with this alternative would be isolated and short in duration and therefore would have negligible effects on parking.

2 This table only lists roadway segments and intersections where parking is anticipated to be affected by the TSM/TDM Alternative. All other locations not listed are assumed to be unaffected.

3 Parking supply numbers for TSM/TDM Intersections reflect on-street parking within the limits of the TSM/TDM improvements (includes parking loss at cross streets but not on arterials outside of intersection crosswalks). For roadway segments, parking supply numbers reflect total parking spaces within the defined limits and do not include parking loss at intersections (between intersection crosswalks), including cross streets.

4 Permanent parking loss during weekday AM and PM peak periods (estimated to be 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively) due to proposed roadway and intersection TSM/TDM improvements. Parking will be available during off-peak (non-peak period) hours.

5 Permanent loss of parking spaces as a result of the construction of this alternative.

6 Remaining parking during AM and PM peak periods reflects the total parking supply less permanent AM and PM peak period-parking loss and permanent parking loss at intersections and roadways.

7 Remaining parking for all non-peak period hours reflects the total parking supply less the permanent parking loss at intersections and roadway segments.

8 T-1 site reflects a loss of 135 existing parking spaces for the Grifols property. The project proposes to restore a total of 141 parking spaces.

ID = improvement identification number

TABLE 3.5.11:
BRT Alternative Parking Displacement Summary between Stations (Operations)

Side of the Street	Street	Stations		Parking Summary		
		From	To	Supply[1]	Weekday AM and PM Peak-Period Parking Loss[2]	Permanent Parking Loss[3]
Between Whittier and Pomona Stations						
East	Atlantic Boulevard	Whittier	Pomona	114	100	4
West	Atlantic Boulevard	Whittier	Pomona	88	0	0
			Section 1 Subtotals	***202***	***100***	***4***
Between Pomona and Cesar Chavez Stations						
East	Atlantic Boulevard	Pomona	Cesar Chavez	28	27	0
West	Atlantic Boulevard	Pomona	Cesar Chavez	14	0	0
			Section 2 Subtotals	***42***	***27***	***0***
Between Cesar Chavez and Garvey Stations						
East	Atlantic Boulevard	Cesar Chavez	Garvey	172	160	0
West	Atlantic Boulevard	Cesar Chavez	Garvey	192	192	0
			Section 3 Subtotals	***364***	***352***	***0***
Between Garvey and Valley Stations						
East	Atlantic Boulevard	Garvey	Valley	59	0	27
West	Atlantic Boulevard	Garvey	Valley	87	81	0
			Section 4 Subtotals	***146***	***81***	***27***
Between Valley and Main Stations						
East	Atlantic Boulevard	Valley	Main	12	0	12
West	Atlantic Boulevard	Valley	Main	13	3	0
			Section 5 Subtotals	***25***	***3***	***12***
Between Main and Huntington/Garfield Stations						
East	Atlantic Boulevard	Main	Huntington/Garfield	99	0	0
West	Atlantic Boulevard	Main	Huntington/Garfield	142	0	0
			Section 6 Subtotals	***241***	***0***	***0***
Between Huntington/Garfield and Marengo Stations						
North	Huntington Drive	Huntington/Garfield	Marengo	88	85	0
South	Huntington Drive	Huntington/Garfield	Marengo	89	79	10
			Section 7 Subtotals	***177***	***164***	***10***
Between Marengo and Mission Stations						
East	Fair Oaks Avenue	Marengo	Mission	56	52	4
West	Fair Oaks Avenue	Marengo	Mission	57	49	5
			Section 8 Subtotals	***113***	***101***	***9***
Between Mission and Glenarm Stations						
East	Fair Oaks Avenue	Mission	Glenarm	92	83	4
West	Fair Oaks Avenue	Mission	Glenarm	90	61	29
			Section 9 Subtotals	***182***	***144***	***33***
Between Glenarm and California Stations						
East	Fair Oaks Avenue	Glenarm	California	31	30	0
West	Fair Oaks Avenue	Glenarm	California	31	0	10
			Section 10 Subtotals	***62***	***30***	***10***
Between California and Fair Oaks/Del Mar Stations						
East	Fair Oaks Avenue	California	Fair Oaks/Del Mar	37	27	0
West	Fair Oaks Avenue	California	Fair Oaks/Del Mar	31	0	0
			Section 11 Subtotals	***68***	***27***	***0***
Between Fair Oaks/Del Mar and Los Robles Stations						
North	Del Mar Boulevard	Fair Oaks/Del Mar	Los Robles	9	0	0
South	Del Mar Boulevard	Fair Oaks/Del Mar	Los Robles	7	0	0
			Section 12 Subtotals	***16***	***0***	***0***
Between Los Robles and Lake Stations						
North	Del Mar Boulevard	Los Robles	Lake	15	0	4
South	Del Mar Boulevard	Los Robles	Lake	0	0	0
			Section 13 Subtotals	***15***	***0***	***4***

TABLE 3.5.11:
BRT Alternative Parking Displacement Summary between Stations (Operations)

Side of the Street	Street	Stations		Parking Summary		
		From	To	Supply[1]	Weekday AM and PM Peak-Period Parking Loss[2]	Permanent Parking Loss[3]
Between Lake and Hill Stations						
North	Del Mar Boulevard	Lake	Hill	50	0	0
South	Del Mar Boulevard	Lake	Hill	46	0	0
			Section 14 Subtotals	***96***	***0***	***0***
Between Hill and Colorado/Hill Stations						
East	Hill Avenue	Hill Avenue	Colorado/Hill	0	0	0
West	Hill Avenue	Hill Avenue	Colorado/Hill	26	0	0
			Section 15 Subtotals	***26***	***0***	***0***
Between Colorado/Hill and Colorado/Lake Stations						
North	Colorado Boulevard	Colorado/Hill	Colorado/Lake	85	0	0
South	Colorado Boulevard	Colorado/Hill	Colorado/Lake	85	0	5
			Section 16 Subtotals	***170***	***0***	***5***
Between Colorado/Lake and End Line Stations						
East	Lake Avenue	Colorado/Lake	End Line	38	0	0
West	Lake Avenue	Colorado/Lake	End Line	36	0	0
			Section 17 Subtotals	***74***	***0***	***0***
			TOTALS	**2,019**	**1,029**	**114**

Source: *Transportation Technical Report* (2014).
Note: The BRT Alternative parking summary is based on build out (operations) of the project. Construction activities associated with this alternative would be isolated and short in duration and therefore would have negligible effects on parking.
[1] Parking supply numbers reflect on-street parking within the defined limits (if on-street parking is unmarked, the distance of available curb was measured).
[2] Permanent parking loss during weekday AM and PM peak periods (estimated to be from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively) due to operation of the BRT Alternative.
[3] Permanent parking losses due to placement of station or operation of a dedicated BRT lane.

TABLE 3.5.12:
LRT Alternative Parking Demand versus Parking Supply at Proposed Stations (Operations)

Station	Parking Summary		
	Estimated LRT Parking Demand[1]	Proposed Parking Supply[2]	Surplus/(Shortfall)
Civic Center	–	–	–
Floral	370	415	45
California State University, Los Angeles	–	–	–
Alhambra	341	382	41
Huntington	355	397	42
South Pasadena	268	338	70
Fillmore	–	–	–
TOTALS	**1,334**	**1,532**	**240**

Source: *Transportation Technical Report* (2014).
Note: Construction of the LRT parking structures would not result in the loss of any existing parking spaces. No parking structures will be provided at the Civic Center, California State University, Los Angeles, and Fillmore LRT Stations.
[1] Parking demand based on 2035 park-and-ride model output and applying an average vehicle occupancy of 1.12.
[2] Parking supply based on January 24, 2014, station conceptual site plans.

TABLE 3.5.13:
Horizon Year (2035) System, Highway, and Transit Performance by Alternative

Performance Measure	No Build	TSM/TDM	BRT	LRT	Freeway Tunnel Alternative					
					Single-Bore Design Variation			Dual-Bore Design Variation		
					Toll	Toll, No Trucks	Toll, Express Bus	No Toll	No Toll, No Trucks	Toll
SYSTEM PERFORMANCE										
Total Vehicular Travel Distance (miles)										
Daily Study Area VMT	25,120,000	25,190,000	25,170,000	25,160,000	25,300,000	25,320,000	25,300,000	25,520,000	25,580,000	25,530,000
Combined AM and PM Peak Period Study Area VMT	10,320,000	10,350,000	10,340,000	10,345,000	10,425,000	10,415,000	10,430,000	10,520,000	10,530,000	10,520,000
Daily Regional Area VMT	471,435,000	471,485,000	471,450,000	471,320,000	471,560,000	471,730,000	471,530,000	471,950,000	471,780,000	471,820,000
Combined AM and PM Peak Period Regional Area VMT	190,110,000	190,140,000	190,120,000	190,175,000	190,270,000	190,195,000	190,275,000	190,435,000	190,325,000	190,360,000
Total Vehicular Travel Time (hours)										
Daily Study Area VHT	706,000	702,000	702,000	706,000	689,000	691,000	689,000	684,000	684,000	684,000
Combined AM and PM Peak Period Study Area VHT	291,000	290,000	290,000	292,000	287,000	287,000	287,000	284,000	284,000	284,000
Daily Regional Area VHT	12,107,000	12,106,000	12,103,000	12,118,000	12,082,000	12,110,000	12,086,000	12,088,000	12,074,000	12,081,000
Combined AM and PM Peak Period Regional Area VHT	4,985,000	4,985,000	4,984,000	4,999,000	4,984,000	4,991,000	4,985,000	4,984,000	4,978,000	4,981,000
Daily Person Throughput (persons)										
Daily Person Trips on East-West Screenline for Autos and Transit	3,210,000	3,218,000	3,225,000	3,223,000	3,263,000	3,259,000	3,263,000	3,298,000	3,299,000	3,298,000
Employment Accessibility (jobs)										
Jobs Accessible within 29.4 Minutes	2,028,000	2,052,000	2,049,000	2,040,000	2,094,000	2,091,000	2,092,000	2,069,000	2,076,000	2,087,000
HIGHWAY PERFORMANCE										
Volume Served (vehicles)										
Daily Volume on Arterials Crossing East-West Screenline	881,000	890,000	891,000	890,000	839,000	836,000	837,000	790,000	794,000	800,000
Daily Volume on Freeways Crossing East-West Screenline	1,042,000	1,039,000	1,039,000	1,040,000	1,117,000	1,118,000	1,118,000	1,186,000	1,184,000	1,178,000
Traffic Diversion to Local Arterials										
Daily Study Area VMT on Arterials	8,180,000	8,180,000	8,170,000	8,220,000	7,900,000	7,890,000	7,895,000	7,600,000	7,610,000	7,655,000
Use of Local Arterials for Long Trips										
PM Peak Period Percent Cut-Through	13.7%	14.3%	14.2%	14.0%	10.3%	10.6%	10.3%	7.3%	7.4%	7.8%
Travel Time Improvement										
Percent of AM and PM Peak Period Trips More Than 2.5 Minutes Faster Than No Build	0%	0%	0%	3%	13%	13%	13%	7%	8%	10%
TRANSIT PERFORMANCE										
New Transit Trips										
Change in Total Daily Linked Transit Trips in the Southern California Association of Governments	Not Applicable	11,250	13,500	15,350	11,350	8,350	10,650	7,900	10,900	10,300

TABLE 3.5.13:
Horizon Year (2035) System, Highway, and Transit Performance by Alternative

Performance Measure	No Build	TSM/TDM	BRT	LRT	Freeway Tunnel Alternative					
					Single-Bore Design Variation			Dual-Bore Design Variation		
					Toll	Toll, No Trucks	Toll, Express Bus	No Toll	No Toll, No Trucks	Toll
Region (compared to the 2035 baseline of 1,846,000 linked transit trips)										
Transit Mode Share										
Study Area Mode Share	4.2%	4.2%	4.3%	4.3%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
North-South Transit Throughput										
Daily Person Trips Crossing East-West Screenline	209	211	215	214	213	211	212	211	212	212
Transit Accessibility										
Percent of Study Area Population and Employment within 0.25 Mile of High-Frequency Service	80.6%	80.6%	80.6%	80.7%	80.6%	80.6%	80.6%	80.6%	80.6%	80.6%

Source: *Transportation Technical Report* (2014).
VHT = vehicle hours traveled
VMT = vehicle miles traveled

TABLE 3.5.14
Summary of Projected 2035 Average Daily Traffic

Alternative	ADT (vpd)	Bidirectional AM Peak Hour (vph)	AM Peak Hour in the Peak Direction (vph)	Bidirectional PM Peak Hour (vph)	PM Peak Hour in the Peak Direction (vph)
Single-Bore Tunnel (with toll)	89,900	5,750	3,160	5,370	2,790
Single-Bore Tunnel (with toll and no trucks)	93,300	5,950	3,180	5,650	3,030
Single-Bore Tunnel (with toll and Express Bus)	92,400	5,880	3,170	5,560	2,980
Dual-Bore Tunnel (no toll)	180,000	12,150	6,460	12,320	6,490
Dual-Bore Tunnel (no toll and no trucks)	180,000	12,150	6,480	12,520	6,690
Dual-Bore Tunnel (with toll)	169,400	11,240	5,860	11,210	5,720

Note: These volume summaries are based on the SR 710 North Transportation Technical Report.
vpd = vehicles per day
vph = vehicles per hour

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TABLE 3.5.15:
Summary of 2035 Adverse Impacts on Intersections by Alternative

Description	Existing Traffic Control	Adverse Impact	Potential Improvement	LOS if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
TSM/TDM ALTERNATIVE							
Atlantic Boulevard/Main Street	Signal	In the PM peak hour, the intersection delay is expected to increase from 46.2 seconds (LOS D) in the No Build Alternative to 57.6 seconds (LOS E).	Optimize the signal system.	51.3 seconds (LOS D)	●		Yes, recommended for implementation.
Atlantic Boulevard/Mission Road	Signal	In the PM peak hour, the intersection delay is expected to increase from 67.4 seconds (LOS E) in the No Build Alternative to 86.8 seconds (LOS F).	Add an eastbound through lane.	56.0 seconds (LOS E)		●	No, this improvement is not recommended for implementation because it would require seven partial right-of-way acquisitions from adjacent residential and commercial properties.
Fremont Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 51.2 seconds (LOS D) in the No Build Alternative to 122.5 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 69.8 seconds (LOS E) in the No Build Alternative to 126.3 seconds (LOS F).	Add a westbound left-turn lane, a northbound right-turn lane, and a southbound through lane.	AM: 52.1 seconds (LOS D) PM: 65.8 seconds (LOS E)		●	No, this improvement is not proposed for implementation because it would require five partial right-of-way acquisitions and an aerial easement with Union Pacific Railroad tracks.
SR 710 Northbound Off-Ramp/Valley Boulevard	Signal	In the AM peak hour, the intersection delay is expected to increase from 33.5 seconds (LOS C) in the No Build Alternative to 547.6 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 17.2 seconds (LOS B) in the No Build Alternative to 622.9 seconds (LOS F).	Potential minimization strategies that were evaluated include channelization/new turn lanes, a roundabout, and an elevated flyover structure.	Not evaluated		●	No improvement recommended. Channelization and a roundabout would not mitigate the traffic impacts without building a grade separation. A grade-separated roundabout or other flyover would require additional right of way and result in unacceptable secondary impacts.
Rosemead Boulevard/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 116.5 seconds (LOS F) in the No Build Alternative to 120.6 seconds (LOS F).	Optimize the signal system.	107.0 seconds (LOS F)	●		Yes, recommended for implementation.
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 119.0 seconds (LOS F).	Optimize the signal system.	110.0 seconds (LOS F)	●		Yes, recommended for implementation.
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 181.1 seconds (LOS F).	Optimize the signal system.	159.8 seconds (LOS F)	●		Yes, recommended for implementation.
Eagle Rock Boulevard/Verdugo Road/ Avenue 40	Signal	In the PM peak hour, the intersection delay is expected to increase from 50.0 seconds (LOS D) in the No Build Alternative to 61.5 seconds (LOS E).	Optimize the signal system.	46.1 seconds (LOS D)	●		Yes, recommended for implementation.
Huntington Drive/Monterey Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 53.7 seconds (LOS D) in the No Build Alternative to 96.4 seconds (LOS F).	Optimize the signal system.	50.0 seconds (LOS D)	●		Yes, recommended for implementation.
Rosemead Boulevard/Lower Azusa Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 26.5 seconds (LOS C) in the No Build Alternative to 100.9 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 25.3 seconds (LOS C) in the No Build Alternative to 59.9 seconds (LOS E).	Add a westbound left-turn lane and a northbound right-turn lane.	AM: 29.5 seconds (LOS C) PM: 24.6 seconds (LOS C)		●	No, this improvement is not proposed for implementation because it would require partial right-of-way acquisition from a nearby high school.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 86.2 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 50.3 seconds (LOS D) in the No Build Alternative to 72.1 seconds (LOS E).	Add an eastbound left-turn lane, an eastbound right-turn lane, and a northbound left-turn lane.	AM: 46.9 seconds (LOS D) PM: 51.7 seconds (LOS D)		●	No, this improvement is not proposed for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Rosemead Boulevard/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 56.0 seconds (LOS E) in the No Build Alternative to 63.8 seconds (LOS E).	Optimize the signal system.	54.9 seconds (LOS D)	●		Yes, recommended for implementation.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 124.0 seconds (LOS F) in the TSM/TDM Alternative. In the PM peak hour, the intersection delay is expected to increase from 66.7 seconds (LOS E) in the No Build Alternative to 79.9 seconds (LOS E) in the TSM/TDM Alternative.	Add a northbound through lane.	AM: 60.6 seconds (LOS E) PM: 25.0 seconds (LOS C)		●	No, this improvement is not proposed for implementation because it would require two partial right-of-way acquisitions from adjacent businesses.
Del Mar Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 68.5 seconds (LOS E) in the No Build Alternative to 79.0 seconds (LOS E) in the TSM/TDM Alternative.	Optimize the signal system.	68.3 seconds (LOS E)	●		Yes, recommended for implementation.
Atlantic Boulevard/Huntington Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 59.1 seconds (LOS E) in the No Build Alternative to 76.2 seconds (LOS E) in the TSM/TDM Alternative.	Add a westbound left-turn lane and a northbound left-turn lane.	42.2 seconds (LOS D)		●	No, this improvement is not proposed for implementation because it would require partial right-of-way acquisition from an adjacent restaurant.

TABLE 3.5.15:
Summary of 2035 Adverse Impacts on Intersections by Alternative

Description	Existing Traffic Control	Adverse Impact	Potential Improvement	LOS if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 77.5 seconds (LOS E) in the TSM/TDM Alternative.	Add an eastbound left-turn lane, eastbound right-turn lane, and a northbound left lane.	54.2 seconds (LOS D)	●		Yes, recommended for implementation.
Marengo Avenue/Valley Boulevard	Signal	In the AM peak hour, the intersection delay is expected to increase from 46.8 seconds (LOS D) in the No Build Alternative to 59.7 seconds (LOS E) in the TSM/TDM Alternative.	Optimize the signal system.	51.0 seconds (LOS E)	●		Yes, recommended for implementation.
Concord Avenue/Alhambra Avenue	Two-Way Stop Control	In the AM peak hour, the intersection delay is expected to increase from 40.8 seconds (LOS E) in the No Build Alternative to >300 seconds (LOS F) in the TSM/TDM Alternative. In the PM peak hour, the intersection delay is expected to increase from 113.2 seconds (LOS F) in the No Build Alternative to >300 seconds (LOS F) in the TSM/TDM Alternative.	Signalize the existing stop-controlled intersection.	AM: 19.2 seconds (LOS B) PM: 83.5 seconds (LOS F)	●		Yes, recommended for implementation.
BRT ALTERNATIVE[1]							
Atlantic Boulevard/Mission Road	Signal	In the PM peak hour, the intersection delay is expected to increase from 67.4 seconds (LOS E) in the No Build Alternative to 89.4 seconds (LOS F).	Add an eastbound through lane.	59.1 seconds (LOS E)		●	No, this improvement is not recommended for implementation because it would require seven partial right-of-way acquisitions from adjacent residential and commercial properties.
Fremont Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 51.2 seconds (LOS D) in the No Build Alternative to 122.3 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 69.8 seconds (LOS E) in the No Build Alternative to 118.7 seconds (LOS F).	Add a westbound left-turn lane and a northbound right-turn lane.	AM: 53.9 seconds (LOS D) PM: 69.1 seconds (LOS E)		●	No, this improvement is not recommended for implementation because it would require five partial right-of-way acquisitions and an aerial easement with Union Pacific Railroad.
SR 710 Northbound Off-Ramp/Valley Boulevard	Signal	In the AM peak hour, the intersection delay is expected to increase from 33.5 seconds (LOS C) in the No Build Alternative to 623.7 seconds (LOS F).	Potential mitigation strategies that were evaluated include channelization/new turn lanes, a roundabout, and an elevated flyover structure.	Not evaluated		●	No improvement recommended. Channelization and a roundabout would not mitigate the traffic impacts without building a grade separation. A grade-separated roundabout or other flyover would require additional right of way and result in unacceptable secondary impacts.
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 122.7 seconds (LOS F).	Optimize the signal system.	108.0 seconds (LOS F)	●		Yes, recommended for implementation
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 177.3 seconds (LOS F).	Optimize the signal system.	159.3 seconds (LOS F)	●		Yes, recommended for implementation.
Huntington Drive/Monterey Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 53.7 seconds (LOS D) in the No Build Alternative to 95.6 seconds (LOS F).	Optimize the signal system	79.0 seconds (LOS E)	●		Yes, recommended for implementation.
Rosemead Boulevard/Lower Azusa Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 26.5 seconds (LOS C) in the No Build Alternative to 55.5 seconds (LOS E).	Optimize the signal system	51.5 seconds (LOS D)	●		Yes, recommended for implementation.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 87.3 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 50.3 seconds (LOS D) in the No Build Alternative to 67.1 seconds (LOS E).	Add a westbound left-turn lane, a westbound right-turn lane, and a northbound right-turn lane.	AM: 50.9 seconds (LOS D) PM: 52.1 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 128.4 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 66.7 seconds (LOS E) in the No Build Alternative to 79.3 seconds (LOS E).	Add a northbound through lane.	AM: 61.4 seconds (LOS E) PM: 34.2 seconds (LOS C)		●	No, this improvement is not recommended for implementation because it would require two partial right-of-way acquisitions from adjacent businesses.
Del Mar Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 68.5 seconds (LOS E) in the No Build Alternative to 77.1 seconds (LOS E).	Optimize the signal system.	67.6 seconds (LOS E)	●		Yes, recommended for implementation.
Atlantic Boulevard/Huntington Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 59.1 seconds (LOS E) in the No Build Alternative to 70.5 seconds (LOS E).	Add a westbound left-turn lane.	42.8 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require a partial right-of-way acquisition from an adjacent restaurant.
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 61.7 seconds (LOS E).	Optimize the signal system.	48.1 seconds (LOS D)	●		Yes, recommended for implementation.

TABLE 3.5.15:
Summary of 2035 Adverse Impacts on Intersections by Alternative

Description	Existing Traffic Control	Adverse Impact	Potential Improvement	LOS if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
Concord Avenue/Alhambra Avenue	Two-Way Stop Control	In the PM peak hour, the intersection delay is expected to increase from 67.4 seconds (LOS E) in the No Build Alternative to 89.4 seconds (LOS F).	Signalize the existing stop-controlled intersection.	AM: 17.7 seconds (LOS B) PM: 82.8 seconds (LOS F)	●		Yes, recommended for implementation.
LRT ALTERNATIVE[2]							
Fremont Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 51.2 seconds (LOS D) in the No Build Alternative to 69.8 seconds (LOS E). In the PM peak hour, the intersection delay is expected to increase from 69.8 seconds (LOS E) in the No Build Alternative to 95.7 seconds (LOS F).	Add a westbound left-turn lane and northbound right-turn lane.	AM: 52.1 seconds (LOS D) PM: 56.2 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require five partial right-of-way acquisitions and an aerial easement with Union Pacific Railroad.
SR 710 Northbound Off-Ramp/Valley Boulevard	Signal	In the AM peak hour, the intersection delay is expected to increase from 33.5 seconds (LOS C) in the No Build Alternative to 447.7 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 17.2 seconds (LOS B) in the No Build Alternative to 562.5 seconds (LOS F).	Potential mitigation strategies that were evaluated include channelization/new turn lanes, a roundabout, and an elevated flyover structure.	Not evaluated		●	No improvement recommended. Channelization and a roundabout would not mitigate the traffic impacts without building a grade separation. A grade-separated roundabout or other flyover would require additional right of way and result in unacceptable secondary impacts.
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 126.4 seconds (LOS F).	Add a northbound right-turn lane.	87.6 seconds (LOS F)	●		Yes, recommended for implementation.
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 176.1 seconds (LOS F).	Optimize the signal system.	155.3 seconds (LOS F)	●		Yes, recommended for implementation.
Huntington Drive/Monterey Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 53.7 seconds (LOS D) in the No Build Alternative to 85.4 seconds (LOS F).	Add an eastbound left-turn lane and a northbound left-turn lane.	50.6 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require two partial right-of-way acquisitions from adjacent businesses.
Pasadena Avenue/Broadway	Signal	In the AM peak hour, the intersection delay is expected to increase from 192.9 seconds (LOS F) in the No Build Alternative to 199.9 seconds (LOS F).	Optimize the signal system.	172.6 seconds (LOS F)	●		Yes, recommended for implementation.
Rosemead Boulevard/Lower Azusa Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 26.5 seconds (LOS C) in the No Build Alternative to 58.1 seconds (LOS E).	Add a westbound left-turn lane.	37.8 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require partial right-of-way acquisition from an adjacent nearby high school.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 95.3 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 50.3 seconds (LOS D) in the No Build Alternative to 70.2 seconds (LOS E).	Add an eastbound left-turn lane, an eastbound right-turn lane, and a southbound right-turn lane.	AM: 51.5 seconds (LOS D) PM: 53.3 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 167.4 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 66.7 seconds (LOS E) in the No Build Alternative to 92.6 seconds (LOS F).	Add a northbound through lane.	AM: 95.2 seconds (LOS F) PM: 38.9 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require two partial right-of-way acquisitions from adjacent businesses.
Del Mar Avenue/Valley Boulevard	Signal	In the AM peak hour, the intersection delay is expected to increase from 41.4 seconds (LOS D) in the No Build Alternative to 49.4 seconds (LOS D) in the LRT Alternative.	Optimize the signal system.	66.0 seconds (LOS E)	●		Yes, recommended for implementation.
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 62.3 seconds (LOS E).	Optimize the signal system.	53.2 seconds (LOS D)	●		Yes, recommended for implementation.
Garfield Avenue/Norwood Place	TWSC	In the AM peak hour, the intersection delay is expected to increase from 10.7 seconds (LOS B) in the No Build Alternative to 39.5 seconds (LOS E).	Signalize the existing stop-controlled intersection.	6.7 seconds (LOS A)	●		Yes, recommended for implementation.
Concord Avenue/Alhambra Avenue	TWSC	In the PM peak hour, the intersection delay is expected to increase from 113.2 seconds (LOS F) in the No Build Alternative to 123.7 seconds (LOS F).	Signalize the existing stop-controlled intersection.	7.5 seconds (LOS A)	●		Yes, recommended for implementation.

TABLE 3.5.15:
Summary of 2035 Adverse Impacts on Intersections by Alternative

Description	Existing Traffic Control	Adverse Impact	Potential Improvement	LOS if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
FREEWAY TUNNEL ALTERNATIVE[3]							
Single-Bore Operational Variation: *With Tolls*							
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 119.9 seconds (LOS F).	Optimize the signal system.	110.9 seconds (LOS F)	●		Yes, recommended for implementation.
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 190.5 seconds (LOS F).	Add a westbound left-turn lane.	108.4 seconds (LOS F)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Orange Grove Boulevard/Colorado Boulevard	Signal	In the AM peak hour, the intersection delay is expected to increase from 19.7 seconds (LOS B) in the No Build Alternative to 55.1 seconds (LOS E).	Optimize the signal system.	33.8 seconds (LOS C)	●		Yes, recommended for implementation.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 82.8 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 50.3 seconds (LOS D) in the No Build Alternative to 69.4 seconds (LOS E).	Add an eastbound left-turn lane, a northbound left-turn lane, and an eastbound right-turn lane.	AM: 44.9 seconds (LOS D) PM: 44.8 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Rosemead Boulevard/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 56 seconds (LOS E) in the No Build Alternative to 61.8 seconds (LOS E).	Optimize the signal system.	54.1 seconds (LOS D)	●		Yes, recommended for implementation.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 118.6 seconds (LOS F).	Add a northbound through lane.	66.4 seconds (LOS E)		●	No, this improvement is not recommended for implementation because it would require two partial right-of-way acquisitions from adjacent businesses.
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 86.2 seconds (LOS F).	Add a westbound left-turn lane and an eastbound right-turn lane.	53.7 seconds (LOS D)	●		Yes, recommended for implementation.
Marengo Avenue/Valley Boulevard	Signal	In the AM peak hour, the intersection delay is expected to increase from 46.8 seconds (LOS D) in the No Build Alternative to 55.4 seconds (LOS E).	Optimize the signal system.	49.0 seconds (LOS D)	●		Yes, recommended for implementation.
Fremont Avenue/Norwood Avenue	Two-Way Stop Control	In the AM peak hour, the intersection delay is expected to increase from 71.6 seconds (LOS F) in the No Build Alternative to 112.6 seconds (LOS F).	Signalize the existing stop-controlled intersection.	5.0 seconds (LOS A)	●		Yes, recommended for implementation.
Single-Bore Operational Variation: *With Tolls and No Trucks*							
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 120.5 seconds (LOS F).	Optimize the signal system.	112.1 seconds (LOS F)	●		Yes, recommended for implementation.
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 187 seconds (LOS F).	Add a westbound left-turn lane.	105.0 seconds (LOS F)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Pasadena Avenue/Broadway	Signal	In the AM peak hour, the intersection delay is expected to increase from 192.9 seconds (LOS F) in the No Build Alternative to 195.5 seconds (LOS F).	Add an eastbound left-turn lane.	105.0 seconds (LOS F)		●	No, this improvement is not recommended for implementation because it would require an aerial easement over the rail tracks on both sides of the Broadway overcrossing, which would require railroad coordination and potential impacts to train operations.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 81.2 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 50.3 seconds (LOS D) in the No Build Alternative to 65.7 seconds (LOS E).	Add an eastbound left-turn lane, a northbound left-turn lane, and an eastbound right-turn lane.	AM: 47.4 seconds (LOS D) PM: 49.6 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 118.5 seconds (LOS F). In the PM peak hour, the intersection delay is expected to increase from 66.7 seconds (LOS E) in the No Build Alternative to 77.9 seconds (LOS E).	Add a northbound through lane.	AM: 66.4 seconds (LOS E) PM: 31.3 seconds (LOS C)		●	No, this improvement is not recommended for implementation because it would require two partial right-of-way acquisitions from adjacent businesses.
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 68.5 seconds (LOS E).	Add a westbound left-turn lane.	53.7 seconds (LOS D)	●		Yes, recommended for implementation.
Fremont Avenue/Norwood Avenue	TWSC	In the AM peak hour, the intersection delay is expected to increase from 71.6 seconds (LOS F) in the No Build Alternative to 89.4 seconds (LOS F).	Signalize the existing stop-controlled intersection	4.9 seconds (LOS A)	●		Yes, recommended for implementation.
Concord Avenue/Alhambra Avenue	TWSC	In the PM peak hour, the intersection delay is expected to increase from 113.2 seconds (LOS F) in the No Build Alternative to an overflow (excessive) delay (LOS F).	Signalize the existing stop-controlled intersection.	1.1 seconds (LOS A)	●		Yes, recommended for implementation.

TABLE 3.5.15:
Summary of 2035 Adverse Impacts on Intersections by Alternative

Description	Existing Traffic Control	Adverse Impact	Potential Improvement	LOS if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
Single-Bore Operational Variation: *With Tolls and Express Bus*							
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 123.8 seconds (LOS F).	Add a northbound right-turn lane.	88.6 seconds (LOS F)	●		Yes, recommended for implementation.
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 191.3 seconds (LOS F).	Add a westbound left-turn lane.	108.5 seconds (LOS F)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 82.4 seconds (LOS F).	Add an eastbound left-turn lane, a northbound left-turn lane, and an eastbound right-turn lane.	AM: 47.4 seconds (LOS D) PM: 49.6 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 113.4 seconds (LOS F).	Add a northbound through lane.	63.7 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require two partial right-of-way acquisitions from adjacent businesses.
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 69.4 seconds (LOS E).	Add a westbound left-turn lane.	54.1 seconds (LOS D)	●		Yes, recommended for implementation.
Fremont Avenue/Norwood Avenue	TWSC	In the AM peak hour, the intersection delay is expected to increase from 71.6 seconds (LOS F) in the No Build Alternative to 118.7 seconds (LOS F).	Signalize the existing stop-controlled intersection.	3.9 seconds (LOS A)	●		Yes, recommended for implementation.
Dual-Bore Operational Variation: *No Tolls*							
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 122.5 seconds (LOS F).	Add a northbound right-turn lane.	87.4 seconds (LOS F)	●		Yes, recommended for implementation.
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 186.7 seconds (LOS F).	Add a westbound left-turn lane.	106.4 seconds (LOS F)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Figueroa Street/Avenue 26	Signal	In the AM peak hour, the intersection delay is expected to increase from 53.4 seconds (LOS D) in the No Build Alternative to 58.6 seconds (LOS E).	Optimize the signal system.	51.5 seconds (LOS D)	●		Yes, recommended for implementation.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 76.4 seconds (LOS E). In the PM peak hour, the intersection delay is expected to increase from 50.3 seconds (LOS D) in the No Build Alternative to 62.7 seconds (LOS E).	Add an eastbound left-turn lane, a northbound left-turn lane, and an eastbound right-turn lane.	AM: 49.8 seconds (LOS D) PM: 53.8 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 105.9 seconds (LOS F).	Optimize the signal system.	90.8 seconds (LOS F)	●		Yes, recommended for implementation.
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 61.9 seconds (LOS E) in the dual-bore no toll operational variation of the Freeway Tunnel Alternative.	Optimize the signal system.	52.6 seconds (LOS D)	●		Yes, recommended for implementation.
Fremont Avenue/Norwood Avenue	TWSC	In the AM peak hour, the intersection delay is expected to increase from 71.6 seconds (LOS F) in the No Build Alternative to 95.3 seconds (LOS F).	Signalize the existing stop-controlled intersection.	3.8 seconds (LOS A)	●		Yes, recommended for implementation.
Garfield Avenue/Norwood Place	TWSC	In the AM peak hour, the intersection delay is expected to increase from 10.7 seconds (LOS B) in the No Build Alternative to 35.1 seconds (LOS E).	Signalize the existing stop-controlled intersection.	7.1 seconds (LOS A)	●		Yes, recommended for implementation.
I-210 Eastbound Ramps/Berkshire Place	TWSC	In the AM peak hour, the intersection delay is expected to increase from 15.3 seconds (LOS C) in the No Build Alternative to 42.7 seconds (LOS E).	Signalize the existing stop-controlled intersection.	13.0 seconds (LOS B)	●		Yes, recommended for implementation.
I-210 Westbound Ramps/Berkshire Place	TWSC	In the AM peak hour, the intersection delay is expected to increase from 18.5 seconds (LOS C) in the No Build Alternative to 39.7 seconds (LOS E).	Signalize the existing stop-controlled intersection.	13.3 seconds (LOS B)	●		Yes, recommended for implementation.
I-210 Eastbound Ramps/Mountain Street	TWSC	In the PM peak hour, the intersection delay is expected to increase from 21.3 seconds (LOS C) in the No Build Alternative to 38 seconds (LOS E).	Signalize the existing stop-controlled intersection.	6.4 seconds (LOS A)	●		Yes, recommended for implementation.
Dual-Bore Operational Variation: *No Tolls and No Trucks*							
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 124.3 seconds (LOS F).	Add a northbound right-turn lane.	88.6 seconds (LOS F)	●		Yes, recommended for implementation.

TABLE 3.5.15:
Summary of 2035 Adverse Impacts on Intersections by Alternative

Description	Existing Traffic Control	Adverse Impact	Potential Improvement	LOS if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 191.1 seconds (LOS F).	Add a westbound left-turn lane.	109.3 seconds (LOS F)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 75.7 seconds (LOS E). In the PM peak hour, the intersection delay is expected to increase from 50.3 seconds (LOS D) in the no-build scenario to 62.1 seconds (LOS E).	Add an eastbound left-turn lane, a northbound left-turn lane, and an eastbound right-turn lane.	AM: 48.6 seconds (LOS D) PM: 44.8 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 99.6 seconds (LOS F).	Optimize the signal system.	84.3 seconds (LOS F)	●		Yes, recommended for implementation.
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 59.5 seconds (LOS E).	Optimize the signal system.	52.6 seconds (LOS D)	●		Yes, recommended for implementation.
Fremont Avenue/Norwood Avenue	TWSC	In the AM peak hour, the intersection delay is expected to increase from 71.6 seconds (LOS F) in the No Build Alternative to 85.8 seconds (LOS F).	Signalize the existing stop-controlled intersection.	3.7 seconds (LOS A)	●		Yes, recommended for implementation.
Garfield Avenue/Norwood Place	TWSC	In the AM peak hour, the intersection delay is expected to increase from 10.7 seconds (LOS B) in the No Build Alternative to 35.5 seconds (LOS E).	Signalize the existing stop-controlled intersection.	7.1 seconds (LOS A)	●		Yes, recommended for implementation.
I-210 Eastbound Ramps/Mountain Street	TWSC	In the PM peak hour, the intersection delay is expected to increase from 21.3 seconds (LOS C) in the No Build Alternative to 37.9 seconds (LOS E).	Signalize the existing stop-controlled intersection.	6.6 seconds (LOS A)	●		Yes, recommended for implementation.
I-210 Westbound Ramps/Mountain Street	TWSC	In the AM peak hour, the intersection delay is expected to increase from 15.0 seconds (LOS C) in the No Build Alternative to 36.0 seconds (LOS E).	Signalize the existing stop-controlled intersection.	10.7 seconds (LOS B)	●		Yes, recommended for implementation.
Dual-Bore Operational Variation: *With Tolls*							
Durfee Avenue/Valley Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 111.1 seconds (LOS F) in the No Build Alternative to 122.5 seconds (LOS F).	Add a northbound right-turn lane.	87.4 seconds (LOS F)	●		Yes, recommended for implementation.
Broadway/Colorado Boulevard	Signal	In the PM peak hour, the intersection delay is expected to increase from 160.1 seconds (LOS F) in the No Build Alternative to 186.7 seconds (LOS F).	Add a westbound left-turn lane.	106.4 seconds (LOS F)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Figueroa Street/Avenue 26	Signal	In the AM peak hour, the intersection delay is expected to increase from 53.4 seconds (LOS D) in the No Build Alternative to 58.6 seconds (LOS E).	Optimize the signal system.	51.5 seconds (LOS D)	●		Yes, recommended for implementation.
Rosemead Boulevard/Mission Drive	Signal	In the AM peak hour, the intersection delay is expected to increase from 45.5 seconds (LOS D) in the No Build Alternative to 76.4 seconds (LOS E). In the PM peak hour, the intersection delay is expected to increase from 50.3 seconds (LOS D) in the No Build Alternative to 62.7 seconds (LOS E).	Add an eastbound left-turn lane, a northbound left-turn lane, and an eastbound right-turn lane.	AM: 49.8 seconds (LOS D) PM: 53.8 seconds (LOS D)		●	No, this improvement is not recommended for implementation because it would require one partial right-of-way acquisition from an adjacent business.
Del Mar Avenue/Mission Road	Signal	In the AM peak hour, the intersection delay is expected to increase from 97.3 seconds (LOS F) in the No Build Alternative to 105.9 seconds (LOS F).	Optimize the signal system.	90.8 seconds (LOS F)	●		Yes, recommended for implementation.
San Gabriel Boulevard/Huntington Drive	Signal	In the PM peak hour, the intersection delay is expected to increase from 52.4 seconds (LOS D) in the No Build Alternative to 61.9 seconds (LOS E).	Optimize the signal system.	52.6 seconds (LOS D)	●		Yes, recommended for implementation.
Fremont Avenue/Norwood Avenue	TWSC	In the AM peak hour, the intersection delay is expected to increase from 71.6 seconds (LOS F) in the No Build Alternative to 95.3 seconds (LOS F).	Signalize the existing stop-controlled intersection.	3.8 seconds (LOS A)	●		Yes, recommended for implementation.
Garfield Avenue/Norwood Place	TWSC	In the AM peak hour, the intersection delay is expected to increase from 10.7 seconds (LOS B) in the No Build Alternative to 35.1 seconds (LOS E).	Signalize the existing stop-controlled intersection.	7.1 seconds (LOS A)	●		Yes, recommended for implementation.
I-210 Eastbound Ramps/Berkshire Place	TWSC	In the AM peak hour, the intersection delay is expected to increase from 15.3 seconds (LOS C) in the No Build Alternative to 43.9 seconds (LOS E).	Signalize the existing stop-controlled intersection.	13.0 seconds (LOS B)	●		Yes, recommended for implementation.
I-210 Westbound Ramps/Berkshire Place	TWSC	In the AM peak hour, the intersection delay is expected to increase from 18.5 seconds (LOS C) in the No Build Alternative to 40.1 seconds (LOS E).	Signalize the existing stop-controlled intersection.	13.3 seconds (LOS B)	●		Yes, recommended for implementation.
I-210 Eastbound Ramps/Mountain Street	TWSC	In the PM peak hour, the intersection delay is expected to increase from 21.3 seconds (LOS C) in the No Build Alternative to 39.9 seconds (LOS E).	Signalize the existing stop-controlled intersection.	6.4 seconds (LOS A)	●		Yes, recommended for implementation.

Source: CH2M HILL (2014).
[1] The intersections that would experience adverse impacts include intersections impacted by the improvements provided in the BRT Alternative and the improvements in the TSM/TDM Alternative that are included in the BRT Alternative.
[2] The intersections that would experience adverse impacts include intersections impacted by the improvements provided in the LRT Alternative and the improvements in the TSM/TDM Alternative that are included in the LRT Alternative.
[3] The intersections that would experience adverse impacts include intersections impacted by the improvements provided in the Freeway Tunnel Alternative and the improvements in the TSM/TDM Alternative that are included in the Freeway Tunnel Alternative.
LOS = level of service

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
TSM/TDM ALTERNATIVE							
I-5 northbound between the SR 110 northbound off-ramp and the Pasadena Avenue/Broadway on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 8,920 vph (LOS F) in the No Build Alternative to 9,110 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%	●		Yes, recommended for implementation.
I-710 northbound between the Cesar Chavez on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the No Build Alternative to 7,770 vph (LOS F).	Add a lane between the Cesar Chavez Avenue on-ramp and the I-10 off-ramp.	Operations will improve from LOS F (density of 76 passenger cars/mile/lane) to LOS E (density of 37 passenger cars/mile/lane)		●	No, this improvement is not proposed for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,260 vph (LOS F).		Operations will improve from LOS F (density of 58 passenger cars/mile/lane) to LOS D (density of 32 passenger cars/mile/lane)			
SR 710 southbound between the westbound I-10 off-ramp and the westbound I-10 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 3,130 vph (LOS C) in the No Build Alternative to 4,800 vph (LOS F).	Add a lane between the westbound I-10 off-ramp and the westbound I-10 on-ramp. Modify the westbound I-10 on-ramp to one lane.	Operations will improve from LOS F (density of 58 passenger cars/mile/lane) to LOS D (density of 27 passenger cars/mile/lane)		●	No, this improvement is not proposed for implementation This mitigation is rejected due to impacts to transit movements and secondary impacts due to the major construction of three bridge structures.
I-710 southbound between the eastbound I-10/Ramona Boulevard on-ramp and the Cesar Chavez Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,710 vph (LOS E) in the No Build Alternative to 6,290 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,850 vph (LOS F) in the No Build Alternative to 8,200 vph (LOS F).	Add a lane between the Ramona Boulevard on-ramp and the SR 60 off-ramp.	Operations will improve from LOS F (density of 42 passenger cars/mile/lane) to LOS D (density of 26 passenger cars/mile/lane) Operations will improve from LOS F (density of 97 passenger cars/mile/lane) to LOS E (density of 40 passenger cars/mile/lane)		●	No, this improvement is not proposed for implementation This mitigation is rejected due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 southbound between the Cesar Chavez Avenue off-ramp and the SR 60 off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,370 vph (LOS F) in the No Build Alternative to 7,700 vph (LOS F).	Add a deceleration lane for the SR 60 off-ramp, and add a lane between the SR 60 off-ramp and the Cesar Chavez Avenue on-ramp.	Operations will improve from LOS F (density of 73 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)		●	No, this improvement is not proposed for implementation This mitigation is rejected due to secondary impacts from the major construction of one bridge structure.
I-710 southbound between the Cesar Chavez Avenue on-ramp and the Third Street on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,460 vph (LOS F) in the No Build Alternative to 6,620 vph (LOS F).	Add a lane starting at the Cesar Chavez Avenue on-ramp and drop it before the SR 60 on-ramp.	Operations will improve from LOS F (density of 47 passenger cars/mile/lane) to LOS D (density of 28 passenger cars/mile/lane)		●	No, this improvement is not proposed for implementation This mitigation is rejected due to secondary impacts from the major construction of seven bridge structures.
I-710 southbound between the Third Street on-ramp and the Third Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,570 vph (LOS F) in the No Build Alternative to 6,710 vph (LOS F).		Operations will improve from LOS F to LOS D (density of 33 passenger cars/mile/lane)			
BRT ALTERNATIVE[2]							
I-5 northbound between the SR 110 northbound off-ramp and the Pasadena Avenue/Broadway on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 8,920 vph (LOS F) in the No Build Alternative to 9,110 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%	●		Yes, recommended for implementation.
I-5 southbound between the Western Avenue off-ramp and the Western Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,960 vph (LOS F) in the No Build Alternative to 9,150 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%			
SR 60 westbound between the northbound I-5/US-101/Soto Street off-ramp and the northbound I-5 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,880 vph (LOS F) in the No Build Alternative to 6,000 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 3.1%			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended? Yes	No	Comment
I-710 northbound between the Cesar Chavez Avenue on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the No Build Alternative to 7,720 vph (LOS F).	Add a lane between the Cesar Chavez Avenue on-ramp and the I-10 off-ramp.	Operations will improve from LOS F (density of 75 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,210 vph (LOS F).		Operations will improve from LOS F (density of 56 passenger cars/mile/lane) to LOS D (density of 31 passenger cars/mile/lane)			
SR 710 southbound between the westbound I-10 off-ramp and the westbound I-10 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 3,130 vph (LOS C) in the No Build Alternative to 4,790 vph (LOS F).	Add a lane between the westbound I-10 off-ramp and the westbound I-10 on-ramp. Modify the westbound I-10 on-ramp to one lane.	Operations will improve from LOS F (density of 58 passenger cars/mile/lane) to LOS D (density of 27 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to impacts to transit movements and secondary impacts due to the major construction of three bridge structures.
I-710 southbound between the eastbound I-10/Ramona Boulevard on-ramp and the Cesar Chavez Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,710 vph (LOS E) in the No Build Alternative to 6,270 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,850 vph (LOS F) in the No Build Alternative to 8,220 vph (LOS F).	Add a lane between the Ramona Boulevard on-ramp and the SR 60 off-ramp.	Operations will improve from LOS F (density of 43 passenger cars/mile/lane) to LOS D (density of 26 passenger cars/mile/lane) Operations will improve from LOS F (density of 97 passenger cars/mile/lane) to LOS E (density of 40 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 southbound between the Cesar Chavez Avenue off-ramp and the SR 60 off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,370 vph (LOS F) in the No Build Alternative to 7,720 vph (LOS F).		Operations will improve from LOS F (density of 74 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)			
I-710 southbound between the Cesar Chavez Avenue on-ramp and the Third Street on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,460 vph (LOS F) in the No Build Alternative to 6,690 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.1%	●		Yes, recommended for implementation.
I-710 southbound between the Third Street on-ramp and the Third Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,570 vph (LOS F) in the No Build Alternative to 6,770 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%			
I-710 southbound between the Third Street off-ramp and the SR 60 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,390 (LOS E) in the No Build Alternative to 6,580 (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.7%			
LRT ALTERNATIVE[3]							
I-10 westbound between the Garvey Avenue/Durfee Avenue off-ramp and the northbound Peck Road off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,210 vph (LOS E) in the No Build Alternative to 8,850 vph (LOS F).	Add a lane between the Garvey Avenue off-ramp and the Peck Road off-ramp.	Operations will improve from LOS F (density of 39 passenger cars/mile/lane) to LOS D (density of 30 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to right-of-way conflicts, impacts to rail movements, and secondary impacts due to the major construction of seven bridge structures, a retaining wall, and a sound wall.
I-10 westbound between the Santa Anita Avenue on-ramp and the Temple City Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,370 vph (LOS F) in the No Build Alternative to 8,670 vph (LOS F).	Add an auxiliary lane between the Santa Anita Avenue on-ramp and Temple City Boulevard off-ramp.	Operations will improve from LOS F (density of 42 passenger cars/mile/lane) to LOS D (density of 34 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to right-of-way conflicts, impacts to transit movements, impacts to Fletch Park, and secondary impacts due to the major construction of four bridge structures, a retaining wall, and a sound wall.
I-10 westbound between the Temple City Boulevard on-ramp and the Rosemead Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,550 vph (LOS F) in the No Build Alternative to 8,830 vph (LOS F).	Add an auxiliary lane between the Temple City Boulevard on-ramp and the Rosemead Boulevard off-ramp.	Operations will improve from LOS F (density of 41 passenger cars/mile/lane) to LOS D (density of 34 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-10 westbound between the Rosemead Boulevard on-ramp and the Walnut Grove Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,870 vph (LOS F) in the No Build Alternative to 9,160 vph (LOS F).		Operations will improve from LOS F (density of 48 passenger cars/mile/lane) to LOS E (density of 44 passenger cars/mile/lane)			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended? Yes	No	Comment
I-10 westbound between the Walnut Grove Avenue on-ramp and the San Gabriel Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,890 vph (LOS F) in the No Build Alternative to 9,140 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.6%	●		Yes, recommended for implementation.
I-10 westbound between the Garfield Avenue on-ramp and the Atlantic Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,510 vph (LOS F) in the No Build Alternative to 8,710 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%			
I-10 westbound between the Atlantic Boulevard on-ramp and the Fremont Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,430 vph (LOS F) in the No Build Alternative to 8,670 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.7%			
SR 134 westbound between the San Fernando Road on-ramp and the northbound I-5 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 4,640 vph (LOS F) in the No Build Alternative to 4,750 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 4.1%			
I-5 northbound between the State Street on-ramp and the I-10 westbound on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,390 vph (LOS F) in the No Build Alternative to 8,560 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%			
I-5 southbound between the Stadium Way off-ramp and the SR 2 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,490 vph (LOS E) in the No Build Alternative to 6,690 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%			
I-605 southbound between the I-10 on-ramp and the Valley Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,660 vph (LOS F) in the No Build Alternative to 8,860 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%			
I-605 southbound between the Valley Boulevard on-ramp and the SR 60 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,140 vph (LOS F) in the No Build Alternative to 9,340 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.1%			
SR 60 westbound between the I-710 on-ramp and the Downey Road off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,820 vph (LOS F) in the No Build Alternative to 10,020 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.0%			
I-710 northbound between the South of northbound I-5 off-ramp and the northbound I-5 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 11,420 vph (LOS F) in the No Build Alternative to 11,660 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.5%			
I-710 northbound between the northbound I-5 off-ramp and the Olympic Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,940 vph (LOS F) in the No Build Alternative to 8,120 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,620 vph (LOS F) in the No Build Alternative to 7,800 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5% With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.6%			
I-710 northbound between the Cesar Chavez Avenue on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the No Build Alternative to 7,600 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%			
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,050 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%			
FREEWAY TUNNEL ALTERNATIVE[4]							
Single-Bore Operational Variation: *With Tolls*							
SR 134 westbound between the southbound SR 2 on-ramp and the Glendale Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,560 vph (LOS F) in the No Build Alternative to 7,720 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.9%	●		Yes, recommended for implementation.
SR 134 westbound between the Glendale Avenue on-ramp and the Brand Boulevard/Central Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,570 vph (LOS D) in the No Build Alternative to 7,780 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-210 eastbound between the Marengo Avenue on-ramp and the Lake Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,650 vph (LOS E) in the No Build Alternative to 10,060 vph (LOS F).	Braid ramps around the Marengo Avenue interchange	Operations remain at LOS F, but the density will be reduced to 16 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one structure and two retaining walls.
I-120 westbound between the Lake Avenue on-ramp and the Marengo Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,750 vph (LOS F) in the No Build Alternative to 11,190 vph (LOS F).	Add an auxiliary lane between the Lake Avenue on-ramp and the Marengo Avenue off-ramp, and add one lane to the Lake Avenue on-ramp and the Marengo Avenue off-ramp.	Operations remain at LOS F, but the density will be reduced to 36 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts due to the major construction of three tie-back walls at the El Molino Avenue overcrossing, the utility overcrossing, and the Los Robles Avenue overcrossing.
I-5 southbound between the Western Avenue off-ramp and the Western Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,960 vph (LOS F) in the No Build Alternative to 9,230 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.3%	●		Yes, recommended for implementation.
I-5 southbound between the Western Avenue on-ramp and the SR 134 eastbound off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,920 vph (LOS F) in the No Build Alternative to 10,130 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.9%			
I-5 southbound between the Stadium Way off-ramp and the SR 2 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,490 vph (LOS E) in the No Build Alternative to 6,680 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.7%			
I-5 southbound between the SR 60 eastbound off-ramp and the Soto Street off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 4,350 vph (LOS F) in the No Build Alternative to 4,510 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 3.2%			
I-5 southbound between the Seventh Street on-ramp and the Eighth Street on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 4,070 vph (LOS E) in the No Build Alternative to 4,200 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 4.2%			
I-5 southbound between the Eighth Street on-ramp and the SR 60 eastbound on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 4,250 vph (LOS F) in the No Build Alternative to 4,370 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 4.2%			
SR 60 westbound between the northbound Atlantic Boulevard on-ramp and the southbound Atlantic Boulevard on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,590 vph (LOS B) in the No Build Alternative to 6,740 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.3%			
I-710 northbound between the Cesar Chavez Avenue on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the No Build Alternative to 8,070 vph (LOS F).	Add a lane between the Cesar Chavez Avenue on-ramp and the I-10 off-ramp.	Operations will improve from LOS F (density of 83 passenger cars/mile/lane) to LOS E (density of 39 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,460 vph (LOS F).		Operations will improve from LOS F (density of 62 passenger cars/mile/lane) to LOS D (density of 33 passenger cars/mile/lane)			
I-710 southbound between the eastbound I-10/Ramona Boulevard on-ramp and the Cesar Chavez Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,710 vph (LOS E) in the No Build Alternative to 6,430 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,850 vph (LOS F) in the No Build Alternative to 8,310 vph (LOS F).	Add a lane between the Ramona Boulevard on-ramp and the SR 60 off-ramp.	Operations will improve from LOS F (density of 43 passenger cars/mile/lane) to LOS D (density of 32 passenger cars/mile/lane) Operations remain at LOS F, but the density will be reduced from 103 to 39 passenger cars/mile/lane		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-710 southbound between the Cesar Chavez Avenue off-ramp and the SR 60 off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,370 vph (LOS F) in the No Build Alternative to 7,730 vph (LOS F).		Operations will improve from LOS F (density of 74 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)			
I-710 southbound between the Cesar Chavez Avenue on-ramp and the Third Street on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,460 vph (LOS F) in the No Build Alternative to 6,980 vph (LOS F).	Add a lane starting at the Cesar Chavez Avenue on-ramp and drop it before the SR 60 on-ramp.	Operations will improve from LOS F (density of 54 passenger cars/mile/lane) to LOS D (density of 30 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of seven bridge structures.
I-710 southbound between the Third Street on-ramp and the Third Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,570 vph (LOS F) in the No Build Alternative to 7,010 vph (LOS F).		Operations will improve from LOS F to LOS D (density of 31 passenger cars/mile/lane)			
I-710 southbound between the Third Street off-ramp and the SR 60 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,390 vph (LOS E) in the No Build Alternative to 6,820 vph (LOS F).	Add a lane between the Third Street off-ramp and the SR 60 on-ramp.	Operations will improve from LOS F (density of 50 passenger cars/mile/lane) to LOS D (density of 29 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one bridge structure.
Single-Bore Operational Variation: *With Tolls and No Trucks*							
I-210 eastbound between the Polk Street on-ramp and the Hubbard Street off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,410 vph (LOS F) in the No Build Alternative to 6,550 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.5%	●		Yes, recommended for implementation.
I-210 eastbound between the Hubbard Street on-ramp and the Maclay Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7430 vph (LOS F) in the No Build Alternative to 7580 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.0%			
I-210 eastbound between the Maclay Avenue off-ramp and the Maclay Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,010 vph (LOS F) in the No Build Alternative to 7,170 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.0%			
I-210 eastbound between the Pennsylvania Avenue off-ramp and the Pennsylvania Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,330 vph (LOS F) in the No Build Alternative to 8,530 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%			
I-210 eastbound between the Marengo Avenue on-ramp and the Lake Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,650 vph (LOS E) in the No Build Alternative to 10,110 vph (LOS F).	Braid ramps around the Marengo Avenue interchange	Operations remain at LOS F, but the density will be reduced to 16 passenger cars/hour/lane. Capacity will be increased with extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one structure and two retaining walls.
I-210 westbound between the Lake Avenue on-ramp and the Marengo Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,750 vph (LOS F) in the No Build Alternative to 11,060 vph (LOS F).	Add an auxiliary lane between the Lake Avenue on-ramp and the Marengo Avenue off-ramp, and add one lane each to the Lake Avenue on-ramp and the Marengo Avenue off-ramp.	Operations remain at LOS F, but the density will be reduced to 35 passenger cars/hour/lane. Capacity will be increased with extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts due to the major construction of three tie-back walls at the El Molino Avenue overcrossing, the utility overcrossing, and the Los Robles Avenue overcrossing.
I-5 southbound between the Western Avenue off-ramp and the Western Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,960 vph (LOS F) in the No Build Alternative to 9,170 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.0%	●		Yes, recommended for implementation.
SR 60 westbound between the northbound Atlantic Boulevard on-ramp and the southbound Atlantic Boulevard on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,590 vph (LOS B) in the No Build Alternative to 6,740 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.3%			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-710 northbound between the Olympic Boulevard on-ramp and the SR 60 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,360 vph (LOS F) in the No Build Alternative to 8,550 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 8,130 vph (LOS F) in the No Build Alternative to 8,350 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.3% With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.0%			
I-710 northbound between the Cesar Chavez Avenue on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the No Build Alternative to 8,180 vph (LOS F).	Add a lane between the Cesar Chavez Avenue on-ramp and the I-10 off-ramp	Operations will improve from LOS F (density of 89 passenger cars/mile/lane) to LOS E (density of 39 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,570 vph (LOS F).		Operations will improve from LOS F (density of 65 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)			
I-710 southbound between the eastbound I-10/Ramona Boulevard on-ramp and the Cesar Chavez Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,710 vph (LOS E) in the No Build Alternative to 6,610 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,850 vph (LOS F) in the No Build Alternative to 8,450 vph (LOS F).	Add a lane between the Ramona Boulevard on-ramp to the SR 60 off-ramp.	Operations will improve from LOS F (density of 47 passenger cars/mile/lane) to LOS D (density of 32 passenger cars/mile/lane) Operations remain at LOS F, but the density will be reduced from 113 to 40 passenger cars/mile/lane		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 southbound between the Cesar Chavez Avenue off-ramp and the SR 60 off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,370 vph (LOS F) in the No Build Alternative to 7,860 vph (LOS F).		Operations will improve from LOS F (density of 79 passenger cars/mile/lane) to LOS E (density of 37 passenger cars/mile/lane)			
I-710 southbound between the Cesar Chavez on-ramp and the Third Street on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,460 vph (LOS F) in the No Build Alternative to 7,060 vph (LOS F).	Add a lane starting at the Cesar Chavez Avenue on-ramp and drop it before the SR 60 on-ramp.	Operations will improve from LOS F (density of 55 passenger cars/mile/lane) to LOS D (density of 31 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of seven bridge structures.
I-710 southbound between the Third Street on-ramp and the Third Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,570 vph (LOS F) in the No Build Alternative to 7,090 vph (LOS F).		Operations will improve from LOS F to LOS D (density of 31 passenger cars/mile/lane)			
I-710 southbound between the Third Street off-ramp and the SR 60 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,390 vph (LOS E) in the No Build Alternative to 6,880 vph (LOS F).	Add a lane between the Third Street off-ramp and the SR 60 on-ramp.	Operations will improve from LOS F (density of 52 passenger cars/mile/lane) to LOS D (density of 30 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one bridge structure.
I-710 southbound between the SR 60 on-ramp and the Whittier Boulevard/Olympic Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,890 vph (LOS F) in the No Build Alternative to 8,070 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 10,500 vph (LOS F) in the No Build Alternative to 10,720 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5% With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.8%	●		Yes, recommended for implementation.
I-710 southbound between the Whittier Boulevard/Olympic Boulevard on-ramp and the southbound I-5 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,310 vph (LOS F) in the No Build Alternative to 6,480 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.1%			
Single-Bore Operational Variation: *With Tolls and Express Bus*							
SR 134 westbound between the southbound SR 2 on-ramp and the Glendale Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,560 vph (LOS F) in the No Build Alternative to 7,730 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.7%	●		Yes, recommended for implementation.
SR 134 westbound between the Glendale Avenue on-ramp and the Brand Boulevard/Central Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,570 vph (LOS D) in the No Build Alternative to 7,760 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-210 eastbound between the Pennsylvania Avenue off-ramp and the Pennsylvania Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,330 vph (LOS F) in the No Build Alternative to 8,510 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.4%			
I-210 eastbound between the Marengo Avenue on-ramp and the Lake Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,650 vph (LOS E) in the No Build Alternative to 10,090 vph (LOS F).	Braid ramps around the Marengo Avenue interchange	Operations remain at LOS F, but the density will be reduced to 16 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one structure and two retaining walls.
I-210 westbound between the Lake Avenue on-ramp and the Marengo Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,750 vph (LOS F) in the No Build Alternative to 11,030 vph (LOS F).	Add an auxiliary lane between the Lake Avenue on-ramp and the Marengo Avenue off-ramp, and add one lane to the Lake Avenue on-ramp and the Marengo Avenue off-ramp.	Operations remain at LOS F, but the density will be reduced to 35 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts due to the major construction of three tie-back walls at the at El Molino Avenue overcrossing, the utility overcrossing, and the Los Robles Avenue overcrossing.
I-5 southbound between the Western Avenue off-ramp and the Western Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,960 vph (LOS F) in the No Build Alternative to 9,230 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.3%	●		Yes, recommended for implementation.
I-5 southbound between the Western Avenue on-ramp and the SR 134 eastbound off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,920 vph (LOS F) in the No Build Alternative to 10,130 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.9%			
I-5 southbound between the Stadium Way off-ramp and the SR 2 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,490 vph (LOS E) in the No Build Alternative to 6,630 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.5%			
I-5 southbound between the SR 60 eastbound off-ramp and the Soto Street off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 4,350 vph (LOS F) in the No Build Alternative to 4,460 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 4.4%			
SR 60 westbound between the northbound Atlantic Boulevard on-ramp and the southbound Atlantic Boulevard on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,590 vph (LOS B) in the No Build Alternative to 6,740 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.3%			
I-710 northbound between the Cesar Chavez Avenue on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the No Build Alternative to 8,090 vph (LOS F).	Add a lane between the Cesar Chavez Avenue on-ramp and the I-10 off-ramp.	Operations will improve from LOS F (density of 84 passenger cars/mile/lane) to LOS E (density of 39 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,490 vph (LOS F).		Operations will improve from LOS F (density of 63 passenger cars/mile/lane) to LOS D (density of 33 passenger cars/mile/lane)			
I-710 southbound between the eastbound I-10/Ramona Boulevard on-ramp and the Cesar Chavez Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,710 vph (LOS E) in the No Build Alternative to 6,540 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,850 vph (LOS F) in the No Build Alternative to 8,330 vph (LOS F).	Add a lane between the Ramona Boulevard on-ramp and the SR 60 off-ramp.	Operations will improve from LOS F (density of 46 passenger cars/mile/lane) to LOS D (density of 31 passenger cars/mile/lane) Operations remain at LOS F, but the density will be reduced from 105 to 39 passenger cars/mile/lane		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 southbound between the Cesar Chavez Avenue off-ramp and the SR 60 off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,370 vph (LOS F) in the No Build Alternative to 7,750 vph (LOS F).		Operations will improve from LOS F (density of 75 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-710 southbound between the Cesar Chavez Avenue on-ramp and the Third Street on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,460 vph (LOS F) in the No Build Alternative to 6,970 vph (LOS F).	Add a lane starting at the Cesar Chavez Avenue on-ramp and drop it before the SR 60 on-ramp.	Operations will improve from LOS F (density of 53 passenger cars/mile/lane) to LOS D (density of 30 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation because it would require major construction of seven bridge structures.
I-710 southbound between the Third Street on-ramp and the Third Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,570 vph (LOS F) in the No Build Alternative to 7,010 vph (LOS F).		Operations will improve from LOS F to LOS D (density of 31 passenger cars/mile/lane)			
I-710 southbound between the Third Street off-ramp and the SR 60 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,390 vph (LOS E) in the No Build Alternative to 6,800 vph (LOS F).	Add a lane between the Third Street off-ramp and the SR 60 on-ramp.	Operations will improve from LOS F (density of 50 passenger cars/mile/lane) to LOS D (density of 29 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one bridge structure.
I-710 southbound between the SR 60 on-ramp and the Whittier Boulevard/Olympic Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,890 vph (LOS F) in the No Build Alternative to 8,060 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.6%	●		Yes, recommended for implementation.
I-710 southbound between the Whittier Boulevard/Olympic Boulevard on-ramp and the southbound I-5 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,310 vph (LOS F) in the No Build Alternative to 6,460 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.4%			
Dual-Bore Operational Variation: *No Tolls*							
I-10 westbound between the southbound I-605 on-ramp and the Garvey Avenue/Durfee Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,510 vph (LOS F) in the No Build Alternative to 7,680 vph (LOS F)	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.7%	●		Yes, recommended for implementation.
SR 134 westbound between the Linda Vista Avenue/San Rafael Avenue on-ramp and the Figueroa Street/Colorado Boulevard off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,840 vph (LOS E) in the No Build Alternative to 8,420 vph (LOS F).	Add an auxiliary lane between the San Rafael Avenue on-ramp and the Figueroa Street off-ramp.	Operations will improve from LOS F (density of 43 passenger cars/mile/lane) to LOS D (density of 32 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to right-of-way conflicts and secondary impacts due to the construction of a retaining wall along the north side of SR 134 near the Figueroa Street off-ramp.
SR 134 westbound between the southbound SR 2 on-ramp and the Glendale Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,560 vph (LOS F) in the No Build Alternative to 7,950 vph (LOS F).	Add a lane from the Harvey Drive on-ramp and drop it after the Central Avenue off-ramp.	Operations will improve from LOS F to LOS D (density of 28 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to right-of-way conflicts and secondary impacts due to the major construction of four realignments, six bridge reconstructions, and several retaining and sound walls.
SR 134 westbound between the Glendale Avenue on-ramp and the Brand Boulevard/Central Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,570 vph (LOS D) in the No Build Alternative to 8,050 vph (LOS F).		Operations will improve from LOS F to LOS E (density of 38 passenger cars/mile/lane)			
I-210 eastbound between the Polk Street on-ramp and the Hubbard Street off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,410 vph (LOS F) in the No Build Alternative to 6,790 vph (LOS F).	Add a lane between the Polk Street on-ramp and the Paxton Street off-ramp.	Operations will improve from LOS F (density of 56 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to right-of-way conflicts and secondary impacts due to the major construction of seven realignments, three widenings, and two reconstructions, as well as several tie-back and retaining walls.
I-210 eastbound between the Hubbard Street off-ramp and the Hubbard Street on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,040 vph (LOS E) in the No Build Alternative to 6,430 vph (LOS F).		Operations will improve from LOS F (density of 49 passenger cars/mile/lane) to LOS D (density of 29 passenger cars/mile/lane)			
I-210 eastbound between the Hubbard Street on-ramp and the Maclay Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,430 vph (LOS F) in the No Build Alternative to 7,790 vph (LOS F).		Operations will improve from LOS F (density of 94 passenger cars/mile/lane) to LOS E (density of 40 passenger cars/mile/lane)			
I-210 eastbound between the Maclay Avenue off-ramp and the Maclay Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,010 vph (LOS F) in the No Build Alternative to 7,410 vph (LOS F).		Operations will improve from LOS F (density of 76 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-210 eastbound between the Maclay Avenue on-ramp and the westbound SR 118 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,030 vph (LOS F) in the No Build Alternative to 8,420 vph (LOS F).		Operations remain at LOS F, but the density will be reduced to 47 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.			
I-210 eastbound between the Pennsylvania Avenue off-ramp and the Pennsylvania Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,330 vph (LOS F) in the No Build Alternative to 8,710 vph (LOS F).	Add a lane between the Pennsylvania Avenue off-ramp and the Ocean View Boulevard off-ramp.	Operations will improve from LOS F (density of 51 passenger cars/mile/lane) to LOS D (density of 33 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts due to the major construction of two tie-back walls at the Ramsdell and Rosemont overcrossings, and a retaining wall along the span of Mayfield Avenue.
I-210 eastbound between the Pennsylvania Avenue on-ramp and the La Crescenta Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,450 vph (LOS F) in the No Build Alternative to 9,830 vph (LOS F).		Operations will improve from LOS F (density of 74 passenger cars/mile/lane) to LOS E (density of 40 passenger cars/mile/lane)			
I-210 eastbound between the La Crescenta Avenue on-ramp and the Ocean View Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,570 vph (LOS F) in the No Build Alternative to 10,950 vph (LOS F).		Operations will improve from LOS F (density of 52 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)			
I-210 westbound between the Lake Avenue on-ramp and the Marengo Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,750 vph (LOS F) in the No Build Alternative to 11,150 vph (LOS F).	Add an auxiliary lane between the Lake Avenue on-ramp and the Marengo Avenue off-ramp, and add one lane each to the Lake Avenue on-ramp and the Marengo Avenue off-ramp.	Operations remain at LOS F, but the density will be reduced to 36 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts due to the major construction of three tie-back walls at the El Molino Avenue overcrossing, the utility overcrossing, and the Los Robles Avenue overcrossing.
I-210 westbound between the eastbound SR 118 on-ramp and the Maclay Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,280 vph (LOS F) in the No Build Alternative to 7,490 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.2%	●		Yes, recommended for implementation.
I-210 westbound between the Maclay Avenue off-ramp and the Maclay Avenue on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,280 vph (LOS E) in the No Build Alternative to 6490 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.4%			
I-210 westbound between the Maclay Avenue on-ramp and the Hubbard Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,590 vph (LOS F) in the No Build Alternative to 6,790 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%			
I-210 westbound between the Hubbard Street on-ramp and the Polk Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 5,840 vph (LOS E) in the No Build Alternative to 6,050 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%			
I-5 northbound between the SR 2 northbound off-ramp and the SR 2 southbound off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,590 vph (LOS F) in the No Build Alternative to 9,840 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.5%			
I-5 northbound between the SR 2 southbound off-ramp and the SR 2 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,730 vph (LOS F) in the No Build Alternative to 9,980 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.5%			
I-5 southbound between the Stadium Way off-ramp and the SR 2 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,490 vph (LOS E) in the No Build Alternative to 6,720 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.1%			
I-710 northbound between the Olympic Boulevard on-ramp and the SR 60 off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 8,130 vph (LOS F) in the No Build Alternative to 8,390 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.5%			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-710 northbound between the Cesar Chavez Avenue on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the No Build Alternative to 8,170 vph (LOS F).	Add a lane between the Cesar Chavez Avenue on-ramp and the I-10 off-ramp.	Operations will improve from LOS F (density of 88 passenger cars/mile/lane) to LOS E (density of 39 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,660 vph (LOS F).		Operations will improve from LOS F (density of 68 passenger cars/mile/lane) to LOS D (density of 34 passenger cars/mile/lane)			
I-710 northbound between the I-10 off-ramp and the eastbound I-10 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 2,330 vph (LOS C) in the No Build Alternative to 4,830 vph (LOS F).	Add a lane between the I-10 off-ramp and the eastbound I-10 on-ramp.	Operations will improve from LOS F (density of 57 passenger cars/mile/lane) to LOS D (density of 26 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to impacts to transit movements and secondary impacts due to the major construction of five bridge structures.
I-710 southbound between the eastbound I-10/Ramona Boulevard on-ramp and the Cesar Chavez Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,710 vph (LOS E) in the No Build Alternative to 7,060 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,850 vph (LOS F) in the No Build Alternative to 8,420 vph (LOS F).	Add a lane between the Ramona Boulevard on-ramp to the SR 60 off-ramp.	Operations will improve from LOS F (density of 56 passenger cars/mile/lane) to LOS D (density of 31 passenger cars/mile/lane) Operations will improve from LOS F (density of 112 passenger cars/mile/lane) to LOS E (density of 42 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 southbound between the Cesar Chavez Avenue off-ramp and the SR 60 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,360 vph (LOS D) in the No Build Alternative to 6,500 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,370 vph (LOS F) in the No Build Alternative to 7,810 vph (LOS F).		Operations will improve from LOS F (density of 45 passenger cars/mile/lane) to LOS D (density of 28 passenger cars/mile/lane) Operations will improve from LOS F (density of 77 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)			
I-710 southbound between the SR 60 off-ramp and the Cesar Chavez Avenue on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 5,770 vph (LOS E) in the No Build Alternative to 6,840 vph (LOS F).	Add a deceleration lane for the SR 60 off-ramp, and add a lane between the SR 60 off-ramp and the Cesar Chavez Avenue on-ramp.	Operations will improve from LOS F (density of 51 passenger cars/mile/lane) to LOS D (density of 29 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one bridge structure.
I-710 southbound between the Cesar Chavez Avenue on-ramp and the Third Street on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,460 vph (LOS F) in the No Build Alternative to 7,420 vph (LOS F).	Add a lane starting at the Cesar Chavez Avenue on-ramp and drop it before the SR 60 on-ramp.	Operations will improve from LOS F (density of 64 passenger cars/mile/lane) to LOS D (density of 33 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of seven bridge structures.
I-710 southbound between the Third Street off-ramp and the SR 60 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,390 vph (LOS E) in the No Build Alternative to 7,270 vph (LOS F).	Add a lane between the Third Street off-ramp and the SR 60 on-ramp.	Operations will improve from LOS F (density of 60 passenger cars/mile/lane) to LOS D (density of 32 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one bridge structure.
I-710 southbound between the SR 60 on-ramp and the Whittier Boulevard/Olympic Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,890 vph (LOS F) in the No Build Alternative to 8,130 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 10,500 vph (LOS F) in the No Build Alternative to 10,770 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.8% With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.3%	●		Yes, recommended for implementation.
I-710 southbound between the Whittier Boulevard/Olympic Boulevard on-ramp and the southbound I-5 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,310 vph (LOS F) in the No Build Alternative to 6,510 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.6%			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
Dual-Bore Operational Variation: *No Tolls and No Trucks*							
I-10 westbound between the southbound I-605 on-ramp and the Garvey Avenue/Durfee Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,510 vph (LOS F) in the No Build Alternative to 7,680 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.7%	●		Yes, recommended for implementation.
SR 134 westbound between the southbound SR 2 on-ramp and the Glendale Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,560 vph (LOS F) in the No Build Alternative to 7,940 vph (LOS F).	Add a lane from the Harvey Drive on-ramp and drop it after the Central Avenue off-ramp.	Operations will improve from LOS F to LOS D (density of 28 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to right-of-way conflicts and secondary impacts due to the major construction of four realignments, six bridge reconstruction, and several retaining and sound walls.
SR 134 westbound between the Glendale Avenue on-ramp and the Brand Boulevard/ Central Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,570 vph (LOS D) in the No Build Alternative to 8,050 vph (LOS F).		Operations will improve from LOS F to LOS E (density of 38 passenger cars/mile/lane)			
I-210 eastbound between the Polk Street on-ramp and the Hubbard Street off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,410 vph (LOS F) in the No Build Alternative to 6,770 vph (LOS F).	Add a lane between the Polk Street on-ramp and the Paxton Street off-ramp.	Operations will improve from LOS F (density of 56 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to right-of-way conflicts and secondary impacts due to the major construction of seven realignments, three widenings, and two reconstructions, as well as several tie-back and retaining walls.
I-210 eastbound between the Hubbard Street off-ramp and the Hubbard Street on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,040 vph (LOS E) in the No Build Alternative to 6,400 vph (LOS F).		Operations will improve from LOS F (density of 48 passenger cars/mile/lane) to LOS D (density of 29 passenger cars/mile/lane)			
I-210 eastbound between the Hubbard Street on-ramp and the Maclay Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,430 vph (LOS F) in the No Build Alternative to 7,780 vph (LOS F).		Operations will improve from LOS F (density of 94 passenger cars/mile/lane) to LOS E (density of 40 passenger cars/mile/lane)			
I-210 eastbound between the Maclay Avenue off-ramp and the Maclay Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,010 vph (LOS F) in the No Build Alternative to 7,400 vph (LOS F).		Operations will improve from LOS F (density of 75 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)			
I-210 eastbound between the Maclay Avenue on-ramp and the westbound SR 118 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,030 vph (LOS F) in the No Build Alternative to 8,410 vph (LOS F).		Operations remain at LOS F, but the density will be reduced to 47 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.			
I-210 eastbound between the Pennsylvania Avenue off-ramp and the Pennsylvania Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,330 vph (LOS F) in the No Build Alternative to 8,790 vph (LOS F).	Add a lane between the Pennsylvania Avenue off-ramp and the Ocean View Boulevard off-ramp.	Operations will improve from LOS F (density of 52 passenger cars/mile/lane) to LOS D (density of 33 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts due to major construction of two tie-back walls at the Ramsdell and Rosemont overcrossings, and a retaining wall along the span of Mayfield Avenue.
I-210 eastbound between the Pennsylvania Avenue on-ramp and the La Crescenta Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,450 vph (LOS F) in the No Build Alternative to 9,940 vph (LOS F).		Operations will improve from LOS F (density of 78 passenger cars/mile/lane) to LOS E (density of 41 passenger cars/mile/lane)			
I-210 eastbound between the La Crescenta Avenue on-ramp and the Ocean View Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,570 vph (LOS F) in the No Build Alternative to 11,060 vph (LOS F).		Operations will improve from LOS F (density of 53 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)			
I-210 westbound between the Lake Avenue on-ramp and the Marengo Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,750 vph (LOS F) in the No Build Alternative to 11,210 vph (LOS F) in the dual-bore no toll/no trucks operational variation of the Freeway Tunnel Alternative.	Add an auxiliary lane between the Lake Avenue on-ramp and the Marengo Avenue off-ramp, and add one lane to the Lake Avenue on-ramp and the Marengo Avenue off-ramp.	Operations remain at LOS F, but the density will be reduced to 36 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts due to major construction of three tie-back walls at the El Molino Avenue overcrossing, the utility overcrossing, and the Los Robles Avenue overcrossing.

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-210 westbound between the eastbound SR 118 on-ramp and the Maclay Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,280 vph (LOS F) in the No Build Alternative to 7,470 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%	●		Yes, recommended for implementation.
I-210 westbound between the Maclay Avenue off-ramp and the Maclay Avenue on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,280 vph (LOS E) in the No Build Alternative to 6,460 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.9%			
I-210 westbound between the Maclay Avenue on-ramp and the Hubbard Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,590 vph (LOS F) in the No Build Alternative to 6,760 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.0%			
I-210 westbound between the Hubbard Street on-ramp and the Polk Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 5,840 vph (LOS E) in the No Build Alternative to 6,010 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.2%			
I-5 southbound between the Stadium Way off-ramp and the SR 2 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,490 vph (LOS E) in the No Build Alternative to 6,700 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.4%			
SR 60 eastbound between the I-710 on-ramp and the Atlantic Boulevard off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 12,450 vph (LOS F) in the n No Build Alternative o 12,700 vph (LOS F)	Add a lane between the I-710 off-ramp and the I-710 on-ramp, and add one more lane to the Atlantic Boulevard on-ramp.	Operations will improve from LOS F to LOS D (density of 31 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts due to the complete demolition and reconstruction of the I-710/SR 60 interchange.
I-710 northbound between the northbound I-5 off-ramp and the Olympic Boulevard off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,620 vph (LOS F) in the No Build Alternative to 7,780 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.8%	●		Yes, recommended for implementation.
I-710 northbound between the Olympic Boulevard on-ramp and the SR 60 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,360 vph (LOS F) in the No Build Alternative to 8,610 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 8,130 vph (LOS F) in the No Build Alternative to 8,460 vph (LOS F).	Add one more lane to the Olympic Boulevard on-ramp and an auxiliary lane between the Olympic Boulevard on-ramp and the SR 60 off-ramp. Drop the fifth lane after the SR 60 off-ramp.	Operations will improve from LOS F to LOS D (density of 29 passenger cars/mile/lane) Operations will improve from LOS F to LOS D (density of 28 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due secondary impacts from widening a bridge.
I-710 northbound between the Cesar Chavez Avenue on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the n No Build Alternative to 8,330 vph (LOS F).	Add a lane between the Cesar Chavez Avenue on-ramp and the I-10 off-ramp.	Operations remain at LOS F, but the density will be reduced to 39 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location will provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,840 vph (LOS F).		Operations will improve from LOS F (density of 38 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)			
I-710 northbound between the I-10 off-ramp and the eastbound I-10 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 2,330 vph (LOS C) in the No Build Alternative to 4,880 vph (LOS F).	Add a lane between the I-10 off-ramp and the eastbound I-10 on-ramp.	Operations will improve from LOS F (density of 45 passenger cars/mile/lane) to LOS D (density of 27 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to impacts to transit movements and secondary impacts due to the major construction of five bridge structures.
I-710 southbound between the eastbound I-10/Ramona Boulevard on-ramp and the Cesar Chavez Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,710 vph (LOS E) in the No Build Alternative to 7,230 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,850 vph (LOS F) in the No Build Alternative to 8,590 vph (LOS F).	Add a lane between the Ramona Boulevard on-ramp to the SR 60 off-ramp.	Operations will improve from LOS F (density of 45 passenger cars/mile/lane) to LOS D (density of 32 passenger cars/mile/lane) Operations will improve from LOS F (density of 127 passenger cars/mile/lane) to LOS E (density of 44 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location will provide nominal relief to a small area compared to the overall congestion in the corridor.

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Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-710 southbound between the Cesar Chavez Avenue off-ramp and the SR 60 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,360 vph (LOS D) in the No Build Alternative to 6,640 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,370 vph (LOS F) in the No Build Alternative to 7,970 vph (LOS F).		Operations will improve from LOS F (density of 52 passenger cars/mile/lane) to LOS D (density of 28 passenger cars/mile/lane) Operations will improve from LOS F (density of 84 passenger cars/mile/lane) to LOS E (density of 38 passenger cars/mile/lane)			
I-710 southbound between the SR 60 off-ramp and the Cesar Chavez Avenue on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 5,770 vph (LOS E) in the No Build Alternative to 6,890 vph (LOS F).	Add a deceleration lane for the SR 60 off-ramp and add a lane between the SR 60 off-ramp and the Cesar Chavez on-ramp	Operations will improve from LOS F (density of 52 passenger cars/mile/lane) to LOS D (density of 30 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one bridge structure.
I-710 southbound between the Cesar Chavez Avenue on-ramp and the Third Street on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,460 vph (LOS F) in the No Build Alternative to 7,470 vph (LOS F).	Add a lane starting at the Cesar Chavez Avenue on-ramp and drop it before the SR 60 on-ramp	Operations will improve from LOS F (density of 66 passenger cars/mile/lane) to LOS D (density of 34 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of seven bridge structures.
I-710 southbound between the Third Street off-ramp and the SR 60 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,390 vph (LOS E) in the No Build Alternative to 7,310 vph (LOS F).	Add a lane between the Third Street off-ramp and the SR 60 on-ramp.	Operations will improve from LOS F (density of 61 passenger cars/mile/lane) to LOS D (density of 31 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one bridge structure.
I-710 southbound between the SR 60 on-ramp and the Whittier Boulevard/Olympic Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,890 vph (LOS F) in the No Build Alternative to 8,250 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 10,500 vph (LOS F) in the No Build Alternative to 10,810 vph (LOS F).	Extend auxiliary lane from the Whittier/Olympic off-ramp to the Whittier/Olympic on-ramp	Operations remain at LOS F, but the density will be reduced to 58 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes. Operations remain at LOS F, but the density will be reduced to 71 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 southbound between the Whittier Boulevard/Olympic Boulevard on-ramp and the southbound I-5 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,310 vph (LOS F) in the No Build Alternative to 6,560 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.8%	●		Yes, recommended for implementation.
Dual-Bore Operational Variation: *With Tolls*							
SR 134 westbound between the southbound SR 2 on-ramp and the Glendale Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,560 vph (LOS F) in the No Build Alternative to 7,890 vph (LOS F).	Add a lane from the Harvey Drive on-ramp, and drop it after the Central Avenue off-ramp.	Operations will improve from LOS F to LOS D (density of 28 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to right-of-way conflicts and secondary impacts due to the major construction of four realignments, six bridge reconstructions, and several retaining and sound walls.
SR 134 westbound between the Glendale Avenue on-ramp and the Brand Boulevard/Central Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,570 vph (LOS D) in the No Build Alternative to 7,920 vph (LOS F).		Operations will improve from LOS F to LOS E (density of 37 passenger cars/mile/lane)			
I-210 eastbound between the Polk Street on-ramp and the Hubbard Street off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,410 vph (LOS F) in the No Build Alternative to 6,760 vph (LOS F).	Add a lane between the Polk Street on-ramp and the Paxton Street off-ramp.	Operations will improve from LOS F (density of 56 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)	●		No, this improvement is not recommended for implementation due to right-of-way conflicts and secondary impacts due to the major construction of seven realignments, three widenings, and two reconstructions, as well as several tie-back and retaining walls.
I-210 eastbound between the Hubbard Street off-ramp and the Hubbard Street on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,040 vph (LOS E) in the No Build Alternative to 6,390 vph (LOS F).		Operations will improve from LOS F (density of 48 passenger cars/mile/lane) to LOS D (density of 29 passenger cars/mile/lane)			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
I-210 eastbound between the Hubbard Street on-ramp and the Maclay Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,430 vph (LOS F) in the No Build Alternative to 7,770 vph (LOS F).		Operations will improve from LOS F (density of 93 passenger cars/mile/lane) to LOS E (density of 40 passenger cars/mile/lane)			
I-210 eastbound between the Maclay Avenue off-ramp and the Maclay Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,010 vph (LOS F) in the No Build Alternative to 7,380 vph (LOS F).		Operations will improve from LOS F (density of 75 passenger cars/mile/lane) to LOS E (density of 36 passenger cars/mile/lane)			
I-210 eastbound between the Maclay Avenue on-ramp and the westbound SR 118 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,030 vph (LOS F) in the No Build Alternative to 8,400 vph (LOS F).		Operations remain at LOS F, but the density will be reduced to 47 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.			
I-210 eastbound between the Pennsylvania Avenue off-ramp and the Pennsylvania Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,330 vph (LOS F) in the No Build Alternative to 8,690 vph (LOS F).	Add a lane between the Pennsylvania Avenue off-ramp and the Ocean View Boulevard off-ramp.	Operations will improve from LOS F (density of 51 passenger cars/mile/lane) to LOS D (density of 32 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts due to the major construction of two tie-back walls at the Ramsdell and Rosemont overcrossings, and a retaining wall along the span of Mayfield Avenue.
I-210 eastbound between the Pennsylvania Avenue on-ramp and the La Crescenta Avenue on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 9,450 vph (LOS F) in the No Build Alternative to 9,820 vph (LOS F).		Operations will improve from LOS F (density of 74 passenger cars/mile/lane) to LOS E (density of 40 passenger cars/mile/lane)			
I-210 eastbound between the La Crescenta Avenue on-ramp and the Ocean View Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,570 vph (LOS F) in the No Build Alternative to 10,950 vph (LOS F).		Operations will improve from LOS F (density of 52 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)			
I-210 westbound between the Lake Avenue on-ramp and the Marengo Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 10,750 vph (LOS F) in the No Build Alternative to 11,140 vph (LOS F).	Add an auxiliary lane between the Lake Avenue on-ramp and the Marengo Avenue off-ramp, and add one lane each to the Lake Avenue on-ramp and the Marengo Avenue off-ramp.	Operations remain at LOS F, but the density will be reduced to 35 passenger cars/hour/lane. Capacity will be increased with the extension of the auxiliary lane, and safety will be improved with the additional distance for lane changes.		●	No, this improvement is not recommended for implementation due to secondary impacts due to the major construction of three tie-back walls at the at El Molino Ave overcrossing, the utility overcrossing, and Los Robles Avenue overcrossing.
I-210 westbound between the eastbound SR 118 on-ramp and the Maclay Avenue off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 7,280 vph (LOS F) in the No Build Alternative to 7,470 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.5%	●		Yes, recommended for implementation.
I-210 westbound between the Maclay Avenue off-ramp and the Maclay Avenue on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,280 vph (LOS E) in the No Build Alternative to 6,470 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.8%			
I-210 westbound between the Maclay Avenue on-ramp and the Hubbard Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,590 vph (LOS F) in the No Build Alternative to 6,770 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.8%			
I-210 westbound between the Hubbard Street on-ramp and the Polk Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 5,840 vph (LOS E) in the No Build Alternative to 6,010 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 2.2%			
I-5 northbound between the SR 2 northbound off-ramp and the SR 2 southbound off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 8,350 vph (LOS F) in the No Build Alternative to 8,520 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.8%			
I-710 northbound between the Olympic Boulevard on-ramp and the SR 60 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 8,360 vph (LOS F) in the No Build Alternative to 8,570 vph (LOS F). In the PM peak hour, the freeway demand is expected to		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.1% With the implementation of ATDM			

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended?		
					Yes	No	Comment
		increase from 8,130 vph (LOS F) in the No Build Alternative to 8,400 vph (LOS F).		strategies, the volume/capacity ratio will be reduced by 0.4%			
I-710 northbound between the Cesar Chavez Avenue on-ramp and the Ramona Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,410 vph (LOS F) in the No Build Alternative to 8,240 vph (LOS F).	Add a lane between the Cesar Chavez Avenue on-ramp and the I-10 off-ramp.	Operations will improve from LOS F (density of 92 passenger cars/mile/lane) to LOS E (density of 39 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation because due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 northbound between the Ramona Boulevard off-ramp and the I-10 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,830 vph (LOS F) in the No Build Alternative to 7,770 vph (LOS F).		Operations will improve from LOS F (density of 72 passenger cars/mile/lane) to LOS E (density of 35 passenger cars/mile/lane)			
I-710 northbound between the I-10 off-ramp and the eastbound I-10 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 2,330 vph (LOS C) in the No Build Alternative to 4,810 vph (LOS F).	Add a lane between the I-10 off-ramp and the eastbound I-10 on-ramp.	Operations will improve from LOS F (density of 56 passenger cars/mile/lane) to LOS D (density of 26 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to impacts to transit movements and secondary impacts due to the major construction of five bridge structures.
I-710 southbound between the eastbound I-10/Ramona Boulevard on-ramp and the Cesar Chavez Avenue off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,710 vph (LOS E) in the No Build Alternative to 7,080 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,850 vph (LOS F) in the No Build Alternative to 8,520 vph (LOS F).	Add a lane between the Ramona Boulevard on-ramp to the SR 60 off-ramp.	Operations will improve from LOS F (density of 57 passenger cars/mile/lane) to LOS D (density of 31 passenger cars/mile/lane) Operations will improve from LOS F (density of 119 passenger cars/mile/lane) to LOS E (density of 43 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to the relatively small size of improvement limits compared to the entire I-710 freeway network. An improvement in this location would provide nominal relief to a small area compared to the overall congestion in the corridor.
I-710 southbound between the Cesar Chavez Avenue off-ramp and the SR 60 off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 5,360 vph (LOS D) in the No Build Alternative to 6,500 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 7,370 vph (LOS F) in the No Build Alternative to 7,910 vph (LOS F).		Operations will improve from LOS F (density of 45 passenger cars/mile/lane) to LOS D (density of 28 passenger cars/mile/lane) Operations will improve from LOS F (density of 81 passenger cars/mile/lane) to LOS E (density of 37 passenger cars/mile/lane)			
I-710 southbound between the SR 60 off-ramp and the Cesar Chavez Avenue on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 5,770 vph (LOS E) in the No Build Alternative to 6,840 vph (LOS F).	Add a deceleration lane for the SR 60 off-ramp, and add a lane between the SR 60 off-ramp and the Cesar Chavez on-ramp.	Operations will improve from LOS F (density of 51 passenger cars/mile/lane) to LOS D (density of 29 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of one bridge structure.
I-710 southbound between the Cesar Chavez Avenue on-ramp and the Third Street on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,460 vph (LOS F) in the No Build Alternative to 7,410 vph (LOS F).	Add a lane starting at the Cesar Chavez Avenue on-ramp and drop it before the SR 60 on-ramp.	Operations will improve from LOS F (density of 64 passenger cars/mile/lane) to LOS D (density of 33 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due to secondary impacts from the major construction of seven bridge structures.
I-710 southbound between the Third Street on-ramp and the Third Street off-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,570 vph (LOS F) in the No Build Alternative to 7,420 vph (LOS F).		Operations will improve from LOS F to LOS C (density of 24 passenger cars/mile/lane)			
I-710 southbound between the Third Street off-ramp and the SR 60 on-ramp	–	In the PM peak hour, the freeway demand is expected to increase from 6,390 vph (LOS E) in the No Build Alternative to 7,240 vph (LOS F).	Add a lane between the Third Street off-ramp and the SR 60 on-ramp.	Operations will improve from LOS F (density of 59 passenger cars/mile/lane) to LOS D (density of 32 passenger cars/mile/lane)		●	No, this improvement is not recommended for implementation due secondary impacts from the major construction of one bridge structure.

TABLE 3.5.16:
Summary of the 2035 Adverse Impacts of the Build Alternatives on Freeway Segments

Description	Existing Traffic Control	Adverse Impact	Potential Improvement[1]	Operations if Improvement Is Implemented	Is improvement recommended? Yes	No	Comment
I-710 southbound between the SR 60 on-ramp and the Whittier Boulevard/Olympic Boulevard off-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 7,890 vph (LOS F) in the No Build Alternative to 8,160 vph (LOS F). In the PM peak hour, the freeway demand is expected to increase from 10,500 vph (LOS F) in the No Build Alternative to 10,780 vph (LOS F).	Active Traffic and Demand Management	With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.4% With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 0.2%	●		Yes, recommended for implementation.
I-710 southbound between the Whittier Boulevard/Olympic Boulevard on-ramp and the southbound I-5 on-ramp	–	In the AM peak hour, the freeway demand is expected to increase from 6,310 vph (LOS F) in the No Build Alternative to 6,520 vph (LOS F).		With the implementation of ATDM strategies, the volume/capacity ratio will be reduced by 1.4%			

Source: CH2M HILL (2014).
[1] Active Transportation and Demand Management (ATDM) encompasses a wide range of strategies, including advanced ramp metering, changeable message signs and other driver guidance, dynamic ramp metering, and dynamic lane control (including shoulders). FHWA (http://ops.fhwa.dot.gov/atdm/approaches/atm.htm) has identified a range of strategies that can be implemented for freeways. A modest benefit of up to 300 vehicles/hour (less than 5% of the freeway capacity) was used as the threshold for ATDM implementation. Greater increases could only be addressed with physical improvements.
[2] The freeway segments that would experience adverse impacts include freeway segments impacted by the improvements in the BRT Alternative and the improvements in the TSM/TDM Alternative that are included in the BRT Alternative.
[3] The freeway segments that would experience adverse impacts include freeway segments impacted by the improvements in the LRT Alternative and the improvements in the TSM/TDM Alternative that are included in the LRT Alternative.
[4] The freeway segments that would experience adverse impacts include freeway segments impacted by the improvements in the Freeway Tunnel Alternative and the improvements in the TSM/TDM Alternative that are included in the Freeway Tunnel Alternative.
LOS = level of service
vph = vehicles per hour

TABLE 3.5.17:
Intersections with the Highest Increases in Delay and Volumes of Pedestrians by Build Alternative

Intersection	Jurisdiction	Pedestrian Volumes Per Hour	Change in Intersection Delay (Seconds Per Vehicle)
Changes in Delay for the TSM/TDM Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	40.7
Del Mar Avenue/Valley Boulevard	San Gabriel	180	10.5
Griffin Avenue/Broadway	Los Angeles	247	3.4
Garfield Avenue/Main Street	Alhambra	160	3.7
Atlantic Boulevard/Main Street	Alhambra	101	11.4
Fair Oaks Avenue/Monterey Road	South Pasadena	70	24
Rosemead Boulevard/Valley Boulevard	Rosemead	107	7.8
Avenue 20/Broadway	Los Angeles	135	3.7
Durfee Avenue/Valley Boulevard	El Monte	91	7.9
Huntington Drive/Monterey Road	Los Angeles	57	42.7
Changes in Delay for the BRT Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	41.8
Del Mar Avenue/Valley Boulevard	San Gabriel	180	8.6
Griffin Avenue/Broadway	Los Angeles	247	3.1
Garfield Avenue/Main Street	Alhambra	160	3.9
Durfee Avenue/Valley Boulevard	El Monte	91	11.6
Fair Oaks Avenue/Monterey Road	South Pasadena	70	22
Avenue 20/Broadway	Los Angeles	135	3.4
Fair Oaks Avenue/California Boulevard	Pasadena	100	6.6
Huntington Drive/Monterey Road	Los Angeles	57	41.9
Atlantic Boulevard/Main Street	Alhambra	101	5.1
Changes in Delay for the LRT Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	44.1
Atlantic Boulevard/Valley Boulevard	Alhambra	136	27.9
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	146	19.8
Del Mar Avenue/Valley Boulevard	San Gabriel	180	7
Figueroa Street/Avenue 26	Los Angeles	253	4.7
Griffin Avenue/Broadway	Los Angeles	247	4.3
Durfee Avenue/Valley Boulevard	El Monte	91	15.3
Fair Oaks Avenue/Monterey Road	South Pasadena	70	21.3
Lake Avenue/Maple Street (I-210 WB On-Ramp)	Pasadena	112	5.3
Avenue 20/Broadway	Los Angeles	135	3.8
Changes in Delay for the Single-Bore With Toll Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	37.3
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	154	9
Griffin Avenue/Broadway	Los Angeles	247	4.6
Avenue 20/Broadway	Los Angeles	135	4.1
Rosemead Boulevard/Valley Boulevard	Rosemead	107	5.8
Lake Avenue/Maple Street (I-210 WB On-Ramp)	Pasadena	112	4.2
Durfee Avenue/Valley Boulevard	El Monte	91	8.8
Atlantic Boulevard/Whittier Boulevard	East Los Angeles	330	2.4
Fair Oaks Avenue/Monterey Road	South Pasadena	70	11.6
Lake Avenue/Corson Street (I-210 EB Off-Ramp)	Pasadena	113	2.9
Changes in Delay for the Single-Bore With Toll Without Trucks Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	35.7
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	154	6.7
Griffin Avenue/Broadway	Los Angeles	247	3.4
Marengo Street/Maple Street (I-210 WB Ramps)	Pasadena	213	3.3
Avenue 20/Broadway	Los Angeles	135	4.1
Durfee Avenue/Valley Boulevard	El Monte	91	9.4

TABLE 3.5.17:
Intersections with the Highest Increases in Delay and Volumes of Pedestrians by Build Alternative

Intersection	Jurisdiction	Pedestrian Volumes Per Hour	Change in Intersection Delay (Seconds Per Vehicle)
Lake Avenue/Maple Street (I-210 WB On-Ramp)	Pasadena	112	3.3
Del Mar Avenue/Valley Boulevard	San Gabriel	180	2.3
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	57	24.2
Fair Oaks Avenue/Monterey Road	South Pasadena	70	7.3
Changes in Delay for the Single-Bore With Toll with Express Bus Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	36.9
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	154	7.6
Griffin Avenue/Broadway	Los Angeles	247	4.2
Atlantic Boulevard/Whittier Boulevard	East Los Angeles	330	2.6
Durfee Avenue/Valley Boulevard	El Monte	91	12.7
Avenue 20/Broadway	Los Angeles	135	4.5
Marengo Street/Maple Street (I-210 WB Ramps)	Pasadena	213	2.3
Del Mar Avenue/Valley Boulevard	San Gabriel	180	2.2
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	146	2.5
Lake Avenue/Maple Street (I-210 WB On-Ramp)	Pasadena	112	3.1
Changes in Delay for the Dual-Bore Without Toll Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	30.9
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	146	14.5
Atlantic Boulevard/Whittier Boulevard	East Los Angeles	330	4.8
Figueroa Street/Avenue 26	Los Angeles	253	5.2
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	154	8.6
Griffin Avenue/Broadway	Los Angeles	247	3.6
Del Mar Avenue/Valley Boulevard	San Gabriel	180	4.1
Atlantic Boulevard/Cesar Chavez Avenue	Monterey Park	177	3.4
Durfee Avenue/Valley Boulevard	El Monte	91	11.4
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	57	25.7
Changes in Delay for the Dual-Bore Without Toll Without Trucks Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	30.2
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	146	14.7
Atlantic Boulevard/Whittier Boulevard	East Los Angeles	330	4.4
Griffin Avenue/Broadway	Los Angeles	247	5.1
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	154	8.2
Del Mar Avenue/Valley Boulevard	San Gabriel	180	3.1
Durfee Avenue/Valley Boulevard	El Monte	91	13.2
Avenue 20/Broadway	Los Angeles	135	3.1
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	57	28.4
Lake Avenue/Corson Street (I-210 EB Off-Ramp)	Pasadena	113	2.6
Changes in Delay for the Dual-Bore With Toll Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	168	30.9
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	146	14.5
Atlantic Boulevard/Whittier Boulevard	East Los Angeles	330	4.8
Figueroa Street/Avenue 26	Los Angeles	253	5.2
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	154	8.6
Del Mar Avenue/Valley Boulevard	San Gabriel	180	4.1
Griffin Avenue/Broadway	Los Angeles	247	3.6
Atlantic Boulevard/Cesar Chavez Avenue	Monterey Park	177	3.4
Durfee Avenue/Valley Boulevard	El Monte	91	11.4
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	57	27.8

Source: *Transportation Technical Report* (2014).

TABLE 3.5.18:
Intersections with the Highest Increases in Delay and Volumes of Bicycles by Build Alternative

Intersection	Jurisdiction	Bicycle Volumes Per Hour	Change in Intersection Delay (Seconds Per Vehicle)
Changes in Delay for the TSM/TDM Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	40.7
Fremont Avenue/Mission Road	Alhambra	23	71.3
Del Mar Avenue/Valley Boulevard	San Gabriel	12	10.5
Durfee Avenue/Valley Boulevard	El Monte	9	7.9
Rosemead Boulevard/Valley Boulevard	Rosemead	7	7.8
Walnut Grove Avenue/Valley Boulevard	Rosemead	11	2.5
Baldwin Avenue/Valley Boulevard	El Monte	25	1.6
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	18	23.7
Eagle Rock Boulevard/Verdugo Road/Avenue 40	Los Angeles	25	11.5
Eagle Rock Boulevard/York Boulevard	Los Angeles	8	5
Changes in Delay for the BRT Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	41.8
Fremont Avenue/Mission Road	Alhambra	23	71.1
Durfee Avenue/Valley Boulevard	El Monte	12	11.6
Del Mar Avenue/Valley Boulevard	San Gabriel	9	8.6
Walnut Grove Avenue/Valley Boulevard	Rosemead	25	2.6
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	11	25.7
Rosemead Boulevard/Valley Boulevard	Rosemead	18	2.3
Baldwin Avenue/Valley Boulevard	El Monte	11	1.1
Eagle Rock Boulevard/York Boulevard	Los Angeles	8	4.9
Avenue 20/Broadway	Los Angeles	7	3.4
Changes in Delay for the LRT Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	44.1
Durfee Avenue/Valley Boulevard	El Monte	11	15.3
Fremont Avenue/Mission Road	Alhambra	13	25.9
Walnut Grove Avenue/Valley Boulevard	Rosemead	23	7.1
Del Mar Avenue/Valley Boulevard	San Gabriel	11	7
Lake Avenue/Maple Street (I-210 WB On-Ramp)	Pasadena	12	5.3
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	25	26.4
Rosemead Boulevard/Valley Boulevard	Rosemead	11	3.4
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	22	19.8
Baldwin Avenue/Valley Boulevard	El Monte	18	1.9
Changes in Delay for the Single-Bore With Toll Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	37.3
Durfee Avenue/Valley Boulevard	El Monte	14	8.8
Walnut Grove Avenue/Valley Boulevard	Rosemead	12	4.2
Rosemead Boulevard/Valley Boulevard	Rosemead	18	5.8
Fair Oaks Avenue/Walnut Street	Pasadena	25	11.6
Lake Avenue/Maple Street (I-210 WB On-Ramp)	Pasadena	22	4.2
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	25	26.6
Fremont Avenue/Mission Road	Alhambra	16	3
Avenue 20/Broadway	Los Angeles	11	4.1
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	12	9
Changes in Delay for the Single-Bore With Toll Without Trucks Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	35.7
Durfee Avenue/Valley Boulevard	El Monte	14	9.4
Walnut Grove Avenue/Valley Boulevard	Rosemead	12	4.1
Marengo Street/Maple Street (I-210 WB Ramps)	Pasadena	34	3.3
Fair Oaks Avenue/Walnut Street	Pasadena	18	12.2

TABLE 3.5.18:
Intersections with the Highest Increases in Delay and Volumes of Bicycles by Build Alternative

Intersection	Jurisdiction	Bicycle Volumes Per Hour	Change in Intersection Delay (Seconds Per Vehicle)
Lake Avenue/Maple Street (I-210 WB On-Ramp)	Pasadena	25	3.3
Fremont Avenue/Mission Road	Alhambra	22	3.2
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	23	24.2
Avenue 20/Broadway	Los Angeles	13	4.1
Eagle Rock Boulevard/Verdugo Road/Avenue 40	Los Angeles	11	5.3
Changes in Delay for the Single-Bore With Toll with Express Bus Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	36.9
Durfee Avenue/Valley Boulevard	El Monte	14	12.7
Fair Oaks Avenue/Walnut Street	Pasadena	12	11.6
Walnut Grove Avenue/Valley Boulevard	Rosemead	16	3.7
Marengo Street/Maple Street (I-210 WB Ramps)	Pasadena	25	2.3
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	18	24.8
Lake Avenue/Maple Street (I-210 WB On-Ramp)	Pasadena	34	3.1
Fair Oaks Avenue/Orange Grove Boulevard	Pasadena	23	1.8
Avenue 20/Broadway	Los Angeles	13	4.5
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	22	7.6
Changes in Delay for the Dual-Bore Without Toll Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	30.9
Durfee Avenue/Valley Boulevard	El Monte	13	11.4
Fair Oaks Avenue/Walnut Street	Pasadena	16	11.6
Del Mar Avenue/Valley Boulevard	San Gabriel	11	4.1
Walnut Grove Avenue/Valley Boulevard	Rosemead	14	3
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	12	25.7
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	23	14.5
Atlantic Boulevard/Pomona Boulevard	East Los Angeles	10	1.2
Atlantic Boulevard/Whittier Boulevard	East Los Angeles	25	4.8
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	13	8.6
Changes in Delay for the Dual-Bore Without Toll Without Trucks Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	30.2
Durfee Avenue/Valley Boulevard	El Monte	13	13.2
Fair Oaks Avenue/Walnut Street	Pasadena	16	12.4
Walnut Grove Avenue/Valley Boulevard	Rosemead	12	2.4
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	14	28.4
Del Mar Avenue/Valley Boulevard	San Gabriel	23	3.1
Atlantic Boulevard/Pomona Boulevard	East Los Angeles	25	1.3
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	18	14.7
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	13	8.2
Atlantic Boulevard/Whittier Boulevard	East Los Angeles	12	4.4
Changes in Delay for the Dual-Bore With Toll Variation of the Freeway Tunnel Alternative			
Rosemead Boulevard/Mission Drive	Rosemead	23	30.9
Durfee Avenue/Valley Boulevard	El Monte	13	11.4
Fair Oaks Avenue/Walnut Street	Pasadena	16	11.6
Del Mar Avenue/Valley Boulevard	San Gabriel	11	4.1
Walnut Grove Avenue/Valley Boulevard	Rosemead	14	3
Fair Oaks Avenue/SR 110 NB Off-Ramp	South Pasadena	23	27.8
Mednik Avenue/Cesar Chavez Avenue	East Los Angeles	12	14.5
Atlantic Boulevard/Pomona Boulevard	East Los Angeles	10	1.2
Arroyo Seco Parkway/Colorado Boulevard	Pasadena	25	8.6
Atlantic Boulevard/Whittier Boulevard	East Los Angeles	13	4.8

Source: *Transportation Technical Report* (2014).

TABLE 3.5.19:
Transportation Management Plan Strategies Applicable to the Build Alternatives

Transportation Management Plan Strategy	Will the strategy apply to the Build Alternative? (● = Yes, ○ = No)				
	TSM/TDM	BRT	LRT	Freeway Tunnel: Single-Bore Design Variation	Freeway Tunnel: Dual-Bore Design Variation
Public Information Strategies					
Brochures and Mailers	●	●	●	●	●
Press Releases	●	●	●	●	●
Paid Advertising	●	●	●	●	●
Public Meetings/Speakers Bureau	●	●	●	●	●
Internet	●	●	●	●	●
Public Meeting Rooms	●	●	●	●	●
Motorist Information Strategies					
Fixed Changeable Message Signs	○	○	○	○	○
Portable Changeable Message Signs	●	●	●	●	●
Ground-Mounted Signs	●	●	●	●	●
Highway Advisory Radio	○	○	○	○	○
Caltrans Highway Information Network	○	○	○	●	●
Incident Management					
Construction Zone Enhanced Enforcement Program	●	○	●	●	●
Traffic Management Team	●	●	●	●	●
Construction Strategies					
Lane Closure Chart	●	●	●	○	●
Reduced Speed Zone	○	●	○	○	○
Connector and Ramp Closures	●	○	○	●	●
Incentives and Disincentives (e.g., early completion payments and late re-opening penalties for contractors)	●	●	○	●	●
Movable Barrier	○	●	○	○	○
Temporary Pedestrian Walkways and Detour	●	●	●	●	●
Demand Management Strategies					
Ramp Metering (Temporary)	○	●	●	○	○

Source: *Draft Project Report* (2014).

TABLE 3.5.20
Summary of Affected Intersections and Freeway Segments

Scenario	Intersections[1]		Freeway Segments[2]	
	Number Affected	Number of Recommended Improvements	Number Affected	Number of Recommended Improvements
TSM/TDM Alternative	18	11	8	1
BRT Alternative	13	7	11	2
LRT Alternative	13	7	17	1
Freeway Tunnel Alternative				
Single-Bore Operational Variations				
-- With Tolls	9	6	18	2
-- With Tolls and No Trucks	8	4	18	3
-- With Tolls and Express Bus	6	3	19	3
Dual-Bore Operational Variations				
-- No Tolls	11	9	31	3
-- No Tolls and No Trucks	9	7	30	5
-- With Tolls	11	9	28	2

Source: Summarized from Tables 3.5.12 and 3.5.13.
1 There are 156 intersections in the study area.
2 There are 606 freeway segments in the study area.

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3.6 Visual/Aesthetics

3.6.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA) in its implementation of NEPA (23 USC 109[h]) directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

3.6.2 Affected Environment

The information in this section is based on the *Visual Impact Assessment* (VIA) (2014). The VIA technical study was performed under a licensed landscape architect.

3.6.2.1 Methodology

This section summarizes the methodology and terminology used to assess the potential visual impacts of the Build Alternatives. Additional details regarding this methodology are provided in the VIA. The visual impact analysis followed the methodology in the *Visual Impact Assessment for Highway Projects* (FHWA, March 1981). As required by Caltrans, the VIA was prepared under the direction of a California-licensed Landscape Architect.

The following six principal steps were carried out to assess the potential visual impacts of the proposed project:

1. Define the existing visual environment.
2. Identify Key Views for visual assessment.
3. Analyze existing visual resources (visual quality and visual character) and viewer groups.
4. Depict the visual appearance of the project alternatives and viewer response.
5. Assess the visual impacts of the project alternatives.
6. Propose methods to avoid, minimize, and/or mitigate adverse visual impacts.

3.6.2.2 Visual Setting

The regional landscape establishes the general visual environment of a project. The specific visual environment on which this assessment focuses was determined by defining landscape units and the project viewshed. The study area for the visual analysis includes unincorporated areas of Los Angeles County and the Cities of Alhambra, Arcadia, El Monte, Los Angeles, Monterey Park, Pasadena, San Gabriel, San Marino, South Pasadena, and Temple City. The overall project study area extends across approximately 100 square miles, and is in the area generally bounded by State Route 2 (SR 2) and Interstate 5 (I-5), Interstate 10 (I-10), Interstate 210 (I-210), and Interstate 605 (I-605) in east/northeast Los Angeles and the western San Gabriel Valley. The existing terminus of the State Route 710 (SR 710) southern stub is at Valley Boulevard in Alhambra, just north of I-10, while the existing terminus of the SR 710 northern stub ends at Del Mar Boulevard in Pasadena, just south of the SR 134/I-210/SR 710 freeway interchange.

3.6.2.3 Topography

The Greater Los Angeles Basin is a coastal sediment-filled plain at the northern end of the Peninsular Ranges geomorphic province in southern California. It extends across the central part of the City of Los Angeles, as well as its southern and southeastern suburbs. It is approximately 50 miles (mi) long and 25 mi wide, bounded on the north by the Santa Monica Mountains, San Gabriel Mountains, and the Elysian, Repetto, and Puente Hills; on the east by the Santa Ana Mountains; and on the south by the Pacific Ocean and the Palos Verdes Hills. The confluence of the Los Angeles and Rio Hondo Rivers is in the center of the basin. The low land surface slopes gently south toward the ocean, but it is interrupted by the Coyote Hills near the northeast margin, by a line of elongated low hills and mesas to the south and west that extends from Newport Bay northwest to Beverly Hills, and by the Palos Verdes Peninsula at the southwest extremity.

3.6.2.4 Landscape Units

A landscape unit is a part of the regional landscape and can be thought of as an outdoor room that exhibits distinct visual character. A landscape unit will often correspond to a place or district that is commonly known among local viewers. The landscape units identified in the SR 710 North Project area are described below and shown on Figures 3.6-1, 3.6-2, and 3.6-3 for the Bus Rapid Transit (BRT), Light Rail Transit (LRT), and Freeway Tunnel Alternatives, respectively. (Please note that the figures cited in this section, with the exception of Figures 3.6-A, 3.6-B, and 3.6-C, are provided in Appendix M, Visual Impact Assessment Figures. Figures 3.6-A through 3.6-C are provided after the last page of text in this section.)

Key View locations were identified in each landscape unit. Key Views primarily represent views from public areas where physical features of the Build Alternatives would most likely be visible. In some instances, Key Views overlap and represent two landscape units. For example, Figure 3.6-13 (refer to Appendix M), Key View 10-LRT, represents both freeway and commercial/retail landscape units.

Residential Landscape Unit

The residential landscape unit applies solely to viewers from residential settings. This unit includes views of the project features from nearby residences extending across the study area from East Los Angeles to Pasadena. It is represented by Figure 3.6-8, Key View 5-LRT; Figure 3.6-15, Key View 12-LRT; and Figure 3.6-19, Key View 16-LRT (refer to Appendix M). This unit includes areas predominately zoned for housing, including single-family homes, multiple-family housing (e.g., apartments, townhouses, and condominiums), and mobile homes. These man-made structures vary in height, housing styles and landscaping among residential areas. Typical landscaping found in residential areas varies from large, mature street trees to individually maintained front yards.

Recreation/Open Space Landscape Unit

The recreation/open space landscape unit applies to parks, golf courses, other recreational/leisure-time facilities, and undeveloped open areas. The landscape within this unit consists of wide open spaces. Trees, shrubs, and grass are abundant throughout and form the boundaries of these spaces. Trees such as California pepper, Canary Island pine, eucalyptus, and sweetgum are prevalent in this unit. This landscape unit is represented by Figure 3.6-6, Key View 3-LRT, and Figure 3.6-29, Key View 26-FWY (refer to Appendix M).

Education Landscape Unit

The education landscape unit is characterized by Figure 3.6-25, Key View 22-FWY, and Figure 3.6-31, Key View 28-FWY (refer to Appendix M), which are adjacent to California State University, Los Angeles (Cal State LA) and Maranatha High School, respectively. These landscapes are characterized by large buildings spread throughout the school boundaries with sections of open spaces for recreation. Often, the boundaries are set with chainlink fences. Numerous trees, shrubs, and groundcovers are planted on the properties occupied by these facilities.

There are 13 educational institutions (including Cal State LA and Maranatha High School) in proximity to the SR 710 North Project area. Although most of these schools are within approximately 0.2 mi of the Freeway Tunnel Alternative, sound walls and surrounding buildings contribute to obstructing views of this alternative from these schools. These schools are:

- CESA Charter School, East Los Angeles
- Morris K. Hamasaki Elementary School, Los Angeles
- Brooklyn Avenue Elementary School, Los Angeles
- Cal State LA
- Emery Park Elementary School, Alhambra
- Institute for Redesign, Alhambra
- South Pasadena Middle School, South Pasadena
- Holy Family School, South Pasadena
- South Pasadena High School, South Pasadena
- Marengo Elementary School, Alhambra
- Total Education Solutions, South Pasadena
- Sequoyah School, Pasadena
- Maranatha High School, Pasadena

Industrial Landscape Unit

The industrial landscape unit includes manufacturing and storage facilities. These large structures are typically clustered together and have very little focus on landscaping. Various trees, shrubs, and groundcovers are planted in these areas and differ by owner. There is little foot traffic in these areas. Workers' viewer exposure is very limited and the buildings they work in have little to no viewer exposure once inside. Due to these factors, no Key Views were selected to represent this unit.

Commercial/Retail Landscape Unit

The commercial/retail landscape unit applies to office building complexes (including government buildings), business parks with small office areas and larger back warehouses, individual retail stores, and small strip-center retail shopping areas. These spaces vary from groups of small structures along busy streets to large clusters of tall buildings with wide concrete pavements such as parking and streets. Various trees, shrubs, and groundcovers are typically planted within each building's/center's area and differ by owner. This landscape unit is represented by Figure 3.6-4, Key View 1-BRT; Figure 3.6-7, Key View 4-LRT; Figure 3.6-9, Key View 6-LRT; Figure 3.6-13, Key View 10-LRT; Figure 3.6-14, Key View 11-LRT; Figure 3.6-16, Key View 13-LRT; Figure 3.6-17, Key View 14-LRT; Figure 3.6-18, Key View 15-LRT; Figure 3.6-20, Key View 17-LRT; Figure 3.6-21, Key View 18-LRT; Figure 3.6-22, Key View 19-BRT; Figure 3.6-23, Key View 20-BRT; Figure 3.6-27, Key View 24-FWY; Figure 3.6-28, Key View 25-FWY; Figure 3.6-30, Key View 27-FWY; and Figure 3.6-33, Key View 30-FWY (refer to Appendix M).

Freeway Landscape Unit

The freeway landscape unit is located between SR 2 and I-5, I-10, I-210, and I-605. Freeway structures, overpasses, signage, lighting, landscaping, and vehicles compose this unit, which is located at the two ends of the project where SR 710 currently terminates at Valley Boulevard in Alhambra and the proposed northern portion of SR 710 that would extend from I-210 to California Boulevard in Pasadena. Typically, drought-tolerant planting and irrigation are found within State rights of way (ROW). Groundcover may be plants or inorganic materials. This landscape unit is represented by Figure 3.6-5, Key View 2-BRT; Figure 3.6-10, Key View 7-LRT; Figure 3.6-11, Key View 8-LRT; Figure 3.6-12, Key View 9-LRT; Figure 3.6-24, Key View 21-FWY; Figure 3.6-26, Key View 23-FWY; and Figure 3.6-32, Key View 29-FWY (refer to Appendix M).

3.6.2.5 Project Viewshed

A viewshed comprises all the surface areas visible from an observer's viewpoint. The limits of a viewshed are defined as the visual limits of the views from the physical features of the Build Alternatives. The viewshed also includes the locations of viewers likely to be affected by visual changes as a result of the Build Alternatives. The Verdugo Mountains, San Gabriel Mountains, and Santa Ana Mountains are within the viewshed for the SR 710 North Project. Mountains in the viewshed are shown on Figure 3.6-24, Key View 21-FWY; and Figure 3.6-29, Key View 26-FWY (refer to Appendix M), in the background.

3.6.2.6 Visual Quality

Visual quality is evaluated by identifying the vividness, intactness, and unity within a viewshed. FHWA states that this method should correlate with the public's opinions of visual quality well enough to predict those judgments. This approach is particularly useful in highway planning because it does not presume that a highway project is necessarily aesthetically displeasing. This approach to evaluating visual quality also helps in identifying specific measures for reducing, avoiding, or mitigating impacts that may occur as a result of a project. The criteria for evaluating visual quality are:

- **Vividness (V)**: Vividness is the visual power or memorability of landscape components as they combine in distinctive visual patterns.
- **Intactness (I)**: Intactness is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements. It can be present in well-kept urban and rural landscapes, as well as natural settings.
- **Unity (U)**: Unity is the visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual man-made components in the landscape.

The distance limit to assess visual quality was set at 0.2 mi in the SR 710 North Project area. This distance represents a reasonable range within which the physical improvements in the BRT, LRT, and Freeway Tunnel Alternatives would be visible to viewers.

The existing visual quality in the study area is described below by landscape unit:

- **Residential Landscape Unit:** The overall visual quality in the Residential Landscape Units ranges from moderately low to high based on the various neighborhoods in the different cities in the study area. The vividness is low because the landscape components are low. The visual coherence and compositional unity of the natural and man-built landscape as a whole is considered moderate in the Residential Landscape Unit.

- **Recreation/Open Space Landscape Unit**: The overall visual quality is moderate in the Recreation/Open Space Landscape Unit. The vividness consists of the overall harmony between the natural landscape and the skyline on the horizon. The intactness has minimal encroachments within the unit because there are only a few utility power lines. The overall unity contributes to moderately high unity.
- **Education Landscape Unit:** The overall visual quality is low in the Education Landscape Unit. Vividness is low due to the limited landscaping. Intactness is low due to the encroachment of walls, light poles, fences, and utility power lines from the background. Unity is low because there are several elements of fences, walls, playgrounds, buildings, and other facilities in this landscape unit.
- **Industrial Landscape Unit:** The overall visual quality is low in the Industrial Landscape Unit. There are no memorable landscape components that would contribute to vividness. Aboveground utility and power lines, lighting fixtures, and signage result in low intactness. The unity of the Industrial Landscape Unit is moderately low due to the presence of buildings, warehouses, cargo, vehicles, parking lots, and other facilities.
- **Commercial/Retail Landscape Unit:** The overall visual quality is low to moderately low in the Commercial/Retail Landscape Unit. There are no memorable landscape components that would contribute to vividness. Aboveground utility and power lines, lighting fixtures, and signage result in moderately low intactness. The unity of the Commercial/Retail Landscape Unit is also moderately low due to the presence of buildings, vehicles, gas stations, parking lots, and other facilities.
- **Freeway Landscape Unit:** The overall visual quality is moderately low in the Freeway Landscape Unit. Vividness is low because there is minimal visual power of the landscape components. Intactness is low because highway posts, light poles, and utility lines are major encroachments. Unity is moderate because the highway is the main component.

3.6.2.7 Visual Character

Visual character includes attributes such as form, line, color, and texture, and is used to describe but not evaluate those attributes. That is, these attributes are considered neither good nor bad. However, a change in visual character can be evaluated when it is compared with the viewer response to that change. If there is public preference for the established visual character of a specific landscape and resistance to a project that would contrast with that character, then changes in the visual character would be evaluated.

The existing visual character is described below by landscape unit:

- **Residential Landscape Unit:** The Residential Landscape Unit consists of multiple communities in cities that are composed of long-term, single-family and multifamily housing units. The form, line, color, techniques, and materials depend on each household’s preferences regarding design features.
- **Recreation/Open Space Landscape Unit:** Depending on the type of recreational property, visual features such as topography, water elements, vegetation, land area, geology, and structures characterize this landscape unit. It hosts leisure and relaxation activities.

- **Education Landscape Unit:** This landscape unit is represented by institutional facilities characterized by the use of unified materials and amenities such as walkways, lighting, buildings, and site furniture. Open spaces and landscaping are incorporated in this landscape unit.
- **Industrial Landscape Unit:** Industrial buildings are relatively larger in size and low-lying where there are few viewers or views that would be affected. Industrial and warehouse workers are considered the group that would be least impacted by visual changes resulting from the Build Alternatives. The lack of windows in these buildings obstructs the viewers from seeing the landscape unit outside the buildings.
- **Commercial/Retail Landscape Unit:** Commercial buildings are generally located in business parks with small office areas. Office buildings are typically small to medium-sized (including government office complexes such as the Los Angeles County Sheriff's Department in Monterey Park). Retail buildings are typically small strip center styles. These buildings are typically taller where viewers would view the Build Alternatives through windows and doors.
- **Freeway Landscape Unit:** Freeway structures, signage, lighting, landscaping, and vehicles compose the Freeway Landscape Unit, which is located where SR 710 currently terminates at Valley Boulevard in Alhambra and where the proposed northern segment of SR 710 would extend from I-210 to California Boulevard in Pasadena.

3.6.2.8 Viewer Groups

Any person with a view of the Build Alternatives would be considered a viewer. Because it is not feasible to analyze each of these viewers, it is necessary to define viewers in select groups (in relationship to the landscape unit categories) in a representative manner. These viewer groups with visual access to the Build Alternatives are motorists, pedestrians/residents, cyclists, park and recreational facility users, employees, and users of commercial and industrial facilities. Because pedestrian/residents and park and recreation facility users would be viewers with similar visual access to the Build Alternative, they have been grouped together as pedestrians.

Motorists, cyclists, employee and users of commercial and industrial facilities would also be viewers with similar visual access to the Build Alternatives and they have been grouped together as motorists. The viewer groups for the proposed project are as follows:

- **Pedestrians in Residential Landscape Units:** This group of viewers consists mainly of occupants of residential units within view of a given Key View. Viewers in this category tend to be walking, sitting, or standing in or around these units. From these standpoints, this group of viewers would be considered to have a high level of viewer response to the visual changes.
- **Motorists in Residential Landscape Units:** This group is composed of motorists traveling along residential streets. This group of viewers would be considered to have a moderately high response to visual changes.
- **Pedestrians in Recreation/Open Space Landscape Units:** Viewers in this category are at recreational facilities and open spaces and have the expectation of experiencing a comfortable and enjoyable environment. This group of viewers would be considered to have a moderately high response to visual changes.
- **Pedestrians in Educational Landscape Units:** This set of viewers would be focused on activities related to studies and/or teaching. This group of viewers would be considered to have a moderately high response to visual changes.

- **Pedestrians and Motorists in Industrial Landscape Units:** Viewers located in these areas would be focused on going to and from the businesses. This group of viewers would be considered to have a low response to visual changes.
- **Pedestrians in Commercial/Retail Landscape Units:** Viewers located in these areas are focused on going to and from the businesses. This group of viewers would be considered to have a moderate response to visual changes.
- **Motorists in Commercial/Retail Landscape Units:** Viewers in this category have similar views of the surrounding visual elements as pedestrians in the same locations. This group of viewers would be considered to have a moderately low response to visual changes.
- **Motorists in Freeway Landscape Units:** Motorists driving along the freeway normally experience views of elements in the foreground, middle ground, and background over extended periods of time as motorists navigate longer distances on freeways. Changes to existing street scenes or memorable visual elements in the background are easily viewed by this group. However, because the freeway units terminate shortly after entering the project area, these viewers would not be in this unit long enough to have an opportunity to visually experience many elements. These viewers would be considered to have a low response to visual changes.

3.6.2.9 Viewer Response

Viewer response is composed of two elements: viewer sensitivity and viewer exposure. These elements combine to form a method of predicting how the public might react to visual changes brought about by physical changes resulting from the Build Alternatives. The resulting level of visual impact is determined by averaging the severity of the resource change with the degree to which people are likely to be affected by the change. The levels of visual impact are described as follows:

- **Low:** Minor change to the existing visual resource with low viewer response to the change in the visual environment. A low visual impact may or may not require measures to address those types of effects.
- **Moderately Low-** Moderate to moderately low change to the existing visual resource, with low viewer response, or low change with moderate to moderately low viewer response to change in the visual environment. Architectural aesthetic treatments or landscaping could neutralize the impacts upon project completion or within 3 years of finished construction.
- **Moderate:** Moderate change to the existing visual resource with moderate viewer response. A moderate visual impact can be substantially mitigated within approximately 5 years using conventional landscaping treatments (e.g., planting young shrubs and trees that would be able to grow to a sufficient height/width to mitigate the effect within approximately 5 years).
- **Moderately High:** Moderate change to the existing visual resource with a higher viewer response. Extraordinary measures and landscape treatments may be required and would generally take longer than 5 years to substantially mitigate this effect.
- **High:** Excessive change to the existing visual resource with a higher level of viewer response to visual changes such that architectural design and landscape treatment cannot substantially mitigate those impacts. Viewer response level is high and alternative project design may be required to avoid a high level of impact.

Viewer Sensitivity

Viewer sensitivity is defined both as the viewers' concern for scenic quality and their response to changes in the visual resources that make up the view. Local values and goals may confer visual importance on landscape components and areas that would otherwise appear unexceptional. Even when the existing appearance of a project site is uninspiring, a community may still object to projects that fall short of its visual goals. This project has been in the planning process for 40 years, but in analyzing the level of viewer sensitivity, no components are compromised. Viewer activity, local values, and cultural significance maintain their influence on viewer sensitivity. The study area consists of various historical districts, residential landscapes, and cultural landscapes that influence how important existing views are and how much the proposed Build Alternatives will impact the visual character. The viewers from the selected key views for this project, whether historically located or not, have an overall moderate level of sensitivity to little to no impact on sensitivity toward the Build Alternatives.

- **Travelers:** This viewer group includes commuters, passengers, school bus drivers, truck drivers, motorcyclists, and tourists. Passengers have high viewer sensitivity because they are not required to focus their views on the traffic ahead of them and can look at different areas to their right and left and in the distance. All individual views of the Build Alternatives typically have shorter durations due to the constant movement of these viewers. View duration would vary based on time, weather, season, and traffic conditions.
- **Local Communities:** This viewer group involves a larger variety of viewers, including residents, pedestrians on local streets, users of bicycle trails and other recreational facilities, and employees and visitors in commercial, office, retail, and industrial uses. All individual views of the Build Alternatives in this viewer group are typically longer in duration due to the slower speeds while walking on local streets and the longer length of activities in which people engage. View duration would be different based on time, weather, season, and traffic conditions.

Viewer Exposure

Viewer exposure is determined by the number of viewers who would be exposed to views of the Build Alternatives, with a combination of factors such as the viewer's activity, distance from the view, and duration of the view. Longer duration, closer distance, or less movement by the viewer would result in higher viewer exposure. Higher viewer exposure would heighten the importance of visual measures or enhancement associated with the Build Alternatives.

Viewer Awareness

Viewer awareness is determined by the viewer's activity, response to the change in the visual environment, and visual preference (such as local values and cultural importance). Higher visual quality of the view would tend to catch the viewer's attention and make the viewer look at the view more closely and at greater length. High viewer awareness is a critical factor in project design and the resulting measures to address visual changes resulting from the project.

3.6.2.10 Key Views

A total of 30 Key Views were developed to show the visual changes as a result of the conceptual designs of the LRT, BRT, and Freeway Tunnel Alternatives. The Key Views show existing visual characteristics and surrounding conditions as well as future conditions with the project features. Each Key View was chosen to represent a particular landscape unit in a location that showed a high-profile view that an end-user would frequently encounter. These Key Views are described below and are shown on Figures 3.6-4 through 3.6-33, which are provided in Appendix M, Visual Impact Assessment Figures.

Key View 1-BRT

The existing setting and visual simulation for Key View 1-BRT are shown on Figure 3.6-4 (refer to Appendix M). This Key View is at 1100 West Valley Boulevard as it crosses South Atlantic Boulevard in Alhambra. South Atlantic Boulevard is a busy commercial corridor connecting Huntington Drive in South Pasadena to the north and East Los Angeles (and beyond) to the south. The view looking northeast consists of commercial businesses and restaurants. The existing visual quality of this view is moderately low.

The existing vividness of this Key View is moderately low because the intersection includes a cluster of commercial buildings of different colors and varying signage that do not contain any outstanding visual cues that increase eye focus to one element. The existing intactness is moderately low because the streetscape has very little street planting other than a few shrubs with minimal encroachments due to light and signal poles. The existing unity is moderate because the one- and two-story buildings are compatible with each other and create a uniform visual horizon that adds strength to the horizontal visual plane.

Key View 2-BRT

The existing setting and visual simulation for Key View 2-BRT are shown on Figure 3.6-5 (refer to Appendix M). This Key View is on the east side of Fair Oaks Boulevard between State Street and Raymond Hill Road in South Pasadena. Fair Oaks Avenue is a busy commercial corridor connecting Huntington Drive in South Pasadena to the south and Pasadena to the north. The view looking northeast is framed by street trees in front of two-story apartments. The existing visual quality of this view is moderate.

The existing vividness is moderate because the two-story apartments that front Fair Oaks Avenue include various types of street palms that create a memorable visual cluster of vertical elements which help define the view. The existing intactness is moderate because the palm street trees and front-yard landscaping are consistent around each residential unit; there are very few elements that interrupt the visual flow. The existing unity is moderate because the repeating pattern of the two-story apartment buildings forms a consistent front-yard setback.

Key View 3-LRT

The existing setting and visual simulation for Key View 3-LRT are shown on Figure 3.6-6 (refer to Appendix M). This Key View is on the west side of South Mednik Avenue between Civic Center Drive and East 3rd Street in East Los Angeles. The corner of 3rd Street and Mednik Avenue is an important civic hub for East Los Angeles and serves the Chicano Resource Center and the East Los Angeles Library. This area includes a relatively new linear retail/restaurant center with a parking lot behind the buildings. To the north of the retail/restaurant strip, there is a two-story office building. Further to the north there is another single-story strip of retail shops. These two buildings are set back from the street, with parking in the front of the buildings. Chinese flame trees are planted along Mednik Avenue. The existing visual quality of this view is moderately low.

The existing vividness is low considering the break in the retail shop frontage exposes the single bay of parking, wall, and telephone poles beyond, and there are no elements in this view that would attract the eye to one specific area. The existing intactness is moderately low because approximately 90 percent of the area is either paved or covered with buildings, with only limited landscaping at the retail shops and in front of the parking lot. The existing unity is moderately low because there is no natural landscape and the horizontal lines created by the street and travel lanes in the foreground contribute a small degree of uniform visual flow.

Key View 4-LRT

The existing setting and visual simulation for Key View 4-LRT are shown on Figure 3.6-7 (refer to Appendix M). This Key View is west of Mednik Avenue on State Route 60 (SR 60). The existing visual quality of this view is moderately low. Large shade trees cover the hillsides on both sides.

The existing vividness is moderately low because the trees on the slopes screen most of the development along SR 60 and there are no visible memorable features. The existing intactness is moderate because a few utility poles and developments are visible and offer minor intrusions. The existing unity is moderate because landforms and vegetation along both sides of SR 60 are consistent and the upward angle of the travel lanes creates a uniform flow toward a single horizon point.

Key View 5-LRT

The existing setting and visual simulation for Key View 5-LRT are shown on Figure 3.6-8 (refer to Appendix M) along the western boundary of Mednik Avenue. This Key View is within the baseball field at Belvedere Community Regional Park. This is a popular park with a baseball field, a soccer field, a skate park, tennis courts, playgrounds, and picnic areas. Pine trees along the street and clusters of eucalyptus and California pepper trees across the street provide a filtered view of the multifamily apartments on the west side of Mednik Avenue. The existing visual quality of this view is moderately low.

The existing vividness is moderate because the trees along Mednik Avenue and in the background combine and enhance the visual attractiveness and vividness of the view. The existing intactness is moderately low because the tall sports field lighting encroaches into the view and detracts from the view of the vegetation across the street. The existing unity is moderately low because the fencing and light poles create an inconsistent streetscape with no particular pattern.

Key View 6-LRT

The existing setting and visual simulation for Key View 6-LRT are shown on Figure 3.6-9 (refer to Appendix M). This Key View is on East Cesar Chavez Avenue, one block west of Mednik Avenue, and consists of an assortment of commercial uses. The intersection of East Cesar Chavez Avenue and Mednik Avenue is a busy commercial intersection with multifamily apartments on the northeast corner. The existing visual quality of this view is moderately low.

The existing vividness is moderately low because although the streetscape is clean, the building facades and associated signage compete for attention. The street trees bring some order to the views by visually framing the surface of the street. The existing intactness is moderately low because the signage and light fixtures detract from the street planting. The existing unity is moderately low because the competing signage lacks a cohesive pattern and neutralizes the uniform mass of the street in the foreground.

Key View 7-LRT

The existing setting and visual simulation for Key View 7-LRT are shown on Figure 3.6-10 (refer to Appendix M). This Key View is on Floral Drive east of Mednik Avenue. The intersection of Floral Drive and Mednik Avenue is a busy commercial intersection with multifamily apartments on the southeast corner. Several apartment patios face Mednik Avenue and pedestrians frequently use the sidewalks between the neighborhood, the businesses, and Belvedere Community Regional Park. Land uses along the south side of Floral Drive include single-story commercial and industrial buildings and multifamily apartments. The market on the northeast corner of Floral Drive and Mednik Avenue has prominent signage, and several of the single-story industrial sites west of the store on Floral Drive are salvage yards visible from the street. With this assortment of commercial and industrial uses across the street from the vegetated slope of the Monterey Business Center Park, the existing visual quality of this view is moderately low.

The existing vividness is moderate, the existing intactness is moderately low, and the existing unity is low because the commercial strip of businesses along the south side of Floral Drive contrasts with the heavily landscaped slope of trees at the Monterey Park Business Center.

Key View 8-LRT

The existing setting and visual simulation for Key View 8-LRT are shown on Figure 3.6-11 (refer to Appendix M). This Key View is on the south side of the Monterey Park Business Center. The perimeter of the business center's parking lot is screened by eucalyptus, sycamore, sweetgum, white mulberry, shiny xylosma, and Brazilian pepper trees. The existing visual quality of this view is moderate.

The existing vividness is moderate because the edge of the parking lot is set with a backdrop of trees and hedges that creates a memorable visual element. The existing intactness is moderate because the background of dense vegetation creates a consistent background with no man-made elements encroaching into the view. The existing unity is moderately low because a fire department valve and painted curb detract from the consistent backdrop of the tree buffer.

Key View 9-LRT

The existing setting and visual simulation for Key View 9-LRT are shown on Figure 3.6-12 (refer to Appendix M). This Key View is on Interstate 710 (I-710) between commercial office buildings on the east and the Los Angeles County Sheriff's Office property on the west. The view on I-710 is looking north between SR 60 and I-10. I-710 is a busy corridor between Long Beach and West Valley Boulevard in Alhambra with a speed limit of 65 miles per hour (mph). Vegetation on the east side of I-710 is thick, while the western slope is sparsely vegetated. The San Gabriel Mountains can be seen in the background. The existing visual quality of the view is moderately high.

The existing vividness is moderately high because the natural landscape and vegetation on the east side of the freeway, the undeveloped hillside on the west side, and a vista of the San Gabriel Mountains blend together into a memorable view. The existing intactness is moderate because the only man-made features that encroach into the view are the freeway itself, pole lights, and in the distance, fencing at the Monterey Park Golf Course. The existing unity is moderately high because I-710 cuts through the valley of a relatively underdeveloped stretch of Los Angeles County in two large single masses of sky and freeway paving.

Key View 10-LRT

The existing setting and visual simulation for Key View 10-LRT are shown on Figure 3.6-13 (refer to Appendix M). This Key View is on I-10 looking east. I-10 is a major freeway from Los Angeles to the suburbs in the east. In the background, SR 710 crosses above I-10. The visual quality of this view is moderately low.

The existing vividness is moderately low because the view of the I-10/SR 710 interchange is somewhat offset by the wooded residential hillside in the background in Monterey Park. The existing intactness is moderately low because the foreground view of the SR 710 bridges distracts from the wooded residential hillside beyond. The existing unity is moderately low because the man-made features of I-10 and SR 710 are highly visible in front of the wooded residential hillside in Monterey Park and detract from the smooth flow of the I-10 freeway in the foreground and the sky in the upper half of the view.

Key View 11-LRT

The existing setting and visual simulation for Key View 11-LRT are shown on Figure 3.6-14 (refer to Appendix M). This Key View is on SR 710 looking west at the slope below Cal State LA. The slope is planted with grass and groups of trees, most of which are eucalyptus. The existing visual quality of this view is moderate due to the large vegetated hillside.

The existing vividness is moderately high because the large hillside over SR 710 is planted with groundcover and large trees that create a single vivid focal point. The existing intactness is moderate, considering a few utility poles and the fencing on top of the retaining wall encroach into and reduce the quality of the view. The existing unity is moderate because the guardrail and retaining wall form a strong linear horizontal pattern at the base of the vegetated slope.

Key View 12-LRT

The existing setting and visual simulation for Key View 12-LRT are shown on Figure 3.6-15 (refer to Appendix M). This Key View is on Valley Boulevard at the entrance of the on-ramp to southbound SR 710 looking northeast. Valley Boulevard is a busy road connecting El Sereno to the west and Alhambra to the east. The berm on the north side of Valley Boulevard is planted with grass and the existing visual quality of this view is low.

The existing vividness is low even though the hill is undeveloped because the chain-link fence, utility lines, and signage in the background are distracting and do not provide any memorable visual features. The existing intactness is low because the utility lines, traffic signals, and signage encroach into the view. The existing unity is low due to the high contrast between the undeveloped hill and the commercial buildings and signage that creates a stark and inconsistent view.

Key View 13-LRT

The existing setting and visual simulation for Key View 13-LRT are shown on Figure 3.6-16 (refer to Appendix M). This Key View is on Valley Boulevard at the end of the northbound off-ramp of SR 710 looking southwest. The berm on the south side of Valley Boulevard is landscaped with groundcover, shrubs, and trees. The existing visual quality of this view is moderate.

The existing vividness is moderate, considering the hill between the SR 710 mainline and the on- and off-ramps is landscaped, which creates a visual focus point. The existing intactness is moderate because telephone poles encroach into the view of this landscaped hill. The existing unity is moderate because the vertical lines of the telephone poles conflict with the soft horizontal lines of the landscaped hill.

Key View 14-LRT

The existing setting and visual simulation for Key View 14-LRT are shown on Figure 3.6-17 (refer to Appendix M). This Key View is on Front Street looking west from the edge of the historic Shorb Street neighborhood in Alhambra. That residential street terminates at a chain-link fence with a view of the back of a building within an industrial plant. The existing visual quality of this view is moderately low.

The existing vividness is moderately low because the chain-link fence and nondescript building do not add to the character of this residential tree-lined street. The existing intactness is moderately low because the fencing, telephone wires, and commercial building in the background detract from the views of this residential neighborhood. The existing unity is moderately low because the non-descript building in the background does not match the architecture of the residential street and does not blend in to create any uniformity in the view.

Key View 15-LRT

The existing setting and visual simulation for Key View 15-LRT are shown on Figure 3.6-18 (refer to Appendix M). This Key View is along South Fremont Avenue looking at the Fremont Plaza shopping center. South Fremont Avenue is a busy commercial corridor connecting Monterey Park to the south and South Pasadena to the north. This shopping center is well kept and the architecture consists of clean, simple lines and neutral colors. There are low shrubs and short street trees between the sidewalk and the parking lot along South Fremont Avenue. The existing quality of this view is moderately low.

The existing vividness is moderately low, and even though the shopping center is well kept, the view is still of a parking lot in front of big-box retail stores. All these elements are mixed in a way that does not create a focal point for the viewer. The existing intactness is moderately low because the entire surface is impervious paving or buildings except for a few landscaped islands. The existing unity is moderately low because the site is categorized by big-box architecture that does not contribute any uniformity for the viewer.

Key View 16-LRT

The existing setting and visual simulation for Key View 16-LRT are shown on Figure 3.6-19 (refer to Appendix M). This Key View is along Huntington Drive looking west in South Pasadena. Huntington Drive is a busy commercial corridor connecting Los Angeles to the west and San Marino to the east. Large camphor trees on both sides of the street provide a filtered view of the commercial uses along Huntington Drive. The existing visual quality of this view is moderate.

The existing vividness is moderate because the large trees in the median and along both sides of Huntington Drive frame the street and provide a memorable perspective down the street to a horizon point. The existing intactness is moderate because everything fits within the context of the streetscape view with very little intrusion into the view by man-made elements. The flagpole and light fixture on the right side of the view are small in scale relative to the larger trees and street paving. The existing unity is moderate because everything is in scale and the mass of the building on the left is screened by the large shade trees. Additionally, the mass of the street paving and the mass of the sky above are balanced to create an overall uniform view.

Key View 17-LRT

The existing setting and visual simulation for Key View 17-LRT are shown on Figure 3.6-20 (refer to Appendix M). This Key View is along the south side of Huntington Drive between South Fremont Avenue and Fair Oaks Avenue in South Pasadena. Clusters of street trees, including carrotwood and fern pine, provide a filtered view of this commercial block. The existing visual quality of this view is low.

The existing vividness is low because the parking lot is exposed to the street with no screening other than street trees, which creates an unfocused view. The existing intactness is moderately low because utility poles, tenant signage, and a lack of landscape screening diminish the view. The existing unity is moderately low because the expanse of rocks in the center median, impervious paving, and cars create an imbalance within the view.

Key View 18-LRT

The existing setting and visual simulation for Key View 18-LRT are shown on Figure 3.6-21 (refer to Appendix M). This Key View is on Mission Street one block east of Fair Oaks Avenue in South Pasadena. Fair Oaks Avenue is a busy commercial corridor connecting Huntington Drive to the south in South Pasadena and Pasadena to the north. This area is bounded by El Centro on the south, Brent Avenue on the east, Mission Street on the north, and Fair Oaks Avenue on the west. To the left is a parking lot behind a small retail center. Behind this view is a residential neighborhood. There are crape myrtle street trees. The existing visual quality of this view is moderate.

The existing vividness is moderate because of a brick screen wall in front of a surface parking lot and single-story commercial buildings at the front of the commercial zone. There are no structures along the street or behind the trees on the left side of the street. The existing intactness is moderate because low-scale buildings match the trees in the streetscape, with the minor exception of the light fixture in the middle of the view. The existing unity is moderate because the architecture and street plantings are in harmony and create balanced vertical and horizontal views.

Key View 19-LRT

The existing setting and visual simulation for Key View 19-LRT are shown on Figure 3.6-22 (refer to Appendix M). This Key View is on Fair Oaks Avenue. The view looking south is framed by street trees in front of commercial businesses and restaurants. The existing visual quality of this view is moderate.

The existing vividness is moderate because, although this block is the heart of the commercial area of South Pasadena with its historic facades and storefronts, the view lacks distinctive features to distinguish it from any other average commercial area The existing intactness is moderate because this block is accented with historic facades and signage. The man-made elements, including the light fixtures and traffic signal poles, are at a small scale and do not encroach into the view. The existing unity is moderate because the streetscape contains a well-kept group of stores, businesses, and restaurants. There is a balance of between both street and sky from a horizontal perspective and a balance of the building textures from right and left, but the view would be more harmonious if the buildings were taller to balance the width of the road, or the road narrower to balance the heights of the buildings.

Key View 20-LRT

The existing setting and visual simulation for Key View 20-LRT are shown on Figure 3.6-23 (refer to Appendix M). This Key View is on South Raymond Avenue in Pasadena. Raymond Avenue is a busy commercial street starting in north Pasadena and terminating at the power plant on Raymond Hill at East Glenarm Street. The view looking east is framed by scattered street trees, including palms, lemon bottlebrush, and oaks, in front of commercial businesses and warehouses. Some buildings have iconic 1960s architectural features or are otherwise industrial in nature with high-security fencing in the adjacent storage yards. The existing visual quality of this view is moderately low.

The existing vividness is moderately low because this neighborhood is made up of industrial-type warehouses and storage yards. There is very little to create visual focal points for the viewer. The existing intactness is moderately low because although the streetscape is relatively clean, several types of oversized lighting fixtures encroach into the view. The existing unity is moderately low because the streetscape alternates between buildings lining the sidewalk and storage yards with high-security fencing minimizing visual balance and uniformity throughout the view.

Key View 21-FWY

The existing setting and visual simulation for Key View 21-FWY are shown on Figure 3.6-24 (refer to Appendix M). This Key View is looking north on SR 710 just north of the I-10 interchange between Cal State LA on the left and the Midwick Park neighborhood in Alhambra on the right. The existing visual quality of this view is moderate.

The existing vividness is moderate because the eucalyptus trees on the west side of the freeway and the backdrop of the San Gabriel Mountains make this a memorable view. The existing intactness is moderately low because the fencing, the light poles, and the back of the freeway sign detract from the tree-lined road and mountains seen in the background. The existing unity is moderate because the continuous lines of trees, light poles, and fencing form strong repetitive lines in this view.

Key View 22-FWY

The existing setting and visual simulation for Key View 22-FWY are shown on Figure 3.6-25 (refer to Appendix M). This Key View is on the west side of Hellman Avenue facing east toward the overpass over SR 710. Hellman Avenue connects to Alhambra on the east and Cal State LA on the west. The existing visual quality of this view is moderate.

The existing vividness is moderate because the small two-lane bridge leading into the residential neighborhood is framed with heavy foliage and these elements converge to a horizon point in the middle left of the view. The existing intactness is moderate because the campus light fixture in the foreground and the utility poles in the background encroach into the view. The existing unity is moderate because the bridge railing and light poles form a strong repetitive pattern in a curving movement from the bottom left, extending to the middle and then terminating at the horizon point in the middle left of the view.

Key View 23-FWY

The existing setting and visual simulation for Key View 23-FWY are shown on Figure 3.6-26 (refer to Appendix M). This Key View is looking north on SR 710 just north of the Hellman Avenue overpass. The existing visual quality of this view is moderate.

The existing vividness is moderate because the freeway is framed by heavy vegetation on both sides and the San Gabriel Mountains in the background create a memorable scene. The existing intactness is moderate because utility poles encroach into the view along both sides of the freeway. The existing unity is moderate because the trees along the sides of the road and within the freeway median reinforce the horizontal nature of this view.

Key View 24-FWY

The existing setting and visual simulation for Key View 24-FWY are shown on Figure 3.6-27 (refer to Appendix M). This Key View is at the end of SR 710 where the end of the exit ramp meets West Valley Boulevard, looking southwest to where the proposed freeway tunnel off-ramp would connect to West Valley Boulevard. Existing West Valley Boulevard connects to heavily used on- and off-ramps in the City of Alhambra. The existing visual quality of this view is moderate.

The existing vividness is moderate because the scene is a nicely landscaped berm that serves as the visual focal point for the viewer. The existing intactness is moderately low considering the utility poles and traffic signs that encroach into the views of the landscape and the view in general. The existing unity is moderate because the larger part of the view is dominated by the landscaped berm. This berm, the sky, and the street result in three distinct visual masses in uniform proportion.

Key View 25-FWY

The existing setting and visual simulation for Key View 25-FWY are shown on Figure 3.6-28 (refer to Appendix M). This Key View is looking northeast where the West Valley Boulevard on-ramp begins to connect to SR 710. West Valley Boulevard is a major gateway into Alhambra from SR 710. A large berm dominates the view on the north side of West Valley Boulevard between the on-ramp and off-ramp. The existing visual quality of this view is moderately low.

The existing vividness is moderate because the large berm dominates the north side of West Valley Boulevard between several businesses. The existing intactness is low considering that utility poles, power lines, and a variety of business signage disrupt the view of this streetscape. The existing unity is moderately low because the clutter of utilities and signage affects the proportions of the view and there are no distinct visual masses or flows for the viewer.

Key View 26-FWY

The existing setting and visual simulation for Key View 26-FWY are shown on Figure 3.6-29 (refer to Appendix M). This Key View is from Singer Park on St. John Avenue looking northeast and is at the intersection of St. John Avenue and California Boulevard. A view of the San Gabriel Mountains can be seen in the background. The existing visual quality of this view is moderately low.

The existing vividness is moderate because it is an orderly streetscape consisting of large shade trees canopied over two-story residential buildings that serve as the focus of the view. The existing intactness is moderately low because a few street signs and utility poles encroach into the streetscape. The existing unity is moderately low because the scale of the residential architecture sets a uniform pattern along the street. However, there are no visual masses to create patterns and uniformity with the exception of the sky.

Key View 27-FWY

The existing setting and visual simulation for Key View 27-FWY are shown on Figure 3.6-30 (refer to Appendix M). This Key View is at the intersection of two major roads in Pasadena. The view is looking north-northwest from the intersection of California Boulevard and South Pasadena Avenue toward the existing SR 710 stub terminus. The existing community consists mainly of commercial and institutional uses. The visual character includes mature landscaping and trees. The existing visual quality of this view is moderate.

The existing vividness is moderately high due to the skyline of mature trees that occupy the majority of the view. This large mass of trees creates a lush greenbelt, making this element dominant over the street and surrounding structures. The existing intactness is moderate because there are very few visual intrusions of man-made elements into this view. The surrounding streets serve to visually balance the mass of the trees. The existing unity is moderate because the linear pattern of the trees, the configuration of the street, and the visual character of the street striping all work together in the view.

Key View 28-FWY

The existing setting and visual simulation for Key View 28-FWY are shown on Figure 3.6-31 (refer to Appendix M). This Key View looks east down Del Mar Boulevard on the west side of the SR 710 terminus from Maranatha High School toward the southern edge of downtown Pasadena. The existing visual quality of this view is moderately low.

The existing vividness is moderately low considering the overpass bridge leads across the end of the SR 710 stub terminus toward apartments and businesses which create minor points of visual interest. The existing intactness is moderately low because street signage and lighting encroach into this view across the overpass bridge. The existing unity is moderate due to the railing, light poles, and scale of the buildings strengthening the pattern of the streetscape scene. There is a clear massing of street paving and sky to create visual balance and uniformity.

Key View 29-FWY

The existing setting and visual simulation for Key View 29-FWY are shown on Figure 3.6-32 (refer to Appendix M). This Key View is on the SR 710 stub just north of the Del Mar Boulevard overpass bridge. The SR 710 stub terminus handles a high volume of vehicular traffic traveling south toward the downtown Pasadena exits. The existing visual quality of this view is moderate.

The existing vividness is moderate because the tall grouping of mature trees on the west side of SR 710 offers a memorable focal point for the viewer. The existing intactness is moderately low considering that the tall light poles on the Del Mar Boulevard overpass bridge and the construction trailers and concrete barriers in the median of the freeway distract from the view. The existing unity is moderate because the linear forms of the freeway lanes, fencing, and roadside landscaping provide strong patterns of visual flow for this view.

Key View 30-FWY

The existing setting and visual simulation for Key View 30-FWY are shown on Figure 3.6-33 (refer to Appendix M). This Key View is on the western side of the Colorado Boulevard bridge overpass of the SR 710 stub terminus. The existing visual quality of this view is moderately low.

The existing vividness is moderately low considering the overpass bridge leads across the SR 710 stub terminus toward businesses in downtown Pasadena and creates no strong visual accents. The existing intactness is moderately low because the heights of the buildings gradually change to taller buildings in the background and the traffic signals and lighting fixtures encroach into the view. The existing unity is moderate because the tree-lined boulevard frames the gradual progression of building forms leading into downtown Pasadena. These combine to delineate a view dominated by two strong visual masses: sky and street pavement.

3.6.3 Environmental Consequences

Table 3.6.1 provides the visual quality ratings for all the Key Views for existing conditions and for the with-project conditions for the BRT, LRT, and Freeway Tunnel Alternatives. (Please note that the tables cited in this section are provided at the end of this section.) The overall visual quality rating, which ranges from 1.0 to 7.0 (or from very low with poor experience to very high with good experience), is an average of the three criteria ratings: vividness, intactness, and unity. The use of these evaluation criteria helps to establish an existing baseline to evaluate the potential effects of the Build Alternatives on the visual quality of each Key View. In addition to the visual quality analyses, viewer groups are identified and viewer exposure, viewer sensitivity, and visual character are analyzed for each Key View.

3.6.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives and, as a result, would not result in any short-term visual effects.

Build Alternatives

Short term visual impacts would occur to viewer groups during the construction period. Those effects would include views of demolition of existing structures; removal of existing mature vegetation; grading of cut-fill slopes; construction of tunnel, bridge, and road structures; construction vehicles; construction staging areas; temporary roadside barriers; and construction lighting and signage. The effects of vegetation clearing would gradually cease over time as replacement landscaping for the SR 710 North Project matures. New plantings can reasonably be expected to reach mature growth within a 1- to 3-year period (depending on the species and initial planting size). Some tree species could take longer to reach mature growth.

TSM/TDM Alternative

The TSM/TDM Alternative would have short-term temporary impacts due to construction activities. Construction of the TSM/TDM Alternative could take 2 years. Moderate to moderately high visual impacts would occur for the duration of the construction work. However, the visual impacts related to construction activities would cease after completion of construction.

BRT Alternative

The BRT Alternative would have short-term temporary impacts due to construction activities. Construction of the BRT Alternative could take 14 months. Moderate to moderately high visual impacts would occur for the duration of the construction work. However, the visual impacts related to construction activities would cease after completion of construction.

LRT Alternative

The LRT Alternative would have short-term temporary impacts due to construction activities. Construction of the LRT Alternative could take 6 years. Moderate to moderately high visual impacts would occur for the duration of the construction work. However, the visual impacts related to construction activities would cease after completion of construction.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative would have short-term temporary impacts due to construction activities. Construction of the tunnel for the Freeway Tunnel Alternative could take up to 4.9 years. A moderately low to moderate visual impact would occur for the duration of the construction work.

3.6.3.2 Permanent Impacts

In order to analyze the project alternatives, key views were selected as representative views of the project. Impacts and mitigation measures would extend beyond these key views, but the key view analysis should represent the expected impacts and potential mitigation measures. To assist in the evaluation of potential visual impacts, computer simulations of the future improvements visible from each of the Key Views were prepared. The visual simulations for the Key Views are shown on Figures 3.6-4 through 3.6-33 (refer to Appendix M), which also include photographs of the existing setting at the location of each Key View.

Noise barriers have been proposed as preliminary noise abatement measures. These barriers are recommended and final determination of locations and heights of the barriers will be determined after the public input process and identification of the Preferred Alternative. The potential visual effects of these preliminary barriers are presented in the discussion below.

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives and, as a result, would not result in any permanent visual effects.

Build Alternatives

TSM/TDM Alternative

Key Views

There were no Key Views for the TSM/TDM Alternative because this Build Alternative mainly involves minor improvements to existing roads and intersections without substantive changes in physical facilities or views to/from those improvements. As a result, there would only be minor physical changes to the physical and visual environments. In addition, due to the low-profile (ground-level) nature of these improvements and the low perspective of potential viewers, the TSM/TDM Alternative would not result in substantial permanent visual impacts.

Noise Barriers

For preliminary noise barriers proposed for the TSM/TDM Alternative, visual impacts would range from low to high. Visual impacts would vary depending on wall locations, the viewers affected, and barrier heights. Taller walls will generally have a higher visual impact. Preliminary noise abatement measures proposed for the TSM/TDM Alternative include 7 TSM/TDM Noise Barriers (TNBs): 2 for Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10), 1 for Local Street Improvement L-5 (Rosemead Boulevard from Lower Azusa Road to Marshall Street), 2 for Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road), and 2 for Other Road Improvement T-2 (State Route 110 [SR 110]/Fair Oaks Avenue Hook Ramps).

L3/TNB No. 1 would be an approximately 48 ft long barrier that ranges in height from 16 to 20 ft and would be located along the perimeter of the private swimming pool area at the Atlantic Riviera Apartments located at 1417 South Atlantic Boulevard. L3/TNB No. 1 would be visible from the adjacent multifamily residences. Given that a noise barrier height approaching 20 ft may be considered, there would be a moderate to moderately high visual impact to the multifamily residences. Taller walls would have a higher visual impact.

L3/TNB No. 2 would be an approximately 46 ft long barrier that ranges in height from 6 to 20 ft and would be located along the private property line of 1721 South Atlantic Boulevard. L3/TNB No. 2 would be visible from the adjacent single-family residences. Given that a noise barrier height approaching 20 ft may be considered, there would be a moderate to high visual impact to the single-family residences. to high impact. Visual impact would vary depending on the wall location, viewers affected, and barrier height. Taller walls will generally have a higher visual impact.

L5/TNB No. 1 would be an approximately 202 ft long barrier that ranges in height from 6 to 14 ft and would be located along the private property line of the single-family residence at 3955 Rosemead Boulevard. L5/TNB No. 1 would be visible from the adjacent single-family residences and the surrounding commercial properties. Given that a noise barrier height approaching 14 ft may be considered, there would be a moderately high visual impact to the single-family residences and a low impact to neighboring commercial properties.

T1/TNB No. 1 would be an approximately 1,247 ft long barrier, with a height of 8 ft, that would be located along the State ROW/private property line along the northbound side of SR 710, south of Valley Boulevard. T1/TNB No. 1 would be visible from the adjacent single-family residences along Westmont Drive. Given that a noise barrier height would be 8 ft and the view of SR 710 from the residences is currently shielded by vegetation, there would be a moderate to high visual impact to the single-family residences.

T1/TNB No. 2 would be an approximately 963 ft long barrier that ranges in height from 16 to 20 ft and would be located along the edge of shoulder on the southbound side of SR 710, south of Valley Boulevard. Given the distance of the single-family residences along southbound SR 710, these barriers would not be highly visible. Therefore, the visual impact to the single-family residences would be low.

The following noise barriers were proposed for Other Road Improvement T-2 (SR 110/Fair Oaks Avenue Hook Ramps). However, subsequent to the circulation of the Draft EIR/EIS, and in an effort to minimize adverse visual effects to historic resources, the following noise barriers were no longer proposed:

- T2/TNB No. 1 would be an approximately 743 ft long barrier that ranges in height from 6 to 16 ft and would be located along the northbound side of SR 110 and along the State ROW and private property line.
- T2/TNB No. 2 would be an approximately 963 ft long barrier that ranges in height from 12 to 20 ft and would be located on the southbound side of SR 110, along the State ROW and the edge of State Street. Light, Glare, and Shade and Shadows

The TSM/TDM Alternative would include new signage, traffic lights, traffic lanes, and roads, which would minimally increase lighting in existing business and residential areas. However, lighting associated with those improvement fixtures would be fitted with shields to focus light onto roads and to minimize light spillage onto adjacent land uses.

Glare impacts associated with the TSM/TDM Alternative would be limited. Changes in timing and duration of the traffic control cycles would not noticeably create or lessen glare; they would just change the cycles of lighting during peak or low traffic times. The TSM/TDM Alternative would manage the volume of traffic during peak travel hours with the addition of travel lanes, which would result in minimal glare impacts. In addition, glare from new automotive traffic on new roads would be dissipated by means of distance from source to viewer.

The TSM/TDM Alternative would have no shade or shadow impacts because this alternative manages traffic flow by systemically programming and monitoring traffic and by accommodating traffic with new lanes on existing streets and/or on new roads. Because all the TSM/TDM Alternative improvements involve either management of traffic, reconfiguration of existing streets, or addition of new roads, the TSM/TDM Alternative would not contribute to or create new sources of shade or shadow.

In summary, the TSM/TDM Alternative would not result in permanent impacts related to views, light, glare, and shade and shadows.

BRT Alternative

Key Views

Figure 3.6-A (below) shows a visual resource change that is the average of change in visual quality and character compatibility. There would be no change to visual quality as shown in the view simulations on Figure 3.6-4, Key View 1-BRT, and Figure 3.6-5, Key View 2-BRT (refer to Appendix M) during operation of the BRT Alternative. Additionally, as shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the BRT Alternative is rated 0.0, showing a no change rating for both Key Views 1-BRT and 2-BRT. Character change would be very low, 0.0 for both key views. Since character change is compatible, the change is positive. The overall resource change would be low as well. Figure 3.6.2 shows viewer response which is the average of viewer sensitivity and viewer exposure. Viewer response would range from moderate, such as in Key View 1-BRT to moderately high in areas similar to Key View 2-BRT. Therefore, operation of the BRT Alternative would result in a moderately low to moderately permanent visual impact due to a low resource change.

Noise Barriers

The preliminary noise barriers proposed for the BRT Alternative are BRT Noise Barriers (BNB) No. 1, No. 3, and No. 5. BNB No. 1 would be a 340 ft long barrier, with a height ranging from 10 to 18 ft, along the private property line of the multifamily use along Atlantic Boulevard and De La Fuente Street. BNB No. 3 would be a 623 ft long barrier, with a height ranging from 6 to 20 ft, within the private property line of the residences along Atlantic Boulevard and De La Fuente Street. BNB Nos. 1 and 3 would be visible from adjacent multifamily residences along South Atlantic Boulevard. Given that a noise barrier height approaching 20 ft may be considered, there would be a moderate to moderately high visual impact to the multifamily residences, depending on the height of the barrier. The barrier would block views and light to first-story landscapes and windows and would potentially block views for upper story windows.

BNB No. 5 would be a 623 ft long barrier, with a height ranging from 6 to 10 ft, along the private property line at the northeast corner of Atlantic Boulevard and San Marino Avenue. BNB No. 5 would be visible from the adjacent single-family residences along Atlantic Boulevard. Given that BNB No. 5 is only feasible and reasonable up to 10 ft, there would be a moderately high visual impact to the single-family residences nearby.

Light, Glare, and Shade and Shadows

The BRT Alternative would slightly increase vehicle lights along the bus route although this would represent only a very minor increase in lighting along those routes.

Glare impacts associated with the BRT Alternative would be limited because vehicles operating along the bus routes would be similar to the existing vehicles on those routes. The BRT Alternative bus stops would have shielded lighting to direct glare away from the surrounding land uses.

The BRT Alternative would have minimal shade and shadow impacts. The widening of the roadway for the bus lanes would shift existing utilities at some locations. However, there would not be an addition or reduction in the amount of shade and shadows due to utility relocations, only a shift in locations of where the shade and shadows would occur (Key Views 1-BRT and 2-BRT). New bus stops and signage, due to their small vertical profiles, may contribute a small amount of new shade and shadows to the immediate surrounding areas. The sources of new shade and shadows would affect a very small area and would likely not impact any nearby businesses or homes.

In addition to the effects of the noise barriers described above, the BRT Alternative would also include the moderate to high visual effects of 5 of the 7 noise barriers included in the TSM/TDM Alternative (the remaining 2 noise barriers are for Local Street Improvement L-3 [Atlantic Boulevard from Glendon Way to I-10], which is not included in the BRT Alternative) described earlier in this section. The TSM/TDM Alternative would not result in permanent impacts related to views, light, glare, shade, and shadows; therefore, the TSM/TDM Alternative improvements included in the BRT Alternative would not result in any of those types of impacts as part of the BRT Alternative.

Therefore, the BRT Alternative would not result in permanent impacts related to views, light, glare, and shade and shadows.

LRT Alternative

Key Views

As shown in Table 3.6.2, the potential effects of the LRT Alternative on 18 Key Views were evaluated. Figures 3.6-6 through 3.6-23 (refer to Appendix M) show the existing views at those Key View locations and provide visual simulations of the future with LRT Alternative conditions at those Key Views. Table 3.6.2 describes the permanent changes in visual quality at these Key Views between the existing conditions and the future with LRT Alternative conditions. Figures 3.6-A, 3.6-B, and 3.6-C discussed in this section are provided following the last page of Table 3.6.3 in this section.

Landscape units in the LRT Alternative include Recreation, Commercial, Freeway, and Residential. Viewer groups include Recreation, Commercial, Freeway, and Residential pedestrians and motorists. Table 3.6.1 shows visual quality for the LRT Alternative. As shown in Table 3.6.1, the existing visual quality ranged from moderately low to moderately high. Visual quality after implementation of the LRT Alternative would be low to moderately high. Visual quality change ranged from -1.9 to 1.1, moderately low to low. Figure 3.6-A shows that character compatibility ranged from poor compatibility to moderately good compatibility, depending on the Key View. Figure 3.6-A shows resource change for the LRT Alternative ranged from -2.0 to 1.6, low to moderately low, including some views with very little change. Figure 3.6-C shows the LRT Alternative resource change, viewer response, and visual impact. Viewer response for the LRT Alternative ranged from 2.0 to 5.5, low to high. Visual impact for the LRT Alternative ranged from -3.0 to 3.3, moderately low to moderate. For detailed descriptions of changes and impacts, see Figures 3.6-6 through 3.6-23 (Key View 3-LRT through Key View 20-LRT) for the LRT Alternative. Table 3.6.2 is provided following the last page of text in this section. Key Views for the LRT Alternative are provided in Appendix M.

Noise Barriers

There are no noise barriers proposed for the LRT Alternative.

Light, Glare, and Shade and Shadows

In the LRT Alternative, traffic light fixtures installed along the elevated LRT facility, such as in Key Views 3-LRT, 4-LRT, 5-LRT, 6-LRT, 7-LRT, 8-LRT, and 10-LRT, would add increased night lighting to some surrounding neighborhoods. The effects of this new light would be partially reduced based on the use of light control appliances on the light fixtures.

Glare from the elevated segment of the LRT Alternative would be minimized by the distance of the viewer from the LRT vehicles and by the implementation of various screening devices, including direct lenses and glare shields. Glare spillage would be further minimized based on the use of light shields on the new light fixtures.

During hours where the sun is low to the horizon (e.g., early morning, evening, and during the winter solar declination season [September through March]), the elevated LRT facility would create shade and/or shadows throughout the study area. The acute angle of the sun relative to the ground would create longer shadows during these times. The shade and shadows created by the elevated LRT facility would impact the neighborhoods shown in Key Views 3-LRT, 5-LRT, 6-LRT, 7-LRT, 8-LRT, 12-LRT, and 13-LRT. However, due to the narrow width and thin profile of the elevated segments of the LRT facility, the shadows cast on those neighborhoods would be minimal and short in duration. In addition, the new screen wall along the Shorb Street neighborhood shown in Key View 14-LRT would cast afternoon shadows on the residents' backyards but for a duration of less than 2 hours. Less than 2 hours of shade would be a low visual impact, considering that the day length in this area is between 10 hours and 14 hours, depending on the season.

The LRT Alternative would also include the moderate to high visual effects of 5 of the 7 noise barriers included in the TSM/TDM Alternative (the remaining 2 noise barriers are for Other Road Improvement T-1 [Valley Boulevard to Mission Road Connector Road], which is not included in the LRT Alternative) described earlier in this section. The TSM/TDM

Alternative would not result in permanent impacts related to views, light, glare, shade, and shadows and, therefore, the TSM/TDM Alternative improvements included in the LRT Alternative would not result in any of those types of impacts as part of the LRT Alternative.

Therefore, the LRT Alternative would result in low permanent impact related to light, glare, and shade and shadows.

Freeway Tunnel Alternative

Key Views

As shown in Table 3.6.3, the potential effects of the Freeway Tunnel Alternative on 10 Key Views were evaluated. Figures 3.6-24 through 3.6-33 (refer to Appendix M) show the existing views at those Key View locations and provide visual simulations of the future with Freeway Tunnel Alternative conditions at those Key Views. Table 3.6.3 describes the permanent changes in the visual quality at these Key Views between the existing conditions and the future with Freeway Tunnel Alternative conditions. Table 3.6.3 is provided following the last page of text in this section. Key Views for the Freeway Tunnel Alternative are provided in Appendix M.

Landscape units in the Freeway Alternative include Recreation, Commercial, Freeway, and Education. Viewer groups include Recreation, Commercial, Freeway, and Education pedestrians and motorists. Figure 3.6-A shows Resource Change, which is an average of visual quality change and character compatibility. Character compatibility ranged from poor compatibility to good compatibility, depending on the Key View. Visual quality change ranged from -0.7 to 1.0, low change at the most. Resource change for the Freeway Alternative ranged from -0.9 to 1.5, low to moderately low. Figure 3.6-B shows viewer response, which is the average of viewer sensitivity and exposure. Viewer response for the Freeway Alternative ranged from 2.0 to 5.0, low to moderately high. Figure 3.6-C shows the Freeway Alternative resource change, viewer response, and visual impact. Visual impact for the Freeway Alternative ranged from -2.4 to 3.3, moderately low to moderate. For more detailed descriptions, see analysis of Key View 21-FWY through Key View 30-FWY.

Noise Barriers

Preliminary noise barriers proposed for the Freeway Tunnel Alternative dual-bore and single-bore design variations are Freeway Tunnel Noise Barrier (FTNB) Nos. 5, 7, 8, and 10. Additional preliminary noise barriers proposed only for the dual-bore design variation are FTNB Nos. 6D and 9. Visual impacts as a result of the noise barriers would range from moderately low to high, depending on the wall location, height, and affected viewer group.

FTNB No. 5 would be a 1,801 ft long barrier, with a height ranging from 6 to 20 ft, located along State ROW and the private property line of multiple single-family residences along Charnwood Avenue and Westmont Drive. FTNB No. 5 would be visible from residences (some of which have existing 6 ft high wood fences) along SR 710. Given that a noise barrier height approaching 20 ft may be considered, there would be a moderately low to moderately high visual impact to the single-family residences based on the height of the wall. Taller walls would have a higher visual impact. The visual impact of FTNB No. 5 is also analyzed as part of Key View 23-FWY, where the overall visual impact of the Built Alternative was determined to be a low impact to freeway motorists.

FTNB No. 6D would be a 1,404 ft long, with a height of 14 ft, and FTNB No. 8 would be a 406 ft long barrier, with a height ranging from 6 to 14 ft. These walls would be along the State ROW/private property line on the west side of SR 710 south of Valley Boulevard, shielding multiple single-family homes along Highbury Avenue. These barriers would be visible from the adjacent single-family residences along Highbury Avenue. Given that the noise barrier heights could approach between 14 ft, there would be a moderate to moderately high visual impact to the single-family residences, depending on the relative height of the wall.

FTNB No. 7 would be an approximately 673 ft long barrier, with a height of 12 ft for both the single and dual-bore design variations and would be located along the Caltrans ROW/private property line on the west side of SR 710, south of Valley Boulevard. The barrier would be visible from multiple adjacent single-family residences. This barrier would be built if the private land is donated[1] by the property owners. Given that the noise barrier would be considered at a height of 12 ft, there would be a moderately low visual impact to the single-family residences adjacent to the barrier.

FTNB No. 9 would be an 84 ft long barrier, with a height ranging from 6 to 14 ft, located within the private property line of the commercial property at the corner of Pasadena Avenue and Colorado Boulevard. FTNB No. 9 for the Freeway Tunnel Alternative dual-bore design variation would be visible from the restaurant at the corner of Pasadena Avenue and Colorado Boulevard. Given that a noise barrier height approaching 14 ft could be considered which would reduce the visibility of the commercial business to motorists traveling along Colorado Boulevard, there would be a moderate impact to viewers outside the restaurant, and a high visual impact to those inside the restaurant.

FTNB No. 10 would be a 1,207 ft long barrier, with a height ranging from 10 to 20 ft for the single-bore design variation and a height of 10 ft or a height ranging from 14 to 20 ft for the dual-bore design variation. This wall would be along the State ROW/private property line was analyzed at the northeast quadrant of the I-210 and SR 134 interchange shielding multiple single-family homes along Orange Grove Place and Cypress Avenue. FTNB No. 10 would be visible from the adjacent single-family residences. Given that a noise barrier height approaching 20 ft may be considered, there would be a moderately high to high visual impact to the single-family residences.

Light, Glare, and Shade and Shadows

With the headlights of automobiles traveling at a horizontal light of sight, it is anticipated that the vehicle light under the Freeway Tunnel Alternative would not impact the surrounding land uses. In addition, with light intensity being inversely proportional to distance, the new light fixtures in the Freeway Tunnel Alternative would be placed at a far enough distance from the surrounding neighborhoods to result in no impacts.

[1] For a barrier for which the cost exceeds the reasonable allowance with the cost of right-of-way included, that barrier was also analyzed as if the resident(s) would be willing to donate the right-of-way for the barrier. This was to assess whether the barrier cost would be less than the total reasonableness allowance if the right-of-way was donated and no cost for right-of-way acquisition was included in the cost of the barrier. For noise barrier FTNB No. 7, the barrier became reasonable at some heights with donated right-of-way. For this barrier, a process will be carried out in which the affected residents are surveyed for their opinion on the proposed abatement (barrier), per the Protocol.

The new non-tunnel segments of the Freeway Tunnel Alternative would be built below the existing grade level leading to the tunnel portals. Therefore, vehicle headlight glare would be minimal. In addition, light fixtures will be designed to direct light onto the freeway facilities and away from adjacent land uses.

Because the majority of the Freeway Tunnel Alternative would be below grade or in a valley, shade and shadows would only be cast along the shoulder of the road, and no shade or shadows would be cast on adjacent land uses such as residential areas.

In addition to the effects of the noise barriers described above, the Freeway Tunnel Alternative would also include the moderate to high visual effects of 3 of the 7 noise barriers included in the TSM/TDM Alternative (the remaining 4 noise barriers are for Other Road Improvements T-1 [Valley Boulevard to Mission Road Connector Road] and T-2 [SR 110/Fair Oaks Avenue Hook Ramps], which are not included in the Freeway Tunnel Alternative) described earlier in this section. The TSM/TDM Alternative would not result in permanent impacts related to views, light, glare, shade, and shadows and, therefore, the TSM/TDM Alternative improvements included in the Freeway Tunnel Alternative would not result in any of those types of impacts as part of the Freeway Tunnel Alternative.

Therefore, the Freeway Tunnel Alternative would not result in any permanent impacts related to light, glare, and shade and shadows based on the location of the improvements in this alternative and the incorporation of light fixtures that minimize light spillage onto adjacent land uses.

3.6.4 Avoidance, Minimization, and/or Mitigation Measures

3.6.4.1 Measures for Long-Term Visual Impacts

Measures V-0 through V-6, below, describe specific concepts to avoid, minimize, and/or mitigate long-term visual impacts of the Build Alternatives related to vividness, intactness, and unity. In order to analyze the project alternatives, key views were selected as representative views of the project. The impacts and measures would extend beyond these key views, but the key view analysis represents the expected impacts and potential measures to address those impacts. In areas where the ratings of any of the three criteria are lowered as a result of the Build Alternatives (resulting in an impact), the following measures will be used to lessen those impacts.

Measure V-0 **Corridor-Wide Aesthetics Master Plan (applies to Preferred Alternative):** A Corridor-Wide Aesthetics Master Plan will be prepared and the detailed and specific measures provided in Measures V-1 through V-6 will be incorporated in the Plan, as appropriate, for the Preferred Alternative during final design.

Measures V-1 through V-6, below, will be incorporated into the *Corridor-Wide Aesthetics Master Plan* for the Preferred Alternative. That Plan will be developed during final design for the Preferred Alternative and will include the following treatment and consultation conditions:

- Identification of specific aesthetic treatments and the locations for those treatments in the Preferred Alternative. Those treatments will be based on the specific design concepts developed in Measures V-1 to V-6, below, related to walls, structures, and landscaping. Specific design treatments such as lighting style, colors, graphics and decorative railing will be developed during the final design phase of the project.

- Plan development in consultation and partnership with the cities/communities where the project features are located, other interested parties/stakeholders, Caltrans, and Metro. Input will be solicited from the cities with jurisdiction, communities, interested parties, and stakeholders specifically related to the desired visual character of the project improvements, the spirit and community culture of each area, and historic values of the communities.
- Implementation as appropriate during the design and construction of the project improvements.

Measures V-1 through V-6, below, provide design/concept methodologies to address the long-term visual impacts of the features included in the Build Alternatives. With the incorporation of the requirements of Measures V-1 through V-6 into the *Corridor-Wide Aesthetics Master Plan*, the long-term impacts of the Build Alternatives, including the Preferred Alternative, would be substantially lessened.

Measure V-1

Vividness (applies to the Light Rail Transit [LRT] and Freeway Tunnel Alternatives): The Los Angeles County Metropolitan Transportation Authority (Metro) (LRT Alternative) and the California Department of Transportation (Caltrans) (Freeway Tunnel Alternative) will address effects of the Build Alternatives related to a reduction in the vividness of views based on inclusion of the following in the final design:

- A single visual element will be introduced into the affected view to serve as a visual focal point in the view. An example of this concept would be to introduce a single specimen tree or a signature architectural feature in view.
- Screening to diminish distracting visual elements and increase the perception/value of another visual element will be added. An example of this concept is to add landscaping and/or architectural components to screen distracting views.
- Visual elements will be added to lend additional focus to an existing accent visual element. An example of this concept is to add trees on both sides of the Key View to visually frame and emphasize an existing visual highlight in the middle of the view.

Measure V-2

Intactness (applies to the LRT and Freeway Tunnel Alternatives): Metro (LRT Alternative) and Caltrans (Freeway Tunnel Alternative) will address effects of the Build Alternatives related to a reduction in the intactness of views based on inclusion of the following in the final design:

- Screening such as landscaping or architectural features will be added to diminish the intrusions of new structures into the view. An example of this will be to visually screen intruding power lines and support structures with landscaping.
- Encroaching elements will be undergrounded or relocated. An example of this is to relocate or underground visible utility lines.

- Intruding objects will be disguised with architectural features, textures, and/or colors. An example of this is to add architectural features to light fixtures or traffic signals that encroach into a view.

Measure V-3 **Unity (applies to the LRT and Freeway Tunnel Alternatives):** Metro (LRT Alternative) and Caltrans (Freeway Tunnel Alternative) will address effects of the Build Alternatives related to a reduction in the unity of views based on inclusion of the following in the final design:

- Screening such as landscaping or architectural features will be added to minimize visual elements that distract from the visual flow of the view. An example of this is to add elements to screen views of new structures or buildings.
- Visual elements will be emphasized to help balance the view into major masses of visual space. An example of this is to add visual elements such as landscaping to minimize the views of new construction and maintain the balance of the view.
- Repetitive elements will be added into the view to introduce or strengthen visual patterns or rhymes of a view. An example of this is to add repetitive elements such as bollards, street trees, flagpoles, or other features to visually tie the view together.

Measure V-4 **Walls with Aesthetic Treatments (applies to all four Build Alternatives):** The final designs of sound walls and retaining walls adjacent to identified viewer groups or within sensitive Key Views within State-owned right of way and for the Freeway Tunnel Alternative will be based on Caltrans Highway Design Manual standards and consideration of community input. Metro design standards will be used for the Transportation System Management/ Transportation Demand Management, Bus Rapid Transit, and LRT Alternatives. The wall designs will include enhancements such as, but not limited to, graphic patterns and colors based on input gathered from the local community, stakeholders, and Caltrans.

Measure V-5 **Built Structures (applies to the LRT Alternative):** Metro will design the project structures (buildings, columns, retaining walls, sound walls, tunnels, portals, and elevated LRT facilities) to blend with or enhance the surrounding areas. Design considerations such as placement, orientation, shape of structure, color, and type of materials used, and addition of decorative features will be incorporated as appropriate in the project structures.

Measure V-6 **Landscaping (applies to the LRT and Freeway Tunnel Alternatives):** Metro (LRT Alternative) and Caltrans (Freeway Tunnel Alternative) will address different levels of visual impacts related to walls and berms and for screening views of project features during final design as follows:

- Low impacts will be addressed based on the incorporation of limited amounts of vines and shrubs and/or trees.
- Moderate impacts will be addressed with a higher concentration of vines, shrubs, trees and/or larger plant materials to minimize visual effects within 5 years. Additional modifications and/or aesthetic treatments may be incorporated into the final landscaping design based on input from viewers of moderately impacted areas.
- Moderately high visual impacts will be addressed with a berm planted with ground cover, shrubs, and trees where space allows. Additional modifications and/or aesthetic treatments may be incorporated into the final landscaping design with input from viewers of moderately impacted areas.

3.6.4.2 Measure for Short-Term Visual Impacts during Construction

Measure V-7

Short-Term Visual Effects (applies to all four Build Alternatives). During final design, Metro (TSM/TDM, BRT, and LRT Alternatives) and Caltrans (Freeway Tunnel Alternative) construction, staging, and materials storage areas will be identified on the construction staging plans during the Plans, Specifications and Estimates (PS&E) phase. The final design will include features to minimize views of those areas, including but not limited to: temporary screening, installation of temporary and/or permanent landscaping (particularly trees and shrubs) as early in the construction process as feasible, and/or installation of temporary and/or permanent berms. Metro and Caltrans will require the Construction Contractor to implement and maintain these features throughout the construction period.

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TABLE 3.6.1:
Visual Quality for Existing Conditions and for the Proposed Build Alternatives

Key View[1]	Existing Visual Quality				Visual Quality for Bus Rapid Transit Alternative					Visual Quality for Light Rail Transit Alternative					Visual Quality for Freeway Tunnel Alternative				
	Vividness (V)	Intactness (I)	Unity (U)	Existing Visual Quality (E) ([V+I+U]/3)	Vividness (V)	Intactness (I)	Unity (U)	Build Alternative Visual Quality (P2) ([V+I+U]/3)	Change in Visual Quality from Existing to BRT Alternative	Vividness (V)	Intactness (I)	Unity (U)	Build Alternative Visual Quality (P1) ([V+I+U]/3)	Change in Visual Quality from Existing to LRT Alternative	Vividness (V)	Intactness (I)	Unity (U)	Build Alternative Visual Quality (P2) ([V+I+U]/3)	Change in Visual Quality from Existing to Freeway Alternative
1-BRT	3.0	3.0	4.0	3.3	3.0	3.0	4.0	3.3	0.0	-	-	-	-	-	-	-	-	-	-
2-BRT	4.0	4.5	4.0	4.2	4.0	4.5	4.0	4.2	0.0	-	-	-	-	-	-	-	-	-	-
3-LRT	2.5	3.5	3.5	3.2	-	-	-	-	-	5.0	4.0	4.0	4.3	+1.1	-	-	-	-	-
4-LRT	3.0	4.0	4.5	3.8	-	-	-	-	-	4.5	3.5	4.0	4.0	+0.2	-	-	-	-	-
5-LRT	4.0	3.5	3.5	3.7	-	-	-	-	-	4.5	2.0	3.5	3.3	-0.4	-	-	-	-	-
6-LRT	3.5	3.5	3.5	3.5	-	-	-	-	-	4.0	2.0	3.0	3.0	-0.5	-	-	-	-	-
7-LRT	4.0	3.5	2.5	3.3	-	-	-	-	-	4.5	2.5	2.5	3.2	-0.1	-	-	-	-	-
8-LRT	4.0	4.5	3.5	4.0	-	-	-	-	-	5.0	2.5	4.0	3.8	-0.2	-	-	-	-	-
9-LRT	5.5	4.5	5.0	5.0	-	-	-	-	-	3.5	3.5	3.5	3.5	-1.5	-	-	-	-	-
10-LRT	3.5	3.5	3.5	3.5	-	-	-	-	-	3.5	3.5	3.5	3.5	0.0	-	-	-	-	-
11-LRT	5.0	4.0	4.0	4.3	-	-	-	-	-	3.5	3.0	4.0	3.5	-0.8	-	-	-	-	-
12-LRT	2.5	2.5	2.5	2.5	-	-	-	-	-	2.0	2.0	2.5	2.2	-0.3	-	-	-	-	-
13-LRT	4.5	4.0	4.0	4.2	-	-	-	-	-	2.5	2.0	2.5	2.3	-1.9	-	-	-	-	-
14-LRT	3.5	3.5	3.0	3.3	-	-	-	-	-	3.0	3.0	3.0	3.0	-0.3	-	-	-	-	-
15-LRT	3.5	3.5	3.5	3.5	-	-	-	-	-	3.5	3.5	3.5	3.5	0.0	-	-	-	-	-
16-LRT	4.5	4.5	4.5	4.5	-	-	-	-	-	4.5	4.5	4.5	4.5	0.0	-	-	-	-	-
17-LRT	2.5	3.0	3.0	2.8	-	-	-	-	-	3.5	3.5	3.5	3.5	+0.7	-	-	-	-	-
18-LRT	4.0	4.0	4.0	4.0	-	-	-	-	-	4.0	4.0	4.0	4.0	0.0	-	-	-	-	-
19-LRT	4.5	4.5	4.0	4.3	-	-	-	-	-	4.5	4.5	4.0	4.3	0.0	-	-	-	-	-
20-LRT	3.5	3.5	3.5	3.5	-	-	-	-	-	4.0	4.0	4.0	4.0	+0.5	-	-	-	-	-
21-FWY	4.0	3.5	4.5	4.0	-	-	-	-	-	-	-	-	-	-	4.0	3.5	4.5	4.0	0.0
22-FWY	4.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-	-	4.0	4.0	4.0	4.0	0.0
23-FWY	4.0	4.0	4.5	4.2	-	-	-	-	-	-	-	-	-	-	4.0	4.0	4.0	4.0	-0.2
24-FWY	4.5	3.5	4.0	4.0	-	-	-	-	-	-	-	-	-	-	3.5	3.0	3.5	3.3	-0.7
25-FWY	3.5	2.5	3.0	3.0	-	-	-	-	-	-	-	-	-	-	5.0	4.0	2.5	3.8	+0.8
26-FWY	4.0	3.0	3.5	3.5	-	-	-	-	-	-	-	-	-	-	4.5	4.0	4.0	4.2	+0.7
27-FWY	4.0	3.0	3.5	3.5	-	-	-	-	-	-	-	-	-	-	4.5	4.0	5.0	4.5	+1.0
28-FWY	3.0	3.5	4.0	3.5	-	-	-	-	-	-	-	-	-	-	4.0	3.5	4.0	3.8	+0.3
29-FWY	4.0	3.5	4.0	3.8	-	-	-	-	-	-	-	-	-	-	3.5	3.0	4.0	3.5	-0.3
30-FWY	3.0	3.5	4.0	3.5	-	-	-	-	-	-	-	-	-	-	6.0	2.5	5.0	4.5	+1.0

Source: *Visual Impact Assessment* (2014).

Note: The visual quality ratings are based on the conceptual ideas of what the views would look like with the proposed Build Alternatives. The change in overall visual quality at project build out is the difference between the "Existing Visual Quality" rating and the "Visual Quality for (BRT/LRT/Freeway) Alternative" rating. For example, if the overall Existing Visual Quality rating is 6.0 and the Visual Quality for a Build Alternative rating is 5.0, then the difference from existing is -1.0. A negative number indicates the potential for lowering the visual impact from the existing visual setting. The greater the negative number, the more substantial the visual impact (e.g., a -1.0 rating would have more visual impact than a -0.4). A positive number represents a potential improvement in the visual setting with the implementation of the particular Build Alternative. As an industry standard, numerical differences between +1.0 and -1.0 are not considered to be a considerable visual impact. The Transportation System Management/Transportation Demand Management Alternative has not been rated as the preliminary evaluation determined the visual impacts of the TSM/TDM Alternative were negligible for all of the selected Key Views.

(1) Refer to Figures 3.6-4 through 3.6-33 (refer to Appendix M) for the locations of these Key Views, the existing conditions at these Key Views, and with project view simulations at these Key Views.

Rating Scale (1.0 to 7.0): 1.0 = very low 2.0 = low 3.0 = moderately low 4.0 = moderate 5.0 = moderately high 6.0 = high 7.0 = very high

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TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
3-LRT	The west side of Mednik Avenue is currently developed with retail shops, restaurants, and offices. Under the LRT Alternative, those buildings would be removed to accommodate the proposed Mednik Station and associated structures (including surface parking) as shown in the view simulation on Figure 3.6-6 (refer to Appendix M).The Mednik Station would be an elevated platform over 25 feet high supported by columns. The overall visual change would be medium. The Mednik Station would result in an increase in vividness to moderately high due to the creation of memorable visual elements. The intactness would increase to moderate due to the mass of buildings filling up the view and because no proposed utilities would interrupt or encroach into this view. In addition, the proposed unity would increase to moderate because the elevated rail station and retail buildings would form a strong horizontal pattern on the streetscape. Therefore, the proposed overall visual quality would increase with the addition of the elevated rail station and associated structures. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated +1.1, a medium increase of the visual quality for Key View 3-LRT. Figure 3.6-A shows change in visual character would have good compatibility with the existing area. The character would be more balanced, and the additional mass of the architectural forms would suit the urban area, creating outdoor rooms for pedestrians and a sense of place for motorists. The resulting resource change would be a moderately low positive change (1.6).Viewer groups include recreation and commercial/retail pedestrians and motorists. Figure 3.6-B shows the average sensitivity and exposure of these viewer groups to the LRT Alternative would be moderately high. Average viewer response would be moderately high as well. Figure 3.6-C shows, under the LRT Alternative, the visual impact in Key View 3-LRT would be moderate (3.3). The elevated rail station would dominate the view, but the visual character of the Built Alternative has good compatibility with the existing character. The elevated station platform and associated structures below would increase the vividness, intactness, and unity a low amount due to their larger size and scale. The buildings along Mednik Avenue would have a stronger edge and have fewer openings in the façades than the existing buildings. Average viewer response of the commercial and recreation viewer groups would be moderately high.
4-LRT	The elevated LRT would add another crossing over SR 60 and the span would be higher than the adjacent Mednik Avenue crossing. The new crossing would be supported by columns and would be visible from both directions of traffic on the freeway as shown in the view simulation on Figure 3.6-7 (refer to Appendix M). The overall visual change would be minor. The elevated track would result in an increase in vividness to moderate because the LRT Alternative facilities would bring the view together and would draw viewer attention. The proposed intactness would decrease to moderately low because the additional bridge would create a low degree of visual intrusion in the view. In addition, the proposed unity would decrease but would remain moderate because the strong horizontal element would minimize the linear flow of travel lanes into the horizon. Therefore, the proposed visual quality would increase with the exposure of the LRT Alternative facilities across SR 60. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated +0.2, a minor increase of the visual quality for Key View 4-LRT. Figure 3.6-A shows change in visual character would have moderately poor compatibility with the existing area (-0.5) since the new bridge would be out of scale with the view and would therefore create a competing focal point. The resulting resource change would be a very low negative change (-0.2). Viewers primarily include freeway motorists. Figure 3.6-B shows viewer exposure would be moderately low due to the high number of viewers, moderate proximity to the project, but very low duration. Average viewer sensitivity is very low because of the preoccupation, low awareness, and lack of local values of freeway motorists. Average viewer response would be low (-2.0) Figure 3.6-C shows, under the LRT Alternative, the visual impact in Key View 4-LRT would be low (-1.1) due to the completion of the LRT Alternative across SR 60. The elevated light rail line would result in an increase of vividness and a decrease of intactness and unity because of the additional infrastructure and taller height visible from the freeway traffic. Overall resource change would be very low, and viewer response would be low.

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
5-LRT	Currently, there are two-story multifamily apartments and surface parking on the west side of Mednik Avenue and the east side of Belvedere Community Regional Park. Under the LRT Alternative, the lanes of Mednik Avenue would be adjusted to accommodate the new light rail line down the center of the roadway. The LRT would be elevated 25 to 30 feet above the street and supported by columns spaced fairly far apart as shown in the view simulation on Figure 3.6-8 (refer to Appendix M). The overall visual change would be moderately low. The elevated track would result in an increase in vividness to moderate because this elevated LRT Alternative facility would be the dominant element in the view. The proposed intactness would decrease to low because it would include an introduction of another man-made object that would encroach into the view. The proposed unity would stay moderately low due to the fact that it would not add any positive aesthetic features to the view. Therefore, the proposed visual quality would decrease due to the presence of the LRT Alternative facility along Mednik Avenue and across the backdrop of Belvedere Community Regional Park. The proposed visual quality rating would be moderately low. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -0.4, a minor decrease of the visual quality for Key View 5-LRT. Figure 3.6-A shows change in visual character would have moderately poor compatibility (-1.0) with the existing area since the new overhead structure would create a competing urban focal point near a park with an otherwise suburban view. The resulting resource change would be a low negative change (-0.7). Belvedere Community Regional Park is a popular park with a baseball field, soccer field, skate park, tennis courts, playgrounds, and picnic areas. A new community pool is planned for the Park. Most viewers would be from the pedestrian recreation group. With the elevated light rail line, sensitivity and viewer exposure to the LRT Alternative would be moderately high. Viewers would be moderately close to the site for a moderately high duration. Viewers would likely be aware of the changes and value the existing visual resource. Figure 3.6-B shows overall viewer awareness would be moderately high (-5.0). Figure 3.6-C shows the visual impact of the LRT Alternative's exposure along Mednik Avenue in Key View 5-LRT would be moderate (-2.9). The light rail line would result in a reduced visual quality because of less vividness and intactness. The visual quality would be reduced as the elevated light rail line cuts across the backdrop of Belvedere Community Regional Park, obscuring a large portion of the neighborhood background. Unity would remain close to the same. The resulting visual resource change would be very low. Viewer response in this recreation area would be moderately high.
6-LRT	Currently, East Cesar Chavez Avenue has one-story commercial businesses and surface parking on the west side of Mednik Avenue and multifamily apartments, commercial businesses, and surface parking on the east side. Under the LRT Alternative, the lanes of Mednik Avenue would be adjusted to accommodate the new LRT down the center of the road. The LRT Alternative facility would be elevated approximately 34 feet above the street and supported by columns spaced fairly far apart as shown in the view simulation on Figure 3.6-9 (refer to Appendix M). The streetscape view would be affected with the introduction of the elevated LRT Alternative tracks and the associated columns. The overall visual change would be minor. The elevated track would result in an increase in vividness to moderate because the elevated light rail line would create a memorable element. The proposed intactness would decrease to low because the introduction of the elevated light rail line facility and support columns would encroach into the view. The proposed unity would decrease but would remain moderately low due to the fact that the elevated light rail would not contribute any positive aesthetic features to the view or its uniformity. Therefore, the proposed visual quality would decrease due to the exposure of the elevated light rail line and would interrupt the view down East Cesar Chavez Avenue. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -0.5, a minor decrease of the visual quality for Key View 6-LRT. Figure 3.6-A shows change in visual character would have moderately poor compatibility (-1.0) with the existing area since the new overhead structure would create a competing urban focal point in an otherwise suburban view. The resulting resource change would be a low negative change (-0.8). The intersection of East Cesar Chavez Avenue and Mednik Avenue is a busy commercial intersection with multifamily apartments on the northeast corner. Viewer groups include commercial pedestrians and motorists. Viewer sensitivity would be moderately low due to preoccupation with shopping, low awareness, and moderately low local values. Viewer exposure to the LRT Alternative would be moderately high due to the close location to the elevated light rail line, moderate duration, and quantity of viewers. Figure 3.6-B shows overall viewer response

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
	would be moderate (-4.0). Figure 3.6-C shows the visual impact in Key View 6-LRT would be moderately low (-2.4) after the introduction of the LRT Alternative on Mednik Avenue. This change in visual quality of the elevated light rail line would result in an increase of vividness and a decrease in intactness and unity because the LRT Alternative interrupts the view down East Cesar Chavez Avenue. The visual resource change would be low. Viewer response would be moderate.
7-LRT	Currently, Floral Drive has one-story commercial businesses and surface parking on both sides of Mednik Avenue. Under the LRT Alternative, the lanes of Mednik Avenue would be adjusted to accommodate the new light rail line down the center of the roadway as shown in the view simulation on Figure 3.6-10 (refer to Appendix M). At the corner, the elevated rail line would be aligned across the Super Salud Liquor and Market property, would be 45 feet above the street, and would be supported by five pairs of columns. The proposed Floral Station would be in the background of this view along the southern boundary of the Monterey Park Business Center. Trees would need to be removed for the construction of the elevated rail line and station. The overall visual change would be minor. The elevated track would result in an increase in vividness but still be moderate because the elevated light rail line would dominate the horizon at the intersection of Floral Drive and Mednik Avenue. The proposed intactness would decrease to low because the elevated track would add another man-made object that would encroach into the streetscape. The proposed unity would remain low because the elevated light rail line would dominate the horizon at this intersection. Therefore, the proposed visual quality would decrease due to the elevated light rail line dominating the horizon. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -0.1, a minor decrease of the visual quality for Key View 7-LRT. Figure 3.6-A shows change in visual character would have moderately poor compatibility (-1.0) with the existing area since the new overhead structure would change the scale and focal point of the view. The additional mass and line of the overhead clash with the existing view. The resulting resource change would be a low negative change (-0.6). The intersection of Floral Drive and Mednik Avenue is a busy commercial intersection with multifamily apartments on the southeast corner. Several apartment patios face Mednik Avenue, and pedestrians frequently use the sidewalks between the neighborhood, the businesses, and Belvedere Park. Viewer groups include commercial and residential motorists and pedestrians. Viewers would have high sensitivity because of high awareness, local values, and unstructured activities. Viewers would have moderately high exposure to the LRT alternative due to the close proximity to the elevated light rail line, high duration of residential viewership, and moderate number of viewers. Figure 3.6-B shows overall viewer response would be high (-5.5). Figure 3.6-C shows the visual impact in Key View 7-LRT would be moderate (-3.0). The elevated light rail line would dominate the horizon, resulting in visual character with moderately poor compatibility with the existing view. Vividness would increase due to the scale of the LRT Alternative dominating the intersection. The elevated light rail line would result in less intactness due to the numerous columns visible along Floral Drive. Unity would remain close to the same. The visual quality would be reduced a minor amount. Viewer awareness at this commercial and residential location would be high.
8-LRT	Currently, the Monterey Park Business Center has a steep vegetated slope south of the parking lot leading down to Floral Drive. Under the LRT Alternative, the proposed elevated light rail line would run along this strip of land very close to the top of the slope. The Floral Station would be on a platform as shown in the view simulation on Figure 3.6-11 (refer to Appendix M). The existing vegetation, including eucalyptus trees, would be removed for the construction of the Floral Station. The overall visual change would be minor. The proposed visual quality of this view for the business center tenants looking out their office windows or driving by in the parking lot would be reduced due to the loss of trees and vegetation to accommodate the construction of the station and elevated rail line. The proposed station would result in an increase in vividness to moderately high because the station would dominate the view from the business park and would clearly create a focal point of interest for viewers because of the creative architectural features of the station. The proposed intactness would decrease to low because the existing vegetation would be removed and replaced by the light rail station. The proposed unity would increase to moderate because the station's straight geometric lines would bring more unity to the view. Therefore, the proposed visual quality would decrease due to the high visibility of the light rail station and the loss of trees on the edge of the Monterey Park Business Center. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -0.2, a minor decrease of the visual quality for Key View 8-LRT. Figure 3.6-A shows change in

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
	visual character would have poor compatibility (-2.0) with the existing view since the new overhead station would remove green, screening vegetation from the foreground and replace it with the massive, urban, concrete station. Without the screening vegetation, the view has two competing focal points: the horizon in the background and the station in the foreground. Additionally, the larger scale of the surrounding urban environment is revealed without the screen. The resulting resource change would be a low negative change (-1.1). Monterey Park Business Center has many businesses among several buildings. Figure 3.6-B shows overall viewer response to the LRT Alternative station changes would be moderate (-4.0). Viewer groups include commercial pedestrians and motorists, more specifically business center tenants who can see out of their office windows or motorists driving by in the parking lot. Viewer sensitivity to the loss of trees for the construction of the station and elevated rail line would be moderate since most viewers are likely preoccupied with working even though they would be aware of the changes and may value the existing scenery. Viewer exposure would be moderate as well due to close proximity, moderately low numbers of viewers, and moderate duration of viewing. Under the LRT Alternative, the visual impact in Key View 8-LRT would be moderate (-2.6) with the high visibility of the light rail station and the loss of trees on the edge of the Monterey Park Business Center. Vividness would increase due to the size and scale of the station. The light rail station would result in a negative change to intactness. The resulting visual resource change would be low. Viewer response would be moderate. Figure 3.6-C shows the visual impact in Key View 8-LRT would be moderate (-2.6) with the high visibility of the light rail station and the loss of trees on the edge of the Monterey Park Business Center. Vividness would increase due to the size and scale of the station. The light rail station would result in a negative change to intactness. The resulting visual resource change would be low. Viewer response would be moderate.
9-LRT	Currently, the I-710 corridor has an open view, with vegetation and office buildings on the east and an undeveloped steep slope on the west. There is a helipad for the Los Angeles County Sheriff's Office on the top of this hill. Under the LRT Alternative, the elevated light rail line would run diagonally across the freeway at a height of approximately 25 feet above the road as shown in the view simulation on Figure 3.6-12 (refer to Appendix M). Due to the vegetation and the alignment of the track, the light rail line would only be seen above the I-710 right of way, offering little obstruction to the views of the vegetation or office buildings. The overall visual change would be major. The elevated light rail line would result in a decrease in vividness to moderately low due to the introduction of a man-made feature blocking the view of trees and the view to the San Gabriel Mountains. The proposed intactness would decrease to moderately low because the elevated light rail line would disrupt the natural view of vegetation and the San Gabriel Mountains and would add another layer of man-made elements. The proposed unity would decrease to moderately low because the man-made feature of the light rail line would interrupt the view of the freeway corridor and disrupt the visual flow of the Key View. Therefore, the proposed visual quality of this view would be reduced because the LRT Alternative facility would block most of the view of the San Gabriel Mountains in the distance as it crosses over the freeway. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -1.5, a major decrease of the visual quality for Key View 9-LRT. Figure 3.6-A shows change in visual character would have moderately poor compatibility (-0.5) with the existing view since the placement of the new bridge would add a contrasting urban mass that would obscure existing views of green trees and the San Gabriel Mountains in the background. The resulting resource change would be a low negative change (-1.0). SR 710 is a busy corridor between Long Beach and West Valley Boulevard in Alhambra with a speed limit of 65 mph. Viewer groups would include freeway motorists and commercial motorists. Viewer exposure to the LRT Alternative would be moderate due to the large number and closeness to the elevated rail line crossing over the freeway but short view duration. Viewer sensitivity would be low due to low local values, and reduced awareness and preoccupation from driving. Figure 3.6-B shows overall viewer response would be moderately low (-3.3). Figure 3.6-C shows the visual impact in Key View 9-LRT would be moderately low (-2.1) from the view of the light rail line coming over the freeway. The LRT Alternative would result in less vividness, intactness, and unity due to the elevated light rail line obscuring the horizon above the freeway and blocking the view of the San Gabriel Mountains beyond. Visual resource change would be low with this new portion of aerial infrastructure. Viewer response would be moderately low.

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
10-LRT	The I-10 corridor currently has an open view of the I-710 overpass and a wooded residential hill. Under the LRT Alternative, the elevated light rail line would run across the freeway at a height of approximately 85 feet above the road and would be supported by two pairs of columns as shown in the view simulation on Figure 3.6-13 (refer to Appendix M). From this Key View vantage point, the elevated light rail line would rise higher than the I-710 bridges and would obscure views of a small part of the wooded hill beyond. There would be no change in visual quality. The elevated light rail line would result in no change in vividness and would remain moderately low because the new man-made feature would not add to the visual interest in the view. The proposed intactness would remain moderately low because the elevated light rail would not block any views of the light fixtures but would block the view of the wooded hillside in the background. The proposed unity would remain moderately low because the concrete infrastructure would add to the existing bridges, limit the views of the wooded hillside, and detract from the smooth blending of the freeway and sky masses. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated 0.0, showing a no change rating for Key View 10-LRT. Figure 3.6-A shows change in visual character would have moderately good compatibility (0.5) with the existing view since the placement of the new bridge would reinforce a pattern of horizontal bridge masses crossing the view. The resulting resource change would be low (0.3). I-10 is a major freeway from Los Angeles to the suburbs to the east. Viewers would include freeway motorists. Viewer sensitivity would be very low since the majority of viewers are not invested in local values and are preoccupied with driving. Viewer exposure would be moderately low because of high numbers, close proximity to the light rail line, but very short durations. The proposed visual quality of this view would be reduced. Figure 3.6-B shows overall viewer response would be low (2.0). Figure 3.6-C shows the visual impact in Key View 10-LRT would be low (1.1). With all the other fly-over overpasses at this major interchange, the view would have low vividness, intactness, and unity. Visual character change would be low, and viewer response for freeway motorists would be low as well.
11-LRT	At this location, the light rail line station would be along the upper part of the hillside. An additional retaining wall would be built at the top of the slope. The construction of the light rail station, elevated track, and retaining wall would completely cover the view of the upper part of the hillside as shown in the view simulation on Figure 3.6-14 (refer to Appendix M). A few trees would likely need to be removed, although the large shade trees on the lower level of the slope would remain and would help screen the new structure. The overall change in visual quality would be medium. The light rail station and elevated track would result in a decrease in vividness to moderately low because they would replace the upper part of the vegetated slope and minimize the primary focal point of the existing view. The proposed intactness would be reduced to moderately low because the man-made structures would intrude into the view of the vegetated slope. The proposed unity would remain moderate because the additional linear pattern of the elevated light rail line and retaining wall would add to the horizontal pattern of the view. Therefore, the proposed visual quality of this view would be reduced due to the introduction of the light rail line and the California State University, Los Angeles Station. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -0.8, a medium decrease of the visual quality for Key View 11-LRT. Figure 3.6-A shows change in visual character would have moderately poor compatibility (-1.0) with the existing view since the project would remove trees and obscure part of the hillside, creating a more urban view. The resulting resource change would be low (-0.9). SR 710 is a major freeway from Long Beach to Valley Boulevard in Alhambra. Viewers include freeway and education pedestrians and motorists. Viewer sensitivity would be moderately low and viewer exposure would be moderate. Figure 3.6-B shows overall viewer response would be moderate (-3.5). Figure 3.6-C shows the visual impact in Key View 11-LRT would be moderately low (-2.2). The light rail line would result in a medium negative change to visual quality with less vividness and intactness as a contrast to the existing vegetated slope. Visual character change would have moderately poor compatibility with the existing view. Resource change would be low, and viewer response would be moderate.

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
12-LRT	Valley Boulevard is currently a four-lane road with two turn lanes at the entrance to southbound SR 710. Under the LRT Alternative, a narrow concrete median would be installed to accommodate concrete columns for the overhead LRT Alternative facility as shown in the view simulation on Figure 3.6-15 (refer to Appendix M). A safety railing would be built on top of the elevated track. The view would be dominated by a high retaining wall and the LRT Alternative overpass. The overall visual change would be minor. The elevated light rail track would result in a decrease in vividness but would remain low because the elevated structure of the LRT Alternative would completely dominate the view of the road, would lessen the expanse of the street paving, and would be unmemorable. The proposed intactness would decrease but would remain low because the view would be entirely made up of man-made structures that intrude into the view. The proposed unity would decrease but would remain low because the strong horizontal patterns would be reflected in the horizontal lines of the elevated structure. Therefore, the proposed visual quality would decrease due to the installation of the elevated LRT. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -0.3, a minor decrease of the visual quality for Key View 12-LRT. Figure 3.6-A shows change in visual character would have poor compatibility (-2.0) with the existing view since the project would obstruct the view with a large concrete mass that would be a much larger scale than the original view. The resulting resource change would be low (-1.2). Valley Boulevard is a busy road connecting El Sereno to the west and Alhambra to the east. Viewer groups include commercial pedestrians and motorists. Viewer sensitivity would be moderately low, and viewer exposure would be moderately high. Figure 3.6-B shows overall viewer response would be moderate (-4.0). Figure 3.6-C shows the visual impact in Key View 12-LRT would be moderate (-2.6) due to the installation of the elevated light rail line. Vividness and intactness would be reduced because of the introduction of the man-made feature that completely dominates the roadway view on Valley Boulevard, in contrast to the undeveloped grassy slope that currently exists. Unity would be close to the same. The resulting visual quality change would be minor. Visual character would change with poor compatibility to the existing view. Viewer response would be moderate.
13-LRT	Valley Boulevard is currently a four-lane road. Under the LRT Alternative, a narrow concrete median would be installed to accommodate the concrete columns for the LRT Alternative overhead as shown in the view simulation on Figure 3.6-16 (refer to Appendix M). A safety railing would be built on top of the elevated track. The view would be dominated by high retaining walls and the LRT Alternative overpass. The overall visual change would be major. The elevated light rail line would result in a decrease in vividness to low because that elevated structure would completely dominate the view of the road and would offer little or no focal point for the viewer. The proposed intactness would decrease to low because the view would be entirely made up of man-made structures that disrupt the view. The proposed unity would decrease to low as the strong patterns of the linear form would be reflected in the elevated structure but would conflict with the angles of the street lines. Therefore, the proposed visual quality would decrease due to the installation of the elevated LRT Alternative facility. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -1.9, a major decrease of the visual quality for Key View 13-LRT. Figure 3.6-A shows change in visual character would have poor compatibility (-2.0) with the existing view since the project would obstruct the view with a large concrete mass that would be a much larger scale than the original view. The resulting resource change would be moderately low (-2.0). Valley Boulevard is a busy road connecting El Sereno to the west and Alhambra to the east. Viewer groups include commercial pedestrians and motorists. Viewer exposure to the light rail line would be moderately high for the LRT Alternative due to the number of viewers, duration, and proximity to the elevated light rail line. Viewer sensitivity would be moderately low. Figure 3.6-B shows the overall viewer response would be moderate (-4.0). Figure 3.6-C shows the visual impact in Key View 13-LRT due to the installation of the elevated light rail line would be moderate (-3.0). There would be a major reduction in vividness, intactness, and unity because of the introduction of the man-made feature that dominates the roadway view on Valley Boulevard in contrast to the undeveloped grassy slope that currently exists. Resource change would be moderately low, and viewer response would be moderate.

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
14-LRT	The Shorb Street neighborhood backs up against the undeveloped SR 710 corridor. Under the LRT Alternative, the light rail line would be underground and would not be visible in this area. However, the parcel above the tunnel would become a maintenance area as shown in the view simulation on Figure 3.6-17 (refer to Appendix M). The homes in the Shorb Street neighborhood adjacent to that parcel would face a new screen wall that would run along the maintenance area. This wall would effectively screen any views to the west. The overall visual change would be minor. Motorists and pedestrians traveling west on Front Street and residents who live on the west side of Westmont Drive would see the tall screen wall. The screen wall would result in a decrease in vividness but vividness would remain moderately low because the tall screen wall would be the strongest feature and would take away from the details of the buildings in the area. The proposed intactness would decrease but would remain moderately low because the proposed retaining wall would end the view of the neighborhood street and both horizontal and vertical man-made elements would be visible. The proposed unity would remain the same because the linear form of the screen wall would form a strong horizontal pattern across the end of the view. Therefore, the proposed visual quality of this view would be reduced due to the view of the screen wall for the maintenance area. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated -0.3, a minor decrease of the visual quality for Key View 14-LRT. Figure 3.6-A shows change in visual character would have moderately good compatibility (1.0) with the existing view since the project would construct a wall that would simplify the view by blocking the maintenance yard in the background. The resulting resource change would be low (0.4). The light rail line would be underground in this location, but a maintenance area would be constructed in this corridor. Viewers include residential motorists and pedestrians traveling Front Street and residents living on the west side of Westmont Drive who look out over their backyards. Viewer sensitivity would be high, and viewer exposure would be moderately high. Figure 3.6-B shows overall viewer response would be high. Figure 3.6-C shows the visual impact caused by the view of the screen wall for the maintenance area behind the houses along the west side of Westmont Drive in Key View 14-LRT would be moderate (2.9). The view would result in less vividness and intactness. Overall resource change would be low. Viewer response would be high.
15-LRT	This segment of South Fremont Avenue is a four-lane road with a center turn lane. Under the LRT Alternative, part of the Fremont Plaza parking lot would be reconfigured to support commuter parking for the Alhambra Station as shown in the view simulation on Figure 3.6-18 (refer to Appendix M). The big-box retail store on the corner of South Fremont Avenue and Concord Avenue would be removed to accommodate that commuter parking lot. Commuter stairway entrances would also be added and would be visible from the sidewalk. The light rail line would be underground at this location. These would be minor changes that would not result in an overall visual change. This segment of the LRT Alternative would result in no change to vividness; vividness would remain moderately low because the parking lot would be extended and the new structures would add additional visual character through architectural treatments. The proposed intactness would remain moderately low because the removal of the blank wall of the pet store would not change the intactness of the view. The proposed unity would remain moderately low because the architectural features of the new structures would bring together the visual weights of the street in the foreground and the sky in the upper part of the view. Therefore, the change in visual impacts would be minimal due to the addition of the view of the commuter stair entrances. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated 0.0, showing a no change rating for Key View 15-LRT. Figure 3.6-A shows change in visual character would have moderately good compatibility (0.5) with the existing view. The removal of a building will simplify the view, and the new structures fit the scale of the existing view. The resulting resource change would be low (0.3). South Fremont Avenue is a busy commercial corridor connecting Monterey Park to the south and South Pasadena to the north. Viewers would include commercial pedestrians and motorists. Viewer sensitivity to the light rail line would be moderately low, and viewer exposure would be moderately high. Figure 3.6-B shows overall viewer response would be moderate. Figure 3.6-C shows the visual impact in Key View 15-LRT would be moderately low (2.1) due to low resource change with only the addition of the commuter stair entrances. The view would result in low visual impact for vividness, intactness, and unity. The Build Alternative would not change the visual quality. Viewer response to the LRT would be moderate, however, the resulting impact would be moderately low for the LRT Alternative due to few visual

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
	resource changes from the light rail being underground.
16-LRT	This segment of Huntington Drive is currently a four-lane road with a median landscaped with large camphor trees. Under the LRT Alternative, part of the commercial block south of Huntington Drive would be removed to accommodate a commuter parking structure for the Huntington Station as shown in the view simulation on Figure 3.6-19 (refer to Appendix M). Commuter stair structures leading down into Huntington Station and signage for the entrances and parking lot would be visible along the sidewalk. At this location, the light rail line would be underground. All these would be minor changes that would result in an overall low visual resource change. This segment of the LRT Alternative would result in no change to vividness and would remain moderate because the large camphor trees in the median and along the sides of Huntington Drive would still dominate the view and provide accent points for the viewer. The intactness would remain moderate because the stair entrances and parking structure would result in very little change in this view. The unity would remain moderate. The change in visual quality would be minimal. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated 0.0, showing a no change rating for Key View 16-LRT. Figure 3.6-A shows visual character compatibility would not change (0.0) from the existing view. The placement of the parking structure will insert an element of visual interest that is proportionally sized to the view. The resulting resource change would be very low (0.0). Huntington Drive is a busy commercial corridor connecting Los Angeles to the west and San Marino to the east. Viewer groups include commercial and residential pedestrians and motorists. Average viewer exposure and sensitivity to the LRT Alternative would be moderately high to high due to the many businesses, nearby residences, and the iconic nature of Huntington Drive. Figure 3.6-B shows overall viewer response would be high (5.5). Figure 3.6-C shows that the visual impact in Key View 16-LRT would be moderate (2.8) due to high viewer response. The view would result in no change for vividness, intactness, and unity. The Build Alternative would not change the visual quality rating, and the visual character change would be very low as well.
17-LRT	This segment of Huntington Drive is currently a four-lane road with a median. Under the LRT Alternative, part of the commercial block south of Huntington Drive would be removed to accommodate a commuter parking structure for the Huntington Station as shown in the view simulation on Figure 3.6-20 (refer to Appendix M). The parking structure would have three levels of parking and would fill in gaps in an already urban environment. At this location, the light rail line would be underground. The proposed vividness would increase to moderate because the new parking structure would create a more memorable focal point along the view. The intactness would increase to moderate because the view would be relatively free from atypical visual intrusions. The proposed unity would increase to moderate because the repetitive levels of parking create a harmonious pattern. Therefore, the proposed visual quality of this view would increase with the removal of the retail stores and implementation of a uniform landscape strip. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated +0.7, which is a medium increase in visual quality for Key View 17-LRT. Figure 3.6-A shows change in visual character would have poor compatibility (-1.5) with the existing view. The addition of a parking structure will unify the space with repetitive elements. The resulting resource change would be low (-0.7). Huntington Drive is a busy commercial corridor connecting Los Angeles to the west and San Marino to the east. Viewer groups include commercial pedestrians and motorists. Sensitivity to the LRT Alternative would be moderately low due to people being distracted with shopping and not necessarily valuing the existing visual aesthetics. Exposure to the LRT Alternative would be moderately high due to the number and closeness of viewers as well as the average duration of viewing. Figure 3.6-B shows overall viewer response would be moderate (-4.0). Figure 3.6-C shows that the visual impact in Key View 17-LRT would be moderately low (-2.4). Viewer response in this commercial area would be moderate, but there would be low visual resource change with the addition of the parking structure and commuter stair entrances for the Huntington Station. With a uniform urban structure, the view would result in improvements for vividness, intactness, and unity that would change the existing visual character.

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
18-LRT	This segment of Mission Street currently transitions from residential single-family homes to commercial businesses. Under the LRT Alternative, the commercial buildings to the left would be removed and the existing parking lot would be reconfigured to accommodate a surface parking lot for the South Pasadena Station as shown in the view simulation on Figure 3.6-21 (refer to Appendix M). Stair structures with associated signage leading down into the station would be visible. The light rail line would be underground at this location. The overall visual quality would not change and would be neutral. The proposed vividness would not change and would remain moderate because everything would remain unchanged except the retail building behind the trees that would be removed and the architectural designs for the station, which would create additional visual interest. The proposed intactness would remain moderate because the stairway structures leading down to the South Pasadena Station would be visible on the streetscape; however, no other changes would negatively impact this view. The proposed unity would remain moderate because the streetscape plantings would help maintain the balance of the street pavement and the visual mass of the sky. Therefore, the change in visual impacts would be minimal, with only the retail parking lot being replaced with the South Pasadena Station commuter lot. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated 0.0, showing a no change rating for Key View 18-LRT. Figure 3.6-A shows change in visual character would have moderately good compatibility (0.5) with the existing view. The removal of the existing wall around the parking lot would open the view. The replacement of one parking lot with another creates little change to the visual character. The resulting resource change would be low (0.3). Fair Oaks Avenue is a busy commercial corridor connecting Huntington Drive in South Pasadena to the south and Pasadena to the north. Viewers include commercial and residential pedestrians and motorists. Sensitivity and exposure to the LRT Alternative is likely to be moderately high to high due to the values and awareness of the local residents and consumers. Figure 3.6-B shows overall viewer response would be high (5.5). Figure 3.6-C shows the visual impact in Key View 18-LRT would be moderate (2.9). Visual resources would change only by a low amount with only the retail parking lot being replaced with the South Pasadena station commuter lot. However, in this mixed commercial and residential area, viewer response would be high.
19-LRT	This segment of Fair Oaks Avenue is currently a four-lane road with a center turn lane. Commuter stair structures and associated signage leading down into the underground South Pasadena Station would be constructed along the sidewalks and be the only new features on the streetscape in this Key View as shown in the view simulation on Figure 3.6-22 (refer to Appendix M). At this location, the light rail line would be underground. The overall visual quality would not change and would remain neutral. The proposed vividness would remain moderate because the only change to the streetscape would be the addition of the stair structures and associated signage. The designs of these elements would include architectural treatments that would merge into the existing visual character. The proposed intactness would remain moderate because the only change to the streetscape would be the addition of the stair structures and associated signage. The proposed unity would remain moderate because the only change to the streetscape would be the addition of the stair structures and associated signage, and the visual balance from left to right and from top to bottom would be maintained. Therefore, the change in visual impacts would be minimal with the light rail line underground. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated 0.0, showing a no change rating for Key View 19-LRT. Figure 3.6-A shows no noticeable change in visual character would occur (0.0) with the Built Alternative. The creation of stairs and addition of signage to the station does not change the character of an already commercial area. The resulting resource change would be no change (0.0). Fair Oaks Avenue is a busy commercial corridor connecting Huntington Drive in South Pasadena to the south and Pasadena to the north. Viewer groups would include commercial pedestrians and motorists. Figure 3.6-B shows sensitivity to the LRT Alternative would be moderately low due to the broadness of the view and the preoccupation of the viewers. Viewer exposure would be moderate because of the relative proximity to the project, number of viewers, and moderate length of duration. Average viewer response would be moderate. Figure 3.6-C shows the visual impact in Key View 19-LRT would be moderately low (1.8) since the light rail line would be underground. The changes would result in no impact for vividness, intactness, and unity since the only change is the addition of the stair structures and associated signage leading down into the South Pasadena Station. No change in visual resources would be noticeable. Because of the sensitivity and exposure of viewers in the

TABLE 3.6.2:
Permanent Visual/Aesthetic Impacts – LRT Alternative

Key View[1]	Permanent Impacts
	commercial area, the viewer awareness would be moderate.
20-LRT	This segment of South Raymond Avenue is currently a four-lane road. Commuter stair structures and associated signage leading down into the underground Fillmore Station would be constructed within this block as shown in the view simulation on Figure 3.6-23 (refer to Appendix M). At this location, the light rail station would be underground. The overall visual change would be minor. Viewer sensitivity to the Fillmore Station is likely to be very high, although the visual impact would be moderate because the station itself would be underground. The proposed vividness would increase to moderate because the industrial buildings would be replaced with a surface parking lot with landscaping, and these architectural designs would create visual interest and add a memorable feature to the view. The proposed intactness would increase to moderate because a consistent streetscape planting would screen the surface parking lot and all other constructed elements would remain at a small scale. The proposed unity would increase to moderate because a more compatible streetscape would be created as well as an overall balanced view. Therefore, the change in visual impacts would improve the quality of the view because the area would become more open and the light rail line would be constructed underground. The resulting visual quality rating would be moderate. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the LRT Alternative is rated +0.5, a minor increase in visual quality for Key View 20-LRT. Figure 3.6-A shows change in visual character would have moderately good compatibility (1.0) with the existing scene. The creation of a small transit plaza at the Fillmore Station widens the view, creates a point of interest, and adds an interesting focal point to the view. The resulting resource change would be low (0.8). South Raymond Avenue is a busy commercial street starting in north Pasadena and terminating at the power plant on Raymond Hill at East Glenarm Street. Viewer groups include commercial pedestrians and motorists. Viewer exposure to the Fillmore Station would be moderately high, and viewer sensitivity would be moderately low. Figure 3.6-B shows overall viewer response would be moderate (4.0). Figure 3.6-C shows that the visual impact in Key View 20-LRT would be moderately low (2.4). The plain building facades and high-security fencing would be removed. The view would result in an increase of vividness and intactness with a better defined perimeter landscape around the surface parking and plaza paving. The visual quality would improve since the area would become more open. Viewer response would be moderate in this commercial area.

Source: *Visual Impact Assessment* (2014).

1 Refer to Figures 3.6-6 through 3.6-23 (refer to Appendix M) for the locations of these Key Views, the existing conditions at these Key Views, and the with project view simulations at these Key Views.

TABLE 3.6.3:
Permanent Visual/Aesthetic Impacts – Freeway Tunnel Alternative

Key View[1]	Permanent Impacts
21-FWY	The California State University, Los Angeles campus is on top of the vegetated slope on the left side of this view. Under the Freeway Tunnel Alternative, the freeway would be widened, with one new lane with a concrete barrier added each side of the freeway as shown in the view simulation on Figure 3.6-24 (refer to Appendix M). To accommodate the road widening, concrete retaining walls would cut into the existing slope on each side of the freeway right of way and some trees would need to be removed. The overall visual quality would not change and would remain neutral. The proposed vividness would not change and would remain moderate because even though some trees would be removed, there would still be a line of trees on the western slope and the mountains would still be seen in the background. The proposed intactness would not change and would remain moderately low because the additional man-made structures would detract from the original view. The proposed unity would remain moderate because the additional man-made elements would add to the pattern of repeating features and the visual flow of the freeway lanes would be reinforced. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated 0.0, showing a no change rating for Key View 21-FWY. Figure 3.6-A shows change in visual character would have moderately good compatibility (0.5) with the existing scene. The additional freeway lanes, concrete barrier walls, and retaining walls help define the space and enforce the linear pattern of the existing view. The resulting resource change would be low (0.3). SR 710 is a major freeway connecting Long Beach and Alhambra. Viewers would be freeway motorists. Viewer exposure would be moderately low because of the speed of the viewers. Viewer sensitivity would be very low because of distraction and a low awareness of surroundings while driving. Freeway viewers would also be less likely to value the local existing views. Figure 3.6-B shows overall viewer awareness would be low (2.0). Figure 3.6-C shows that the visual impact of the additional freeway lanes, concrete barrier walls, and retaining walls in Key View 21-FWY would be low (1.1). Despite the widening of the freeway, vividness and intactness would not change. The change in visual character would be neutral. Viewer response of motorists on the freeway would be low.
22-FWY	The west side of SR 710 contains surface parking for the California State University, Los Angeles student housing, and the Midwick Park single-family neighborhood in Alhambra is on the east side of SR 710 in this Key View. Under the Freeway Tunnel Alternative, retaining walls would be added on each side of Paseo Rancho Castilla to accommodate the widening of the Hellman Avenue Bridge as shown in the view simulation on Figure 3.6-25 (refer to Appendix M). The overall visual quality would not change and would remain neutral. The proposed vividness would remain moderate because this segment of the existing freeway would remain largely unchanged under the Freeway Tunnel Alternative except for the addition of the retaining walls. The proposed intactness would remain moderate because the addition of another man-made feature (retaining wall) would intrude into the view as much as the existing freeway. The proposed unity would remain moderate because this view would remain largely unchanged from the existing view and the balance along both the horizontal axis and vertical axis would be maintained. Therefore, the change in visual impacts would be minimal even with the addition of the retaining walls on both sides of the freeway. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated 0.0, showing a no change rating for Key View 22-FWY. Figure 3.6-A shows change in visual character would have moderately poor compatibility (-0.5) with the existing scene. The widening of the bridge urbanizes the character of the view, which is more suburban in the existing view. The resulting resource change would be low (-0.3). Hellman Avenue connects Alhambra on the east and California State University, Los Angeles on the west. The majority of viewers would be in the education pedestrian viewer group. With the widening of the bridge, sensitivity and viewer exposure to the freeway is likely to be moderate to high. Viewer exposure would be moderate due to the nearness to the view and duration of viewership, and sensitivity would be moderately high due to local values, awareness, and narrow focus. Figure 3.6-B shows overall viewer response would be moderately high (-4.5). Figure 3.6-C shows that the visual impact in Key View 22-FWY would be moderately low (-2.4). Change to visual resources, even with the addition of the retaining walls on either side of the road, would be low because very little change would happen in character compatibility, vividness, intactness, and unity. Viewer response from the education pedestrian viewer group would be moderately high.

TABLE 3.6.3:
Permanent Visual/Aesthetic Impacts – Freeway Tunnel Alternative

Key View[1]	Permanent Impacts
23-FWY	The existing outside shoulders of SR 710 are vegetated. Under the Freeway Tunnel Alternative, the freeway would be widened to accommodate the upper and lower deck lanes, which would be visible within the SR 710 right of way as shown in the view simulation on Figure 3.6-26 (refer to Appendix M). A new retaining wall would be visible along the east side of the right of way and the construction of the wall would require the removal of some trees. Additionally, a new noise barrier (6 to 20 feet in height) would be constructed in this same location. The dual-bore tunnel design variation would result in a greater impact than the single-bore tunnel design variation due to the increased number of tunnel portal openings. The single-bore tunnel design variation would result in a slightly reduced impact in terms of the number of retaining walls that would be constructed and may also result in fewer disturbed areas on the adjacent hillsides compared to the dual-bore tunnel design variation. The overall change in visual quality would be minor. The proposed vividness would remain moderate because the heavy vegetation and the view of the San Gabriel Mountains would be largely unchanged from the existing view. The proposed intactness would remain moderate because the wider freeway would remove a small number of trees in the foreground and would intrude into this view. The proposed unity would decrease but would remain moderate because the road widening, retaining walls, and noise barrier would add to the repeating pattern in this view and would create a strong visual flow. Therefore, the proposed visual quality would decrease with the view of the entrance tunnels, the widening of the freeway, and the creation of the retaining wall and noise barrier. In addition, the visual quality under the single-bore tunnel design variation would also be reduced, but to a lesser degree compared to the dual-bore tunnel design variation. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated -0.2, a minor decrease in visual quality for Key View 23-FWY. Figure 3.6-A shows change in visual character would have poor compatibility (-1.5) with the existing scene. The grade changes, freeway widening, walls, and tunnels add contrasting chaos to the existing narrow, simple, calm stretch of freeway. The resulting resource change would be low (-0.9). SR 710 is a major freeway between Long Beach and Alhambra. Freeway motorists would be the main viewer group at this Key View location. Sensitivity and viewer exposure to SR 710 is likely to be moderately low to low because of distraction from driving, wide views, and lack of local value for the existing area. Figure 3.6-B shows the overall viewer response would be low (-2.0). Figure 3.6-C shows that the visual impact from the widening of the freeway and creation of the retaining wall and noise barrier in Key View 23-FWY would be low (-1.4). The visual quality would be reduced. Visual character change would have poor compatibility with the existing view. Visual resource change and viewer response from freeway motorists would be low. Under the single-bore design variation of the Freeway Tunnel Alternative, the visual quality would also be reduced but to a lesser degree. The resulting visual impact could be extrapolated from the dual-bore design variation rating, which is low as well.
24-FWY	The area between the SR 710 off- and on-ramps at West Valley Boulevard is currently a large landscaped berm. Under the Freeway Tunnel Alternative, the berm would be removed and the SR 710 tunnel would be underground at this location as shown in the view simulation on Figure 3.6-27 (refer to Appendix M). The overall visual change would be medium. The proposed vividness would decrease to moderately low due to the removal of the landscape berm and the vehicles in the parking lot on the west side being visible. The proposed intactness would decrease slightly but would still be moderately low because additional vehicles would be visible and would intrude into the view. The proposed unity would decrease to moderately low because the lack of screening would make more vehicles visible and would minimize the original proportions of the view. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated -0.7, a medium decrease in visual quality for Key View 24-FWY. Figure 3.6-A shows change in visual character would have moderately poor compatibility (-1.0) with the existing scene due to the removal of an existing hill. Removing the hillside would remove a green, vegetated feature of visual interest. The resulting resource change would be low (-0.9). West Valley Boulevard is a heavily used exit and on-ramp for the City of Alhambra. Viewer groups for this Key View would include freeway and commercial motorists and pedestrians. Viewer exposure would be moderate due to the large number of viewers but relatively short duration of viewership. Viewer sensitivity would be low due to the wide views and distracting activities in the area, such as driving and shopping. Figure 3.6-B shows overall viewer

TABLE 3.6.3:
Permanent Visual/Aesthetic Impacts – Freeway Tunnel Alternative

Key View[1]	Permanent Impacts
	response would be moderately low (-3.0). Figure 3.6-C shows that the visual impact associated with the Freeway Tunnel Alternative and removal of the landscaped berm in Key View 24-FWY would be moderately low (-1.9). Visual resource change would be low, and viewer awareness would be moderately low.
25-FWY	This Key View features an undeveloped area (State right of way) consisting of a grassy berm. Under the Freeway Tunnel Alternative, the new Operations and Maintenance Center would have frontage on the north side of West Valley Boulevard as shown in the view simulation on Figure 3.6-28 (refer to Appendix M). The existing berm would be regraded to a lower profile and would be re-landscaped. Additionally a ventilation structure is located in the middle of the Operations and Maintenance Center building. However this does not extend above the roof line. The overall visual quality change would be medium. The proposed vividness would increase to moderately high due to the addition of the Operations and Maintenance Center building and the associated landscaped area, which would add features that would create a notable experience for the viewer with the change from the existing view. The proposed intactness would increase to moderate due to the replacement of the utility lines and fencing with the new building and streetscape. The proposed unity would decrease to low because the Operations and Maintenance Center building would stand out from the existing structures on West Valley Boulevard. Therefore, the addition of the new building and new landscaping would result in a positive impact and the proposed visual quality of this view would increase. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated +0.8, a medium increase in visual quality for Key View 25-FWY. Figure 3.6-A shows change in visual character would have moderately good compatibility (1.0) with the existing view. The new Operations and Maintenance Center building would have interesting architecture, creating a feature of visual interest. The resulting resource change would be low (0.9). West Valley Boulevard serves as one of the major gateways into Alhambra from SR 710. Viewer groups would include commercial pedestrians and motorists. Figure 3.6-B shows viewer sensitivity would be moderately low due to unlikely value for the existing view and distracting activities and awareness. Viewer exposure would be moderately high due to the large number of viewers. Average viewer response would be moderate. Figure 3.6-C shows the visual impact in Key View 25-FWY would be moderate (2.5). The addition of a new building and new landscaping would result in a positive resource change with more vividness, intactness, and compatible character change. Viewer response would be moderate.
26-FWY	St. John Avenue currently serves as the off-ramp for southbound traffic from SR 710 onto California Boulevard. Under the Freeway Tunnel Alternative, the realignment of the off-ramp on California Boulevard would require new paving for this intersection across from Singer Park as shown in the view simulation on Figure 3.6-29 (refer to Appendix M). At this location, the proposed Operations and Maintenance Center might be seen in the background. The overall visual change would be medium. The proposed vividness would increase but remain moderate because the new paving and sidewalks would give the intersection a fresh appearance and the replacement of the traffic signal and wood pole would give a clearer view of the mountains in the background. The proposed intactness would increase to moderate because the addition of the Operations and Maintenance Center would add a larger profile on the streetscape compared to existing conditions. The proposed unity would increase to moderate because there would be very little change within the view other than the new paving, sidewalks, and the Operations and Maintenance Center, which would not improve the flow or unity of the view. Therefore, the proposed visual quality of this view would be increased with new paving and the existing trees that would be retained on the northeast corner. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated +0.7, a medium increase in visual quality for Key View 26-FWY. Figure 3.6-A shows change in visual character would have moderately good compatibility (0.1) with the existing view. The new Operations and Maintenance Center building would have interesting architecture, creating a feature of visual interest. The resulting resource change would be low (0.1). Viewer groups represented at this Key View location would include recreation pedestrians. Figure 3.6-B shows viewers would have moderately high exposure and sensitivity to the project from this public park, which includes a playground. Figure 3.6-C shows the visual impact in Key View 26-FWY would be moderate (2.6) because of the moderately high

TABLE 3.6.3:
Permanent Visual/Aesthetic Impacts – Freeway Tunnel Alternative

Key View[1]	Permanent Impacts
	response from the recreation viewer group. Visual resource change with the new paving of St. John Avenue and where this off-ramp meets California Boulevard would be low.
27-FWY	The proposed Operations and Maintenance Center would be visible at the far end of the mass of mature trees on the left side of South Pasadena Avenue in this Key View, as shown in the view simulation on Figure 3.6-30 (refer to Appendix M). There would be no change in visual quality. Travelers heading northbound on South Pasadena Avenue or turning onto South Pasadena Avenue from West California Boulevard would experience a limited view of the Operations and Maintenance Center building. The filtered view, combined with the perspective of the viewer's angle, would create the illusion that the Operations and Maintenance Center building is among or behind the mass of trees in this view. As a result, the Operations and Maintenance Center building would not appear to be higher than the trees. The proposed vividness would remain moderately high due to the large mass of mature trees on the left side of South Pasadena Avenue that would remain unaffected. The proposed intactness would remain moderate because the introduction of the Operations and Maintenance Center building would not alter the original intrusion-free character of the view. The proposed unity would be moderate because the Operations and Maintenance Center building would not negatively impact the visual pattern or flow of the existing condition. Therefore, there would be no change in visual quality with the addition of the Operations and Maintenance Center building. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated +1.0, a medium increase in visual quality for Key View 27-FWY. Figure 3.6-A shows no change in visual character occurs (0.0) with the existing scene due to the removal of an existing hill. The filtered view combined with the perspective of the viewer's angle would create the illusion that the Operations and Maintenance Center building is among or behind the tree mass. It does not appear to be taller than these trees. The visual resources would not change (0.0). Viewer groups at this Key View location include commercial pedestrians and motorists. Viewer exposure would be moderate since a large number of viewers may travel through the area for moderate durations of time. Viewer sensitivity would be moderately low because of reduced awareness, wide views, and distracting activities. Figure 3.6-B shows average viewer response would be moderate (3.5). Figure 3.6-C shows the visual impact in Key View 27-FWY would be moderately low (1.8). The addition of the proposed Operations and Maintenance Center building does not change the vividness, intactness, or unity of the existing view. Viewer response in this commercial area would be moderate (3.5).
28-FWY	The west side of SR 710 is residential in this Key View, with the overpass linking the neighborhood to the lower downtown area of Pasadena. Under the Freeway Tunnel Alternative, improvements to the overpass, including new paving and turn lane islands, would be made to realign St. John Avenue as shown in the view simulation on Figure 3.6-31 (refer to Appendix M). The overall visual change would be minor. However, due to the width of the overpass, viewer exposure to SR 710 would be limited to pedestrians on the overpass sidewalks or bus passengers with a high vantage point. The proposed vividness would increase to moderate because the new paving, the new overpass railing, and the addition of the new turn lane island would add a fresh look and give a visual focal point to this overpass. The proposed intactness would remain moderately low as the new hardscape improvements would not change the intactness of this view due to the remaining light fixtures. The proposed unity would remain moderate because the new hardscape improvements would be within the existing overpass and would create the same visual balance between pavement and sky as the existing conditions. Therefore, the proposed visual quality would increase with the addition of new paving. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated +0.3, a minor increase in visual quality for Key View 28-FWY. Figure 3.6-A shows change in visual character would have moderately good compatibility (1.0) with the existing view. New paving would reinforce the existing character with new asphalt and bright paint. The visual resources change would be low (0.7). Del Mar Boulevard serves as a major exit for the lower side of downtown Pasadena and surrounding neighborhoods. The nearby Maranatha High School makes this view representative of education viewer groups, which are mostly pedestrians. Viewer exposure would be moderate, and viewer sensitivity would be moderately high. Figure 3.6-B shows overall viewer response would be moderately high. Figure 3.6-C shows that the visual impact in Key View 28-FWY would be moderate (2.6).The new paving would result in an increase in vividness. Intactness and unity would remain similar. Change in visual character would have

TABLE 3.6.3:
Permanent Visual/Aesthetic Impacts – Freeway Tunnel Alternative

Key View[1]	Permanent Impacts
	moderately good compatibility with the existing view. Viewer response from the education viewer groups would be moderately high.
29-FWY	The west side of the SR 710 stub is currently a grassy slope with large shade trees at the top of the slope. Under the Freeway Tunnel Alternative, the SR 710 stub would be widened to accommodate the freeway lanes going into the tunnel and the freeway lanes exiting on Del Mar Boulevard as shown in the view simulation on Figure 3.6-32 (refer to Appendix M). The slope would be regraded and the existing trees would be removed to accommodate the road widening. The proposed vividness would decrease to moderately low due to the removal of the existing trees for the realignment of St. John Avenue and any memorable elements would be minimized or removed from this view. The proposed intactness would decrease but would remain moderately low because the removal of the existing vegetation and addition of the tunnel entrances would emphasize man-made features. The proposed unity would remain moderate because the view would still contain strong lines from the grassy slope, the overpass, and the tunnel entrances, which would supersede the existing flow with strong horizontal lines. Therefore, the proposed visual quality would be reduced due to the loss of trees at the top of the slope and the overpass. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated -0.3, a minor decrease in visual quality for Key View 29-FWY. Figure 3.6-A shows change in visual character would have good compatibility (2.0) with the existing view. The existing character of the freeway would be reinforced by the built project. The view of the portals is well balanced. The visual resources change would be low (0.9). The SR 710 northern terminus handles a high volume of vehicular traffic traveling south toward the Pasadena downtown exits. Viewer groups would include freeway motorists. Figure 3.6-B shows viewer exposure would be moderately low and viewer sensitivity would be low. Overall viewer response would be low (2.0). Figure 3.6-C shows that the visual impact in Key View 29-FWY would be low (1.4). The built project would create a higher profile along this section of SR 710. Visual resource change would be low, and viewer response would be low.
30-FWY	The west side of Colorado Boulevard in this Key View consists of businesses and the Norton Simon Museum. East of SR 710 is the downtown district of Old Pasadena. Under the Freeway Tunnel Alternative, the overpass in this Key View would not be widened. However a series of six approximately 50-foot structures, one being used for ventilation of the tunnel at the north portal of the tunnel, are depicted under the conceptual design. These ventilation structures would be the predominant visual element in this view due to their size and colors. Other visible features would include new paving and striping as shown in the view simulation on Figure 3.6-33 (refer to Appendix M). The overall change in visual quality would be minor. Due to the width of the overpass, viewer exposure to SR 710 would be limited to pedestrians on overpass sidewalks or bus passengers with a high vantage point. The proposed vividness would increase to moderate because the new ventilation structures, would add a predominant and memorable visual element to this view. Also, the new paving and striping would improve the look for this entrance into Old Pasadena and the new bridge railing would add additional focus points for the viewer. The proposed intactness would decrease to low because the addition of the ventilation structures, which are approximately 50 feet in height, would create visual intrusion into this view. The proposed unity would increase to moderately high because the new ventilation structures located on both sides of Colorado Boulevard would create a visual flow which follows the perspective lines toward Old Town Pasadena and the new paving and striping improve the look for this entrance into Old Town Pasadena. As shown in Table 3.6.1, the change in visual quality from the existing condition to the construction of the Freeway Tunnel Alternative is rated +1.0, a medium increase in visual quality for Key View 30-FWY. Figure 3.6-A shows change in visual character would have good compatibility (2.0) with the existing view. The built project would create an interesting, colorful entrance to the area. The view of the portals is well balanced with harmonious repetition. The visual resource change would be moderate (1.5). Viewer groups include commercial motorists and pedestrians. Figure 3.6-B shows viewer sensitivity to the new ventilation structures, paving, and striping along Colorado Boulevard would be moderately high. The ventilation structures form a memorable visual element. However, due to the width of the overpass, viewer exposure to SR 710 would be limited to pedestrians on the overpass sidewalks or bus passengers with a high vantage point. Overall viewer response would be moderately high.

TABLE 3.6.3:
Permanent Visual/Aesthetic Impacts – Freeway Tunnel Alternative

Key View[1]	Permanent Impacts
	Figure 3.6-C shows that the visual impact in Key View 30-FWY would be moderate (3.3). The ventilation structures for the northern portal, new paving, and striping on this section of Colorado Boulevard would result in an increase in vividness. Intactness would decrease due to the added visual encroachments. Unity would increase with the visual flow in the direction of Old Town being reinforced by the new ventilation structures. Visual character would have good compatibility with the existing view. Visual character would be moderate, and viewer response would be moderately high.

Source: *Visual Impact Assessment* (2014).

[1] Refer to Figures 3.6-24 through 3.6-33 (refer to Appendix M) for the locations of these Key Views, the existing conditions at these Key Views, and the with project view simulations at these Key Views.

	1-BRT	2-BRT	3-LRT	4-LRT	5-LRT	6-LRT	7-LRT	8-LRT	9-LRT	10-LRT	11-LRT	12-LRT	13-LRT	14-LRT	15-LRT
Visual Character Change	0.1	0.1	2.0	-0.5	-1.0	-1.0	-1.0	-2.0	-0.5	0.5	-1.0	-2.0	-2.0	1.0	0.5
Visual Quality Change	0.0	0.0	1.1	0.2	-0.4	-0.5	-0.1	-0.2	-1.5	0.0	-0.8	-0.3	-1.9	-0.3	0.0
Visual Resource Change	0.1	0.1	1.6	-0.2	-0.7	-0.8	-0.6	-1.1	-1.0	0.3	-0.9	-1.2	-2.0	0.4	0.3

	16-LRT	17-LRT	18-LRT	19-LRT	20-LRT	21-FWY	22-FWY	23-FWY	24-FWY	25-FWY	26-FWY	27-FWY	28-FWY	29-FWY	30-FWY
Visual Character Change	0.0	-1.5	0.5	0.0	1.0	0.5	-0.5	-1.5	-1.0	1.0	-0.1	0.0	1.0	2.0	2.0
Visual Quality Change	0.0	0.7	0.0	0.0	0.5	0.0	0.0	-0.2	-0.7	0.8	0.2	0.0	0.3	-0.3	1.0
Visual Resource Change	0.0	-0.4	0.3	0.0	0.8	0.3	-0.3	-0.9	-0.9	0.9	0.1	0.0	0.7	0.9	1.5

Visual Character Change: -3.0 = very poor compatibility, -2.0 = poor compatibility, -1.0 = moderately poor compatibility, 0.0 = no visible change, 1.0 = moderately good compatibility, 2.0 = good compatibility, 3.0 = very good compatibility
Visual Quality Change is the difference between the existing visual quality of a key view and the projected visual quality after the Built Alternative would be constructed.
Visual Resource Change: (-5.0 = high negative change, -4.0 = moderately high negative change, -3.0 = moderate negative change, -2.0 = moderately low negative change, -1.0 = low negative change, 0.0 = no visible change, 1.0 = low positive change, 2.0 = moderately low positive change, 3.0 = moderate positive change, 4.0 = moderately high positive change, 5.0 = high positive change)

FIGURE 3.6-A

SR 710 North Project

Resource Change by Build Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Tatsumi and Partners, Inc. (2014)

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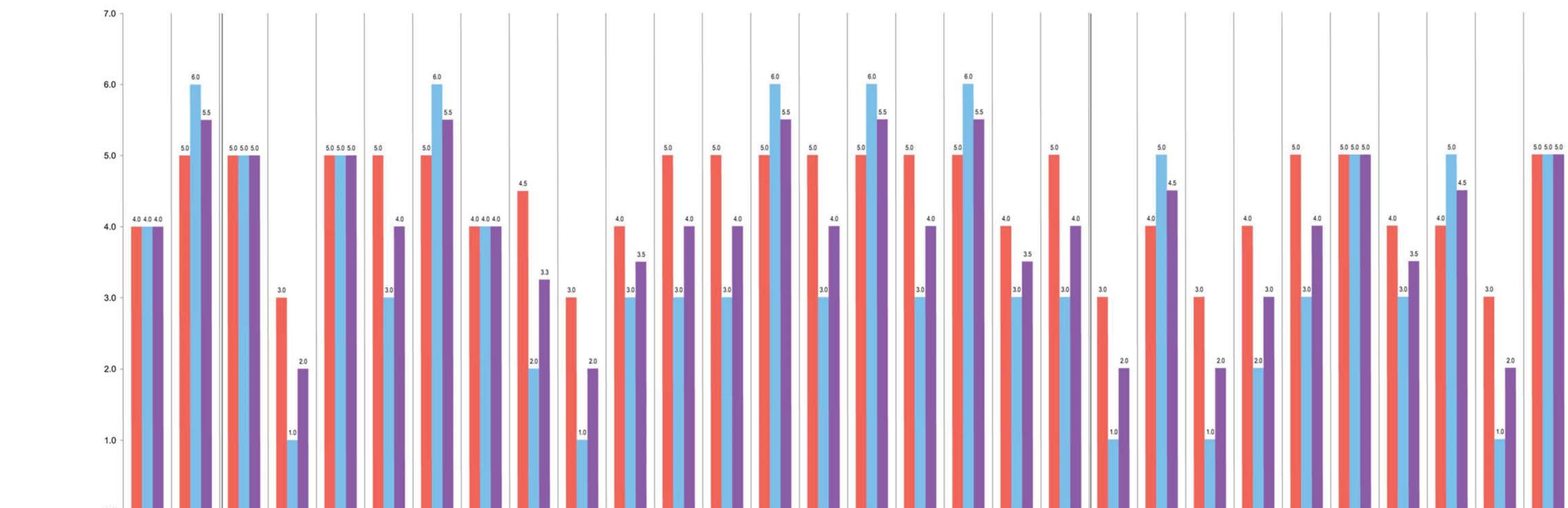

	1-BRT	2-BRT	3-LRT	4-LRT	5-LRT	6-LRT	7-LRT	8-LRT	9-LRT	10-LRT	11-LRT	12-LRT	13-LRT	14-LRT	15-LRT
Viewer Exposure	4.0	5.0	5.0	3.0	5.0	5.0	5.0	4.0	4.5	3.0	4.0	5.0	5.0	5.0	5.0
Viewer Sensitivity	4.0	6.0	5.0	1.0	5.0	3.0	6.0	4.0	2.0	1.0	3.0	3.0	3.0	6.0	3.0
Average Viewer Response	4.0	5.5	5.0	2.0	5.0	4.0	5.5	4.0	3.3	2.0	3.5	4.0	4.0	5.5	4.0

	16-LRT	17-LRT	18-LRT	19-LRT	20-LRT	21-FWY	22-FWY	23-FWY	24-FWY	25-FWY	26-FWY	27-FWY	28-FWY	29-FWY	30-FWY
Viewer Exposure	5.0	5.0	5.0	4.0	5.0	3.0	4.0	3.0	4.0	5.0	5.0	4.0	4.0	3.0	5.0
Viewer Sensitivity	6.0	3.0	6.0	3.0	3.0	1.0	5.0	1.0	2.0	3.0	5.0	3.0	5.0	1.0	5.0
Average Viewer Response	5.5	4.0	5.5	3.5	4.0	2.0	4.5	2.0	3.0	4.0	5.0	3.5	4.5	2.0	5.0

0.0 = no response, 1.0 = very low, 2.0 = low, 3.0 = moderately low, 4.0 = moderate, 5.0 = moderately high, 6.0 = high, 7.0 = very high

FIGURE 3.6-B

SR 710 North Project

Viewer Response by Build Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Tatsumi and Partners, Inc. (2014)

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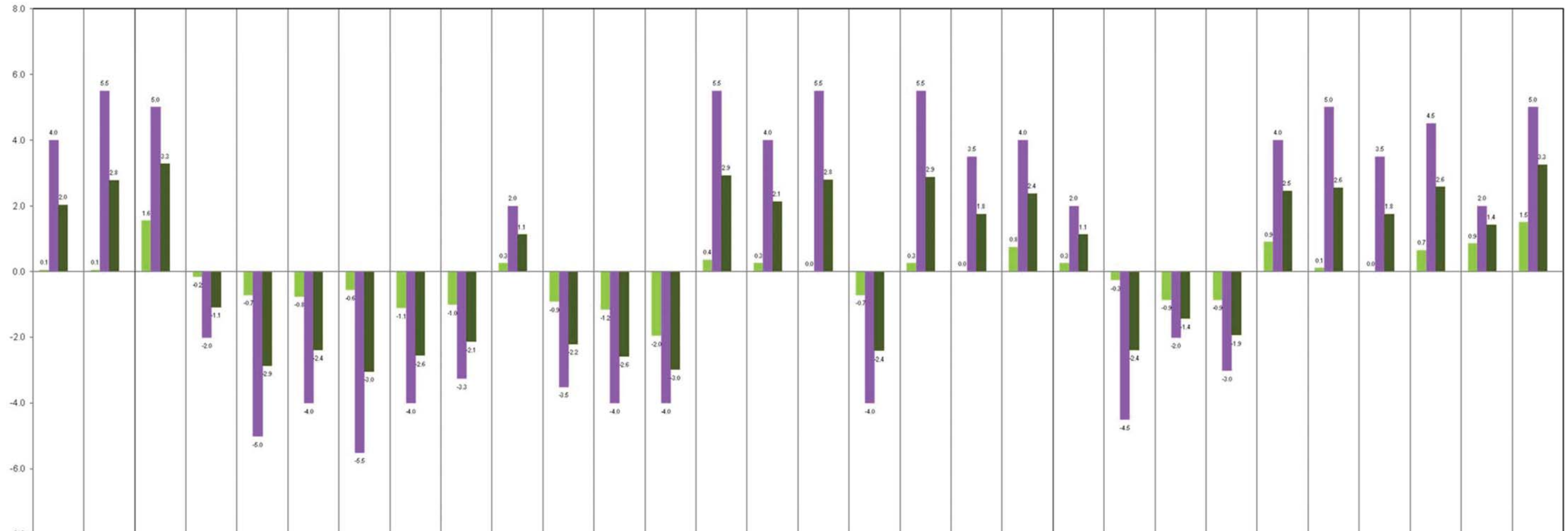

	1-BRT	2-BRT	3-LRT	4-LRT	5-LRT	6-LRT	7-LRT	8-LRT	9-LRT	10-LRT	11-LRT	12-LRT	13-LRT	14-LRT	15-LRT	16-LRT	17-LRT	18-LRT	19-LRT	20-LRT	21-FWY	22-FWY	23-FWY	24-FWY	25-FWY	26-FWY	27-FWY	28-FWY	29-FWY	30-FWY
Resource Change	0.1	0.1	1.6	-0.2	-0.7	-0.8	-0.6	-1.1	-1.0	0.3	-0.9	-1.2	-2.0	0.4	0.3	0.0	-0.7	0.3	0.0	0.8	0.3	-0.3	-0.9	-0.9	0.9	0.1	0.0	0.7	0.9	1.5
Viewer Response	4.0	5.5	5.0	-2.0	-5.0	-4.0	-5.5	-4.0	-3.3	2.0	-3.5	-4.0	-4.0	5.5	4.0	5.5	-4.0	5.5	3.5	4.0	2.0	-4.5	-2.0	-3.0	4.0	5.0	3.5	4.5	2.0	5.0
Visual Impact	2.0	2.8	3.3	-1.1	-2.9	-2.4	-3.0	-2.6	-2.1	1.1	-2.2	-2.6	-3.0	2.9	2.1	2.8	-2.4	2.9	1.8	2.4	1.1	-2.4	-1.4	-1.9	2.5	2.6	1.8	2.6	1.4	3.3
Visual Impact Rank	ML	M	M	L	M	ML	M	M	ML	L	ML	M	M	M	ML	M	ML	M	ML	ML	L	ML	L	ML	M	M	ML	M	L	M

Viewer Response: 0.0 = no change, 1.0 = very low, 2.0 = low, 3.0 = moderately low, 4.0 = moderate, 5.0 = moderately high, 6.0 = high, 7.0 = very high
Visual Resource Change: -5.0 = high negative change, -4.0 = moderately high negative change, -3.0 = moderate negative change, -2.0 = moderately low negative change, -1.0 = low negative change, 0.0 = no visible change, 1.0 = low positive change, 2.0 = moderately low positive change, 3.0 = moderate positive change, 4.0 = moderately high positive change, 5.0 = high positive change
Visual Impact: 0.0 = no impact, 1.0 = low impact, 2.0 = moderately low impact, 3.0 = moderate impact, 4.0 = moderately high impact, 5.0 = high impact

FIGURE 3.6-C

SR 710 North Project

Visual Impact by Build Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Tatsumi and Partners, Inc. (2014)

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3.7 Cultural Resources

3.7.1 Regulatory Setting

The term "cultural resources," as used in this document, refers to the "built environment" (e.g., structures, bridges, railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including "historic properties," "historic sites," "historical resources," and "tribal cultural resources." Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places (NRHP). Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the ACHP (36 Code of Federal Regulations [CFR] 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA) among the Federal Highway Administration (FHWA), the ACHP, the California State Historic Preservation Officer (SHPO), and the California Department of Transportation (Caltrans) went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the ACHP's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties (in Section 4(f) terminology—historic sites). See Appendix B for specific information about Section 4(f).

The California Environmental Quality Act (CEQA) requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as "unique" archaeological resources. California Public Resources Code (PRC) Section 5024.1 established the California Register of Historical Resources (CRHR) and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the CRHR and, therefore, a historical resource. Historical resources are defined in PRC Section 5020.1(j). In 2014, Assembly Bill 52 (AB 52) added the term "tribal cultural resources" to CEQA, and AB 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in PRC Section 21074(a), a tribal cultural resource is a CRHR or local register eligible site, feature, place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. It further requires Caltrans to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the

NRHP or are registered or eligible for registration as California Historical Landmarks. Procedures for compliance with PRC Section 5024 are outlined in a Memorandum of Understanding (MOU)[1] between Caltrans and SHPO, effective January 1, 2015. For most Federal-aid projects on the State Highway System, compliance with the Section 106 PA will satisfy the requirements of PRC Section 5024.

3.7.2 Affected Environment

Cultural resources in the Area of Potential Effects (APE) were identified in the *Historic Property Survey Report* (HPSR) (Caltrans 2014), the *Historical Resources Evaluation Report* (HRER) (Caltrans 2014), the *Archaeological Survey Report* (ASR) (Caltrans 2014), and the Supplemental HPSR (SHPSR) (Caltrans 2017). The HRER and the ASR are attachments to the HPSR. The potential for the State Route 710 (SR 710) North Project Build Alternatives to affect cultural resources is based on the *Finding of Adverse Effect for the State Route 710 North Project* (Caltrans 2017), and the analyses in other sections of this EIR/EIS, including Appendix B, State Route 710 North Study Section 4(f) Evaluation, as summarized in this section.

3.7.2.1 Finding of Adverse Effect

Subsequent to the circulation of the Draft EIR/EIS, Caltrans reviewed comments received from municipalities, public agencies, preservation organizations, and members of the public concerning the potential for effects of the Build Alternatives on cultural resources in the APE. In addition, based on extensive consultation between Caltrans and SHPO, as well as input from Consulting Parties through the Section 106 process, Caltrans reanalyzed and revised the effects evaluations for all historic properties in the APE, and the overall No Adverse Effect finding for the proposed project was changed to an overall Adverse Effect finding. As a result, Caltrans prepared a Finding of Adverse Effect (FOAE) for the proposed project consistent with the requirements of Section 106 in December 2017. Caltrans submitted the FOAE to the SHPO in January 2018 and received SHPO concurrence on the determinations on May 3, 2018.

3.7.2.2 Area of Potential Effects

The APE for the project was established in consultation with Caltrans District 7 Cultural Studies staff and is a combination of the areas of potential direct and indirect effects, including, but not limited to, the following: existing and proposed right of way (ROW), temporary construction easements (TCEs), staging areas, and areas with potential visual and/or setting impacts. The APE maps are provided as Maps 3A, 3B, and 3C in Attachment A of the HPSR. Based on feedback from the public and the Consulting Parties during the EIR/EIS public comment period, Caltrans enlarged the APE in some areas and evaluated additional properties in the SHPSR (Caltrans 2017).

Because of the diversity of the Build Alternatives and the geographic locations, the APE includes several discontinuous areas. For example, the APEs for the Freeway Tunnel and Light Rail Transit (LRT) Alternatives overlap in some areas and are a few miles apart in other areas. The APE for the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative consists of small discontinuous areas around the various intersection improvements in that alternative.

The areas of direct effects (direct APE) are generally limited to the existing and proposed ROWs and include the horizontal and vertical areas associated with ground-disturbing activities. For this

[1] The MOU is located on the SER at http://www.dot.ca.gov/ser/vol2/5024mou_15.pdf.

project, the vertical impact area ranges from a maximum height of 74 feet (ft) (bridge construction) to a maximum depth of 173 ft (tunnel excavation). All areas that may experience ground settling related to the proposed tunnels are included in the direct APE.

As discussed previously, several alternatives are being considered. Of those, the Freeway Tunnel and LRT Alternatives involve tunnels and underground elements for substantial distances over their alignments. The Freeway Tunnel and LRT Alternatives would consist of the following major elements that could result in excavation-induced ground movements: bored tunnels, cross passages, construction portals, and station excavation (LRT Alternative only).

The areas of indirect effects (indirect APE) extend beyond the areas of direct effects and incorporate areas that may be indirectly affected by visual, noise, vibration, and/or other effects. The indirect APE generally includes all properties adjacent to the proposed ROWs, unless they are undeveloped or have no buildings closer than 200 ft to the proposed improvements. In most cases, the APE includes only the properties adjacent to the proposed ROWs and/or TCEs, but additional parcels may be included if they are small (typically less than 0.15 acre [ac]/6,500 square feet [sf]) residential properties that may experience indirect impacts. In some cases, parcels adjacent to potential ground settlement areas are included. Parcels with buildings that are within 200 ft of a proposed bridge or a bridge that is being widened by more than 30 ft are also included in the indirect APE. Exceptions include properties that are buffered by topographic features, large parking and/or landscaped areas, and/or buildings on other properties. Aside from these listed exceptions, the indirect APE extends around the entirety of those parcels where the built environment may be indirectly affected.

After circulation of the Draft EIR/EIS, the following refinements were made to the APE as a result of consultation with the SHPO and the Consulting Parties:

- Ventilation structures at the north end of the APE were identified on the APE map.
- The Old Pasadena Historic District map was updated. APE Map Reference No. 424-3A is a non-contributing property to the Historic District and, therefore, was removed from the Supplemental APE. Map Reference No. 426-3A is a parking lot and non-contributor to the Historic District and, therefore, was removed from the APE. Map Reference No. 429-3A was reassigned from a non-contributing property (169 West Colorado Boulevard) to a contributing property (166 West Colorado Boulevard) (Map 3C sheet 36/42).
- Proposed sound wall at the southeast corner of Colorado Boulevard and South Pasadena Avenue was removed from the Freeway Tunnel Alternative.
- Two proposed sound walls were removed from the TSM/TDM Alternative to avoid visual impacts: (1) T-2/TNB No. 1, a 743-ft-long barrier along the northbound side of SR 110, with heights ranging from 6 to 16 ft, and (2) T-2/TNB No. 2, a 963-ft-long barrier along the edge of the shoulder on the southbound side of SR 110, with heights ranging from 12 to 20 ft.
- The APE for permanent visual effects was expanded to include the buildings on the east side of South Mednik Avenue for the construction of the LRT aerial railway.
- Three properties were not identified during the original HPSR that were included in the Supplemental HPSR (Maravilla Handball Court and El Centro Grocery, Edward R. Roybal Comprehensive Health Center, and West Colorado Street Auto Row).
- Ambassador Hall of Administration at 300 W. Green Street, Pasadena (Map Reference No. 423-3A), formerly a contributor to the Ambassador West Cultural Landscape Historic District.

3.7.2.3 Supplemental Historic Property Survey Report

Based on feedback from the public and the Consulting Parties during the Draft EIR/EIS public comment period, Caltrans made a minor refinement to the APE and evaluated additional historic properties. The project team conducted additional field surveys in September 2015 and consulted with the Consulting Parties to evaluate the additional properties. Caltrans prepared an SHPSR (Caltrans 2017) that identified an additional three properties (Maravilla Handball Court and El Centro Grocery, Edward R. Roybal Comprehensive Health Center, and the West Colorado Street Auto Row) within the APE that are determined eligible for listing in the NRHP and are historical resources for the purposes of CEQA. Caltrans submitted the SHPSR to the SHPO in October 2017 and received concurrence on the determinations on November 9, 2017. A copy of the letter is provided in Chapter 5, Correspondence.

3.7.2.4 Records Search

As part of the pre-field research, a records search was conducted at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton. The records search included review of the SCCIC electronic databases for previously identified historical and archaeological resources in or near the APE and existing cultural resources reports pertaining to the areas in and around the APE.

The following repositories and resources were used to access historical information relevant to properties within, and in the vicinity of, the APE:

- American Indian Studies Center Library at the University of California, Los Angeles
- California Historic Highway Bridge Inventory
- California Historical Landmarks
- California Historical Resources Information System
- California Points of Historical Interest
- California Register of Historical Resources
- California Inventory of Historic Resources
- Caltrans Cultural Resources Database
- Charles E. Young Research Library at the University of California, Los Angeles
- City of Alhambra Development Services Planning Division
- City of Los Angeles Department of Building and Safety
- City of Los Angeles Office of Historic Preservation
- City of Monterey Park Building and Safety Division
- City of Pasadena Light and Power Department
- City of Pasadena Planning and Community Development Department
- City of San Gabriel Building and Safety Division
- City of San Marino Planning and Building Department
- City of South Pasadena Planning and Building Department
- Claremont Library
- County of Los Angeles Building and Safety Department
- Crowell Public Library in San Marino
- Doheny Library at the University of Southern California
- East Los Angeles Library, Chicano Resource Center
- Franciscan Ceramics Archive
- Glendora Public Library
- Historic aerial photographs accessed online at www.historicaerials.com
- Historic *Los Angeles Times* news articles accessed online via the Los Angeles Public Library
- Historic news articles accessed online via www.geneaologybank.com
- Los Angeles Central Library
- Los Angeles Office of Historic Resources
- Los Angeles Public Library – History Department
- Norwalk Central Library

- Norwalk Public Library
- NRHP
- Pasadena Central Library
- Rosemead Library
- South Pasadena Public Library
- United States Geological Survey (USGS) topographic maps
- University of California, Riverside Library

The following historical institutions, groups, and individuals were also contacted:

- Alhambra Chamber of Commerce
- Alhambra Historical Society Museum
- Alhambra Preservation Group
- Arroyo Seco Foundation
- Bill Pascarella, Pasadena Power Plant Shift Supervisor
- Bungalow Heaven Neighborhood Association (Pasadena)
- California African American Museum
- California Historic Route 66 Association
- California Preservation Foundation (Route 66)
- Chinese American Museum
- Claire W. Bogaard
- El Sereno Historical Society
- Friends of the Gamble House (Pasadena)
- Garfield Heights Neighborhood Association (Pasadena)
- Garvanza Improvement Association
- Getty Research Institute
- Highland Park Heritage Trust
- Historic Highland Park Neighborhood Council
- Historic Highlands Neighborhood Association (Pasadena)
- Historical Society of Southern California
- J. Paul Getty Trust
- Japanese American National Museum
- Jewish Historical Society of Southern California
- La Cañada Flintridge Chamber of Commerce and Community Association
- La Cañada Flintridge Community Development Department Planning Division, Historic Preservation
- Lanterman House/La Cañada Flintridge Historical Society
- Los Angeles City Historical Society
- Los Angeles Conservancy
- Los Angeles Fire Department Historical Society
- Los Angeles Police Historical Society
- Los Angeles Railroad Heritage Foundation
- Luis Hoyos, California State Polytechnic University, Pomona
- Modern Committee of the Los Angeles Conservancy (ModCom)
- Montebello Historical Society
- Montebello Planning Department
- Montecito Heights Improvement Association
- Monterey Park Historical Society Museum
- Monterey Park, Recreation and Parks Department
- National Historic Route 66 Federation
- Old Pasadena Management District
- Orange Heights Neighborhood Association (Pasadena)
- Our Town El Sereno (community newsletter)
- Pasadena Chamber of Commerce
- Pasadena Heritage
- Pasadena Museum of History
- Pasadena Roadster Club
- Railway and Locomotive Historical Society, Inc., Southern California Chapter
- Route 66 Corridor Preservation Program, Federal Advisory Council Route 66 Preservation Foundation
- Route 66 Territory Visitors Bureau
- San Marino Historical Society
- San Rafael Neighborhoods Association (Pasadena)
- Society of Architectural Historians, Southern California Chapter
- South Pasadena Chamber of Commerce
- South Pasadena Historical Museum
- South Pasadena Preservation Foundation, Inc.
- The Electric Railway Historical Association of Southern California
- West Pasadena Residents' Association

3.7.2.5 Survey Methods

Architectural Survey Methods

Intensive-level field surveys of the APEs for the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives were conducted in August, September, and October 2013, and in September 2015. During those surveys, buildings were photographed and detailed notations were made of each building's structural and architectural characteristics, current condition, setting, and associated features. In some cases, the property owner allowed the architectural historian access to the property so a more thorough survey could be completed. When possible, owners and area residents were interviewed to collect more detailed information about the buildings and the development of the area.

Based on the surveys and basic property-specific research, many buildings in the APE were determined to meet the criteria for classification under Property Types 2 through 4 and 6, as defined in Attachment 4 (Properties Exempt from Evaluation) in the Caltrans Section 106 PA and, therefore, were not further documented. Most of the buildings that were found to be exempt are modern (post-1971).

For the purposes of the SR 710 North Project cultural resources studies and to account for lead time between preparation of Section 106 compliance and actual project construction, buildings constructed prior to 1971 were considered for this study.

Archaeological Survey Methods

The Archaeological Survey Area (ASA) for the Build Alternatives was defined as the horizontal extent of anticipated ground-disturbing activities. The ASA is entirely within the direct APE. Archaeological field surveys were conducted in September and October 2013. Two archaeological resources were identified within, or adjacent to, the ASA. Despite the disturbed condition of the APE and the ASA, ethnographic accounts and archival research indicate there is the potential for archaeological resources to be present in native soil at two sites (the Horatio Rust and Otsungna Village sites) within the APE.

3.7.2.6 Historic Properties Within the Area of Potential Effect

Archaeological Resources

The direct APE was surveyed for archaeological resources. Two archaeological resources were identified within, or adjacent to, the APE. Based on ethnographic accounts and archival research, there is the potential for archaeological resources to be present in native soil at the two sites in the APE.

NRHP Listed, Eligible for Listing, or Determined Eligible for Listing Properties

Of the approximately 2,200 properties in the project APE, a total of 74 properties are listed in, or eligible for listing in, the NRHP. Of the 74 properties, 67 are previously listed in, or determined eligible for listing in, the NRHP, including 8 residential historic districts; 3 commercial historic districts; 2 other landscape and cultural historic districts; 9 religious, educational, municipal, and institutional buildings; 3 theatres and performing arts centers; 7 commercial buildings; 5 multi-family residential buildings; 25 single-family residential buildings; 1 park (Jardin del Encanto and Cascades Park); 2 historic waiting station properties consisting of 3 structures); 1 linear feature (Arroyo Seco Parkway Historic District); and 1 object (Bekins Storage Company Roof Sign). In addition, seven properties (Horatio Rust Site, Otsungna Village Site, segments of Route 66, 318

Fairview Avenue, 2020 Fremont Avenue, 904 Monterey Road, and the Library Neighborhood Historic District) are considered eligible for listing in the NRHP for purposes of this project only.

Native American Sacred Sites/Traditional Cultural Properties

No Native American Sacred Sites or Traditional Cultural Properties (TCPs) were identified within the APE. There is potential for previously undocumented cultural materials or human remains to be unearthed during site preparation, grading, or excavation for the improvements in the TSM/TDM Alternative. Because there are no Native American sacred sites/TCPs in the APE for the TSM/TDM Alternative, the construction and operation of the Build Alternatives would not result in impacts on those types of resources. However, as noted previously, several Native American Tribal representatives have indicated the overall study area is sensitive for cultural resources. As a result, the construction of the Build Alternatives could potentially affect unknown cultural resources, if encountered.

3.7.2.7 Cultural Resources Protected Under Section 4(f)

The requirements for protection of cultural resources under Section 4(f) are triggered by the use of NRHP-listed or eligible for listing historic properties in the APE. The TSM/TDM Alternative and the BRT Alternative would result in a use of properties in, or eligible for listing in, the NRHP: Arroyo Seco Parkway Historic District and Jardin del Encanto and Cascades Park, respectively. Refer to Appendix B (Section 4f Evaluation) for the detailed evaluation of the expected effects under Section 4(f) on the Arroyo Seco Parkway Historic District and Jardin del Encanto and Cascades Park and for other historic properties evaluated under Section 4(f).

3.7.2.8 Discovery of Cultural Materials or Human Remains

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains and the Los Angeles County Coroner shall be contacted. Pursuant to California PRC Section 5097.98, if the remains are thought to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC), which will then notify the Most Likely Descendant (MLD). The person who discovered the remains will also contact the Caltrans District 7 Environmental Branch Chief so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

3.7.3 Environmental Consequences

The potential for the SR 710 North Project Build Alternatives to affect cultural resources is based on the FOAE for the SR 710 North Project (Caltrans 2017) and the analyses in other sections of this EIR/EIS, including Appendix B (Section 4(f) Evaluation), as summarized in this section. The SHPO concurred with the findings for the preferred alternative, the TSM/TDM Alternative, on May 3, 2018. The SHPO specifically did not concur with the other alternative findings. The concurrence letter is included in Chapter 5 of this Final EIR/EIS. The actual and potential Section 4(f) uses of historic properties are discussed in Appendix B.

3.7.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives; as a result, this alternative would not result in any short-term effects on cultural resources in the study area.

Build Alternatives

The construction of the Build Alternatives could potentially impact documented and previously undocumented cultural resources. Any such impacts during construction of the Build Alternatives would be considered permanent (not temporary) impacts of the Build Alternatives. As a result, potential impacts on cultural resources during construction of the Build Alternatives are discussed in Section 3.7.3.3, Permanent Impacts.

As noted previously and as shown on Figure 3.1-3, construction of the BRT Alternative would require the temporary occupancy of approximately 0.02 ac of land in two small areas of Cascades Park for TCEs. The sidewalks in Jardin del Encanto and Cascades Park shown on Figure 3.1-3 would be closed temporarily during construction of the BRT Alternative improvements along Atlantic Boulevard. Alternative pedestrian routes will be provided during construction to ensure that park patrons continue to have access to and from Jardin del Encanto and Cascades Park. As discussed in Section 3.1, at the completion of construction of the BRT Alternative in this area, the land temporarily occupied by the TCEs would be returned to a condition that is at least as good as that which existed prior to the project (see Measure Cascades-1 in Section 3.1). The existing sidewalks will be replaced and permanently incorporated within the boundary of Jardin del Encanto and Cascades Park, and the grass/turf areas affected by project construction would be re-landscaped and returned to a condition that is at least as good as that which existed prior to the project (see Measure Cascades-2 in Section 3.1). The nearest construction of BRT Alternative improvements would be in excess of 400 ft northwest of the El Encanto building and 400 ft northeast of the Cascades.

3.7.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative does not include the construction or operation of any improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any effects related to cultural properties associated with improvements in the SR 710 North Project.

Build Alternatives

Caltrans has considered all views concerning such effects which have been provided by consulting parties and the public, per 36 CFR 800.5(a) and determined that the undertaking as a whole would have an Adverse Effect on historic properties pursuant to Section 106 PA Stipulation X.C. The SHPO concurred with the findings for the preferred alternative, the TSM/TDM Alternative, on May 3, 2018.

TSM/TDM Alternative (Preferred Alternative)

The TSM/TDM Alternative has the potential to affect cultural resources, based on the FOAE for the SR 710 North Project (Caltrans 2017). Caltrans has determined that the construction and operation of the TSM/TDM Alternative would result in the following effects on historic properties under Section 106:

- **No effect on 1 historic property:** San Marino Municipal Building.

- **No adverse effect on 8 historic properties:** Rialto Theatre, Fair Hope Building, Markham Place Historic District, Neighborhood Church/Sequoyah School, Ambassador West Cultural Landscape Historic District, Ambassador College Dining Hall, Ambassador Auditorium Performing Arts Center, and Historic Route 66.
- **An adverse effect on 1 historic property**: Arroyo Seco Parkway Historic District.

The historic property with an adverse effect under the TSM/TDM Alternative is described below. For information on the historic properties with no adverse effect or no effect under the TSM/TDM Alternative, refer to the FOAE for the SR 710 North Project (Caltrans 2017).

Historic Property with an Adverse Effect under the TSM/TDM Alternative

- **The Arroyo Seco Parkway Historic District:** The Arroyo Seco Parkway Historic District is located between the cities of Pasadena and Los Angeles in Los Angeles County. It consists of a linear district comprising 60 components, including a divided roadway, on- and off-ramps, bridges, tunnels, grade separations, overcrossings, pedestrian overpasses, pedestrian and equestrian under-crossings, a four-level interchange, the Arroyo Seco Channel, and two buildings at the Arroyo Seco Maintenance Station. The district was constructed in three phases from 1938 to 1953. It starts at Post Mile (PM) 31.89, just south of Glenarm Street in the City of Pasadena, runs 8.21 miles along the Arroyo Seco Channel, and ends at PM 23.69 at the four-level interchange in the City of Los Angeles.

  The historic district boundaries include all road-related features and associated landscaping within the legal ROW. The character-defining features of the Arroyo Seco Parkway Historic District include the roadway and all related features, such as service lanes, landscaping, the Arroyo Seco Channel, bridges, tunnels, fences, and walls. The character-defining features include the three 11-ft-wide lanes in each direction, outer lanes paved in Portland cement, inner lanes paved in dark asphalt concrete, broken concrete and mortar retaining walls, chain-link fences along the edge of the Parkway, five circa 1929 on- and off-ramp entrances and exits, (compressed cloverleaf) acceleration/deceleration ramps, banked roadway around curves, landscaped slope between the curbs and fences (between 3 and 4 ft), 50 “refuge areas” or “safety bays,” storm drains, sewers, road base, concrete curbs (6 inches higher than the roadway with sloped edges and a 4-inch horizontal surface) and gutters (12 inches wide), 6-ft-wide center median, divided lanes of traffic, traffic islands, Marbelite lamps and globes, and safety features.

Proposed TSM/TDM Alternative Features and Assessment of Effect to the Arroyo Seco Parkway Historic District

Existing Condition

Proposed Simulation

Figure 3.7-1: View of NB Off-Ramp from the Arroyo Seco Parkway onto Fair Oaks Avenue

1. **Fair Oaks Avenue Overcrossing, Road Reconfiguration within and Adjacent to the District:** Widen the northbound SR 110 (Arroyo Seco Parkway) off-ramp at Fair Oaks Avenue from two lanes on the outside to four lanes. Convert two existing 12-ft lanes into dedicated left-turn lanes. One additional lane would be a 12-ft through lane, and the outermost lane would be a 12-ft combination through/right-turn lane for traffic onto eastbound Grevelia Street and southbound Fair Oaks Avenue, respectively (see Figure 3.7-1 above).

   The off-ramp at Fair Oaks Avenue is a character-defining feature of the Arroyo Seco Parkway. The widening would remove portions of the ramp itself, including character-defining curbs and the character-defining vegetated embankment. Therefore, the widening of this feature would cause an adverse direct effect on the Arroyo Seco Parkway.

   The off-ramp, with its vegetated embankment, is a character-defining feature to the significance of the Arroyo Seco Parkway Historic District. Therefore, the proposed lane alteration would cause an adverse indirect visual effect on the Arroyo Seco Parkway.

Existing Condition

Proposed Simulation

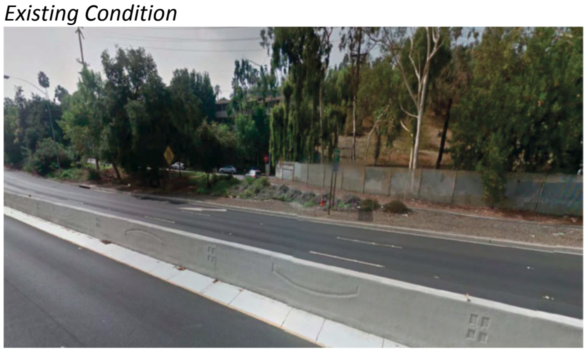
Figure 3.7-2: View of NB Off-Ramp onto Fair Oaks Avenue

2. **Fair Oaks Avenue Overcrossing, New Transportation Elements within the District:** Install an approximately 275-ft-long retaining wall, ranging from approximately 6 to 20 ft in height, along the south side of the widened off-ramp to accommodate the new configuration. The retaining wall is needed to support Grevelia Street at the top of the wall and allow the proposed lane configuration of the northbound off-ramp. The wall would be approximately 22 ft tall near the base of the ramp and would gradually diminish in height to ground level at approximately 50 ft from the top of the ramp. At the top of the ramp, a concrete barrier and a 3-ft-wide planting area would separate the roadway from the new sidewalk along the south side of Grevelia Street to the top of the ramp. A 275-ft-long K-rail deflective concrete barrier would be installed at the base and front of the proposed retaining wall for safety (see Figure 3.7-2 above).

   The off-ramp at Fair Oaks Avenue is a character-defining feature of the Arroyo Seco Parkway, and the installation of the retaining wall and concrete barrier would remove portions of the ramp and its character-defining features. Therefore, the proposed retaining wall would cause an adverse direct effect on the Arroyo Seco Parkway Historic District.

   The proposed retaining wall and barrier are located within the Arroyo Seco Parkway Historic District boundaries and introduce new elements that are incongruous within the historic district. Therefore, the proposed retaining wall and barrier would cause an adverse indirect visual effect on the Arroyo Seco Parkway Historic District.

Existing Condition



Proposed Simulation

Figure 3.7-3: View from the Arroyo Seco Parkway at the State Street Exit

3. **SR 110 State Street On-Ramp:** Construct a new southbound SR 110 on-ramp, approximately 2,500 ft long, at State Street, located approximately 2,300 ft east of Fair Oaks Avenue and immediately adjacent to the existing State Street off-ramp. The existing SR 110 off-ramp on State Street that accesses Fair Oaks Avenue would be shifted to the north and realigned. The radius of the realigned ramp is approximately 140 ft. The tie-in points to SR 110 from this realignment would not change (see Figure 3.7-3 above).

   The off-ramp at State Street, the chain-link fence, and landscaped shoulder are character-defining features of the Arroyo Seco Parkway. The reconfiguration of the off-ramp and construction of a new on-ramp would remove portions of the historic property. Therefore, reconfiguration of the State Street off-ramp to construct a new on-ramp would cause an adverse direct effect on the Arroyo Seco Parkway Historic District.

   The proposed on- and off-ramp reconfiguration is located within the Arroyo Seco Parkway Historic District and introduces new design features into the historic district, including new stone landscaping, new curbs, and new barriers. Although the proposed new features would be similar to the historic off-ramp features, the construction of a new on-ramp would require removal of landscaping features that characterize the property and introduce new cobblestone paving, thereby changing the setting of the historic district in that area. Therefore, the proposed on- and off-ramp reconfiguration would cause an adverse indirect visual effect on the Arroyo Seco Parkway Historic District.

4. **SR 110 State Street Off-Ramp:** Construct a new retaining wall and concrete barrier approximately 2,000 ft in length along the edge of the SR 110 shoulder to support the grade differential between the ramp and State Street. The retaining wall would be 22 ft at the maximum height and 8 ft at the minimum. The recommended wall type is consistent with the existing stone face or “crazy quilt” rock pattern wall on the southbound side of SR 110 toward downtown and adjacent to the Figueroa Tunnel sections. The treatment proposed for the unplantable gore and shoulder area is a cobblestone rock blanket (see Figure 3.7-3 above).

   The SR 110 off-ramp at State Street is a character-defining feature of the Arroyo Seco Parkway, and the installation of the retaining wall and concrete barrier would remove portions of the ramp and its character-defining features. Therefore, the proposed retaining wall would cause an adverse direct effect on the Arroyo Seco Parkway Historic District.

   The proposed retaining wall and barrier are located within the Arroyo Seco Parkway Historic District and introduce new elements that are incongruous within the historic district.

Therefore, the proposed retaining wall and barrier would cause an adverse indirect visual effect on the Arroyo Seco Parkway Historic District.

Existing Condition *Proposed Simulation*

Figure 3.7-4: View of the Arroyo Seco Parkway (Near the Intersection with Raymondale Drive)

5. **SR 110 State Street Off-Ramp Reconfiguration:** Move the southbound SR 110 off-ramp exit to accommodate the new, southbound on-ramp. This would require moving the existing off-ramp approximately 65 ft north from its existing location. This realignment would require acquisition of approximately 9,750 sf from the southeastern portion of APN 5317-090-092 to accommodate the reconfigured southbound off-ramp. In addition, a new retaining wall and concrete barrier approximately 290 ft in length and 8 to 12 ft in height would be installed along the edge of shoulder (see Figure 3.7-4 above).

   The SR 110 off-ramp at State Street is a character-defining feature of the Arroyo Seco Parkway, and the reconfiguration of the ramp and installation of a retaining wall and concrete barrier would alter the ramp and its character-defining features. Therefore, the proposed ramp reconfiguration and retaining wall would cause an adverse direct effect on the Arroyo Seco Parkway Historic District.

   The proposed ramp reconfiguration, retaining wall, and barrier are located within the Arroyo Seco Parkway Historic District and would introduce new elements that are incongruous within the character of the historic district. Therefore, the proposed ramp reconfiguration, addition of a retaining wall, and new barrier would cause an adverse indirect visual effect on the Arroyo Seco Parkway Historic District.

6. **Phase 1 Pavement**: Restripe the adjacent lanes accordingly.

   Because the Phase 1 Roadway dual-tone paved surfaces (design, not materials) of the Arroyo Seco Parkway Historic District are character-defining features, restriping in those areas has the potential to cause an adverse direct effect on the Arroyo Seco Parkway Historic District.

BRT Alternative

The BRT Alternative has the potential to affect cultural resources, based on the FOAE for the SR 710 North Project (Caltrans 2017). Caltrans has determined that the construction and operation of the BRT Alternative would result in the following effects on historic properties under Section 106:

- **No effect on 1 historic property:** the Bekins Storage Company Roof Sign.
- **No adverse effect on 8 historic properties:** Golden Gate Theatre, Saint Alphonsus Church, South Pasadena Middle School, Community Facilities Planners Building, War Memorial Building, Raymond Hill Waiting Station, Glenarm Building and Electric Fountain (counted as one historic property), and Historic Route 66.
- **A conditional no adverse effect on 8 historic properties:** Dr. Henry K. Kawamoto Office Building, Jardin del Encanto and Cascades Park, Rialto Theatre, Fair Hope Building, Oaklawn Historic District, Oaklawn Bridge and Waiting Station (counted as one historic property), the Old Pasadena Historic District, and the Horatio Rust Site.
- **An adverse effect on 1 historic property as a result of improvements in the TSM/TDM Alternative included in the BRT Alternative:** Arroyo Seco Parkway Historic District.

Historic properties with an adverse effect or conditional no adverse effect under the BRT Alternative are described below. For more information on properties with no adverse effect or no effect under the BRT Alternative, refer to the FOAE for the SR 710 North Project (Caltrans 2017).

Historic Property with an Adverse Effect under the BRT Alternative

- **The Arroyo Seco Parkway Historic District:** As noted previously, the BRT Alternative includes the improvements in the TSM/TDM Alternative, including improvement T-2, but would not include Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). As a result, the BRT Alternative would result in the same effect as the TSM/TDM Alternative on the Arroyo Seco Parkway Historic District.

Historic Properties with a Conditional No Adverse Effect under the BRT Alternative

The BRT Alternative would cause a conditional no adverse effect on the following properties. For more detailed information on avoidance, minimization or mitigation measures see Section 3.7.4.

- **Dr. Henry K. Kawamoto Office Building:** The BRT Alternative could have an adverse effect on the NRHP-eligible Dr. Henry K. Kawamoto Office Building if jackhammering is used within 6 ft of the historic property. However, with implementation of avoidance measures (use of alternative construction equipment such as saw cutters), the BRT Alternative would have a conditional no adverse effect on the Dr. Henry K. Kawamoto Office Building.
- **Jardin del Encanto and Cascades Park:** The BRT Alternative could have an adverse effect on the NRHP-eligible Jardin del Encanto and Cascades Park; however, with incorporation of design elements from existing medians into the design of newly reconfigured medians at the El Portal Place/South Atlantic Boulevard intersection that are consistent with the context but do not create a false sense of historical development, the proposed alteration of the median would have a conditional no adverse effect on the Jardin del Encanto and Cascades Park.
- **Rialto Theater:** The BRT Alternative could have an adverse effect on the NRHP-eligible Rialto Theater if jackhammering is used within 6 ft of the historic property. However, with implementation of avoidance measures (use of alternative construction equipment such as saw cutters), the BRT Alternative would have a conditional no adverse effect on the Rialto Theater.

- **Fair Hope Building:** The BRT Alternative could have an adverse effect on the NRHP-eligible Fair Hope Building if jackhammering is used within 6 ft of the historic property. However, with implementation of avoidance measures (use of alternative construction equipment such as saw cutters), the BRT Alternative would have a conditional no adverse effect on the Fair Hope Building.
- **The Oaklawn Historic District:** The BRT Alternative could have an adverse effect on the NRHP-eligible Oaklawn Historic District if jackhammering is used within 10 ft of the historic property's contributing Oaklawn Waiting Station. However, with avoidance measures (use of alternative construction equipment such as saw cutters), the BRT Alternative would have a conditional no adverse effect on the NRHP-eligible Oaklawn Historic District.
- **Oaklawn Bridge and Waiting Station:** The BRT Alternative could have an adverse effect on the NRHP-eligible Oaklawn Bridge and Waiting Station if jackhammering is used within 6 ft of the historic property. However, with implementation of avoidance measures (use of alternative construction equipment such as saw cutters), the BRT Alternative would have a conditional no adverse effect on the Oaklawn Bridge and Waiting Station.
- **Old Pasadena Historic District:** The BRT Alternative could have an adverse effect on the NRHP eligible Old Pasadena Historic District if jackhammering is used within 6 ft of the historic property. However, with implementation of avoidance measures, (use of alternative construction equipment such as saw cutters), the BRT Alternative would have a conditional no adverse effect on the Old Pasadena Historic District.
- **Horatio Rust Site:** The BRT Alternative could have an adverse effect on the Horatio Rust Site, which has been assumed eligible for the purposes of this undertaking only. However, with the archaeological measures outlined in the post-review discovery and monitoring plan, the BRT Alternative would have a conditional no adverse effect on the Horatio Rust Site should any associated, intact subsurface materials be encountered.

LRT Alternative

The LRT Alternative has the potential to affect cultural resources, based on the FOAE for the SR 710 North Project (Caltrans 2017). Caltrans has determined that the construction and operation of the LRT Alternative would result in the following effects on historic properties under Section 106:

- **No effect on 1 historic property:** Horatio Rust Site.
- **No adverse effect on 14 historic properties:** Edward R. Roybal Comprehensive Health Center, 4777 East Cesar E. Chavez Avenue, 2020 Fremont Avenue, South Pasadena Middle School, Community Facilities Planners Building, Fair Hope Building, Arroyo Seco Parkway Historic District, Oaklawn Historic District, Oaklawn Bridge and Waiting Station, War Memorial Building, Raymond Hill Waiting Station, Glenarm Building and Electric Fountain, Hospital Veterinary, and Historic Route 66.
- **A conditional no adverse effect on 4 historic properties:** Rialto Theatre, 100 North Fremont Avenue, the Raymond Florist Historic District, and the Otsungna Village Site.
- **An adverse effect on 1 additional historic property:** Maravilla Handball Court and El Centro Grocery (counted as one historic property).
- **An adverse effect on 1 historic property as a result of improvements in the TSM/TDM Alternative included in the LRT Alternative:** Arroyo Seco Parkway Historic District.

Historic properties with adverse effects and conditional no adverse effects under the LRT Alternative are described below. For information on historic properties with no adverse effect or no effect under the LRT Alternative, refer to the FOAE for the SR 710 North Project (Caltrans 2017).

Historic Properties with Adverse Effects under the LRT Alternative

- **The Arroyo Seco Parkway Historic District:** As noted previously, the LRT Alternative includes the improvements in the TSM/TDM Alternative, including improvement T-2, but does not include Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). As a result, the LRT Alternative would result in the same effect as the TSM/TDM Alternative on the Arroyo Seco Parkway Historic District.

- **Maravilla Handball Court and El Centro Grocery:** The Maravilla Handball Court and El Centro Grocery consist of a vernacular masonry handball court and wood-framed store and residence, constructed in 1928 and 1946, respectively, in no particular architectural style. The Maravilla Handball Court and El Centro Grocery (collectively) was determined eligible for listing in the NRHP under Criteria A and C, at the local level of significance, with a period of significance from 1928 to 1989 (SHPO concurrence on November 9, 2017). It is significant for its association with social history and ethnic heritage, and as an excellent, rare, and well-preserved example of a vernacular recreational handball court, which may be the oldest remaining in the City of Los Angeles.

  The character-defining features of the El Centro Grocery/Residential Building include its irregular L-shaped plan; flat roof with low-profile parapet; stucco-clad exterior walls with “El Centro Grocery” painted on the south wall; plaster interior walls; open floor plan of the store; concrete floor of the store; pine wood floors of the residence; and wood window frames and trim. Non-character-defining features of the El Centro Grocery/Residential Building include the non-original plywood cladding on the east elevation and non-original security bars over doors and windows.

  The character-defining features of the Maravilla Handball Court include the vernacular brick walls that form rectangular-shaped tournament and practice courts; walls buttressed at the north elevation; chain-link fencing along the edge of the brick wall; absence of a roof; concrete court surface; and wood framing at the interior west wall and built-in benches. The aspects of integrity that are necessary for the property to convey its historic significance include its location, design, materials, workmanship, feeling, and association.

Proposed LRT Alternative Features and Assessment of Effect to the Maravilla Handball Court and El Centro Grocery

Existing Condition *Proposed Simulation*

Figure 3.7-5: View of the Maravilla Handball Court and El Centro Grocery

1. **New Aerial Light Rail Line:** The LRT Alternative would install a new aerial (elevated) light rail line structure along North Mednik Avenue. The bottom of the aerial light rail line track would be located 30 ft above the sidewalk, 35 ft wide, and supported on 7-ft-diameter concrete columns. The columns would be located within a new raised median along North Mednik Avenue (see Figure 3.7-5 above). The construction of an aerial light rail line has the potential to cause an adverse visual effect on the handball court. The introduction of a light rail line may cause a play of light/shadow on the handball court, inhibiting its intended use. After a preferred alternative is identified and the alignment is finalized during the design phase, additional study would be required under the LRT Alternative, if applicable. In the case of the Maravilla Handball Court and El Centro Grocery, the proposed aerial light rail line would introduce a new visual element into the setting of the historic property and obscure views to and from the resource. Because the views of the historic property would be significantly obscured, the new feature would have an adverse visual effect on the Maravilla Handball Court and El Centro Grocery.

   The support columns for the elevated light rail line will be built using caisson drilling, which typically generates 0.09 peak particle vibration (PPV) (inch per second [in/sec]) at a distance of 25 ft. The Federal Transit Administration (FTA) and Association for Preservation Technology (APT) established guidelines for assessing potential damage to historic buildings from vibrations at 0.120 PPV (in/sec). The Maravilla Handball Court and El Centro Grocery (collectively) is approximately 50 ft from the closest column. The vibrations generated from the caisson drilling would not cause an adverse vibratory effect on historic properties. Similarly, demolishing the existing roadway and building a new raised median would likely require the use of jackhammers, approximately 40 ft from the historic properties. The vibrations generated from 25 ft away by jackhammering are approximately 0.035 PPV (in/sec) and would not cause an adverse direct vibratory effect on historic properties. Therefore, the construction of the aerial line and median would not cause an adverse direct vibratory effect on the Maravilla Handball Court and El Centro Grocery.

2. **Widen North Mednik Avenue:** North Mednik Avenue is a four-lane surface street with a central left-turn lane. The widening would take place 20 ft on the eastern side of the street, away from the historic property. The widening would involve the construction of new sidewalks, curbs, and gutters. North Mednik Avenue would be reconfigured and striped to provide one automobile travel lane in each direction and a bicycle lane in each direction, and street parking would be added to the east side of Mednik Avenue.

   The proposed widening takes place on the side of the street opposite of the Maravilla Handball Court and El Centro Grocery. The widening of the roadway and construction of new infrastructure elements (sidewalks, curbs, and gutters) would not add any new elements to the viewshed of the historic property, nor would they alter the public's ability to view Maravilla Handball Court and El Centro Grocery. The immediate setting is not an essential aspect of integrity for the property to convey its historic significance and the proposed road widening would not cause an adverse visual effect on the Maravilla Handball Court and El Centro Grocery.

   All demolition activities associated with the proposed road widening would take place approximately 75 ft from the historic resource. The vibrations generated from 25 ft away by jackhammering are approximately 0.035 PPV (in/sec) and would not cause an adverse vibratory effect on historic properties. Therefore, the widening of North Mednik Avenue would not cause an adverse direct vibratory effect on the Maravilla Handball Court and El Centro Grocery.

3. **Operational Activity:** Operation of new elevated trains along the new aerial light rail line would increase operational noise, ground-borne noise, and vibration.

   The ground-borne noise levels were not evaluated for the Maravilla Handball Court and El Centro Grocery. Vibration impacts to historic properties can occur due to ground-borne noise and vibration, affecting the normal use of such properties, but only for indoor activities. Outdoor activities are not impacted by ground-borne noise or vibration. The Maravilla Handball Court activities are considered outdoor; therefore, this historic resource would not be impacted by noise or vibration. Properties with commercial uses are not considered to be noise and vibration sensitive receptors according to the land use category under FTA criteria. The El Centro Grocery land use category is commercial[2]; therefore, it would not be evaluated for impacts from ground-borne noise or vibration[3]. The train operation would not have an adverse effect for ground-borne noise on the Maravilla Handball Court and El Centro Grocery.

   The current noise level near the Maravilla Handball Court and El Centro Grocery is 67.6 decibel (A-weighted scale) (dBA). After completion of the improvements under the LRT Alternative, the predicted noise level would increase to 70.6 dBA, which falls under a “moderate impact,” based on the FTA criteria. The predicted increase in noise for a commercial property would not constitute an adverse noise effect on historic properties. Additionally, the LRT Alternative proposes to introduce 4-ft-high noise barriers on the aerial structure, which would ultimately reduce the noise at this location to less than current levels (estimated 60.4 dBA). Therefore, the operation of an elevated light rail would not cause a noise effect on the Maravilla Handball Court and El Centro Grocery.

   Vibration impacts to historic properties are not considered for outdoor activities or properties with commercial land uses; therefore, the vibration caused by the operation of new LRTs would not have a direct vibratory effect on the Maravilla Handball Court and El Centro Grocery.

Historic Properties with a Conditional No Adverse Effect under the LRT Alternative

The LRT Alternative would cause a conditional no adverse effect on the following historic properties. For more information on avoidance, minimization or mitigation measures see Section 3.7.4.

- **Rialto Theater:** The LRT Alternative could have an adverse effect on the NRHP-eligible Rialto Theater because of ground-borne noise. However, with the implementation of measures to reduce ground-borne noise, such as the use of alternative tracks, the LRT Alternative would have a conditional no adverse effect on the Rialto Theater.
- **100 North Fremont Avenue:** The LRT Alternative could have an adverse effect on the NRHP-eligible 100 North Freemont Avenue because of ground-borne noise. However, with the implementation of measures to reduce ground-borne noise, such as the use of

[2] http://gis.planning.lacounty.gov/GIS-NET3_Public/Viewer.html (APN 5235-018-012).
[3] Source: Section 3.1, SR 710 North Groundborne Noise and Vibration Impact Study.

alternative tracks, the LRT Alternative would have a conditional no adverse effect on 100 North Fremont.

- **Raymond Florist Historic District:** The LRT Alternative could have an adverse effect on the Raymond Florist Historic District because of ground-borne vibratory effects from excavation. However, with the implementation of measures to reduce settlement and vibratory effects, such as a settlement monitoring plan, a *Secretary of the Interior's Standards for the Treatment of Historic Properties* (SOIS) plan, and vibration management and monitoring plan, the LRT Alternative would have a conditional no adverse effect on the Raymond Florist Historic District.
- **Otsungna Village Site:** The LRT Alternative could have an adverse effect on the Otsungna Village Site, which has been assumed eligible for the NRHP for the purposes of this undertaking only. However, with the archaeological measures outlined in the post-review discovery and monitoring plan, the LRT Alternative would have a conditional no adverse effect on the site should any associated, intact subsurface materials be encountered.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative has the potential to affect cultural resources, based on the FOAE for the SR 710 North Project (Caltrans 2017). Caltrans has determined that the construction and operation of the Freeway Tunnel Alternative would result in the following effects on historic properties under Section 106:

- **No effect on 33 historic properties** (31 that are included in Appendix E of the FOAE, plus Route 66 and Horatio Rust Site).
- **No adverse effect on 7 historic properties**: Pasadena Avenue Historic District, Hurlbut Street Fire Station No. 5, Reverend Hiram Hill/Alonzo Beal House, Ambassador West Cultural Landscape Historic District, Ambassador College Dining Hall, Ambassador Auditorium Performing Arts Center, and the Colorado Street Auto Row.
- **A conditional no adverse effect on 7 historic properties:** 801 South Pasadena Avenue, Tompkins House, Page House, Miss Markham House, Caroline Walkley/Alice and Robert Wood House (dual-bore Alternative only), 206-216 West California Boulevard, and Old Pasadena Historic District.
- **An adverse effect on 1 historic property as a result of improvements in the TSM/TDM Alternative included in the Freeway Tunnel Alternative:** Arroyo Seco Parkway Historic District.
- **An adverse effect on the following 4 additional historic properties:** Markham Place Historic District, Caroline Walkley House and Small Apartment (counted as one historic property), Driscoll House, and Neighborhood Church/Sequoyah School.

Historic properties with an adverse effect or conditional no adverse effect under the Freeway Tunnel Alternative are described below. For more information on properties with a no adverse effect or no effect, refer to the FOAE for the SR 710 North Project (Caltrans 2017).

Historic Properties with an Adverse Effect under the Freeway Tunnel Alternative

- **The Arroyo Seco Parkway Historic District:** As noted earlier, the Freeway Tunnel Alternative includes the improvements in the TSM/TDM Alternative, including improvement T-2 but does not include Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (Saint John Avenue Extension between Del Mar Boulevard and

California Boulevard). As a result, the Freeway Tunnel Alternative would result in the same effects as the TSM/TDM Alternative on the Arroyo Seco Parkway Historic District.

- **Markham Place Historic District:** The Markham Place Historic District is a historic district primarily comprising single-family residential buildings located in southwest Pasadena. The district is roughly bounded by West California Boulevard on the north, South Pasadena Avenue on the east, Bellefontaine Street on the South, and South Orange Grove Boulevard on the west. The district encompasses over 100 parcels, including 72 contributing properties dating from 1887 to 1937 (see Figure 3.7-6) A wide range of architectural styles are represented in the district, and it is distinguished as a residential area of architecturally significant homes designed by prominent architects of the region.

  The Markham Place Historic District was listed in the NRHP, under Criteria A and C, at the local level, with a period of significance from 1887 to 1937 (Keeper acceptance March 2013).

  The character-defining features of the Markham Place Historic District include a variety of architectural styles representing those most popular during the period of significance; consistent and uniform setbacks for a block, with deep setbacks for larger homes and shallow setbacks for smaller homes; high visibility into homes; and mature street trees and hedgerows. The streetlights and other landscape features are typical of Pasadena's early subdivisions. All streetlights have cast stone posts and glass globes. Mature street tree plantings vary by street but generally are uniform on each street. Common alterations to the historic district include the loss of minor ornamental features from residences, as well as rear and side additions.

Proposed Freeway Tunnel Alternative Features and Assessment of Effect to the Markham Place Historic District

The Freeway Tunnel Alternative would excavate either two tunnels for the dual-bore design variation or one tunnel under the single-bore design variation, using tunnel boring machines (TBMs). Each tunnel would be approximately 60 ft in diameter. In this location, the tunnels are between Saint John Avenue and South Pasadena Avenue, with the top of the tunnel approximately 90 ft below grade at the southern end of the historic district and about 45 ft at the northern end. The eastern side of the Markham Place Historic District is located within the zone of potential settlement for both the dual- and single-bore design variations. Based on the second stage assessment results summarized in *Technical Memorandum: Potential Settlement Effects on Historic Properties* (CH2M HILL, 2015), the Markham Place Historic District spans Settlement Groups K, L, M, N, O, and P (Finding of Adverse Effect, Appendix C, Table 2). The predicted damage level classification is "slight" for Settlement Group K, "moderate" for Settlement Groups M and O, and "moderate to severe" for Groups L, N, and P. The boring of the Freeway Tunnel Alternative would cause an adverse direct settlement effect on the Markham Place Historic District.

Seventy-two contributing properties are located within the Markham Place Historic District. Under the dual-bore design variation, 28 historic properties are within the potential settlement zone; under the single-bore design variation, 12 historic properties are within the potential settlement zone. The Freeway Tunnel Alternative (single- and dual-bore design variation) would have an adverse effect on the Markham Place Historic District due to potentially adverse direct settlement effects on at least three contributors to the district (Driscoll House, Caroline Walkley House and Small Apartment, and the Neighborhood Church/Sequoyah School), as discussed next.

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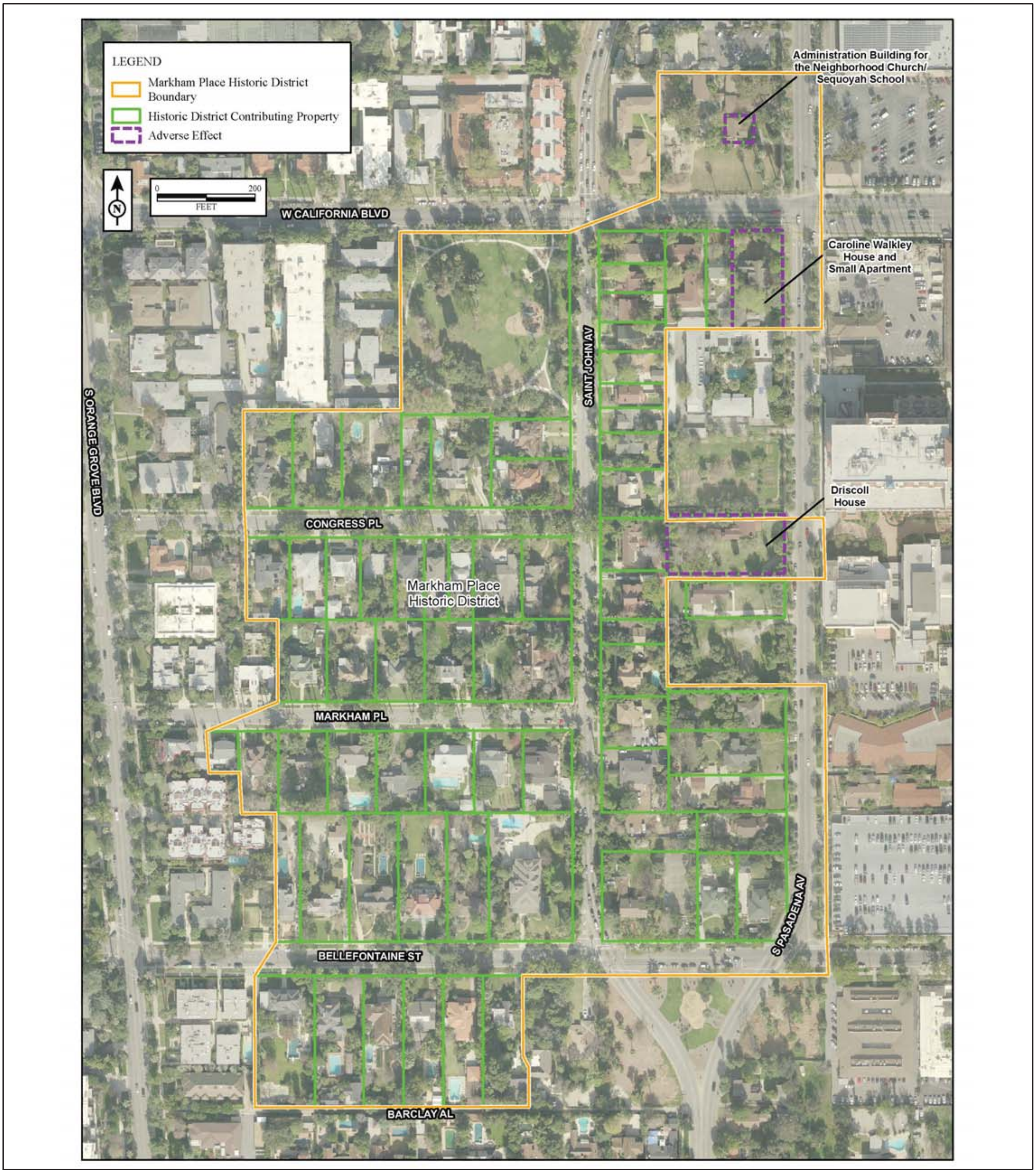

FIGURE 3.7-6

SR 710 North Project

Markham Place Historic District

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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- **Driscoll House:** The Driscoll House is located at 679 South Pasadena Avenue, north of Bellefontaine Street and south of West California Boulevard in the City of Pasadena. It faces east onto South Pasadena Avenue. The wood-shingled residence was constructed in 1909 and is an example of the transition between Colonial Revival and Craftsman architecture (see Figure 3.7-7). The Driscoll House was determined individually eligible for listing in the NRHP under Criterion C, at the local level, with a period of significance of 1909 (SHPO Concurrence on February 26, 2015). The house was designed by Charles Driscoll and represents the Arts and Crafts era of architecture. Because the property was determined eligible for listing in the NRHP, it is automatically included in the California Register under Criterion 3. The historic property is also a contributor to the Markham Place Historic District, which was listed in the NRHP in March 2013.

Figure 3.7-7: Driscoll House

The character-defining features of the Driscoll House include its two stories; irregular plan and asymmetrical façade; moderately pitched side-gabled roof with shallow, boxed eaves; wood shingle cladding; projecting porch; wood paneled front door; tripartite and double-hung multi-light wood sash windows; bay windows; and a carriage house to the rear. There are no obvious exterior alterations. Non-character-defining features include a wood picket perimeter fence and wood lattice gate across the driveway.

The aspects of integrity that are necessary for the property to convey its historic significance include its location, design, workmanship, materials, and feeling.

Proposed Freeway Tunnel Alternative Features and Assessment of Effect to the Driscoll House

The Freeway Tunnel Alternative would excavate either two tunnels under the dual-bore design variation or one tunnel under the single-bore design variation, using TBMs. Each tunnel would be approximately 60 ft in diameter. In this location, the tunnels are between Saint John Avenue and South Pasadena Avenue, with the top of the tunnel approximately 65 ft below grade. The Driscoll House is located completely within the zone of potential settlement for both the dual- and single-bore design variations.

Based on the second stage assessment results summarized in the *Technical Memorandum: Potential Settlement Effects on Historic Properties* (CH2M HILL, 2015), the Driscoll House is located in Settlement Group L, with a predicted damage level classification of “moderate to severe." The boring of the Freeway Tunnel Alternative would cause an adverse direct settlement effect on the Driscoll House.

- **Caroline Walkley House and Small Apartment:** The Caroline Walkley House and Small Apartment (collectively) is located at 595 South Pasadena Avenue, at the southwest corner of South Pasadena Avenue and West California Boulevard in the City of Pasadena. It has an alternate address of 190 West California Boulevard. It faces east onto South Pasadena Avenue. The two-story wood and brick residence was constructed in 1904 in the Shingle style with Craftsman influences (see Figure 3.7-8).

Figure 3.7-8: Caroline Walkley House and Small Apartment

The Caroline Walkley House and Small Apartment was previously determined individually eligible for listing in the NRHP under Criterion C, at the local level, with a period of significance of 1904 (SHPO Concurrence on June 30, 2001). It is an excellent example of the Shingle and Craftsman styles designed by J.J. Blick. Because the property was determined eligible for the NRHP, it is automatically included in the California Register under Criterion 3. It is also a contributor to the Markham Place Historic District, which was listed in the NRHP in March 2013.

The character-defining features of the Caroline Walkley House and Small Apartment include the dramatic intersecting gables of the roof with wide, overhanging eaves and exposed rafter tails; wood-shingle and horizontal clapboard exterior; brick porch; groups of wooden windows elaborated with diamond-light glazing, geometric muntins, and/or leaded glass; pergola; and detached garage to the rear. Non-character-defining features include a non-original wood carport on the property.

The aspects of integrity that are necessary for the property to convey its historic significance under Criterion C include its design, workmanship, materials, and feeling.

Proposed Freeway Tunnel Alternative Features and Assessment of Effect to the Carolyn Walkley House and Small Apartment

The Freeway Tunnel Alternative would excavate either two tunnels under the dual-bore design variation or one tunnel for the single-bore design variation, using TBMs. Each tunnel would be approximately 60 ft in diameter. In this location, the tunnels are between Saint John Avenue and South Pasadena Avenue, with the top of the tunnel approximately 50 ft below grade. The

Caroline Walkley House and Small Apartment is partially within the zone of potential settlement for both the dual- and single-bore tunnel variations.

The second stage assessment results summarized in the *Technical Memorandum: Potential Settlement Effects on Historic Properties* (CH2M HILL, 2015) show the Caroline Walkley House and Small Apartment is located in Settlement Group N, with a predicted damage level classification of “moderate to severe.” The boring of the Freeway Tunnel Alternative would cause an adverse direct settlement effect on the Caroline Walkley House and Small Apartment.

- **Neighborhood Church/Sequoyah School:** The Neighborhood Church/Sequoyah School complex is a four-building school complex located at 535 South Pasadena Avenue in the City of Pasadena. It is located on the northwest corner of the intersection of West California Boulevard and South Pasadena Avenue. The complex comprises four buildings: a two-story Craftsman-style parsonage constructed in 1910 and three Mid-Century Modern styled buildings that were constructed between 1948 and 1956. All four buildings were historically linked to the Neighborhood Church, a large Shingle- and Gothic Revival-style church built in 1887 and demolished in 1974 (see Figure 3.7-9).

Figure 3.7-9: Neighborhood Church/Sequoyah School

The Parsonage Building is listed in the NRHP as a contributor to the Markham Place Historic District under Criteria A and C at the local level of significance. The parsonage is a two-story Craftsman-style former parsonage built in 1910 and designed by prominent Craftsman-style architect Sylvanus Marston. It is now used as the administration building for the Sequoyah School. The other three buildings on the campus are not contributors to the Markham Place Historic District because they were constructed outside the historic district’s period of significance (1887 to 1937). These three buildings are the Children’s Chapel (built in 1954), Nursery School (built in 1948), and Religious Education Building (built in 1956). All three were individually determined eligible for listing in the NRHP, at the local level of significance, under Criterion C, as very good examples of the work of master architects and for their association with the influence of graduates from the University of Southern California’s School of Architecture and the development of a distinct Pasadena idiom of Mid-Century Modernism. The three buildings are Mid-Century Modern in style and were designed by the architectural firm of Smith and Williams (Whitney R. Smith and Wayne R. Williams). The three buildings are also listed in the California Register under Criterion 3. All four buildings are currently associated with the Sequoyah School. The complex has not been evaluated as a distinct district.

Proposed Freeway Tunnel Alternative Features and Assessment of Effects to the Neighborhood Church/Sequoyah School

The Freeway Tunnel Alternative would excavate either two tunnels for the dual-bore design variation or one tunnel for the single-bore design variation, using TBMs. Each tunnel would be approximately 60 ft in diameter. In this location, the tunnels are between Saint John Avenue and South Pasadena Avenue, with the top of the tunnel approximately 45 ft below grade. The Neighborhood Church/Sequoyah School is located within the zone of potential settlement for both the dual- and single-bore design variations.

Based on the second stage assessment results summarized in the *Technical Memorandum: Potential Settlement Effects on Historic Properties* (CH2M HILL, 2015), the Neighborhood Church/Sequoyah School is located in Settlement Group P (Finding of Adverse Effect, Appendix C, Table 2) and has a predicted damage level classification of “moderate-severe.” The boring the Freeway Tunnel Alternative would cause an adverse direct settlement effect on the Neighborhood Church/Sequoyah School.

Historic Properties with a Conditional No Adverse Effect under the Freeway Tunnel Alternative

The Freeway Alternative would cause a conditional no adverse effect on the following historic properties. For more information on avoidance, minimization and mitigation see Section 3.7.4.

- **801 S. Pasadena Avenue:** The Freeway Tunnel Alternative could cause a potential adverse settlement effect on the NRHP-eligible 801 S. Pasadena Avenue as a result of boring tunnels below the historic property. However, with the avoidance and minimization measures (measures to reduce settlement and compliance with the SOIS), the Freeway Tunnel Alternative would have a conditional no adverse effect on 801 S. Pasadena Avenue.
- **Tompkins House:** The Freeway Tunnel Alternative could cause a potential adverse settlement effect on the NRHP-eligible Tompkins House as a result of boring tunnels below the historic property. However, with the avoidance and minimization measures (measures to reduce settlement and compliance with the SOIS), the Freeway Tunnel Alternative would have a conditional no adverse effect on Tompkins House.
- **Page House:** The Freeway Tunnel Alternative could cause a potential adverse settlement effect on the NRHP-eligible Page House due to boring tunnels below the historic property. However, with the avoidance and minimization measures (measures to reduce settlement and the SOIS), the Freeway Tunnel Alternative would have a Conditional No Adverse Effect on Page House.
- **Miss Markham House:** The Freeway Tunnel Alternative could cause a potential adverse settlement effect on the NRHP-eligible Miss Markham House due to boring tunnels below the historic property. However, with the avoidance and minimization measures (measures to reduce settlement and the SOIS), the Freeway Tunnel Alternative would have a Conditional No Adverse Effect on Miss Markham House.
- **Caroline Walkley/Alice and Robert Wood House:** The Freeway Tunnel Alternative could cause a potential adverse settlement effect on the NRHP-eligible Caroline Walkley/Alice and Robert Wood House as a result of boring tunnels below the historic property. However, with

the avoidance and minimization measures (measures to reduce settlement and compliance with the SOIS), the Freeway Tunnel Alternative would have a conditional no adverse effect on Caroline Walkley/Alice and Robert Wood House.

- **206-216 West California Boulevard:** The Freeway Tunnel Alternative could cause a potential adverse settlement effect on the NRHP-eligible 206-216 West California Boulevard as a result of boring tunnels below the historic property. However, with the avoidance and minimization measures (measures to reduce settlement and compliance with the SOIS), the Freeway Tunnel Alternative would have a conditional no adverse effect on 206-216 West California Boulevard.
- **Old Pasadena Historic District:** The Freeway Tunnel could have an adverse effect on the NRHP-listed Old Pasadena Historic District if the ventilation structure is located at the SR 710/Colorado Boulevard interchange. However, to minimize visual effects to a no adverse effect by using a context sensitive design and by implementing a design which complies with the SOIS, then the Freeway Tunnel Alternative would have a Conditional No Adverse Effect.

3.7.3.3 Consultation with the State Historic Preservation Officer

Consultation with the SHPO was conducted regarding the HPSR (Caltrans 2014), Supplemental HPSR (Caltrans 2017), and FOAE for the SR 710 North Project (Caltrans 2017). Concurrence on the eligibility of cultural resources evaluated in the HPSR by the SHPO was provided in a letter dated February 26, 2015. A copy of the letter is provided in Chapter 5, Correspondence. In that letter, the SHPO indicated they had no objection to the following determinations and assumptions of eligibility:

- Pursuant to Stipulation VIII.C.6 of the PA, concurrence that the 440 properties listed in Attachment 1, Table 2 of the Caltrans letter dated February 20, 2015, are not eligible for the NRHP.
- Pursuant to Stipulation VIII.C.6 of the PA, concurrence that the 22 properties listed in Attachment 1, Table 3 of the Caltrans letter dated February 20, 2015, are eligible for the NRHP.
- Pursuant to Stipulation VIII.C.4, Caltrans is assuming NRHP eligibility for the purposes of the undertaking for the following properties: 318 Fairview Avenue, South Pasadena; 2020 Fremont Street, South Pasadena; U.S. Highway 66; Horatio Rust Site; and Otsungna Village Site.
- In addition, based on additional correspondence (email and phone) on February 26, 2015, Caltrans will also, pursuant to Stipulation VIII.C.4 of the PA, assume the following properties are NRHP eligible for the purposes of the project (these properties were listed as not eligible in Attachment 1, Table 2 of the Caltrans letter dated February 20, 2015): Library Neighborhood Historic District; 904 Monterey Road, South Pasadena; and 270 South Orange Grove Boulevard, Pasadena.

In a letter to SHPO dated February 26, 2015, Caltrans initiated a phased approach of the Application of Criteria of Adverse Effects and consultation regarding the Preliminary Finding of No Adverse Effect for the project.

Based on feedback from the public and the Consulting Parties during the Draft EIR/EIS public comment period, Caltrans enlarged the APE in some areas and evaluated additional properties in the SHPSR (Caltrans 2017). Caltrans submitted the SHPSR to the SHPO in October 2017, and the SHPO concurred with the SHPSR on November 9, 2017. In January 2018, the FOAE for the SR 710 North Project (Caltrans 2017) was submitted to the SHPO and the Consulting Parties for their review. Concurrence on the findings and analysis in the FOAE for the TSM/TDM (preferred) Alternative was received from SHPO on May 3, 2018.

Caltrans continued consultation with the SHPO and considered the input received from the Consulting Parties to resolve adverse effects and develop treatment measures for all properties that would be adversely affected by the TSM/TDM Alternative. Caltrans prepared a draft Memorandum of Agreement (MOA) in accordance with the Section 106 PA and provided Consulting Parties an opportunity to review and provide input. The MOA was executed by Caltrans and SHPO on October 18, 2018.

3.7.4 Avoidance, Minimization, and/or Mitigation Measures

3.7.4.1 Introduction

Under Section 106, anticipated adverse effects should be avoided or minimized wherever possible to satisfy federal regulations for the treatment of historic properties. When it is not possible to incorporate avoidance or minimization measures into the final design, construction, or operation details of the undertaking, mitigation measures must be agreed on by the appropriate parties through the preparation of a project-specific agreement document.

The measures discussed in this section, as applicable to the Preferred Alternative, are contained in the approved MOA between the SHPO and Caltrans. The avoidance and minimization measures are organized by effect types (direct and indirect) and subtype, where appropriate (settlement, vibratory, auditory, or visual). Each historic property that is adversely affected is identified and the measures to avoid those effects are identified, where possible. Where avoidance and minimization measures are not possible, mitigation measures are proposed for each adversely affected property.

3.7.4.2 Pre-Construction Surveys

CUL-1 **Pre-Construction Surveys.** Pre-construction surveys are required and shall be conducted on all historic properties with a FOAE or Finding of Conditional No Adverse Effect before any construction activities commence. The pre-construction survey will be performed by a licensed structural engineer with a specialization in historic buildings in collaboration with a qualified architectural historian and/or historic architect. The qualifications for the structural engineer, architectural historian, and/or historic architect shall be approved by a Caltrans professionally qualified staff (PQS) in collaboration with the Los Angeles County Metropolitan Transportation Authority (Metro).

The pre-construction condition assessment shall be carried out during final project design phase when more data on site-specific geotechnical conditions are available. The surveys shall document the baseline physical conditions of each historic property (with a FOAE or Finding of Conditional No Adverse Effect) to better understand the building's structure and condition. Additional localized geotechnical studies shall be performed near each historic property to identify additional strategies and control measures to better protect each historic property during construction. The condition assessment reports shall document all aspects of known structural conditions through observations and measurements, plans, photographs, and any other data the qualified preparer may deem appropriate.

Photographs and plans may also be used to indicate existing damage on the historic property. The information developed in the pre-construction surveys shall be integrated into the Property-Specific Protection Plans described in Section 3.7.4.8.

The pre-construction condition assessment reports shall be prepared according to an agreed-upon template and shall provide baseline information on the historic properties in sufficient detail to assess their existing structural condition and determine the safe threshold of the historic property compared to the proposed activity at that location. The pre-construction condition assessment reports shall be completed at least 2 months prior to construction in the vicinity of the property. The pre-construction surveys will include, but are not be limited to, information regarding the inspection of building foundations, exterior walls, driveways, sidewalks, hardscape elements, and interior floors and walls, and documentation of any pre-existing defects such as cracks, settlement, subsidence, bulges, walls out of plumb, sticking windows and doors, corrosion, and water damage. The inspection can be documented by, but is not limited to, measured drawings, sketches, or CAD drawings of all cracks, or photographing or videotaping the elements of the property under inspection. Evaluation of the risk from construction activities may also be incorporated into the reports.

Immediately prior to the initiation of construction, the properties where pre-construction surveys were completed as part of the studies for the EIR/EIS will be revisited to confirm the information in the surveys remains valid. The pre-construction surveys will be used as the baseline in the post-construction surveys (discussed in Section 3.7.4.9), which will document any evidence of a change in the physical condition of historic properties following completion of construction.

A copy of the pre-construction survey will be made available to the property owner(s). A copy of each survey will also be kept on file with the appropriate municipal department as well as at Caltrans and/or Metro for the duration of the project. If requested by the SHPO, its office may also receive copies of the pre-construction surveys.

This measure applies to the following properties and Build Alternatives, which were determined to have adverse or conditional no adverse effects on historic properties.

Property	Effect	Alternatives for which the Pre-Construction Surveys Requirement Applies
Arroyo Seco Parkway Historic District	AE	TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives
Dr. Henry K. Kawamoto Office Building	CNAE	BRT Alternative
Jardin del Encanto and Cascades Park	CNAE	BRT Alternative
Rialto Theatre	CNAE	BRT and LRT Alternatives
Fair Hope Building	CNAE	BRT Alternative
Oaklawn Historic District	CNAE	BRT Alternative
Oaklawn Bridge and Waiting Station	CNAE	BRT Alternative
Old Pasadena Historic District	CNAE	BRT and Freeway Tunnel Alternatives
Maravilla Handball Court & El Centro Grocery	AE	LRT Alternative
100 North Fremont Avenue	CNAE	LRT Alternative
Raymond Florist Historic District	CNAE	LRT Alternative
Markham Place Historic District	AE	Freeway Tunnel Alternative
801 South Pasadena Avenue	CNAE	Freeway Tunnel Alternative
Tompkins House	CNAE	Freeway Tunnel Alternative
Page House	CNAE	Freeway Tunnel Alternative

Property	Effect	Alternatives for which the Pre-Construction Surveys Requirement Applies
Miss Markham House	CNAE	Freeway Tunnel Alternative
Driscoll House	AE	Freeway Tunnel Alternative
Caroline Walkley/Alice and Robert Wood House	CNAE	Freeway Tunnel Alternative
Caroline Walkley House and Small Apartment	AE	Freeway Tunnel Alternative
206-216 West California Boulevard	CNAE	Freeway Tunnel Alternative
Neighborhood Church/Sequoyah School	AE	Freeway Tunnel Alternative

AE = Adverse Effect
CNAE = Conditional No Adverse Effect

3.7.4.3 Property-Specific SOIS Plans

As discussed previously in Section 3.7, the TSM/TDM Alternative (which is also included in the BRT, LRT, and Freeway Tunnel Alternatives) and the BRT Alternative would cause direct effects, resulting in damage to, or destruction of, parts of two historic properties: the Arroyo Seco Parkway Historic District and Jardin del Encanto and Cascades Park. Measures to minimize the effects on the two historic properties are described in the following sections.

CUL-2 **Arroyo Seco Parkway Historic District – SOIS Plan.** The plan will conform with the SOIS and will be prepared in consultation with the Caltrans Cultural Studies Office (CSO) and the SHPO, as required. The TSM/TDM Alternative would destroy landscaped buffers, install new retaining walls within the boundaries of this historic district, move an existing off-ramp at State Street, add a new on-ramp, and widen another off-ramp. These adverse effects of the TSM/TDM Alternative improvements in the historic district cannot be avoided.

To minimize the effects on the character-defining features of the Arroyo Seco Parkway Historic District, the new construction for the TSM/TDM Alternative improvements shall be designed in a manner that is consistent with the SOIS. The project architectural historian shall review the final design plans, review mockups as needed, and conduct a field visit to ensure that the following work is performed in accordance with the SOIS. At a minimum, the SOIS plan will ensure:

- New elements such as retaining walls, off-ramps, on-ramps, lighting, and curbing will be designed to be compatible with the historic district in terms of color, materials, profiles, dimensions, and so forth.
- Any work taking place on character-defining features will minimize potential damage to the historic district.
- All revegetation of buffers and planting strips will be designed to be compatible with the historic district.

The requirements for preparation of an SOIS plan for the TSM/TDM Alternative improvements in the Arroyo Seco Parkway Historic District apply to all four Build Alternatives (TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives).

Caltrans will install a highway sign near the northern entrance to the Parkway at Glenarm Street that welcomes drivers to the Arroyo Seco Parkway Historic District. The sign will be compatible with similar signage found at the southern entrance to the Parkway.

Create and Post electronic content for a smart phone traveler application (the Clio or equal) that describes and interprets the Historic District. The content will include historical narrative information, as well as historical photographs, and other documentation. This application will be available free to the public through smartphone application stores prior to the termination of this agreement. The availability of the application will be advertised on or in Metro facilities such as bus benches, local bus lines, Gold Line Stations and rail cars within the project area.

Caltrans shall submit design development plans for the Fair Oaks and State Street Interchanges for review and comment at 60% and 90% completion.

All parties to the MOA will be invited to review the design development plans to determine whether the plans conform to concepts described in the SOIS Plan. All parties to the MOA will provide comments on the submittals to Caltrans within 30 calendar days of receipt. If MOA parties do not comment within the time provided. Caltrans may assume that the MOA parties concur and the package meets the cited objectives.

Caltrans will incorporate MOA parties' comments into the project plans to the fullest extent. If Caltrans revises project plans in response to MOA parties' comments, then no further review is required for that consultation package.

Should Caltrans object to incorporation of MOA parties' comments into consultation packages at any stage of the project, Caltrans will provide the MOA parties with written explanation of that objection. Objection to the plans shall be resolved in accordance with Stipulation IV.B of the MOA.

CUL-3 **Jardin del Encanto and Cascades Park – SOIS Plan.** The SOIS plan will be prepared in consultation with the Caltrans CSO and the SHPO, as required. The BRT Alternative would remove 6-ft of park land from a character-defining median within the Jardin del Encanto and Cascades Park. The BRT Alternative would require widening the existing roadway to accommodate a proposed new bus lane. Therefore, the physical destruction of 6 ft of sidewalk and park land in that area cannot be avoided.

Parts of the sidewalk and park, including the planting strip, in this area have been altered previously.

Caltrans shall prepare an SOIS plan for the Jardin del Encanto and Cascades Park that shall include the following measures:

- Design of the BRT Alternative shall recreate the same curb plan and profile for the median. The final improvement plans within and near the historic property shall be made in collaboration among the project engineer, the architectural historian, and/or historic architect, and Caltrans and/or Metro. The architectural historian and/or historic architect shall approve the final plans before project-related activity in this area commences.
- Confirmation that the curved bull nose on the median being removed is not historic will be obtained (e.g., ensure that the materials have been replaced within the past 10 years). The proposed new curb shall match the existing curb's bull-nose plan. Additionally, the new curb materials shall match the existing

curb materials, aggregate size, dimension of curb, shape, color, profile, and so forth.

- The sign shall be relocated to have the same relationship to the sidewalk as it did before construction.
- The new sidewalk shall match the historic sidewalk's color, aggregate, finish, and surface scoring patterns.
- The width of the new planting area between the inner edge of the sidewalk and the grassy area shall be consistent with the historical design.
- A revegetation and irrigation plan for the new planting areas will be prepared in collaboration and agreement with the City of Monterey Park Public Works Director. The new planting areas will be similar to the existing, non-character-defining plantings. The cost of the revegetation plans will be paid by Caltrans and/or Metro.

3.7.4.4 Measures for Properties Potentially Affected by Direct Settlement Effects

As described previously in Section 3.7, the construction of the Build Alternatives will have an adverse direct settlement effect on the following historic properties:

Property	Effect	Alternatives for Which the Direct Settlement Effects Apply
Raymond Florist Historic District	CNAE	LRT Alternative
Markham Place Historic District	AE	Freeway Tunnel Alternative
801 South Pasadena Avenue	CNAE	Freeway Tunnel Alternative
Tompkins House	CNAE	Freeway Tunnel Alternative
Page House	CNAE	Freeway Tunnel Alternative
Miss Markham House	CNAE	Freeway Tunnel Alternative
Driscoll House	AE	Freeway Tunnel Alternative
Caroline Walkley/Alice and Robert Wood House	CNAE	Freeway Tunnel Alternative
Caroline Walkley House and Small Apartment	AE	Freeway Tunnel Alternative
206-216 West California Boulevard	CNAE	Freeway Tunnel Alternative
Neighborhood Church/Sequoyah School	AE	Freeway Tunnel Alternative

AE = Adverse Effect
CNAE = Conditional No Adverse Effect

Measures to Avoid and Minimize Settlement Effects

Total avoidance of potential settlement effects is not possible, based on the nature of tunneling. However, as described below, a settlement management and monitoring plan (settlement monitoring plan) will be developed to minimize potential direct settlement effects and SOIS plans will be prepared to document the process for restoring historic properties adversely affected by settlement.

CUL-4 **Settlement Monitoring Plan.** The settlement monitoring plan will be prepared in consultation with the Caltrans CSO and the SHPO. The objectives of the settlement monitoring plan are to establish reasonable and feasible ground-improvement measures and alternative approaches for minimizing settlement to ensure that historic properties sustain the minimum amount of settlement to prevent damage, and to identify persons who are responsible for developing, reviewing, and approving aspects of the settlement monitoring plan. The results of the pre-construction surveys described in Measure CUL-1 will be used to develop the appropriate level of effort to manage and monitor settlement on a case-by-case basis. The settlement monitoring plan will be collaboratively prepared, reviewed, approved, and administered by a qualified geotechnical engineer, with input from the designated structural engineer and the designated historic architect. The settlement monitoring plan will be approved by the structural engineer, historic architect, geotechnical engineer, and as required, by the Caltrans CSO and the SHPO, prior to any construction or demolition near the historic properties identified in that plan.

The primary objective of monitoring is to verify that safe, acceptable levels of settlement resulting from construction-related activities are not exceeded. Monitoring at select historic properties will be based on the expected level of settlement from excavation and the sensitivity of the historic property, including, but not limited to, its method of construction, building height, foundation type (e.g., slab, footer, post-and-pier, or piles), materials, existing overall condition, and overall sensitivity. Any areas identified in the pre-construction surveys that show damage that may be aggravated by construction-related activities would warrant continuous monitoring during construction. The monitors will be installed prior to construction or demolition, and continuous monitoring at those locations will be documented. Settlement management and continuous monitoring will be a combined approach. At the discretion of the resident engineer, the structural engineer, and the geotechnical engineer, with input from the historic architect and the architectural historian and using information from the pre-construction surveys, survey targets and monitors will be placed across existing building cracks to monitor, observe crack behavior, and quantify changes during construction. The monitors can be both attended (monitoring with a technician present) and unattended (automated). Unattended monitors should be located outside buildings in locked cases. The settlement monitoring plan shall be ongoing for up to 3 years. The settlement monitoring plan shall include information on advanced monitoring instrumentation, identification of the proper locations for monitors, process for data acquisition, and exceedance notification and reporting procedures, as described below.

- **Instrumentation:** Settlement monitors common to these applications shall be selected based on consultation between the geotechnical engineer and the structural engineer.
- **Locations of Settlement Monitors:** A scaled plan indicating the specific monitoring locations (including measurements to be taken at construction site boundaries and at nearby historic and non-historic properties) shall be prepared by the structural engineer, geotechnical engineer, and the historic architect. Those proposed locations will be submitted to Caltrans and/or Metro for approval.
- **Data Acquisition:** The information that will be included in the data reports, at a minimum, shall be ground movement readings at the same time of day from multiple locations, the maximum settlement for each direction, and additional information as deemed appropriate by the geotechnical engineer and structural engineer in consultation with the historic architect. If warranted, and as requested at the discretion of the structural engineer, geotechnical engineer, and the historic architect, and as approved by Caltrans and/or Metro, the data reports may be expanded to include a requirement for preparing a daily log of

vibration activity and readings of appropriate crack monitors at specific properties.

- **Exceedance Notification and Reporting Procedures:** The notification of exceedance and reporting procedures shall be described in the settlement monitoring plan. Those procedures shall include follow-up actions to reduce settlement levels to below allowable limits. In the event the measured settlement levels exceed allowable limits, the structural engineer or designated representative shall be notified immediately. Exceedance notices should trigger needed actions, including a potential stop work order to prevent unanticipated damage to a historic property. Work shall be permitted to resume when the geotechnical engineer, structural engineer, historic architect, and architectural historian have determined that the appropriate modifications to stabilize the ground have been incorporated into the construction work plan to ensure that no further damage at the affected historic property would likely result.

CUL-5 **SOIS Plans (Settlement).** Where established damage levels for the project are exceeded due to settlement (slight, moderate, or severe, as delineated in Table 5.1.1-2 of the FOAE for the SR 710 North Project [Caltrans 2017]), measures to address that damage will be required, including the restoration of historic properties following property-specific SOIS plans.

Damage to historic properties shall be identified using the baseline information recorded in the pre-construction surveys (Section 3.7.4.2). That information shall be compared to information in the post-construction surveys (Section 3.7.4.8). If damage resulting from settlement effects is identified, then a property-specific SOIS plan shall be prepared for the damaged historic property. SOIS plans are required to address adverse effects to built environment historic properties and ensure the requirements for protection are met, as required under Stipulation X.B.1.b and Attachment 5 of the Caltrans Section 106 PA and the 5024 MOU. SOIS plans shall conform to the format specified in Exhibit 7.5 of Caltrans Volume 2 – Standard Environmental Reference (as updated) and include a title page, a summary of the SOIS plan, a project description, a historic properties description, effects and conditions proposed, the qualified monitors, the responsible parties, and any specified attachments.

SOIS plans shall be prepared by the project engineer, structural engineer, landscape architect, architectural historian, historic architect, and other appropriate design, engineering, cultural resources specialists, as appropriate, and in consultation with the Caltrans CSO and the SHPO, as required. SOIS plans will be reviewed and approved by the architectural historian, the historic architect, and Caltrans and/or Metro. Final approval of an SOIS plan would be indicated when the Caltrans Environmental Branch signs the plan. During the pre-construction phase, a review of any proposed project improvements covered by an SOIS plan must be completed by a PQS who meets the Caltrans professional qualifications standards as principal architectural historian and has the experience and expertise to ensure conformance with the SOIS.

During meetings in the final design/pre-construction phase, the architectural historian and historic architect shall verify that the SOIS plans meet the SOIS for rehabilitation. The resident engineer will require the construction contractor to give notice with a specific timetable before the start of rehabilitation-related construction in the vicinity of historic properties to ensure that the historic architect or qualified staff under the supervision of the historic architect are available to conduct an advance field inspection and monitor proposed work for conformance with the SOIS for rehabilitation at the identified locations.

3.7.4.5 Measures for Properties Potentially Affected by Permanent Direct Vibratory Effects

As described previously in Section 3.7, the construction activities associated with the Build Alternatives will cause an adverse direct vibratory effect on the following historic properties:

Property	Effect	Alternatives for Which the Direct Vibratory Effects Apply
Dr. Henry K. Kawamoto Office Building	CNAE	BRT Alternative
Rialto Theatre	CNAE	BRT Alternative
Fair Hope Building	CNAE	BRT Alternative
Oaklawn Historic District	CNAE	BRT Alternative
Oaklawn Bridge and Waiting Station	CNAE	BRT Alternative
Old Pasadena Historic District	CNAE	BRT Alternative
Raymond Florist Historic District	CNAE	LRT Alternative
Substation No. 2, PERC	LTSM[1]	BRT Alternative

[1] This resource is not subject to Section 106, the BRT Alternative would result in a less than significant impact with mitigation under CEQA. See Section 4.2.5 for the analysis of this resource.
CNAE = Conditional No Adverse Effect

However, with the equipment changes mandated below, the potential for adverse vibratory effects on the following properties associated with demolition activities will be avoided:

- Dr. Henry K. Kawamoto Office Building (BRT Alternative)
- Rialto Theatre (BRT Alternative)
- Fair Hope Building (BRT Alternative)
- Oaklawn Historic District (BRT Alternative)
- Oaklawn Bridge and Waiting Station (BRT Alternative)
- Old Pasadena Historic District (BRT Alternative)

CUL-6 **Vibratory Effects of Demolition**. Vibratory effects caused by project-related demolition activities can be avoided if jackhammers are not used for demolition activities within 15 ft of historic properties. Avoidance measures for vibratory effects include the required use of alternative types of equipment during demolition within 15 ft of a historic property. Specifically required equipment and techniques to avoid vibration include the use of concrete saws instead of jackhammers (or other heavy pavement breaking machinery) within 15 ft of any historic properties. Requirements for in-field monitoring by the acoustical engineer with a historic architect during demolition and concrete surfacing activities shall be included in the project plans, specifications, and estimates to ensure that the concrete and curb removal is conducted in a manner that generates ground-borne vibration levels that would avoid damage to historic properties.

Pile driving is not proposed to be used during construction of any of the Build Alternatives. If that decision changes, the potential for vibratory effects from pile driving on historic properties shall be evaluated and no pile driving shall take place within 50 ft of historic properties.

CUL-7 **Vibration Management and Monitoring Plan (Raymond Florist Historic District).** The remaining identified adverse vibratory effect that cannot be avoided would be caused by the cut-and-cover excavations in the vicinity of the Raymond Florist Historic District. To minimize damage that results from vibratory effects on that property, a pre-construction survey will be required, followed by implementation of a vibration management and monitoring plan (vibration monitoring plan). The vibration monitoring plan will be prepared, reviewed, approved, and administered collaboratively by a qualified acoustical engineer, the structural engineer, and the historic architect, in consultation with the Caltrans CSO and the SHPO, as required. The objectives of the vibration monitoring plan are to: (a) establish damage thresholds for various building types; (b) develop procedures and alternative approaches for construction and/or demolition to ensure that historic properties sustain the minimum amount of vibration to prevent damage; and (c) identify those persons who are responsible for developing, reviewing, and approving aspects of the vibration monitoring plan. The results of the pre-construction surveys will be used to develop the appropriate level of effort to manage and monitor vibration on a case-by-case basis.

The primary objective of vibration monitoring is to verify that safe, acceptable levels of vibration by construction-related activities are not exceeded. Vibration monitoring at select historic properties will be based on the expected level of vibration of a particular activity and the sensitivity of the historic property to vibration effects, including, but not limited to, the method of construction, building height, foundation type (e.g., slab, footer, post-and-pier, or piles), overall existing condition, and overall sensitivity. Any structural areas identified in the pre-construction surveys that show existing damage or that may be aggravated by vibration generated by construction-related activities would warrant continuous monitoring during construction. At the discretion of the structural engineer and the acoustical engineer, survey equipment will be used to monitor existing cracks to observe any changes during construction. Monitoring can be both attended (monitoring with a technician present) and unattended (automated). Unattended monitors should be located outside the buildings in a locked case.

Unattended monitors should be capable of monitoring continuous data and sending the data in real time to several different parties, including, but not limited to, the structural engineer and the acoustical engineer, to ensure that vibration levels do not exceed the thresholds in the vibration monitoring plan. The vibration monitors should generate an instant email alert when the thresholds are exceeded so that immediate corrective action can be taken. The vibration monitors will provide alerts when vibration events approach 0.120 in/sec PPV. If a second exceedance occurs, a stop work order shall be issued by the resident engineer, the potential damage to historic properties from vibration shall be assessed by the structural engineer and historic architect, and ways to avoid exceeding the vibration limits must be adopted to avoid future exceedances. A visual inspection of the property shall be made by the structural engineer in consultation with the historic architect to verify that no damage is developing, spreading, or occurring as a result of the vibration. A report shall be prepared that documents the cause of the damage and the measures taken to ensure damage does not continue. The resulting report shall be filed with the resident engineer, Caltrans and/or Metro, and the SHPO, if the SHPO indicates it would like to receive those reports.

The vibration monitoring plan shall include the following information on vibration instrumentation, location of vibration monitors, data acquisition, and exceedance notification and reporting procedures:

- Vibration InstrumentationVibration monitors common to these applications shall be selected based on consultation among the resident engineer, structural engineer, the acoustical engineer, and Caltrans and/or Metro. The monitors will be equipped with cellular modems for Internet communication and use of automatic call-home feature to provide real-time notification of vibration level exceedance to the structural engineer or their designated representative. The vibration monitor will be set to automatically record daily events during working (construction) hours and to record peak PPV values in short, regular intervals not greater than 30 minutes during construction activities.
- Location of Vibration Monitors**:** A scaled plan indicating the specific monitoring locations (including measurements to be taken at construction site boundaries and at nearby historic and non-historic properties) shall be prepared by the acoustical engineer and submitted to the qualified historic architect and architectural historian for review and approval.
- Data AcquisitionThe information that will be included in the data reports, at a minimum, shall be daily PPV readings at the same time of day from multiple locations, the maximum peak-vector-sum PPV, the maximum frequency for each direction, and a U.S. Bureau of Mining R18507 compliance chart of maximum PPV versus frequency. At a minimum, vibration monitoring data shall be sent to the structural engineer or their designated representative once a week, or more frequently if needed. The reports shall also identify the construction equipment operating during the monitoring period, and the locations and distances of those pieces of equipment from the vibration-sensitive locations being monitored. The reports shall be reviewed by the structural engineer, acoustical engineer, and historic architect to interpret the findings.
- Exceedance Notification and Reporting Procedures**:** The vibration monitoring plan procedures shall include follow-up actions to reduce vibration levels to below allowable limits. Alarmed monitoring systems shall signal any vibration event that equals or exceeds a threshold of 80 percent of the PPV limit. In the event the measured vibration levels exceed allowable limits, the structural engineer or designated representative shall be notified immediately. The exceedance notice will trigger needed actions, including a potential stop work order to prevent unanticipated damage to a historic property. A survey of any potentially affected historic structure will be undertaken by the structural engineer and the historic architect at this time to ascertain whether any damage to the property has occurred and identify actions that will be undertaken to address this damage and/or future damage. Work shall be permitted to resume when the structural engineer, acoustical engineer, historic architect, and

architectural historian have determined that the appropriate modifications to the vibration monitoring plan have been made to ensure that no further damage at the affected historic property would likely result.

CUL-8 **SOIS Plan (Raymond Florist Historic District).** Where damage to the Raymond Florist Historic District results from vibration, measures to address that damage will be required, including the restoration of historic properties following the SOIS.

Damage to historic properties shall be identified using the baseline information recorded in the pre-construction surveys (Measure CUL-1). That information shall be compared to the information in the post-construction surveys (Measure CUL-13). If damage resulting from vibratory effects is identified, then a property-specific SOIS plan shall be prepared for the damaged historic property.

SOIS plans are required to address adverse effects to built environment historic properties and ensure the requirements for protection are met, as required under Stipulation X.B.1.b and Attachment 5 of the Caltrans Section 106 PA and the 5024 MOU. SOIS plans shall conform to the format specified in Exhibit 7.5 of Caltrans Volume 2 – Standard Environmental Reference (as updated) and include a title page, a summary of the SOIS plan, a project description, a historic properties description, effects and conditions proposed, the qualified monitors, the responsible parties, and any specified attachments.

SOIS plans shall be prepared by the project engineer, structural engineer, landscape architect, architectural historian, historic architect, and other appropriate design, engineering, cultural resources specialists, as appropriate, and in consultation with the Caltrans CSO and the SHPO, as required. SOIS plans will be reviewed and approved by the architectural historian, the historic architect, and Caltrans and/or Metro. Final approval of an SOIS plan would be indicated when the Caltrans Environmental Branch signs the plan. During the pre-construction phase, a review of any proposed project improvements covered by an SOIS plan must be completed by a PQS who meets the Caltrans professional qualifications standards as principal architectural historian and has the experience and expertise to ensure conformance with the SOIS.

During meetings in the final design/pre-construction phase, the architectural historian and historic architect shall verify that the SOIS plans meet the SOIS for rehabilitation. The resident engineer will require the construction contractor to give notice with a specific timetable before the start of rehabilitation-related construction in the vicinity of historic properties to ensure that the historic architect or qualified staff under the supervision of the historic architect are available to conduct an advance field inspection and monitor proposed work for conformance with the SOIS for rehabilitation at the identified locations.

3.7.4.6 Measures for Properties Potentially Affected by Permanent Indirect Visual Effects

As described previously in Section 3.7, the Build Alternatives will cause an adverse indirect visual effect on the following historic properties:

Property	Effect	Alternatives for which the Pre-Construction Surveys Requirement Applies
Maravilla Handball Court and El Centro Grocery	AE	LRT Alternative
Old Pasadena Historic District	CNAE	Freeway Tunnel Alternative

AE = Adverse Effect
CNAE = Conditional No Adverse Effect

CUL-9 **Indirect Visual Effects (Maravilla Handball Court and El Centro Grocery).** For the aerial segments of the light rail line in the LRT Alternative, it is not possible to avoid or minimize the indirect visual effect of the aerial light rail line on the Maravilla Handball Court and El Centro Grocery. For the LRT Alternative, measures to address the indirect visual effect from aerial light rail line structures will be developed in consultation with the Consulting Parties as part of the MOA, if the LRT Alternative is selected as the Preferred Alternative. Preliminary ideas include research projects, interpretative panels, and art installations.

For the potential light/shadow effect during operation of the LRT Alternative, additional studies and consultation with the Consulting Parties should be completed to identify methods for minimizing the light/shadow effects on the Maravilla Handball Court.

CUL-10 **Indirect Visual Effects (Old Pasadena Historic District).** Measures for the proposed ventilation structure adjacent to West Colorado Boulevard near the Old Pasadena Historic District will involve context sensitive design during the pre-construction/ final design phase. The ventilation structure at West Colorado Boulevard is near the Old Pasadena Historic District and will adversely affect the setting of the historic district. If this location is chosen for the ventilation structure in the Freeway Tunnel Alternative, to minimize that adverse visual effect, the ventilation structure must be designed to conform to the SOIS. The final design team members working on the ventilation structure design will include the project engineer, structural engineer, acoustical engineer, the architectural historian, the historic architect, and Caltrans and/or Metro staff. The design process will include the following:

- The proposed ventilation structure locations will be refined to avoid effects to the settings of the Old Pasadena Historic District. A charrette-style meeting shall be conducted that includes the appropriate final design team members, specifically the architectural historian and historic architect, and representatives from the City of Pasadena. The focus of this meeting will be to identify potential areas for locating the ventilation structure that avoid adverse effects on historic properties and to solicit public input regarding the design and materials to be used in the construction of the ventilation structure.
- The final design team will ensure that the ventilation structure will be designed and/or set back to minimize the visual and setting effects.
- As part of the final design team, the historic architect and architectural historian will review and comment on the proposed location for the ventilation structure and will participate in the development of designs and identification of appropriate building materials to ensure conformance with the SOIS for preservation. A report outlining how the final design complies with the SOIS will

be prepared by the historic architect and submitted to Caltrans and/or Metro and the SHPO for review, comment, and approval.

3.7.4.7 Measures for Properties Potentially Affected by Permanent Ground-Borne Noise

As described previously in Section 3.7, the Build Alternatives will cause an adverse indirect ground-borne noise effect on two historic properties (100 North Fremont Avenue and Rialto Theatre). With application of measure CUL-11, potential ground-borne noise effects would be avoided or minimized to a Conditional No Adverse Effect for these two properties.

Property	Effect	Alternatives for Which the Pre-Construction Surveys Requirement Applies
100 North Fremont Avenue	CNAE	LRT Alternative
Rialto Theatre	CNAE	LRT Alternative

CNAE = Conditional No Adverse Effect

CUL-11 **Ground-Borne Noise Effects (100 North Fremont Avenue and Rialto Theatre).** Where properties are located above the underground portion of the LRT Alternative, the project engineer will ensure that the final design of the LRT Alternative complies with appropriate FTA operational ground-borne noise criteria, based on the type of land use activities being undertaken at the property. Where the potential for exceedance for the FTA ground-borne noise criteria is identified, the project engineer will ensure that appropriate abatement measures are incorporated into the design of the rail track to meet FTA criteria for the associated land use. Abatement measures that could be incorporated into the track design to achieve the FTA criteria include, but are not limited to, highly resilient direct fixation (HRDF) fasteners, rail suspension fasteners (RSF), isolated slab track (IST), or floating slab track (FDT).

3.7.4.8 Property-Specific Protection Plans

CUL-12 **Property-Specific Protection Plans.** The intent of the property-specific protection plan is to ensure that the potential effects of the preferred alternative on each adversely affected property are addressed by specific measures implemented as part of the project pre-construction, construction, and post-construction phases.

At a minimum, the property-specific protection plan for the properties adversely affected by the selected alterative will include the following for each affected property:

- Name, address, boundary, and description of the historic property.
- List of potential adverse effects of the selected alternative on each historic property and the measures included in that alternative to address those effects.
- Key actions required in each measure.
- Party/parties responsible for implementing each key action in each measure.
- Other party/parties involved in implementing, overseeing, and/or documenting the implementation of the key actions in each measure.
- Timing of the implementation of the key actions in each measure (final design/pre-construction, construction, and/or post-construction).

- Requirements for documenting compliance with the requirements of each measure.
- Other relevant technical and supporting information.

During final design, the project engineer, in consultation with the historic architect, the architectural historian, the structural engineer, the acoustical engineer, and the geotechnical engineer, will prepare a property-specific protection plan for all properties adversely affected by the project. Properties subject to this measure are the historic properties that would be adversely affected by the Build Alternatives. The property-specific protection plans shall be prepared in consultation with the Caltrans CSO and the SHPO, as required.

A property-specific protection plan will be prepared during the final design for each of the historic properties adversely affected by the preferred alternative. The project engineer, resident engineer, and the construction contractor will be required to implement the property-specific protection plans for each property during the appropriate project phases (pre-construction, construction, and/or post-construction).

3.7.4.9 Post-Construction Building Surveys

CUL-13 **Post-Construction Building Surveys.** Post-construction building surveys (which have the same level of effort, qualifications for preparers, scope, and implementation as the pre-construction surveys described in Section 3.7.4.2) will be conducted for the properties listed in Section 3.7.4.2 that would be adversely affected by the project. The post-construction surveys would be completed within 2 months or 60 days following completion of the work in a specific area. The construction contractor and the resident engineer will notify the structural engineer and architectural historian when construction in the vicinity of a specified historic property or properties is completed. At that time, the structural engineer, the historic architect, the architectural historian, the geotechnical engineer, and other appropriate qualified specialists will conduct the post-construction surveys. The results of the survey will be documented in a written report, illustrated with photographs and drawings, as appropriate.

If the post-construction survey identifies damage to a historic property as a result of project-related activities, the structural engineer and Caltrans and/or Metro will consult with the historic architect to collaborate on a plan to repair the damage per the SOIS. The repairs will be performed by a qualified rehabilitation general contractor who has completed a certified rehabilitation on historic structures. That rehabilitation general contractor will perform those repairs under the direction of the resident engineer, with oversight by the structural engineer and the historic architect. The cost of the repairs will be paid by Caltrans and/or Metro or the construction contractor, depending on the contract provisions. Due to the gradual nature of ground settlement, post-construction settlement monitoring of properties will be ongoing for up to 3 years. Damage connected to slow excavation-induced ground settlement would be addressed using SOIS.

3.7.4.10 Post-Review Discovery and Monitoring Plan

CUL-14 **Post-Review Discovery and Monitoring Plan.** The post-review discovery and monitoring plan (PRDMP) for the proposed project is included in Volume III of the FOAE for the SR 710 North Project (Caltrans 2017). The PRDMP specifies procedures to be followed prior to and during construction activities to ensure compliance with Caltrans Section 106 PA. The policies and procedures in the PRDMP apply during ground-disturbing activities in areas deemed sensitive for subsurface archaeological deposits, particularly in the vicinity of the Horatio Rust Site and Otsungna Village Site. Archaeological monitoring areas are further specified in the PRDMP.

The resident engineer will require the construction contractor to implement the policies and procedures of the PRDMP detailed in Appendix I. The implementation of those requirements will be overseen by a qualified archaeological monitor or a consultant who meets the PQS requirements for a qualified archaeological monitor.

3.7.4.11 Public Outreach

CUL-15 **Public Outreach.** Community outreach will be conducted by Caltrans and/or Metro or their designated representative to educate the public about the project and its expected effects and shall include individual consultation with the owners and occupants of historic properties that are likely to be subjected to project-related settlement and/or ground-borne vibration or any other construction or operational effect described in this document and the FOAE for the SR 710 North Project (Caltrans 2017). This consultation would provide information demonstrating the relationship between ground settlement, ground-borne noise and vibration, human perception, and superficial and structural damage related to tunnel boring and other construction activities associated with the Build Alternatives. Community outreach methods will consist of certified correspondence, public meetings, or in-person meetings. As part of this outreach, Caltrans and/or Metro or their designated representative will provide a procedure for obtaining feedback and maintaining a registry for ensuring that public comments are addressed. The registry will be updated routinely and will contain the responses provided by appropriate staff based on the nature of the inquires, questions, and requests in a deliberate, timely fashion.

The requirements for public outreach apply to all four Build Alternatives.

3.7.4.12 Construction Worker Training

CUL-18 **Construction Worker Training.** Following the notice to proceed but before work begins, the resident engineer and the construction contractor will provide cultural resources training to key personnel and supervisors. The training will be prepared and conducted by an archaeologist, architectural historian, and historic architect. The training, which may be conducted in person or through video, will describe the applicable measures for treatment and protection of historic properties in compliance with the SOIS. The training will present and discuss applicable laws, their penalties, and examples of artifacts that may be encountered and potential conditions where historic resources can be damaged during construction. The training will also outline the steps, in accordance with the PRDMP, that must be taken should work crews encounter cultural resources during project-related activities, including the authority of archaeological monitors in conjunction with the resident engineer to halt work in the area of a discovery to ensure the resource is protected against further effects.

The requirements for construction worker training apply to all four Build Alternatives.

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PHYSICAL ENVIRONMENT

3.8 Hydrology and Floodplain

3.8.1 Regulatory Setting

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

3.8.2 Affected Environment

The information in this section is based on the *Summary Floodplain Encroachment Report* (2014) and the *Location Hydraulic Study* (2014) prepared for the project.

3.8.2.1 Watershed Description

The project study area is located in Los Angeles County within the Los Angeles River Watershed. The Los Angeles River Watershed covers a land area of approximately 834 square miles (sq mi) and is one of the largest watersheds in the region. The Los Angeles River Watershed is part of the larger Los Angeles-San Gabriel Hydrologic Unit (HU). The Los Angeles-San Gabriel HU is divided into Hydrologic Areas (HAs) and Hydrologic Subareas (HSAs). The project study area lies within the Los Angeles-San Gabriel HU; the Raymond, Coastal Plain, and San Fernando HAs; and the Pasadena, Central Split, and Eagle Rock HSAs. The Los Angeles-San Gabriel HU covers approximately 1,608 sq mi within Los Angeles County and small areas in Ventura County.

The major drainages within the study area include Arroyo Seco, San Gabriel River, and Dorchester Channel (the Laguna Channel). The Arroyo Seco and Dorchester Channel both drain to the Los Angeles River. The Los Angeles River and San Gabriel River both drain to the Pacific Ocean. The major drainages adjacent to the study area are the Los Angeles River in the west and Rio Hondo in the east. In addition to these major drainages, there are smaller intermittent drainages adjacent to the study area that include, from west to east, the Alhambra/San Pasqual Wash, Rubio Wash, Eaton Wash, Arcadia Wash, and Santa Anita Wash.

Within the study area, all surface waters eventually drain to the Los Angeles River, which flows to the west and south of the study area to the Pacific Ocean.

3.8.2.2 Floodplain Description

Two floodplains were identified within the study area: Laguna Regulating Basin and Dorchester Channel. There are no published Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) in the study area that include the Laguna Regulating Basin and Dorchester Channel. Information about the floodplains is based on available engineering documents (e.g., As-Built plans) and design reports gathered from the Los Angeles County Department of Public Works (LADPW) and Caltrans. In lieu of a federally established floodplain, the floodplains for the Laguna Regulating Basin and Dorchester Channel are defined below for the purpose of evaluating floodplain impacts. Figure 3.8-1 presents an overview of the existing floodplains.

Laguna Regulating Basin

The Laguna Regulating Basin is an engineered detention basin with an earthen bottom in an urban area. The Laguna Regulating Basin is an LADPW facility that collects runoff from the watersheds north of Interstate 10 (I-10), including the communities of Alhambra, Monterey Hills, and South Pasadena. The Dorchester Channel drains into the Laguna Regulating Basin. The Laguna Regulating Basin drains through several channel systems and eventually discharges into the Los Angeles River in the City of Vernon.

Available information to establish the flood of record for the combined Dorchester Channel and Laguna Regulating Basin is limited. The LADPW indicated there has never been an overtopping flood in the Basin since it was constructed in 1967, even during wet years. Therefore, the highest possible inundated area prior to spillway activity is assumed to be the basis for analyzing impacts to the existing floodplain. The spillway crest elevation is at 318.0 feet (ft) above mean sea level (amsl), and an overtopping flood would rise above this elevation. Given there is no record of an overtopping flood (i.e., spillway activity), this condition is an extreme event with a return frequency likely to be greater than 100 years.

Dorchester Channel

The Dorchester Channel is a concrete-lined storm drain system in a developed urban area. The Dorchester Channel is an LADPW facility that collects runoff from the watersheds north of I-10, including the communities of Alhambra, Monterey Hills, and South Pasadena. Dorchester Channel drains into the Laguna Regulating Basin. As noted above, the Laguna Regulating Basin drains through several channel systems and eventually discharges into the Los Angeles River in the City of Vernon.

The data available for Dorchester Channel indicate that design flows for this system were based on a 50-year frequency in accordance with Los Angeles County methodology, also known as the Capital Flood. In Los Angeles County, the Capital Flood is used for the purpose of floodplain evaluations.

Beneficial Uses

Natural and beneficial floodplain values include, but are not limited to, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge. Beneficial uses for surface waters are defined in the Los Angeles Regional Water Quality Control Board (LARWQCB) Basin Plan (1995) as various ways that water can be used for the benefit of people and/or wildlife. Examples of beneficial uses include municipal and domestic water supply, agricultural water supply, industrial service supplies, industrial process supply, groundwater recharge, water contact recreation,

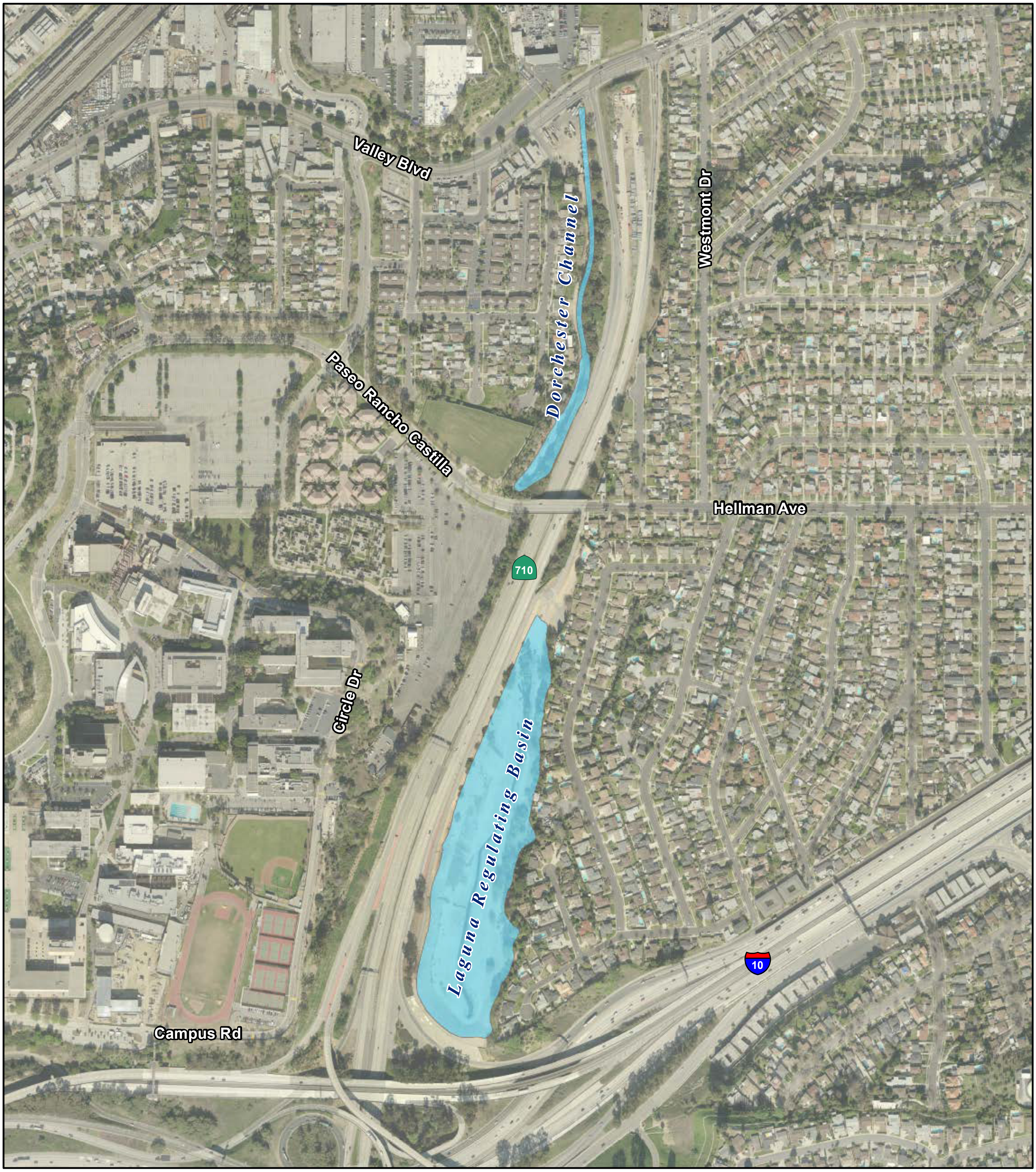

FIGURE 3.8-1

LEGEND

Existing Base Floodplain

N

0 300 600
FEET

SOURCE: LARIAC (2010); CH2M Hill (2013)

SR 710 North Project

Floodplain Overview

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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non-contact water recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, spawning habitat, and rare, threatened, or endangered species habitat. Neither Dorchester Channel nor the Laguna Regulating Basin are listed in the LARWQCB Basin Plan as having any beneficial uses. The Dorchester Channel is a constructed storm drain system in a developed urban area. Because it is an engineered waterway with a concrete bottom and little or no vegetation, the open space, natural beauty and outdoor recreational values of Dorchester Channel are limited. In addition, because the channel is concrete with little or no vegetation, it has limited value to support fish, wildlife, and plant habitat. The Laguna Regulating Basin is an engineered detention basin with an earthen bottom. Some opportunistic vegetation was recorded within the detention basin but no wetland or riparian vegetation was observed. Therefore, the Laguna Regulating Basin has limited value to support fish, wildlife, and plant habitat. Furthermore, because of the Laguna Regulating Basin is an engineered basin located in a developed urban area not used for recreation, the open space, natural beauty and outdoor recreational values of the Laguna Regulating Basin are limited.

3.8.3 Environmental Consequences

The Transportation System Management/Transportation Demand Management (TSM/TDM), Bus Rapid Transit (BRT), and Light Rail Transit (LRT) Alternatives would not result in impacts to floodplains because they would not encroach into any floodplains. Therefore, these alternatives are not discussed further below.

3.8.3.1 Temporary Impacts

No Build Alternative

Under the No Build Alternative, no improvements in the SR 710 North Project Build Alternatives would be constructed and no encroachment into the Laguna Regulating Basin or Dorchester Channel would occur. As a result, the No Build Alternative would not result in the impacts related to hydrology and floodplains associated with improvements in the Freeway Tunnel Alternative.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative includes two design variations that relate to the number of tunnels constructed. The dual-bore Freeway Tunnel Alternative design variation alignment crosses the Laguna Regulating Basin floodplain and Dorchester Channel floodplain. Construction of the single-bore Freeway Tunnel Alternative design variation alignment crosses only the Laguna Regulating Basin floodplain.

Freeway Tunnel Alternative (Dual-Bore)

The Freeway Tunnel Alternative dual-bore design variation requires widening State Route 710 (SR 710) along its east side, which is along the western boundary of the Laguna Regulating Basin. The dual-bore tunnel design variation also requires widening SR 710 along its west side, which is along Dorchester Channel's eastern boundary, and replacing portions of that existing reinforced concrete channel with a reinforced concrete box. Construction equipment would be operated along the Laguna Regulating Basin western boundary and along the Dorchester Channel eastern boundary. Potential temporary impacts could occur during the widening of the road, construction of the bridge structure, excavation under the new bridge structure, and reconstruction of the existing maintenance road. Land and vegetation would be cleared, exposing soil to the potential for erosion and downstream transport of sediments to occur. Under the Construction General Permit, the dual-bore tunnel design variation would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) and implement construction Best Management Practices (BMPs) aimed at reducing pollutants of concern in storm water runoff. The construction BMPs would include Erosion Control, Sediment Control, and Good Housekeeping BMPs designed to minimize erosion, retain sediment on site, and prevent spills. Therefore, the dual-bore tunnel design variation would not result in temporary water quality-related impacts related to the floodplains of the Laguna Regulating Basin or Dorchester Channel.

As stated previously, the Laguna Regulating Basin and Dorchester Channel have limited value to support fish, wildlife, and plant habitat because they are, respectively, an engineered detention basin and an engineered concrete-lined storm drain. Furthermore, the open space, natural beauty, and outdoor recreational values of the Laguna Regulating Basin and Dorchester Channel are limited. Therefore, construction of the Freeway Tunnel Alternative dual-bore design variation would not impact the natural and beneficial floodplain values of the Laguna Regulating Basin and Dorchester Channel.

Freeway Tunnel Alternative (Single-Bore)

The Freeway Tunnel Alternative single-bore design variation would result in the same temporary impacts to the Laguna Regulating Basin as those discussed above for the dual-bore tunnel design variation. The single-bore tunnel design variation would not result in impacts to Dorchester Channel.

3.8.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in the impacts related to hydrology and floodplains associated with improvements in the Freeway Tunnel Alternative.

Freeway Tunnel Alternative

Freeway Tunnel Alternative (Dual-Bore)

Laguna Regulating Basin

The Freeway Tunnel Alternative dual-bore design variation would require widening SR 710 along its east side to provide access to the south portal. Widening SR 710 to provide access to the south portal would involve a longitudinal encroachment within the floodplain of the Laguna Regulating Basin. The longitudinal encroachment would be up to 20 ft wide and 700 ft long along the Laguna Regulating Basin western boundary, on the east side of the new freeway. Widening SR 710 in this location would be accomplished by placing it on a bridge structure. The bridge structure would be supported by piers that would be placed in the floodplain. The area under the bridge would be excavated. By using a bridge structure to widen SR 710 in this location, the storage volume of the Laguna Regulating Basin would not be reduced. The additional excavation that would be required under the bridge structure would result in slight modifications to the floodplain boundary, but the base floodplain elevation would not change.

There is an existing maintenance road along the west side of the Laguna Regulating Basin. Because SR 710 would be widened in this location, it would be necessary to replace the existing maintenance road with a new entrance and maintenance vehicle pull-out area. The new entrance road and maintenance vehicle pull-out area would be constructed on top of a berm that is outside the current floodplain boundary and therefore would not affect the existing floodplain boundary and would not constitute a longitudinal encroachment.

The longitudinal encroachment along the western boundary of the Laguna Regulating Basin is necessary to reduce impacts to existing right of way (ROW), slope easements, channel structures, land uses, hydrology, and potential geotechnical and seismic issues. As noted above, the longitudinal encroachment involves the construction of an elevated bridge structure to accommodate the widening of SR 710. The bridge structure would be supported by piers that would be placed in the floodplain. The area under the bridge would be excavated. By using a bridge structure to widen SR 710 at this location, the proposed encroachment to the floodplain would not reduce the storage volume of the Laguna Regulating Basin; therefore, in the proposed project condition, the base floodplain elevation would not change. Therefore, no alternatives to the longitudinal encroachment are required.

The encroachment into the Laguna Regulating Basin floodplain would result in slight modifications to the floodplain boundary, but the base floodplain elevation would not change. Furthermore, it is possible that the excavation for the bridge structure would increase and not decrease the basin storage volume. Therefore, there would be no increased flood risk and no risk to life or property associated with implementation of the single-bore and dual-bore Freeway Tunnel Alternative design variations.

The dual-bore tunnel design variation would not support incompatible floodplain development. The areas surrounding the Laguna Regulating Basin floodplain are already developed. Additionally, by reducing cut-through traffic, the dual-bore tunnel design variation would lessen the impacts to the existing roadway network as the area continues to be developed or redeveloped.

The Laguna Regulating Basin is an engineered detention basin with limited value to support fish, wildlife, and plant habitat, open space, natural beauty, and outdoor recreational values. Therefore, implementation of the Freeway Tunnel Alternative dual-bore design variation would not result in impacts to the natural and beneficial floodplain values of the Laguna Regulating Basin.

Dorchester Channel

The Freeway Tunnel Alternative dual-bore design variation would require widening the west side of the existing freeway. Widening the west side of SR 710 would involve a longitudinal encroachment within the floodplain of the Dorchester Channel on the west side of the new freeway. The new freeway would affect approximately 728 linear feet of the southern end of the reinforced concrete channel and approximately 267 linear feet of the northern end of the reinforced concrete channel. The dual-bore tunnel design variation would raise the SR 710 roadway profile along the west side of the roadway and place fill into the sunken channel, which would result in a narrowing of the floodplain boundary for approximately 650 ft in a section of the Dorchester Channel north of Hellman Avenue. Where Dorchester Channel would be impacted, the existing 20 ft by 14 ft reinforced concrete channel would be replaced with a double 9.67 ft x 14 ft reinforced concrete box along the original channel alignment. The reinforced concrete channel would be replaced with a reinforced concrete box in the following two locations:

- 59 ft north of Hellman Avenue (for approximately 728 linear feet)
- 246 ft north of the first box (for approximately 267 linear feet)

Fill would be placed above the new reinforced concrete box. The floodplain boundary would only be affected for about 650 ft at the southern end of the channel from 59 ft north of Hellman Avenue.

The dual-bore tunnel design variation minimizes the longitudinal encroachment within the floodplain of the Dorchester Channel. Other design variations considered for this Alternative would have required geometric modifications to the horizontal or vertical alignment, or realignment of the freeway mainline. Those design variations would induce more severe impacts to existing ROW, land uses, and hydrology east of the Freeway. Therefore, alternatives to the longitudinal encroachment are not feasible.

The construction of the new reinforced concrete box would increase the water surface elevation in Dorchester Channel. The increase in water surface elevation would range from a minimum of 0.25 ft to a maximum increase of 2.11 ft. The maximum increase in the water surface elevation would occur approximately 235 ft upstream of the Hellman Avenue crossing. The water surface elevation in the upstream channel would not be altered. While the water surface elevation within the reinforced concrete box would change, it would still be contained within the reinforced concrete box, and the minimum capacity of Dorchester Channel would be maintained. Therefore, there would be no increased flood risk to the upstream community, and no risk to life or property would occur.

The dual-bore tunnel design variation would not support incompatible floodplain development. The areas surrounding the Dorchester Channel floodplain are already developed. Additionally, the dual-bore tunnel design variation would lessen the impacts to the existing roadway network as the area continues to be developed or redeveloped.

Dorchester Channel is a constructed storm drain system with limited value to support fish, wildlife, and plant habitat, open space, natural beauty, and outdoor recreational values. Therefore, implementation of the dual-bore tunnel design variation would not result in impacts to the natural and beneficial floodplain values of Dorchester Channel.

Freeway Tunnel Alternative (Single-Bore)

The Freeway Tunnel Alternative single-bore design variation would result in the same permanent impacts to the Laguna Regulating Basin as those discussed above for the dual-bore tunnel design variation. The single-bore tunnel design variation would not result in impacts to Dorchester Channel because it would not encroach into the Dorchester Channel floodplain.

Significant Encroachment

“Significant encroachment” as defined at 23 CFR 650.105 is a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction or flood-related impacts:

- A significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation route

- A significant risk (to life or property)
- A significant adverse impact on natural and beneficial floodplain values

The proposed action does not constitute a significant floodplain encroachment as defined in 23 CFR Section 650.105(q). The implementation of the proposed project would not change the capacity of the Dorchester Channel to carry water or the Laguna Regulating Basin to store water. The proposed Freeway Tunnel Alternative single-bore and dual-bore design variations would result in a nominal reduction of the floodplain boundaries associated with the Dorchester Channel and Laguna Regulating Basin. This nominal reduction in the floodplain area would not result in an increase in the water surface elevation in the Laguna Regulating Basin and would result in only a minor increase in water surface elevation in Dorchester Channel. The minor change in water surface elevation in Dorchester Channel would not result in any significant change in flood risks or damage, and does not have significant potential for interruption or termination of emergency service or emergency routes. Therefore, the proposed encroachment into the Laguna Regulating Basin and Dorchester Channel is not significant.

The proposed project would not involve a significant encroachment on a regulatory floodway or substantially increase the base flood elevation. There are no existing published FEMA FIRMs in the study area, so a floodplain map revision would not be required. Because the Freeway Tunnel Alternative would encroach on the LADPW's facilities, coordination with LADPW would occur during final design, and an encroachment permit from the LADPW would be required prior to construction.

3.8.4 Avoidance, Minimization, and/or Mitigation Measures

The Build Alternatives would not result in adverse temporary or permanent impacts on floodplain values. The Laguna Regulating Basin and Dorchester Channel possess limited natural and beneficial floodplain values; therefore, the Build Alternatives would not result in impacts on floodplain values. Therefore, no avoidance, minimization, and/or mitigation measures are required to minimize impacts to these waterways.

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3.9 Water Quality and Storm Water Runoff

3.9.1 Regulatory Setting

3.9.1.1 Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source[1] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE’s Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency’s (U.S. EPA) Section 404 (b)(1) Guidelines (U.S. EPA Code of Federal Regulations [CFR] 40 Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less Adverse Effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental

[1] A point source is any discrete conveyance such as a pipe or a man-made ditch.

consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[1] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

3.9.1.2 State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the State. It predates the CWA and regulates discharges to waters of the State. Waters of the State include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined and this definition is broader than the CWA definition of "pollutant". Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions, and then set criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-source point controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

3.9.1.3 State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

[1] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

- National Pollutant Discharge Elimination System (NPDES) Program

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The SWRCB has identified Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans' MS4 permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Caltrans' MS4 Permit (Order No, 2012-0011-DWQ) as amended by Order WQ 2014-0006-EXEC, Order WQ 2014-0077-DWQ and Order WQ 2015-0036-EXEC, was adopted on September 19, 2012 and became effective on July 1, 2013. The permit has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and
3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs) to the Maximum Extent Practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit (Order No. 2009-0009-DWQ) as amended by 2010-0014-DWQ and 2012-006-DWG, adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with Caltrans' Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre.

Local Agency Construction Activity Permitting

For local agency transportation projects off the State Highway System (SHS), the local agency (as owner of the land where the construction activity is occurring) is responsible for obtaining the NPDES permit if required and for signing certification statements (when necessary). Local agencies contact the appropriate RWQCB to determine what permits are required for their construction activity. The local agency is also responsible for ensuring that all permit conditions are included in the construction contract and fully implemented in the field.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

3.9.1.4 Regional and Local Requirements

General WDR Permit for Groundwater Discharges

The Los Angeles Regional Water Quality Control Board (LARWQCB) requires a permit for discharging wastes to surface waters from activities involving groundwater extraction. Order No. R4-2013-0095 (NPDES No. CAG994004) covers treated or untreated groundwater generated from permanent or temporary dewatering operations or other appropriate wastewater discharge not specifically covered in other general NPDES permits in the Los Angeles region. To be covered under this order, a discharger must:

1. Demonstrate that pollutant concentrations in the discharge shall not cause violation of any applicable water quality objective for the receiving waters, including discharge prohibitions;
2. Demonstrate that discharge shall not exceed the applicable water quality objectives/criteria for the receiving waters; and
3. Conduct water quality screening of a representative sample of the discharge to prove that a reasonable potential for discharge of toxics does not exist.

In addition, the permit covers discharge from dewatering operations in the vicinity of creeks where the groundwater is hydrologically connected and has similar water chemistry to the surface water body to which the groundwater would be discharged.

However, if groundwater discharge in the project area is found to exceed the water quality screening levels for general permits, the project would be subject to this General Permit and treatment of the wastewater would be required to treat the groundwater to meet effluent limitations contained in the permit prior to discharge.

Los Angeles Regional Water Quality Control Board WDRs for Municipal Separate Storm Sewer System

A municipal NPDES storm water permit was issued to the County of Los Angeles and 84 unincorporated cities (with the exception of the City of Long Beach) under Order No. R4-2012-0175, NPDES Permit No. CAS004001 by the LARWQCB on November 8, 2012. All of the cities and unincorporated communities in Los Angeles County directly impacted by the project are covered under the LARWQCB MS4 permit. Portions of the Build Alternatives outside Caltrans right-of-way would be subject to the requirements of this permit.

The LARWQCB MS4 Permit established new Low Impact Development (LID) requirements for new development and redevelopment projects. All new development and redevelopment projects that fall under specific project categories must develop LID plans that specify the BMPs to be implemented to mimic predevelopment hydrology and remove pollutants of concern from storm water. The Los Angeles County LID Manual, February 2014) was developed to help guide LID implementation in the County.

The following projects are subject to LID requirements:

- All Development projects equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious surface area.
- Industrial parks with 10,000 square feet or more of surface area.
- Commercial malls with 10,000 square feet or more of surface area.
- Retail gasoline outlets with 5,000 square feet or more of surface area.
- Restaurants with 5,000 square feet or more of surface area.
- Parking Lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces.
- Streets and roads construction with 10,000 square feet or more of impervious surface area. Street and road construction applies to standalone streets, roads, highways, and freeway projects, and also applies to streets within larger projects.

- Automotive service facilities with 5,000 square feet or more of surface area.
- Projects located in or directly adjacent to, or discharging directly to an Environmentally Sensitive Area, where the development will discharge storm water runoff that is likely to impact a sensitive biological species or habitat and create 2,500 square feet or more of impervious surface area.
- Single-family hillside homes.
- Redevelopment Projects that meet the following:
  - Land-disturbing activity that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site as described in the above bullets.
  - Land-disturbing activity that that results in the creation, addition, or replacement of 10,000 square feet or more of impervious surface area on an site that was previously developed as a single-family home.
  - Land-disturbing activity that results in an alteration to more than 50 percent of impervious surface area on an already developed site and the existing site was not subject to post-construction storm water quality control requirements, the entire site must be mitigated.
  - Land-disturbing activity that results in an alteration of less than 50 percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction storm water quality control requirements, only the alteration must be mitigated, and not the entire development.

The SUSMP includes requirements for Site Design BMPs, Source Control BMPs, LID, and Treatment Control BMPs. As labeled, Site Design BMPs are BMPs that are incorporated into the design of the project (e.g., conserving natural areas and properly designing trash storage areas). Source Control BMPs are pollution prevention BMPs that can be structural or nonstructural practices (e.g., good housekeeping, stenciling of catch basins, protecting slopes from erosion, maintenance of BMPs). Treatment Control BMPs are physical devices that remove pollutants from storm water (e.g., biofilters, water quality inlet devices, detention basins). Low Impact Development BMPs are design approaches that promote the use of natural systems for infiltration, evapotranspiration, and reuse of storm water.

Collectively, the proposed project's Site Design, Source Control, and Treatment Control BMPs are required to address the pollutants of concern identified for the proposed project.

Municipal Codes for Impacted Jurisdictions[1]

Portions of the Build Alternatives outside Caltrans right-of-way would be subject to the requirements of the following municipal codes.

- **Alhambra Code of Ordinances:** Chapters 16.34 (Storm Water and Urban Runoff Pollution Control) and 16.36 (Standard Urban Storm Water Mitigation Plan Implementation) set forth standards to protect and improve the water quality of the City's receiving waters. These standards include: prohibiting illicit discharges and connections, including spills, dumping, and disposal; controlling pollutants from sites of industrial activities; requiring BMPs; implementing construction activity storm water measures; and implementing an SUSMP.

1 Section includes only the cities and unincorporated areas that would be directly impacted by the Build Alternatives.

- **Los Angeles County Code and Flood Control District Code:** The Los Angeles County Code applies to the unincorporated areas that are directly impacted by the Build Alternatives, including the unincorporated communities of East Pasadena, East San Gabriel, and East Los Angeles. Chapter 21 (Stormwater and Runoff Pollution Control) sets forth standards to regulate the storm water and non-storm water discharges to the facilities of the Los Angeles County Flood Control District in order to protect those facilities, the water quality of the waters in and downstream of those facilities, and the quality of the water that is being stored in water-bearing zones underground.
- **Monterey Park Municipal Code:** Chapter 6.30 (Stormwater and Urban Runoff Pollution Prevention Controls) sets forth standards to protect the health, safety, and general welfare of the citizens of the City of Monterey Park. These standards include: regulating non-storm water discharge; controlling spillage, dumping or disposal of materials into the storm water system; and reducing pollutants in storm water and urban runoff to the maximum extent practicable.
- **Pasadena Code of Ordinances:** Chapter 8.70 (Stormwater Management and Discharge Control) sets forth standards to ensure the future health, safety, and general welfare of the residents of Pasadena who recreate in and consume from the waters of the United States, and to protect marine habitats and ecosystems. These standards include: regulating non-storm water discharges to the municipal storm water system; providing for the control of spillage, dumping or disposal of materials into the municipal storm water system; and reducing pollutants in storm water and urban runoff to the maximum extent practicable.
- **City of Rosemead Code of Ordinances:** Chapter 13.16 (Storm Water Management) sets forth standards to protect and improve the water quality of the City's receiving waters. These standards include prohibiting illicit connections and discharges, controlling urban runoff, and inspecting sources of discharge into any public drainage system.
- **San Gabriel Municipal Code:** Chapter 53 (Stormwater and Urban Runoff Pollution Prevention) sets forth standards to protect and improve the water quality of the City's receiving waters. These standards include: reducing illicit discharges to the municipal storm water system to the maximum extent practicable; eliminating illicit connections to the municipal storm water system; eliminating spillage, dumping, and disposal of pollutant materials into the municipal storm water system; and reducing pollutant loads in storm water and urban runoff from land uses and activities identified in the municipal NPDES permit.
- **San Marino City Code:** Chapter 10.03.06 (Pollution of Water Supply) sets forth standards to protect and improve the water quality of the City's receiving waters. These standards include prohibiting discharges of oils, gasoline, chemicals, or waste materials that may pollute the water supply and prohibit or render unwholesome or contaminate the water of any drinking fountain, hydrant, water line or place within the City.
- **South Pasadena Municipal Code:** Chapter 23 (Stormwater and Urban Runoff Pollution Control) sets forth standards to protect and improve the water quality of the City's receiving waters. These standards include: reducing illicit discharges to the municipal storm water system to the maximum extent practicable; eliminating illicit connections to the municipal storm water system; eliminating spillage, dumping, and disposal of pollutant materials into the municipal storm water system; and reducing pollutant loads in storm water and urban runoff from land uses and activities identified in the municipal NPDES permit.

3.9.2 Affected Environment

This section is based on the *Water Quality Assessment Report* (2014).

3.9.2.1 Regional Hydrology

The study area is within the Los Angeles River Watershed, which covers a land area of approximately 834 square miles (sq mi) and is one of the largest watersheds in the region. The eastern portion spans from the Santa Monica Mountains to the Simi Hills and in the west from the Santa Susana Mountains to the San Gabriel Mountains. The watershed encompasses and is shaped by the path of the Los Angeles River, which flows from its headwaters in the mountains eastward to the northern corner of Griffith Park. Here the channel turns southward through the Glendale Narrows before it flows across the coastal plain and into San Pedro Bay near Long Beach. The Los Angeles River has evolved from an uncontrolled, meandering river that provided an important source of water for early inhabitants to a major flood protection waterway.

For regulatory purposes, the LARWQCB designates watershed areas in Hydrologic Units (HUs) that are further divided into Hydrologic Areas (HAs) and Hydrologic Subareas (HSAs). As designated by LARWQCB Region 4, the study area is located within the Los Angeles-San Gabriel HU, Raymond HA, Pasadena HSA, Coastal Plain HA, Central HSA Split, San Fernando HA, and Eagle Rock HSA. The Los Angeles-San Gabriel HU covers approximately 1,608 sq mi within Los Angeles County and small areas in Ventura County.

3.9.2.2 Local Hydrology

The major drainages within the study area include the Arroyo Seco, San Gabriel River, and Dorchester Channel (also referred to as the Laguna Channel). The Arroyo Seco and Dorchester Channel both drain to the Los Angeles River. The major receiving waters adjacent to the study area include the Los Angeles River in the west and the Rio Hondo in the east. In the study area, most surface waters eventually drain to the Los Angeles River, which flows to the west and south of the study area.

3.9.2.3 Surface Waters

The Arroyo Seco is an 80-foot (ft) wide, usually shallow stream with an earthen bottom. The Dorchester Channel is mostly channelized in a concrete-lined box channel. In addition, as discussed in Section 3.17, Wetlands and Other Waters, there are a total of 29 potentially jurisdictional drainages within the study area, including 19 aboveground nonjurisdictional drainage features, 8 jurisdictional drainage features, and 2 wetlands.

Beneficial Uses for Surface Streams

Beneficial uses of inland surface waters form the cornerstone of water quality protection under the LARWQCB Basin Plan. They are defined in the Basin Plan as those necessary for the survival of well-being of humans, plants, and wildlife. Examples of beneficial uses include swimming, fishing, drinking water supplies, industrial water supply, and the support of freshwater and marine habitats and their organisms.

The existing, potential, and intermittent beneficial uses, as identified in the LARWQCB Basin Plan, for the project area receiving waters are identified in Table 3.9.1.

TABLE 3.9.1:
Receiving Waters Beneficial Uses

Beneficial Use	Los Angeles River	Rio Hondo to Spreading Grounds	Arroyo Seco South of Devil's Gate Lower (L)[1]	Arroyo Seco South of Devil's Gate Upper (U)[2]
Municipal and Domestic Supply (MUN)	P[3]	P[3]	P[3]	P[3]
Industrial Service Supply (IND)	P	–	–	–
Groundwater Recharge (GWR)	E	I	–	–
Water Contact Recreation (REC-1)	E[4]	I[5]	I	I[5]
Non-Contact Water Recreation (REC-2)	E	E	I	I
Warm Freshwater Habitat (WARM)	E	P	P	P
Wildlife Habitat (WILD)	P	I	P	P
Rare, Threatened, or Endangered Habitat (RARE)	–	–	–	E

Source: *Water Quality Assessment Report* (2014).
1 The Arroyo Seco South of Devil's Gate Lower (L) is located in Central HSA Split of the Los Angeles Coastal Plain.
2 The Arroyo Seco South of Devil's Gate Upper (U) is located in the Pasadena HSA of the Raymond HA.
3 MUN designations are designated under SB-88-63 and RB89-03. Some designations may be considered for exemptions at a later date.
4 Access prohibited by Los Angeles County Department of Public Works.
5 Access prohibited by Los Angeles County Department of Public Works in concrete-channelized areas.
HSA = Hydrologic Subarea   E = existing beneficial uses
HA = Hydrologic Area   I = intermittent beneficial uses
P = potential beneficial uses

Surface Water Quality Objectives

Surface water quality objectives for all inland waters in the Los Angeles region as documented in the LARWQCB Basin Plan are listed in Table 3.9.2.

3.9.2.4 Groundwater

The State Route 710 (SR 710) North Project is located across four alluvial groundwater basins of the South Coast Hydrologic Region as defined by the Department of Water Resources. The subject groundwater basins include the Central Coastal Plain of the Los Angeles Basin, San Fernando Valley Basin, San Gabriel Valley Basin, and the Raymond Basin. The groundwater basins are separated by bedrock upland areas and/or faults. The bedrock upland areas in the study area generally do not contain substantial amounts of groundwater. However, groundwater seepages might be present within local sandstone beds and fault and/or fracture zones.

The Central Coastal Plain of the Los Angeles Basin is bounded on the north by a surface divide called the La Brea high, and on the northeast and east by emergent, less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills. The southeast boundary between the Central Basin and the Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage province boundary. The southwest boundary is formed by the Newport-Inglewood Fault system and the associated folded rocks of the Newport-Inglewood uplift. The Los Angeles and San Gabriel Rivers drain inland basins and pass across the surface of the Central Basin on their way to the Pacific Ocean.

The San Fernando Valley Groundwater Basin includes water-bearing sediments beneath the San Fernando Valley, Tujunga Valley, Browns Canyon, and the alluvial areas surrounding the Verdugo Hills near La Crescenta and Eagle Rock. The basin is bounded on the north and northwest by the Santa Susana Mountains, on the north and northeast by the San Gabriel Mountains, on the east by the San Rafael Hills, on the south by the Santa Monica Mountains and Chalk Hills, and on the west by the Simi Hills. The valley is drained by the Los Angeles River and its tributaries.

TABLE 3.9.2:
Los Angeles Regional Water Quality Control Board Surface Water Quality Objectives for Inland Surface Waters

Constituent	Basin Plan Objectives
Ammonia	Shall not be present at levels that when oxidized to nitrate, pose a threat to groundwater. Numerical ammonia concentrations for inland surface waters are contained in Table 3-1 through 3-4 of the LARWQCB Basin Plan.
Bacterial, Coliform	**REC-1:** Fecal coliform concentration shall not exceed a log mean of 200/100 ml (based on a minimum of not less than four samples for any 30-day period), nor shall more than 10 percent of samples collected during any 30-day period exceed 400/100 ml. **REC-2 (and not designated REC-1):** Fecal coliform concentration shall not exceed a log mean of 2,000/100 ml (based on a minimum of not less than four samples for any 30-day period), nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000/100 ml.
Bioaccumulation	Toxic pollutants shall not be present at levels that will bioaccumulate in aquatic life to levels that are harmful to aquatic life or human health.
Biological Oxygen Demand (BOD)	Waters shall be free of substances that result in increases in the BOD, which adversely affect beneficial uses.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.
Chemical Constituents	Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use. Waters designated for domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in Title 22 CCR and incorporated by reference into Tables 3-5, 3-6, and 3-7 of the LARWQCB Basin Plan.
Chlorine, Total Residual	Chlorine residual shall not be present in surface water discharges at concentrations that exceed 0.1 mg/L and shall not persist in receiving waters at any concentration that causes impairment of beneficial uses.
Color	Waters shall be free of coloration that causes nuisance or adversely affect beneficial uses.
Exotic Vegetation	Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affect beneficial uses.
Floating Material	Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
Methylene Blue Activated Substances (MBAS)	Waters shall not have MBAS concentrations greater than 0.5 mg/L in waters designated MUN.
Mineral Quality	Numerical mineral quality objectives for individual inland surface waters are contained in Table 3-8 of the LARWQCB Basin Plan.
Nitrogen (Nitrate, Nitrite)	Waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen, 45 mg/L as nitrate, 10 mg/L as nitrate-nitrogen, or 1 mg/L as nitrite-nitrogen.
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water that cause nuisance or adversely affect beneficial uses.
Oxygen, Dissolved	The mean annual dissolved oxygen concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5 mg/L, except when natural conditions cause lesser concentrations. The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L.
Pesticides	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life. Waters designated for use as domestic or municipal supply (MUN) shall not contain concentration of pesticides in excess of the limiting concentrations specified in Table 64444-A of Section 64444 of Title 22 CCR, which is incorporated by reference into the LARWQCB Basin Plan.
pH	Inland water shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient percentage of hydrogen (pH) levels shall not be changed more than 0.5 unit from natural conditions as a result of waste discharge.
Polychlorinated Biphenyls (PCBs)	Pass-through or uncontrollable discharges to waters, or at locations where the waste can subsequently reach waters, are limited to 70 pg/L (30-day average) for protection of human health and 14 ng/L (daily average) to protect aquatic life in inland fresh waters.

TABLE 3.9.2:
Los Angeles Regional Water Quality Control Board Surface Water Quality Objectives for Inland Surface Waters

Constituent	Basin Plan Objectives
Radioactive Substances	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. Waters designated for use as domestic or municipal supply (MUN) shall not contain concentration of radionuclides in excess of the limits specified in Table 4 of Section 64443 of Title 22 CCR, which is incorporated by reference into Table 3-9 of the LARWQCB Basin Plan.
Solid, Suspended, or Settleable Materials	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.
Tastes and Odors	Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible aquatic resources, cause nuisance, or adversely affect beneficial uses.
Temperature	The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated that such alteration in temperature does not adversely affect beneficial uses.
Toxicity	All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%. Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%.

Source: *Water Quality Assessment Report* (2014).
CCR = California Code of Regulations
LARWQCB = Los Angeles Regional Water Quality Control Board
mg/L = milligrams per liter
ml = milliliter
MUN = municipal and domestic supply
ng/L = nanograms per liter
NTU = National Turbidity Units
pg/L = picograms per liter
WARM = warm freshwater habitat

The San Gabriel Valley Basin includes water-bearing sediments underlying most of the San Gabriel Valley and a portion of the upper Santa Ana Valley that lies in Los Angeles County. This basin is bounded on the north by the Raymond Fault and the contact between Quaternary sediments and consolidated basement rocks of the San Gabriel Mountains. Exposed consolidated rocks of the Repetto, Merced, and Puente Hills bound the basin on the south and west, and the Chino Fault and San Jose Fault form the eastern boundary. The Rio Hondo and San Gabriel drainages have their headwaters in the San Gabriel Mountains, then surface water flows southwest across the San Gabriel Valley and exits through the Whittier Narrows, which is a gap between the Merced and Puente Hills.

The Raymond Groundwater Basin includes the water-bearing sediments bounded by the contact with consolidated basement rocks of the San Gabriel Mountains on the north and the San Rafael Hills on the southwest. The west boundary is delineated by a drainage divide at Pickens Canyon Wash, and the southeast boundary is the Raymond Fault.

For regulatory purposes, the LARWQCB in its Basin Plan further divided the groundwater basins into the Los Angeles Coastal Plain Central Basin, Main San Gabriel Basin Western Area, Raymond Basin Pasadena Area, San Fernando Basin East of Interstate 405 (I-405) (overall), and Eagle Rock Basin.

Groundwater levels for the overall study area range from 10 to 450 ft below ground surface (bgs). Historically, highest groundwater levels range from 5 to 200 ft bgs. Groundwater levels in the study area are not anticipated to change substantially in the future from natural causes.

Beneficial Uses for Groundwater

The existing beneficial uses for the Los Angeles Coastal Plain Central Basin, Main San Gabriel Basin Western Area, Raymond Basin Pasadena Area, San Fernando Basin East of I-405, and Eagle Rock Basin are listed below:

- **MUN:** Waters are used for community, military, or individual water supply systems.
- **AGR:** Waters are used for farming, horticulture or ranching.
- **IND:** Industrial activities that do not depend primarily on water quality (mining).
- **PROC:** Industrial activities that depend primarily on water quality.

Groundwater Quality Objectives

The groundwater quality objectives for the Los Angeles Region as designated in the LARWQCB Basin Plan are provided in Table 3.9.3. The Build Alternatives are located across three Regional Groundwater Basins: Los Angeles Coastal Plain, San Fernando Valley, and San Gabriel Valley. Each regional groundwater basin is comprised of smaller sub-basins. The Los Angeles Coastal Plain includes the Central Basin, the San Fernando Valley includes the San Fernando Basin East of I-405 (overall) and Eagle Rock Basin, and the San Gabriel Valley includes the Raymond Basin Pasadena Area and the Main San Gabriel Basin Western Area.

TABLE 3.9.3:
Los Angeles Regional Water Quality Control Board Groundwater Quality Objectives

Constituent	Basin Plan Objectives
Bacteria	In groundwaters used for domestic or municipal supply (MUN) the concentration of coliform organisms over any 7-day period shall be less than 1.1/100 mL.
Chemical Constituents and Radioactivity	Groundwaters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents and radionuclides in excess of the limits specified in Title 22 CCR and incorporated by reference into Tables 3-5, 3-6, 3-7, and 3-9 of the LARWQCB Basin Plan.
Nitrogen (Nitrate, Nitrite)	Groundwaters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen, 10 mg/L as nitrate-nitrogen, or 1 mg/L as nitrite-nitrogen.
Taste and Odor	Groundwaters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

Source: *Water Quality Assessment Report* (2014).
CCR = California Code of Regulations
LARWQCB = Los Angeles Regional Water Quality Control Board
mg/L = milligrams per liter
mL = milliliters
MUN = municipal and domestic water supply

3.9.2.5 Regional Water Quality

Surface Water Quality

Pollutants from dense clusters of residential, industrial, and other urban activities have impaired water quality in the middle and lower Los Angeles River watersheds. Added to this complex mixture of pollutant sources (in particular, pollutants associated with urban and storm water runoff), is the high number of point source discharges. Water quality issues in the Los Angeles River Watershed include protection and enhancement of fish and wildlife habitat, removal of exotic vegetation, enhancement of recreational areas, attaining a balance between water reclamation and minimum flows to support habitat, management of storm water quality, assessment of other nonpoint sources (e.g., horse stables, golf courses, and septic systems), pollution from contaminated groundwater, groundwater recharge with reclaimed water, contamination of groundwater by volatile organic compounds (VOCs), leakage of methyl-t-butyl ether (MTBE) from underground storage tanks, groundwater contamination with heavy metals, particularly hexavalent chromium, and contaminated sediments within the Los Angeles River estuary.

Groundwater Quality

Total dissolved solids (TDS) in the Los Angeles Coastal Plain Central Basin range from 200 to 2,500 milligrams per liter (mg/L) and average 453 mg/L according to data from 293 public supply wells. Groundwater is impaired by VOCs from industry and nitrates from subsurface sewage disposal and past agricultural activities, which are the primary pollutants in much of the groundwater throughout the Central Basin.

In the western part of the San Fernando Valley Groundwater Basin, calcium sulfate-bicarbonate character is dominant, and calcium bicarbonate character dominates the eastern part of the Basin. VOCs from industry and nitrates from subsurface sewage disposal and past agricultural activities are the primary pollutants in much of the groundwater through the Basin. A number of investigations have determined contamination of VOCs such as trichloroethylene (TCE), perchloroethylene (PCE), petroleum compounds, chloroform, nitrate, sulfate, and heavy metals. TCE, PCE, and nitrate contamination occurs in the eastern part of the Basin and elevated sulfate concentration occurs in the western part of the Basin. TDS range from 326 mg/L to 615 mg/L and average 499 mg/L according to data from 125 public supply wells.

Water within the San Gabriel Valley Groundwater Basin is primarily calcium bicarbonate in character. Four areas of the San Gabriel Valley Groundwater Basin are Superfund Sites. TCE, PCE, and carbon tetrachloride contaminate the Whittier Narrows, Puente Basin, Baldwin Park, and El Monte areas. VOCs from industry and nitrates from subsurface sewage disposal and past agricultural activities are the primary pollutants in much of the groundwater through the Basin. In the north, west, and central regions of the Basin, TDS range from 90 mg/L to 4,288 mg/L and average around 367 mg/L. In the southern portion of the Basin, TDS average around 1,222 mg/L. TDS content ranges from 500 mg/L to 1,500 mg/L in the eastern part of the Basin, and from 200 mg/L to 500 mg/L in the northeastern part. Data from 259 public supply wells show an average TDS content of 318 mg/L.

Water in the Raymond Groundwater Basin is typically calcium bicarbonate in character. Fluoride content occasionally exceeds recommended levels of 1.6 mg/L near the San Gabriel Mountain front. High nitrate concentrations are found in water from some wells near Pasadena. VOCs are detected in wells near Arroyo Seco. The average TDS content in the Pasadena portion of the Basin is about 400 mg/L with a high of 600 mg/L.

3.9.2.6 List of Impaired Waters

The SWRCB approved the 2010 Integrated Report (CWA Section 303(d) List/305(b) Report) on August 4, 2010. On November 12, 2010, the EPA approved the 2010 California 303(d) List of Water Quality Limited Segments. On October 11, 2011, the EPA issued its final decision regarding water bodies and pollutants added to California’s 2010 303(d) List. Table 3.9.4 shows the 303(d) listed receiving waters within the area of the Build Alternatives. As shown in Table 3.9.4, Los Angeles River Reach 2 (Carson Street to Figueroa Street) is listed on the 2010 California 303(d) List as impaired for ammonia, coliform bacteria, copper, lead, nutrients (algae), oil, and trash. Arroyo Seco Reach 1 (Los Angeles River to West Holly Avenue) is listed as impaired for benthic-macroinvertebrate bioassessments, coliform bacteria, and trash. Rio Hondo Reach 2 (at Spreading Grounds) is listed as impaired for coliform bacteria and cyanide.

TABLE 3.9.4:
2010 Clean Water Act Section 303(d) Listing for Project Receiving Water Bodies

Water Body	Pollutant	TMDL Completion Date	Potential Source
Los Angeles River Reach 2 (Carson Street to Figueroa Street)	Ammonia	EPA Approved in 2007	Point and nonpoint sources
	Coliform bacteria	Expected TMDL Completion Date 2009[1]	Point and nonpoint sources
	Copper	EPA Approved in 2007	Source unknown
	Lead	EPA Approved in 2007	Point and nonpoint sources
	Nutrients (algae)	EPA Approved in 2007	Point and nonpoint sources
	Oil	Expected TMDL Completion Date 2019	Nonpoint source
	Trash	EPA Approved in 2007	Urban runoff/storm sewers, nonpoint source, and surface runoff
Arroyo Seco Reach 1 (Los Angeles River to West Holly Avenue)	Benthic-macroinvertebrate bioassessments	Expected TMDL Completion Date 2021	Source unknown
	Coliform bacteria	Expected TMDL Completion Date 2009[1]	Nonpoint source
	Trash	EPA Approved in 2007	Nonpoint source, surface runoff, and urban runoff/storm sewers
Rio Hondo Reach 2 (at Spreading Grounds)	Coliform bacteria	Expected TMDL Completion Date 2009[1]	Point and nonpoint sources
	Cyanide	Expected TMDL Completion Date 2021	Other

Source: *Water Quality Assessment Report* (2014).
[1] A TMDL has not yet been adopted.
EPA = United States Environmental Protection Agency
TMDL = Total Maximum Daily Load

3.9.3 Environmental Consequences

3.9.3.1 Temporary Impacts

No Build Alternative

Under the No Build Alternative, the temporary impacts discussed below for the SR 710 North Project Build Alternatives would not occur because the No Build Alternative does not include construction of any of the improvements in the Build Alternatives.

TSM/TDM Alternative

The majority of the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative would be located outside Caltrans right of way (ROW) with a few on-/off-ramp locations within Caltrans ROW. Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate. In addition, chemicals, liquid products, and petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked during construction and thereby have the potential to be transported via storm runoff into receiving waters.

Construction activities associated with the TSM/TDM Alternative include grading, excavation, paving, installation of drainage systems, and pavement delineation. During construction of the TSM/TDM Alternative, a total of approximately 21 ac would be disturbed, exposing soils and increasing the potential for soil erosion, which could be a source of downstream sediment. When sediment enters a receiving water body, it can increase turbidity, smother bottom dwelling organisms, and suppress aquatic vegetation growth. When new structures are installed or modified (e.g., street and on-/off-ramp improvements), concrete and/or asphalt applications could be a source of fine sediment, metals, and chemicals that could change the pH levels in downstream water bodies. Grading and other earth-moving activities during construction could be a source of petroleum products and heavy metals if the equipment engines leak. Furthermore, temporary or portable sanitary facilities provided for construction workers could be a source of sanitary waste. Groundwater dewatering during construction would not be required. In compliance with the Construction General Permit, the TSM/TDM Alternative would be required to implement construction BMPs aimed at reducing pollutants of concern in storm water runoff. The construction BMPs would include Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site and Good Housekeeping BMPs designed to prevent and/or contain spills.

Runoff from the TSM/TDM Alternative drains into the Arroyo Seco, Rio Hondo, and Los Angeles River, which are all characterized as highly disturbed drainages and result in limited biological resources that would be able to support a healthy and functioning on-site aquatic environment. However, the runoff from the TSM/TDM Alternative eventually drains into receiving waters such as the Pacific Ocean, which depends on the biological characteristics of the aquatic environment in order to sustain a functioning aquatic ecosystem, an ecosystem that supports the biological (e.g., fish) and human environment (e.g., recreation).

Furthermore, the disturbed and predominantly concrete-lined nature of the Arroyo Seco, Rio Hondo, and Los Angeles River in the study area preclude beneficial uses associated with human activities such as contact and noncontact recreation. The Los Angeles County Department of Public Works (LADPW) prohibits contact recreation in the Los Angeles River and in the channelized portions of Rio Hondo and Arroyo Seco. However, the TSM/TDM Alternative drains into receiving waters such as the Pacific Ocean, which has beneficial uses associated with human activities that include contact and noncontact recreation. In addition, the TSM/TDM Alternative would not result in substantial changes in the quality of runoff reaching downstream receiving waters during construction.

BRT Alternative

The majority of the Bus Rapid Transit (BRT) Alternative would be located outside of Caltrans ROW. During construction of the BRT improvements, a total of approximately 35 ac would be disturbed, exposing soils and increasing the potential for soil erosion, which could be a source of downstream sediment. Pollutants of concern during construction and potential construction impacts would be similar to those described above for the TSM/TDM Alternative. In addition, the improvements included as part of the TSM/TDM Alternative would also be constructed as part of the BRT Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The construction activities of the BRT Alternative would also include construction impacts similar to the TSM/TDM Alternative, discussed above. Construction of the TSM/TDM component of the BRT Alternative would disturb a total of approximately 21 ac of soil. Therefore, the total disturbed soil area during construction of the BRT Alternative would be approximately 56 ac.

LRT Alternative

The Light Rail Transit (LRT) Alternative is located within and outside of Caltrans ROW. During construction of the LRT improvements, a total of approximately 33 ac of surface soil would be disturbed, exposing soils and increasing the potential for soil erosion, which could be a source of downstream sediment. Pollutants of concern during construction and potential construction impacts would be similar to those described above for the TSM/TDM Alternative. In addition, the improvements included as part of the TSM/TDM Alternative would also be constructed as part of the LRT Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, the construction activities of the LRT Alternative would also include construction impacts similar to the TSM/TDM Alternative, discussed above. Construction of the TSM/TDM component of the LRT Alternative would disturb a total of approximately 11 ac of soil. Therefore, the total disturbed soil area during construction of the LRT Alternative would be approximately 44 ac.

Tunnel boring activities are not expected to affect groundwater levels or quality because: (a) the bored tunnels would be excavated with pressurized-face tunnel boring machines that would control the groundwater inflows into the tunnel, and (b) the concrete lining would be designed and constructed to be watertight. After excavation, the space between the outside of the tunnel lining and the soil is typically grouted to prevent groundwater flow along the tunnel bores. In addition, the soil conditioners that may be injected into the ground at the face of the excavation would be nontoxic and biodegradable, and therefore would not adversely impact groundwater quality.

Groundwater dewatering during construction at the tunnel portals may be required for the LRT Alternative. Discharge of the dewatered groundwater has the potential to introduce pollutants to receiving surface waters. Dewatering activities would comply with a groundwater dewatering permit that requires monitoring discharges from groundwater extraction waste from construction to ensure groundwater effluent that is pumped and ultimately discharged to surface water does not exceed surface water effluent limitations for particular pollutant constituents; therefore, it is not anticipated that surface water would be impacted during construction activities as a result of site dewatering so long as the groundwater discharge meets the RWQCB dewatering permit requirements.

Freeway Tunnel Alternative

The majority of the Freeway Tunnel Alternative single-bore and dual-bore tunnel design variations would be located within Caltrans ROW. During construction of the improvements for the Freeway Tunnel Alternative single-bore and dual-bore tunnel design variations, a total of approximately 81 ac and approximately 93 ac of surface soil, respectively, would be disturbed, thereby exposing soils and increasing the potential for soil erosion that could be a source of downstream sediment. Pollutants of concern during construction and potential construction impacts would be similar to those described above for the TSM/TDM Alternative. In addition, the improvements included as part of the TSM/TDM Alternative would also be constructed as part of the Freeway Tunnel Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard). Therefore, the construction activities of the Freeway Tunnel Alternative would also include construction impacts similar to the TSM/TDM Alternative, discussed above. Construction of the TSM/TDM component of the Freeway Tunnel Alternative would disturb a total of approximately 9 ac of soil. Therefore, the total disturbed soil area during construction of the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would be approximately 90 ac and 102 ac, respectively.

Tunnel boring activities are not expected to affect groundwater levels or quality because: (a) the bored tunnels would be excavated with pressurized-face tunnel boring machines that would control the groundwater inflows into the tunnel, and (b) the concrete lining would be designed and constructed to be watertight. After excavation, the space between the outside of the tunnel lining and the soil is typically grouted to prevent groundwater flow along the tunnel bores. In addition, the soil conditioners that may be injected into the ground at the face of the excavation would be nontoxic and biodegradable, and therefore would not adversely impact groundwater quality.

Similar to the LRT Alternative, groundwater dewatering during construction at the tunnel portals may be required for the Freeway Tunnel Alternative. Dewatering activities would comply with a groundwater dewatering permit that requires monitoring discharges from groundwater extraction waste from construction to ensure groundwater effluent that is pumped and ultimately discharged to surface water does not exceed surface water effluent limitations for particular pollutant constituents. Therefore, it is not anticipated that surface water would be impacted during construction activities as a result of site dewatering so long as the groundwater discharge meets the RWQCB dewatering permit requirements.

3.9.3.2 Permanent Impacts

No Build Alternative

Under the No Build Alternative, the permanent impacts of the SR 710 North Project Build Alternatives would not occur because the No Build Alternative does not include operation of any of the improvements in the Build Alternatives.

TSM/TDM Alternative

Primary pollutants of concern are pollutants that are expected to be or have the potential to be in project runoff based on proposed land uses, and which also have been identified as causing impairments to receiving waters on the most recent 303(d) list or have an established TMDL. Other pollutants of concern are those that are expected to be or have the potential to be in project runoff but do not have an established TMDL for receiving waters and have not been identified as causing impairments to receiving waters. Pollutants of concern during operation of the TSM/TDM Alternative include the following: trash and debris, heavy metals, nutrients, bacteria, oil and grease, copper, benthic-macroinvertebrate bioassessments, and cyanide.

These pollutants of concern are typically generated during the operation of a transportation facility. Through road widening, grading, excavation, paving, pavement delineations, installation of traffic control devices, and permanent water quality treatment BMPs, the TSM/TDM Alternative would result in a total net increase of impervious surface area of approximately 3.8 ac (i.e., the result of a decrease of approximately 0.2 ac within Caltrans ROW and an increase of approximately 4 ac outside Caltrans ROW). The approximately 3.8 ac increase of impervious surface area associated with the TSM/TDM Alternative would result in an increase in the volume of storm water runoff during a storm, thereby more effectively transporting pollutants to receiving waters, which in turn causes turbidity and downstream erosion or accretion over existing conditions. Increases in chemical pollutants and changes in temperature and pH may lead to detrimental effects to downstream receiving waters.

During operation, the TSM/TDM Alternative would treat storm water runoff within Caltrans ROW with Caltrans-approved treatment BMPs such as biofiltration swales. The portion of the TSM/TDM Alternative outside of Caltrans ROW would follow the Los Angeles County MS4 permit specifications and would treat runoff with BMPs that meet or exceed the County MS4 permit requirements (e.g., tree box filters, catch basin screens, new inlets with filter inserts, and rock mulch), where feasible, to reduce pollutants of concern. The proposed BMPs would treat approximately 76 percent of the newly created or replaced impervious surface area.

There are no biological resources present on site that are dependent on aquatic resources. However, there are biological resources dependent on aquatic resources downstream of the study area (e.g., the Pacific Ocean). As noted above, the TSM/TDM Alternative would increase the amount of impervious surface area, resulting in an increase in volume of runoff, thereby increasing the energy of the flows and increasing the downstream transport of pollutants to downstream receiving waters.

The disturbed and predominantly concrete-lined nature of the drainages within the study area precludes beneficial uses associated with human activities (e.g., contact and noncontact recreation). However, the TSM/TDM Alternative drains into receiving waters such as the Pacific Ocean that have beneficial uses associated with human activities, including contact and noncontact recreation. As noted above, the TSM/TDM Alternative would implement approved BMPs; therefore, the TSM/TDM Alternative would not result in substantial changes in the quality of runoff that reaches downstream receiving waters during operation.

BRT Alternative

Similar to the TSM/TDM Alternative, pollutants of concern during operation of the BRT Alternative include the following: trash and debris, heavy metals, nutrients, bacteria, oil and grease, copper, benthic-macroinvertebrate bioassessments, and cyanide. Through road widening, grading, excavation, paving, pavement delineations, and permanent water quality treatment BMPs, the BRT improvements would result in a total net increase of impervious surface area of approximately 1.2 ac (i.e., the sum of increases of approximately 0.1 ac within Caltrans ROW and approximately 1.1 ac outside Caltrans ROW). As discussed above under the TSM/TDM Alternative, the increase in impervious surface area would result in an increase in the volume of storm water runoff during a storm, thereby more effectively transporting pollutants to receiving waters. The BRT Alternative would also include operation of all the improvements in the TSM/TDM Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, the operational impact of the BRT Alternative would also include operational impacts similar to the TSM/TDM Alternative, discussed above. The total net increase in impervious surface area would be approximately 3.8 ac for the TSM/TDM component of the BRT Alternative. Therefore, the total net increase in impervious surface area for the BRT Alternative would be approximately 5 ac.

During operation, the small section of the BRT Alternative within Caltrans ROW would treat storm water runoff with Caltrans-approved treatment BMPs such as a biofiltration swale, and outside of Caltrans ROW with BMPs that meet or exceed the County MS4 permit requirements (e.g., tree box filters and a catch basin screen and curb inlet filter assembly). A biofiltration swale, tree box filters, catch basin screen and curb inlet filter assemblies, and rock mulch would treat runoff from the project site and reduce pollutants of concern. For the BRT Alternative, the proposed approved BMPs would respectively treat approximately 575 percent and approximately 114 percent of the new impervious surface area within and outside Caltrans ROW (i.e., the BMPs would treat runoff from approximately 0.5 ac and 36 ac of impervious surface area within and outside Caltrans ROW, respectively).

LRT Alternative

Similar to the TSM/TDM Alternative, pollutants of concern during operation of the LRT Alternative include the following: trash and debris, heavy metals, nutrients, bacteria, oil and grease, copper, benthic-macroinvertebrate bioassessments, and cyanide. Through road widening, grading, excavation, paving, construction of retaining walls and tunnels, and permanent water quality treatment BMPs, the LRT improvements would result in a total net increase of impervious surface area of approximately 16.5 ac (i.e., the sum of increases of approximately 5.5 ac within Caltrans ROW and approximately 11 ac outside Caltrans ROW). As discussed above under the TSM/TDM Alternative, the increase of impervious surface area associated with the LRT Alternative would result in an increase in the volume of storm water runoff during a storm. The LRT Alternative would also include operation of all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, the operational impact of the LRT Alternative would also include operational impacts similar to the TSM/TDM Alternative, discussed above. The total net increase in impervious surface area would be approximately 2.2 ac for the TSM/TDM component of the LRT Alternative. Therefore, the total net increase in impervious surface area for the LRT Alternative would be approximately 18.7 ac.

The LRT Alternative would only treat impervious areas outside the tunnel. The tunnel section would not be treated because it would not have the potential to create storm water impacts and water in the tunnel would be pumped out. During operation, the LRT Alternative would treat storm water runoff within Caltrans ROW with Caltrans-approved treatment BMPs such as biofiltration swales. Outside of Caltrans ROW, much of the elevated track is proposed above steep terrain and treatment is not technically feasible; however, the LRT Alternative would treat storm water runoff with BMPs that meet or exceed the County MS4 permit requirements (e.g., tree box filters, rock mulch, catch basin screens and filter inserts at new inlet locations [where feasible], bioretention facilities for the proposed parking lot areas, and media filters in the ballast areas). The LRT Alternative would treat approximately 31 percent of the new impervious surface area within Caltrans ROW and approximately 47 percent of the newly created or replaced impervious surface area outside Caltrans ROW. The tunnel would include a watertight liner; therefore, any water inside the tunnel would not impact groundwater quality. Water in the tunnel (e.g., during a fire or to clean a spill) would drain to a low point in the tunnel, where a sump would be located. The water would then be pumped to a storage tank and hauled away and disposed of as hazardous waste, if necessary. Therefore, water in the tunnel would not impact surface water quality.

Freeway Tunnel Alternatives

Similar to the TSM/TDM Alternative, pollutants of concern during operation of the Freeway Tunnel Alternative include the following: trash and debris, heavy metals, nutrients, bacteria, oil and grease, copper, benthic-macroinvertebrate bioassessments, and cyanide. Through road widening, grading, excavation, paving, construction of retaining walls and tunnels, and permanent water quality treatment BMPs, the improvements for the Freeway Tunnel Alternative single-bore and dual-bore tunnel design variations would result in net increases in impervious surface area of approximately 1.7 ac and 13.5 ac, respectively. As discussed above under the TSM/TDM Alternative, the increase in impervious surface area would increase the volume of runoff during a storm, which would more effectively transport pollutants to receiving waters. In addition, the improvements included as part of the TSM/TDM Alternative would also be constructed as part of the Freeway Tunnel Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard). Therefore, the operational impact of the Freeway Tunnel Alternative would also include operational impacts similar to the TSM/TDM Alternative, discussed above. The total net increase in impervious surface area would be approximately 1.1 ac for the TSM/TDM component of the single-bore and dual-bore design variations of the Freeway Tunnel Alternative. Therefore, the total net increase in impervious surface area would be approximately 2.8 ac and 14.6 ac, respectively.

During operation, the Freeway Tunnel Alternative would treat storm water runoff using Caltrans-approved treatment BMPs such as biofiltration swales, gross solid removal devices (GSRDs), and rock mulch. BMPs are only proposed in areas outside the tunnel. The tunnel section would not be treated because it does not have the potential to create any storm water impacts. The single-bore tunnel design variation would treat approximately 5,350 percent of the net new impervious surface area (i.e., the BMPs would treat runoff from approximately 90 ac of impervious surface area). The dual-bore tunnel design variation would treat approximately 705 percent of the net new impervious surface area (i.e., the BMPs would treat runoff from approximately 95 ac of impervious surface area). As a result, the single-bore and dual-bore tunnel design variations would not only treat the net new impervious surface area but also the existing impervious surface area.

The tunnel would include a watertight liner; therefore, any water inside the tunnel would not have the potential to impact groundwater quality. Water in the tunnel (e.g., during a fire or to clean a spill) would drain to a low point in the tunnel, where a sump pump would be located. The water would then be pumped to a storage tank and hauled away and disposed of as hazardous waste, if necessary. Therefore, water in the tunnel would not impact surface water quality.

3.9.4 Avoidance, Minimization, and/or Mitigation Measures

The regulatory requirements listed below would be implemented with the Build Alternatives and would avoid impacts related to water quality with implementation of BMPs to target pollutants of concern during construction and operation. Impacts related to water quality would not be adverse.

Measure WQ-1

National Pollutant Discharge Elimination (NPDES) General Permit (applies to all four Build Alternatives): The Los Angeles County Metropolitan Transportation Authority (Metro) (Transportation System Management/Transportation Demand Management [TSM/TDM], Bus Rapid Transit [BRT], and Light Rail Transit [LRT] Alternatives) or the California Department of Transportation (Caltrans) (Freeway Tunnel Alternative) will require the Construction Contractor to comply with the provisions of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) Order No. 2009-0009-DWQ, as amended by 2010-2014-DWQ and 2012-0006-DWQ, NPDES No. CAS000002, or any subsequent permit. The project will comply with the Construction General Permit by preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP) to address all construction-related activities, equipment, and materials that have the potential to impact water quality for the appropriate Risk Level. The SWPPP will identify the sources of pollutants that may affect the quality of storm water and include Best Management Practices (BMPs) (e.g., Erosion Control, Sediment Control, and Good Housekeeping BMPs) to control the pollutants, such as sediment control, catch basin inlet protection, temporary soil stabilization, construction materials management, and non-storm water BMPs.

Measure WQ-2	**Dewatering (applies to all four Build Alternatives):** If dewatering is required, Metro (TSM/TDM, BRT, and LRT Alternatives) or Caltrans (Freeway Tunnel Alternative) will require the Construction Contractor to comply with the requirements of Order No. R4-2013-0095 (NPDES No. CAG994004) for construction site dewatering. Order No. R4-2013-0095 covers general waste discharge permits for discharges to surface waters from activities involving groundwater extraction. It covers treated or untreated groundwater generated from permanent or temporary dewatering operations or other appropriate wastewater discharge not specifically covered in other general NPDES permits in the Los Angeles region. Under this order, permittees are required to monitor their discharges from groundwater extraction waste from construction to ensure that effluent limitations for constituents are not exceeded.
Measure WQ-3	**Groundwater Monitoring (applies to the LRT and Freeway Tunnel Alternatives):** Prior to tunneling and construction activities, Caltrans (for the Freeway Tunnel Alternative) or Metro (for the LRT Alternative) will require the Project Geotechnical Engineer and/or the Project Geologist to perform a comprehensive investigation to establish a baseline for groundwater levels and quality (chemistry) in the areas in which tunneling or excavations would occur. In addition, groundwater monitoring will be performed routinely during tunnel excavation to ensure that the activities are not affecting the local groundwater levels and quality.
Measure WQ-4	**Improvements in State-Owned Right of Way (applies to the Freeway Tunnel Alternative):** During construction of the improvements within State-owned right of way (ROW), the Resident Engineer will require the Construction Contractor to comply with the provisions of the NPDES Permit, Statewide Storm Water Permit, Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation Order No. 2012-0011-DWQ, NPDES No. CAS000003 (Caltrans Permit) or any subsequent permit.
Measure WQ-5	**Improvements Outside State-Owned Right of Way (applies to the TSM/TDM, BRT, and LRT Alternatives):** During construction of the improvements outside State-owned ROW, in compliance with the Standard Urban Storm Water Mitigation Plan (SUSMP) prepared for the Los Angeles Regional Water Quality Control Board WDRs for Municipal Separate Storm Sewer System Order No. R4-2012-0175, NPDES Permit No. CAS004001, as amended, the Resident Engineer will require the Construction Contractor to prepare and implement a final project-specific SUSMP. The final project-specific SUSMP will include implementation of Site Design, Source Control, and Treatment Control BMPs to the maximum extent practicable. Site Design, Source Control, and Treatment Control BMPs include BMPs such as tree box filters, catch basins, curb inlet filters, media filters, and bioretention facilities.

Measure WQ-6 **Improvements in State-Owned Right of Way (applies to the Freeway Tunnel Alternative):** For improvements within State-owned ROW, the Resident Engineer will require the Construction Contractor to prepare and implement Caltrans-approved Design Pollution Prevention BMPs to the maximum extent practicable consistent with the requirements of the Caltrans Permit and Project Planning and Design Guide. Design Pollution Prevention BMPs include preservation of existing vegetation, slope/surface protection systems (permanent soil stabilization and replanting of vegetation), asphalt concrete dikes, toe-of-fill ditches, and downdrains/overside drains.

Measure WQ-7 **Improvements in State-Owned Right of Way (applies to the Freeway Tunnel Alternative):** For improvements within State-owned ROW, the Resident Engineer will require the Construction Contractor to prepare and implement to implement Caltrans-approved Treatment BMPs to the maximum extent practicable consistent with the requirements of the Caltrans Permit and Project Planning and Design Guide. Treatment BMPs include biofiltration swales and gross solid removal devices.

3.10 Geology/Soils/Seismic/Topography

3.10.1 Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under the California Environmental Quality Act (CEQA).

Earthquakes are prime considerations in the design and retrofit of structures. For the Freeway Tunnel Alternative, Caltrans' Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. Structures are designed using the Caltrans Seismic Design Criteria (SDC). Project specific seismic design criteria was developed for bored tunnel portion of the Freeway Tunnel Alternative, in coordination with Caltrans' Office of Earthquake Engineering. The Caltrans SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification would determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Caltrans Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

For the Light Rail Transit (LRT) Alternative, all design work will be based on the latest version of the Los Angeles County Metropolitan Transportation Authority (Metro) Rail Design Criteria. The seismic design for the LRT Alternative will follow Metro's Supplemental SDC. The Metro Supplemental SDC also provides the performance requirements for LRT structures.

For project features outside the State highway and Metro's rights of way (ROWs), local jurisdictions' design standards related to geology, soils, and seismic concerns would apply.

Section 3.10.2 summarizes the geologic, soils, seismic and topographic conditions in the area of the project alternatives. Assessment of geologic, soils, seismic and topographic impacts associated with the Build Alternatives is presented in Section 3.10.3.

3.10.2 Affected Environment

This section describes the local geology, slope stability, ground settlement, soils, grading, and regional seismic conditions in the study area based on the following reports:

- *Geologic Hazard Evaluation to Support Environmental Studies Documentation* (2014)
- *Preliminary Geotechnical Report* (2014)

Figures 3.10-1, 3.10-4, and 3.10-5 (all figures are provided following the text in this section) show the surface locations of geologic features and hazards in the study area as well as the locations of the improvements in the Build Alternatives. Figures 3.10-2 and 3.10-3 show the geologic features in the subsurface along the LRT and Freeway Tunnel Alternatives.

There are 11 geomorphic provinces in California as defined by the California Geological Survey. Geomorphic provinces are geologic regions with distinct land forms and geology. The study area primarily covers areas in western San Gabriel Valley, the southernmost San Rafael Hills, and the Repetto Hills. These areas are in the transition zone between the northwest-southeast-trending Peninsular Ranges physiographic/geological province on the south and the east-west-trending

Transverse Ranges province on the north. The following sections describe the existing geologic setting in the study area.

3.10.2.1 Topography

The western part of the study area includes the Repetto Hills, a group of small hills and valleys between the Santa Monica Mountains (Transverse Ranges) on the west and the Puente Hills (Peninsular Ranges) on the southeast. The Repetto Hills include Mount Washington, Monterey Park Hills, Montebello Hills, and several unnamed hills along the western edge of the San Gabriel Valley. In the study area, elevations in the Repetto Hills range from approximately 870 feet (ft) above mean sea level (amsl) between Monterey Road and State Route 110 (SR 110) to 200 ft amsl at the western toe of the hills near Rosemead Boulevard. The San Rafael Hills are located between the Repetto Hills and Verdugo Hills, and border the study area on the northwest. Elevations in the San Rafael Hills range from approximately 1,000 ft amsl near State Route 134 (SR 134) and the Arroyo Seco to 600 ft amsl in the vicinity of SR 110 and the Arroyo Seco.

The eastern half of the study area is in the San Gabriel Valley, which is bordered by the Puente Hills and San Jose Hills on the south and east and the San Gabriel Mountains on the north. The San Gabriel Valley is a relatively flat-floored valley between the San Gabriel Mountains on the north, the San Jose Hills on the east, the Puente Hills on the south, and the Repetto/Verdugo/San Rafael Hills on the west. The northern margin of the San Gabriel Valley is characterized by a series of ancient alluvial fans emanating from the San Gabriel Mountains. The San Gabriel Valley floor gently descends south from elevations of approximately 700 to 1,000 ft amsl along the northern margin of the valley to 300 to 400 ft amsl in the south. The gradual descent is interrupted locally by an arcuate escarpment (ranging from approximately 10 to 150 ft high), extending from the Monrovia area to the South Pasadena area and west into the hills of Glendale and Los Angeles. This escarpment includes closed depressions, springs, reverse-tilted fan surfaces, and small ridges, all of which are the result of fault displacement by the Raymond fault.

3.10.2.2 Stratigraphy/Soils

Regional geologic maps indicate the study area is underlain by non-marine, Quaternary-age (i.e., approximately less than 2 million years old) alluvium, marine Tertiary-age (i.e., approximately 2 to 16 million years old) sedimentary rocks, and Cretaceous and pre-Cretaceous (i.e., 120 to 160+ million years old) crystalline basement complex of igneous and metamorphic rocks.

Table 3.10.1 summarizes the generalized stratigraphic column for the study area and lists the geologic formations in that area from youngest to oldest. The alluvial deposits are underlain by Tertiary-age sedimentary rocks or basement complex rocks. The Tertiary-age rocks outcrop in the Repetto Hills and San Rafael Hills and underlie the Quaternary deposits in the valleys. In the northern part of the study area, the Tertiary-age formations and/or alluvium are underlain by basement complex rocks that are composed of Cretaceous and pre-Cretaceous igneous intrusive rocks (diorite, quartz diorite, and quartz monzonite). The surface distribution of these geologic formations in the study area is shown on Figure 3.10-1. Geologic cross sections along the LRT and Freeway Tunnel Alternatives are shown on Figures 3.10-2 and 3.10-3, respectively.

3.10.2.3 Surface Water

The major drainages within the study area include the Arroyo Seco and Dorchester Channel (also referred to as the Laguna Channel). The Arroyo Seco and Dorchester Channel both drain to the Los Angeles River, which in turn drains to the Pacific Ocean. The major drainages adjacent to the

TABLE 3.10.1:
Geologic Formations in the Study Area

Formation (Symbol)[1]	Geologic Epoch (Period)	Approximate Age (years)	Brief Description
Young Alluvium (Qw, Qf, Qyf, Qya/Qal)	Holocene (Quaternary)	0 to 11,000	Sand and gravel with scattered cobbles and boulders and layers/lenses of silt and clay, stream and fan deposits. Poorly defined, lenticular, discontinuous bedding.
Old Alluvium (Qof, Qoa, Qvoa/Qal)	Pleistocene (Quaternary)	11,000 to 2 million	Sand and gravel with scattered cobbles and boulders and layers/lenses of silt and clay, stream and fan deposits. Poorly defined, lenticular, discontinuous bedding.
Fernando (Tss, Tsh/Tf)	Pliocene (Tertiary)	2 to 5 million	Predominantly claystone, siltstone, and mudstone, with some sandstone and conglomerate marine deposits.
Puente[2] (Tss, Tsh/Tp)	Late Miocene (Tertiary)	5 to 11 million	Claystone, siltstone, diatomaceous siltstone, mudstone, shale, and sandstone. Laminated to thinly bedded, locally thickly bedded. Marine deposits.
Topanga (Tss, Tsh/Tt)	Middle Miocene (Tertiary)	11 to 16 million	Siltstone, mudstone, sandstone, and conglomerate, with local volcanic intrusions. Thinly to thickly bedded, marine deposits.
Basement Complex Rocks, Wilson Quartz Diorite (gr/Wqd)	Cretaceous and Pre-Cretaceous	120 to 160+ million	Crystalline igneous rocks (diorite, quartz diorite, monzonite, foliated igneous rocks) and layered metamorphic rocks (gneiss).

Source: *Geologic Hazard Evaluation to Support Environmental Studies Documentation* (2014).
[1] Refer to Figures 3.10-1, 3.10-2, and 3.10-3 for the locations of these geologic formations in the study area.
[2] Includes Monterey, Modelo, and unnamed shale.

study area include the Los Angeles River in the west, the Rio Hondo in the east, and the San Gabriel River in the east. The Rio Hondo drains to the Los Angeles River, which drains to the Pacific Ocean. The San Gabriel River drains directly to the Pacific Ocean.

3.10.2.4 Groundwater

The study area is located within the following four alluvial groundwater basins of the South Coast Hydrologic Region: the San Fernando, (Los Angeles) Central, Raymond, and Main San Gabriel Basins. The groundwater basins contain permeable alluvial materials that can transmit large amounts of groundwater. Groundwater from these basins is a primary source of the water supply for the region. A brief description of these basins is provided below (from the California Department of Water Resources [CDWR], 2003, and 2004a through 2004d).

- The San Fernando Basin includes the water-bearing sediments beneath the San Fernando Valley, Tujunga Valley, Browns Canyon, and the alluvial areas surrounding the Verdugo Mountains near La Crescenta and Eagle Rock. The basin is bounded on the north and northwest by the Santa Susana Mountains, on the north and northeast by the San Gabriel Mountains, on the east by the San Rafael Hills, on the south by the Santa Monica Mountains and Chalk Hills, and on the west by the Simi Hills. The water-bearing sediments consist of the lower Pleistocene Saugus Formation (not observed within the SR 710 North Project Area), and Pleistocene and Holocene alluvium. The groundwater in this basin is mainly unconfined with some confinement within the Saugus Formation in the western part of the basin and in the Sylmar and Eagle Rock areas. TSM/TDM improvements are located within this basin.

- The Raymond Basin includes the water-bearing sediments bounded by the contact with consolidated basement rocks of the San Gabriel Mountains on the north and the San Rafael Hills on the southwest. The west boundary is delineated by a drainage divide at Pickens Canyon Wash. The southeast boundary is the Raymond fault, which acts as a barrier to groundwater flow southward into the San Gabriel Basin. The water-bearing materials of the Raymond Basin are typically unconfined, dominated by unconsolidated Quaternary alluvial sediments deposited by streams flowing out of the San Gabriel Mountains. A portion of each of the alternatives is located within this basin.
- The Main San Gabriel Basin includes the water-bearing sediments underlying most of the San Gabriel Valley. This basin is bounded on the north by the Raymond fault and the contact between Quaternary sediments and basement rocks of the San Gabriel Mountains. Exposed consolidated rocks of the Repetto, Merced, and Puente Hills bound the basin on the south and west. The Chino fault and the San Jose fault form the eastern boundary. The water-bearing materials of this basin are dominated by unconsolidated to semi-consolidated alluvium deposited by streams flowing out of the San Gabriel Mountains. These deposits include Pleistocene and Holocene alluvium and the lower Pleistocene San Pedro Formation. A portion of each of the alternatives is located within this basin.
- The (Los Angeles) Central Basin is bounded on the north by a surface divide called the La Brea High, and on the northeast and east by emergent less-permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills. Throughout the Central Basin, groundwater occurs in Holocene and Pleistocene sediments deposited by streams and rivers flowing out of the San Gabriel Mountains and Elysian, Repetto, Merced, and Puente Hills. The Central Basin is historically divided into forebay and pressure areas. In the SR 710 North Project Area, the Los Angeles forebay of the Central Basin has unconfined groundwater conditions. The southern portions of the BRT and LRT Alternatives are located within this basin.

These groundwater basins are separated from each other by bedrock upland areas and/or faults and contain permeable alluvial materials that can transmit large quantities of groundwater. In these basins, groundwater occurs as deep aquifers and shallow perched zones.

The bedrock units within the study area generally do not contain substantial amounts of groundwater; however, groundwater seepages may be present within local sandstone beds and fault and/or fracture zones. The Raymond fault is a known groundwater barrier. Groundwater levels on the northern side of this fault are more than 100 ft higher than the levels on the southern side of the fault. In addition, the potentially active (Eagle Rock and San Rafael faults) and inactive faults may also act as groundwater barriers.

In the overall study area, groundwater levels vary considerably, ranging from 5 to 450 ft below ground surface (bgs). Groundwater levels for the Bus Rapid Transit (BRT) Alternative range from approximately 20 ft bgs near the Raymond fault (near Arroyo Seco Parkway) in South Pasadena to 330 ft bgs in the vicinity of West Main Street in Alhambra. Groundwater levels for the LRT Alternative range from approximately 10 ft bgs in the area between Interstate 10 (I-10) and Valley Boulevard to roughly 150 ft bgs south of the Raymond fault. Groundwater levels for the Freeway Tunnel Alternative range from approximately 10 ft bgs in the area between I-10 and Valley Boulevard to more than 250 ft bgs in the vicinity of the north portal.

3.10.2.5 Naturally Occurring Oil and Gas

Based on information from the California Division of Oil and Geothermal Resources, the southern part of the study area contains several oil fields south of State Route 60 (SR 60) in the Cities of Commerce and Monterey Park as well as a number of active and abandoned oil wells.

Naturally occurring gas could be encountered in any of the formations in the study area. However, based on experience with the construction of other tunnels in Los Angeles, naturally occurring gas is most likely to be encountered within the Puente Formation. Localized deposits of oil and gas may be present at any depth in the Puente Formation and could also be found within any of the geologic formations within the study area.

3.10.2.6 Faulting

The Southern California region is seismically active because of the influence of several earthquake fault systems resulting from interaction between the Pacific and North American crustal plates. An active fault is defined by the State of California as a sufficiently active and well-defined fault that has exhibited surface displacement within the last 11,000 years. A potentially active fault is defined by the State as a fault with a history of movement between 11,000 and 1.6 million years ago. There are two primary hazards associated with active faults: fault-induced ground rupture and ground shaking.

One active fault (the Raymond fault) and two potentially active faults (the Eagle Rock and San Rafael faults) cross the Freeway Tunnel Alternative at tunnel depth, and one active fault (the Raymond fault) and one potentially active fault (the San Rafael fault) cross the LRT Alternative at tunnel depth. The Raymond and San Rafael faults cross the BRT Alternative at the surface. The locations of these faults and the State Route 710 (SR 710) North Project Build Alternatives are shown on Figure 3.10-1. The locations of these faults along the LRT and Freeway Tunnel Alternatives are also shown on the LRT and Freeway Tunnel Alternatives geologic cross sections on Figures 3.10-2 and 3.10-3, respectively. An earthquake on the Raymond fault may result in ground rupture. Future studies would be performed to evaluate the activity of the Eagle Rock and San Rafael faults; however, for project planning purposes, these faults are treated as active faults that are also capable of ground rupture in the event of an earthquake.

The Upper Elysian Park Blind Thrust fault-generated Coyote Pass escarpment transects SR 710 just north of Floral Drive in the City of Monterey Park. The Coyote Pass escarpment is considered the primary concern with regard to potential co-seismic deformation during an earthquake on the Upper Elysian Park Blind Thrust fault.

Strong ground shaking may occur in the study area as a result of regional faults, active faults, and potentially active faults within the study area. The potential to experience substantial seismic ground shaking is a common hazard for every project in Southern California, and the hazard cannot be avoided. The following paragraphs present a general description of the active and potentially active faults present within the SR 710 North Project Area.

The Raymond fault extends southwest from the Sierra Madre fault zone at the base of the San Gabriel Mountains through Monrovia, Arcadia, San Marino, and Pasadena to the Raymond Hill area of South Pasadena, where it trends more westerly through South Pasadena, Highland Park, and possibly into the City of Los Angeles. This fault is estimated to be approximately 11 to 16 miles (mi) long. Currently, there is little consensus on the rate of slip for the Raymond fault. Caltrans currently assumes a slip rate of 2.0 millimeters per year (mm/yr) (0.08 inch per year [in/yr]) and a maximum moment magnitude (M_{max}) of 6.7 for the Raymond fault.

Existing geologic maps show different locations for the Eagle Rock and San Rafael faults. Some maps identify the San Rafael and Eagle Rock faults as separate features, while others map them as a single feature. The San Rafael fault extends southeast from within the San Rafael Hills to the northern edge of Grace Hill, Raymond Hill, and the smaller associated knolls, essentially along the same trace as the Eagle Rock fault. At the eastern end, the San Rafael fault splits into two branches. One branch extends through the top of Raymond Hill, and the other trends east past the Arroyo Seco Parkway and into the hills north of the main trace of the Raymond fault. The Eagle Rock fault has been mapped south of the San Rafael fault, within the knolls, and projecting south of Raymond Hill. The Eagle Rock and San Rafael faults do not extend across the Raymond fault but appear to join with it in a relationship that is not well understood. The activity of the San Rafael and Eagle Rock faults is unknown at this time.

The Eagle Rock and San Rafael faults are generally considered to be the southern continuation of the Verdugo fault. No paleoseismic studies have been published for the Verdugo fault. The Eagle Rock and San Rafael fault zone also has no quantitative investigations, although all three faults (Eagle Rock, San Rafael, and Verdugo) are considered to be potentially active. Caltrans classifies the Eagle Rock and San Rafael faults as one fault and as a continuation of the Verdugo fault. According to the Caltrans fault database, the Verdugo/Eagle Rock fault is estimated to have a slip rate of 0.6 mm/yr (0.024 in/yr) and an M_{max} of 6.8.

3.10.2.7 Geologic Hazards

In addition to the active and potentially active faults in the study area, the following faults in the region, among others, could affect ground shaking within the study area:

- Transverse Ranges southern boundary faults (Hollywood, Santa Monica, and Malibu faults)
- Puente Hills Blind Thrust fault system
- Alhambra Wash fault (Elsinore fault zone-Whittier segment)
- Newport-Inglewood fault zone
- Sierra Madre fault zone

During an earthquake, seismic waves are produced that extend in all directions from the fault rupture. Seismic waves can produce strong ground shaking that is typically strongest near the fault and attenuates as waves move away from the source. The severity of ground shaking is a function of the magnitude of the fault rupture; the distance from the fault to the affected area; and the type, thickness, and condition of the underlying geologic materials in an area. Areas underlain by unconsolidated recent alluvium or fill may amplify the strength and duration of strong ground motion.

The geologic hazards associated with seismic ground shaking are discussed in the following sections. There are several other types of non-seismic geologic hazards that could occur in the study area that are also described in the following sections.

Liquefaction

Soil liquefaction occurs when saturated, loose soils lose their strength because of excess pore water pressure caused by earthquake ground shaking. The space between the soil particles is completely filled with water, which exerts pressure on the soil particles, thereby influencing how tightly the soil particles are pressed together. Prior to an earthquake, the water pressure is static depending on the depth below the groundwater table; however, the shaking caused by an earthquake can increase the pore water pressure to a point where the soil loses strength and ground deformation can occur.

The primary factors affecting the possibility of liquefaction in a soil deposit are the intensity and duration of the earthquake shaking, the soil type, the relative density of the soil, the pressures of material above the soil, and the depth to groundwater. The types of soils most susceptible to liquefaction are clean, loose, uniformly graded, fine-grained sands; non-plastic silts that are saturated; and silty sands. When liquefaction occurs, the strength of the soil decreases, and the ability of the soil to support structures is reduced. The potential impacts of liquefaction may include settlement of the ground surface, additional forces pushing down on foundation piles as a result of soil settlement above the liquefied layers, and reduction of the shear strength of the liquefied soil, resulting in reduced load-carrying capacity. Liquefied soils can also exert additional dynamic pressures on retaining walls, which can cause them to tilt or slide.

According to the *Geologic Hazard Evaluation to Support Environmental Studies Documentation* (2014) and as shown on Figure 3.10-4, areas in the valley floors in the San Rafael and Repetto Hills, along the Arroyo Seco, and in a large section of the San Gabriel Valley generally east of the I-10/Del Mar Avenue interchange have been identified as Liquefaction Hazard Zones. Liquefaction Hazard Zones have either experienced liquefaction during historical times or are in areas where local geologic conditions indicate a potential for liquefaction.

Seismically Induced Landslides

Seismically induced landslides are rock, earth, or debris flows on slopes that can occur as a result of earthquake-related seismic shaking or specific soil, moisture, and angle or slope conditions. Landslides constitute a major geologic hazard because they can be widespread and can cause substantial damage to life and property. The expansion of urban and recreation uses into hillside areas leads to more people and structures being potentially threatened by landslides. Although landslides commonly occur in connection with other major natural disasters (e.g., earthquakes, volcanoes, wildfires, and floods), they can occur on any terrain given the right conditions of soil, moisture, and angle or slope. Steep bare slopes, clay-rich rock, deposits of stream or river sediment, and heavy rains can also contribute to landslides.

According to the *Geologic Hazard Evaluation to Support Environmental Studies Documentation* (2014) and as shown on Figure 3.10-4, areas along the steep slopes in the San Rafael and Repetto Hills and the San Gabriel Mountains have been identified as seismically induced Landslide Hazard Zones. Landslide Hazard Zones have undergone landslides in the past or are located in an area where local geologic conditions indicate a potential for landslides.

Seismic Settlement

Seismic settlement is a phenomenon in which loose, unsaturated sands tend to settle or become denser during strong seismic shaking. Sediments that are sufficiently loose can experience seismic settlement, which can cause ground settlement and damage to structures. Areas most susceptible to seismically induced settlement would generally be the same as those described earlier as Liquefaction Hazard Zones.

Seismically Induced Inundation

Seismically induced inundation occurs when an earthquake causes catastrophic failure of a water-retaining structure such as a reservoir, dam, or levee, and subsequent flooding occurs because of the release of water from the structures. The County of Los Angeles has prepared a Dam and Reservoir Inundation Routes Map that includes the study area. As shown on Figure 3.10-5, parts of the study area are within a potential dam inundation area.

Tsunami and Seiches

The study area is not adjacent to or in the vicinity of large water bodies that could experience seiches. The study area is above elevations that could experience flooding associated with tsunamis. As a result, tsunamis and seiches are not considered potential geologic hazards for the Build Alternatives and are, therefore, not discussed further in this analysis.

Slope Stability

The stability of a slope depends on the inclination, geology and geologic structure, soil and rock strength, and groundwater and surface water conditions of the slope. Hillside areas in the study area are shown on Figure 3.10-1. Areas with slopes or below slopes can be at risk in the event of slope failure. In addition, slope failure can occur in areas where excavating, grading, and/or fill work is being conducted.

Ground Settlement and Collapsible Soils

Near the surface, ground settlement can occur when new loads are added to soil, or when a change in water levels results in a decrease in pore water pressures within compressible soils. Collapsible soils consist predominantly of sand- and silt-size particles arranged in a loose “honeycomb” structure. This loose structure is held together by small amounts of water-softening cementing agents, such as clay or calcium carbonate. When the soil becomes wet, these cementing agents soften, and the honeycomb structure collapses and generates ground settlement. Ground settlement and soil collapse could both potentially occur in the study area.

Expansive Materials

Expansive soils are clay-rich soils that have the ability to shrink and swell with wetting and drying. The mineralogy and percentage of clay-sized particles present in soil determine the potential for expansive behavior. The shrink-swell capacity of expansive soils can result in differential movement beneath foundations. Clay-rich soils are locally present in the study area. Bedrock units also can exhibit expansive properties as a result of the clay content in the bedrock. Potentially expansive bedrock materials include the claystone and siltstone units in the Fernando, Puente, and Topanga Formations in the study area.

Erosion

Erosion occurs when rock and/or soil surfaces are exposed to weathering caused by wind and/or water. The United States Geological Survey (USGS) has delineated Soil Erodibility Factors (K Factors), which indicate how susceptible surface soils are to erosion. Based on USGS mapping, the study area is in an area of moderate erosion potential.

Subsidence

Regional subsidence results from the withdrawal of groundwater and/or hydrocarbons from subsurface areas. As groundwater or hydrocarbons are pumped out of the ground, the resultant voids or pores are compressed under the pressures of the materials above. Accumulation of the compression results in subsidence of the ground surface. The potential for this hazard to adversely affect the study area is low because groundwater withdrawal in the study area is restricted and managed. The groundwater basins which underlie the study area are discussed in Section 3.10.2.4, and include the San Fernando, Raymond, Main San Gabriel, and Los Angeles Central Groundwater Basins. Groundwater withdrawal and recharge in each of these basins is managed by the following agencies respectively: Upper Los Angeles River Area Watermaster, Raymond Basin Management Board, Main San Gabriel Basin Watermaster, and the Water Replenishment District of Southern

California. Where oil extraction is occurring, the reservoir pressures are compensated for by reinjection of water in volumes similar to or greater than those volumes withdrawn. As a result, regional subsidence is not considered a potential geologic hazard for the Build Alternatives and is, therefore, not discussed further in this analysis.

3.10.2.8 National Natural Landmarks

The nearest National Natural Landmark (NNL) to the study area is Rancho La Brea at the Page Museum at the La Brea Tar Pits in the City of Los Angeles. This NNL is approximately 10 mi southwest of the study area. Because there are no NNLs in or near the study area, NNLs are not discussed further in this analysis.

3.10.3 Environmental Consequences

Figures 3.10-1 through 3.10-5 show the locations of major geologic features and conditions in the study area and the alignments and features in the Build Alternatives.

3.10.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in Adverse Effects related to geology and seismicity associated with the Build Alternatives' improvements.

Build Alternatives

TSM/TDM Alternative

Most of the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative improvements would be located at or close to the ground surface. Only the new and widened bridges would involve geology that extends to some depth below the ground surface.

In association with TSM/TDM Alternative Other Road Improvement T-2 (SR 110/Fair Oaks Avenue Hook Ramps), modifications are proposed to the existing cut slope located between Grevelia Street and SR 110, west of Fair Oaks Avenue. The existing cut slope is proposed to be replaced by a retaining wall. Although grading activities associated with the construction of the TSM/TDM Alternative improvements would modify the existing topography, such grading would be minor and limited to the areas described above. Therefore, the TSM/TDM Alternative would not substantively alter the overall topography of the study area.

Based on the types of improvements included in the TSM/TDM Alternative and the underlying geologic framework, the potential to encounter naturally occurring oil and/or gas during construction of the TSM/TDM Alternative improvements is low. However, two of the TSM/TDM Alternative improvements (i.e., the Garfield Avenue bridge widening associated with Intersection Improvement I-16 and the new bridge associated with Other Road Improvement T-1) would require earthwork that would extend below the ground surface; therefore, there is a potential for naturally occurring oil and gas to be encountered during construction of the deep foundations for the bridge structure supports.

Strong ground shaking may occur at the TSM/TDM improvement sites as a result of regional faults, active faults, and potentially active faults within the study area. As a result, construction activities associated with the TSM/TDM Alternative could be affected by ground motion from seismic activities, liquefaction, and landslides if an earthquake were to occur, although the probability of an earthquake occurring during construction is low.

As shown on Figure 3.10-4, the following three improvements in the TSM/TDM Alternative are within an identified Liquefaction Hazard Zone: (1) Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard); (2) Local Street Improvement L-1 (Figueroa Street from SR 134 to Colorado Boulevard); and (3) Local Street Improvement L-5 (Rosemead Boulevard, north of I-10, from Lower Azusa Road to Marshall Street). As a result, construction activities associated with these TSM/TDM Alternative improvements could be affected by liquefaction if an earthquake were to occur during construction, although the probability is low.

There are no landslides mapped on or adjacent to the TSM/TDM Alternative improvements. However, there is a potential for unmapped landslides to occur on or adjacent to the TSM/TDM improvements, although the probability is low.

As shown on Figure 3.10-5, one of the improvements in the TSM/TDM Alternative, Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard), would be located within a potential dam inundation area. The Eagle Rock Reservoir, which is located on the northern side of SR 134, approximately 1,500 ft west of the SR 134/Figueroa Street interchange, would be the source of the inundation in this area. If seismically induced inundation were to occur during the construction of the TSM/TDM Alternative improvements, it would be a very rare occurrence, and the resultant inundation would be short lived.

Construction activities may temporarily disturb soil outside the footprint of the improvements but within the public ROW, primarily in the staging areas around work areas, heavy equipment traffic areas, and material laydown areas. Construction activities in temporary construction easements (TCEs) outside the public ROW would also temporarily disturb soils in those areas.

Soil would be disturbed during construction of the TSM/TDM Alternative improvements. As a result, during construction of the TSM/TDM Alternative improvements, excavated soil would be exposed, and there would be increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate. Refer to Section 3.9 for additional information regarding construction-related water quality issues.

BRT Alternative

The BRT Alternative generally involves at-grade improvements, with very little work extending more than 10 ft bgs. The BRT Alternative would also include the improvements presented in the TSM/TDM Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10).

Considering the type of improvements in the BRT Alternative and the underlying geologic framework, the potential for naturally occurring oil or gas to be encountered during construction of the BRT Alternative is low. However, two of the TSM/TDM Alternative improvements (Intersection Improvement I-16 [Garfield Avenue/Mission Road] and Other Road Improvement T-1 [Valley Boulevard to Mission Road Connector Road]), would require earthwork that would extend below the ground surface, resulting in a potential for naturally occurring oil and gas to be encountered during construction of the deep foundations for the bridge structure supports.

Strong ground shaking may occur along the BRT Alternative because of regional faults, active faults, and potentially active faults within the study area. As a result, construction activities associated with the BRT Alternative could be affected by ground motion from seismic activities, liquefaction, and landslides if an earthquake were to occur, although the probability of an earthquake occurring during construction is low.

Construction activities associated with the BRT Alternative could be affected by liquefaction if an earthquake were to occur during construction, although the probability is low.

As shown on Figure 3.10-4, the BRT Alternative is located within a seismically induced Landslide Hazard Zone in Monterey Park that generally lies between Harding Avenue and Garvey Avenue. None of the improvements in the BRT Alternative would require modification of slopes in this area. There are no landslides mapped along or adjacent to the BRT Alternative; however, there is a potential for unmapped landslides to occur along or adjacent to the BRT Alternative, although the probability is low.

As shown on Figure 3.10-5, none of the BRT Alternative improvements would be located within a potential dam inundation area. Therefore, none of the BRT Alternative improvements would be subject to seismically induced inundation during construction. Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard) would be located within a potential dam inundation area. If seismically induced inundation were to occur during construction of the improvement, it would be a very rare occurrence, and the resultant inundation would be short lived.

Soil would be disturbed during construction of the BRT Alternative improvements. As a result, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate.

LRT Alternative

The LRT Alternative includes a passenger rail line operated along a dedicated guideway, similar to other Metro light rail lines, as well as a bored tunnel segment. The LRT Alternative would be approximately 7.5 mi long, with approximately 3 mi of aerial segments and approximately 4.5 mi of bored tunnel segments. Bi-directional tunnels are proposed with tunnel diameters of approximately 20 ft each, with the crown (top) of the tunnels located from approximately 20 to 90 ft bgs. The LRT Alternative would also include the improvements presented in the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road).

Unconsolidated or water-saturated alluvial soil deposits would likely be encountered in excavations for the portal, the Alhambra Station, and along segments of the LRT tunnel. Open excavation and tunneling in unconsolidated and/or saturated alluvium have the potential for groundwater inflows and flowing ground conditions at the heading of the excavation, which could potentially result in settlement of the ground surface if not properly controlled. Groundwater inflows are also anticipated in the fractured or sheared rock adjacent to faults, which may act as groundwater barriers.

Groundwater inflows could also occur during construction of the LRT portal and at the Alhambra Station, where construction may occur below the groundwater table. Based on the available information, the groundwater table at the site of the other three LRT stations (Huntington, South Pasadena, and Fillmore) is deeper than the stations' base slab levels, and therefore inflows are not expected to be encountered at these locations.

The proposed excavation would result in the potential for ground settlement and differential settlement immediately above and adjacent to the bored tunnel portion, and the portal and station excavations of the LRT Alternative; however, tunneling equipment and procedures as well as portal and station support methods are capable of controlling ground movements to limit surface settlements and in turn minimize damage to existing structures.

Tunnel excavation for the LRT Alternative would be through several different geologic units, including alluvium (soil) and weak sedimentary rocks. Some inherent variability exists within and between the sedimentary formations present along the LRT Alternative, including occasional hard to very hard cemented layers and concretions, and the presence of cobbles. The structure within the Fernando, Puente, and Topanga Formations would be variable, ranging from massively bedded to laminated.

A portion of the bored tunnel segment of the LRT Alternative is anticipated to be constructed within Puente Formation bedrock. There is a low to moderate potential of encountering naturally occurring oil or gas, most likely within the Puente Formation, along the tunnel segment of the LRT Alternative. However, naturally occurring oil and/or gas could also be found within any of the geologic formations within the study area. If oil and/or gas were encountered, the tunnel could be classified by the California Occupational Safety and Health Administration (Cal/OSHA) as a "Gassy or Potentially Gassy Operation." The presence of naturally occurring oil and/or gas is not unusual, especially in the Los Angeles region, and tunnels have been excavated through these conditions previously.

In addition, two of the TSM/TDM Alternative improvements (Intersection Improvement I-16 [Garfield Avenue/Mission Road] and Other Road Improvement T-1 [Valley Boulevard to Mission Road Connector Road]) would require earthwork that would extend below the ground surface, resulting in a potential for naturally occurring oil and gas to be encountered during construction of the deep foundations for the bridge structure supports.

Strong ground shaking may occur along the LRT Alternative because of regional faults, active faults, and potentially active faults within the study area. As a result, construction activities associated with the LRT Alternative could be affected by ground motion during an earthquake, liquefaction, and landslides if an earthquake were to occur during construction, although the probability of an earthquake occurring during construction is low. Therefore, the potential for liquefaction occurring during construction is also low for this alternative. With the exception of ground motion and liquefaction, the other potential hazards are considered outside the bored tunnel portion of the LRT Alternative.

As shown on Figure 3.10-4, the LRT Alternative is located within a Liquefaction Hazard Zone, primarily in the vicinity of I-10 and west of Corporate Place. As a result, construction activities associated with the LRT Alternative (outside the bored tunnel limits) could be affected by liquefaction if an earthquake were to occur during construction, although the probability is low.

As shown on Figure 3.10-4, the LRT Alternative is located within a seismically induced Landslide Hazard Zone, primarily in the vicinity of I-10 and west of Corporate Place. As a result, construction activities associated with the LRT Alternative (outside the bored tunnel limits) could be affected by landslides if an earthquake were to occur during construction. There are no landslides mapped along or adjacent to the LRT Alternative; however, there is a potential for unmapped landslides to occur along or adjacent to the LRT Alternative, although the probability is low.

As shown on Figure 3.10-5, only the portion of the LRT Alternative in the immediate vicinity of I-10 is located within a potential dam inundation area. The inundation zone identified is related to seismically induced failure of the Laguna Regulating Basin. The Laguna Regulating Basin is an ungated basin intended to collect sediment from runoff. The Los Angeles County Department of Public Works (LADPW) has no record of the Laguna Regulating Basin ever being filled to capacity since its construction in 1967. During the rare occurrences where inflow exceeds outflow within the Laguna Regulating Basin, the amount of time the runoff would be pooled within the Basin would be limited because the Basin is allowed to run off freely. Therefore, the potential for impacts from dam inundation during construction of the LRT Alternative is low. Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard) would be located within a potential dam inundation area. If seismically induced inundation were to occur during construction of the improvement, it would be a very rare occurrence, and the resultant inundation would be short lived.

Soil would be disturbed during construction of the LRT Alternative improvements. As a result, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate. Refer to Section 3.9 for additional information regarding construction-related water quality.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative includes single-bore and dual-bore design variations, each of which is approximately 4.2 mi in length. Short segments of cut-and-cover tunnels would be located at the southern and northern termini to provide access via portals to the bored tunnels. The Freeway Tunnel Alternative would also include the improvements presented in the TSM/TDM Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard).

Like the LRT Alternative, unconsolidated and/or water-saturated alluvial soil deposits would likely be encountered in excavations for the portals and along segments of the tunnel for the Freeway Tunnel Alternative. Open excavation and tunneling in unconsolidated and/or saturated alluvium have the potential for groundwater inflows and flowing ground conditions at the heading of the excavation, which could potentially result in settlement of the ground surface if not properly controlled. Groundwater inflows are also anticipated in the fractured or sheared rock and in proximity to fault zones, which may act as groundwater barriers.

Groundwater inflows could also occur during construction of the Freeway Tunnel Alternative south portal, where construction would occur below the groundwater table. Because of the relatively deep groundwater elevations compared to the tunnel bottom depth, groundwater control does not appear to be an issue for tunnel construction at the north portal.

The proposed excavations would result in the potential for ground settlement and differential settlement immediately above and adjacent to the bored tunnel portion, and the portal excavations of the Freeway Tunnel Alternative; however, tunneling equipment and procedures as well as portal support methods are capable of controlling ground movements to limit surface settlements and in turn minimize damage to existing structures.

Some inherent variability exists within and between the sedimentary formations present along the Freeway Tunnel Alternative, including occasional hard to very hard cemented layers and concretions, and the presence of cobbles. The structure within the Fernando, Puente, and Topanga Formations would be variable, ranging from massively bedded to laminated. In addition, the Wilson Quartz Diorite is expected to be locally weak and fractured.

Tunnel excavation for the Freeway Tunnel Alternative would be through several different geologic units, including alluvium (soil), weak sedimentary rocks, and stronger granitic-type rocks. A portion of the bored tunnel of the Freeway Tunnel Alternative is anticipated to be constructed within Puente Formation bedrock. There is a low to moderate potential for encountering naturally occurring oil and/or gas within the Puente Formation; however, naturally occurring oil and/or gas could also be found within any of the geologic formations in the study area. If naturally occurring oil and/or gas is encountered, the tunnel could be classified by Cal/OSHA as a "Gassy or Potentially Gassy Operation." The presence of naturally occurring oil and/or gas is not unusual, especially in the Los Angeles region, and tunnels have been excavated through these conditions previously.

In addition, two of the TSM/TDM Alternative improvements (Intersection Improvement I-16 [Garfield Avenue/Mission Road] and Other Road Improvement T-1 [Valley Boulevard to Mission Road Connector Road]) would require earthwork that would extend below the ground surface, resulting in a potential for naturally occurring oil and gas to be encountered during construction of the deep foundations for the bridge structure supports.

Strong ground shaking may occur along the Freeway Tunnel Alternative because of regional faults, active faults, and potentially active faults within the study area. As a result, construction activities associated with the Freeway Tunnel Alternative could be affected by ground motion during an earthquake, liquefaction, and landslides if an earthquake were to occur during construction, although the probability of an earthquake occurring during construction is low. Therefore, the potential for liquefaction occurring during construction is also low for this alternative. With the exception of ground motion, the other potential hazards are considered outside the bored tunnel portion of the Freeway Tunnel Alternative.

As shown on Figure 3.10-4, the Freeway Tunnel Alternative is located within a Liquefaction Hazard Zone that generally lies south of I-10. As a result, construction activities associated with the Freeway Tunnel Alternative (outside the bored tunnel limits) could be affected by liquefaction if an earthquake were to occur during construction, although the probability is low.

Figure 3.10-4 shows the locations of the Freeway Tunnel Alternative improvements and the identified seismically induced Landslide Hazard Zones in the study area. Construction activities associated with the Freeway Tunnel Alternative (outside the bored tunnel limits) could be affected by landslides if an earthquake were to occur during construction. There are no landslides mapped along or adjacent to the Freeway Tunnel Alternative; however, there is a potential for unmapped landslides to occur along or adjacent to the Freeway Tunnel Alternative, although the probability is low.

As shown on Figure 3.10-5, only the portion of the Freeway Tunnel Alternative in the immediate vicinity of I-10 is located within a potential dam inundation area. The inundation zone identified is related to seismically induced failure of the Laguna Regulating Basin. During the rare occurrences where inflow exceeds outflow within the Laguna Regulating Basin, the amount of time the runoff would be pooled within the Basin would be limited because the Basin is allowed to run off freely. If the Laguna Regulating Basin were to be filled during a seismic event that caused failure of the Basin, the resulting inundation would be short lived. Therefore, the potential for impacts from dam inundation during construction of the Freeway Tunnel Alternative is low. Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard) would be located within a potential dam inundation area. If seismically induced inundation were to occur during construction of the improvement, it would be a very rare occurrence, and the resultant inundation would be short lived.

During construction, soil would be disturbed for the single-bore and dual-bore design variations of the Freeway Tunnel Alternative. As a result, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate. Refer to Section 3.9 for additional information regarding construction-related water quality issues.

3.10.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any effects related to geology and seismicity associated with Build Alternative improvements.

Build Alternatives

TSM/TDM Alternative

Most of the TSM/TDM Alternative improvements would be located at or close to the ground surface. Only the new and widened bridges would involve geology that extends to some depth below the ground surface.

The operation of the TSM/TDM Alternative improvements would not require construction that would reach naturally occurring subsurface oil and gas.

As shown on Figure 3.10-1, one of the TSM/TDM Alternative improvements, Other Road Improvement T-2 (SR 110/Fair Oaks Avenue Hook Ramps), crosses the Raymond and San Rafael faults. Local street improvements such as those proposed with Other Road Improvement T-2 are not protected against fault-induced surface rupture. However, road damage resulting from fault rupture is expected to be minor. Moderate to severe seismic shaking may occur in the study area during the life of the improvements under the TSM/TDM Alternative.

As shown on Figure 3.10-4, the following improvements under the TSM/TDM Alternative are located within designated Liquefaction Hazard Zones: Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard) and Local Street Improvements L-1 (Figueroa Street from SR 134 to Colorado Boulevard) and L-5 (Rosemead Boulevard from Lower Azusa Road to Marshall Street). In addition, localized deposits of liquefiable soils could be identified during future investigations. Typically, at-grade road improvements are not protected against liquefaction.

Loose, unsaturated granular soils are susceptible to seismically induced settlement. This could include the alluvial soils located above the groundwater table at TSM/TDM Alternative improvement sites.

As shown on Figure 3.10-4, no TSM/TDM Alternative improvements are located within a seismically induced Landslide Hazard Zone, and there are no landslides mapped within or adjacent to the TSM/TDM Alternative improvements. However, there is a potential for unmapped landslides to occur within or adjacent to the TSM/TDM Alternative improvements.

As shown on Figure 3.10-5, one of the improvements in the TSM/TDM Alternative (Intersection Improvement I-2 [Eagle Rock Boulevard/York Boulevard]) would be located within a potential dam inundation area. The Eagle Rock Reservoir, which is located on the northern side of SR 134, approximately 1,500 ft west of the SR 134/Figueroa Street interchange, would be the source of the inundation in this area. If seismically induced inundation were to occur during the operation of the improvements, it would be a very rare occurrence, and the resultant inundation would be short lived.

As shown on Figure 3.10-1, few of the TSM/TDM Alternative improvements are located within or adjacent to hillside areas. Other Road Improvement T-2 (SR 110/Fair Oaks Avenue Hook Ramps) includes modifications to the existing cut slope located between Grevelia Street and SR 110, west of Fair Oaks Avenue. No other slopes would be adversely affected by the TSM/TDM Alternative improvements.

Some of the TSM/TDM Alternative improvements are underlain by alluvial soils (refer to Figure 3.10-1), which may be prone to ground settlement or collapsible soils.

There are clay-rich expansive soils and bedrock present beneath many of the TSM/TDM Alternative improvements (e.g., artificial fill soils, alluvial soils, and the siltstone and/or claystone units of the Fernando, Puente, and Topanga Formations).

The surficial soils present beneath the TSM/TDM Alternative improvements have a moderate susceptibility to erosion. However, because those improvements would include pavement and/or landscaping over those soils, the TSM/TDM Alternative improvements would not result in erosion in those areas over the long term.

BRT Alternative

The operation of the BRT Alternative improvements would not require construction that would reach naturally occurring subsurface oil and/or gas.

Although grading activities associated with the construction of the BRT Alternative improvements would modify the existing topography, such grading would be minor and limited to relatively few areas in the study area. Therefore, the BRT Alternative would not substantively alter the overall topography of the study area.

As shown on Figure 3.10-1, the BRT Alternative crosses the Raymond and San Rafael faults. The BRT Alternative would involve at-grade road improvements. Typically, at-grade road improvements are not protected against fault-induced surface rupture. If the road is damaged due to fault rupture, the damage is expected to be minor. Moderate to severe seismic shaking may occur in the study area during the life of the improvements under the BRT Alternative.

As shown on Figure 3.10-4, the BRT Alternative is not located within an area delineated as a Liquefaction Hazard Zone, although localized deposits of liquefiable soils could be identified during future investigations. Typically, at-grade road improvements are not protected against liquefaction.

Loose, saturated, or unsaturated granular soils are susceptible to seismically induced settlement. This could include the alluvial soils located above the groundwater table along the alignment of the BRT Alternative.

As shown on Figure 3.10-4, the BRT Alternative is located within a seismically induced Landslide Hazard Zone in Monterey Park that generally lies between Harding Avenue and Garvey Avenue. None of the improvements in the BRT Alternative would require modification of slopes in this area. There are no landslides mapped along or adjacent to the BRT Alternative. However, there is a potential for unmapped landslides to occur along or adjacent to the BRT Alternative.

As shown on Figure 3.10-5, none of the BRT Alternative improvements would be located within a potential dam inundation area. Therefore, none of the BRT Alternative improvements would be subject to seismically induced inundation over the long term. Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard) would be located within a potential dam inundation area. If seismically induced inundation were to occur during the operation of the improvement, it would be a very rare occurrence, and the resultant inundation would be short lived.

As shown on Figure 3.10-1, the BRT Alternative traverses part of the Repetto Hills, generally between Brightwood Street and Garvey Avenue in Monterey Park. The proposed improvements do not require modification of the slopes in this area.

Some areas along the alignment of the BRT Alternative improvements are underlain by alluvial soils that may be prone to ground settlement or collapsible soils.

There are clay-rich expansive soils and bedrock present beneath the alignment of the BRT Alternative (e.g., artificial fill soils, alluvial soils, and the siltstone and/or claystone units of the Fernando, Puente, and Topanga Formations).

The surficial soils present beneath the BRT Alternative improvements have a moderate susceptibility to erosion. However, because those improvements would include pavement and/or landscaping over those soils, the BRT Alternative improvements would not result in erosion in those areas over the long term.

LRT Alternative

A portion of the LRT tunnels and underground stations are expected to be constructed below the groundwater table; however, groundwater inflows into the tunnel and stations are not anticipated as the linings can be designed to limit the groundwater inflows.

A portion of the bored tunnel segment of the LRT Alternative is anticipated to be constructed within Puente Formation bedrock. There is a low-to-moderate potential of encountering naturally occurring oil and/or gas within the Puente Formation along the subterranean portion of the LRT Alternative. Naturally occurring oil and/or gas could also be found within any of the geologic formations within the study area. The presence of naturally occurring oil and/or gas is not unusual, especially in the Los Angeles region, and linings can be designed to control gas intrusions.

Although grading activities associated with the construction of the LRT Alternative improvements would modify the existing topography, such grading would be minor and limited to relatively few areas in the study area. Therefore, the LRT Alternative would not substantively alter the overall topography of the study area.

As shown on Figures 3.10-1 and 3.10-2, the LRT Alternative crosses the active Raymond fault and the potentially active San Rafael fault and does not cross the Eagle Rock fault. Therefore, there is a potential for fault rupture to occur during an earthquake. Future studies may reveal that the San Rafael fault is inactive; however, for planning purposes, this fault is treated as an active fault. The bottom of the LRT Alternative tunnel in the vicinity of these faults would be located approximately 70 to 100 ft bgs. Preliminary fault rupture displacement estimates have been prepared for the LRT Alternative at the fault crossings based on Metro Supplemental SDC (Preliminary Geotechnical Report, 2014).

The Coyote Pass escarpment (generated by the Upper Elysian Park Blind Thrust fault) transects the elevated portion of the LRT Alternative in the vicinity of Corporate Center Drive and Corporate Center Place, just east of I-710 in Monterey Park. The Coyote Pass escarpment is considered the primary concern with regard to potential co-seismic deformation during an earthquake on the Upper Elysian Park Blind Thrust fault.

Moderate to severe seismic shaking may occur in the study area during the life of the improvements under the LRT Alternative. The potential to experience substantial seismic ground shaking is a common hazard for every project in Southern California, and the hazard cannot be avoided. Experience in California and worldwide shows that bored tunnels generally perform well during earthquake ground shaking, typically suffering less damage than surface structures. Because they are embedded in the ground, they move with the ground, and thus, their motion is not magnified by the pendulum effect that occurs when an aboveground structure is shaken by an earthquake (Hashash et al. 2001). As an example, during the Northridge Earthquake in 1994, Metro’s Segment 1 Red Line tunnels received ground motions at the level of the operating Design Earthquake without damage. Inspection was performed, and the system was reopened for service the following day, with greatly increased ridership because highways were closed because of earthquake damage to bridges. Another example is the 1989 Loma Prieta earthquake that shook San Francisco, collapsing key elevated highways but leaving the Bay Area Rapid Transit (BART) tunnel system unaffected. Following an inspection of the tunnels and trackwork, the system was quickly opened.

As shown on Figure 3.10-4, the LRT Alternative (above grade segment, in the vicinity of I-10 and west of Corporate Place) is located within a Liquefaction Hazard Zone. The liquefaction potential beneath the LRT bored tunnel segment is considered low. The occurrence of liquefaction could lead to loss in foundation support, reduction in lateral support of deep foundations, flow and lateral spreading, and liquefaction-induced settlement.

Loose, unsaturated granular soils are also susceptible to seismically induced settlement. This may include the alluvial soils located above the groundwater table in areas outside the bored tunnel segment of the LRT Alternative. Settlement issues could also be of concern at the tunnel portal.

As shown on Figure 3.10-4, the LRT Alternative is located within a seismically induced Landslide Hazard Zone that generally extends from Corporate Place north to I-10. There are no known landslides mapped along the LRT Alternative alignment. However, there is a potential for unmapped landslides to occur along or adjacent to the LRT Alternative alignment.

As shown on Figure 3.10-5, only the portion of the LRT Alternative in the immediate vicinity of I-10 is located within a potential dam inundation area. The inundation zone identified is related to seismically induced failure of the Laguna Regulating Basin. During the rare occurrences where inflow exceeds outflow within the Laguna Regulating Basin, the amount of time the runoff would be pooled within the Basin would be limited because the Basin is allowed to run off freely. Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard) would be located within a potential dam inundation area. If seismically induced inundation were to occur during the operation of the improvement, it would be a very rare occurrence, and the resultant inundation would be short lived.

If the Laguna Regulating Basin were to be filled during a seismic event that caused failure of the Basin, the resulting inundation would be short lived. The affected portion of the LRT Alternative would be elevated approximately 80 ft above existing grade. The LRT portal is situated more than 50 ft higher than the top of the Laguna Regulating Basin embankment. As such, the potential for seismically induced inundation from the Laguna Regulating Basin to adversely affect the LRT Alternative is very low.

As shown on Figure 3.10-1, the LRT Alternative traverses hillside areas. In some areas, the improvements have the potential to adversely affect the stability of existing slopes and/or developments atop existing slopes.

Areas along the LRT Alternative are underlain by alluvial soils (refer to Figures 3.10-1 and 3.10-2), which may be prone to ground settlement or collapsible soils (outside the bored tunnel limits), although the probability is low.

Clay-rich expansive soils and bedrock are present along portions of the LRT Alternative elevated structure and bored tunnel, and the portal area. Potentially expansive materials present along the LRT Alternative include artificial fill soils, alluvial soils, and the siltstone and/or claystone units of the Fernando, Puente, and Topanga Formations.

The surficial soils present along the LRT Alternative have a moderate susceptibility to erosion. During operation, the LRT Alternative would treat storm water runoff within the Caltrans ROW with Caltrans-approved treatment Best Management Practices (BMPs) (e.g., biofiltration swales). Outside of Caltrans ROW, much of the elevated track is proposed above steep terrain, and treatment is not technically feasible; however, the LRT Alternative would treat storm water runoff with devices such as tree box filters, catch basin screens and filter inserts at new inlet locations (where feasible), bioretention facilities for the proposed parking lot areas, and media filters in the ballast areas. Refer to Section 3.9 for additional information regarding operation-related water quality issues.

Freeway Tunnel Alternative

Because of the shallow groundwater conditions present relative to tunnel depth, groundwater control would be an important consideration for long-term operations at the south portal; however, no Adverse Effects would be anticipated, and no permanent dewatering would be required. A portion of the Freeway tunnels are expected to be constructed below the groundwater table; however, groundwater inflows into the tunnel are not anticipated as the linings can be designed to limit the groundwater inflows. Because of the relatively deep groundwater elevations compared to the depth of the bottom of the tunnel, groundwater control does not appear to be a substantial issue for permanent effects at the north portal.

A portion of the bored tunnel segment of the Freeway Tunnel Alternative is anticipated to be constructed within Puente Formation bedrock. There is a low to moderate potential of encountering naturally occurring oil and/or gas within the Puente Formation along the subterranean portion of the Freeway Tunnel Alternative. Naturally occurring oil and/or gas could also be found within any of the geologic formations within the study area. The presence of naturally occurring oil and gas is not unusual, especially in the Los Angeles region and linings can be designed to control gas intrusions.

Although grading activities associated with the construction of the Freeway Tunnel Alternative improvements would modify the existing topography, such grading would be minor and limited to relatively few areas in the study area. Therefore, the Freeway Tunnel Alternative would not substantively alter the overall topography of the study area.

As shown on Figures 3.10-1 and 3.10-3, the Freeway Tunnel Alternative crosses the active Raymond fault and the potentially active San Rafael and Eagle Rock faults. Therefore, there is a potential for fault rupture to occur during an earthquake. Future studies may reveal that the San Rafael and Eagle Rock faults are inactive; however, for planning purposes, these faults are treated as active faults. The bottom of the Freeway Tunnel Alternative in the vicinity of these faults would be located from roughly 160 ft to more than 300 ft bgs. Preliminary fault rupture displacement estimates have been prepared for the Freeway Tunnel Alternative at the fault crossings based on the seismic design criteria developed in conjunction with Caltrans (Preliminary Geotechnical Report, 2014).

Moderate to severe seismic shaking may occur in the study area during the life of the improvements under the Freeway Tunnel Alternative. The potential to experience substantial seismic ground shaking is a common hazard for every project in Southern California, and the hazard cannot be avoided. Experience in California and worldwide shows that bored tunnels generally perform well during earthquake ground shaking, typically suffering less damage than surface structures. Because they are embedded in the ground, they move with the ground, and thus, their motion is not magnified by the pendulum effect that occurs when an aboveground structure is shaken by an earthquake (Hashash et al. 2001).

As shown on Figure 3.10-4, the Freeway Tunnel Alternative (generally south of I-10) is located within a Liquefaction Hazard Zone. The bottom of the bored freeway tunnel varies from approximately 160 to 300 feet below the ground surface. The majority of the material under the bored tunnel is bedrock and only a few isolated areas are underlain by very dense soils. As a result, the liquefaction potential beneath the Freeway Tunnel Alternative bored tunnel segment is considered low. The occurrence of liquefaction could lead to loss in foundation support, reduction in lateral support of deep foundations, flow and lateral spreading, and liquefaction-induced settlement.

Loose, unsaturated granular soils are also susceptible to seismically induced settlement. This may include the alluvial soils located above the groundwater table in areas outside the bored tunnel segment of the Freeway Tunnel Alternative. Settlement issues could also be critical at both tunnel portals.

As shown on Figure 3.10-4, the Freeway Tunnel Alternative in the vicinity of I-10 and near Summit Drive in South Pasadena is located within or adjacent to a seismically induced Landslide Hazard Zone. There are no known landslides mapped along the Freeway Tunnel alignment. However, there is a potential for unmapped landslides to occur along or adjacent to the Freeway Tunnel alignment. There are no potential impacts from landslides for the bored tunnel segment of the Freeway Tunnel Alternative.

As shown on Figure 3.10-5, only the portion of the Freeway Tunnel Alternative in the immediate vicinity of I-10 is located within a potential dam inundation area. The inundation zone identified is related to seismically induced failure of the Laguna Regulating Basin. During the rare occurrences where inflow exceeds outflow within the Laguna Regulating Basin, the amount of time the runoff would be pooled within the Basin would be limited because the Basin is allowed to run off freely. If the Laguna Regulating Basin were to be filled during a seismic event that caused failure of the Basin, the resulting inundation would be short lived. The Freeway Tunnel south portal is situated more than 50 ft higher than the top of the Laguna Regulating Basin embankment. As such, the potential for seismically induced inundation from the Laguna Regulating Basin to adversely affect the Freeway Tunnel Alternative is very low. Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard) would be located within a potential dam inundation area. If seismically induced inundation were to occur during the operation of the improvement, it would be a very rare occurrence, and the resultant inundation would be short lived.

As shown on Figure 3.10-1, the Freeway Tunnel Alternative traverses hillside areas. In some areas, the improvements have the potential to adversely affect the stability of existing slopes and/or developments atop existing slopes. Areas along the Freeway Tunnel Alternative are underlain by alluvial soils (refer to Figures 3.10-1 and 3.10-4), which may be prone to ground settlement or collapsible soils (outside the bored tunnel limits).

Clay-rich expansive soils and bedrock are present along some of the surficial improvement areas, and portions of the bored tunnel of the Freeway Tunnel Alternative. Potentially expansive materials present along the Freeway Tunnel Alternative include artificial fill soils, alluvial soils, and the siltstone and/or claystone units of the Fernando, Puente, and Topanga Formations.

The surficial soils present along the Freeway Tunnel Alternative have a moderate susceptibility to erosion. During operation, the Freeway Tunnel Alternative would treat storm water runoff using Caltrans-approved methods such as biofiltration swales and gross solid removal devices (GSRDs). Refer to Section 3.9 for additional information regarding operation-related water quality issues.

3.10.4 Avoidance, Minimization, and/or Mitigation Measures

All improvements in all four Build Alternatives will be designed, constructed, and operated in accordance with all applicable standards, including the following design and safety standards:

- Caltrans design standards (for highway and roadway improvements on Caltrans facilities outside the tunnel limits in the Build Alternatives) in the *Highway Design Manual* (2012 or more current).
- American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) specifications for bridge structure design (2012 [6th Edition] or more current, per Caltrans requirements).
- Caltrans amendments to the AASHTO LRFD bridge design specification (2014 or more current).
- Caltrans Memo to Designers 20-1, Seismic Design Methodology for the seismic design of the Freeway Tunnel Alternative (2010 or more current).

- Federal Highway Administration (FHWA) tunnel design standards (for tunnel-related highway improvements included in the Freeway Tunnel Alternative) in the FHWA Technical Manual for Design and Construction of Road Tunnels – Civil Elements (2009 or more current).
- Metro's Rail Design Criteria (for light rail improvements included in the LRT Alternative) in the Rail Transit Design Criteria and Standards (2013 or more current). Includes Metro Supplementary SDC appended to Section 5 in 2013.
- Metro design criteria for BRT systems (2008 or more current) for roadway and other improvements for the BRT Alternative.
- Local jurisdiction design and safety standards (for local roadway improvements included in the Build Alternatives)
- Cal/OSHA related to worker safety during construction and operation in Title 8, Chapter 3.2, California Safety and Health Regulations, California Code of Regulations.
- National Fire Protection Association Safety Codes and Standards.

A pressurized-face tunnel boring machine (TBM) is expected to be used for construction of the tunnels for the LRT and Freeway Tunnel Alternatives as it is ideally suited to excavate through the expected conditions on this project including potential for high groundwater pressures and variability of the types and the strength of the soil and rock units expected. Pressurized face TBMs have been successfully used to limit ground loss at the tunnel face during construction, resulting in limiting ground settlements. Excavation of a tunnel using a pressurized-face TBM would actively control groundwater inflows and gas intrusion at the tunnel heading; special care would have to be exercised when tunneling through a fault zone that has a substantial difference in groundwater levels on opposite sides of the fault. The tunnels would have a precast concrete segmental lining system typically with double rubber gaskets, with appropriate cross gaskets to control water and/or gas inflows into the tunnel in the temporary and permanent condition. After excavation, the space between the outside of the tunnel lining and the soil would be grouted to prevent groundwater flow along the tunnel bores.

Compliance with the applicable agency or jurisdiction seismic design standards will address the risk associated with geologic hazards related to seismicity, soil erosion, and slope instability during construction and operation of the Build Alternatives to acceptable levels. Measure GEO-1 will further address potential impacts related to liquefaction, seismic shaking, surface fault rupture, slope instability, and erosion. Measures GEO-1 and GEO-2 will be applied to any of the Build Alternatives. Measures GEO-3 and GEO-4 will address potential geologic hazards associated with construction and operation of the LRT and Freeway Tunnel Alternatives.

Measure GEO-1 **Final Geotechnical/Baseline Report (applies to all four Build Alternatives):** During preliminary and final design, a comprehensive geologic and geotechnical investigation will be conducted and design-level geotechnical/baseline reports will be prepared. This report will document and provide design recommendations for seismic hazards such as fault-induced ground rupture, ground shaking, co-seismic deformation, slope instability, seismic settlement, liquefaction, or related secondary seismic impacts that may be present along the alignment of the selected Build Alternative project. The report will also provide design recommendations for geology-related constraints such as settlement, collapse potential, expansion, landslides, erosion, and naturally occurring gas. The performance standard for this report will be the geotechnical design standards of the State of California and the California Department of Transportation (Caltrans), the Federal Highway Administration (FHWA), the Los Angeles County Metropolitan Transportation Authority (Metro), and/or the local jurisdiction, as applicable.

The Project Engineer will incorporate the measures recommended in the design-level geotechnical report in the final design and project specifications.

The Construction Contractor, Design/Build Contractor, or the Private Public Partnership developer, as applicable, will implement the measures recommended in the design-level geotechnical reports as included in the project design and specifications.

Measure GEO-2

Quality Assurance/Quality Control Plan (applies to all four Build Alternatives): The Resident Engineer will maintain a quality assurance/quality control (QA/QC) plan during construction (i.e., a Metro QA/QC plan for the Transportation System Management/ Transportation Demand Management [TSM/TDM], Bus Rapid Transit [BRT], and Light Rail Transit [LRT] Alternatives, and a Caltrans QA/QC plan for the Freeway Tunnel Alternative). The QA/QC plan will include observing, monitoring, and testing by the Project Geotechnical Engineer and/or the Project Geologist prior to and during construction to confirm that the geotechnical/geologic recommendations from the design-level geotechnical report and standard design and construction practices are fulfilled by the Contractor, or if different site conditions are encountered, appropriate changes are made to accommodate such issues. Comprehensive real-time monitoring with geotechnical tunnel data management software and implementation of an observational approach to construction management will be implemented during construction of the LRT or Freeway Tunnel Alternatives. The Project Geotechnical Engineer and/or the Project Geologist will submit weekly reports to Caltrans or Metro during all project-related grading, excavation, and construction activities.

Measure GEO-3

Tunnel Design (applies to the LRT and Freeway Tunnel Alternatives): During preliminary and final design, the Metro (LRT Alternative) or Caltrans (Freeway Tunnel Alternative) Project Engineer will make sure that the following measures are included in the comprehensive geologic and geotechnical investigation and the design-level geotechnical/baseline report and the project design and specifications:

- A comprehensive geotechnical investigation program will be developed and performed, including a site-specific seismic hazards assessment and a site-specific fault characterization evaluation.

- A robust construction instrumentation and monitoring program will be developed to monitor ground movements on and below the ground surface along the bored tunnel alignments, cut-and-cover tunnels, and at portal and underground station excavations in real time. Additionally, structures and groundwater levels will also be monitored. Warning and action levels for ground movements will be set so that during construction, the contractor will be required to act if action levels are exceeded.
- Pre-construction condition surveys of structures along the tunnel alignment will be performed prior to excavation to determine baseline conditions and the potential for damage of the structures along the alignment.
- A detailed construction methods assessment will be performed to identify construction methods required to overcome the geologic challenges along the alignment (e.g., variable ground conditions, mixed-face conditions, high groundwater heads, and potentially gassy ground conditions).
- There is extensive experience with the capability of underground structures to remain stable during earthquake shaking. The tunnels, portals, and underground stations will be designed using established procedures to accommodate earthquake shaking.
- A fault crossing design will be evaluated to be able to accommodate the expected fault offset, maintaining the structural integrity of the tunnel lining and preventing the intrusion of surrounding groundwater into the tunnel. The design will meet the performance criteria of the operating agency.
- To control gas and groundwater infiltration into the tunnel, a precast concrete segmental tunnel lining with double rubber-gasketed joints will be used to provide a watertight and gastight tunnel. Gas-proof and waterproof membranes will be required where applicable for underground stations, cross passages and vault excavations for the fault crossing of the LRT Alternative.

Measure GEO-4

Tunnel Construction (applies to the LRT and Freeway Tunnel Alternatives): It is expected that bored tunnels for either the LRT or Freeway Tunnel Alternative would be constructed using a tunnel boring machine (TBM). During construction, the Project Engineer will select a pre-qualified contractor with experience with large, pressurized-face TBMs. The Project Engineer will ensure that the

Construction Contractor implements the following measures during tunnel boring operations:

- The contractor is expected to use pressurized-face TBMs for the bored tunnels, which are routinely used to successfully control ground losses and the contractor will be required to use a sufficiently-stiff support system for the portal and underground station excavation support to meet specific ground loss guidelines developed in the design phase to minimize surface ground settlement, which would minimize damage to existing structures. Conservative values and techniques will be specified so that ground movements are below the levels that could cause structural damage, and the TBM will be operated to comply with the requirements. The contractor will have a contingency plan of action if the instruments read that ground movements are above established action levels.
- During tunneling, a positive face pressure will be applied to the tunnel heading as required to limit surface settlement and loss of ground. The ground will be properly conditioned by injecting additives in front of the TBM to allow an adequate face pressure to be maintained.
- Ground treatment will be performed in areas identified during the design phase to improve ground conditions and to protect critical structures.
- The ground movements at the surface and above and around the tunnel will be monitored in real time. Ground movements will be controlled throughout the construction duration to confirm that ground control is being achieved and ground movements are below the acceptable levels set during design. If ground movements exceed acceptable levels set during design, then additional measures will be required to reduce excavation-induced settlement and lessen or eliminate the ground movement effects on the adjacent structures. Several methods could be employed including:
  - Permeation grouting
  - Compaction grouting
  - Underpinning
- The TBM expected to be used for the running tunnels will have a comprehensive and integrated backfill grouting system to limit tail- and shield-related ground losses.

Refer also to Section 3.9, Water Quality and Storm Water Runoff, for additional measures related to soil erosion, including BMPs.

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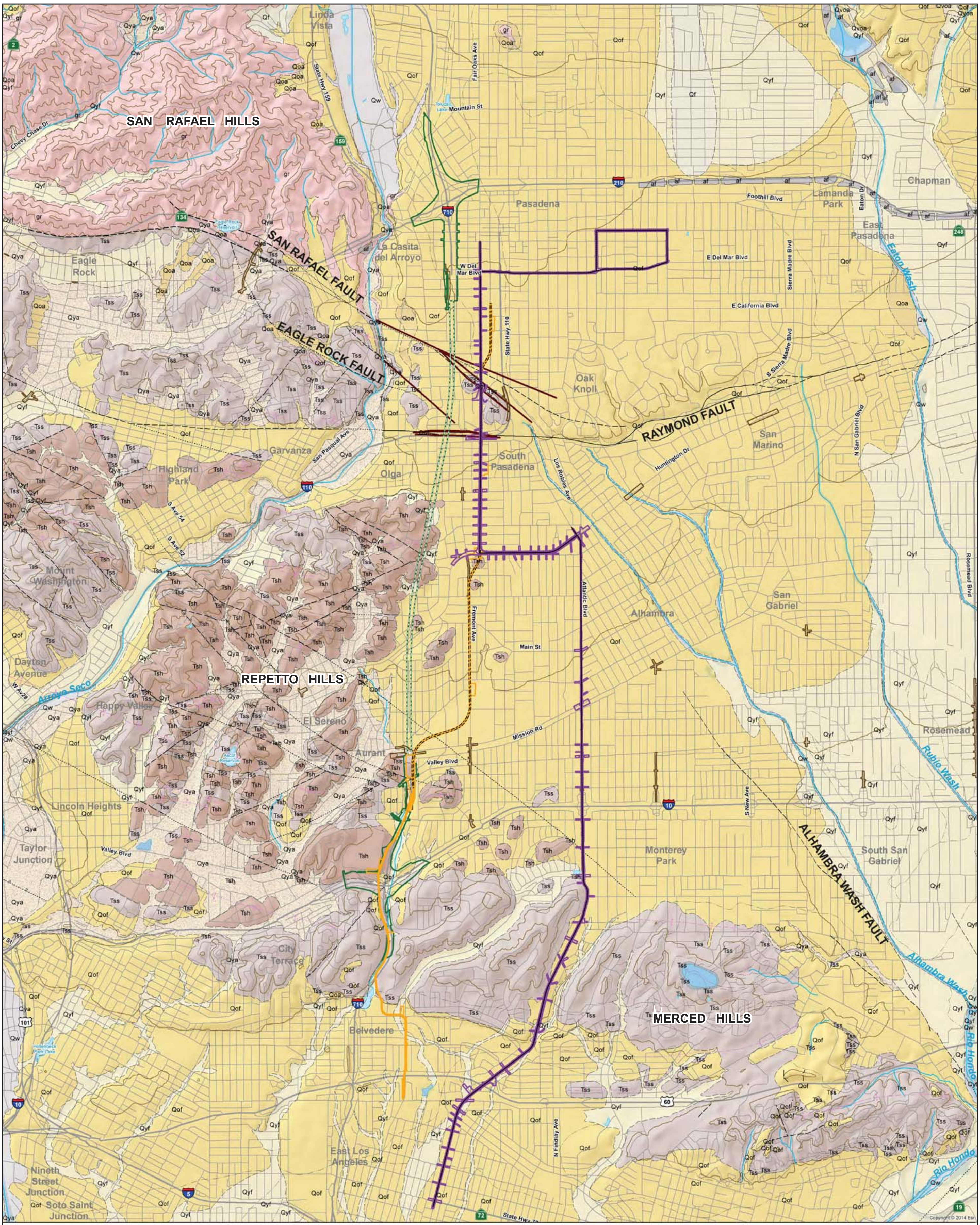

Legend

SR 710 North Project Alternatives

- TSM/TDM Alternative, Potential Disturbance Limit (PDL)
- BRT Alternative PDL, with Centerline
- LRT Alternative PDL
- LRT Tunnel Zone of Potential Influence
- Freeway Tunnel Alternative PDL
- Freeway Tunnel Zone of Potential Influence

Symbols

- Eagle Rock, Raymond and San Rafael faults, location based on this study

Base Map:

- Elevation Contour
- Roads
- Stream
- Water Bodies

Base map: Modified from CGS, 2012

- anticline, identity and existence certain, location approximate
- anticline, identity and existence certain, location concealed
- overturned anticline, identity and existence certain, location accurate
- syncline, identity and existence certain, location approximate
- syncline, identity and existence certain, location concealed
- contact, identity and existence certain, location accurate
- contact, identity and existence certain, location approximate
- contact, identity or existence questionable, location approximate
- reference contact, identity and existence certain, location concealed
- reference contact, identity or existence questionable, location approximate
- reference contact, identity and existence certain, location approximate
- reference contact, identity and existence certain, location accurate
- fault, identity and existence certain, location accurate
- fault, identity and existence certain, location approximate
- fault, identity and existence certain, location concealed
- fault, identity or existence questionable, location approximate
- fault, identity or existence questionable, location concealed
- reverse fault, identity and existence certain, location approximate
- reverse fault, identity and existence certain, location concealed
- thrust fault, identity and existence certain, location accurate
- thrust fault, identity and existence certain, location approximate
- thrust fault, identity and existence certain, location concealed
- thrust fault, identity and existence certain, location concealed
- water boundary

af	Artificial Fill - deposits of fill resulting from human construction, mining, or other quarrying activities; includes engineered fill for buildings, roads, dams, airport runways, harbor facilities, and waste landfills
Qw	Alluvial Wash Deposits - unconsolidated sandy and gravelly sediment deposited in recently active channels of streams and rivers; may contain loose to moderately loose sand and silty sand
Qf	Alluvial Fan Deposits - uncosolidated boulders, cobbles, gravel, sand, and silt recently deposited where a river or stream issues from a confined valley or canyon; sediment typically deposited in a fan-shaped cone; gravel sediment generally more dominant than sandy sediment
Qyf	Young Alluvial Fan Deposits - unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon
Qya	Young Alluvial Valley Deposits - unconsolidated to slightly consolidated, undissected to slightly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers
Qof	Old Alluvial Fan Deposits - slightly to moderately consolidated, moderately dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon
Qoa	Old Alluvial Valley Deposits - slightly to moderately consolidated, moderately dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers
Qvoa	Very Old Alluvial Fan Deposits - moderately to well-consolidated, highly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers; generally uplifted and deformed
Tss	Coarse-grained Tertiary age formations - primarily sandstone and conglomerate. Includes Fernando (Tf), Puente (Tp) and Topanga (Tt) Formations
Tsh	Fine-grained Tertiary age formations - includes fine-grained sandstone, siltstone,mudstone, shale, siliceous and calcareous sediments. Includes Fernando (Tf), Puente (Tp) and Topanga (Tt) Formations
Tv	Tertiary age formations of volcanic origin
pKm	Cretaceous and pre-Cretaceous metamorphic formations of sedimentary and volcanic origin
gr	Granitic and other intrusive crystalline rocks of all ages. Includes Wilson Quartz Diorite (Wqd)
	Water

N

0 2300 4600

FEET

SOURCE: CH2M HILL (2014)

FIGURE 3.10-1

SR 710 North Project

Geologic Map

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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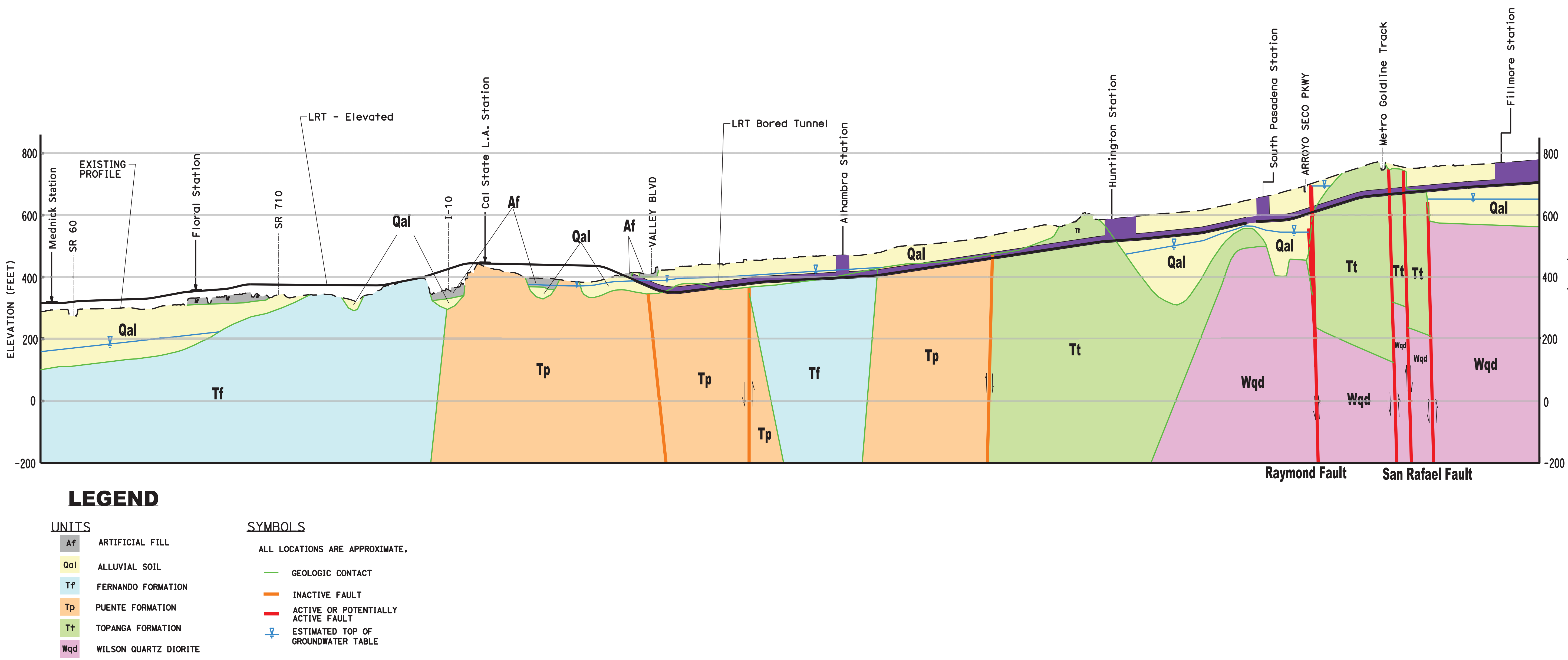

FIGURE 3.10-2

SR 710 North Project

Geologic Cross Section - LRT Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2014)

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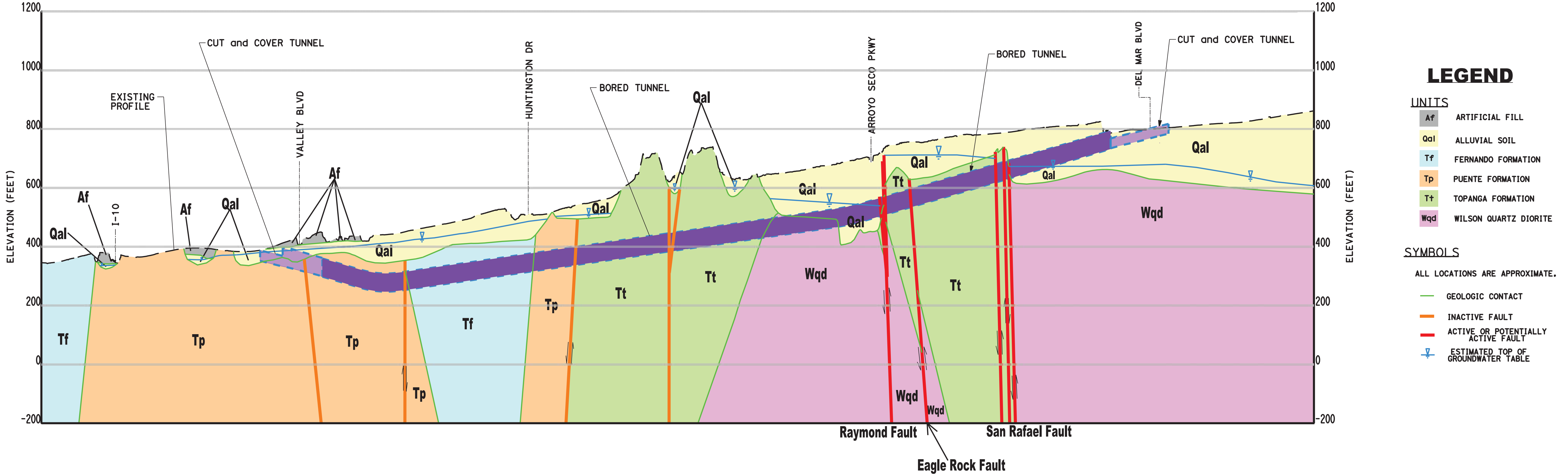

FIGURE 3.10-3

SR 710 North Project

Geologic Cross Section - Freeway Tunnel Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2014)

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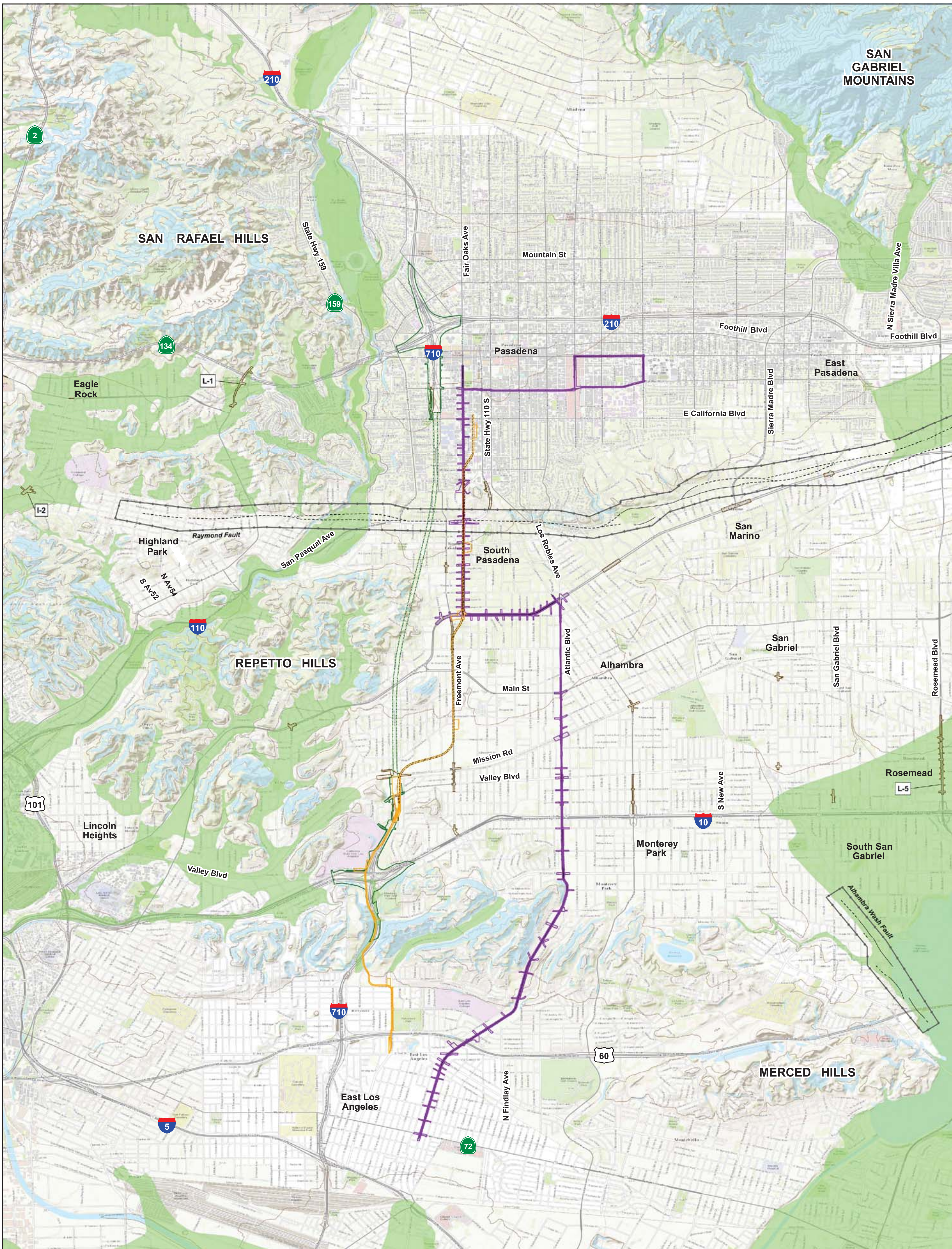

LEGEND

SR 710 North Project Alternative

- TSM/TDM Alternative, Potential Disturbance Limit (PDL)
- BRT Alternative PDL, with Centerline
- LRT Alternative PDL
- LRT Tunnel Zone of Potential Influence
- Freeway Tunnel Alternative PDL
- Freeway Tunnel Zone of Potential Influence

Alquist-Priolo Act Fault Zone
These are delineated as straight-line segments that connect encircled turning points so as to define special studies zone segments.

Liquefaction Zone
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Landslide Zone
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Fault
- Fault - Certain
- Fault - Inferred
- Fault - Concealed

Elevation Contour

N

0 2800 5600
FEET

SOURCE: CH2M HILL (2014)

FIGURE 3.10-4

SR 710 North Project
Geologic Hazard Zones

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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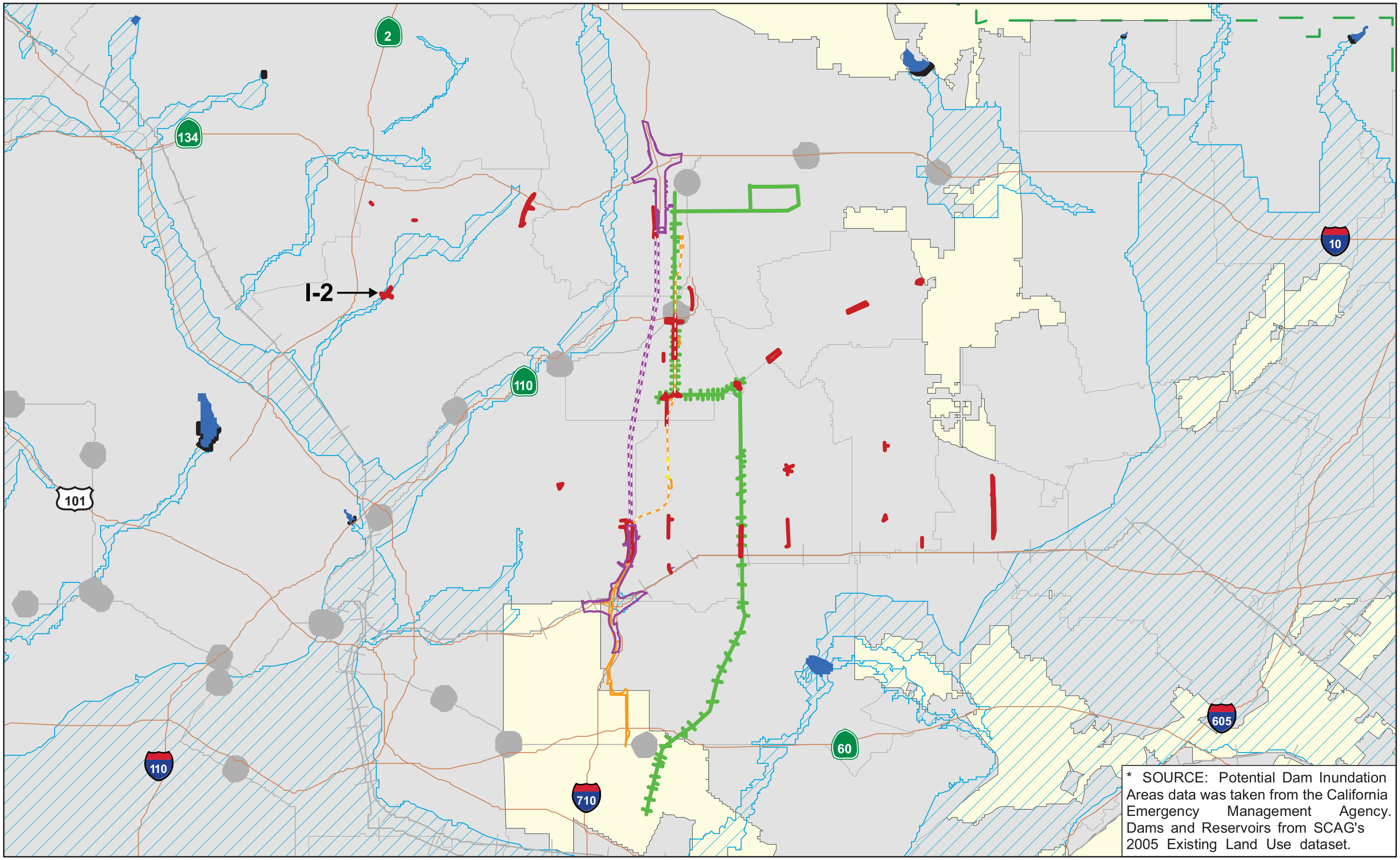

* SOURCE: Potential Dam Inundation Areas data was taken from the California Emergency Management Agency. Dams and Reservoirs from SCAG's 2005 Existing Land Use dataset.

Potential Dam Inundation Areas*
Dam*
Reservoirs*
Unincorporated Area
Cities
National Forest
Military Land
Freeways
Metrolink
Existing Metro Rail
TSM/TDM Alternative, Potential Disturbance Limit (PDL)
BRT Alternative PDL with Centerline
LRT Alternative PDL
LRT Tunnel Zone of Potential Influence
Freeway Tunnel Alternative PDL
Freeway Tunnel Zone of Potential Influence

0 1
MILES

SOURCE: CH2M HILL (2014)

FIGURE 3.10-5

SR 710 North Project

Dam Inundation Areas

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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3.11 Paleontology

3.11.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

23 United States Code (USC) 1.9(a) requires that the use of federal-aid funds must be in conformity with federal and state law.

23 United States Code (USC) 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA).

3.11.2 Affected Environment

The information in this section is based on the *Paleontological Identification and Evaluation Report* (PIR/PER) (2014) prepared for the project.

Paleontological resources (fossils) are defined as any trace of a past life form. While wood, bones, and shells are the most common fossils, under certain conditions soft tissues, tracks, and trails may be preserved as fossils. Fossils are most commonly found in sedimentary rock layers.

The area studied for each Build Alternative is referred to as the “project area.” The project area for each Build Alternative includes all areas where project activities will occur, such as new right of way (ROW) alignments, existing ROW, temporary construction easements, and signage.

3.11.2.1 Literature Review and Locality Search

The literature review included an examination of geologic maps of the project areas for the Build Alternatives and a review of relevant geological and paleontological literature to determine which geologic units are present within the project areas and whether fossils have been recovered from those or similar geologic units elsewhere in the region. As geologic units may extend over large geographic areas and contain similar lithologies and fossils, the literature review includes areas well beyond the project areas.

The purpose of a locality search is to establish the status and extent of previously recorded paleontological resources within and adjacent to the study area for a given project. In June 2013, a locality search was completed through the Natural History Museum of Los Angeles County (LACM). This search identified any vertebrate localities in the LACM records that exist within several miles of the project areas in the same or similar deposits.

The LACM has no records of vertebrate fossil localities within the boundaries of the project areas for the Build Alternatives. However, there are localities within 5 miles (mi) or less of these project areas from the same geologic units. The LACM states that all the geologic units that the project areas cross have the potential to contain scientifically significant paleontological remains, either at or below the surface. The LACM has four vertebrate localities in older Quaternary Alluvium near the project areas for the four alternatives. Within the marine Pliocene Fernando Formation, the LACM records four fossil vertebrate localities in downtown Los Angeles, about 5 mi west of the project areas for the Transportation System Management/Transportation Demand Management (TSM/TDM), Light Rail Transit (LRT), and Freeway Tunnel Alternatives and 6 mi west of the project area for the Bus Rapid Transit (BRT) Alternative. The LACM has numerous fossil localities throughout the Los Angeles Basin in the marine Miocene Puente Formation, which may also be referred to as the Modelo or Monterey Formation. The LACM has one vertebrate locality from the marine deposits of the Miocene Topanga Group less than 2 mi west of the project areas for the Build Alternative improvements at Figueroa Street and Colorado Boulevard.

Shallow (less than several feet) excavations in the Quaternary Alluvial Deposits found at the surface throughout most of the project areas are unlikely to uncover any scientifically significant vertebrate fossils. However, deeper excavations in the Quaternary Alluvial Deposits, as well as any excavations into exposures of the Fernando Formation, Puente Formation, or Topanga Group, have the potential to uncover scientifically significant vertebrate fossils. Therefore, the LACM believes that any substantial excavation within these deposits should be monitored by a paleontologist to quickly and professionally recover any fossils that may be present while not impeding development during grading within the project area. Any recovered fossils should be placed into an accredited scientific institution for the benefit of current and future generations.

3.11.2.2 Field Survey

Within all the project areas, exposures of native deposits are extremely limited because they lie within commercial or residential areas, most of which are either paved or disturbed from previous construction of buildings, streets, or freeways. This is particularly true for the TSM/TDM and BRT Alternatives' project areas, which involve modifications to the existing ROW. For the LRT and Freeway Tunnel Alternatives, large portions of the project areas are underground and not possible to inspect. Other portions at the surface follow active freeway ROW, which is also paved and disturbed from previous construction and is unsafe to inspect. For the abovementioned reasons, a field inspection of the Build Alternatives' project areas was not conducted as part of this report.

3.11.2.3 Geology

The project is located in the transition zone between the northern Peninsular Ranges Geomorphic Province and the south-central portion of the Transverse Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province is an approximately 900 mi long northwest-southeast-trending structural block that extends from the Transverse Ranges in the north to the tip of Baja California in the south and includes the Los Angeles Basin. This province is characterized by mountains and valleys that trend in a northwest-southeast direction, roughly parallel to the San Andreas Fault. The total width of the province is approximately 225 mi, extending from the Colorado Desert in the east, across the continental shelf, to the Southern Channel Islands (i.e., Santa Barbara, San Nicolas, Santa Catalina, and San Clemente). It contains extensive pre-Cretaceous (more than 145 million years ago [mya]) and Cretaceous (145 to 66 mya) igneous and metamorphic rock covered by limited exposures of post-Cretaceous (less than 66 mya) sedimentary deposits. The Transverse Ranges Geomorphic Province is characterized by steep mountains and valleys that trend in an east-west direction at an oblique angle to the northwest-southeast trend of the California coast, hence the name "Transverse." This type of trend is extremely rare elsewhere in the United States. Compression along the San Andreas Fault is squeezing and rotating the Transverse Ranges, making this area one of the most rapidly rising regions on earth. Tectonic activity in this province has also folded and faulted thick sequences of Cenozoic, organic-rich sedimentary rocks, making the area an important source for oil.

Within this larger region, the project borders the western edge of the San Gabriel Valley, running from north to south along the San Rafael Hills and through the Repetto Hills. These low-lying hills rise out of the Los Angeles Basin, separating the San Gabriel Valley from the rest of the Basin. They contain exposures of marine sedimentary rocks deposited in the ancient Los Angeles Basin approximately 16 to 2.6 mya. Combined, these deposits have a maximum thickness of 20,000 feet (ft); however, because they have been uplifted, folded, faulted, and partially eroded, the thickness and amount of exposure of each unit varies throughout the region. It is from these sedimentary rocks that most of the petroleum in the Los Angeles Basin has been produced, and for this reason, oil wells have been drilled throughout the San Rafael and Repetto Hills. Also present within the project area are sediments that eroded from the San Rafael Hills, Repetto Hills, and San Gabriel Mountains. These deposits accumulated in the valleys and range from approximately 800,000 to 10,000 years ago.

Geologic mapping indicates there may be eight geologic units present in the project areas of the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives: Holocene Alluvial Fan Deposits, Young Alluvial Fan Deposits, Young Alluvium, Old Alluvial Fan Deposits, Old Alluvium, Fernando Formation, Puente Formation, and Topanga Group. In addition, Artificial Fill likely occurs within the project areas along existing interstates, highways, and streets, where it was used during construction to adjust for changes in topography and for overpasses and interchanges. Each of these units is described briefly below and in Table 3.11.1.

Artificial Fill (Af)

Artificial Fill consists of sediments that have been removed from one location and transported to another by humans. The transportation distance can range from a few feet to dozens of miles. Composition is dependent on the source. When it is compacted and dense, it is known as “engineered fill,” but it can be unconsolidated and loosely compacted. Artificial Fill will sometimes contain modern debris such as asphalt, wood, bricks, concrete, metal, glass, plastic, and even plant material.

Depending on the area, the thickness of these deposits can range from less than 1 ft to several hundred feet. Only large areas of Artificial Fill have been mapped. Artificial Fill is not mapped within the project areas for the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives. However, Artificial Fill is likely present in portions of the project areas along existing interstates, highways, and streets, where it was used during their construction to adjust for changes in topography and for overpasses and interchanges.

Holocene Alluvial Fan Deposits (Qf)

The Holocene Alluvial Fan Deposits formed less than 11,700 years ago and consist of unconsolidated bouldery, cobbly, gravelly, sandy, or silty alluvial deposits on active and recently active alluvial fans and in some channel segments. These sediments were deposited by flooding streams and debris flows coming down from higher elevations and generally form a fan or lobe shape at the base of hills and mountains or in stream channels. These deposits are mapped in the northern portion of the project area for the Freeway Tunnel Alternative along the Arroyo Seco channel.

TABLE 3.11.1:
Geologic Units within the Project Areas for the Alternatives of the SR 710 North Project

<table>
<tr><th>Geologic Formation/Unit</th><th colspan="2">Map Symbol</th><th>Age (years ago)</th><th>Geologic Epoch</th></tr>
<tr><td>Artificial Fill</td><td colspan="2">Af (not mapped)</td><td>Less than 100</td><td>Holocene</td></tr>
<tr><td>Holocene Alluvial Fan Deposits</td><td colspan="2">Qf</td><td>Less than 11,700</td><td>Holocene</td></tr>
<tr><td>Young Alluvial Fan Deposits</td><td colspan="2">Qyf (undivided)</td><td>Less than 126,000</td><td>Late Pleistocene to Holocene</td></tr>
<tr><td>Young Alluvium</td><td colspan="2">Qyaa (undivided, sandy)</td><td>Less than 126,000</td><td>Late Pleistocene to Holocene</td></tr>
<tr><td>Old Alluvial Fan Deposits</td><td colspan="2">Qof (undivided)</td><td>781,000 to 11,700</td><td>Middle to Late Pleistocene</td></tr>
<tr><td rowspan="3">Old Alluvium</td><td rowspan="3">Qoa (undivided) and Qoaa (undivided, sandy)</td><td>Qoa3g (gravelly)</td><td>126,000 to 11,700</td><td>Late Pleistocene</td></tr>
<tr><td>Qoa2g (gravelly)</td><td>126,000 to 11,700</td><td>Late Pleistocene</td></tr>
<tr><td>Qoa1a (sandy)</td><td>781,000 to 126,000</td><td>Middle Pleistocene</td></tr>
<tr><td>Fernando Formation</td><td colspan="2">Tf3 (member 3)
Tf1 (member 1)</td><td>5.333 to 2.588 million</td><td>Pliocene</td></tr>
<tr><td rowspan="3">Puente Formation</td><td colspan="2">Tpnz (siltstone)</td><td>5.333 to 3.6 million</td><td>Early Pliocene</td></tr>
<tr><td colspan="2">Tpns (siliceous shale)</td><td>5.333 to 3.6 million</td><td>Early Pliocene</td></tr>
<tr><td colspan="2">Tpna (sandstone)</td><td>11.62 to 5.333 million</td><td>Late Miocene</td></tr>
<tr><td>Topanga Group</td><td colspan="2">Ttcg (conglomerate)
Tta (sandstone)
Ttz (siltstone)</td><td>15.97 to 11.62 million</td><td>Middle Miocene</td></tr>
</table>

Source: *Paleontological Identification and Evaluation Report* (2014).

Young Alluvial Fan Deposits (Qyf)

The Young Alluvial Fan Deposits are Late Pleistocene to Holocene in age (less than 126,000 years ago) and consist of unconsolidated gravel, sand, and silt with occasional cobbles and boulders near mountain fronts. These sediments were deposited by flooding streams and debris flows coming down from higher elevations and generally form a fan or lobe shape at the base of hills and mountains. In some areas, the surfaces can show slight to moderate soil development.

These deposits are mapped in all the project areas, predominantly in the southern portions. In the TSM/TDM Alternative, these deposits are mapped around the improvements along Figueroa Street from Colorado Boulevard to State Route 134 (SR 134), at the intersection of Valley Boulevard and South Del Mar Avenue, and along San Gabriel Boulevard and Rosemead Boulevard just north of Interstate 10 (I-10). In the project area for the BRT Alternative, they are mapped along Atlantic Boulevard between Brightwood Drive and Floral Drive, as well as between Pomona Boulevard and East Beverly Boulevard. In the project areas for the LRT and Freeway Tunnel Alternatives, these deposits are found along Interstate 710 (I-710) from the interchange at I-10 south to Floral Drive.

Young Alluvium (Qyaa)

The deposits of Young Alluvium are Late Pleistocene to Holocene in age (less than 126,000 years ago) and consist of unconsolidated and generally friable silt, sand, and gravel that were deposited by streams. In some areas, the surfaces of these deposits can show slight to moderate soil development. Young Alluvium is mapped in the project area for the TSM/TDM Alternative around the improvement at the intersection of West Broadway and Colorado Boulevard.

Old Alluvial Fan Deposits (Qof)

Similar to the Young Alluvial Fan Deposits, the Old Alluvial Fan Deposits consist of gravel, sand, and silt deposited by flooding streams and debris flows coming down from higher elevations. However, these deposits are slightly to moderately consolidated and older, ranging in age from the Middle to Late Pleistocene (781,000 to 11,700 years ago). Some surfaces show increased soil development and are dissected by erosional gullies. These sediments were deposited contemporaneously with the Old

Alluvial Fan Deposits but are distinguished by their visible fan or lobe shape near the base of hills and mountains.

These deposits are mapped within the project areas for all the alternatives. Most of the improvements within the project area for the TSM/TDM Alternative are within areas mapped as Old Alluvial Fan Deposits, including improvements in the Cities of South Pasadena, Alhambra, Monterey Park, San Marino, San Gabriel, and Rosemead. Similarly, these deposits are mapped within most of the project area for the BRT Alternative, from Pasadena to Monterey Park, including portions of the route along East Colorado Boulevard, Del Mar Boulevard, Fair Oaks Avenue, Huntington Drive, and Atlantic Boulevard. Within the project areas for the LRT and Freeway Tunnel Alternatives, these deposits are mapped at the surface roughly from the Arroyo Seco Parkway (State Route 110 [SR 110]) in the north to Hellman Avenue in the south, and they may be encountered at or below the surface along different segments of the alignments. For the LRT Alternative, the deposits may be encountered during excavation of the maintenance yard; the Mednik, Floral, Alhambra, Huntington, and South Pasadena Stations; the aerial segment from East 3rd Street to Floral Drive and Hellman Avenue to Valley Boulevard; the tunnel section from Valley Boulevard to Alhambra Road and Huntington Drive to SR 110 (Arroyo Seco Parkway); and during widening of Mednik Avenue between 1st Street and Floral Drive. For the Freeway Tunnel Alternative, the deposits may be encountered below the surface in the cut-and-cover tunnel segment at the south portal near Valley Boulevard and in the bored tunnel segment from Monterey Road to the Arroyo Seco Parkway (SR 110).

Old Alluvium (Qoa, Qoaa, Qoa1a, Qoa2g, Qoa3g)

The Old Alluvium deposits are comprised of unconsolidated to moderately indurated brown to reddish-brown gravel, sand, and silt deposited by streams during the Middle to Late Pleistocene (781,000 to 11,700 years ago). Surfaces are dissected by erosional gullies and show some soil development, including a distinctive reddish “B” soil horizon that can be recognized in some areas. Three informal geologic units (Units 1, 2, and 3) have been mapped to divide these deposits where they could be distinguished based on relative terrace levels. Deposits that could not be easily distinguished are mapped as Qoa for undivided Old Alluvium. Qoa3g belongs to Unit 3, the youngest of the three subunits where they can be distinguished. It is Late Pleistocene (126,000 to 11,700 years ago) in age and predominantly composed of gravel. Qoa2g is also a gravelly unit and dates to the Late Pleistocene (126,000 to 11,700 years ago), but it is older than Unit 3. Unit 1, the oldest of the three subunits, contains the Qoa1a deposits, which are mainly sand and were deposited in the Middle Pleistocene (781,000 to 126,000 years ago).

Old Alluvium is mapped within the project areas for all the alternatives. Within the project area for the TSM/TDM Alternative, these deposits are mapped at the intersection of Eagle Rock Boulevard and Colorado Boulevard, along St. John Avenue, and along the Arroyo Seco Parkway (SR 110). In the BRT Alternative, they are mapped in the north along Fair Oaks Avenue from Del Mar Boulevard to the Arroyo Seco Parkway (SR 110). For the LRT Alternative, Old Alluvium is mapped at the surface at the northern end of the project area, from California Boulevard to the Arroyo Seco Parkway (SR 110). The deposit would also be encountered below the surface from approximately Fillmore Street to Glenarm Street and during excavation for the Fillmore Street Station. For the Freeway Tunnel Alternative, these deposits are mapped at the northern end of the project area from the State Route 710 (SR 710)/SR 134/Interstate 210 (I-210) interchange to the Arroyo Seco Parkway (SR 110), and they would be encountered in the cut-and-cover and bored segments of the tunnel from approximately Del Mar Boulevard to Bellefontaine Street.

Fernando Formation (Tf1, Tf3)

The Fernando Formation is mapped in the Monterey Park area of the Repetto Hills and in the hills of the Highland Park area. Its massive siltstone, sandstone, and pebbly conglomerate were deposited in deep to shallow marine environments during the Pliocene (5.333 to 2.588 mya). This formation is distributed widely in the subsurface of the Los Angeles Basin, and has produced oil in the Puente and Coyote Hills to the southeast. It is exposed in the Santa Ana Mountains and correlates with the Capistrano and Niguel Formations of coastal Orange County. In the vicinity of the project areas, three informal members of the Fernando Formation, labeled 1, 2, and 3, have been mapped.

The oldest member (Tf1) is a massive, light gray siltstone. The middle member (Tf2) is a massive, fine- to medium-grained, brown sandstone. The youngest member (Tf3) is a light to reddish-brown, coarse pebble conglomerate. Deposition of these sediments began in a deep marine environment, with water depths greater than 4,000 ft. Over time, this area became progressively shallower, and the coarser-grained sandstones and conglomerates of the upper members were deposited in waters less than 600 ft deep. The formation increases in thickness from west to east, reaching a maximum of 6,000 ft in the Monterey Park area of the Repetto Hills. Only the oldest (Tf1-siltstone) and youngest (Tf3-conglomerate) members are mapped in the project areas for the BRT, LRT, and Freeway Tunnel Alternatives.

The Fernando Formation is mapped at the surface in a small portion of the southern end of project area for the BRT Alternative along Atlantic Boulevard from West El Repetto Drive to Cadiz Street. For the LRT and Freeway Tunnel Alternatives, this formation is mapped at the surface from the SR 710/I-10 interchange north to Mission Road. For the LRT Alterative, the Fernando Formation may also be encountered below the surface during excavation for the aerial segment from Corporate Center Drive to the SR 710/I-10 interchange, in the bored tunnel segment from approximately Meridian Avenue to Commonwealth Avenue, and for the Alhambra Station. This formation may also be reached at the surface during grading for construction of a mechanically stabilized earth embankment that will support the aerial segment in the area south of the SR 710/I-10 interchange. For the Freeway Alternative, these deposits may be encountered below the surface during excavation of the bored tunnel segment from approximately Norwich Avenue to Huntington Drive.

Puente Formation (Tpnz, Tpns, Tpna)

Originally named for exposures in the Puente Hills, the Puente Formation in the Repetto Hills is comprised of over 2,000 ft of marine siltstone, sandstone, and shale deposited during the Late Miocene to Early Pliocene (11.62 to 3.6 mya). In the Repetto Hills area, rock type was used to map four non-sequential, interbedded units, which have not been specifically correlated with formal members identified elsewhere in Los Angeles and Orange Counties. Subsequently, these four units were consolidated into the three (Tpnz, Tpns, and Tpna) that are mapped in the project areas for the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives.

Rocks mapped as Tpnz consist of Early Pliocene (5.333 to 3.6 mya) well-bedded, light gray siltstone. These beds are thickest in the youngest part of the formation, while older sediments are interbedded with those of the underlying rock type. Also deposited in the Early Pliocene (5.333 to 3.6 mya) is the light gray, siliceous shales and siltstones labeled Tpns, which contain thin, discontinuous beds of fine- to coarse-grained sandstone. Lastly, the brown to light gray, very fine- to very coarse-grained sandstones mapped as Tpna contain discoidal concretions in some places and are slightly older, having been deposited in the Late Miocene (11.62 to 5.333 mya).

Rocks of the Puente Formation in this area show deformation structures typical of slumping and sliding that occurred as they were being deposited, evidence that these sediments formed as part of the southeast lobe of the Tarzana submarine fan recognized in the Santa Monica Mountains. This submarine fan developed as sediments eroded off the coast to the northwest and accumulated at the mouth of a submarine canyon in water several thousand feet deep. After these rocks were deposited, they were uplifted, folded, and faulted, factors that along with their compositional properties have allowed them to trap oil. Oil wells have been drilled into this formation around the Los Angeles Basin and in the Repetto Hills near the project area, but most of the production has come from the Puente Hills.

Within the project area for the TSM/TDM Alternative, the Puente Formation is mapped at the surface only in a very small portion of the improvement at the SR 710/Valley Boulevard intersection. Similarly, within the project area for the BRT Alternative, this formation is mapped at the surface in a small area near the intersection of Atlantic Boulevard and West Garvey Avenue. These deposits are mapped at the surface in the project areas for the LRT and Freeway Tunnel Alternatives around California State University, Los Angeles (Cal State LA) near the SR 710/I-10 interchange, and the deposits may also be encountered below the surface during excavation of the aerial segment from the SR 710/I-10 interchange north to Valley Boulevard, the excavation of the Cal State LA Station, and in the tunnel segment from Valley Boulevard to Mission Road and from Commonwealth Avenue to Main Street. For the Freeway Tunnel Alternative, the formation may be encountered in the cut-and-cover tunnel segment around Valley Boulevard and in the bored tunnel segment from approximately Valley Boulevard to Norwich Avenue and from Huntington Drive to Newtonia Drive.

Topanga Group (Ttcg, Tta, Ttz)

The Topanga Group in the project area includes conglomerate, sandstone, siltstone, and shale deposited in a marine environment in the Middle Miocene (15.97 to 11.62 mya). The “Topanga Formation” was first mapped in the Santa Monica Mountains, and it has since been correlated with deposits throughout the Los Angeles Basin, as well as in the Santa Ana Mountains and San Joaquin Hills in Orange County.

In the Repetto Hills area, these rocks were designated as the Topanga Group and then mapped as three informal subunits based on rock type. The Ttcg subunit is a light brown conglomerate that forms distinct beds in the southeast, but is massive and without visible beds in the northwest. Rocks labeled Tta consist of light brown and gray, medium- to coarse-grained sandstone that forms visible layers. And Ttz designates medium to dark brown siltstone with interbedded sandstone, shale, and chert. All three subunits are composed of sediment carried from land to the northwest and deposited in shallow to deep water on the slopes of the ancient Los Angeles Basin.

Within the project area for the TSM/TDM Alternative, the Topanga Group is mapped along Arroyo Seco Parkway (SR 110) and along Figueroa Street just south of SR 134. Within the project area for the BRT Alternative, these deposits are mapped in small areas off Fair Oaks Avenue, including Mound Avenue, State Street, Raymond Hill Drive, and Grave Walk. In the project area for the LRT Alternative, deposits of the Topanga Group are mapped around Huntington Drive and just north of the Arroyo Seco Parkway (SR 110), and may also be encountered below the surface during excavation for the Huntington Street Station, as well as in the tunnel segment from approximately Main Street north to Huntington Drive and from Arroyo Seco Parkway (SR 110) to Glenarm Street. For the Freeway Tunnel Alternative, these deposits are mapped at the surface from Alhambra Road to Monterey Road and may be encountered below the surface during excavation for the bored tunnel segments from approximately Newtonia Drive to Monterey Road and from Arroyo Seco Parkway (SR 110) to Bellefontaine Street.

3.11.2.4 Paleontological Sensitivity

A formation or rock unit has paleontological sensitivity or the potential for scientifically significant paleontological resources if it previously has produced, or is capable of preserving, vertebrate fossils and associated or regionally uncommon invertebrate or plant fossils. All sedimentary rocks, certain volcanic rocks, and mildly metamorphosed rocks are considered to have potential for paleontological resources.

As discussed above, formations with potential paleontological resources are located within the project areas for the Build Alternatives. The scientific significance of a resource is often referred to as the “sensitivity” or “potential.” In most cases, decisions about how to manage paleontological resources must be based on the potential because the actual situation cannot be known until construction excavation for the project is underway. Paleontological scientific significance may also be stated for a particular rock unit, predicated on the research potential of fossils suspected to occur in that unit. Caltrans and the Society of Vertebrate Paleontology (SVP) each have a ranking system to describe paleontological sensitivity, both of which are included here.

Caltrans Ranking System for Paleontological Sensitivity

The sensitivity of rock units and formations that may contain paleontological resources is assessed on the basis of high, low, or no potential for paleontological resources:

- **High Potential:** Rock units which, based on previous studies, contain or are likely to contain scientifically significant vertebrate, invertebrate, or plant fossils. These units include, but are not limited to, sedimentary formations that contain scientifically significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. These units may also include some volcanic and low-grade metamorphic rock units. Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., tar pits and caves) are given special consideration and ranked as highly sensitive. High sensitivity includes the potential for containing: (1) abundant vertebrate fossils; (2) a few scientifically significant fossils (large or small vertebrate, invertebrate, or plant fossils) that may provide new and scientifically significant taxonomic, phylogenetic, ecologic, and/or stratigraphic data; (3) areas that may contain datable organic remains older than Recent, including Neotoma (sp.) middens; and/or (4) areas that may contain unique new vertebrate deposits, traces, and/or trackways. Areas with a high potential for containing scientifically significant paleontological resources require monitoring and mitigation.
- **Low Potential:** This category includes sedimentary rock units that: (1) are potentially fossiliferous, but have not yielded scientifically significant fossils in the past; (2) have not yet yielded fossils, but possess a potential for containing fossil remains; or (3) contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood. Sedimentary rocks expected to contain vertebrate fossils are not placed in this category because vertebrates are generally rare and found in more localized strata. Rock units designated as low potential generally do not require monitoring and mitigation. However, as excavation for construction gets underway, it is possible that new and unanticipated paleontological resources might be present. If this occurs, a Construction Change Order (CCO) must be prepared in order to have a qualified Principal Paleontologist evaluate the

resource. If the resource is determined to be scientifically significant, monitoring and mitigation are required.

- **No Potential:** Rock units of intrusive igneous origin, most extrusive igneous rocks, and moderately to highly metamorphosed rocks are classified as having no potential for containing scientifically significant paleontological resources. For projects encountering only these types of rock units, paleontological resources can generally be eliminated as a concern when the Preliminary Environmental Analysis Report (PEAR) is prepared and no further action taken.

Society of Vertebrate Paleontology

According to the SVP, paleontological potential is the potential for the presence of scientifically significant, nonrenewable paleontological resources. All sedimentary rocks, some volcanic rocks, and some metamorphic rocks have potential for the presence of scientifically significant, nonrenewable paleontological resources, and review of available literature may further refine the potential of each rock unit, formation, or facies. The SVP has four categories of potential, or sensitivity: High, Low, None, and Undetermined. If a geographic area or geological unit is classified as having undetermined potential for paleontological resources, studies must be undertaken to determine whether that rock unit has a sensitivity of either High, Low, or None. These categories are described in more detail below.

- **High Sensitivity:** Rock units from which vertebrate or scientifically significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional scientifically significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ashes or tephras), some low-grade metamorphic rocks that contain scientifically significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones). Paleontological potential consists of both: (a) the potential for yielding abundant or scientifically significant vertebrate fossils or for yielding a few scientifically significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils; and (b) the importance of recovered evidence for new and scientifically significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units that contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways, are also classified as having high potential.
- **Low Potential:** Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have a low potential for yielding scientifically significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus, fossils are only preserved in rare circumstances; the presence of fossils is the exception, not the rule (e.g., basalt flows or Recent colluvium). Rock units with low potential typically will not require impact mitigation measures to protect fossils.
- **No Potential:** Some rock units have no potential to contain scientifically significant paleontological resources (e.g., high-grade metamorphic rocks [such as gneisses and schists] and plutonic igneous rocks [such as granites and diorites]). Rock units with no potential require no protection or impact mitigation measures relative to paleontological resources.

- **Undetermined Potential:** Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine whether these rock units have high or low potential to contain scientifically significant paleontological resources. A field survey by a qualified professional to specifically determine the paleontological resource potential of these rock units is required before a Paleontological Resources Impact Mitigation Program (PRIMP) can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.

3.11.2.5 Paleontological Sensitivity within the Project Areas for the Build Alternatives

Generally, scientifically significant paleontological resources are geologic sites or sedimentary deposits containing individual fossils or assemblages of fossils that are unique or unusual, are stratigraphically important, and add to the existing body of knowledge in specific areas, stratigraphically, taxonomically, or regionally. All vertebrate fossils are classified as "significant." These fossils found undisturbed and not subjected to disturbance after their initial burial and fossilization are particularly important as they provide information for interpretation of tectonic events, past climates, the relationship between aquatic and terrestrial species, and evolution in general.

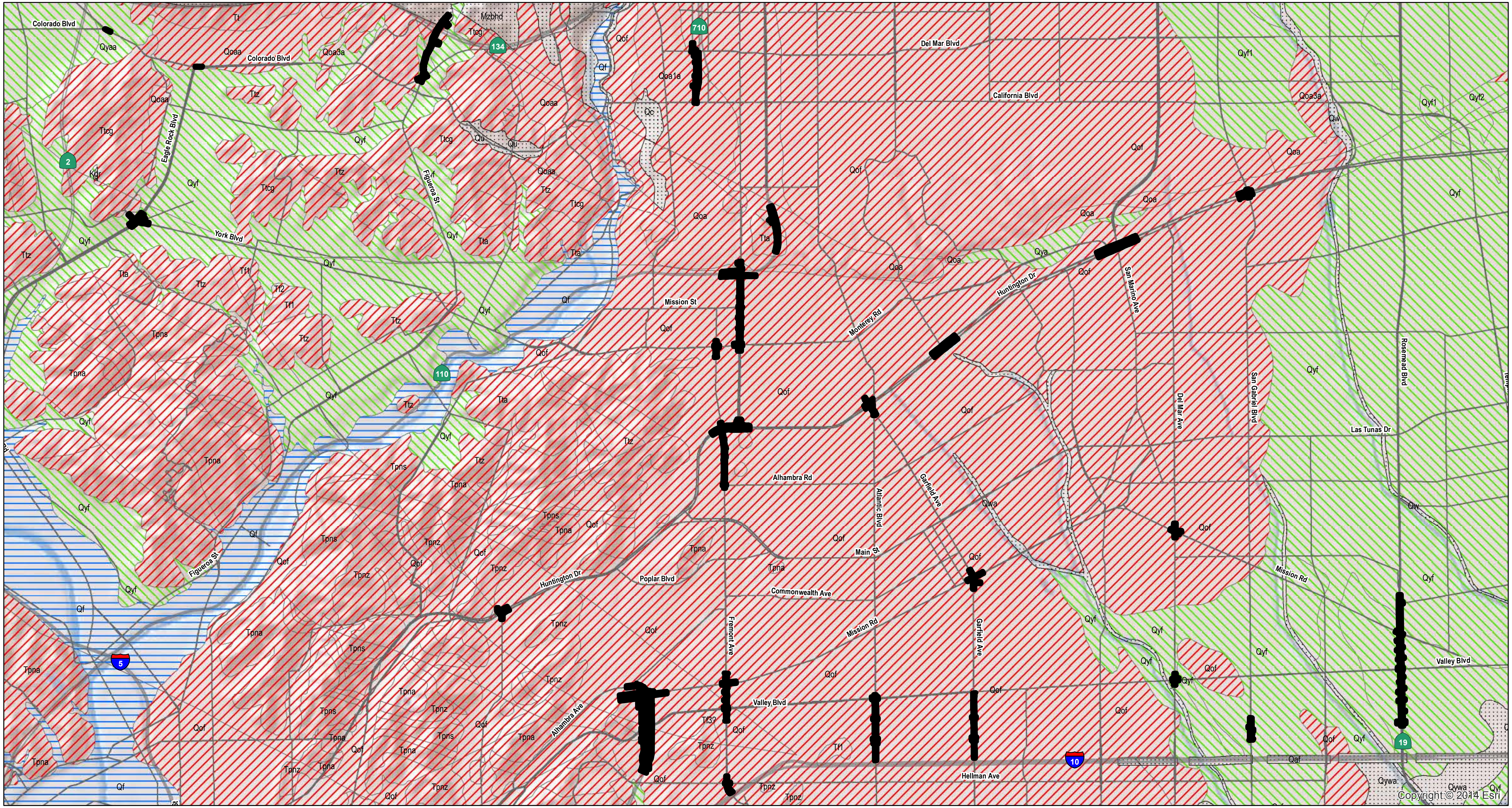
The project areas for the Build Alternatives would cross eight geologic units that were deposited between approximately 16 mya and the present. Figures 3.11-1 through 3.11-4 present the paleontological sensitivity within the Build Alternatives' project areas.

Table 3.11.2 summarizes the specific sensitivities for units within the project areas of the Build Alternatives and lists the Paleontological Sensitivity/Potential ranking system used by Caltrans and the SVP.

TABLE 3.11.2:
Paleontological Sensitivity/Potential of Geologic Units

Geologic Unit	Paleontological Sensitivity/Potential
Artificial Fill	No
Holocene Alluvial Fan Deposits	No
Young Alluvial Fan Deposits	Low – Above a depth of 10 feet High – Below a depth of 10 feet
Young Alluvium	Low – Above a depth of 10 feet High – Below a depth of 10 feet
Old Alluvial Fan Deposits	High
Old Alluvium	High
Fernando Formation	High
Puente Formation	High
Topanga Group	High

Source: *Paleontological Identification and Evaluation Report* (2014).



LEGEND

TSM/TDM Alternative Local Street and Intersection Improvements Project Area

Paleontological Sensitivity

High

Low - Above a depth of 10 feet, High - Below a depth of 10 feet

Low

Not Applicable

0 1650 3300
FEET

SOURCE: ESRI (2008); Yerkes and Campbell (2005)

FIGURE 3.11-1

SR 710 North Project

TSM/TDM Alternative Local Street and Intersection Improvements Project Area Paleontological Sensitivity

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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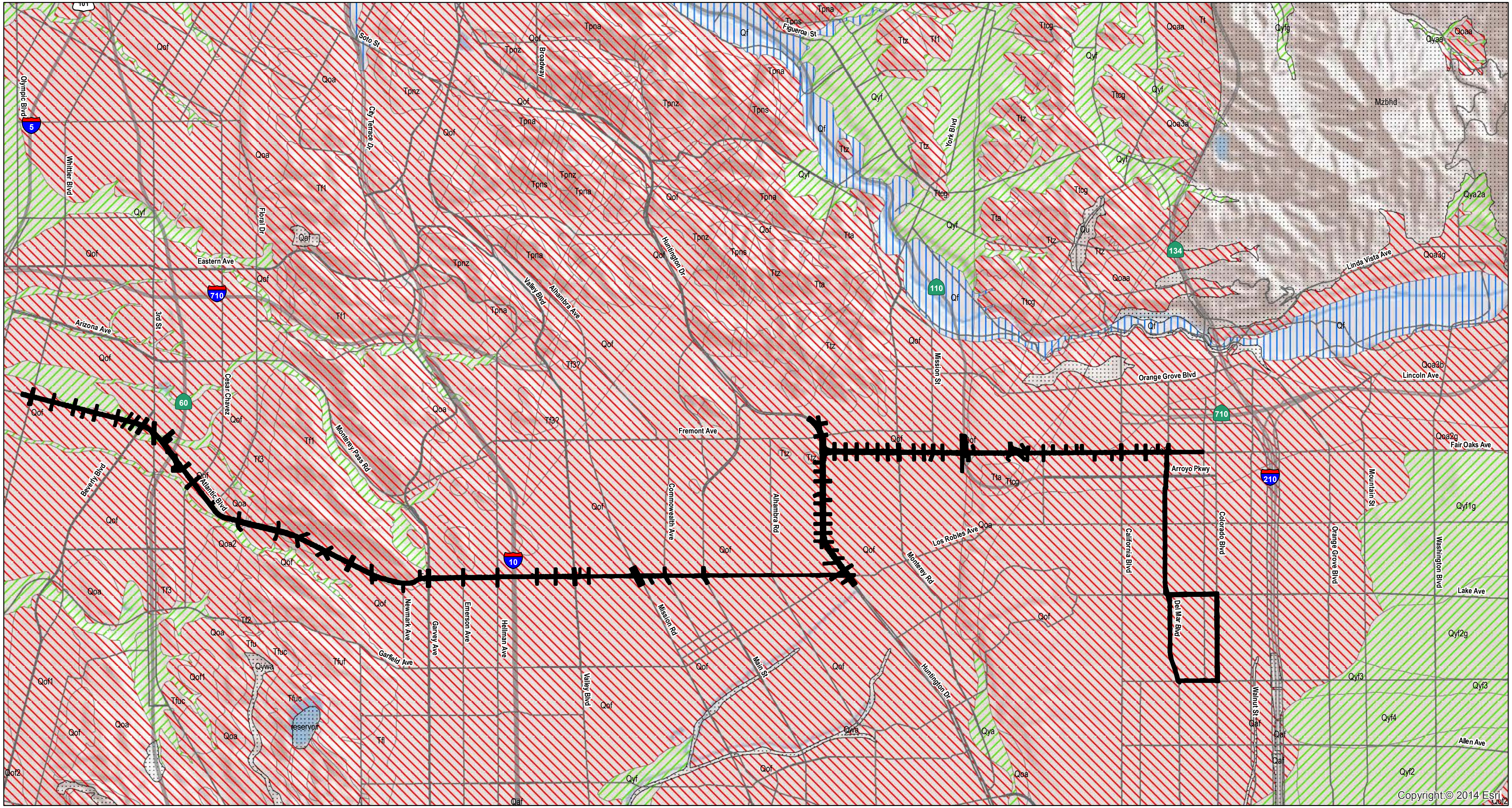

FIGURE 3.11-2

LEGEND

BRT Alternative Project Area

Paleontological Sensitivity

High

Low - Above a depth of 10 feet, High - Below a depth of 10 feet

Low

Not Applicable

0 1800 3600
FEET

SOURCE: ESRI (2008);Yerkes and Campbell (2005)

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SR 710 North Project

BRT Alternative Project Area Paleontological Sensitivity

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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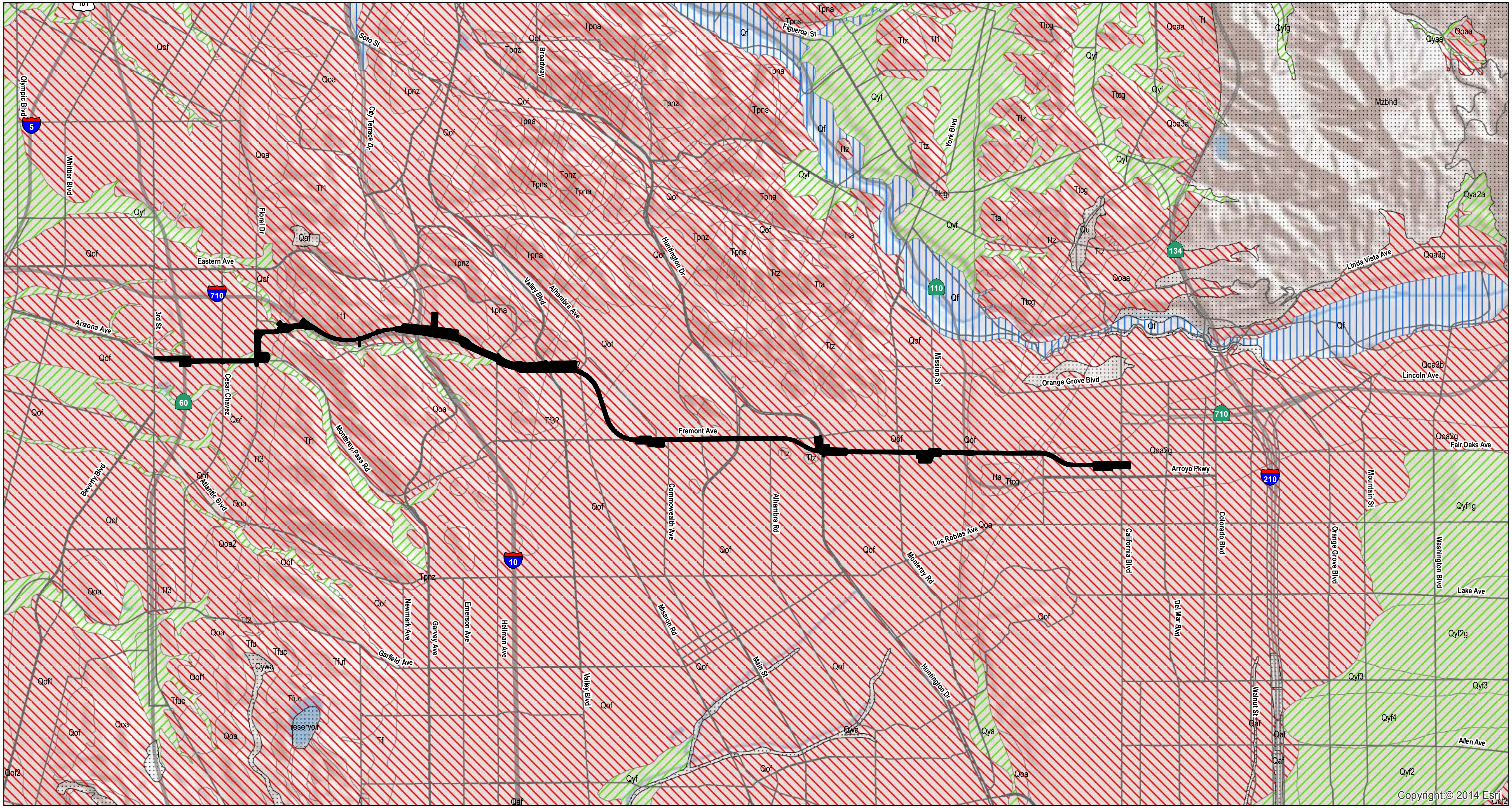

LEGEND

LRT Alternative Project Area

Paleontological Sensitivity

High

Low - Above a depth of 10 feet, High - Below a depth of 10 feet

Low

Not Applicable

0 1800 3600
FEET

SOURCE: ESRI (2008);Yerkes and Campbell (2005)

I:\CHM1105\GIS\MXD_EIR_EIS\Chapter_3\Paleo\Sensitivity_LRT.mxd (1/12/2018)

FIGURE 3.11-3

SR 710 North Project

LRT Alternative Project Area Paleontological Sensitivity

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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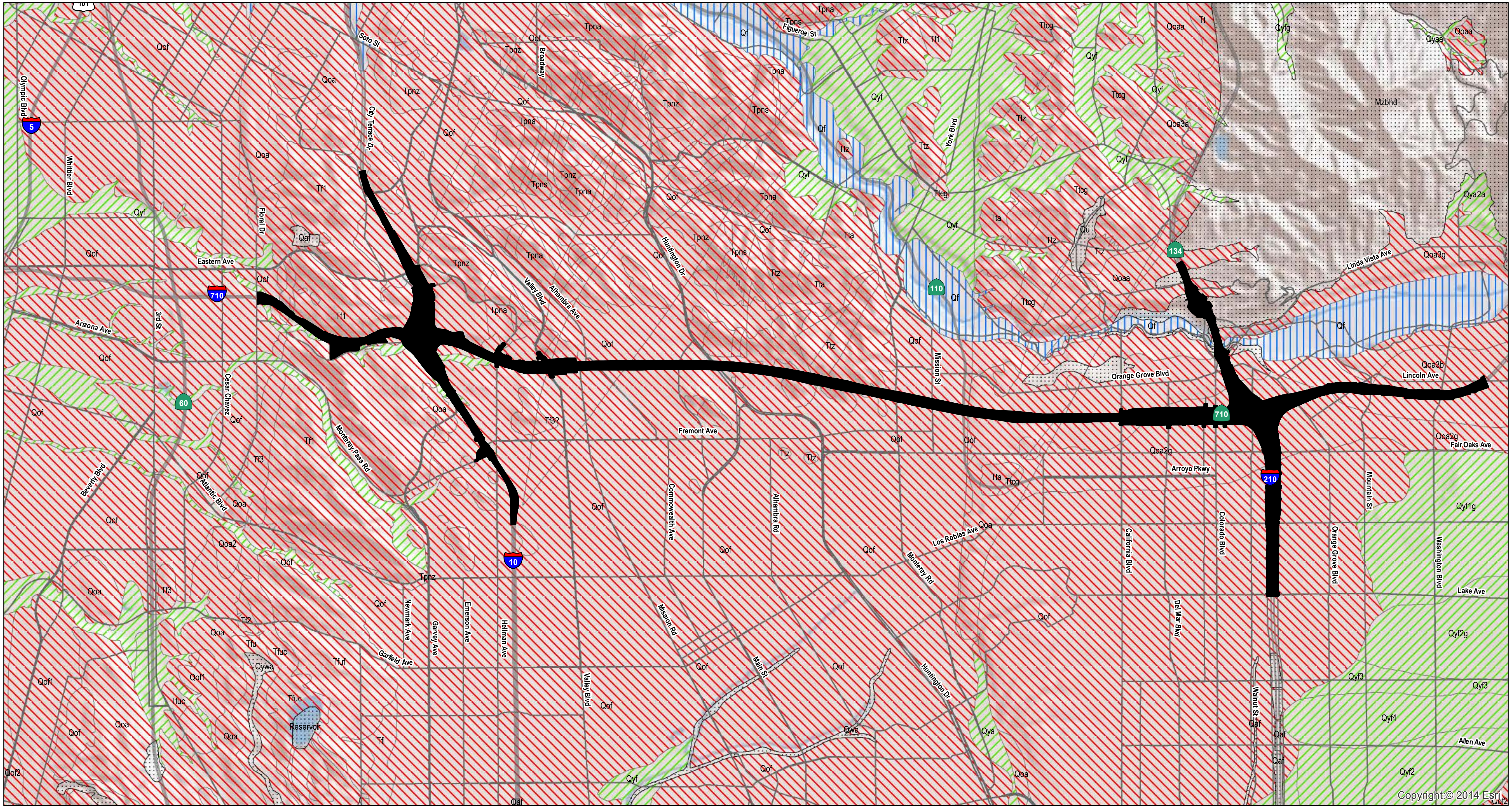

LEGEND

Freeway Tunnel Alternative Alignment

Paleontological Sensitivity

High

Low - Above a depth of 10 feet, High - Below a depth of 10 feet

Low

Not Applicable

0 1800 3600
FEET

SOURCE: ESRI (2008);Yerkes and Campbell (2005)

I:\CHM1105\GIS\MXD_EIR_EIS\Chapter_3\Paleo\Sensitivity_FwyTunnel.mxd (1/12/2018)

FIGURE 3.11-4

SR 710 North Project

Freeway Tunnel Alternative Project Area Paleontological Sensitivity

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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Artificial Fill

Artificial Fill can contain fossils, but these fossils have been removed from their original location. Because these fossils are out of context, they are not considered important for scientific study. As a result, Artificial Fill is considered to have no paleontological sensitivity.

Holocene Alluvial Fan Deposits

The Holocene Alluvial Fan Deposits are less than 11,700 years old. Any fossils recovered from these deposits would be conspecific with modern species and therefore not considered to be scientifically significant fossils. As a result, these deposits are identified as having no paleontological sensitivity.

Young Alluvial Fan Deposits

The Young Alluvial Fan Deposits are Late Pleistocene to Holocene in age (less than 126,000 years ago), and fossils are known in similar age deposits from scientific research as well as from excavations for roads, housing developments, and quarries within the Southern California area. Examples of these fossils include bison, camels, saber-toothed cats, dire wolves, ground sloths, horses, rodents, reptiles, birds, and fish, as well as invertebrates and plants. There is a potential to encounter these types of fossils in the older sediments within this unit below a depth of approximately 10 ft. Any vertebrate, invertebrate, and plant fossils recovered would be considered scientifically significant because they would add to our understanding of the environment in this area over the last 126,000 years, as well as the evolution of the animals and plants that lived here. Therefore, these deposits are assigned a low paleontological sensitivity above a depth of 10 ft and a high sensitivity below 10 ft.

Young Alluvium

The deposits of Young Alluvium are Late Pleistocene to Holocene in age (less than 126,000 years ago), and fossils are known in similar age deposits from scientific research as well as from excavations for roads, housing developments, and quarries within the Southern California area. Examples of these fossils include bison, camels, saber-toothed cats, dire wolves, ground sloths, horses, rodents, reptiles, birds, and fish, as well as invertebrates and plants. There is a potential to encounter these types of fossils in the older sediments within this unit below a depth of 10 ft, and any vertebrate, invertebrate, and plant fossils recovered would be considered scientifically significant because they would add to the understanding of the environment and biological evolution over the last 126,000 years. Young Alluvium is therefore assigned a low paleontological sensitivity above a depth of 10 ft and a high sensitivity below 10 ft.

Old Alluvial Fan Deposits

The Old Alluvial Fan Deposits formed during the Middle to Late Pleistocene (781,000 to 11,700 years ago), and fossils are known in similar age sediments from scientific research as well as from excavations for roads, housing developments, and quarries within the Southern California area. Mammoths are perhaps the best-known fossil from the Pleistocene epoch, and remains of large mammals such as camels, saber-toothed cats, dire wolves, ground sloths, and horses have been found in these sediments. Smaller vertebrates like birds, rodents, reptiles, and fish as well as invertebrates and plants have also been found in Pleistocene sediments and help describe climatic and habitat conditions during this epoch. There is a potential to encounter these types of fossils in the Old Alluvial Fan Deposits in the project areas. Any vertebrate, invertebrate, and plant fossils recovered from these deposits would be considered scientifically significant because they would add to our understanding of the environment of this area during the Pleistocene and the evolution of the animals and plants that lived there. Therefore, these deposits are assigned a high paleontological sensitivity.

Old Alluvium

The Old Alluvium deposits accumulated during the Middle to Late Pleistocene (781,000 to 11,700 years ago). Fossils are known in similar age deposits from scientific research as well as from excavations for roads, housing developments, and quarries within the Southern California area. Mammoths are perhaps the best-known fossil from the Pleistocene epoch, and remains of other large mammals such as camels, saber-toothed cats, dire wolves, ground sloths, and horses have been found in these sediments. Smaller vertebrates like birds, rodents, reptiles, and fish as well as invertebrates and plants have also been found in Pleistocene sediments and help describe climatic and habitat conditions during this epoch. There is a potential to encounter these types of fossils in the Old Alluvium deposits in the project areas, and any vertebrate, invertebrate, and plant fossils recovered from these deposits would be considered scientifically significant because they would add to our understanding of the environment and biological evolution during the Pleistocene. Therefore, Old Alluvium is assigned a high paleontological sensitivity.

Fernando Formation

The shallow to deep marine siltstones, sandstones, and pebbly conglomerates of the Pliocene (5.333 to 2.588 mya) Fernando Formation are known to be fossiliferous throughout Los Angeles and Orange Counties. Near the project area, marine fossils have been recovered, including brachiopods, bivalves, gastropods, and shark teeth. Five localities from the Fernando Formation and from the Santa Ana Mountains contain remains of gastropods, bivalves, and barnacles. The marine sediments of the Fernando Formation in the project areas have the potential to yield similar fossils. By producing both vertebrate and invertebrate fossils from shallow to deep marine environments, these deposits provide information for studies on the biological evolution, biostratigraphy, and paleoecology of this region. Therefore, these fossils are considered scientifically significant, and because these deposits have the potential to yield scientifically significant paleontological resources, they are given a high sensitivity rating.

Puente Formation

Scientifically significant paleontological resources have been recovered from the Late Miocene to Early Pliocene (11.62 to 3.6 mya) sandstones, siltstones, and shales of the Puente Formation. Near the project areas, marine fossils have been recovered, including fish, marine mammals (mostly whales), invertebrates such as bivalves, gastropods, and barnacles, plants, hexactinellid sponges, and shrimp and crabs. The marine sediments of the Puente Formation in the project areas are similar to those found in other areas where this formation is mapped and therefore have the potential to yield similar fossils, which would be useful for taxonomic, evolutionary, and paleoecological studies. Moreover, because these rocks record depositional and tectonic changes that occurred in the Los Angeles Basin through the Late Miocene to Early Pliocene, fossils recovered from this area could be beneficial for biostratigraphic studies and for correlating geologic units across the basin. This information would ultimately present a clearer, more complete picture of the geologic history of Southern California. Because these deposits have the potential to yield scientifically significant paleontological resources, they are given a high sensitivity rating.

Topanga Group

The sandstones, siltstones, and shales of the Topanga Group are known to be fossiliferous and to record the marine life that existed in the ancient Los Angeles Basin during the Middle Miocene (15.97 to 11.62 mya). Fifteen genera of fish were reported from the Topanga Group in the Repetto and Elysian Hills, six of which were from four localities within 1 mi of the project areas. In addition, many marine fossils have been recovered near the project area, including bivalves, gastropods, foraminifera, plants, echinoids, barnacles, crabs, invertebrates, plants, and vertebrates like sharks, whales, sea cows, and sea lions. The marine sediments of the Topanga Group in the project areas have the potential to yield invertebrate and vertebrate fossils similar to those found in other areas where this group is mapped. In addition, fossils recovered from these areas could be beneficial for biostratigraphic studies and for correlating geologic units across the basin, which could ultimately present a clearer, more complete picture of the geologic history of Southern California. As such, fossils from the Topanga Group are considered scientifically significant, and these deposits are given a high sensitivity rating.

3.11.2.6 Scientifically Significant Paleontological Resources

Scientifically significant paleontological resources are fossils and fossiliferous deposits that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Particularly important are fossils found in situ (undisturbed) in primary context because they aid in stratigraphic correlation, as well as the interpretation of tectonic events, geomorphologic evolution, paleoecology, paleoclimatology, the relationships between aquatic and terrestrial species, and evolution in general. All vertebrate fossils that are in stratigraphic context are considered a scientifically significant nonrenewable paleontological resource. Invertebrate and plant fossils associated with vertebrate fossils are considered scientifically significant. Certain invertebrate and plant fossils that are regionally rare or uncommon, or help to define stratigraphy, age, or taxonomic relationships, are also considered scientifically significant.

3.11.3 Environmental Consequences

3.11.3.1 Temporary Impacts

Impacts to paleontological resources are considered permanent, not temporary, and are discussed below under Section 3.11.3.2, Permanent Impacts.

3.11.3.2 Permanent Impacts

Fossils and their associated contextual data are significant nonrenewable scientific resources, and the loss of these resources resulting from construction of any of the Build Alternatives would be the primary impact on paleontological resources. Earth-moving operations could result in the destruction of fossils and fossiliferous rock units within the construction disturbance limits. It is often not possible to completely eliminate impacts to fossil resources. It is understood that earthmoving activity could, unavoidably, destroy some fossils. These types of impacts can be partially mitigated by collecting and preserving a representative sample of the entire fossil assemblage and associated geological information in the areas disturbed by project construction. Permanent impacts on paleontological resources would include:

- Destruction of paleontological resources;
- Damage to paleontological resources during grading;
- Destruction of rock units that may contain paleontological resources;

- Loss of contextual data associated with paleontological resources; and
- Loss of associations between paleontological resources.

The recovery of fossils during construction activities would make new information available to scientists, educators, and the general public that they would not possess otherwise. Fossil recovery and curation would make specimens available for scientific research by qualified paleontologists. Their work may generate new data on the evolutionary relationships and development trends among organisms, as well as information on the age of rock units or sedimentary strata, the depositional history of the region and timing of geological events, the development of biological communities, interactions between ancient plant and animal species, geographic restrictions on past species, and unusual or spectacular circumstances in the history of life. Recovered fossil specimens or casts of specimens could also serve as a source of educational material and be incorporated into exhibits for public display.

No Build Alternative

Under the No Build Alternative, the permanent impacts discussed below for the SR 710 North Project Build Alternatives would not occur because the No Build Alternative does not include construction or operation of any of the improvements in the Build Alternatives. Because the No Build Alternative would not involve grading, excavation, or tunneling in the study area, there would be no impact to paleontological resources.

TSM/TDM Alternative

Most of the improvements in the TSM/TDM Alternative consist of modifications to existing ROW, such as widening roads and sidewalks, installing new traffic signals, constructing medians, and relocating light poles. For the most part, the TSM/TDM Alternative involves relatively minor ground disturbance.

Most of the area within the TSM/TDM Alternative has been previously disturbed for the existing roads, sidewalks, and landscaping and are likely underlain by some amount of Artificial Fill. Fossils encountered in this unit are not considered important for scientific study. The amount of Artificial Fill, excavation method, and depth at each of the TSM/TDM Alternative improvements is unknown. Excavation for the larger-scale improvements (e.g., Other Road Improvements T-1 [Valley Boulevard to Mission Road Connector Road] and T-2 [SR 110/Fair Oaks Avenue Hook Ramps]) could reach native deposits, which in most areas are considered to be highly sensitive for paleontological resources.

The majority of improvements are in geologic units mapped as having high sensitivity, including Old Alluvial Fan Deposits, Old Alluvium, Puente Formation, and Topanga Group. Scientifically significant fossil remains have been recovered from these units in other areas; therefore, it is likely that similar scientific significant paleontological resources may be encountered. Any vertebrate, invertebrate, and plant fossils recovered from these deposits would be considered scientifically significant.

A few improvements are located in geologic units mapped as having a low sensitivity to a depth of 10 ft and a high sensitivity below 10 ft. These improvements pass through Young Alluvial Fan Deposits and Young Alluvium.

Potential direct impacts to paleontological resources could result from ground-disturbing activities associated with the clearing of vegetation and soil, excavation, and construction of the TSM/TDM Alternative. Although construction would be a short-term activity, the loss of some fossil remains and fossil-bearing rocks would be a permanent impact of the TSM/TDM Alternative based on the scientific significance of potential paleontological resources in formations in the project area. Because some of the TSM/TDM Alternative improvements are part of the BRT, LRT, and Freeway Tunnel Alternatives, these impacts would also occur in the Build Alternatives discussed below.

BRT Alternative

Most of the improvements in the BRT Alternative consist of modifications to existing ROW, such as widening roads and sidewalks, installing new traffic signals, constructing medians, and relocating light poles. For the most part, the BRT Alternative involves relatively minor ground disturbance.

Most of the area within the BRT Alternative has been previously disturbed for the existing roads, sidewalks, and landscaping and are likely underlain by some amount of Artificial Fill. The presence and thickness of Artificial Fill and the excavation depth are unknown. Fossils encountered in this unit are not considered important for scientific study.

Most of the improvements in the BRT Alternative occur in geologic units mapped as having high sensitivity deposits, including Old Alluvial Fan Deposits, Old Alluvium, Fernando Formation, Puente Formation, and Topanga Group. Scientifically significant fossil remains have been recovered from these units in other areas; therefore, it is likely that similar scientifically significant paleontological resources may be encountered. Any vertebrate, invertebrate, and plant fossils recovered from these deposits would be considered scientifically significant.

A few improvements are located in a geologic unit mapped as having low sensitivity to a depth of 10 ft and a high sensitivity below 10 ft. The improvements pass through Young Alluvial Fan Deposits. There is potential to encounter scientifically significant paleontological fossils in older sediments within this unit (below 10 ft).

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The majority of the TSM/TDM improvements are in geologic units mapped as having high sensitivity, and a few improvements are located in geologic units mapped as having a low sensitivity to a depth of 10 ft and high sensitivity below 10 ft. However, many TSM/TDM improvements are in areas that have been previously disturbed and likely contain some amount of Artificial Fill. The amount of Artificial Fill, excavation method, and excavation depth at each of the TSM/TDM Alternative improvements is unknown. Excavation for the larger-scale improvements (e.g., Other Road Improvements T-1 [Valley Boulevard to Mission Road Connector Road] and T-2 [SR 110/Fair Oaks Avenue Hook Ramps]) could reach native deposits, which in most areas are considered to be highly sensitive for paleontological resources.

Potential direct impacts to paleontological resources could result from ground-disturbing activities associated with the clearing of vegetation and soil, excavation, and construction of the BRT Alternative and all the improvements of the TSM/TDM Alternative, with the exception of Local Street Improvements L-8 and L-3. Although construction would be a short-term activity, the loss of some fossil remains and the fossil-bearing soil and rock formations would be a permanent impact of the BRT Alternative based on the scientific significance of potential paleontological resources in formations in the project area.

LRT Alternative

The LRT Alternative involves much more substantial excavation and ground disturbance than the TSM/TDM or BRT Alternatives. The LRT Alternative includes excavation for support structures for the aerial section, a bored tunnel section, and rail stations along the route. The bored tunnel sections are expected to be excavated using a tunnel boring machine (TBM), which would prevent access to the face of the excavation. The TBM will grind sediments and rock, thereby limiting the opportunity for fossil recovery. However, the size of the material recovered and the actual amount of fossil recovery will depend on the specific type of machinery used. During excavation for the portals and underground stations, fossil recovery would not be limited.

Artificial Fill may be located at the small-scale improvements in existing ROW from previous construction. Artificial Fill may be encountered at the surface in the southern part of the project area, below the aerial portion approximately from Kern Avenue to Corporate Center Drive and around the SR 710 and I-10 interchange, as well as in the tunnel portion around Valley Boulevard. The presence and thickness of Artificial Fill and the excavation depth are unknown. Fossils encountered in this unit are not considered important to scientific study.

Most of the improvements in the LRT Alternative occur in areas mapped as having high sensitivity deposits, specifically:

- **Old Alluvial Fan Deposits:** Old Alluvial Fan Deposits may be reached during excavation for the maintenance yard; the Mednik, Floral, Alhambra, Huntington, and South Pasadena Stations; the aerial section from East 3rd Street to Floral Drive and Hellman Avenue to Valley Boulevard; the tunnel section from Valley Boulevard to Alhambra Road and Huntington Drive to SR 110 (Arroyo Seco Parkway); and during widening of Mednik Avenue between 1st Street and Floral Drive.
- **Old Alluvium:** Old Alluvium may be encountered in the subsurface approximately from Fillmore Street to Glenarm Street and during excavation for the Fillmore Street Station.
- **Fernando Formation:** The Fernando Formation may be encountered in the subsurface during excavation for the aerial section from Corporate Center Drive to the I-710/I-10 interchange, in the bored tunnel section roughly from Meridian Avenue to Commonwealth Avenue, and for the Alhambra Station. This formation may also be reached at the surface during grading for construction of a mechanically stabilized earth embankment that would support the aerial section in the area south of the I-710/I-10 interchange.
- **Puente Formation:** The Puente Formation may be encountered in the subsurface during excavation for the aerial section from the I-710/I-10 interchange north to Valley Boulevard, the Cal State LA Station, and in the tunnel section from Valley Boulevard to Mission Road and Commonwealth Avenue to Main Street.
- **Topanga Group:** The Topanga Group may be encountered in the subsurface during excavation for the Huntington Street Station, as well as in the tunnel section roughly from Main Street north to Huntington Drive and from Arroyo Seco Parkway (SR 110) to Glenarm Street.

Scientifically significant fossil remains have been recovered from these units in other areas; therefore, it is likely that similar scientifically significant paleontological resources may be encountered. Any vertebrate, invertebrate, and plant fossils recovered from these deposits would be considered scientifically significant.

A few improvements are located in a geologic unit mapped as having low sensitivity to a depth of 10 ft and a high sensitivity below 10 ft. The improvements pass through Young Alluvial Fan Deposits. There is potential to encounter scientifically significant paleontological fossils in older sediments within this unit (below 10 ft).

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). The majority of the TSM/TDM improvements are in geologic units mapped as having high sensitivity, and a few improvements are located in geologic units mapped as having a low sensitivity to a depth of 10 ft and high sensitivity below 10 ft. However, many TSM/TDM Improvements are in areas that have been previously disturbed and likely contain some amount of Artificial Fill. The amount of Artificial Fill, excavation method, and excavation depth at each of the TSM/TDM Alternative improvements is unknown. Excavation for the larger-scale improvements (e.g., Other Road Improvement T-2 [SR 110/Fair Oaks Avenue Hook Ramps]) could reach native deposits, which in most areas are considered to be highly sensitive for paleontological resources.

Potential direct impacts to paleontological resources could result from ground-disturbing activities associated with the clearing of vegetation and soil, excavation, and construction of the LRT Alternative and all the improvements of the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Although construction would be a short-term activity, the loss of some fossil remains and the fossil-bearing soil and rock formations would be a permanent impact of the LRT Alternative based on the scientific significance of potential paleontological resources in formations in the project area.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative involves more substantial excavation and ground disturbance than the TSM/TDM or BRT Alternatives. The Freeway Tunnel Alternative includes excavation for a central bored tunnel with cut-and-cover tunnels at the portals at both ends. The bored tunnel sections are expected to be excavated using a TBM, which would prevent access to the excavation area. The TBM will grind sediments and rock, thereby precluding the opportunity for fossil recovery. During excavation for the portals and the cut-and cover sections, fossil recovery would be possible. However, the size of the material recovered and the actual amount of fossil recovery will depend on the specific type of machinery used at these locations. Artificial Fill may be located at improvements in the existing ROW from previous construction. Artificial Fill may be encountered at the southern end of the project area at the SR 710 and I-10 interchange and in the cut-and-cover tunnel around Valley Boulevard. The presence and thickness of Artificial Fill and the excavation depth are unknown. Fossils encountered in this unit are not considered important to scientific study.

Holocene Alluvial Fan Deposits are located at the surface in the northern end of the project area. This geologic unit is identified as having no sensitivity rating; any fossils recovered from these deposits would be conspecific with modern species and therefore not considered to be scientifically significant fossils.

A majority of the Freeway Tunnel Alternative's improvements, including the cut-and cover tunnels, pass through high sensitivity deposits, specifically:

- **Old Alluvial Fan Deposits:** Old Alluvial Fan Deposits may be encountered below the surface in the cut-and-cover tunnel at the south portal near Valley Boulevard and in the bored tunnel from Monterey Road to the Arroyo Seco Parkway (SR 110).

- **Old Alluvium:** Old Alluvium may be encountered in the cut-and-cover and bored sections of the tunnel roughly from Del Mar Boulevard to Bellefontaine Street.
- **Fernando Formation:** The Fernando Formation may be reached in the subsurface during excavation of the bored tunnel roughly from Norwich Avenue to Huntington Drive.
- **Puente Formation:** The Puente Formation may be reached in the cut-and-cover tunnel around Valley Boulevard and in the bored tunnel roughly from Valley Boulevard to Norwich Avenue and from Huntington Drive to Newtonia Drive.
- **Topanga Group:** The Topanga Group may be reached in the subsurface during excavation for the bored tunnel approximately from Newtonia Drive to Monterey Road and from Arroyo Seco Parkway (SR 110) to Bellefontaine Street.

Scientifically significant fossil remains have been recovered from these units in other areas; therefore, it is likely that similar scientifically significant paleontological resources may be encountered. Any vertebrate, invertebrate, and plant fossils recovered from these deposits would be considered scientifically significant.

The Freeway Tunnel Alternative's improvements also pass through a geologic unit mapped as having low sensitivity to a depth of 10 ft and a high sensitivity below 10 ft. The improvements pass through Young Alluvial Fan Deposits. There is potential to encounter scientifically significant paleontological fossils in older sediments within this unit (below 10 ft).

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). The majority of the TSM/TDM improvements are in geologic units mapped as having high sensitivity, and a few improvements are located in geologic units mapped as having a low sensitivity to a depth of 10 ft and high sensitivity below 10 ft. However, many TSM/TDM improvements are in areas that have been previously disturbed and likely contain some amount of Artificial Fill. The amount of Artificial Fill, excavation method, and excavation depth at each of the TSM/TDM Alternative improvements is unknown. Excavation for the larger-scale improvements (e.g., Other Road Improvement T-2 [SR 110/Fair Oaks Avenue Hook Ramps]) could reach native deposits, which in most areas are considered to be highly sensitive for paleontological resources.

Potential direct impacts to paleontological resources could result from ground-disturbing activities associated with the clearing of vegetation and soil, excavation, and construction of the Freeway Tunnel Alternative and all the improvements of the TSM/TDM Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). Although construction would be a short-term activity, the loss of some fossil remains and the fossil-bearing soil and rock formations would be a permanent, adverse impact of the Freeway Tunnel Alternative based on the scientific significance of potential paleontological resources in formations in the project area.

3.11.4 Avoidance, Minimization, and/or Mitigation Measures

In most cases, avoidance and minimization are not viable options because the specific locations of fossils within the scientifically significant geologic units are unknown and geologic units can extend for great distances both horizontally and vertically. However, implementation of the mitigation measure described below would reduce impacts to nonrenewable paleontological resources. No State or federal permits for impacts to paleontological resources would be required.

Measure PAL-1

Paleontological Mitigation Plan (PMP) and Paleontological Resources Impact Mitigation Program (PRIMP): For the Transportation System Management/Transportation Demand Management (TSM/TDM), Bus Rapid Transit (BRT), Light Rail Transit (LRT) and Freeway Tunnel Alternatives, during final design, a PRIMP that follows the guidelines of the Society of Vertebrate Paleontology (2010) will be prepared. Preparation of a PMP or PRIMP, as appropriate, during Plans, Specifications, and Estimates (PS&E) will follow the guidelines provided in the Caltrans Standard Environmental Reference Environmental Handbook, Volume 1, Chapter 8, and includes the measures listed below.

- A qualified paleontologist or representative will attend the pre-construction meeting. At this meeting, the paleontologist will conduct paleontological resources awareness training, including describing the likelihood of encountering paleontological resources during grading and excavation, what types of resources might be discovered, the roles and authorities of the paleontological resources monitors, the methods used to assess and recover discovered resources, and other information relevant to paleontological resources and the monitoring that will be conducted during project construction.
- A preconstruction field survey will be conducted in areas with deposits of high paleontological sensitivity after vegetation and paving have been removed, and any observed surface paleontological resources salvaged prior to the beginning of additional grading.
- In general, a qualified paleontological monitor will initially be present on a full-time basis whenever excavation would occur within the sediments that have a high paleontological sensitivity rating, and on a spot-check basis when excavating in sediments that have a low sensitivity rating. No monitoring is generally necessary in deposits with no paleontological sensitivity, such as Artificial Fill and Holocene Alluvial Fan Deposits. However, the specific monitoring levels and locations will be developed according to the final design plans and take into account the excavation methods and depths, the thickness of any Artificial Fill and/or Holocene Alluvial Fan Deposits present in the project area, and the sensitivity of the deposits underlying those two geologic units.
- Full-time monitoring may be reduced to a part-time or spot-check basis if no resources are being discovered in sediments with a high sensitivity rating (monitoring reductions, when they occur, will be determined by the qualified Principal

Paleontologist in consultation with the Resident Engineer). The monitor will inspect fresh cuts and/or spoils piles to recover paleontological resources and/or screen wash for smaller fossils, depending on the material available for inspection. The monitor will be empowered to temporarily divert construction equipment away from the immediate area of the discovery. The monitor will be equipped to rapidly stabilize and remove fossils to avoid prolonged delays to construction schedules. If large mammal fossils or large concentrations of fossils are encountered, heavy equipment will be used to assist in the removal and collection of large materials.

- Native sediments of high and low sensitivity will occasionally be spot-screened on site through 1/8- to 1/20-inch mesh screens to determine whether microvertebrates or other small fossils are present. If small fossils are encountered, sediment samples (up to 3 cubic yards, or 6,000 pounds) will be collected and processed through 1/20-inch mesh screens to recover additional fossils.
- Recovered specimens will be prepared to the point of identification and permanent preservation. This includes the sorting of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and storage cost, and the addition of approved chemical hardeners/stabilizers to fragile specimens.
- Specimens will be identified to the lowest taxonomic level possible and curated into an institutional repository with retrievable storage. The repository institutions usually charge a one-time fee based on volume, so removing surplus sediment is important. The repository institution may be a local museum or university with a curator who can retrieve the specimens on request. Caltrans requires that a draft curation agreement be in place with an approved curation facility prior to the initiation of any paleontological monitoring or mitigation activities.
- For the Freeway Tunnel Alternative, a Paleontological Mitigation Report will be prepared and submitted to Caltrans to document completion of the mitigation plan. For the TSM/TDM, BRT, and LRT Alternatives, a final report of findings will be prepared and submitted to Metro to document completion of the mitigation program.

3.12 Hazardous Waste/Materials

3.12.1 Regulatory Setting

Hazardous materials including hazardous substances and wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage, and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as "Superfund," is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the California Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

3.12.2 Affected Environment

The information in this section is based on the *Phase I Initial Site Assessment* (ISA) (2014) prepared for the proposed project.

The ISA was prepared to evaluate the study area for the presence of recognized environmental conditions (RECs) and/or activity and use limitations (AULs) and to recommend additional studies (if needed) prior to the start of the construction phase of the proposed project. The ISA study area is approximately 100 square miles (sq mi) and is generally bounded by Interstate 210 (I-210) on the north, Interstate 605 (I-605) on the east, Interstate 10 (I-10) on the south, and Interstate 5 (I-5) and State Route 2 (SR 2) on the west.

The ISA was prepared in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1527-05, Phase 1 – Assessment Standard Process. The scope of this ISA does not include site inspections or interviews with property owners/operators. This process included records review of historical information sources such as the ones listed below using either a 0.5-mile (mi) buffer on either side of the corridor or a maximum 1 mi search area:

- Environmental Data Resources, Inc. (EDR) database report, which provides a compiled list of sites from a wide collection of local, State and federal databases that pertain to hazardous materials
- Historical aerial photographs
- Historical topographic maps
- Sanborn fire insurance maps
- Oil and gas maps
- Regional Water Quality Control Board (RWQCB) Database of Environmental Sites website (GeoTracker)
- California Department of Toxic Substances Control (DTSC) Database of Environmental Sites website (EnviroStor)

The EDR database report identified more than 1,000 known sites with known environmental impact within the search distance. These identified sites were further screened based on their proximity to the proposed Build Alternatives and whether they had impacts to soil or groundwater. Sites with no impacts to soil or groundwater and that were not in close proximity to the proposed Build Alternatives were not given further consideration. Based on this initial screening, 24 remaining sites were researched further by:

- Researching regulatory databases;
- Reviewing current status and extent of environmental impact (based on reports available from GeoTracker);
- Conducting file reviews at various regulatory agencies such as the Los Angeles Regional Water Quality Control Board (LARWQCB), Los Angeles County Fire Department, and Los Angeles County Department of Public Works (LADPW);
- Corresponding (phone or email) with various regulatory personnel; and
- Performing site reconnaissance from outside the site boundaries.

Based on this detailed extensive review, many of the sites were either included or eliminated in the final list based on the following criteria:

- **Extent and Intensity of Environmental Impact:** Localized on-site or off-site impact affecting the study alternatives

- **Media of Impact:** Soil, soil vapor, and/or groundwater

Based on these criteria, sites were eliminated from the final list if: (1) the site was determined to have impacts to the soil only and was not in close proximity to the Build Alternatives, or (2) the site was determined to have groundwater impacts, but the location was downgradient and not in close proximity with respect to the local groundwater flow direction relative to the Build Alternatives. Applying this final extensive detailed screening resulted in a final list of eight sites that may have an impact on the Build Alternatives' right of way (ROW). Figure 3.12-1 shows the locations of these six sites with respect to the Build Alternatives' ROW.

The following eight sites are included in the final screening list:

1. Former Circle K Stores, 1000 West Valley Boulevard, Alhambra
2. Fashion Master Cleaners, 1433 Huntington Drive, South Pasadena
3. Railroad ROW, North of Valley Boulevard and State Route 710 (SR 710), and immediately south of Alhambra Avenue/Mission Road
4. Elite Cleaners, 1310 Fair Oaks Avenue, South Pasadena
5. Blanchard Landfill, 4531 East Blanchard Street, Monterey Park
6. Mercury Die/Mission Corrugated, 3201 West Mission Road, Alhambra
7. Arco Station, 3201 Valley Boulevard, Alhambra
8. Former Tosco/Unocal Station, 2140 Huntington Drive, South Pasadena

3.12.2.1 Former Circle K Stores (Subject Property 1)

Former Circle K Stores (Subject Property 1) is located at 1000 West Valley Boulevard and at the intersection of Valley Boulevard and Atlantic Boulevard in the City of Alhambra (Figure 3.12-1). This site is adjacent to the Bus Rapid Transit (BRT) Alternative. This site is a former Mobil gas station with a Circle K Store and is identified as either Mobil Station 18-MJA or Circle K Stores in regulatory documents. Based on records review, the Mobil Station/Circle K initiated operations sometime between 1959 and 1981, although the exact year could not be determined. The facility continued operations until the end of 2012 after which the site was graded for redevelopment. In early 2013, a Chase Bank was constructed on this site. This site is identified in the EDR database report and in the GeoTracker database under the Leaking Underground Storage Tank (LUST) database. Per the EDR database report, the case status of this facility is listed as completed as of February 25, 2010. In January 2010, a low-risk closure form for the site was reviewed and approved by LARWQCB. However, based on a file reviewed from the GeoTracker database, LARWQCB later sent a letter, dated December 21, 2012, to Circle K indicating that LARWQCB had concerns about soil and groundwater impacts at this location, and further information and investigation should be provided to LARWQCB. The GeoTracker database has the case status listed as Open-Site Assessment. In addition, a low-threat closure policy form provided in the GeoTracker database indicated that the site has been classified as a soil-only issue. The report did not indicate any evidence of groundwater impact at the site and indicates impacts mostly within 50 feet (ft) below ground surface (bgs), although the extent of impact (off site or on site) cannot be determined from the existing site data.

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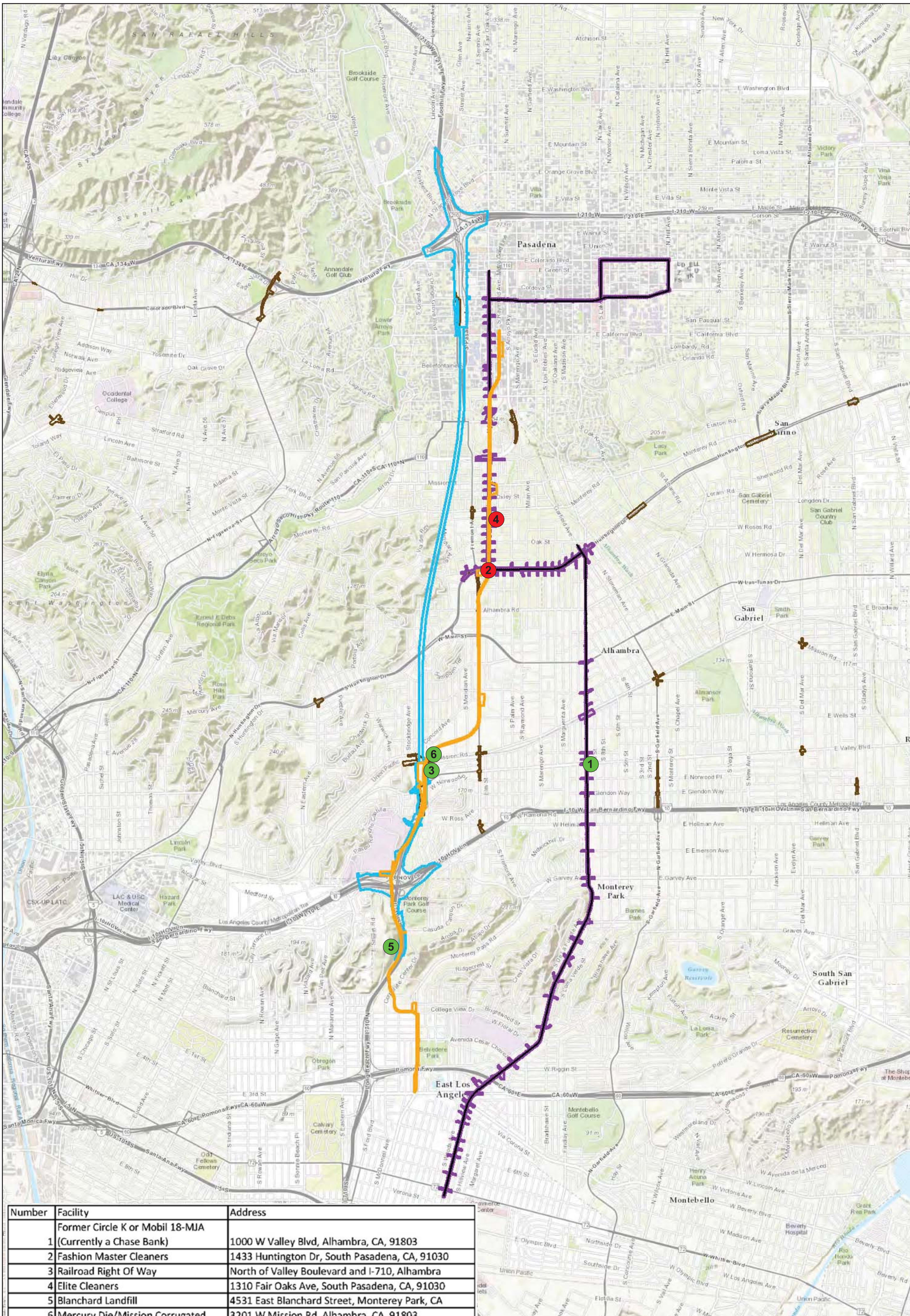

Number	Facility	Address
1	Former Circle K or Mobil 18-MJA (Currently a Chase Bank)	1000 W Valley Blvd, Alhambra, CA, 91803
2	Fashion Master Cleaners	1433 Huntington Dr, South Pasadena, CA, 91030
3	Railroad Right Of Way	North of Valley Boulevard and I-710, Alhambra
4	Elite Cleaners	1310 Fair Oaks Ave, South Pasadena, CA, 91030
5	Blanchard Landfill	4531 East Blanchard Street, Monterey Park, CA
6	Mercury Die/Mission Corrugated	3201 W Mission Rd, Alhambra, CA, 91803

LEGEND

- Facilities with both groundwater and soil vapor impact
- Facilities with soil/soil vapor impact
- LRT Alternative
- BRT Alternative PDL, with Centerline
- Freeway Tunnel Alternative
- TSM/TDM

N

0 2250 4500
Feet

SOURCE: CH2M HILL (2014)

Note: These are the facilities identified during environmental screening to have impacted soil, soil vapor, or groundwater that may be of significance to the project study. TSM/TDM alternative is only partly shown because of its wide spread out.

FIGURE 3.12-1

SR 710 North Project
Sites of Concern
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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A report dated February 26, 2012, indicated that underground storage tanks (USTs) were removed from this location in February 2012, and soil sampling conducted from beneath the USTs indicated elevated concentrations of volatile hydrocarbon fuel and benzene, toluene, ethylbenzene, and total xylenes (BTEX). This indicates that the impact identified in 2012 could have been from a later-date fuel release after the closure was granted in 2010. This report also indicated that during a previous UST removal, soil containing hydrocarbons was removed and excavated from beneath the USTs. Because the Former Circle K has elevated concentrations of volatile organic compounds (VOCs) as documented during the 2012 UST removal, impacted soil may be present beneath the BRT Alternative alignment.

3.12.2.2 Fashion Master Cleaners (Subject Property 2)

Fashion Master Cleaners (Subject Property 2) is located at 1433 Huntington Drive in the City of South Pasadena (Figure 3.12-1) and is currently used as a dry cleaning facility. The date operations began at this facility could not be determined from the records review. This site is located adjacent to construction activities for Intersection Improvement I-10 (Huntington Drive/Fair Oaks Avenue) to the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative, BRT Alternative, and Light Rail Transit (LRT) Alternative. This site is identified in the EDR database report under various databases, including the Spills, Leaks, Investigations, and Cleanup (SLIC) and Dry Cleaners, and in the GeoTracker database. Per the EDR database report and GeoTracker, the case status of this facility is listed as Open-Site Assessment. A letter prepared by LARWQCB dated February 2, 2012, indicates that VOCs in soil vapor, specifically tetrachloroethene, also known as perchloroethylene (PCE), is present at this facility and has migrated towards the Big Lots facility located to the immediate west of Fashion Master Cleaners. This was also confirmed by the LARWQCB project manager for this facility during a telephone interview on October 7, 2013. Fashion Master Cleaners installed one groundwater monitoring well in June 2008. PCE was detected in groundwater at a concentration of 490 micrograms per liter (μg/L). The groundwater monitoring well has not been sampled since June 2008 because the facility focused on installing a soil vapor extraction system to address the contamination in the vadose zone (unsaturated zone). In a work plan dated October 2011, Athanor Environmental Services, Inc., on behalf of Fashion Master Cleaners, proposed conducting a second subsurface soil vapor survey in the Big Lots parking lot and sidewalk. However, it is unknown whether an investigation has been completed because a report indicating the results for this investigation was unavailable.

3.12.2.3 Railroad ROW (Subject Property 3)

Railroad ROW (Subject Property 3) is located north of Valley Boulevard and SR 710 and immediately south of Alhambra Avenue/Mission Road (Figure 3.12-1). Parts of the TSM/TDM Alternative associated with Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) and the LRT and Freeway Tunnel Alternatives pass through the footprint of this site. However, the LRT and Freeway Tunnel Alternatives beneath this site footprint are designed to be an underground tunnel, and the shallowest ground impact during construction is expected to be 60 ft bgs. If property is acquired for the project in fee or easement, the current conditions (i.e., the lateral and vertical extent of contamination, identification of source areas, and types and concentrations of contaminants) must be investigated. Information is currently unavailable regarding environmental impacts (if any) at this location. Railroads are typically anticipated to have environmental impacts from various chemical constituents present in railroad ties and wooden posts (wood-treating chemicals) and other releases such as metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), asbestos, total petroleum hydrocarbons, pesticides, herbicides, and polychlorinated biphenyls (PCBs).

3.12.2.4 Elite Cleaners (Subject Property 4)

Elite Cleaners (Subject Property 4) is located at 1310 Fair Oaks Avenue in South Pasadena (Figure 3.12-1) and is currently a dry cleaning facility. Based on records review, this site probably started operations around 1956; however, the exact date operations were initiated could not be determined. This site is adjacent to the BRT and LRT Alternatives. This site is identified in the EDR database report under various databases, including SLIC, RCRA-Small Quantity Generator (RCRA-SQG) and Dry Cleaners, and the GeoTracker database. Per the EDR database report and GeoTracker, the case status of this facility is listed as Open-Site Assessment. Based on a chemical questionnaire form reviewed during this screening, this facility stored PCE in a barrel (approximately 20 gallons).

In addition, a deep soil vapor investigation, a groundwater monitoring well construction work plan, and soil vapor investigation reports indicated the presence of VOCs at depths up to 75 ft bgs. According to records of the Los Angeles County Hydraulic and Water Conservation Department, depth to groundwater encountered in the nearest monitoring well to this facility in 2006 was at 178 ft bgs.

3.12.2.5 Blanchard Landfill (Subject Property 5)

Blanchard Landfill (Subject Property 5) is located between Blanchard Avenue and McBride Avenue at 4531 East Blanchard Street in the City of Monterey Park (Figure 3.12-1). A portion of the LRT Alternative is located immediately adjacent to the former landfill boundary. The landfill is bordered on the north by the former Cogen Disposal Facility and the Sybil Brand Institute, on the west by Biscailuz Center, and on the east by I-710. The site was once called the Blanchard Street Dump. The property, which contains the former Blanchard Disposal Facility, is currently owned by the County of Los Angeles. Currently residing on the Blanchard Landfill are County buildings, parking lots, an oval jogging track, helipad, and an auto storage yard.

The landfill opened in approximately 1935 and operated as an open burning dump until approximately 1946. Operations at the former Blanchard Disposal Facility predate current solid waste management regulations by more than 30 years; as such, the facility did not have a liner, leachate collection and recovery system, waste acceptance and screening procedures, or record keeping substantiating waste acceptance and operational practices. The facility operated as a Class II landfill from 1946 to 1958. The facility was allowed to accept liquid, solid, chemical, and industrial wastes, with the exception of hazardous waste such as acid sludge, brines, and tank bottoms. Historical documents indicate that the facility accepted several forms of liquid waste, which were mixed with soil prior to disposal. In 1957, the State of California condemned a small part of the southeastern corner of the disposal facility for construction of the Long Beach Freeway (I-710). The site closed and ceased disposal activities in 1958. The structures observed today on the former disposal facility were constructed in the early 1970s. The on-site facilities were primarily used as a custody facility for male inmates (known as the Biscailuz Recovery Center). The site was then developed to consist of five inmate accommodation blocks, an administrative office building, a visitors center, an inmate outdoor recreation area, a weapons training central pistol range, a gymnasium, a portable classroom building, two aluminum portable buildings, a carpet shop, a car wash, a carpenter shop, a kitchen/dining room building, a sheriff radio service building, and storage buildings. The site also had approximately 180 parking spaces contained within three large parking lots located on the southern perimeter, along Sheriff Road. The men's custody facility ceased operations in 2001. The site was then used as a training facility for the Los Angeles County Sheriff's Department.

Based on a review of environmental reports for this site, none of the reports identified hydrocarbon contaminant issues in soil; however, additional methane gas investigations are being done at this facility. A methane gas investigation conducted in 2010 indicated methane concentrations exceeding the California Code of Regulations (CCR) Title 27 regulatory limit of 5 percent by volume in air for methane monitoring wells installed within the site. Previous investigations have included groundwater monitoring with analysis for VOCs, organochlorine pesticides, chlorinated herbicides, PCBs, SVOCs, and PAHs. These investigations concluded that methyl tert-butyl ether (MTBE) at a maximum concentration of 62 µg/L was the only VOC that was consistently identified throughout the 5-year reporting period, which is not typically associated with a landfill. The source of the MTBE is reported to be unknown. The GeoTracker database lists the facility cleanup status as Open – Verification Monitoring. Based on this information, methane or VOC vapors may have migrated beneath the LRT Alternative alignment.

3.12.2.6 Mercury Die/Mission Corrugated (Subject Property 6)

Mercury Die/Mission Corrugated (Subject Property 6) is located at 3201 West Mission Road in the City of Alhambra (Figure 3.12-1). Based on historical aerial photographs, structures at the location of the Mercury Die/Mission Corrugated site have been present since at least between 1938, with significant increases to the number and size of buildings in 1956. Historically, the site manufacturing processes for corrugated cardboard have included the use of various glues and coatings. Segments of the LRT and Freeway Tunnel Alternatives and parts of the TSM/TDM Alternative associated with Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) run through this site. A letter dated July 14, 1997, from the LADPW indicated that a closure status requested from Mercury Die/Mission Corrugated was approved by the agency, and no further action was required. However, based on information provided by the Project Manager for the United States Environmental Protection Agency's (EPA's) Area 3 Project, there are subsurface shallow soil vapor VOC impacts at this site (Waite 2014). The EPA is planning to conduct additional investigations at this facility to investigate whether there are also impacts to soil and groundwater at greater depths below ground surface at this site. Impacted soil vapor and/or groundwater may be present beneath the LRT Alternative, Freeway Tunnel Alternative, parts of the TSM/TDM Alternative associated with Other Road Improvement T-1, or Mission Road. A small part of the proposed ROW for the TSM/TDM Alternative passes through Mission Road.

3.12.2.7 Arco Station (Subject Property 7)

An Arco Station (Subject Property 7) was located at 3201 Valley Boulevard (north side) and at the terminus of I-710 intersection with Valley Boulevard (Figure 3.12-1). This site is adjacent to the TSM/TDM Alternative and Freeway Tunnel Alternative. According to records from the LARWQCB Geotracker database, a leak from a LUST was reported in September 17, 1987. This site is identified in the EDR database report and in the GeoTracker database under the LUST database. A 580-gallon waste oil UST and four 6,000-gallon gasoline tanks were removed in October 1989. Numerous site investigations were performed at the site between August 1989 and January 2003. These reports identified elevated concentrations of volatile hydrocarbon fuel, BTEX, and MTBE in the soil. Between January 2003 and March 2008, a soil vapor extraction (SVE) system was operated to remove petroleum hydrocarbons in the subsurface, and was later replaced by an air sparging system. As of August 2010, gasoline range organics (GRO) were reported to remain in the groundwater at 39 µg/L and 4.7 µg/L of MTBE, at an approximate groundwater depth of 40 feet bgs. The groundwater flow reported in this area is to the southeast. Soil impacts from total petroleum hydrocarbons, such as gasoline (TPH [gas]) and benzene, were reported at concentrations of 14,700 milligrams per kilogram (mg/kg) and 172 mg/kg, respectively beneath former dispensers, but these concentrations were reported prior to remedial efforts. Approximately 605 cubic yards of impacted soil were removed as part of remediation. Therefore, the concentrations in the soil would not be considered representative of current conditions. Per the EDR database report, the case status of this facility is listed as closed as of August 12, 2013.

3.12.2.8 Former Tosco/Unocal Station (Subject Property 8)

A former Tosco/Unocal Station (Subject Property 8) was located at 2140 Huntington Drive (Figure 3.12-1). This site is adjacent to the TSM/TDM Alternative. In December 1998, a UST removal action identified impacted soil with concentrations of TPH (gas) at 45 mg/kg, benzene at 0.32 mg/kg, MTBE at 17 mg/kg, and total recoverable petroleum hydrocarbons (TRPH) at 35 mg/kg. An abandoned 280-gallon UST was removed from the eastern edge of the site, adjacent to Garfield Avenue. Soil samples collected from beneath the abandoned UST identified TRPH in the soil at a concentration of 35 mg/kg. Although no groundwater samples were collected, groundwater flow at this site was reported to be toward the southeast. Groundwater at the site was reported in 2006 to be at approximately 420 feet bgs. The Geotracker website lists the status of this site as closed as of June 9, 2008.

Table 3.12.1 lists the sites of concern for the Build Alternatives.

TABLE 3.12.1:
Sites of Concern for the Build Alternatives

Subject Property No.	Facility	Address	Hazardous Material(s) of Concern	Media Affected[1]	Alternative(s) Affected
1	Former Circle K Stores	1000 West Valley Boulevard, Alhambra	VOCs from gasoline	Soil	BRT
2	Fashion Master Cleaners	1433 Huntington Drive, South Pasadena	Chlorinated VOCs	Soil Vapor, GW	BRT, LRT, TSM/TDM (I-10)
3	Railroad ROW	North of Valley Boulevard and SR 710 and immediately south of Alhambra Avenue/ Mission Road	VOCs, semi-VOCs from transported materials, pesticides, metals, wood-treating chemicals, TPH, asbestos	Soil, soil vapor	TSM/TDM (Other Road Improvement T-1[2])
4	Elite Cleaners	1310 Fair Oaks Avenue, South Pasadena	Chlorinated VOCs	Soil Vapor, GW	BRT, LRT
5	Blanchard Landfill	4531 East Blanchard Street, Monterey Park	Methane, VOCs, SVOCs, metals, PAHs, TPH, PCBs, asbestos	Soil, soil Vapor	LRT
6	Mercury Die/ Mission Corrugated	3201 West Mission Road, Alhambra	VOCs, metals	Soil Vapor	LRT, Freeway Tunnel, TSM/TDM (Other Road Improvement T-1[2])
7	Arco Station	3201 Valley Boulevard, Alhambra	VOCs, BTEX, TPH, MTBE	Soil and GW	TSM/TDM, Freeway Tunnel
8	Former Tosco/Unocal Station	2140 Huntington Drive, South Pasadena	Benzene, TPH, TRPH, MTBE,	Soil	TSM/TDM

Source: *Phase I Initial Site Assessment* (2014).
[1] Media affected indicates an existing impact or a potential to impact one.
[2] Valley Boulevard to Mission Road Connector Road

BRT = Bus Rapid Transit
BTEX = benzene, toluene, ethylbenzene, and total xylenes
GW = Groundwater
LRT = Light Rail Transit
MTBE = methyl tert-butyl ether
PCBs = polychlorinated biphenyls
ROW = right of way
SR 710 = State Route 710
TDM = Transportation Demand Management
TPH = Total petroleum hydrocarbons
TRPH = Total recoverable petroleum hydrocarbons
TSM = Transportation System Management
VOCs = volatile organic compounds

Other hazardous materials of potential concern for the Build Alternatives include:

- **Polychlorinated Biphenyls (PCBs):** PCBs were used in electrical transformers manufactured prior to 1980 for cooling purposes. Utility companies have replaced most PCB-containing transformers over the past 20 years. Generally, transformers are not considered a potential environmental concern unless they are leaking. Pole-mounted transformers were observed on or adjacent to Subject Properties 1, 2, and 3. The transformers appeared to be in good condition, though it is unknown whether these transformers contain PCBs. Transformers that previously used PCB oil and were drained and refilled with non-PCB oil have detected positive for PCBs when tested. This makes these transformers a concern for containing PCBs.
- **Aerially Deposited Lead (ADL):** Because part of the study area includes older roadways, there is a high potential for encountering ADL (which is associated with exhaust from former lead-gas combustion in motor vehicles) along the unpaved sides of the roadways.
- **Lead Chromate:** Yellow traffic markings (thermoplastic and paint) potentially contain hazardous levels of lead chromate.
- **Lead-Based Paint (LBP):** It is possible for LBP to be present in buildings and structures, including bridges.
- **Asbestos Containing Materials (ACMs):** The potential exists for the bridges within the study area to have been constructed prior to 1989. ACMs may be present in any of these structures that were built before 1989.
- **Equipment Containing Chlorofluorocarbons (CFCs):** It is possible for CFC-containing equipment to be present in buildings and structures.
- **Soils Within Railroad ROW Containing Wood-Treating Chemicals:** The potential exists for soils containing wood-treating chemicals from railroad ties and wood posts to be present within or adjacent to the ROW for the Build Alternatives.

For the SR 710 North Project Build Alternatives, hazardous materials would be identified, characterized, treated, and disposed of in accordance with applicable local, State, and federal regulations and requirements.

3.12.3 Environmental Consequences

3.12.3.1 Temporary Impacts

No Build Alternative

Under the No Build Alternative, the SR 710 North Project Build Alternatives would not be constructed. As a result, the No Build Alternative would not result in any short-term Adverse Effects related to hazardous materials and wastes associated with improvements in the SR 710 corridor.

Build Alternatives

The Build Alternatives would involve the disturbance of soils and the demolition of existing structures and bridges; therefore, known and unknown hazardous materials (i.e., PCBs, ADL, lead chromate, LBP, and ACM) may be encountered during construction. Where known contamination is located adjacent to a Build Alternative, a Phase II Site Investigation would be conducted during final design to clarify the limits of contamination and its location to the Build Alternative. Results of the Phase II could require design modifications if contamination is encountered within the construction limits of the improvements. Other potential temporary impacts are listed by Build Alternative below.

TSM/TDM Alternative

The majority of the proposed improvements under the TSM/TDM Alternative do not involve ground-disturbing activities during construction; therefore, potential adverse hazardous materials impacts would be less than those associated with the LRT or Freeway Tunnel Alternatives. However, the TSM/TDM Alternative includes improvements to local streets and intersections and other road improvements that would involve some ground disturbance during construction. As shown in Table 3.12.1, the TSM/TDM would potentially be impacted by the hazardous materials associated with Subject Properties 1, 2, 3, 6, 7, and 8.

Subject Property 1 is immediately adjacent to Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10) of the TSM/TDM Alternative footprint (within 10 to 15 ft) and is known to have impacted soil with VOCs, mostly within 50 ft bgs. Reports reviewed from GeoTracker did not indicate groundwater contamination at this site, and the depth to groundwater at wells within 1.5 to 2 mi of this site is mentioned to be 250 to 350 ft bgs. During final design of Local Street Improvement L-3, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 1. The purpose of a Phase II Investigation is to collect samples (e.g., soil and/or groundwater samples) to determine the potential for contaminants present in the soil or groundwater at levels that would be considered hazardous according to federal and State regulations.

Subject Property 2 is immediately adjacent to Intersection Improvement I-10 (Huntington Drive/ Fair Oaks Avenue) of the TSM/TDM Alternative footprint (within 10 to 15 ft). Review of historical reports indicates that the site has soil (vapor) and groundwater impacted with VOCs. Construction activities for Intersection Improvement I-10 in the TSM/TDM Alternative are expected to be within 10 to 15 ft bgs; therefore, groundwater impact from this site, if any, will not be a potential issue. However, soil (vapor) could adversely affect the I-10 improvement in the TSM/TDM Alternative. During final design of Intersection Improvement I-10, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 2. The Phase II Site Investigation would provide clarity on the extent of impact within and adjacent to the limits of the I-10 improvement if Intersection Improvement I-10 is selected as part of the Preferred Alternative.

A small part of Subject Property 3, railroad ROW, is within the footprint of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) in the TSM/TDM Alternative. The TSM/TDM Alternative is designed to be an underpass at this location, but the shallowest depth of ground disturbance during construction is anticipated to be 15 ft bgs. The construction of Other Road Improvement T-1 could potentially be affected by soil impacted at Subject Property 3. Although information is currently unavailable regarding environmental impacts (if any) at this location, railroads are typically anticipated to have environmental adverse impacts from various chemical constituents present in railroad ties and wooden posts (wood-treating chemicals). Therefore, hazardous materials may be present in the soil in this area and could adversely impact this alternative. During final design of Other Road Improvement T-1, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 3. The Phase II Site Investigation would provide clarity on the extent of adverse impacts within and adjacent to the limits of the T-1 improvement if Other Road Improvement T-1 is selected as part of the Preferred Alternative.

Subject Property 6 is immediately adjacent to Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) in the TSM/TDM Alternative footprint (within 10 to 15 ft).

Mercury Die/Mission Corrugated has shallow soil vapor impacts beneath its footprint. VOC soil vapors may have migrated from this property into the TSM/TDM alignment footprint and could present a concern for this alternative. During final design of Other Road Improvement T-1, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 6. The Phase II Site Investigation would provide clarity on the extent of adverse impacts within and adjacent to the limits of the T-1 improvement if Other Road Improvement T-1 is selected as part of the Preferred Alternative.

Subject Property 7 is immediately adjacent to Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) in the TSM/TDM Alternative footprint. The Arco Station site is identified as a former LUST site that had a 580-gallon waste oil UST and four 6,000-gallon gasoline tanks that were removed in October 1989. Site investigations completed at this site identified elevated concentrations of volatile hydrocarbon fuel, BTEX, and MTBE in the soil and groundwater. This site received regulatory closure on December 1, 1987. However, residual contamination may be present in the footprint of the TSM/TDM alignment that could present a concern for this alternative. During final design of Other Road Improvement T-1, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 7. The Phase II Site Investigation would provide clarity on the extent of adverse impacts within and adjacent to the limits of the T-1 improvement if Other Road Improvement T-1 is selected as part of the Preferred Alternative.

Subject Property 8 is immediately adjacent to Intersection Improvements I-13, I-14, I-15 (Huntington Drive, Atlantic Boulevard/Garfield Avenue) in the TSM/TDM footprint. The former Tosco/Unocal Station is identified as a LUST site with soil impacted by TPH (gas), benzene, MTBE, and TRPH. This site received regulatory closure on June 9, 2008. However, residual contamination may be present in the footprint of the TSM/TDM alignment that could present a concern for this alternative since it also involves a partial acquisition of the parcel. During final design of Intersection Improvements I-13, I-14, and I-15, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 8. The Phase II Site Investigation would provide clarity on the extent of adverse impacts within and adjacent to the limits of the Intersection Improvements if Intersection Improvements at I-13, I-14, and I-15 is selected as part of the Preferred Alternative.

ADL from the historical use of leaded gasoline, exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of ADL on the state highway system right of way within the limits of the Road Improvement T-2, where a retaining wall is to be constructed along the northbound Fair Oaks off-ramp from SR-110.

BRT Alternative

The majority of the proposed improvements under the BRT Alternative do not involve ground-disturbing activities during construction; therefore, potential adverse hazardous materials impacts would be less than those associated with the LRT or Freeway Tunnel Alternatives. The BRT alternative does include the construction of 17 BRT stations with associated improvements placed, on average, at approximately 0.8 mi intervals at major activity centers and cross streets. Typical station improvements would include new shelters, seating, wind screens, leaning rails, variable message signs (next bus information), lighting, bus waiting signals, trash receptacles, and stop markers. Construction of these improvements would involve some ground disturbance. As shown in Table 3.12.1, the BRT Alternative would potentially be impacted by the hazardous materials associated with Subject Properties 1, 2, and 4.

Subject Property 1 is immediately adjacent to the BRT Alternative footprint (within 10 to 15 ft) and is known to have impacted soil with VOCs, mostly within 50 ft bgs. Construction activities for the BRT Alternative are expected to be within 10 to 15 ft bgs; therefore, groundwater impact from this site, if any, will not be a potential issue. However, soil impact from this property could be a concern for the BRT Alternative. During final design of the BRT Alternative, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 1. The Phase II Site Investigation would provide clarity on the extent of impact within and adjacent to the limits of the BRT Alternative if it is selected as the Preferred Alternative.

Subject Property 2 is immediately adjacent to the BRT Alternative footprint (within 10 to 15 ft). Review of historical reports indicates that the site has soil (vapor) and groundwater impacted with VOCs. Construction activities for the BRT Alternative are expected to be within 10 to 15 ft bgs; therefore, groundwater impact from this site, if any, will not be a potential issue. However, soil (vapor) impact from this property could be a concern for the BRT Alternative. During final design of the BRT Alternative, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 2. The Phase II Site Investigation would provide clarity on the extent of impact within and adjacent to the limits of the BRT Alternative if it is selected as the Preferred Alternative.

Subject Property 4 is immediately adjacent to the BRT Alternative footprint (within 10 to 15 ft). For Elite Cleaners, Subject Property 4 , previous soil vapor investigation conducted at this site indicated the presence of VOCs at depths up to 75 ft bgs. Therefore, soil vapor impacts from Subject Property 4 could be a concern for the construction of BRT Alternative. During a telephone interview on October 3, 2013, the LARWQCB project manager for this facility indicated that this facility may have impacted groundwater beneath the area. A Phase II Site Investigation, consistent with regulatory requirements, is required for Subject Property 4 during final design of the BRT Alternative. The Phase II Site Investigation will provide clarity on the extent of impact within and adjacent to the limits of the BRT Alternative, if selected as the Preferred Alternative.

The BRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road), and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). Therefore, the BRT Alternative with the TSM/TDM component would potentially be impacted by the hazardous materials associated with Subject Properties 1, 2, 3, 4, and 6.

LRT Alternative

The LRT Alternative would construct a passenger rail system operated along a dedicated guideway, similar to other Metro light rail lines. The LRT alignment is approximately 7.5 mi long, with approximately 3 mi of aerial segments and approximately 4.5 mi of bored tunnel segments. Construction of these improvements would involve major ground disturbance during construction. As shown in Table 3.12.1, the LRT Alternative would potentially be impacted by the hazardous materials associated with Subject Properties 2, 4, 5, and 6. Subject Property 5 is located adjacent to the aerial segment of the LRT Alternative alignment. Subject Properties 3 and 6 are located adjacent to the maintenance yard and above the tunnel segment and Subject Properties 2 and 4 are located above the tunnel segment of the LRT Alternative alignment.

Subject Property 2 is immediately adjacent to the LRT Alternative footprint. Review of historical reports indicates that the site has soil (vapor) and groundwater impacted with VOCs. The LRT Alternative beneath this site's footprint is designed to be an underground tunnel. As a result, impacted groundwater, in addition to soil vapor, could be encountered during construction activities. In addition, reviewed reports indicate that based on local topography, the groundwater flow is expected to be to the east or southeast toward the center of the Main San Gabriel Basin. This groundwater flow direction is toward the LRT alignment and could be a concern for this alternative. A Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 2 during final design of the LRT Alternative. The Phase II Site Investigation would provide clarity on the extent of impact within and adjacent to the LRT Alternative if it is identified as the Preferred Alternative.

A segment of the LRT Alternative that is to the north SR 710 and Valley Boulevard, and at the intersection of Mission Road and Concord Avenue, passes through part of Subject Property 3, Railroad ROW. However, the LRT Alternative beneath this site footprint is designed to be an underground tunnel and the shallowest ground impact from this is expected to be 60 ft bgs. Therefore, this property may not cause an impact to the LRT Alternative. Although information is currently unavailable regarding environmental impacts at this location, if any, railroads are typically anticipated to have adverse environmental impacts from various chemical constituents present in railroad ties and wooden posts (wood-treating chemicals).

Subject Property 4 is immediately adjacent to the LRT Alternative. For Subject Property 4, Elite Cleaners, previous soil vapor investigation conducted at this site indicated the presence of VOCs at depths up to 75 ft bgs. Previous investigation has also confirmed VOC impact to groundwater. According to the records of the Los Angeles County Hydraulic and Water Conservation Department, depth to groundwater encountered in the monitoring well nearest to this facility in 2006 was at 178 ft bgs. In addition, this site is a facility of interest for the EPA for its ongoing investigation of the San Gabriel Valley Area 3 Superfund Site. The LARWQCB project manager for this facility mentioned during a telephone interview that this facility may have impacted groundwater beneath the area. The LRT Alternative beneath this site footprint is designed to be an underground tunnel. As a result, impacted groundwater, in addition to soil vapor, could be encountered during construction activities and could be a concern for this alternative. During a telephone interview on October 3, 2013, the LARWQCB project manager for this facility indicated that this facility may have impacted groundwater beneath the area. A Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 4 during final design of the LRT Alternative. The Phase II Site Investigation would provide clarity on the extent of impact within and adjacent to the LRT Alternative, if selected as the Preferred Alternative.

Segments of the LRT Alternative are immediately adjacent to Subject Property 5, the Blanchard Landfill boundary. The former Blanchard Disposal Facility had operations predating current solid waste management regulations by more than 30 years; as such, the facility did not have a liner, leachate collection and recovery system, waste acceptance and screening procedures, or record keeping substantiating waste acceptance and operational practices. Moreover, a methane gas investigation conducted in 2010 indicated methane concentrations exceeding the CCR Title 27 regulatory limit of 5 percent by volume in air in methane monitoring wells installed at the site. Since the LRT Alternative at this location would be an aerial structure and tunneling would not occur, the potential to encounter impacted groundwater, if any, during construction activities is minimal. However, if structural reinforcements for the project at this area could reach deeper depths, then groundwater impact should also be considered as a potential issue. A Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 5 during final design of the LRT Alternative. The Phase II Site Investigation would provide clarity on the extent of impact within and adjacent to the LRT Alternative if it is identified as the Preferred Alternative.

Subject Property 6 is immediately adjacent to the LRT Alternative footprint (within 10 to 15 ft). Mercury Die/Mission Corrugated has shallow soil vapor impacts beneath its footprint. Adverse soil vapor and groundwater impacts may have migrated from this property into the alignment of the LRT Alternative and could present a concern for this alternative. A Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 6 during final design of the LRT Alternative. The Phase II Site Investigation would provide clarity on the extent of impacts within and adjacent to the LRT Alternative if it is identified as the Preferred Alternative.

The LRT Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). Therefore, the LRT Alternative with the TSM/TDM component would potentially be impacted by the hazardous materials associated with Subject Properties, 1, 2, and 4.

For the tunnel segment of the LRT Alternative, it is expected that the tunnel boring machine (TBM) could potentially pass through impacted soil or groundwater as stated in the discussions for Subject Properties 2 and 4.

During tunnel construction activities for the LRT Alternative, a temporary stockpiling area will be set up at the construction portal so that excavated material can be sampled as it is excavated. A sampling and analysis plan would be required so that the excavated material is classified properly and the correct handling methods and appropriate disposal facility are selected according to State and Caltrans regulatory requirements. Water (including construction water, groundwater, and wet weather flows), if encountered, would also be sampled. If necessary, the water can be treated at the construction portal area prior to being discharged in compliance with an appropriate approved discharge permit into the sewer system. A contractor is typically required to have basic water treatment capabilities at the construction site. If the water cannot be treated to meet sewer discharge requirements or if the volume of water for disposal exceeds the discharge permit's capacity, it may need to be transported to an off-site disposal location. Disposal of all materials would need to meet all local, State, and federal regulations, where applicable.

For the construction of the tunnel for the LRT Alternative, the tunneling method proposed for the bored tunnel is a pressurized-face TBM. This closed-face machine would reduce or eliminate the potential for uncontrolled entry of groundwater during excavation due to its closed excavation face.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative would construct a tunnel starting at the existing southern stub of SR 710 in Alhambra, just north of I-10, and connecting to the existing northern stub of SR 710, south of the I-210/State Route 134 (SR 134) interchange in Pasadena. The Freeway Tunnel Alternative has two design variations: a dual-bore tunnel and a single-bore tunnel. An operations and maintenance (O&M) building would be constructed at the northern and southern ends of the tunnel. As part of both design variations of the Freeway Tunnel

Alternative, the SR 710 northbound off-ramp and southbound on-ramp at Valley Boulevard would be modified. Construction of these improvements would involve major ground disturbance during construction. As shown in Table 3.12.1, the Freeway Tunnel Alternative would potentially be impacted by the hazardous materials associated with Subject Properties 5, 6, and 7.

The segment of the proposed Freeway Tunnel Alternative that is to the north of I-710 and Valley Boulevard, and at the intersection of Mission Road and Concord Avenue, passes through part of Subject Property 3, Railroad ROW. However, the Freeway Tunnel Alternative beneath this site footprint is designed to be an underground tunnel and the shallowest ground impact from this is expected to be 75 ft bgs. Therefore, this property may not cause an impact to the Freeway Tunnel Alternative. Although information is currently unavailable regarding environmental impacts at this location, if any, railroads are typically anticipated to have adverse environmental impacts from various chemical constituents present in railroad ties and wooden posts (wood-treating chemicals).

The segment of the Freeway Tunnel Alternative immediately south of I-10 along SR 710 is immediately adjacent to the boundary of Subject Property 5, Blanchard Landfill. The former Blanchard Disposal Facility had operations predating current solid waste management regulations by more than 30 years; as such, the facility did not have a liner, leachate collection and recovery system, waste acceptance and screening procedures, or record keeping substantiating waste acceptance and operational practices. Moreover, a methane gas investigation conducted in 2010 indicated methane concentrations exceeding the CCR Title 27 regulatory limit of 5 percent by volume in air in methane monitoring wells installed at the site. Since the Freeway Tunnel Alternative at this location would be an aerial structure and tunneling would not occur, the potential to encounter impacted groundwater, if any, during construction activities is minimal. However, if structural reinforcements for the project in this area could reach deeper depths, then groundwater impact should also be considered as a potential concern for this alternative. A Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 5, if the Freeway Tunnel Alternative is selected as the Preferred Alternative. The Phase II Site Investigation would be conducted during final design of the Freeway Tunnel Alternative to provide clarity as to the extent of any effect on the Freeway Tunnel Alternative.

Subject Property 6 is immediately adjacent to the Freeway Tunnel Alternative footprint (within 10 to 15 ft). Mercury Die/Mission Corrugated is known to have shallow soil vapor impacts beneath its footprint and may have deeper impacts to soil vapor and groundwater. Therefore, adverse soil vapor and groundwater impacts from this property extending into the alignment of the Freeway Tunnel Alternative could be a potential concern for this alternative. In order to avoid or minimize these adverse impacts, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 6 if the Freeway Tunnel Alternative is selected as the Preferred Alternative. The Phase II Site Investigation would be conducted during final design of the Freeway Tunnel Alternative to provide clarity as to the extent of any effect on the Freeway Tunnel Alternative.

Subject Property 7 is immediately adjacent to the Freeway Tunnel Alternative footprint (within 100 ft). The former Arco site is identified as a former LUST site that had a 580-gallon waste oil UST and four 6,000-gallon gasoline tanks that were removed in October 1989. Site investigations completed at this site identified elevated concentrations of volatile hydrocarbon fuel, BTEX, and

MTBE in the soil and groundwater. This site received regulatory closure on December 1, 1987. However, residual contamination may be present in the footprint of the Freeway Tunnel Alternative. Therefore, a potential for residual contamination from this property extending into the alignment of the Freeway Tunnel Alternative could be a potential concern for this alternative. To avoid or minimize these adverse impacts, a Phase II Site Investigation, consistent with regulatory requirements, would be required for Subject Property 7 if the Freeway Tunnel Alternative is selected as the Preferred Alternative. The Phase II Site Investigation would be conducted during final design of the Freeway Tunnel Alternative to provide clarity as to the extent of any effect on the Freeway Tunnel Alternative.

ADL from the historical use of leaded gasoline, exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of ADL on the state highway system right of way within the limits of the Freeway Tunnel Alternative.

The Freeway Tunnel Alternative would also include all the improvements in the TSM/TDM Alternative with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John extension between Del Mar Boulevard and California Boulevard). Therefore, the Freeway Tunnel Alternative with the TSM/TDM component would potentially be impacted by the hazardous materials associated with Subject Properties 1, 2, 5, 6, and 7.

For the construction of the tunnels for the Freeway Tunnel Alternative, it is expected that the TBM could potentially pass through impacted soil or groundwater as stated in the discussions for Subject Properties 5, 6, and 7.

During tunnel construction activities for the Freeway Tunnel Alternative, a temporary stockpiling area at the construction portals would be set up so that excavated material can be sampled as it is excavated. A sampling and analysis plan would be required so that the excavated material is classified properly and the correct handling methods and appropriate disposal facility are selected according to State and Caltrans regulatory requirements. Water (including construction water, groundwater, and wet weather flows), if encountered, would also be sampled. If necessary, the water can be treated at the construction portal areas prior to being discharged in compliance with an appropriate approved discharge permit into the sewer system. A contractor is typically required to have basic water treatment capabilities at the construction site. If the water cannot be treated to meet sewer discharge requirements or if the volume of water for disposal exceeds the discharge permit’s capacity, it may need to be transported to an off-site disposal location. Disposal of all materials would need to meet all local, State, and federal regulations, where applicable.

For the Freeway Tunnel Alternative, the TBM tunneling methods would be similar to those discussed for the LRT Alternative. The tunneling methods of the bored tunnels proposed for the Freeway Tunnel Alternative would also use pressurized-face TBMs. These closed-face machines reduce or eliminate the potential for uncontrolled entry of groundwater during excavation due to their closed excavation faces.

Construction Activities for Bridges

For the TSM/TDM Alternative, the widening of the Garfield Avenue Bridge would be required. For the Freeway Tunnel Alternative, the dual-bore design variation would require the widening of the Ramona Boulevard undercrossing bridge and the SR 710/I-10 bridge. Both the single- and dual-bore design variations would require demolition and replacement of the Hellman Avenue overcrossing bridge, the Green Street overcrossing bridge, and the Del Mar Boulevard overcrossing. No widening or demolition of bridges would be required for the BRT and LRT Alternatives.

Based on the potential for bridges within the project area to have been constructed prior to 1989 (when the federal ban on asbestos use was implemented), ACM may be present in these structures. The presence of these materials would pose a potential hazardous waste risk if the removal of materials for the widening or demolition of bridges is required. An asbestos survey would be conducted, the potential for ACM would be identified and characterized, and the ACM would be disposed of during construction activities at a Class I or II disposal facility in conformance with applicable regulatory requirements.

3.12.3.2 Permanent Impacts

No Build Alternative

Under the No Build Alternative, with the operation of the existing roadways and freeways, there is potential for accidents and hazardous spills to occur that would be similar to the potential for accidents and hazardous spills under the Build Alternatives. Any spills would be cleaned up and treated consistent with regulatory requirements. Similar to the Build Alternatives, routine maintenance activities would continue under the improvements included in the No Build Alternative, including compliance with applicable regulations regarding the handling and disposal of potentially hazardous materials.

Build Alternatives

During operation of the tunnels for the LRT and Freeway Tunnel Alternatives, the anticipated linings of the TBM-constructed tunnels are expected to be water- and gas-tight, gasketed, precast concrete segmental liners, which will reduce or eliminate water or gas entry into the tunnels. It should be noted that vehicles carrying flammable or hazardous materials would be restricted from using the tunnel(s) for the Freeway Tunnel Alternative under all design variations. Measures will be taken during construction to prevent cross-contamination, creating a conduit for migration of contamination, and exacerbating existing contamination.

Operation and maintenance of the new facilities proposed for the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives would not introduce new sources of hazardous materials/waste. Routine maintenance activities would continue after the completion of the project, and would be required to follow applicable regulations with respect to handling and disposal of potentially hazardous materials/wastes.

No new permanent adverse impacts related to hazardous materials/waste (direct or indirect) beyond existing conditions would occur during the operation of the project. Therefore, potential adverse permanent impacts associated with hazardous materials/waste are not considered substantial.

3.12.4 Avoidance, Minimization, and/or Mitigation Measures

The measures below would avoid or substantially minimize impacts related to hazardous materials/wastes potentially encountered during construction of the Build Alternatives.

Measure HW-1 **Striping and Pavement Markings (applies to all four Build Alternatives):** During Plans, Specifications and Estimates (PS&E), the Project Engineer will ensure the specifications related to the sampling, handling, and treatment of pavement markings are included and implemented during construction. A qualified contractor will sample and test the striping paint along roads to be disturbed as part of the project for lead chromate. Sampling will be performed on the residue after waste is generated to characterize the waste so that it can be disposed at an appropriate landfill. The field and analytical data obtained during this study will be used to provide a review of the sampling locations and descriptions, a summary of the analytical results, and recommendations for striping paint removal, containment, and off-site transportation and disposal, as appropriate. The sampling, handling, treatment and disposal of hazardous waste will be conducted in accordance with applicable local, State and federal regulations and requirements, prior to and during construction of the project.

Measure HW-2

Transformers (applies to the Transportation System Management/Transportation Demand Management [TSM/TDM], Bus Rapid Transit [BRT], and Light Rail Transit [LRT] Alternatives): During PS&E, the Project Engineer will ensure the specifications related to the handling and treatment of transformers are included and implemented if transformer removal is required. The Construction Contractor will contact Southern California Edison prior to handling or removal of electric transformers. Should wood utility poles require removal, the Resident Engineer will require the Construction Contractor to manage (handle, store, transport, and dispose) wood poles as Treated Wood Waste (TWW), a non-RCRA (California) hazardous waste. TWW is wood treated with chemical preservatives such as arsenic, chromium, copper, pentachlorophenol (often associated with the preservation of wooden electric poles) and requires appropriate disposal methods. Any hazardous transformers or poles that are disturbed/removed will be disposed of in accordance with the California Health and Safety Code and Title 22 CCR.

Measure HW-3

Aerially Deposited Lead (ADL) and Lead Compliance Plan (applies to all four Build Alternatives): Prior to construction, the Project Engineer will ensure that the specifications related to the testing and handling of soils with ADL are included during PS&E and implemented during construction. The Construction Contractors responsible for excavating, transporting, or stockpiling soil will prepare a Lead Compliance Plan in accordance with the California Department of Transportation (Caltrans) Code of Safety Practices (Freeway Tunnel Alternative), the California Code of Regulations (all four Build Alternatives), and California Occupational Safety and Health Administration (all four Build Alternatives) standards. The Lead Compliance Plan will address the presence of ADL in the soils within the project area and the health and safety of construction workers.

Measure HW-4 **Aerially-Deposited Lead Investigation (applies to all four Build Alternatives):** During PS&E, the Project Engineer will ensure the specifications related to soil sampling and handling of soils with ADL are included and implemented prior to any site preparation, disturbance, grading, and construction. The qualified contractor will conduct soil sampling for ADL in unpaved locations adjacent to existing roadways within the project alignment. The analytical results of the soil sampling will determine the appropriate handling of the soil in those areas and the disposal of surplus materials. The sampling, handling, treatment and disposal of hazardous waste will be conducted in accordance with applicable local, State and federal regulations and requirements, prior to and during construction of the project.

Measure HW-5 **Demolition of Structures (applies to all four Build Alternatives):** The Project Engineer will ensure the specifications related to the sampling, handling, treatment, and disposal of ACM, LBP, and equipment containing CFCs, PCBs, (fluorescent lights, PCB ballasts), mercury switches, timers, sensors, thermostats, and mercury vapor lamps for structures planned for demolition are included during PS&E and implemented after property acquisition and prior to demolition. The qualified contractor will assess structures planned for demolition within the project area for the possible presence of ACM, LBP, and equipment containing CFCs, PCBs (fluorescent lights, PCB ballasts), mercury switches, timers, sensors, thermostats, and mercury vapor lamps. These studies will be conducted by trained and/or licensed professionals and will comply with the EPA National Emission Standards for Hazardous Air Pollutants 40 Code of Federal Regulations (CFR), South Coast Air Quality Management District (SCAQMD) Rule 1403, Housing and Urban Development, and California Department of Public Health guidelines.

Measure HW-6 **Demolition of Bridges (applies to all four Build Alternatives):** The qualified contractor will assess bridges planned for demolition within the project area for the possible presence of ACM and LBP. These studies will be conducted by trained and/or licensed professionals and will comply with the EPA National Emission Standards for Hazardous Air Pollutants 40 CFR, SCAQMD Rule 1403, Housing and Urban Development, and California Department of Public Health guidelines. The results of these studies will provide a description of the ACM and LBP locations, estimated quantity, and recommendations for removal, containment, and off-site transportation and disposal. The sampling, handling, treatment and disposal of hazardous waste will be conducted in accordance with applicable local, State and federal regulations and requirements, prior to and during construction of the project.

Measure HW-7 **Traffic Signal Upgrades (applies to all four Build Alternatives):** The qualified contractor will assess planned upgrades to traffic signals for the possible presence of mercury containing equipment, mercury lamps, cathode ray tubes, etc. These studies will be conducted by trained and/or licensed professionals. The results of these studies will provide a description of the mercury containing equipment locations, estimated quantity, and recommendations for removal, containment, and off-site transportation and disposal. The sampling, handling, treatment and disposal of hazardous waste will be conducted in accordance with applicable local, State and federal regulations and requirements, prior to and during construction of the project.

Measure HW-8 **SCAQMD Rule 1403 (applies to all four Build Alternatives):** The Project Engineer will ensure the specifications related to air pollution control during demolition or renovation of a structure or bridge are included during PS&E and implemented prior to demolition or renovation of a structure or bridge. The Construction Contractor will notify the SCAQMD and submit the required fees at least 10 days prior to proceeding with the demolition work (refer to SCAQMD Rule 1403). Failure to do so may result in Los Angeles County Metropolitan Transportation Authority (Metro) or Caltrans being cited for regulatory noncompliance. Notification would fall under Section 7-1.01F, Air Pollution Control, and Section 7-1.04, Permits and Licenses of the Standard Specifications. The Construction Contractors will be required to adhere to the requirements of SCAQMD Rule 1403 during renovation/demolition activities. The sampling, handling, treatment and disposal of hazardous waste will be conducted in accordance with applicable local, State and federal regulations and requirements, prior to and during construction of the project.

Measure HW-9 **Phase II Site Investigations (applies to all four Build Alternatives):** The Project Engineer will ensure the specifications related to the handling, treatment, and disposal of hazardous wastes are included during PS&E and implemented prior to Phase II Site Investigations to determine if special handling, treatment, or disposal provisions associated with hazardous wastes will be required for the project and if remediation of a property prior to or after construction and protection of health and safety of workers are required. A qualified contractor will conduct Phase II Site Investigations at all parcels proposed for acquisition or easement and other properties identified in the ISA at the following locations:

1. Former Circle K Stores (Subject Property 1), 1000 West Valley Boulevard, Alhambra
2. Fashion Master Cleaners (Subject Property 2), 1433 Huntington Drive, South Pasadena

3. Railroad ROW (Subject Property 3) north of Valley Boulevard and SR 710 and immediately south of Alhambra Avenue/Mission Road
4. Elite Cleaners (Subject Property 4), 1310 Fair Oaks Avenue, South Pasadena
5. Blanchard Landfill (Subject Property 5), between Blanchard Avenue and McBride Avenue at 4531 East Blanchard Street, Monterey Park
6. Mercury Die/Mission Corrugated (Subject Property 6), 3201 West Mission Road, Alhambra
7. Arco Station (Subject Property 7), 3201 Valley Boulevard, Alhambra
8. Former Tosco/Unocal Station (Subject Property 8), 2140 Huntington Drive, South Pasadena

The ISA was performed to identify impacts to the project from hazardous waste and petroleum product. These impacts will be investigated through a Phase II Site Investigation.The Phase II Site Investigations will be performed prior to completion of the PS&E phase of the project for properties that may be potentially impacted by the selected Build Alternative. Based on the results of the Phase II Site Investigations, additional soil and/or groundwater sampling as well as removal and/or treatment of soil and/or groundwater prior to construction may be necessary. The sampling, handling, treatment and disposal of hazardous waste will be conducted in accordance with applicable local, State and federal regulations and requirements, prior to and during construction of the project.

Measure HW-10

Soils Adjacent to the Railroad ROW (applies to the TSM/TDM Alternative): The Project Engineer will ensure the specifications related to the sampling and handling of soils adjacent to the railroad ROW are included during PS&E and implemented prior to disturbance of soils adjacent to the railroad ROW in the Build Alternative ROW. A qualified contractor will sample those soils to determine whether they require special handling and disposal.

Measure HW-11

Tunnel Construction Activities (applies to the LRT and Freeway Tunnel Alternatives): The Project Engineer will ensure the specifications related to the sampling and handling of soils and water during tunnel excavation and boring activities are included during PS&E and implemented prior to the initiation of tunnel excavation and boring. The Construction Contractor will set up a temporary stockpiling area at the construction portals so that excavated material can be sampled as it is excavated. A Sampling and Analysis Plan will be required so that the excavated material is classified properly and so the correct handling methods and the appropriate disposal facility are selected according to Caltrans and

State regulatory requirements. Water, including construction water, groundwater, and wet weather flows, will also be sampled. If necessary, the water can be treated at the construction portal areas by the Construction Contractor prior to discharge following an appropriate approved discharge permit into the sewer system or discharge to the storm drain through a National Pollutant Discharge Elimination System (NPDES) permit; typically a Construction Contractor is required to have basic water treatment capabilities at the construction site. If the water cannot be treated to meet sewer discharge requirements or if the volume of water for disposal exceeds the discharge permit's capacity, it may need to be transported to an offsite disposal location. Disposal of all materials would need to meet all local, State, and federal regulations, where applicable.

Measure HW-12

Unknown Hazards (applies to all four Build Alternatives): The Project Engineer will ensure the specifications related to the monitoring of soil excavations for visible soil staining, odor, and the possible presence of unknown hazardous material sources and pre- and post-construction remediation are included during PS&E and implemented during construction. The Construction Contractor will monitor excavations soil excavations for visible soil staining, odor, and the possible presence of unknown hazardous material sources. The Construction Contractor will have field monitoring equipment (e.g., photoionization detector) on site to facilitate the timely detection of potentially hazardous conditions in the field and protection of workers. If signs of potential impact (odors, discolored soil, etc.) are noted or observed during construction activity, sampling and analysis should be conducted. Soil samples should be analyzed for total petroleum hydrocarbons with carbon chain analysis using EPA Method 8015B and volatile organic compounds by EPA Method 8260B, heavy metals by EPA Method 6010/7000 series, semi-volatile organic compounds by EPA Method 8270, PAHs by EPA Method 8310, and other analytical methods depending on the suspected contaminant where run-off may have collected. If other hazardous materials contamination or sources are suspected or identified during project construction activities, an environmental professional will evaluate the course of action required. This course of action will follow the Unknown Hazards Procedures described in Chapter 7 of the Caltrans Construction Manual (August 2006) for areas within State-owned ROW. For improvements outside the State-owned ROW, applicable State and federal regulations will be followed during construction activities and if any impacts are identified. The sampling, handling, treatment and disposal of hazardous waste will be conducted in accordance with applicable local, State and federal regulations and requirements, prior to and during construction of the project.

Measure HW-13	**Bridge Retaining Walls, Noise Barriers, Pile installation (applies to all four Build Alternatives):** Special construction methods are to be used during construction of Bridge Retaining Walls, Noise Barriers, and Pile installation where there is contaminated soil and perched groundwater to prevent cross-contamination and creating a conduit for migration of contamination.

In addition to these measures, Measure WQ-2 in Section 3.9, Water Quality and Storm Water Runoff, would be required for construction activities related to dewatering. Measure GEO-1 in Section 3.10, Geology, would be required prior to construction activities in areas potentially contaminated with hazardous materials or wastes.

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3.13 Air Quality

3.13.1 Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act is its companion state law. These laws, and related regulations by the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

3.13.1.1 Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to the State Implementation Plan (SIP) for attaining the NAAQS. "Transportation Conformity" applies to highway and transit projects and takes place on two levels: the regional—or planning and programming—level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. EPA regulations at 40 Code of Federal Regulations (CFR) 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), sulfur dioxide (SO_2). California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO_2, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years for the RTP, and 4 years for the FTIP. RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA), make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope[1] that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models, and in PM areas, the project complies with control measures in the SIP, if any. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts. The TSM/TDM Alternative has been identified as the Preferred Alternative and is exempt under 40 CFR 93.126 traffic control devices and operating assistance other than signalization projects and pavement marking from all conformity requirements, determined by SCAG (SCAG 2018).

3.13.2 Affected Environment

This section is based on the *Air Quality Assessment Report* (2015) and the *Supplemental Air Quality Assessment Report* (2018) for the State Route 710 (SR 710) North Project.

3.13.2.1 Climate

The project site is in the part of Los Angeles County in the South Coast Air Basin (Basin). The Basin includes all of Orange County and the non-desert parts of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in the Basin is administered by the South Coast Air Quality Management District (SCAQMD).

The climate in the Basin is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwest boundary of the Basin, and high mountains surround the rest of the Basin. The Basin is in the semipermanent high pressure zone of the eastern Pacific Ocean. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur in the Basin.

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s (measured in degrees Fahrenheit [°F]). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site where temperature is monitored is the Pasadena Station. The annual average maximum temperature recorded at that station is 76.8°F, and the annual average minimum is 51.0°F. January is typically the coldest month in this area of the Basin.

The majority of rainfall in the Basin occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in

[1] "Design concept" means the type of facility that is proposed, such as a freeway or arterial highway. "Design scope" refers to those aspects of the project that would clearly affect capacity and thus any regional emissions analysis, such as the number of lanes and the length of the project.

the east part of the Basin along the coastal side of the mountains. The closest climatological station to the project limits where precipitation is monitored is the Pasadena Station. Average rainfall measured at that station varied from a high of 4.54 inches in February to 0.43 inch or less between May and September, with an average annual total of 20.24 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed from mid-afternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

Winds in the project area blow predominantly from the west and southwest at relatively low velocities, with wind speeds averaging approximately 4 miles per hour (mph). Summer wind speeds average slightly higher than winter wind speeds. Low average wind speeds together with a persistent temperature inversion limit the vertical dispersion of air pollutants throughout the Basin. Strong, dry, northerly or northeasterly Santa Ana winds occur during the fall and winter months, dispersing air contaminants. Santa Ana conditions tend to last for several days at a time.

Inversion layers have a substantial role in determining O_3 formation. O_3 and its precursors will mix and react to produce higher concentrations under an inversion. Inversions also simultaneously trap and hold directly emitted pollutants such as CO_2. PM_{10} is both directly emitted and created indirectly in the atmosphere as a result of chemical reactions. Concentration levels are directly related to inversion layers due to the limitation of mixing space.

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, when heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground-level air to float up through the inversion layer.

The combination of stagnant wind conditions and low inversions produces the greatest concentration of air pollutants. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore from Los Angeles and Orange Counties into Riverside and San Bernardino Counties. In the winter, the greatest pollutants are CO and nitrogen oxides (NO_X) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, longer daylight hours and brighter sunshine combine to cause a reaction between hydrocarbons and NO_X to form photochemical smog.

3.13.2.2 Monitored Air Quality

The SCAQMD operates several air quality monitoring stations in the Basin. The closest monitoring station to the project area is the 752 South Wilson Avenue Pasadena Station. Pollutants monitored at that station are CO, O_3, $PM_{2.5}$, and NO_2. The next closest station to the project area is the 1630 North Main Street Los Angeles Station, which monitors CO, O_3, PM_{10}, $PM_{2.5}$, NO_2, and SO_2. Tables 3.13.1 and 3.13.2 list air quality trends identified from data collected between 2012 and 2016 for

TABLE 3.13.1:
Air Quality Levels Measured at the 752 South Wilson Avenue Pasadena Station

Pollutant		Standard	2012	2013	2014	2015	2016
Carbon Monoxide							
Max 1-hr concentration (ppm)			2.4	2.5	3.1	2.6	1.5
No. days exceeded:	State	> 20 ppm/1-hr	0	0	0	0	0
	Federal	> 35 ppm/1-hr	0	0	0	0	0
Max 8-hr concentration (ppm)			1.58	1.7	1.8	1.6	1.0
No. days exceeded:	State	> 9.0 ppm/8-hr	0	0	0	0	0
	Federal	> 9.0 ppm/8-hr	0	0	0	0	0
Ozone							
Max 1-hr concentration (ppm)			0.111	0.099	0.124	0.111	0.126
No. days exceeded:	State	> 0.09 ppm/1-hr	8	2	6	12	12
Ozone							
Max 8-hr concentration (ppm)			0.086	0.075	0.096	0.084	0.090
No. days exceeded:	State	> 0.07 ppm/8-hr	20	2	13	18	18
	Federal	> 0.07 ppm/8-hr	9	0	7	7	15
Particulate matter less than 10 microns in size (PM_{10})							
Max 24-hr concentration ($\mu g/m^3$)			N/A	N/A	N/A	N/A	N/A
No. days exceeded:	State	> 50 $\mu g/m^3$	N/A	N/A	N/A	N/A	N/A
	Federal	> 150 $\mu g/m^3$	N/A	N/A	N/A	N/A	N/A
Annual avg. concentration ($\mu g/m^3$)			N/A	N/A	N/A	N/A	N/A
Exceeds Standard?	State	> 20 $\mu g/m^3$	N/A	N/A	N/A	N/A	N/A
Particulate matter less than 2.5 microns in size ($PM_{2.5}$)							
Max 24-hr concentration ($\mu g/m^3$)			30.5	25.7	32.5	48.5	29.2
No. days exceeded:	Federal	> 35 $\mu g/m^3$	0	0	0	2	0
Annual avg. concentration ($\mu g/m^3$)			10.1	10.2	11.1	9.8	9.5
Exceeds Standard?	State	> 12 $\mu g/m^3$	No	No	No	No	No
	Federal	> 12 $\mu g/m^3$	No	No	No	No	No
Nitrogen Dioxide							
Max 1-hr concentration (ppb)			71.2	66.7	75.2	74.9	71.9
No. days exceeded:	State	> 180 ppb/1-hr	0	0	0	0	0
	Federal	> 100 ppb/1-hr	0	0	0	0	0
Annual avg. concentration (ppb)			17.24	20.84	16.56	15	15
Exceeds Standard?	Federal	53 ppb annual average	No	No	No	No	No
Sulfur Dioxide							
Max 1-hr concentration (ppb)			N/A	N/A	N/A	N/A	N/A
No. days exceeded:	State	250 ppb	N/A	N/A	N/A	N/A	N/A
	Federal	75 ppb					
Max 24-hr concentration (ppb)			N/A	N/A	N/A	N/A	N/A
Exceed standard?	State	40 ppb	N/A	N/A	N/A	N/A	N/A

Source 1: CARB. 2017. iADAM: Air Quality Data Statistics Top Four Summary. Available online at: http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed September 2017.
Source 2: EPA. 2017. Outdoor Air Quality Data, Monitor Values Report. Available online at: http://www.epa.gov/airquality/airdata/ad_rep_mon.html.
$\mu g/m^3$ = micrograms per cubic meter
N/A = there was insufficient (or no) data available to determine a value
ppb = parts per billion
ppm = parts per million

TABLE 3.13.2:
Air Quality Levels Measured at the 1630 North Main Street Los Angeles Station

Pollutant		Standard	2012	2013	2014	2015	2016
Carbon Monoxide							
Max 1-hr concentration (ppm)			2.2	2.5	2.5	3.2	1.9
No. days exceeded:	State	> 20 ppm/1-hr	0	0	0	0	0
	Federal	> 35 ppm/1-hr	0	0	0	0	0
Max 8-hr concentration (ppm)			1.91	2.0	2.0	1.8	1.4
No. days exceeded:	State	> 9.0 ppm/8-hr	0	0	0	0	0
	Federal	> 9.0 ppm/8-hr	0	0	0	0	0
Ozone							
Max 1-hr concentration (ppm)			0.093	0.081	0.113	0.104	0.103
No. days exceeded:	State	> 0.09 ppm/1-hr	0	0	3	2	2
Ozone							
Max 8-hr concentration (ppm)			0.077	0.069	0.094	0.074	0.078
No. days exceeded:	State	> 0.07 ppm/8-hr	2	0	6	6	4
	Federal	> 0.07 ppm/8-hr	2	0	2	0	1
Particulate matter less than 10 microns in size (PM_{10})							
Max 24-hr concentration (μg/m^3)			90.9	74.5	86.8	88.5	74.6
No. days exceeded:	State	> 50 μg/m^3	43	20	38	30	21
	Federal	> 150 μg/m^3	0	0	0	0	0
Annual avg. concentration (μg/m^3)			30.0	35.3	30.2	27.0	25.8
Exceeds Standard?	State	> 20 μg/m^3	Yes	Yes	Yes	Yes	Yes
Particulate matter less than 2.5 microns in size ($PM_{2.5}$)							
Max 24-hr concentration (μg/m^3)			58.7	43.1	59.9	56.4	44.3
No. days exceeded:	Federal	> 35 μg/m^3	4	1	6	7	2
Annual avg. concentration (μg/m^3)			12.7	18.9	12.5	12.5	12.0
Exceeds Standard?	State	> 12 μg/m^3	Yes	Yes	Yes	Yes	No
	Federal	> 12 μg/m^3	Yes	Yes	Yes	Yes	Yes
Nitrogen Dioxide							
Max 1-hr concentration (ppb)			77.3	90.3	82.1	79.1	64.7
No. days exceeded:	State	> 180 ppb/1-hr	0	0	0	0	0
	Federal	> 100 ppb/1-hr	0	0	0	0	0
Annual avg. concentration (ppb)			24.77	21.52	22	22	20
Exceeds Standard?	Federal	53 ppb annual average	No	No	No	No	No
Sulfur Dioxide							
Max 1-hr concentration (ppb)			5.2	6.0	5.4	12.6	13.4
No. days exceeded:	State	250 ppb	0	0	0	0	0
	Federal	75 ppb	0	0	0	0	0
Max 24-hr concentration (ppb)			1.7	1.5	11.0	5.0	1.6
Exceed standard?	State	40 ppb	No	No	No	No	No

Source 1: CARB. 2017. iADAM: Air Quality Data Statistics Top Four Summary. Available online at: http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed September 2017.
Source 2: EPA. 2017. Outdoor Air Quality Data, Monitor Values Report. Available online at: http://www.epa.gov/airquality/airdata/ad_rep_mon.html. Accessed September 2017.
μg/m^3 = micrograms per cubic meter
N/A = there was insufficient (or no) data available to determine a value.
ppb = parts per billion
ppm = parts per million

the South Wilson Avenue Pasadena Station and the North Main Street Los Angeles Station, respectively. These stations are in proximity to SR 710, Interstate 10 (I-10), Interstate 5 (I-5), and State Route 110 (SR 110), which are area freeways that could be affected by the Build Alternatives.

The ambient air quality monitoring is conducted at these stations for the criteria pollutants of concern but not mobile source air toxics (MSATs). The air quality levels measured at these stations represent the ambient conditions for the criteria pollutants in the project area. Figure 3.13-1 shows the locations of these monitoring stations in relation to the improvements in the four Build Alternatives.

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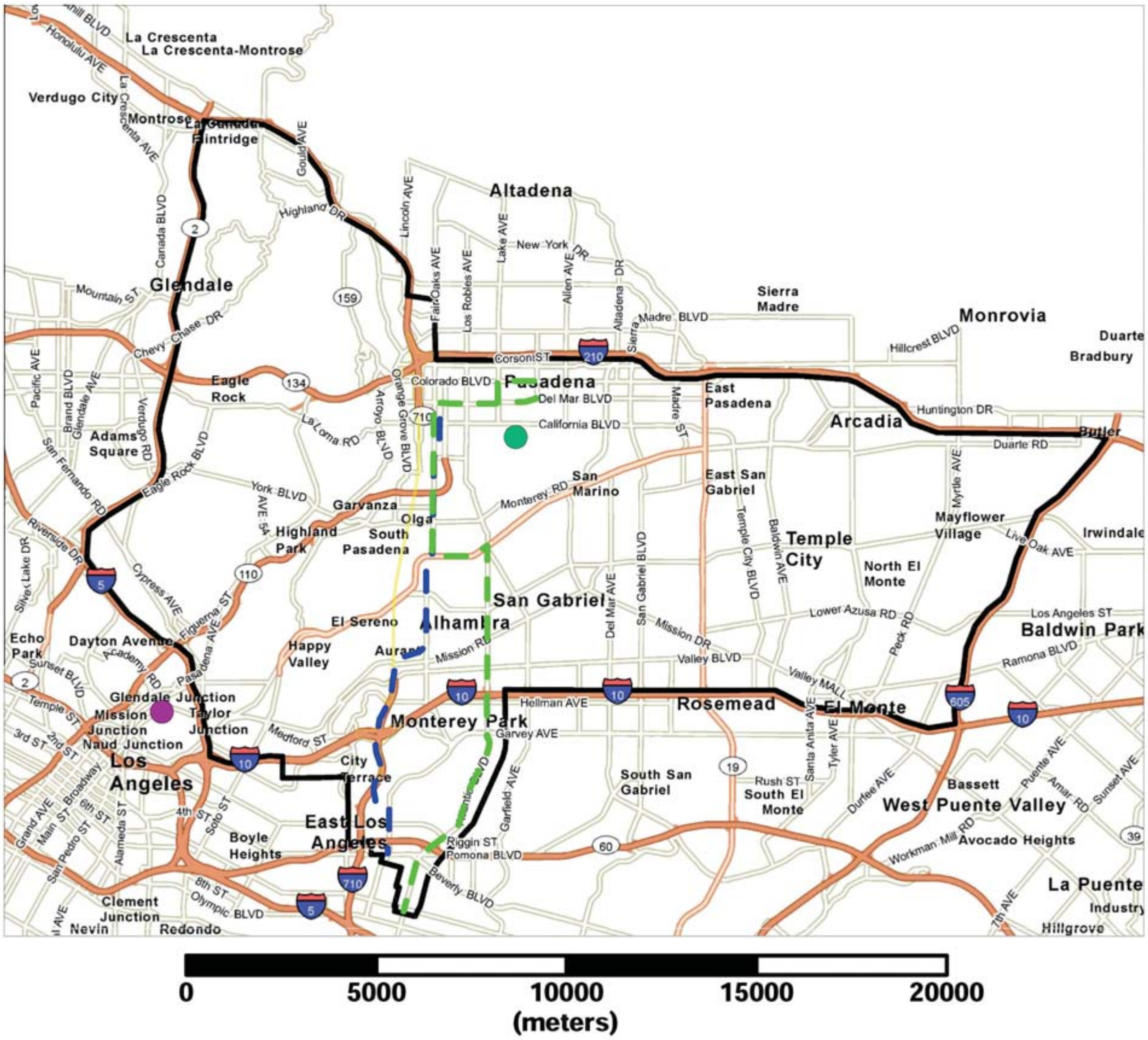

Central Los Angeles Station, 1630 North Main Street
Pasadena Station, 752 South Wilson Avenue.
BRT Alignment
LRT Alignment
Freeway Tunnel Alignment
Project Study Area

FIGURE 3.13-1

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SR 710 North Project
Locations of Ambient Air Quality Monitoring Stations

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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3.13.2.3 Sensitive Receptors

Sensitive populations are defined as populations that are more susceptible to the effects of air pollution than the general population. Sensitive populations (sensitive receptors) in proximity to localized sources of MSATs and CO are of particular concern. Land uses considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, hospitals, rehabilitation centers, convalescent centers, and retirement homes. The majority of the sensitive receptors in or adjacent to the project area are residences, parks, and schools. Figure 3.1-1, provided earlier in Section 3.1, Land Use, shows existing land uses in the study area, including sensitive uses such as residential uses. Locations of sensitive receptors including K-12 schools, daycare centers, hospitals, and nursing homes are shown in Figure 3.13-2.

3.13.2.4 Criteria Pollutant Attainment/Nonattainment Status

As noted earlier, the six criteria pollutants are O_3, CO, PM (including both $PM_{2.5}$ and PM_{10}), NO_2, SO_2, and lead. Table 3.13.3 lists the primary standards for these criteria pollutants, and provides brief descriptions of the health effects associated with exposures to these pollutants and the typical sources of these pollutants. The NAAQS are two-tiered: Primary, to protect public health; and Secondary, to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation and property).

There are air quality monitoring stations located throughout the nation that are maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the EPA to identify regions as attainment, nonattainment, or maintenance, depending on whether the regions meet the requirements stated in the primary NAAQS. The EPA imposes additional restrictions on nonattainment areas. Different classifications of nonattainment (e.g., marginal, moderate, serious, severe, and extreme) are used to classify each air basin on a pollutant-by-pollutant basis. The classifications are used to develop air quality management strategies to improve air quality and comply with the NAAQS. Table 3.13.3 lists the attainment statuses for the criteria pollutants in the Los Angeles County part of the Basin.

3.13.3 Environmental Consequences

3.13.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in adverse short-term air quality effects associated with improvements in the SR 710 North Project Build Alternatives.

Build Alternatives

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, NO_X, volatile organic compounds (VOCs), directly-emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants (TACs) such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NO_X and VOCs in the presence of sunlight and heat.

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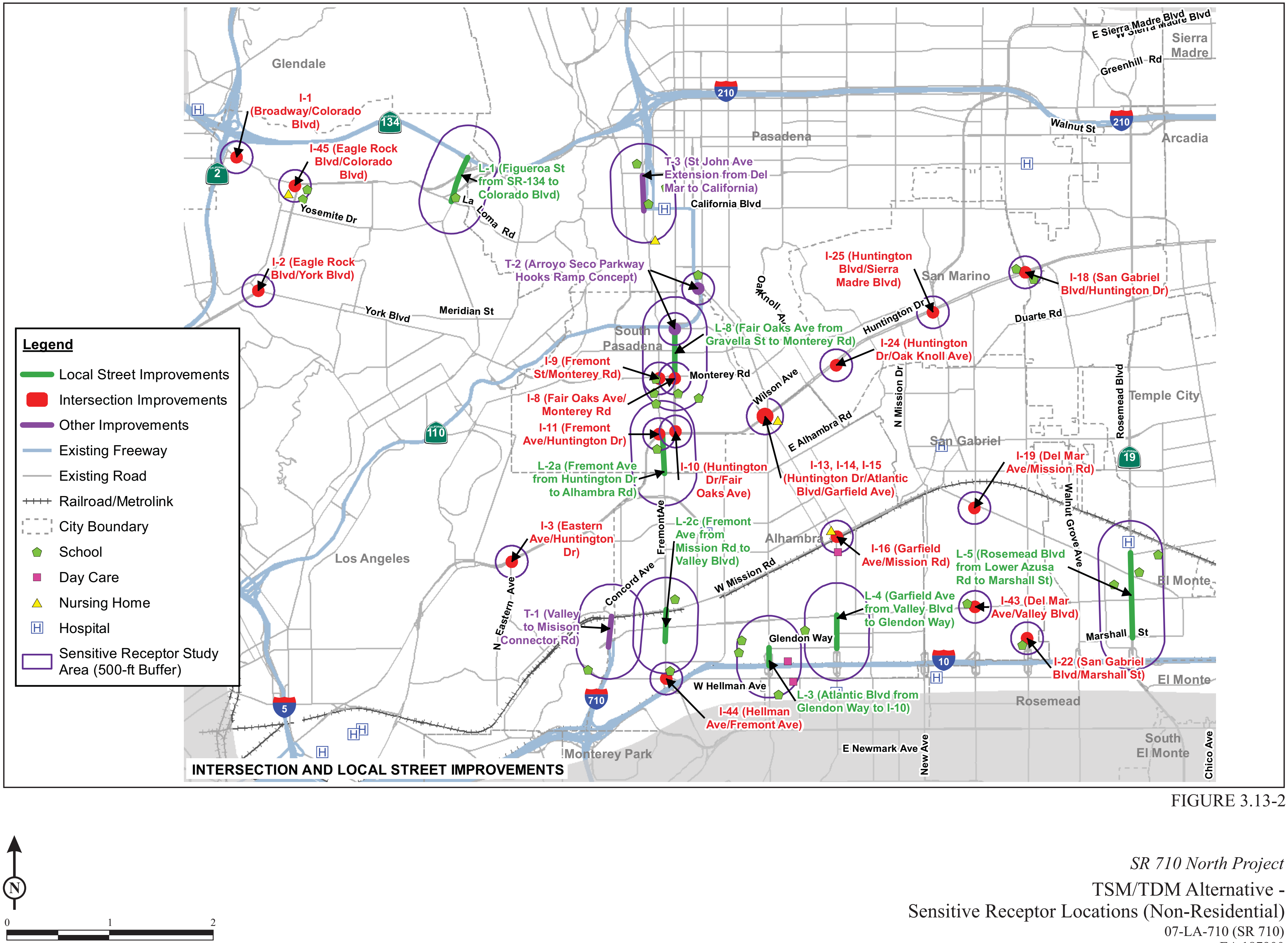

FIGURE 3.13-2

SR 710 North Project

TSM/TDM Alternative -
Sensitive Receptor Locations (Non-Residential)

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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TABLE 3.13.3:
State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard[8]	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Ozone (O_3)[2]	1 hour 8 hours	0.09 ppm 0.070 ppm	--- 0.070 ppm (4th highest in 3 years)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOCs may also contribute.	Low-altitude ozone is almost entirely formed from ROGs/VOCs and NO_X in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.	**Federal:** Extreme Nonattainment (8-hour) **State:** Nonattainment (1-hour and 8-hour)
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm[1] 6 ppm	35 ppm 9 ppm ---	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	**Federal:** Attainment/ Maintenance **State:** Attainment
Respirable Particulate Matter (PM_{10})[2]	24 hours Annual	50 µg/m³ 20 µg/m³	150 µg/m³ ---[2] (expected number of days above standard ≤ 1)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke and vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.	**Federal:** Attainment/Maintenance **State:** Nonattainment
Fine Particulate Matter ($PM_{2.5}$)[2]	24 hours Annual Secondary Standard (annual)	--- 12 µg/m³ ---	35 µg/m³ 12.0 µg/m³ 15 µg/m³ (98th percentile over 3 years)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter (a toxic air contaminant) is in the $PM_{2.5}$ size range. Many toxic and other aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NO_X, SO_X, ammonia, and ROGs.	**Federal:** Nonattainment **State:** Nonattainment
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	0.100 ppm[6] (98th percentile over 3 years) 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NO_X" group of ozone precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.	**Federal:** Attainment/ Maintenance **State:** Nonattainment
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours	0.25 ppm --- 0.04 ppm	0.075 ppm[7] (98th percentile over 3 years) 0.5 ppm	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	**Federal:** Attainment/ Unclassified **State:** Attainment/ Unclassified
Lead (Pb)[3]	Monthly Rolling 3-month average	1.5 µg/m³ ---	--- 0.15 µg/m³ [10]	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from gasoline may exist in soils along major roads.	**Federal:** Nonattainment (Los Angeles County only) **State:** Nonattainment (Los Angeles County only)
Sulfate	24 hours	25 µg/m³	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	**Federal:** Unclassified. **State:** Attainment/ Unclassified
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	**Federal:** Not applicable **State:** Attainment/ Unclassified
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 mi or more (Tahoe: 30 mi) at relative humidity < 70%	---	Reduces visibility. Produces haze.[11]	See particulate matter above.	**Federal:** Not applicable **State:** Attainment/ Unclassified
Vinyl Chloride[3]	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	**Federal:** Not applicable **State:** Attainment/ Unclassified

Source: CARB, 2016 Adapted from Sonoma-Marin Narrows Draft EIR and CARB Air Quality Standards chart (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf)

1 Rounding to an integer value is not allowed for the State 8-hour CO standard. Violation occurs at or above 9.05 ppm.
2 Annual PM_{10} NAAQS revoked October 2006; was 50 µg/m³. 24-hour. $PM_{2.5}$ NAAQS tightened October 2006; was 65 µg/m³. Annual $PM_{2.5}$ NAAQS tightened from 15 µg/m³ to 12 µg/m³ December 2012, and secondary standard set at 15 µg/m³.
3 The CARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both the CARB and the EPA have identified lead and various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for substantial health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.
4 Prior to June 2005, the 1-hour NAAQS was 0.12 ppm.
5 The 0.08-ppm 1997 ozone standard is revoked FOR CONFORMITY PURPOSES ONLY when area designations for the 2008 0.75 ppm standard become effective for conformity use (July 20, 2013). On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for newer NAAQS are found adequate, SIP amendments for the newer NAAQS are approved with a emission budget, EPA specifically revokes conformity requirements for an older standard, or the area becomes attainment/unclassified. SIP-approved emission budgets remain in force indefinitely unless explicitly replaced or eliminated by a subsequent approved SIP amendment. During the "Interim" period prior to availability of emission budgets, conformity tests may include some combination of build vs. no build, build vs. baseline, or compliance with prior emission budgets for the same pollutant.
6 Final 1-hour NO_2 NAAQS published in the *Federal Register* on February 9, 2010, effective March 9, 2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot-spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause redesignation to nonattainment in some areas after 2016.
7 The EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010. On July 25, 2013, EPA designated 29 areas in 16 states as nonattainment for the 2010 SO_2 standards. Designation of other areas will be addressed in future actions.
8 State standards are "not to exceed" or "not to be equaled or exceeded" unless stated otherwise. Federal standards are "not to exceed more than once a year" or as described above.
9 Secondary standard, set to protect public welfare rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.
10 Lead NAAQS are not considered in Transportation Conformity analysis.
11 Not related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas.

µg/m³ = micrograms per cubic meter
CARB = California Air Resources Board
EPA = United States Environmental Protection Agency
mi = mile(s)
NAAQS = national ambient air quality standards
NO_X = nitrogen oxides
ppb = parts per billion
ppm = parts per million
ROGs = reactive organic gases
SIP = State Implementation Plan
SO_X = sulfur oxides
VOCs = volatile organic compounds

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Site preparation and construction would involve clearing, cut-and-fill activities, grading, removing or improving existing transportation facilities, and paving. Construction-related effects on air quality from most transportation projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, as well as CO, SO_2, NO_X, VOCs, and TACs, including diesel particulate matter. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large projects are estimated by the EPA to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs, and some soot particulate (PM_{10} and $PM_{2.5}$) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain up to 5,000 parts per million (ppm) of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and CARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO_2-related issues due to diesel exhaust would be minimal. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would be quickly dispersed below detectable thresholds as distance from the site(s) increases.

Construction emissions were estimated for the Build Alternatives using detailed equipment inventories and project construction scheduling information, combined with emissions factors from the EMFAC2014 and OFFROAD models. The construction-related emissions associated with each of the Build Alternatives are discussed below. The emissions presented in Table 3.13.4 are based on the best information available at the time of calculations, and without taking into account any control measures.

Construction activities would not last for more than 5 years at one general location, so construction-related emissions do not need to be included in the regional and project-level conformity analyses (40 CFR 93.123(c)(5)).

TABLE 3.13.4:
Maximum Construction Emissions by Alternative (lbs/day)

Construction Activity	ROGs	CO	NO_X	PM_{10}	$PM_{2.5}$
TSM/TDM Alternative					
Mobilization/Utility Relocation	7	81	134	5	5
Group I Improvements	33	361	629	21	19
Group II Improvements	49	542	934	33	30
Group III Improvements	16	177	310	10	9
Group IV Improvements	20	214	373	12	11
Fugitive Dust	–	–	–	480	101
TSM/TDM Alternative Peak Activity	**49**	**542**	**934**	**512**	**130**
BRT Alternative					
Mobilization/Staging	5	54	90	3	3
Whittier to SR 60	8	88	153	5	5
SR 60 to I-10	11	121	205	7	6
I-10 to Huntington Drive	8	88	153	5	5
Huntington Drive to Del Mar Avenue	11	121	206	7	6
Del Mar Avenue to Colorado Boulevard	6	68	116	4	4
Fugitive Dust	–	–	–	320	67
BRT Alternative Peak Activity	**11**	**121**	**205**	**327**	**74**
LRT Alternative					
Mobilization/Staging	6	76	123	5	5
Aerial Structure	34	371	648	21	20
At-Grade Structures	33	365	627	21	19
Tunnel Excavation and Construction	21	227	394	13	12
Above-Grade Construction	16	175	294	11	10
Rail Tracks and Maintenance Yard	8	98	154	7	6
Fugitive Dust	–	–	–	640	134
LRT Alternative Total	**118**	**1,312**	**2,240**	**719**	**206**
Freeway Tunnel Alternative					
Single-Bore Design Variation					
South Portal					
Staging and Survey	3	33	54	2	2
Earth Work	57	549	1,245	45	34
Bridge Construction	16	179	307	10	9
Tunnel Excavation and Construction	26	291	503	17	15
North Portal					
Staging and Survey	3	33	54	2	2
Earth Work	83	844	1,725	60	48
Tunnel Excavation and Construction	13	153	254	9	8
Material Delivery	1	7	31	1	1
Fugitive Dust	–	–	–	960	202
Freeway Tunnel Single-Bore Total	**202**	**2,089**	**4,174**	**1,107**	**321**
Dual-Bore Design Variation					
South Portal					
Staging and Survey	3	33	54	2	2
Earth Work	69	648	1,587	58	41
Bridge Construction	23	249	445	15	13
Tunnel Excavation and Construction	26	290	502	17	15
North Portal					
Staging and Survey	3	33	54	2	2
Earth Work	53	488	1,213	45	31
Bridge Construction	21	226	404	14	12
Tunnel Excavation and Construction	21	229	407	14	12
Material Delivery	2	14	61	2	1
Fugitive Dust	–	–	–	1,280	269
Freeway Tunnel Dual-Bore Total	**221**	**2,210**	**4,728**	**1,448**	**400**

Source: *Supplemental Air Quality Assessment Report* (2018).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ROGs = reactive organic gases
TSM = Transportation System Management
TDM = Transportation Demand Management

TSM/TDM Alternative

Construction-related emissions for the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative are presented in Table 3.13.4. The SO_2 emissions would be minimal due to the ultra-low sulfur content in the fuel; therefore, SO_2 was not included in Table 3.13.4. All the intersection, local road, and other improvements associated with the TSM/TDM Alternative were separated into four construction groups:

- **Group I**
  - Intersection Improvements I-1, I-8, I-9, I-16, I-19, and I-25
  - Local Street Improvement L-2c
- **Group II**
  - Intersection Improvements I-10, I-11, I-18, I-43, I-44, and I-45
  - Local Street Improvements L-2a and L-5
  - Other Road Improvement T-1
- **Group III**
  - Intersection Improvements I-2, I-13, I-14, I-15, and I-22)
  - Local Street Improvement L-3
  - Other Road Improvement T-3
- **Group IV**
  - Intersection Improvements I-3 and I-24
  - Local Street Improvements L-1, L-4, and L-8
  - Other Road Improvement T-2

The emissions listed in Table 3.13.4 represent the peak daily construction emissions that would be generated by each construction activity.

BRT Alternative

Construction-related emissions for the Bus Rapid Transit (BRT) Alternative are presented in Table 3.13.4. SO_2 emissions would be minimal due to the ultra-low sulfur content in the fuel; therefore, SO_2 was not included in Table 3.13.4. The BRT Alternative would be built in six segments. The emissions listed in Table 3.13.4 represent the peak daily construction emissions that would be generated by each construction activity.

The BRT Alternative includes portions of the TSM/TDM Alternative; therefore, the TSM/TDM Alternative analysis discussed above would also apply to this alternative. However, because the construction schedule for the TSM/TDM improvements would not overlap with the construction schedule for the BRT Alternative, the emissions would not be additive.

LRT Alternative

Construction-related emissions for the Light Rail Transit (LRT) Alternative are presented in Table 3.13.4. SO_2 emissions would be minimal due to the ultra-low sulfur content in the fuel; therefore, SO_2 was not included in Table 3.13.4. The emissions listed in Table 3.13.4 represent the peak daily construction emissions that would be generated during construction of the LRT Alternative and assume that all of the construction activities would overlap on a peak day.

The LRT Alternative includes portions of the TSM/TDM Alternative; therefore, the TSM/TDM Alternative analysis discussed above would also apply to this alternative. However, because the construction schedule for the TSM/TDM improvements would not overlap with the construction schedule for the LRT Alternative, the emissions would not be additive.

Freeway Tunnel Alternative Single-Bore Design Variation

Construction-related emissions for the single-bore design variation of the Freeway Tunnel Alternative are presented in Table 3.13.4. SO_2 emissions would be minimal due to the ultra-low sulfur content in the fuel; therefore, SO_2 was not included in Table 3.13.4. The emissions listed in Table 3.13.4 represent the peak daily construction emissions that would be generated during construction of the single-bore design variation and assume that all of the construction activities would overlap on a peak day.

The Freeway Tunnel Alternative single-bore design variation includes portions of the TSM/TDM Alternative; therefore, the TSM/TDM Alternative analysis discussed above would also apply to this design variation. However, because the construction schedule for the TSM/TDM improvements would not overlap with the construction schedule for the Freeway Tunnel Alternative single-bore design variation, the emissions would not be additive.

Freeway Tunnel Alternative Dual-Bore Design Variation

Construction-related emissions for the dual-bore design variation of the Freeway Tunnel Alternative are presented in Table 3.13.4. SO_2 emissions would be minimal due to the ultra-low sulfur content in the fuel; therefore, SO_2 was not included in Table 3.13.4. The emissions listed in Table 3.13.4 represent the peak daily construction emissions that would be generated during construction of the dual-bore design variation and assume that all of the construction activities would overlap on a peak day.

The Freeway Tunnel Alternative dual-bore design variation includes portions of the TSM/TDM Alternative; therefore, the TSM/TDM Alternative analysis discussed above would also apply to this design variation. However, because the construction schedule for the TSM/TDM improvements would not overlap with the construction schedule for the Freeway Tunnel Alternative dual-bore design variation, the emissions would not be additive.

Naturally Occurring Asbestos

The project is located in Los Angeles County, which is among the counties listed as containing serpentine and ultramafic rock. However, the portion of the County known to contain serpentine or ultramafic rock is limited to the island of Santa Catalina. Therefore, the impact from naturally occurring asbestos (NOA) during project construction would be minimal to none.

3.13.3.2 Permanent Impacts

The baselines used for the air quality evaluation are existing conditions and the No Build conditions in the 2020/2025 Opening Years and the 2035 Build Out Year. Comparison of the Build Alternatives to the 2020/2025 and 2035 No Build condition, as well as existing conditions, is appropriate because air quality effects are considered for the projected future conditions. For long-term planning on their facilities, Caltrans uses a 20-year planning horizon, which is consistent with standard FHWA practice for transportation project planning.

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in the long-term air quality effects associated with improvements in the SR 710 Build Alternatives.

As discussed in more detail below under the Build Alternatives, the EPA's vehicle and fuel regulations, coupled with fleet turnover, would result in substantial reductions over time that would cause regionwide MSAT levels to be substantially lower than they are today. As a result, as shown later in Table 3.13.6, the future No Build Alternative MSAT emissions in the project study area would be substantially lower compared to existing conditions. The MSAT emissions under the Build Alternatives would generally be only slightly less than under the No Build Alternative in the Opening Years. In the Horizon Year, the emissions of the Build Alternatives would generally be slightly less or more than under the No Build Alternative, depending on the individual MSATs.

The No Build Alternative would not result in the construction of any of the proposed project improvements and, therefore, would not result in permanent effects related to CO, $PM_{2.5}$, PM_{10}, MSATs, or regional emissions described below for the Build Alternatives.

Build Alternatives

The air quality analysis for the BRT, LRT, and Freeway Tunnel Alternatives described in this section includes the effects of the TSM/TDM Alternative improvements that would be included in these Build Alternatives. These improvements include the complete TSM/TDM Alternative minus the following portions:

- Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road), the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10), and enhancements to Route 762 would not be implemented with the BRT Alternative.
- Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) would not be implemented with the LRT Alternative.
- Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector) and T-3 (St. John Extension between Del Mar Boulevard and California Boulevard) would not be implemented with the Freeway Tunnel Alternative.

Transportation Conformity

The TSM/TDM Alternative has been identified as the Preferred Alternative and is exempt under 40 CFR 93.126 traffic control devices and operating assistance other than signalization projects and pavement marking from all transportation conformity requirements, determined by SCAG (SCAG 2018) as shown in the 2017 FTIP, project ID 1M0101. Therefore, a conformity determination for the project is not required. Therefore, a conformity determination for the project is not required. (Please refer to Chapter 5, Section 5.4, Interagency Coordination Regarding Air Quality (Transportation Conformity Working Group)).

CO and PM Hot-Spot Analyses

The proposed project is in a nonattainment area for the federal $PM_{2.5}$ standards and in an attainment/maintenance area for the federal CO and PM_{10} standards. CO and PM hot-spot analyses were performed for the Project to evaluate if any of the Build Alternatives would cause new violations or worsen existing violations of the two pollutants in the project area.

Carbon Monoxide Screening Analysis

The CO hot-spot analysis followed the methodology in the Caltrans Transportation Project-Level Carbon Monoxide Protocol (Protocol) and followed its Local Analysis flow chart in Figure 3 of Section 4.

This flowchart is used to determine the localized impacts from the Build Alternatives. Below is a step-by-step explanation of the flowchart. Each level cited is followed by a response, which in turn determines the next applicable level of the flowchart for the Build Alternatives. The flowchart begins at level 1:

- Level 1. Is the project in a CO non-attainment area?.. **NO**

  The project site is in an area that has demonstrated attainment with the federal CO standard.

- Level 1 (cont.). Was the area redesignated as “attainment” after the 1990 Clean Air Act? .... **YES**
- Level 1 (cont.). Has “continued attainment” been verified with the local air district, if appropriate?.. **YES**

  The Basin was designated as attainment/maintenance by the EPA on June 11, 2007. (Proceed to Level 7.)

- Level 7. Does the project worsen air quality? .... **YES**

  Because the proposed project would add a new freeway tunnel to the project area and/or would widen existing local roads, it would potentially worsen air quality.

- Level 7 (cont.): Is the project suspected of resulting in higher CO concentrations than those existing in the region at the time of attainment demonstration?................ **NO**

Four intersections were evaluated in the 1997 CO Attainment Demonstration: Wilshire Boulevard at Veteran Avenue, Sunset Boulevard at Highland Avenue, La Cienega Boulevard at Century Boulevard, and Long Beach Boulevard at Imperial Highway. CO concentrations at the intersections under study would be lower than those reported for the maximum of the intersections analyzed in the CO attainment plan because all of the following conditions, listed in Section 4.7.2 of the Protocol, are satisfied:

- The receptor locations at the intersections under study are at the same distance or farther from the traveled road than the receptor locations used in the intersection in the attainment plan. The attainment plan evaluates the CO concentrations at a distance of 10 ft from the edge of the roads. The Protocol does not permit the modeling of receptor locations closer than this distance.
- The project intersection traffic volumes and geometries are not substantially different from those included in the attainment plan. Also, the intersections under study have less total traffic and the same or fewer numbers of lanes than the intersections in the attainment plan.

- The assumed meteorology for the intersections under study is the same as the assumed meteorology for the intersections in the attainment plan. Both use the worst-case scenario meteorology settings in the CALINE4 and/or CAL3QHC model.
- As shown in Table 3.13.5, total intersection volumes are lower for the intersections under study than those assumed for the intersection in the attainment plan.
- The percentages of vehicles operating in cold start mode are the same or lower for the intersection under study compared to those used for the intersection in the attainment plan. It is assumed that all vehicles in the intersection are in a fully warmed-up mode.
- The percentage of heavy-duty gas trucks in the intersections under study is the same or lower than the percentages used for the intersections in the attainment plan analysis. It is assumed that the traffic distribution at the intersections under study does not vary from the California Emission Factor Model (EMFAC) standards.
- Average delay and queue length for each approach are the same or less for the intersection under study compared to those found in the intersections in the attainment plan. The predicted levels of service (LOS) for the intersections under study range from LOS A to F. The LOS for the intersections in the attainment plan are not listed; however, the traffic counts and intersection geometries correspond to LOS F for three of the four intersections in the attainment plan.
- The background concentrations in the area of the intersection under study are 2.9 ppm for 1 hour and 2.4 ppm for 8 hours, which are lower than the background concentrations for the intersections in the attainment plan. These varied from 5.3 to 13.2 ppm for 1 hour and 3.7 to 9.9 ppm for 8 hours.

All of the Build Alternatives for the project are not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards. Therefore, the project would not cause any new violations in the project area, and a detailed CALINE4 CO hot-spot analysis is not required.

Particulate Matter Hot-Spot Analysis

PM hot spot analysis was performed for the project to demonstrate that the project would not cause localized violations of NAAQS. A $PM_{2.5}$ and PM_{10} hot-spot form (May 2014) was submitted to and reviewed by the Transportation Conformity Working Group (TCWG) on May 27, 2014 and additional requested information was provided in June 2014. [2] The primary TCWG members are EPA, FHWA, and Caltrans Headquarters. On October 28, 2014, the TCWG determined that the TSM/TDM, BRT, and LRT Alternatives are not Projects of Air Quality Concern (POAQC). In other words, based on the information in the PM Hot-Spot Form, these alternatives are not expected to result in new exceedances, or delay attainment, of the federal PM standards. Therefore, a quantitative hot-spot analysis would not be required for the TSM/TDM, BRT, and LRT Alternatives. A copy of the TCWG determination is included in Chapter 5, Correspondence.

[2] PM Hot-spot form available at: http://www.scag.ca.gov/programs/TCWG%20Document%20Library/4.1-2%2018790EPAcomments/4.1-3_18790revJune2014Complete.pdf

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TABLE 3.13.5:
Total Intersection Traffic Volume Comparisons

Attainment Plan Maximum Volumes							
INTERSECTION 1: Wilshire Blvd/ Veteran Ave		INTERSECTION 2: Sunset Blvd/ Highland Ave		INTERSECTION 3: La Cienega Blvd/Century Blvd		INTERSECTION 4: Long Beach Blvd/Imperial Hwy	
AM	PM	AM	PM	AM	PM	AM	PM
8,062	7,719	6,614	7,374	6,635	8,674	4,212	5,514

Alternatives	2035 Proposed Project Maximum Volumes															
	INTERSECTION 1: Fremont Ave / Norwood Ave		INTERSECTION 2: Garfield Ave / Norwood Pl		INTERSECTION 3: I-210 EB Ramps / Berkshire Pl		INTERSECTION 4: I-210 WB Ramps / Berkshire Pl		INTERSECTION 5: Broadway / Colorado Blvd		INTERSECTION 6: Concord Ave / Alhambra Ave		INTERSECTION 7: Pasadena Ave / Broadway		INTERSECTION 8: Rosemead Blvd / Mission Dr	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
No Build Alternative	2,028	2,254	2,740	3,291	1,101	764	1,903	1,283	1,697	2,976	1,437	1,822	3,746	2,288	4,065	4,188
TSM/TDM Alternative	1,714	1,980	2,551	2,975	1,099	766	1,924	1,289	1,749	3,055	2,314	3,874	3,624	2,270	5,473	5,300
BRT Alternative	1,724	1,978	2,503	2,981	1,095	768	1,921	1,295	1,744	3,037	2,326	3,838	3,667	2,284	5,493	5,293
LRT Alternative	2,011	2,405	2,744	3,157	1,095	763	1,925	1,294	1,759	3,053	1,360	1,808	3,790	2,313	5,878	5,369
Freeway Tunnel Alternative																
Single-Bore Operational Variations																
With Tolls	2,200	2,420	2,569	3,072	1,232	935	2,118	1,582	1,805	3,247	1,297	1,796	3,732	2,311	5,434	5,231
With Tolls and No Trucks	2,127	2,380	2,580	3,061	1,161	873	2,114	1,681	1,793	3,223	1,306	1,793	3,747	2,298	5,385	5,220
With Tolls and Express Bus	2,213	2,373	2,559	3,061	1,239	923	2,123	1,571	1,804	3,266	1,286	1,740	3,748	2,314	5,418	5,224
Dual-Bore Operational Variations																
No Tolls	2,134	2,355	2,573	2,960	1,499	1,124	2,395	1,681	1,825	3,359	1,277	1,666	3,593	2,314	5,506	5,089
No Trucks	2,097	2,350	2,569	2,958	1,475	995	2,309	1,582	1,823	3,414	1,265	1,659	3,547	2,309	5,471	5,049
With Tolls	2,134	2,355	2,573	2,960	1,551	1,103	2,407	1,667	1,825	3,359	1,277	1,666	3,593	2,314	5,506	5,089

Source: *Air Quality Assessment Report* (2014).
EB = eastbound
WB = westbound

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Quantitative PM_{10} and $PM_{2.5}$ hot-spot modeling was performed for the Freeway Tunnel Alternative following the Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (EPA Guidance, November 2015). Methodologies, assumptions, and modeling setups are consistent with those presented in the TCWG-approved *Quantitative $PM_{2.5}$ and PM_{10} Hot Spot Analysis Protocol for the SR 710 North Study* (Modeling Protocol; Caltrans, 2016) and the *Supplemental Information to the Quantitative $PM_{2.5}$ and PM_{10} Hot Spot Analysis Protocol for the SR 710 North Study* (Caltrans, 2017). The following sections provide a summary of the key methodologies used in the hot-spot analysis.

Types of Emissions Considered

In accordance with the EPA Guidance, this quantitative analysis was based on directly emitted and re-entrained $PM_{2.5}$ and PM_{10} emissions. Tailpipe, brake wear, tire wear, and road dust $PM_{2.5}$ and PM_{10} emissions were therefore considered in this analysis.

Vehicles cause dust from paved and unpaved roads to be re-entrained, or re-suspended, in the atmosphere. The SCAQMD 2016 Air Quality Management Plan (AQMP) identified re-entrained road dust as a substantial source of particulate matter in the area's emission budget. Therefore, re-entrained road dust was considered in this analysis.

Secondary particles formed through $PM_{2.5}$ and PM_{10} precursor emissions from a transportation project take several hours to form in the atmosphere, giving emissions time to disperse beyond the immediate study area of concern for localized analyses; therefore, they were not considered in this analysis.

Dispersion Models Used

The EPA Guidance recommends that quantitative analyses be developed consistent with the EPA's current recommended model under Appendix W to 40 CFR Part 51. While the American Meteorological Society/EPA Regulatory Model (AERMOD) is the EPA's recommended near-field dispersion model, Section 3.2 of Appendix W provides applicable guidance with which an EPA's Regional Office may determine acceptability of alternative models (e.g., some commercial graphical user interface [GUI] versions of AERMOD).

Modeling Locations

The roadways within the project study area were evaluated based on the projected increase of total vehicle traffic volumes and diesel vehicle traffic volumes derived from the traffic analysis of the project. The increases in total annual daily traffic (ADT) and truck ADT in comparison with the No Build Alternative at each freeway segment and system interchange within the study area were evaluated and ranked. The total ADT and truck ADT ranking of the freeways and interchanges and the proximity to nearby sensitive receptors were used as the basis for identifying the potential PM_{10}/$PM_{2.5}$ hot-spot locations to be included in the hot-spot analysis.

The selected modeling locations were presented in tables and figures in Appendix A of the TCWG-approved Modeling Protocol (Caltrans, 2016), and are summarized below:

- **Two new freeway segments near the tunnel portals.** These are the new freeway segments to be built that will connect the existing freeway to the new tunnels, which include the segment connecting the SR 710/I-210/SR 134 interchange to the tunnel's north portal, and the segment connecting the SR 710/I-10 interchange to the tunnel's south portal. These two segments are also among the top five freeway segments that have the highest total vehicle ADT increase.

- **Two freeway tunnel ventilation towers.** One would be located near the SR 710/SR 134/I-210 interchange, and the other near the Valley Boulevard. Freeway tunnel ventilation structures are the venting point for the vehicle emissions that occur inside the tunnel.
- **Top two system interchanges that are anticipated to have the highest PM_{10} and $PM_{2.5}$ emission increases among all interchanges.** There are a total of 10 system interchanges in the project study area. The highest PM_{10} and $PM_{2.5}$ emission increases would occur at the SR 710/I-210/SR 134 and I-710/I-10 interchanges for all six design variations. Because these two interchanges have the highest potential for PM_{10} and $PM_{2.5}$ emission increases, and because they are located near sensitive receptors (i.e., schools and residential areas) and commercial areas, they were selected to represent the interchanges with the worst-case impacts.
- **Three additional freeway segments.** The top two system interchanges selected for the modeling already include several freeway mainline segments that have the highest potential for PM_{10} and $PM_{2.5}$ emission increases. To capture the PM_{10} and $PM_{2.5}$ emission impacts from various roadway configurations, three additional freeway segments (in addition to those located inside the interchanges) were included in the modeling based on the ranking of total vehicle ADT and truck ADT. These freeway segments are all located in populated areas and are in close proximity to schools and/or residential areas.

Because the selected locations would represent where the worst-case PM impacts would occur, PM_{10} and $PM_{2.5}$ impacts from other freeway segments and arterials in the project study area would be lower than those at the selected locations.

Emission Source Setup

In accordance with the EPA Guidance, vehicle emissions from highways and principal arterials were modeled as area sources. Emissions from the freeway tunnel ventilation structures were modeled as point sources.

For roadway area sources, release height, width, length, angle, and initial vertical dispersion coefficient were determined based on Section 3.3.2.8: LINE Source Inputs in the *User's Guide for the AMS/EPA Regulatory Model-AERMOD EPA-454/B-16-001* (EPA, 2016b) and the EPA PM Guidance, Appendix J. The use of the LINE source yielded one or more links to define each roadway segment.

The tunnel ventilation structure emissions were modeled as point sources. The north ventilation structure located near the SR 710/SR 134/I-210 interchange handles the vehicle emissions from northbound traffic. The south ventilation structure located near Valley Boulevard handles the vehicle emissions from the southbound traffic. The tunnel ventilation parameters used in the modeling are displayed in Table 3.13-6.

TABLE 3.13-6:
Ventilation Structure Source Parameters

Structure Location	Easting (meters)	Northing (meters)	Structure Height (feet)	Temperature (Kelvin)[1]	Exhaust Flow Rate (cubic feet/minute)[2]	Structure Diameter (feet)[2]
Single-Bore Design Variation						
North Portal	393,531	3,779,288	50	298	826,300	17.6
South Portal	392,864	3,771,149	50	298	762,800	18.9
Dual-Bore Design Variation						
North Portal	393,531	3,779,288	50	298	1,652,700	17.6
South Portal	392,864	3,771,149	50	298	1,525,500	18.9

1 Ventilation exhaust temperature was based on information provided by ILF on April 29, 2013 (ILF, 2013b).
2 Ventilation structure diameters and flow rates were obtained from *Tunnel Systems Report for the Freeway Tunnel Alternative* (2014b).

Vehicle Emissions

Vehicle emissions were estimated for five types of vehicle categories: light heavy-duty trucks, medium heavy-duty trucks, heavy heavy-duty trucks, buses, and autos and other light-duty vehicles. Emission factors of vehicle exhaust, tire wear, and brake wear for each vehicle category at different vehicle travel speeds were obtained from the CARB's EMFAC2014 program.

PM_{10} and $PM_{2.5}$ emissions due to re-entrained road dust were calculated using EPA AP-42 Compilation of Air Pollutant Emission Factors. Silt content of the freeways and the average vehicle weight used in the emission calculation were based on the default values for California provided in CARB's Miscellaneous Process Methodology 7.9: Entrained Road Travel, Paved Road Dust (CARB, 2016).

Emissions were calculated for each of the following five time periods of the day using the results of the project's traffic analysis:

- AM Peak Period (6 a.m. to 9 a.m.)
- Midday Period (9 a.m. to 3 p.m.)
- PM Peak Period (3 p.m. to 7 p.m.)
- Evening Period (7 p.m. to 9 p.m.)
- Nighttime Period (9 p.m. to 6 a.m.)

Both ventilation structures of the tunnel (i.e., the southbound and northbound ventilation structures) will be equipped with PM control systems. Control efficiency of the PM filters depends on the particle size distribution and varies between a low of 80 percent and a high of greater than 99 percent for the proposed PM emission control system (Tunnel Systems Report, 2013a). To be conservative, the lowest control efficiency of 80 percent was used to estimate the emissions from the ventilation structures, such that 20 percent of total PM emissions generated inside the tunnels was assumed to be released to the atmosphere through the ventilation structures.

Meteorological Data

On January 17, 2017, EPA published the "Appendix W Final Rule," which included an update to the AERMOD and AERMET version (currently Version 16216). The update to Appendix W included a new default option for AERMET that incorporates the adjustment to the surface friction velocity (u-star or u*) to address issues with overprediction under stable and low-speed meteorological conditions in AERMOD.

Surface meteorological data from the Central Los Angeles Station and upper meteorological air data from the Miramar Station in San Diego for the 5-year period of 2006 through 2011 were used in the AERMOD modeling. The current AERMOD-ready meteorological data published on SCAQMD's website were processed with AERMET Version 14134. These data have not yet been updated to include the u* option. On March 7, 2017, SCAQMD provided the project with AERMET Version 14134 input files for the years 2006 through 2012, which allowed the project to update the meteorological data using the latest AERMET Version 16216. To be consistent with the currently published AERMOD-ready meteorological data available on the SCAQMD website and used previously for the SR 710 North Project, the meteorological data for the years of 2006, 2007, 2009, 2010, and 2011 were extracted and processed with the u* option using AERMET Version 16216. Through ongoing coordination with SCAQMD, the updated meteorological data processed with the u* option were approved by SCAQMD for the project on June 28, 2017 (SCAQMD, 2017).

Receptor Grids

Receptors were placed to capture the highest concentrations of $PM_{2.5}$ and PM_{10} to determine any possible violations of the NAAQS.

For the AERMOD modeling, layers of receptor grids were included as follows:

- 25-meter grid spacing starting 5 meters from the edge of all arterials/highways or right-of-way (ROW) out to 100 meters.
- 100-meter grid spacing between 100 meters and 500 meters from the edge of all roadways or ROW.
- Receptors within fenced areas with restricted public access and within Caltrans ROW were excluded from modeling.

Background Concentrations

According to the EPA PM Guidance Section 8.3.2: Adjusting Air Quality Monitoring Data to Account for Future Changes in Air Quality, to account for future emission changes, it may be appropriate in some cases to use future background concentrations that have been calculated based on modeled outputs from a Chemical Transport Model (CTM).

SCAQMD recently approved (on March 3, 2017) the 2016 AQMP that demonstrates attainment of the 1-hour and 8-hour ozone NAAQS as well as the latest 24-hour and annual $PM_{2.5}$ standards. The 2016 AQMP was incorporated by the CARB into the 2016 State Strategy for the State Implementation Plan (State SIP Strategy; CARB, 2017). The State SIP Strategy was adopted by the CARB on March 23, 2017.

The 2016 AQMP ozone and $PM_{2.5}$ attainment demonstration was developed using the EPA-supported Community Multiscale Air Quality (CMAQ) (Version 5.0.2) modeling platform. Based on the CMAQ modeling that takes into account the ozone and $PM_{2.5}$ measures identified in the plan, the 2016 AQMP provided a future 24-hour $PM_{2.5}$ concentration of 27.6 μg/m^3 and an annual concentration of 9.7 μg/m^3 for the Los Angeles location. These values were used in the PM hot-spot analysis as the future background concentrations for $PM_{2.5}$. PM_{10} background concentrations were based on the monitored concentrations as described in the Modeling Protocol (Caltrans, 2016).

Modeling Results

Hot spot modeling was performed for each of the design and operational variations for the build and No Build alternatives for the opening year 2025 and horizon year 2035. Modeling results are presented in Tables 13.3-7 through 13.3-9. The purpose of the modeling was to evaluate whether the project alternatives would cause new violations or worsen existing violations in the project study area. Modeling of the existing conditions was not performed.

TABLE 3.13.7:
24-Hour $PM_{2.5}$ Concentrations – Quantitative Modeling Results

Scenario	No Build Alternative (μg/m^3)	Freeway Tunnel Alternative (μg/m^3)
Opening Year 2025		
Single-Bore Design Variation Operational Variations		
– With Toll	31.2	31.2
– With Toll without Trucks	31.2	31.2
– With Toll with Express Bus	31.2	31.3
Dual-Bore Design Variation Operational Variations		
– Without Toll	31.2	31.8
– Without Toll without Trucks	31.2	31.7
– With Toll	31.2	31.9
Horizon Year 2035		
Single-Bore Design Variation Operational Variations		
– With Toll	31.3	31.3
– With Toll without Trucks	31.3	31.3
– With Toll with Express Bus	31.3	31.3
Dual-Bore Design Variation Operational Variations		
– Without Toll	31.3	32.0
– Without Toll without Trucks	31.3	31.8
– With Toll	31.3	31.9

Source: *Supplemental Air Quality Assessment Report* (2018).
Notes: Concentrations are provided for the design/operational variations of the Freeway Tunnel Alternative that were determined to be of air quality concern for particulate matter.
Reported concentrations included the background concentration of 27.6 μg/m^3.
Concentrations of No Build Alternative vary for each scenario because the impacted locations of the roadway segments of each scenario are different.
Modeling results in the table are the highest concentrations among all receptors modeled.
μg/m^3 = micrograms per cubic meter
$PM_{2.5}$ = particulate matter less than 2.5 microns in size

TABLE 3.13.8:
Annual $PM_{2.5}$ Concentrations – Quantitative Modeling Results

Scenario	No Build Alternative (μg/m³)	Freeway Tunnel Alternative (μg/m³)
Opening Year 2025		
Single-Bore Design Variation Operational Variations		
– With Toll	11.9	12.0
– With Toll without Trucks	11.8	12.0
– With Toll with Express Bus	11.8	12.0
Dual-Bore Design Variation Operational Variations		
– Without Toll	12.3	12.7
– Without Toll without Trucks	12.3	12.6
– With Toll	12.3	12.8
Horizon Year 2035		
Single-Bore Design Variation Operational Variations		
– With Toll	12.0	12.1
– With Toll without Trucks	11.9	12.0
– With Toll with Express Bus	11.9	12.1
Dual-Bore Design Variation Operational Variations		
– Without Toll	12.3	12.8
– Without Toll without Trucks	12.3	12.7
– With Toll	12.3	12.8

Source: *Supplemental Air Quality Assessment Report* (2018).
Notes: Concentrations are provided for the design/operational variations of the Freeway Tunnel Alternative that were determined to be of air quality concern for particulate matter.
Reported concentrations included the background concentration of 9.7 μg/m³.
Concentrations of No Build Alternative vary for each scenario because the impacted locations of the roadway segments of each scenario are different.
Modeling results in the table are the highest concentrations among all receptors modeled.
μg/m³ = micrograms per cubic meter
$PM_{2.5}$ = particulate matter less than 2.5 microns in size

TABLE 3.13.9:
24-Hour PM_{10} Quantitative Concentrations – Modeling Results

Scenario	No Build Alternative (μg/m³)	Freeway Tunnel Alternative (μg/m³)
Opening Year 2025		
Single-Bore Design Variation Operational Variations		
– With Toll	87.9	88.1
– With Toll without Trucks	87.9	88.2
– With Toll with Express Bus	87.9	88.1
Dual-Bore Design Variation Operational Variations		
– Without Toll	87.9	89.4
– Without Toll without Trucks	87.9	89.2
– With Toll	87.9	89.9
Horizon Year 2035		
Single-Bore Design Variation Operational Variations		
– With Toll	88.4	88.6
– With Toll without Trucks	88.4	88.6
– With Toll with Express Bus	88.4	88.6
Dual-Bore Design Variation Operational Variations		
– Without Toll	88.4	90.4
– Without Toll without Trucks	88.4	90.1
– With Toll	88.4	90.1

Source: *Supplemental Air Quality Assessment Report* (2018).
Notes: Concentrations are provided for the design/operational variations of the Freeway Tunnel Alternative that were determined to be of air quality concern for particulate matter.
Reported concentrations included the background concentration of 73 μg/m³.
Concentrations of No Build Alternative vary for each scenario because the impacted locations of the roadway segments of each scenario are different.
Modeling results in the table are the highest concentrations among all receptors modeled.
μg/m³ = micrograms per cubic meter
PM_{10} = particulate matter less than 10 microns in size

Figures showing the PM_{10} and $PM_{2.5}$ concentrations are presented in Appendix B of the *Supplemental Air Quality Assessment Report* (2018).

24-Hour Average $PM_{2.5}$ Concentrations

As shown in Table 3.13-7, compared to the No Build condition, the Freeway Tunnel Alternative would have slightly higher 24-hour $PM_{2.5}$ concentrations in the PM hot-spot modeling areas in 2025 and 2035. The highest concentrations of 24-hour $PM_{2.5}$ for the No Build and Build Alternatives in the modeling areas, after taking into account the background concentration of 27.6 $\mu g/m^3$, ranges from 31.2 $\mu g/m^3$ to 31.9 $\mu g/m^3$. In general, dual-bore options would have higher increases of the concentrations than single-bore options because the dual-bore options would attract more vehicles in the areas near the two interchanges and the two freeway tunnel portal areas. Both the Build and No Build Alternatives would have 24-hour average $PM_{2.5}$ concentration below the NAAQS of 35 $\mu g/m^3$. The modeling results indicate that the freeway tunnel alternative, regardless of the design or operation variations, would not cause new violations of the 24-hour $PM_{2.5}$ NAAQS. There is no CAAQS for 24-hour $PM_{2.5}$ concentrations.

Annual Average $PM_{2.5}$ Concentrations

As shown in Table 3.13-8, compared to the No Build condition, the Freeway Tunnel Alternative would have slightly higher worst-case annual $PM_{2.5}$ concentrations in the PM hot-spot modeling areas. The concentration of the highest annual $PM_{2.5}$ for the No Build and Build Alternatives, after taking into account the background concentration of 9.7 $\mu g/m^3$, ranges from 11.8 $\mu g/m^3$ to 12.8 $\mu g/m^3$. In general, dual-bore options would have higher increases of the concentrations than single-bore options because the dual-bore options would attract more vehicles in the areas near the two interchanges and the two freeway tunnel portal areas. The single-bore options' highest concentrations would be approximately 0.1 to 0.2 $\mu g/m^3$ higher than those of the No Build. The dual-bore options' highest concentrations in the modeled areas would increase by 0.4 to 0.5 $\mu g/m^3$ in comparison to No Build.

The single-bore option with toll without truck and the option with toll and express bus would have annual $PM_{2.5}$ concentration of 12.0 $\mu g/m^3$ and 12 $\mu g/m^3$, equal to the NAAQS and CAAQS respectively. Therefore, these two single-bore variations would not cause violations of NAAQS and CAAQS. The other single-bore option (toll with truck) and all three dual-bore options would have total annual $PM_{2.5}$ concentrations greater than the NAAQS and CAAQS. These exceedances would only occur at a few near-road locations in the interchange areas.

24-Hour Average PM_{10} Concentrations

As shown in Table 3.13-9, compared to the No Build condition, the Freeway Tunnel Alternative would have slightly higher 24-hour PM_{10} concentrations in 2025 and 2035. The highest concentrations of 24-hour PM_{10} in the PM hot-spot modeling areas for the No Build and Build Alternatives, after taking into account the background concentration of 73 $\mu g/m^3$, ranges from 87.9 $\mu g/m^3$ to 90.4 $\mu g/m^3$. In general, dual-bore options would have higher increases of the concentrations than single-bore options because the dual-bore options would attract more vehicles in the areas near the two interchanges and the two freeway tunnel portal areas. The single-bore options' highest concentrations would be approximately 0.2 to 0.3 $\mu g/m^3$ higher than the No Build. The dual-bore options' highest concentrations in the modeling areas would increase by approximately 2.0 $\mu g/m^3$ in 2035. Both the Build and No Build Alternatives would have 24-hour average PM_{10} concentrations below the NAAQS of 150 $\mu g/m^3$. The background concentrations of 24-hour PM_{10} in the project study area would be greater than the CAAQS of 50 $\mu g/m^3$.

The modeling results indicate that the Freeway Tunnel Alternative, regardless of the design or operation variations, would not cause any new violations of the 24-hour PM_{10} NAAQS. The concentration would be greater than the CAAQS for all Build and No Build Alternatives because the background concentrations are already higher than CAAQS.

Long-Term Regional Emissions

The purpose of the proposed project is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles. The VMT and VHT data used in these analyses were calculated using the daily traffic volumes in the project study area. The proposed project would not generate new vehicular traffic trips because it would not construct new homes or businesses. However, there is a possibility that some traffic currently using other routes would use the new facilities, therefore increasing vehicle miles traveled (VMT) in the project area. Therefore, the potential impact of the proposed project on regional vehicle emissions was calculated using traffic data for the project region and emission rates from the EMFAC2014 emission model.

The traffic analysis estimated the impact that the proposed project would have on regional VMT and vehicle hours traveled (VHT). The VMT and VHT data, along with the EMFAC2014 emission rates, were used to calculate the CO, reactive organic gas (ROG), NO_X, PM_{10}, $PM_{2.5}$, and CO_2 emissions for the Existing (2012), 2020, 2025, and 2035 regional conditions. The results of the modeling are summarized in Table 3.13.10.

TSM/TDM Alternative

As shown in Table 3.13.10, the 2020 TSM/TDM Alternative criteria pollutant emissions are lower than the existing condition emissions and, with the exception of PM_{10}, are lower than the 2020 No Build Alternative emissions. As also shown in Table 3.13.10, the 2035 TSM/TDM Alternative criteria pollutant emissions are lower than the existing condition emissions.

The TSM/TDM Alternative ROG and NOx emissions would be lower than the 2035 No Build Alternative emissions. The CO, PM_{10}, and $PM_{2.5}$ emissions would be higher than the 2035 No Build Alternative emissions.

BRT Alternative

As shown in Table 3.13.10, the 2020 BRT Alternative criteria pollutant emissions are lower than the existing condition emissions and the 2020 No Build Alternative emissions. The 2035 BRT Alternative criteria pollutant emissions are lower than the existing condition emissions. The BRT Alternative ROG and NOx emissions would be lower than the 2035 No Build Alternative emissions. The CO, PM_{10}, and $PM_{2.5}$ emissions would be higher than the 2035 No Build Alternative emissions.

TABLE 3.13.10:
2020/2025 Opening Year and 2035 Horizon Year Regional Vehicle Emissions – Project Study Area (lbs/day)

Alternative	CO	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO	ROG	NO_X	PM_{10}	$PM_{2.5}$
2012 Existing	117,289	5,464	38,707	3,425	1,810	117,289	5,464	38,707	3,425	1,810	117,289	5,464	38,707	3,425	1,810
	2020 Opening Year					**2025 Opening Year**					**2035 Horizon Year**				
No Build Alternative	51,567	2,090	18,028	3,020	1,317	35,846	1,488	9,292	2,978	1,253	24,671	1,209	6,280	3,027	1,246
Change from Existing	*-65,722*	*-3,374*	*-20,679*	*-405*	*-494*	*-81,443*	*-3,976*	*-29,416*	*-446.8497*	*-557.3372*	*-92,618*	*-4,255*	*-32,428*	*-397*	*-564*
TSM/TDM Alternative	51,452	2,075	17,971	3,020	1,316	–	–	–	–	–	24,680	1,204	6,222	3,036	1,249
Change from Existing	*-65,837*	*-3,389*	*-20,736*	*-404*	*-494*	–	–	–	–	–	*-92,609*	*-4,260*	*-32,486*	*-389*	*-561*
Change from No Build	*-116*	*-15*	*-57*	*0.4*	*-0.3*	–	–	–	–	–	*9*	*-5*	*-58*	*8*	*3*
BRT Alternative	51,394	2,071	17,947	3,018	1,315	–	–	–	–	–	24,681	1,206	6,237	3,034	1,248
Change from Existing	*-65,895*	*-3,393*	*-20,760*	*-407*	*-495*	–	–	–	–	–	*-92,608*	*-4,259*	*-32,471*	*-391*	*-562*
Change from No Build	*-174*	*-19*	*-81*	*-2*	*-1*	–	–	–	–	–	*10*	*-4*	*-43*	*6*	*2*
LRT Alternative	–	–	–	–	–	35,751	1,479	9,231	2,977	1,252	24,724	1,207	6,252	3,032	1,248
Change from Existing	–	–	–	–	–	*-81,538*	*-3,986*	*-29,476*	*-447.549*	*-557.9389*	*-92,565*	*-4,257*	*-32,455*	*-392*	*-562*
Change from No Build	–	–	–	–	–	*-95.0*	*-9.4*	*-60.6*	*-0.7*	*-0.6*	*53*	*-2*	*-27*	*5*	*2*
Freeway Tunnel Alternative															
Single-Bore Operational Variation: *With Tolls*	–	–	–	–	–	35,561	1,448	9,046	2,990	1,256	24,533	1,179	6,011	3,048	1,253
Change from Existing	–	–	–	–	–	*-81,728*	*-4,016*	*-29,661*	*-435*	*-554*	*-92,755*	*-4,285*	*-32,697*	*-377*	*-557*
Change from No Build	–	–	–	–	–	*-285*	*-40*	*-246*	*12*	*3*	*-138*	*-30*	*-269*	*20*	*7*
Single-Bore Operational Variation: *With Tolls and No Trucks*	–	–	–	–	–	35,560	1,447	9,037	2,992	1,257	24,532	1,178	6,001	3,050	1,254
Change from Existing	–	–	–	–	–	*-81,729*	*-4,017*	*-29,671*	*-432.7*	*-553.0*	*-92,757*	*-4,286*	*-32,706*	*-375*	*-556*
Change from No Build	–	–	–	–	–	*-285*	*-41*	*-255*	*14*	*4*	*-139*	*-31*	*-279*	*22*	*8*
Single-Bore Operational Variation: *With Tolls and Express Bus*	–	–	–	–	–	35,568	1,450	9,058	2,990	1,257	24,522	1,177	5,988	3,047	1,253
Change from Existing	–	–	–	–	–	*-81,720*	*-4,014*	*-29,649*	*-435*	*-554*	*-92,767*	*-4,287*	*-32,720*	*-377*	*-557*
Change from No Build	–	–	–	–	–	*-277*	*-38*	*-233*	*12*	*4*	*-149*	*-32*	*-292*	*20*	*7*
Dual-Bore Operational Variation: *No Tolls*	–	–	–	–	–	35,608	1,437	8,987	3015	1266	24,544	1,169	5,910	3,073	1,264
Change from Existing	–	–	–	–	–	*-81,681*	*-4,028*	*-29,721*	*-410*	*-544*	*-92,745*	*-4,295*	*-32,797*	*-351*	*-547*
Change from No Build	–	–	–	–	–	*-237*	*-52*	*-305*	*37*	*13*	*-127*	*-40*	*-369*	*46*	*18*
Dual-Bore Operational Variation: *No Trucks*	–	–	–	–	–	35,642	1,438	8,999	3020	1268	24,572	1,169	5,898	3,080	1,266
Change from Existing	–	–	–	–	–	*-81,647*	*-4,026*	*-29,709*	*-405*	*-542*	*-92,717*	*-4,295*	*-32,810*	*-345*	*-544*
Change from No Build	–	–	–	–	–	*-204*	*-50*	*-293*	*42*	*15*	*-99*	*-41*	*-382*	*52*	*20*
Dual-Bore Operational Variation: *With Tolls*	–	–	–	–	–	35,659	1,442	9,018	3,017	1,267	24,533	1,168	5,903	3,074	1,264
Change from Existing	–	–	–	–	–	*-81,630*	*-4,022*	*-29,689*	*-408*	*-543*	*-92,756*	*-4,296*	*-32,804*	*-351*	*-546*
Change from No Build	–	–	–	–	–	*-187*	*-46*	*-273*	*39*	*14*	*-138*	*-41*	*-376*	*47*	*18*

BRT = bus rapid transit
CO = carbon monoxide
lbs/day = pounds per day
LRT = light rail transit
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ROG = reactive organic gases
SCAQMD = South Coast Air Quality Management District
TSM/TDM = Transportation System Management/Transportation Demand Management

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LRT Alternative

As shown in Table 3.13.10, the 2025 LRT Alternative criteria pollutant emissions are lower than the existing condition emissions and the 2025 No Build Alternative emissions. The 2035 LRT Alternative criteria pollutant emissions are lower than the existing condition emissions. The LRT Alternative ROG and NOx emissions would be lower than the 2035 No Build Alternative emissions. The CO, PM_{10}, and $PM_{2.5}$ emissions would be higher than the 2035 No Build Alternative emissions.

Freeway Tunnel Alternative Single-Bore Design Variation

As shown in Table 3.13.10, the 2025 criteria pollutant emissions for the Freeway Tunnel Alternative single-bore design variation are lower than the existing condition emissions and, with the exception of PM_{10} and $PM_{2.5}$, are lower than the 2025 No Build Alternative emissions. The 2035 criteria pollutant emissions for the Freeway Tunnel Alternative single-bore design variation are lower than the existing condition emissions and, with the exception of PM_{10} and $PM_{2.5}$, are lower than the 2035 No Build Alternative emissions.

Freeway Tunnel Alternative Dual-Bore Design Variation

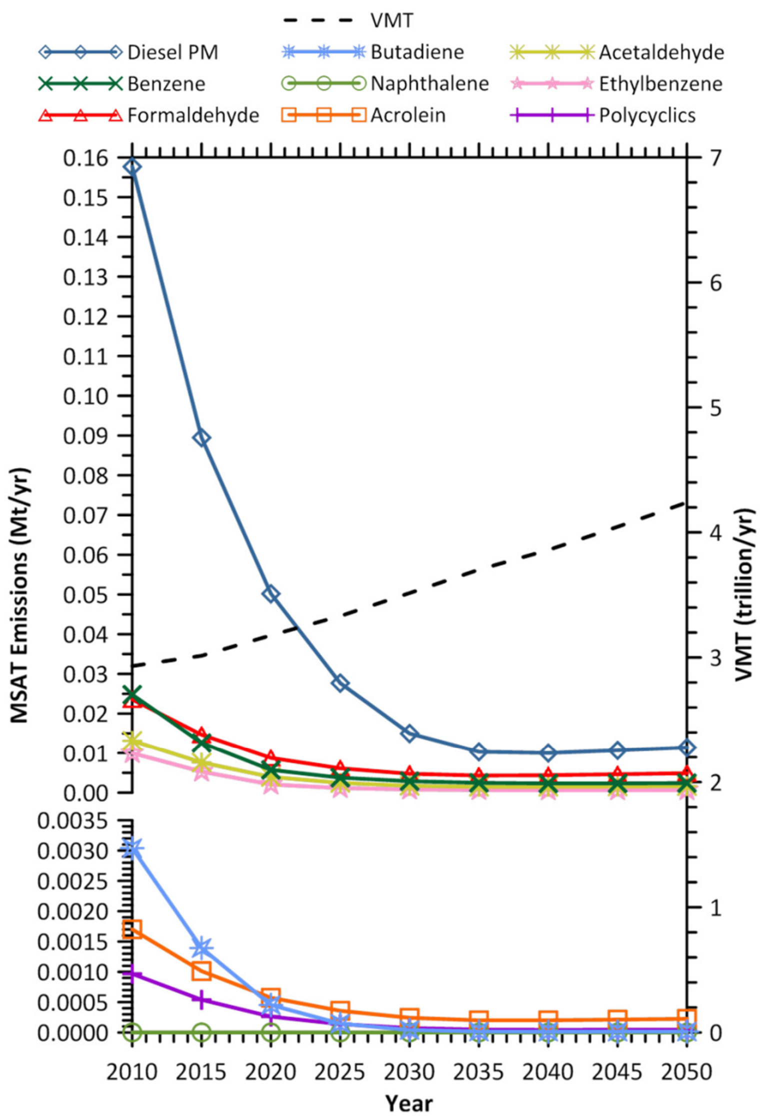
As shown in Table 3.13.10, the 2025 criteria pollutant emissions for the Freeway Tunnel Alternative dual-bore design variation are lower than the existing condition emissions, and with the exception of PM_{10} and $PM_{2.5}$, are lower than the 2025 No Build Alternative emissions. With the exception of PM_{10} and $PM_{2.5}$, the 2035 criteria pollutant emissions for the Freeway Tunnel Alternative dual-bore design variation are lower than the existing condition emissions and the 2035 No Build Alternative emissions.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS). In addition, EPA identified the following nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 2011 National Air Toxics Assessment (NATA): acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter (POM). While FHWA considers these compounds to be the priority MSAT, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Based on an FHWA analysis using EPA's MOVES2014a model, as shown on Figure 3.13-3, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total



Source: EPA MOVES2014a model runs conducted by FHWA, September 2016.
Note: Trends for specific locations may be different, depending on locally derived information representing vehicle miles traveled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

Figure 3.13-3: FHWA Projected National MSAT Emission Trends 2010-2050 for Vehicles Operating on Roadways Using EPA's MOVES2014a Model

annual emissions for the priority MSAT is projected for the same time period. Diesel PM is the dominant component of MSAT emissions, making up 50 to 70 percent of all priority MSAT pollutants by mass, depending on calendar year.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, decision-makers are duly expected by the public and other agencies to address MSAT impacts in environmental documents. The FHWA, EPA, Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. FHWA will continue to monitor the developing research in this field.

NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the federal government be interpreted and administered in accordance with its environmental protection goals. NEPA also requires federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. In addition to evaluating the potential adverse environmental effects, we must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in regulations at 23 CFR Part 771.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

This MSAT analysis includes a basic analysis of the likely MSAT impacts of the proposed project. Due to the limitations of information and methodology of the MSAT analysis, the following discussion is included in accordance with Council on Environmental Quality regulations regarding incomplete or unavailable information (40 CFR 1502.22[b]). The discussion regarding the limitations of the MSAT analysis is prototype language taken from Appendix C of the FHWA Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents (FHWA, 2016).

In FHWA's view, information is incomplete or unavailable to credibly predict project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from known or anticipated Adverse Effects of an air pollutant. The EPA is the lead authority for administering the Clean Air Act and its amendments and has specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects." Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents (FHWA, 2016). Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings;

cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects) or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts; each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings and/or uncertain science that prevent a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roads, to determine the amount of time that people are actually exposed at a specific location, and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, which is a concern expressed by the HEI. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, “the absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk (EPA IRIS database, Diesel Engine Exhaust, Section II.C. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642.htm#quainhal).”

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires the EPA to determine a “safe” or “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the United States Court of Appeals for the District of Columbia Circuit upheld the EPA’s approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk determined to be greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, which are better suited for quantitative analysis.

Qualitative MSAT Analysis

Depending on the specific project circumstances, the FHWA has identified three levels of analysis:

1. **Projects with No Meaningful Potential MSAT Effects, or Exempt Projects:** The types of projects included in this category are:

   a. Projects qualifying as a Categorical Exclusion under 23 CFR 771.117(c) (subject to consideration whether unusual circumstances exist under 23 CFR 771.117(b));
   b. Projects exempt under the Clean Air Act conformity rule under 40 CFR 93.126; or
   c. Other projects with no meaningful impacts on traffic volumes or vehicle mix.

   For projects that are categorically excluded under 23 CFR 771.117(c), or that are exempt from conformity requirements under the Clean Air Act pursuant to 40 CFR 93.126, no analysis or discussion of MSAT is necessary. Documentation sufficient to demonstrate that the project qualifies as a Categorical Exclusion and/or exempt project will suffice. For other projects with no or negligible adverse traffic impacts, regardless of the class of NEPA environmental document, no MSAT analysis is recommended. However, the project record should document the basis for the determination of "no meaningful potential impacts" with a brief description of the factors considered.

2. **Projects with Low Potential MSAT Effects:** The types of projects included in this category are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. This category covers a broad range of projects.

   It is anticipated that most highway projects that need an MSAT assessment will fall into this category. Any projects not meeting the criteria in Category 1 above or Category 3 below should be included in this category. Examples of these types of projects are minor widening projects, new interchanges, replacement of a signalized intersection on a surface street, or projects where design year traffic is projected to be less than 140,000 to 150,000 annual average daily traffic (AADT).

   For these projects, a qualitative assessment of emissions projections should be conducted. This qualitative assessment would compare, in narrative form, the expected effect of the project on traffic volumes, vehicle mix, or routing of traffic and the associated changes in MSAT for the project alternatives, including No Build, based on VMT, vehicle mix, and speed. It would also discuss national trend data projecting substantial overall reductions in emissions due to stricter engine and fuel regulations issued by the EPA. Because the adverse emission effects of these projects are typically low, it is expected that there would be no appreciable difference in overall MSAT emissions among the various alternatives.

3. **Projects with Higher Potential MSAT Effects:** This category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives. It is expected that a limited number of projects would meet this two-pronged test. To fall into this category, a project should:

   a. Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location, involving a significant number of diesel vehicles for new projects or accommodating a significant increase in the number of diesel vehicles for expansion projects; or

   b. Create new capacity or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000 or greater by the design year.

      The project should also be proposed to be located in proximity to populated areas.

   Projects falling within this category should be more rigorously assessed for adverse impacts. For these projects, a quantitative assessment of emissions projections should be conducted. This approach would include a quantitative analysis to forecast local-specific emission trends of the priority MSAT for each alternative for use as a basis of comparison.

As indicated in the *Transportation Technical Report* (2014), the traffic volumes along I-10, I-210, State Route 60 (SR 60), and SR 134 in the project area have average annual daily trips exceeding 140,000. In addition, the Freeway Tunnel Alternative design variations would construct a new highway facility within 500 to 1,000 ft of sensitive land uses. Consequently, this project is considered to have higher potential MSAT effects, and a quantitative analysis of MSAT emissions is required. The results of that analysis are summarized below.

Quantitative MSAT Analysis Methodology

The MSAT analysis evaluated all Build Alternatives for the project, even though the TSM/TDM Alternative (Preferred Alternative) would not have meaningful MSAT effects because it is exempt under 40 CFR 93.126. The basic procedure for analyzing emissions for on-road MSATs is to calculate emission factors using CT-EMFAC2014 (Version 6.0) and apply the emission factors to speed and VMT data specific to the project. CT-EMFAC2014 is an emission model developed by Caltrans that calculates emission inventories for motor vehicles using EMFAC2014 emission rates.

This analysis focuses on the MSAT pollutants included in the CT-EMFAC2014, including acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel PM, formaldehyde, naphthalene, and POM. Because ethylbenzene is not included in the CT-EMFAC2014 program, Caltrans's Ethylbenzene Emissions Calculator v1.0 was used to quantify ethylbenzene emissions.

Quantitative MSAT Analysis Results

Emissions factors for each of the MSATs were obtained for the Basin using emission rates generated by CT-EMFAC2014. Individual MSAT emissions were calculated using VMT separated by speed bins and the corresponding emission rates. Results of the analyses are tabulated in Table 3.13.11 for the 2012, 2020, 2025, and 2035 conditions.

TABLE 3.13.11:
2012, 2020/2025 Opening Year, and 2035 Horizon Year MSAT Emissions – Project Study Area (lbs/day)

Alternative	Diesel PM	Benzene	1,3-Butadiene	Naphthalene	POM	Acrolein	Formaldehyde	Acetaldehyde	Ethyl-benzene	Diesel PM	Benzene	1,3-Butadiene	Naphthalene	POM	Acrolein	Formaldehyde	Acetaldehyde	Ethyl-benzene	Diesel PM	Benzene	1,3-Butadiene	Naphthalene	POM	Acrolein	Formaldehyde	Acetaldehyde	Ethyl-benzene
2012 Existing	684.8	180.7	36.8	5.4	9.4	7.5	381.1	164.0	68.3	684.8	180.7	36.8	5.4	9.4	7.5	381.1	164.0	68.3	684.8	180.7	36.8	5.4	9.4	7.5	381.1	164.0	68.3
	2020 Opening Year									**2025 Opening Year**									**2035 Horizon Year**								
No Build Alternative	120.33	67.78	13.46	1.99	3.24	2.79	147.10	63.45	25.31	45.15	49.01	9.82	1.45	2.20	2.05	104.13	44.77	18.45	33.48	39.55	7.754	1.266	1.603	1.559	96.45	42.80	14.47
Change from Existing	*-564.48*	*-112.93*	*-23.31*	*-3.45*	*-6.16*	*-4.76*	*-234.01*	*-100.57*	*-43.00*	*-639.66*	*-131.70*	*-26.96*	*-3.99*	*-7.20*	*-5.50*	*-276.98*	*-119.26*	*-49.85*	*-651.32*	*-141.16*	*-29.02*	*-4.172*	*-7.801*	*-5.989*	*-284.66*	*-121.23*	*-53.83*
TSM/TDM Alternative	120.13	67.27	13.37	1.97	3.22	2.77	145.65	62.79	25.14	–	–	–	–	–	–	–		–	33.51	39.39	7.727	1.260	1.595	1.554	95.80	42.48	14.42
Change from Existing	*-564.68*	*-113.44*	*-23.40*	*-3.47*	*-6.19*	*-4.77*	*-235.46*	*-101.23*	*-43.17*	–	–	–	–	–	–	–		–	*-651.30*	*-141.32*	*-29.05*	*-4.178*	*-7.808*	*-5.993*	*-285.31*	*-121.54*	*-53.88*
Change from No Build	*-0.20*	*-0.50*	*-0.09*	*-0.02*	*-0.03*	*-0.02*	*-1.45*	*-0.66*	*-0.17*	–	–	–	–	–	–	–		–	*0.022*	*-0.162*	*-0.027*	*-0.006*	*-0.008*	*-0.004*	*-0.65*	*-0.31*	*-0.05*
BRT Alternative	120.00	67.16	13.35	1.97	3.21	2.77	145.34	62.65	25.09	–	–	–	–	–	–	–		–	33.50	39.44	7.734	1.262	1.597	1.555	95.99	42.58	14.44
Change from Existing	*-564.81*	*-113.55*	*-23.43*	*-3.47*	*-6.19*	*-4.78*	*-235.77*	*-101.37*	*-43.21*	–	–	–	–	–	–	–		–	*-651.30*	*-141.27*	*-29.04*	*-4.176*	*-7.806*	*-5.992*	*-285.12*	*-121.45*	*-53.87*
Change from No Build	*-0.33*	*-0.62*	*-0.11*	*-0.02*	*-0.03*	*-0.02*	*-1.76*	*-0.80*	*-0.21*	–	–	–	–	–	–	–		–	*0.020*	*-0.118*	*-0.020*	*-0.004*	*-0.005*	*-0.003*	*-0.46*	*-0.22*	*-0.04*
LRT Alternative	–	–	–	–	–	–	–	–		45.03	48.70	9.76	1.44	2.19	2.04	103.19	44.33	18.35	33.55	39.48	7.739	1.264	1.600	1.556	96.32	42.74	14.44
Change from Existing	–	–	–	–	–	–	–	–		*-639.78*	*-132.01*	*-27.01*	*-4.00*	*-7.22*	*-5.51*	*-277.92*	*-119.69*	*-49.96*	*-651.26*	*-141.23*	*-29.04*	*-4.174*	*-7.803*	*-5.992*	*-284.79*	*-121.28*	*-53.86*
Change from No Build	–	–	–	–	–	–	–	–		*-0.12*	*-0.31*	*-0.06*	*-0.01*	*-0.02*	*-0.01*	*-0.95*	*-0.43*	*-0.10*	*0.064*	*-0.072*	*-0.015*	*-0.002*	*-0.003*	*-0.003*	*-0.13*	*-0.06*	*-0.03*
Freeway Tunnel Alternative																											
Single-Bore Operational Variation: *With Tolls*	–	–	–	–	–	–	–	–	–	44.74	47.72	9.58	1.41	2.14	2.00	100.11	42.92	18.02	33.34	38.59	7.588	1.233	1.558	1.530	92.90	41.12	14.17
Change from Existing	–	–	–	–	–	–	–	–	–	*-640.07*	*-132.99*	*-27.19*	*-4.03*	*-7.27*	*-5.54*	*-281.00*	*-121.11*	*-50.28*	*-651.47*	*-142.13*	*-29.19*	*-4.206*	*-7.845*	*-6.018*	*-288.21*	*-122.90*	*-54.14*
Change from No Build	–	–	–	–	–	–	–	–	–	*-0.41*	*-1.29*	*-0.23*	*-0.04*	*-0.06*	*-0.04*	*-4.02*	*-1.85*	*-0.43*	*-0.142*	*-0.968*	*-0.165*	*-0.033*	*-0.044*	*-0.029*	*-3.55*	*-1.68*	*-0.30*
Single-Bore Operational Variation: *With Tolls and No Trucks*	–	–	–	–	–	–	–	–	–	44.74	47.67	9.58	1.41	2.13	2.00	99.94	42.84	18.01	33.34	38.56	7.584	1.232	1.557	1.529	92.76	41.05	14.16
Change from Existing	–	–	–	–	–	–	–	–	–	*-640.07*	*-133.04*	*-27.20*	*-4.03*	*-7.27*	*-5.55*	*-281.17*	*-121.19*	*-50.30*	*-651.46*	*-142.15*	*-29.19*	*-4.207*	*-7.846*	*-6.019*	*-288.35*	*-122.98*	*-54.14*
Change from No Build	–	–	–	–	–	–	–	–	–	*-0.42*	*-1.34*	*-0.24*	*-0.04*	*-0.07*	*-0.04*	*-4.19*	*-1.93*	*-0.45*	*-0.140*	*-0.998*	*-0.170*	*-0.034*	*-0.045*	*-0.029*	*-3.70*	*-1.75*	*-0.31*
Single-Bore Operational Variation: *With Tolls and Express Bus*	–	–	–	–	–	–	–	–	–	44.76	47.78	9.60	1.41	2.14	2.01	100.27	42.99	18.04	33.33	38.52	7.578	1.231	1.556	1.528	92.65	41.00	14.15
Change from Existing	–	–	–	–	–	–	–	–	–	*-640.05*	*-132.93*	*-27.18*	*-4.03*	*-7.26*	*-5.54*	*-280.84*	*-121.03*	*-50.26*	*-651.48*	*-142.19*	*-29.20*	*-4.208*	*-7.848*	*-6.020*	*-288.46*	*-123.03*	*-54.16*
Change from No Build	–	–	–	–	–	–	–	–	–	*-0.39*	*-1.23*	*-0.22*	*-0.04*	*-0.06*	*-0.04*	*-3.86*	*-1.78*	*-0.41*	*-0.155*	*-1.032*	*-0.176*	*-0.035*	*-0.047*	*-0.030*	*-3.80*	*-1.80*	*-0.32*
Dual-Bore Operational Variation: *No Tolls*	–	–	–	–	–	–	–	–	–	44.78	47.34	9.52	1.40	2.12	1.99	98.67	42.24	17.91	33.39	38.28	7.545	1.221	1.543	1.524	91.41	40.39	14.09
Change from Existing	–	–	–	–	–	–	–	–	–	*-640.03*	*-133.37*	*-27.25*	*-4.04*	*-7.29*	*-5.55*	*-282.44*	*-121.79*	*-50.40*	*-651.42*	*-142.43*	*-29.23*	*-4.217*	*-7.860*	*-6.024*	*-289.70*	*-123.63*	*-54.22*
Change from No Build	–	–	–	–	–	–	–	–	–	*-0.37*	*-1.67*	*-0.30*	*-0.06*	*-0.09*	*-0.05*	*-5.46*	*-2.53*	*-0.55*	*-0.091*	*-1.271*	*-0.209*	*-0.045*	*-0.060*	*-0.035*	*-5.05*	*-2.40*	*-0.38*
Dual-Bore Operational Variation: *No Trucks*	–	–	–	–	–	–	–	–	–	44.83	47.40	9.54	1.40	2.12	2.00	98.75	42.26	17.93	33.43	38.27	7.545	1.220	1.542	1.524	91.29	40.33	14.09
Change from Existing	–	–	–	–	–	–	–	–	–	*-639.97*	*-133.31*	*-27.24*	*-4.04*	*-7.28*	*-5.55*	*-282.36*	*-121.76*	*-50.37*	*-651.37*	*-142.44*	*-29.23*	*-4.218*	*-7.861*	*-6.024*	*-289.82*	*-123.69*	*-54.21*
Change from No Build	–	–	–	–	–	–	–	–	–	*-0.32*	*-1.61*	*-0.28*	*-0.05*	*-0.08*	*-0.05*	*-5.38*	*-2.51*	*-0.52*	*-0.050*	*-1.280*	*-0.209*	*-0.046*	*-0.061*	*-0.034*	*-5.17*	*-2.46*	*-0.38*
Dual-Bore Operational Variation: *With Tolls*	–	–	–	–	–	–	–	–	–	44.86	47.52	9.56	1.40	2.12	2.00	99.11	42.43	17.97	33.38	38.26	7.543	1.220	1.542	1.524	91.27	40.33	14.09
Change from Existing	–	–	–	–	–	–	–	–	–	*-639.95*	*-133.19*	*-27.22*	*-4.04*	*-7.28*	*-5.55*	*-282.00*	*-121.59*	*-50.34*	*-651.43*	*-142.45*	*-29.23*	*-4.218*	*-7.862*	*-6.024*	*-289.84*	*-123.70*	*-54.22*
Change from No Build	–	–	–	–	–	–	–	–	–	*-0.29*	*-1.49*	*-0.26*	*-0.05*	*-0.08*	*-0.05*	*-5.02*	*-2.34*	*-0.48*	*-0.102*	*-1.290*	*-0.211*	*-0.046*	*-0.061*	*-0.035*	*-5.18*	*-2.47*	*-0.38*

BRT = bus rapid transit
Diesel PM = diesel particulate matter
lbs/day = pounds per day
LRT = light rail transit
MSAT = Mobile Source Air Toxics
POM = polycyclic organic matter
TSM/TDM = Transportation System Management/Transportation Demand Management

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The analysis indicates that substantially lower MSAT emissions can be expected between the existing (2012) and future (2020, 2025, and 2035) No Build Alternative conditions. This trend is prevalent throughout the priority MSATs and the analyzed alternatives. The lower MSAT emissions in comparison to existing conditions are consistent with the aforementioned FHWA study that projects a substantial reduction in on-road emissions of MSATs between 2010 and 2050. Based on the analysis for this project, between the 2012 existing and 2035 No Build Alternative conditions, expected reductions in MSATs in the project study area are: 95 percent of diesel PM, 78 percent of benzene, 79 percent of 1,3-butadiene, 77 percent of naphthalene, 83 percent of POM, 79 percent of acrolein, 75 percent of formaldehyde, 74 percent of acetaldehyde, and 79 percent of ethylbenzene. These projected reductions are achieved while total VMT in the project area increase by 11.3 percent.

TSM/TDM Alternative

As shown in Table 3.13.11, the 2020 TSM/TDM Alternative MSAT emissions of the project study area are lower than the existing condition emissions and the 2020 No Build Alternative emissions. The 2035 TSM/TDM Alternative MSAT emissions are lower than the existing condition emissions. With the exception of the diesel PM emissions, the 2035 TSM/TDM Alternative MSAT emissions are all lower than the 2035 No Build Alternative emissions.

BRT Alternative

As shown in Table 3.13.11, the 2020 BRT Alternative MSAT emissions of the project study area are lower than the existing condition emissions and the 2020 No Build Alternative emissions. The 2035 BRT Alternative MSAT emissions are lower than the existing condition emissions and, with the exception of diesel PM, are lower than the 2035 No Build Alternative emissions.

LRT Alternative

As shown in Table 3.13.11, the 2025 LRT Alternative MSAT emissions of the project study area are lower than the existing condition emissions and the 2025 No Build Alternative emissions. The 2035 LRT Alternative MSAT emissions are lower than the existing condition emissions and, with the exception of diesel PM, are lower than the 2035 No Build Alternative emissions.

Freeway Tunnel Alternative Single-Bore Design Variation

As shown in Table 3.13.11, the 2025 MSAT emissions of the project study area for the Freeway Tunnel Alternative single-bore design variation are lower than the existing condition emissions and the 2025 No Build Alternative emissions. The 2035 MSAT emissions for the Freeway Tunnel Alternative single-bore design variation are lower than the existing condition emissions and the 2035 No Build Alternative emissions.

Freeway Tunnel Alternative Dual-Bore Design Variation

As shown in Table 3.13.11, the 2025 MSAT emissions of the project study area for the Freeway Tunnel Alternative dual-bore design variation are lower than the existing condition emissions and the 2025 No Build Alternative emissions. The 2035 MSAT emissions for the Freeway Tunnel Alternative dual-bore design variation are lower than the existing condition emissions and the 2035 No Build Alternative emissions.

Summary

In general, the Build and No Build Alternatives would have lower MSAT emissions in comparison to the existing conditions. The Build Alternatives would have overall lower MSAT emissions than No Build. While the Build Alternatives would result in a small decrease in localized MSAT emissions in comparison to the No Build Alternative, and MSAT emissions would be expected to decrease from other roadways in the project area due to the re-distribution of vehicle traffic and the improved travel efficiency. The EPA's vehicle and fuel regulations, coupled with fleet turnover, will cause substantial reductions over time that will cause regionwide MSAT levels to be substantially lower than they are today.

3.13.3.3 Ultrafine Particulate Matter

As scientific studies and environmental regulations are expanding, their focus on the smaller particles in ambient air (total suspended particulate to PM_{10} to $PM_{2.5}$) has grown. An increasing interest in particles less than 0.1 micrometer, referred to as ultrafine particulate matter or ultrafine particulates (UFPs) is also developing. UFPs are formed as a result of combustion processes as well as secondary atmospheric transformations. Vehicle emissions, especially diesel exhaust, are major sources of UFPs; therefore, proximity to a major roadway is an important factor that affects an individual's exposure to UFPs (Zhu et al., 2002; HEI Review Panel on Ultrafine Particles 2013).

Studies have shown that UFP concentrations decrease sharply with distance from emission sources as a result of particle growth and accumulation processes; for instance Zhu et al. (2002) reported that UFP concentration measurements were equal to background concentrations 300 meters downwind of I-405 near the Los Angeles National Cemetery. Thus, high ambient UFP levels are very localized and exhibit large geographical and temporal variations. Concerns about public exposure to UFPs (especially in areas near freeways) are due to the fact that UFPs and the contaminants they contain are relatively easily transported into the body. This is because (1) smaller particles can be inhaled and deposited deeper into the lungs than larger particles, and (2) the high surface area/mass ratio of UFPs can facilitate adsorption and result in higher content of trace metals and other toxic organic compounds.

Currently, there are no federal or California standards for UFPs. Information on UFPs is limited at this time and is an area of active research. For example, physical transient behaviors, such as particle growth and accumulation, complicate the task of elucidating UFP concentration-response functions. Also, the existing state of knowledge does not yet support the derivation of reliable UFP emission models that account for the particulate growth and accumulation phases. Dispersion modeling of UFPs would also require additional information on the rate of UFP coagulation and absorption so that concentrations can be calculated. Given the lack of information to quantify emissions, dispersion, exposure, and health response to exposure, UFP emissions and impacts could not be quantified for the proposed project. However, in the project study area, using $PM_{2.5}$ or diesel PM as a surrogate, the public exposure to UFPs in the project study area in future years would decrease relative to the 2012 baseline as indicated by the emission decrease trend in Tables 3.13-10 and 3.13-11.

3.13.3.4 Climate Change

Neither the EPA nor the FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and executive orders on climate change, the issue is addressed in Chapter 4, California Environmental Quality Act Evaluation, of this document. The California Environmental Quality Act Evaluation analysis may be used to inform the NEPA determination for the project.

3.13.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures apply to all the Build Alternatives:

Measure AQ-1

Fugitive Dust (applies to all four Build Alternatives): During clearing, grading, earthmoving, or excavation operations, the Resident Engineer will require the construction contractor to control excessive fugitive dust emissions by regular watering or other dust preventive measures using the following procedures, as specified in the South Coast Air Quality Management District Rule 403. The Construction Contractor will be required to:

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites during workdays, weekends, holidays, and windy conditions.
- Install wind fencing, phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit off-road speeds to 15 miles per hour (mph). Limit speed of off-road earthmoving equipment to 10 mph.

Measure AQ-2

Equipment and Vehicle Emissions (applies to all four Build Alternatives): During all site preparation, grading, excavation, and construction, either the Resident Engineer for the TSM/TDM, BRT, and LRT Alternatives or the Resident Engineer for the Freeway Tunnel Alternative, as applicable, will require the Construction Contractor to:

- Reduce use, trips, and unnecessary idling from heavy equipment.
- Use solar-powered rather than diesel-powered changeable message signs.
- Obtain electricity from power poles rather than from generators where feasible.

- Maintain and tune engines per manufacturer's specifications to perform at United States Environmental Protection Agency (EPA) certification levels and at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications.
- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations.
- Use new, clean (diesel or retrofitted diesel) equipment meeting the most stringent applicable federal or State standards and commit to the best available emissions control technology. Use Tier 3, or higher, engines for construction equipment with a rated horsepower exceeding 75. Use Tier 2, or higher, engines for construction equipment with a rated horsepower of less than 75. If non-road construction equipment that meets or exceeds Tier 2 or 3 engine standards is not available, the Construction Contractor will be required to use the best available emissions control technologies on all equipment.
- Utilize EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site.

Measure AQ-3

Diesel Fuel Emissions and Sensitive Receptors (applies to all four Build Alternatives): Prior to any site disturbance, either the Resident Engineer for the TSM/TDM, BRT, and LRT Alternatives or the Resident Engineer for the Freeway Tunnel Alternative, as applicable, will require the Construction Contractor to:

- Meet EPA diesel fuel requirements off road and on highway and, where appropriate, use alternative fuels such as natural gas and electric.
- Identify sensitive receptors in the project area (e.g., residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes) and specify the means by which impacts to these populations will be minimized. For example, locate construction equipment and staging zones away from sensitive receptors and away from fresh air intakes to buildings and air conditioners.

In addition to the measures listed above, the following measure would apply to the Freeway Tunnel Alternative single-bore and dual-bore design variations:

Measure AQ-4

California Department of Transportation (Caltrans) Standard Specifications for Construction (applies to the Freeway Tunnel Alternative): During all site preparation, grading, excavation, and construction, the Resident Engineer will require the Construction Contractor to adhere to Caltrans Standard Specifications for Construction (Sections 14-9 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plant Emissions]).

In addition to Measures AQ-1, AQ-2, and AQ-3, above, the following measure would apply to the TSM/TDM, BRT, and LRT Alternatives.

Measure AQ-5 **Metro Green Construction Policy (applies to the TSM/TDM, BRT, and LRT Alternatives):** Metro will require the Construction Contractors to comply with its "Green Construction Policy" (adopted 2011, or more current) related to the use of greener, less polluting construction equipment and vehicles, and the implementation of best practices to meet or exceed air quality emission standards.

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3.14 Noise and Vibration

3.14.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

3.14.1.1 California Environmental Quality Act

The California Environmental Quality Act requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section will focus on the NEPA 23 Code of Federal Regulations (CFR) 772 noise analysis; please see Chapter 4 of this document for further information on noise analysis under CEQA.

3.14.1.2 National Environmental Policy Act and 23 CFR 772

For highway transportation projects, with FHWA (and Caltrans, as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 Code of Federal Regulations [CFR] 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). Table 3.14.1 lists the noise abatement criteria for use in the NEPA 23 CFR 772 analysis.

Figure 3.14-1 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

According to the Caltrans *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011,* a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Caltrans *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. A minimum 5 dBA reduction in the future noise level must be achieved at one or more receptors shielded by the noise barrier for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations.

TABLE 3.14.1:
Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, L_{eq}(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

[1] Includes undeveloped lands permitted for this activity category.

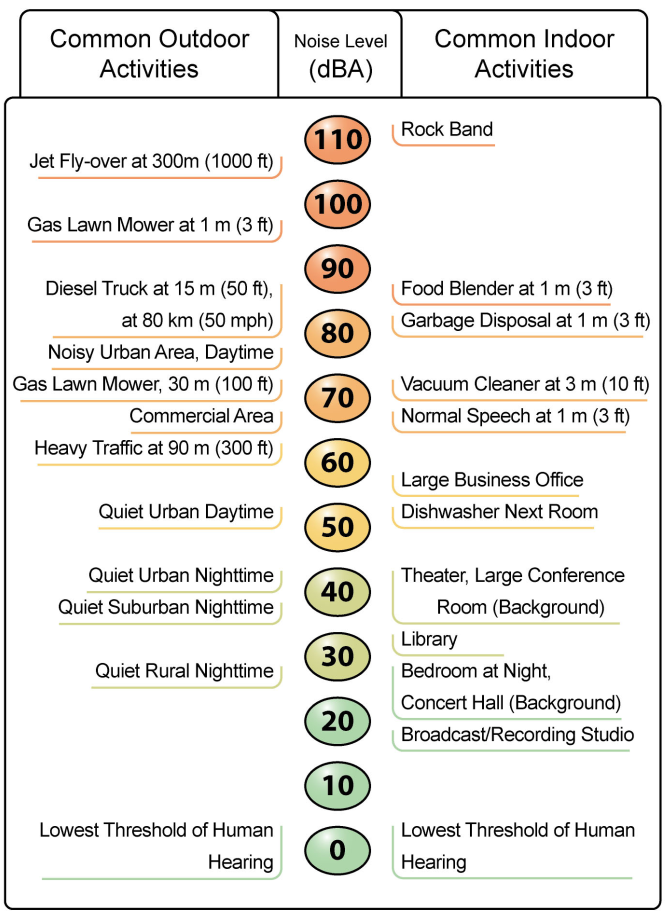


Figure 3.14-1: Noise Levels of Common Activities

The reasonableness determination is a two-step process. The first step of the reasonable determination requires that one or more receptors benefiting from the abatement considered achieve the reduction goal of 7 dBA. The second step in determining reasonableness is a cost-benefit analysis. Additional factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance and the cost per benefited residence.

These criteria will be used for the Bus Rapid Transit (BRT), Transportation System Management/ Transportation Demand Management (TSM/TDM), and Freeway Tunnel Alternatives in this analysis.

3.14.1.3 Federal Transit Administration Criteria

Transit Noise and Vibration Impact Assessment Manual

Federal noise impact thresholds are defined in the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual, May 2006). The FTA criteria are based on the best available research on community response to noise. The research shows that characterizing the overall noise environment using measures of noise exposure provides the best correlation with human annoyance. The FTA provides different thresholds for different land uses. Table 3.14.2 lists the three FTA land use categories and the applicable noise metric for each category. (Please note that the tables and figures cited in this section, with the exception of Table 3.14.1 and Figure 3.14-1, are provided in Appendix N, Noise Tables and Figures.) For Category 2 land uses (residential areas where people sleep), the noise exposure is characterized using L_{dn}. In calculating L_{dn}, noise created during the nighttime hours is more heavily weighted than daytime noise to reflect residents' greater sensitivity to noise during the nighttime hours. For Categories 1 and 3 land uses, areas with primarily daytime use, noise exposure is characterized using the 1-hour L_{eq}. L_{eq} is the steady sound level that represents the same sound energy as the time-varying sound levels over the specified measurement period.

The basic concept of the FTA noise thresholds is that project-related noise levels are allowed to be greater in environments in which ambient noise is higher; however, the allowable increase above existing levels of noise exposure once the project impacts are included is less, in order to protect the sensitive uses from experiencing an even louder environment. The criteria for allowable cumulative noise exposure are shown in Table 3.14.3 (refer to Appendix N) for the three different categories of land use.

If the predicted project noise exceeds the moderate threshold, noise abatement must be considered. If the predicted project noise exceeds the severe threshold, noise abatement must be included in the project unless there are compelling reasons why abatement is not feasible. Noise from existing sources, such as traffic, is not included in the project noise level.

FTA Operational Ground-Borne Noise and Vibration Impact Criteria

Predicted levels of ground-borne noise and vibration were evaluated using the FTA criteria for the land use categories defined in Table 3.14.4 (refer to Appendix N). The vibration criteria provided in Table 3.14.4 are based on the 1/3-octave band levels. However, if the overall vibration level does not exceed the relevant criterion, then neither do the 1/3-octave levels. Therefore, it is sufficient to evaluate just the predicted overall vibration levels unless the criteria are exceeded, in which case an evaluation of the 1/3-octave levels is warranted.

No receivers along the alignment were identified that can be classified under Land Use Category 1. As shown in Table 3.14.4 (refer to Appendix N), those types of receivers include vibration-sensitive manufacturing, research, or special medical facilities. The majority of receivers along the tunnel alignments of the Light Rail Transit (LRT) and Freeway Tunnel Alternatives are Land Use Category 2, which includes residential uses and uses such as hospitals and hotels where people sleep at night. The FTA criteria for Category 2 receivers are 35 dBA for ground-borne noise and 72 vibration velocity decibels (VdB) (re: 10^{-6} inches per second [in/sec]) for vibration. The FTA criteria for institutional land uses under Category 3 with daytime uses only (e.g., schools and churches) are 40 dBA for ground-borne noise and 75 VdB for vibration. Category 3 also applies to “quiet office” spaces such as doctor’s offices and some commercial spaces where quiet is important to occupants. In general, commercial (except for “quiet offices”) and industrial uses are not considered to be noise and vibration sensitive receptors based on the FTA criteria.

An alignment may also include specific receivers (auditoriums or theaters) considered to be Special Land Uses for ground-borne noise and vibration impacts. The criteria for Special Land uses are shown in Table 3.14.5 (refer to Appendix N). No special land uses were identified within 450 feet (ft) of the LRT tunnel alignment.

FTA Construction Vibration Impact Criteria

FTA provides criteria for two types of impact from construction vibration: impacts due to annoyance and impacts due to building damage. For evaluating annoyance impacts, the criteria presented in Table 3.14.4 (refer to Appendix N) are applicable. Construction impacts can result in short term annoyance and can be classified as Infrequent events as indicated in Table 3.14.4 (refer to Appendix N). Construction vibration damage criteria from FTA are provided in Table 3.14.6 (refer to Appendix N).

FTA recommends a damage criterion of 0.12 in/sec for buildings that are extremely susceptible to vibration, which would include fragile historic buildings. At this level of vibration, a fragile historic building may suffer cosmetic damage, characterized by fine plaster cracking and the re-opening of old cracks.

The FTA criteria will be used for the LRT Alternative in this analysis.

3.14.2 Affected Environment

The information in this section is based on and summarized from the project *Noise Study Report* (NSR) (2014), the *Groundborne Noise and Vibration Impacts* (2014), and the *Noise Abatement Decision Report* (NADR) (2014).

3.14.2.1 Noise Measurements

Short- and long-term noise measurements were conducted at representative receptor locations in the vicinity of the improvements in the Build Alternatives to document existing noise levels in the study area. Typically, the area in which noise impacts are analyzed is limited to an area within 500 ft of the physical improvements. If the nearest receptor is located greater than 500 ft away, impacts are handled on a case-by-case basis. If multiple rows of receptors exist within the 500 ft buffer, impacts are typically assessed at the first and second rows, but this is also dependent on the physical setting and topographical considerations. The short-term noise measurements were specific to each Build Alternative and are described below by Alternative.

A total of 26 long-term, 24-hour noise measurements were conducted at representative receptor locations in the overall study area using Quest Type 2 Noise Level Dosimeters. The purpose of these long-term measurements was to identify variations in sound levels throughout the day and to determine the existing peak-hour noise levels. Fifteen measurements were conducted in the study area adjacent to the improvements in the four Build Alternatives. In addition, there were 11 long-term, 24-hour background noise level measurements conducted in areas farther from area freeways and local streets, where those noise sources would not contribute to the total noise level, in order to establish existing ambient background levels in the study area neighborhoods. In addition to the long-term measurements, a total of 152 short-term measurements were gathered throughout the study area to calibrate the TNM noise model and to establish existing noise levels for the LRT Alternative. The locations of the noise monitoring locations are shown on Figures 3.14-2 through 3.14-7 (refer to Appendix N).

3.14.2.2 Surrounding Land Uses and Sensitive Receptors

Field investigation and review of land use maps and aerial photographs were conducted to identify land uses that could be subject to traffic/light rail and construction noise from the Build Alternatives. Land uses in the project area were categorized by land use type, by Activity Category as defined in Table 3.14.1, and by the extent of frequent human use. Existing noise-sensitive land uses in the SR 710 North Project area vary by Alternative and include residential, commercial, and industrial uses, parks and recreation areas, schools and daycare facilities, hospitals and medical centers, and vacant land. Existing noise-sensitive land uses in the SR 710 North Project area are described briefly below by Build Alternative and are represented as receptor locations on Figures 3.14-3 through 3.14-7 (refer to Appendix N). A total of 757 representative receptors were evaluated for Future No Build conditions, and 899 representative receptors were evaluated for potential noise impacts resulting from the Build Alternatives.

Although all developed land uses were evaluated, the focus of the noise impact analysis was on locations of frequent human use that would benefit from lowered noise levels. As a result, the impact analysis focused on locations with defined outdoor activity areas such as residential backyards, common use areas at multifamily residences, playgrounds, schools, parks, and healthcare facilities. The geometry of the project relative to nearby existing and planned land uses was also used as a method for determining noise impacts at specific locations and benefits from a lowered noise level. Noise abatement was only considered for areas of frequent human use that would benefit from lowered noise levels.

Land Uses and Sensitive Receptors in the Vicinity of the TSM/TDM Alternative

Existing land uses in the vicinity of the improvements in the TSM/TDM Alternative include single-family and multifamily residences, five schools, commercial uses, two restaurants, a hospital, a church, a sports field, a park, office and industrial uses, and vacant land. In the vicinity of the TSM/TDM Alternative, there are 13 existing noise barriers. These existing land uses in the vicinity of the TSM/TDM Alternative improvements were evaluated under several of the Activity Categories shown in Table 3.14.1. Existing land uses in the vicinity of individual improvements in the TSM/TDM Alternative are described in further detail in Table 3.14.7 (refer to Appendix N). The noise sensitive receptors in the vicinity of improvements in the TSM/TDM Alternative and the existing and predicted noise levels of those receptors are described in Tables 3.14.8 and 3.14.9 and are shown on Figure 3.14-3 (refer to Appendix N).

Land Uses and Sensitive Receptors in the Vicinity of the BRT Alternative

Existing land uses in the vicinity of the improvements in the BRT Alternative include single-family and multifamily residences, a day-care center, two parks, hospital and medical centers, a museum, two schools, two preschools, seven churches, three hotels, and commercial, office, and industrial uses. In the vicinity of the BRT Alternative, there are eight existing noise barriers. The existing land uses in the vicinity of the BRT Alternative improvements were evaluated under several of the Activity Categories shown in Table 3.14.1. Existing land uses in the vicinity of improvements in the BRT Alternative are described in further detail in Table 3.14.10 (refer to Appendix N). The noise-sensitive receptors in the vicinity of improvements in the BRT Alternative and the existing and predicted noise levels of those receptors are described in Tables 3.14.11 and 3.14.12 and are shown on Figure 3.14-4 (refer to Appendix N).

Land Uses and Sensitive Receptors in the Vicinity of the LRT Alternative

Existing land uses in the vicinity of the improvements in the LRT Alternative include single-family and multifamily residences, office, commercial, and recreational uses, and vacant land. Receptors considered for the noise impact analysis were located within 1,000 ft of the LRT Alternative alignment. There are no existing noise barriers in the area considered for the noise impacts analysis for the LRT Alternative. Existing land uses in the vicinity of the LRT Alternative are described in detail in Table 3.14.13 (refer to Appendix N). The noise-sensitive receptors in the vicinity of the improvements in the LRT Alternative and the existing and predicted noise levels of those receptors are described in Table 3.14.14 and are shown on Figure 3.14-5 (refer to Appendix N).

Land Uses and Sensitive Receptors in the Vicinity of the Freeway Tunnel Alternative

Existing land uses in the vicinity of the Freeway Tunnel Alternative study area include single-family and multifamily residences, a golf course, four schools, California State University, Los Angeles (Cal State LA), a church, a hospital, office, commercial, and recreational uses, and vacant land. In addition, there is an office development planned at the intersection of South Pasadena Avenue and West Dayton Street. In the area of the Freeway Tunnel Alternative, there are 15 existing noise barriers. The existing land uses in the vicinity of the Freeway Tunnel Alternative improvements were evaluated under several of the Activity Categories shown in Table 3.14.1. Existing land uses in the vicinity of the Freeway Tunnel Alternative are described in further detail in Table 3.14.15 (refer to Appendix N). The noise-sensitive receptors in the vicinity of the improvements in the Freeway Tunnel Alternative single-bore design variation and the existing and predicted noise levels of those receptors are described in Tables 3.14.16 and 3.14.17 and are shown on Figure 3.14-6 (refer to Appendix N). The noise-sensitive receptors in the vicinity of the improvements in the Freeway Tunnel Alternative dual-bore design variation and the existing and predicted noise levels of those receptors are described in Tables 3.14.18 and 3.14.19 and are shown on Figure 3.14-7 (refer to Appendix N).

Sensitive Receptor of Concern for Both the LRT and Freeway Tunnel Alternatives

Grifols Biologicals, Inc. maintains a laboratory located at 2410 Lillyvale Avenue in Los Angeles that is considered a sensitive receptor for vibration (Receptors 15, 16, and 17 on Figure 3.14-7 [refer to Appendix N]). This division of Grifols specializes in the development and manufacturing of high-quality, plasma-derived protein therapies for the medical industry. The closest labs at this Grifols facility are located at least 450 ft and most likely 600 ft from where the closest tunnel would be bored. Concern has been raised about the potential for dust becoming airborne inside their clean room laboratories by vibration created during temporary construction activities, including tunnel boring.

3.14.3 Environmental Consequences

The proposed SR 710 North Project is classified as a Type I project because federal aid is proposed under the Freeway Tunnel Alternative to both construct a highway at a new location and physically alter an existing highway, and under the BRT and TSM/TDM Alternatives for which the physical alteration of a highway/roadway will occur. The LRT analysis will follow the criteria established in the FTA Manual. The potential short- and long-term noise and ground-borne noise and vibration impacts of the No Build and Build Alternatives are described in the following sections.

3.14.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives and, as a result, would not result in any short-term noise impacts or impacts associated with ground-borne noise or vibration. However, the No Build Alternative does include projects/planned improvements through 2035 that are included in the Federal Transportation Improvement Program (FTIP), as listed in the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), Measure R, and the funded part of the Los Angeles County Metropolitan Transportation Authority (Metro) 2009 Long Range Transportation Plan (LRTP). It is possible that the construction of those improvements could result in short-term impacts related to short-term noise effects or effects associated with ground-borne noise or vibration. Those effects would be analyzed and mitigated, if needed, as each of those projects/improvements is advanced for implementation.

Build Alternatives

Construction Noise

Two types of short-term noise impacts would occur during construction of the improvements in the Build Alternatives. The first type of construction noise would be from construction crew commutes and the transport of construction equipment and materials to and from the project site, which would incrementally raise noise levels on access roads leading to and from the project site. The pieces of heavy equipment for grading and construction activities would be moved onto the project site, would remain for the duration of each construction phase, and would not add to the daily traffic volumes in the project vicinity. A high single-event noise exposure potential at a maximum instantaneous noise level of 87 A-weighted decibels (dBA L_{max}) from trucks passing at 50 ft would occur as a result of trucks traveling on roads leading to/from project construction areas. The projected traffic volumes from construction crew commutes would be minimal compared to existing traffic volumes on existing freeways and major arterials, and the change in noise level as a result of the increased traffic associated with construction worker commutes would not be perceptible. It is expected that under a worst-case condition of 24-hour operations, based on the construction equipment estimates provided by the project engineer, that approximately 30 heavy trucks per hour would be carrying materials away from the project site to off-site disposal areas. The haul routes will follow existing freeways that currently have much greater hourly and daily volumes than the expected haul truck traffic. Refer to Section 4.2.12, Noise, Parts XII(a), XII(c), and XII(d), which provides specific information regarding noise impacts associated with haul truck activities.

The second type of short-term noise impact is related to noise generated during excavation, grading, and facility construction. Construction is performed in discrete steps, each of which has its own mix of equipment and consequently its own noise characteristics. These various sequential phases would change the character of the noise generated and, consequently, the noise levels in the vicinity of the improvements within each Build Alternative as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 3.14.20 (refer to Appendix N) lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 ft between a piece of construction equipment and a noise receptor. Due to the distance between the TSM/TDM Alternative improvements and the other Build Alternatives, construction-related impacts are not expected to compound should they be constructed simultaneously.

As shown in Table 3.14.20 (refer to Appendix N), typical noise levels at 50 ft from an active construction area range up to 88 dBA L_{max} during the noisiest construction phases (which assumes the combination of a grader, a bulldozer, and trucks). The site preparation phase, which includes grading and paving, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving and compacting equipment include excavating machinery such as backfillers, bulldozers, and front loaders as well as compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Construction of the improvements in the Build Alternatives is expected to require the use of a variety of construction equipment, depending on the specific improvement. Noise associated with pile driving activities, if necessary, is estimated to approach 93 dBA L_{max} at 50 ft from center of activity. Noise associated with the use of construction equipment for the grading phase is estimated to be 88 dBA L_{max} at 50 ft from the active construction area. As shown in Table 3.14.20 (refer to Appendix N), the maximum noise level generated by a grader is estimated to be approximately 85 dBA L_{max} at 50 ft from the source. A bulldozer would generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by water and pickup trucks is approximately 55 dBA L_{max} at 50 ft from these vehicles.

Each doubling of a sound source with equal strength increases the noise level by 3 dBA. Each piece of construction equipment operates as an individual point source. The worst-case composite noise level at the nearest residence during this phase of construction would be 88 dBA L_{max} when the distance between the residences and an active construction area is 50 ft.

Construction Ground-Borne Noise and Vibration

TSM/TDM and BRT Alternatives

Based on the types of improvements in the TSM/TDM and BRT Alternatives and the construction methods and equipment (i.e., no pile driving or other activities that generate high levels of vibration) to construct those improvements, there would be no short-term ground-borne noise or vibration impacts during construction of the TSM/TDM and BRT Alternatives.

LRT and Freeway Tunnel Alternatives

Construction activities can result in varying degrees of ground vibration, depending on the equipment, the type of construction operation being performed, the location of construction equipment inside a construction zone, and the distance to the nearest sensitive receptor. The ground-borne noise and vibration analysis indicated that the following construction activities could result in short-term ground-borne noise and vibration:

- Tunnel excavation (tunnels in the LRT and Freeway Tunnel Alternatives are expected to be constructed with tunnel boring machines [TBMs].)
- Supply and muck train movements to bring supplies and personnel into the tunnel and to remove excavated materials from the tunnel portal areas, if used. If a muck train is used to remove spoils, the installation of an under-track mat (commonly referred to as a ballast mat) at the track level would reduce ground-borne noise and vibration. Construction of previous Metro rail tunnel projects has shown ballast mats to be effective at substantially reducing ground-borne noise and vibration impacts. Ballast mats are elastomeric sheets that can be placed under the muck train tracks to reduce vibration. These mats are typically 1 inch or more thick.
- Excavation and construction of tunnel portals and underground stations, including pile driving, where residents are located nearby.

Potential Effects on all Sensitive Receptors

The bored tunnels of the LRT and Freeway Tunnel Alternatives are expected to be excavated with TBMs, which could result in ground-borne vibration. No blasting is anticipated; however, if higher strength bedrock is expected in the cut-and-cover sections or in the excavation of the cross passages, controlled blasting methods may be evaluated. This would be determined when more detailed geotechnical information is evaluated for these areas.

The following short-term, construction-related impact discussion applies to the tunnel boring for both the LRT and Freeway Tunnel Alternatives. During tunnel boring, there could be short-term construction vibration impacts, which have a potential to be greater for the LRT Alternative because it is generally shallower than the Freeway Tunnel Alternative. The impacts could last as long as 3 days when the tunnel is being constructed directly below sensitive receptors, and is based on how quickly the TBM advances under the sensitive receptor.

The Category 2 (residential) vibration criterion for Infrequent Events is 80 VdB and for Occasional Events it is 75 VdB. Consequently, there may be a very short-term vibration impact (up to 3 days) due to TBM operation, when the tunnel is being constructed directly below a sensitive receiver. This level of vibration would not be capable of producing damage to structures. There would also be longer-term construction vibration impacts associated with supply and muck train movements; however, it is not certain that trains would be used in the tunnels to deliver supplies or remove excavated material. A conveyor system could be used to remove spoils, in place of the muck trains and there would be no vibration impact from this activity. A conveyor is simply a moving conveyor belt onto which soil and rock are placed to be carried along to the point of removal from the tunnel. The belt would run continuously and would produce very little vibration compared to a muck train.

The tunnel for the LRT Alternative would be developed at shallower depths than the Freeway Tunnel Alternative. As a result, tunnel boring and other construction activities for the LRT Alternative would be more likely to cause adverse short-term, construction-related vibration impacts than the Freeway Tunnel Alternative.

There may be short-term construction vibration impacts at station sites where residential receptors are within 200 ft of pile driving and other vibration-producing activities. Best management practices and vibration monitoring to limit vibration at these receptors can be used to minimize, if not eliminate vibration impacts. Where vibration impacts cannot be avoided there may be short-term construction impacts around the stations sites. Other methods of construction could be used to avoid impacts from pile driving. Pre-drilling holes for soldier piles and where feasible, the use of soil mix wall for excavation are some of the vibration control measures that could be applied to reduce ground-borne vibration impacts in these areas.

Potential Effects on Sensitive Receptors of Concern

Potential short-term vibration impacts were assessed at the Grifols laboratory facility. At a distance of 450 ft, a conservative estimate of the ground-borne vibration during tunnel boring is approximately 0.0018 in/sec root mean square (RMS). This is equivalent to a vibration level of 65 VdB. There is no published industry criterion available to evaluate the vibration level necessary for dust inside a clean room to become airborne. For a dust particle to become airborne, the vibration would need to accelerate the particle enough to overcome adhesion factors such as Van der Waals forces, which act at the molecular level and involve electrostatic interactions.

A level of 66 VdB (0.002 in/sec), although very conservative, is sometimes used as an unofficial criterion in the micro-electronics industry as a threshold to evaluate the potential for generation of airborne dust due to vibration. The reason for this is that micro-electronic clean rooms are designed to a vibration level that is substantially less than this. More recently, higher levels are being evaluated as possible criteria for limiting vibration as it relates to dust in clean rooms.

Based on this analysis, it would appear that there would be no impact from tunnel boring vibration to this facility. Vibration-sensitive manufacturing or research of the type that Grifols engages in will require a more detailed evaluation to define the acceptable vibration level to avoid causing dust in their clean rooms to become airborne. If either the LRT Alternative or Freeway Tunnel Alternative is selected, during the engineering phase of the project, this issue would be examined in more detail based on information to be provided by Grifols about ambient levels of dust in their laboratory and refinement of vibration predictions based on identification of the tunnel boring machine and specific soil conditions between the tunnel alignment and the Grifols laboratory.

3.14.3.2 Permanent Impacts

The baseline used for the Noise evaluation is the No Build condition in the 2035 Build Out year. Comparison of the Build Alternatives to the 2035 No Build condition is appropriate because noise effects and abatement are considered for the projected future conditions. For long-term planning on its facilities, Caltrans uses a 20-year planning horizon, which is consistent with standard FHWA practice for transportation project planning.

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives and, as a result, would not result in any permanent noise impacts or impacts associated with ground-borne noise or vibration. However, the No Build Alternative does include projects/planned improvements through 2035 that are included in the FTIP, as listed in the SCAG 2012 RTP/SCS, Measure R, and the funded part of Metro's 2009 LRTP.

The combined short-term noise measurements taken for each individual Build Alternative were used to calibrate the noise model and to predict the noise levels at all 757 unique modeled receptors in the study area. A total of 59 receptors overlap for the BRT and TSM/TDM Build Alternative and 54 receptors overlap for the Freeway Tunnel and TSM/TDM Build Alternatives. Potential long-term noise impacts for No Build conditions were considered assuming only traffic noise. Traffic noise was evaluated for the worst-case traffic condition. Future traffic noise levels at the 757 receptor locations were determined with existing property line walls and noise barriers using the future No Build (2035) peak-hour traffic volumes or the worst-case traffic operations (prior to speed degradation). Traffic noise impacts result from one or more of the following occurrences: (1) if the traffic noise level at a receptor location is predicted to "approach or exceed" the NAC applicable to the land use at that receptor, or (2) if the predicted traffic noise level is 12 dBA or more over its corresponding modeled existing noise level at the receptor location analyzed. When traffic noise impacts occur, noise abatement measures must be considered.

Of the 757 receptor locations, noise levels at 201 receptor locations would approach or exceed the NAC under Activity Categories B, C, D, and E (as applicable to the land uses at each receptor location) for the No Build Alternative. With an increase of up to 2 dBA at all receptors, none of the 757 receptor locations would experience a noise level increase of 12 dBA or more over their corresponding existing noise levels under the No Build Alternative. The Existing and Future No Build noise levels are presented within the tables for each Build Alternative (i.e., Tables 3.14.8, 3.14.11, 3.14.14, and 3.14. 16) (refer to Appendix N).

Build Alternatives

TSM/TDM Alternative

Short-term noise measurements for the TSM/TDM Alternative were conducted at 22 representative receptor locations in the vicinity of the improvements in this Alternative. Of the 22 short-term noise level measurements, 20 noise measurements were used to calibrate the noise model and to predict the noise levels at all 227 modeled receptors in the TSM/TDM Alternative area. The short-term noise measurement receptor locations for the TSM/TDM Alternative are shown on Figure 3.14-3 (refer to Appendix N).

Potential long-term noise impacts associated with operations of the TSM/TDM Alternative are solely from traffic noise. Traffic noise was evaluated for the worst-case traffic condition. Future traffic noise levels at the modeled receptor locations were determined with existing property line walls and noise barriers using the future (2035) peak-hour traffic volumes or the worst-case traffic operations (prior to speed degradation). Of the 227 receptor locations, noise levels at 70 receptor locations, consisting of 178 residences, 8 restaurants and 1 playground, would approach or exceed the NAC under the TSM/TDM Alternative. None of the 227 receptor locations would experience a noise level increase of 12 dBA or more over their corresponding existing noise levels under the TSM/TDM Alternative. Of those 70 receptor locations, 52 were not considered for abatement because of the need for driveway or pedestrian access or because abatement placed along the right of way (ROW) for the TSM/TDM Alternative would not break the line of sight to the impacted receivers. The existing and modeled noise levels for the TSM/TDM Alternative at each of the receptor locations are provided in Tables 3.14.8 and 3.14.9 (refer to Appendix N).

The noise levels with the TSM/TDM Alternative at the remaining 18 receptor locations would approach or exceed the NAC under Activity Categories B, C, D, and E (as applicable to the land uses at each receptor location). Those receptor locations, and the noise abatement considered at those receptor locations, are summarized in Table 3.14.21 (refer to Appendix N).

Section 3 of the Caltrans Traffic Noise Analysis Protocol states that a minimum noise reduction of 5 dBA must be achieved at an impacted receptor for the proposed noise abatement measure to be considered feasible. Greater noise reductions are encouraged if they can be reasonably achieved. Feasibility may also be restricted by the following factors:

- Topography
- Access requirement for driveways
- Presence of local cross streets
- Underground utilities
- Other noise sources in the area
- Safety considerations

Nine noise barriers were evaluated at 2 ft increments at heights ranging between 6 ft and 20 ft to determine the feasibility of reducing noise at the 18 noise receptor locations impacted by the TSM/TDM Alternative. Table 3.14.22 (refer to Appendix N) summarizes the feasibility of the modeled noise barriers, lists the noise barrier heights, approximate lengths, the receptors benefited, the noise attenuation range, the number of benefited units/receptors, the reasonable allowance per benefited unit/receptor, and the total reasonable allowance. The analyzed noise barriers are shown on Figure 3.14-3 (refer to Appendix N). Of the 9 modeled noise barriers evaluated for the TSM/TDM Alternative, all 9 were determined to be feasible. For each noise barrier that was found to be acoustically feasible and had one or more associated receptor that met the 7 dBA design goal, reasonable cost allowances were also calculated as shown in Table 3.14.22 (refer to Appendix N). The feasible and reasonable noise barriers for the TSM/TDM Alternative will also be included with the BRT, LRT, and Freeway Tunnel Alternatives unless the selected alternative prevents specific TSM/TDM improvements from occurring. For the BRT Alternative, TSM/TDM Alternative Local Street Improvements L-3 (Atlantic Boulevard from Glendon Way to I-10) and L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) would not be constructed. For the LRT Alternative, TSM/TDM Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) would not be constructed. For the Freeway Tunnel Alternative, TSM/TDM Other Road Improvements T-1 and T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard) would not be constructed.

BRT Alternative

Short-term noise measurements for the BRT Alternative were conducted at 50 representative receptor locations along the alignment of this Alternative. Of the 50 representative receptor measurements taken, 42 were used to calibrate the noise model and to predict the noise levels at 506 modeled receptors in the vicinity of the BRT Alternative alignment. The short-term noise measurement locations for the BRT Alternative are shown on Figure 3.14-4 (refer to Appendix N).

Potential long-term noise impacts associated with operations of the BRT Alternative are solely from traffic noise. Traffic noise was evaluated for the worst-case traffic condition. Future traffic noise levels at the 506 receptor locations were determined with existing property line walls and noise barriers using the future (2035) peak-hour traffic volumes or the worst-case traffic operations (prior to speed degradation). Existing and predicted future noise levels under the BRT Alternative are provided in Tables 3.14.11 and 3.14.12 (refer to Appendix N). Of the 506 receptors, 117 receptors, consisting of 244 residences, 5 restaurants and 1 church would approach or exceed the NAC under the BRT Alternative. None of the 506 receptors would experience a noise level increase of 12 dBA or more over their corresponding existing noise levels. Of those 117 receptors, 108 were not considered for abatement because of the need for driveway or pedestrian access or because abatement placed along the ROW of the BRT Alternative would not break the line of sight to the impacted receivers.

The noise levels with the BRT Alternative at the remaining 9 receptor locations would approach or exceed the NAC under Activity Categories B, C, D, and E (as applicable to the land uses at each receptor location). Those receptor locations, and the noise abatement considered at those receptor locations, are summarized in Table 3.14.23 (refer to Appendix N).

Six noise barriers were evaluated at 2 ft increments at heights ranging between 6 ft and 20 ft to determine the feasibility of reducing noise at the 9 receptors impacted by the BRT Alternative. Table 3.14.24 (refer to Appendix N) summarizes the feasibility of the modeled noise barriers for the BRT Alternative, lists the noise barrier heights, approximate lengths, the receptors benefited, the noise attenuation range, the number of benefited units/receptors, the reasonable allowance per benefited unit/receptor, and the total reasonable allowance. The analyzed noise barriers are shown on Figure 3.14-4 (refer to Appendix N). Of the 6 modeled noise barriers evaluated for the BRT Alternative, 5 were determined to be feasible as shown in Table 3.14-24 (refer to Appendix N). For each noise barrier that was found to be acoustically feasible and had one or more associated receptor that met the 7 dBA design goal, reasonable cost allowances were also calculated as shown in Table 3.14.24 (refer to Appendix N).

LRT Alternative

Short-term noise measurements for the LRT Alternative were conducted at 16 representative receptor locations along the project alignment. These measurements were used to calibrate the noise model and determine the noise levels at the modeled receptors in the LRT Alternative area. The existing and modeled noise levels for the LRT Alternative at each of the receptor locations are provided in Table 3.14.14 (refer to Appendix N). All short term noise measurement locations for the LRT Alternative are shown on Figure 3.14-5 (refer to Appendix N). Potential long-term noise impacts associated with operations of the LRT Alternative are based on the noise levels at receptors that are within 1,000 ft of the LRT Alternative alignment. Land uses in the vicinity of the LRT Alternative alignment include single-family and multifamily residences, office, commercial, and recreational uses, and vacant land.

Table 3.14.25 (refer to Appendix N) summarizes the potential noise impacts of the LRT Alternative rail operations. With the daily operations of the light rail trains, prior to mitigation, 12 receptors will experience a moderate impact while 5 receptors will experience a severe noise impact as defined by FTA noise criteria. These 17 receptors represent 149 single-family residences, 5 multi-family residential developments, 1 church, 1 health care center, 1 childcare center and 2 schools. To reduce or eliminate potential future noise impacts, noise barriers were considered at the edge of the track due to the track being elevated aboveground. Table 3.14.25 (refer to Appendix N) lists the track height elevations, the noise barrier heights, distance to the tracks, the receptors benefited, the train noise level with mitigation, and the noise exposure increase after mitigation. Figure 3.14-5 (refer to Appendix N) shows the location and height of each evaluated track barrier. All the noise barriers shown on Figure 3.14-5 (refer to Appendix N) are feasible thus all noise-sensitive uses will not be impacted.

Freeway Tunnel Alternative

Short-term noise measurements for the Freeway Tunnel Alternative single-bore and dual-bore design variations were conducted at 64 representative receptor locations along the alignment of this Alternative. Of the 64 representative measurements taken, 55 measurements were used to calibrate the noise model and to predict the noise levels at all 137 modeled receptors in the Freeway Tunnel Alternative area. The existing and modeled noise levels at each of the receptor locations for the Freeway Tunnel Alternative are provided in Tables 3.14.16 and 3.14.17 (refer to Appendix N) for the single-bore design variation, and in Tables 3.14.18 and 3.14.19 (refer to Appendix N) for the dual-bore design variation. The short-term noise measurement locations for the Freeway Tunnel Alternative single-bore and dual-bore design variations are shown on Figures 3.15-6 and 3.15-7, respectively (refer to Appendix N).

Potential long-term noise impacts associated with operations of the Freeway Tunnel Alternative are from traffic noise. The tunnel portals will have ventilation systems that could generate noise impacts, however, those impacts will be overshadowed by the traffic noise. Traffic noise was evaluated for the worst-case traffic condition. Future traffic noise levels at 137 receptor locations were determined with existing walls using the future (2035) peak-hour traffic volumes or the worst-case traffic operations (prior to speed degradation).

A total of 137 receptor locations were evaluated for noise impacts associated with operation of the Freeway Tunnel Alternative. As shown in Table 3.14.26 (refer to Appendix N), of the 137 receptors, 69 receptors, consisting of 150 residences, 2 schools, 1 office and 1 church, for the single-bore design variation and 81 receptors, consisting of 183 residences, 1 restaurant, 2 schools, 1 office and 1 church, for the dual-bore variation would experience noise levels that would approach or exceed the NAC under Activity Categories B, C, D, and E (as applicable to the land uses at each receptor location). None of the 137 receptors would experience a noise level increase of 12 dBA or more over their corresponding existing noise levels. Noise barriers were considered to shield receptors along Interstate 710 (I-710), State Route 60 (SR 60), SR 710, Interstate 10 (I-10), Interstate 210 (I-210), and State Route 134 (SR 134) where receptors would continue to be exposed to traffic noise levels approaching or exceeding the NAC. At each location, noise barriers were evaluated at 2 ft increments at heights ranging between 6 ft and 20 ft to determine the feasibility of reducing noise at the impacted noise receptor locations.

Tables 3.14.27 and Table 3.14.28 (refer to Appendix N) summarize the feasibility of the modeled noise barriers, lists the noise barrier heights, approximate lengths, the receptors benefited, the noise attenuation range, the number of benefited units/receptors, the reasonable allowance per benefited unit/receptor, and the total reasonable allowance for the Freeway Tunnel Alternative single-bore and dual-bore design variations, respectively. The analyzed noise barriers are shown on Figures 3.14-6 and 3.14-7 (refer to Appendix N). Of the 18 modeled noise barriers evaluated for the Freeway Tunnel Alternative, 16 were determined to be feasible. For each noise barrier that was found to be acoustically feasible and that had one or more associated receptor that met the 7 dBA design goal, reasonable cost allowances were also calculated.

Interior Noise Impacts for the TSM/TDM, BRT, and Freeway Tunnel Alternatives

Thirteen schools (SM-01 through SM-13; refer to Figures 3.14-3, 3.14-4, 3.14-6, and 3.14-7 in Appendix N for the locations of those schools) in the study area were analyzed under the TSM/TDM, BRT, and Freeway Tunnel Alternatives for existing exterior-to-interior reductions in noise levels provided by the buildings at each school. As shown in Table 3.14.29 (refer to Appendix N), the predicted future interior noise levels with the TSM/TDM, BRT and Freeway Tunnel Alternatives would not approach or exceed the NAC at any of the schools. Therefore, there would be no substantial increase in interior noise levels at the schools evaluated in the project area, and no noise abatement measures are required.

Since the completion of the noise measurements for the noise analysis, a KIPP Raices School was constructed at 4800 E. Cesar Chavez, Los Angeles. Should the LRT Alternative be chosen as the preferred alternative, during final design, simultaneous exterior-to-interior measurements shall be gathered to identify whether or not an interior noise impact would occur.

Ground-Borne Noise and Vibration Impacts

Ground-borne noise and vibration impacts were predicted based on an empirical model developed for the United States Department of Transportation (USDOT) and adopted by the FTA, project-specific data measured in the SR 710 corridor along the alignments of the Build Alternatives, and other data sources.

TSM/TDM, BRT, and Freeway Tunnel Alternatives

The analysis of the potential for the TSM/TDM, BRT, and Freeway Tunnel Alternatives to result in ground-borne noise and vibration effects during operations indicated there would be no impacts associated with ground-borne noise and vibration from the operation of these Build Alternatives. This result is primarily due to the fact that all three of these alternatives utilize pneumatic, rubber-tired vehicles which are inherently resilient and which do not produce high levels of ground-borne noise or vibration.

LRT Alternative

The analysis of the potential for the LRT Alternative to result in ground-borne noise and vibration impacts associated with rail operations in the tunnel segment of the alignment indicated there would be several areas of ground-borne noise impacts during operations in the tunnel. Specifically, the ground-borne noise predictions indicated that 454 residential buildings and 1 commercial office building would be impacted by ground-borne noise.

Ground-Borne Noise and Vibration Control Measures

The specific operational ground-borne noise and vibration effects for any particular location and measures to address those effects are dependent on several factors, including the dynamic characteristics of the transit vehicle and track, soil characteristics, as well as the type and use of the nearby buildings, all of which affect the frequency content of the resultant noise and vibration inside buildings.

In general, ground-borne noise reduction will be achieved by vibration isolation of the track from the underlying tunnel structure by implementation of individual vibration control measures, such as:

- Highly resilient direct fixation (HRDF) fasteners (e.g., egg type direct fixation fastener)
- Rail suspension fastener (RSF) system (e.g., Panguard fastener)
- Isolated slab track (IST) system (concrete slab poured on top of a continuous elastomeric mat)
- Floating slab track (FST) system (concrete slab supported by discrete elastomeric pads)

If moderate ground-borne noise reduction (i.e., 5 to 7 dBA) is required, then an HRDF rail fastener would be adequate. Where more reduction (i.e., up to 10 dBA) is necessary, an RSF would suffice. If more than 10 dBA of reduction is necessary, then either an IST system (up to 12 dBA reduction) or an FST system (18 dBA or more reduction depending on the design) would be necessary. If properly designed, an FST can result in as much as 25 to 30 dBA of reduction, which would be accomplished by tailoring the FST design. (i.e., tuning it) to the specific circumstances. In terms of ground-borne noise reduction, the important characteristic of an FST is its natural frequency. For the LRT tunnel alignment, an FST with a natural frequency of 16 Hertz (Hz) appears to be adequate.

Figure 3.14-8 (refer to Appendix N) shows the anticipated control measures for ground-borne noise and vibration along the LRT tunnel alignment. The extent of these control measures is the minimum required to achieve the FTA criteria. Table 3.14.30 (refer to Appendix N) summarizes the locations (by civil station), length, and types of control measures to reduce ground-borne vibration impacts along the alignment of the LRT Alternative.

The analysis indicated there would be no ground-borne vibration impacts during rail operations in the tunnel segment of the LRT Alternative.

3.14.4 Avoidance, Minimization, and/or Abatement Measures

3.14.4.1 Measures for Noise and Vibration Effects during Construction

The following measures would avoid and/or minimize construction noise impacts during construction of the improvements in the TSM/TDM, BRT, LRT, and/or Freeway Tunnel Alternatives as noted:

Measure N-1 **Construction in State-Owned Rights of Way (ROW) (applies to the Freeway Tunnel Alternative only):** During construction of the Freeway Tunnel Alternative, the California Department of Transportation (Caltrans) will require the Construction Contractor to control noise from construction activities within State-owned ROWs in conformance with Caltrans Standard Specifications (2015) Section 14-8.02, “Noise Control.” The noise level from the Contractor’s operations between the hours of 9:00 p.m. and 6:00 a.m. will not exceed 86 A-weighted decibels (dBA) at a distance of 50 feet. While not required under the Caltrans Specifications, the Construction Contractor will equip all internal combustion engines with the manufacturer-recommended mufflers and will not operate any internal combustion engine on the job site without the appropriate muffler.

The contractor will be required to prepare and implement a Noise Monitoring and Noise Control Plan prior to construction, to protect sensitive receptors against excessive noise from construction activities.

Measure N-2 **Construction Outside State-Owned ROW (applies to the Transportation System Management/Transportation Demand Management [TSM/TDM], Bus Rapid Transit [BRT] and Light Rail Transit [LRT] Alternatives):** During construction outside State-owned ROWs, the Los Angeles County Metropolitan Transportation Authority (Metro) will require the Construction Contractors to comply with the hours of operation, the allowable noise levels at specified distances from construction activities, and other noise reduction/avoidance requirements in the applicable jurisdiction's Municipal Code and/or Noise Ordinance.

Measure N-3 **Tunnel Boring Machine (applies to the LRT and Freeway Tunnel Alternatives only):** Metro (LRT Alternative) or Caltrans (Freeway Tunnel Alternative), as appropriate, will require the Construction Contractor to maintain machinery in good working order during all tunnel boring activities.

Measure N-4 **Supply and Muck Trains (applies to the LRT and Freeway Tunnel Alternatives only):** The Metro (LRT Alternative) or Caltrans (Freeway Tunnel Alternative) Project Engineer will include the following measure in the Plans, Specifications, and Estimates (PS&E) if supply or muck trains are used to remove spoils:

- ***Resilient Mat:*** A resilient mat system will be used to support and fasten the tunnel train tracks to reduce the ground-borne noise by at least 4 dBA.

Measure N-5 **Ground-Borne Noise and Vibration.** For the TSM/TDM and BRT Alternatives, Caltrans or Metro will not allow the Construction Contractor to use pile driving or other activities that generate high levels of vibration during the construction of the TSM/TDM or BRT Alternatives, respectively.

Metro will require the Construction Contractor to carry out construction activities for the LRT Alternative in compliance with applicable Federal Transit Administration (FTA) criteria and guidelines as well as any applicable local regulations related to ground-borne noise and vibration.

Caltrans will require Construction Contractors to carry out construction activities for the Freeway Tunnel Alternative in compliance with applicable Federal Highway Administration (FHWA) and Caltrans guidelines as well as any applicable local regulations related to ground-borne noise and vibration.

The Project Engineer will develop specific property line vibration limits during final design for inclusion in the construction vibration specifications. Metro (LRT Alternative) or Caltrans (Freeway Tunnel Alternative), as appropriate, will require the Construction Contractors to conduct regular vibration monitoring during construction to verify compliance with those limits.

The following vibration control and minimization measures are anticipated to be applied during construction to meet the vibration limits:

- The Project Engineer will incorporate comprehensive construction vibration specifications in all construction bid documents.
- The Resident Engineer will require the Construction Contractor to initially conduct vibration monitoring daily at the nearest representative affected buildings during the startup of tunnel boring. The vibration measurements will be measured in the vertical direction on the ground surface and measured during peak vibration-generating construction activities. If the measured vibration data are in compliance with the vibration limits (either in terms of velocity levels in dB re: 1 micro-inch/second or peak particle velocity in inches/second), then vibration monitoring may be performed weekly instead of daily monitoring, on approval by Metro.
- The Resident Engineer will require the Construction Contractor to use pre-drilled holes for soldier piles (instead of driving them into the ground) in areas where the LRT Alternative station sites are within 200 feet of residential receptors. The use of soil mix wall for excavation methods could be used in place of pile driving activities; if soldier piles are to be placed into a soil-mix wall, this placement would be done after the excavation of the wall, so the soldier piles would not be driven into the ground.
- The Resident Engineer will require the Construction Contractor to perform vertical direction vibration root-mean-square monitoring on the ground at the nearest representative residential structure during supply train operations in the tunnels. These measurements will be repeated at approximately 1-mile intervals along the tunnel construction.
- The Resident Engineer will require the Construction Contractor to implement a public notification program to alert residents well in advance of construction activities that may result in vibration effects.
- The Resident Engineer will require the Construction Contractor to implement a complaint resolution procedure to rapidly

address any noise and vibration problems that may develop during construction.

- The Resident Engineer will require the Construction Contractor to reduce muck train speeds in the vicinity of noise-sensitive receptors if complaints occur after the supply train is operational, reduce train speeds in the vicinity of noise-sensitive receptors, use ballast mats underneath the train rails, and/or use a conveyor system to remove spoils.

Measure N-6 **Grifols Vibration Study.** For the TSM/TDM Alternative, Caltrans or Metro will not allow the Construction Contractor to use pile driving or other activities that generate high levels of vibration during the construction of the TSM/TDM Alternative.

During PS&E for the Freeway Tunnel Alternative, the Caltrans Project Engineer will prepare a site-specific evaluation of potential airborne dust due to vibration associated with freeway tunnel construction at the Grifols facility. The analysis will use more detailed engineering and soil conditions developed during final design. The Caltrans Project Engineer will include the results of the evaluation, and any specific measures to ensure that vibration from the Project does not affect the clean room's compliance with the International Organization for Standardization (ISO) standards for airborne dust in clean rooms, if found to affect clean room compliance with ISO airborne dust standards, will be incorporated into the PS&E.

During PS&E for the LRT Alternative, the Metro Project Engineer will prepare a site-specific evaluation of potential airborne dust due to vibration associated with the construction of the LRT Alternative at the Grifols facility based on more detailed engineering and soil conditions developed during final design. The Metro Project Engineer will include the results of the evaluation, and any specific measures to address vibration, if found to affect clean room operation, will be incorporated into the PS&E.

In addition to these measures, Measure GEO-1 in Section 3.10, Geology, would be required for construction activities related to the evaluation of potential excavation in high strength bedrock for ground-borne noise and vibration effects.

3.14.4.2 Measures for Vibration and Ground-Borne Noise During Operation

The following measure would avoid and/or minimize vibration and ground-borne noise impacts during the operation of the LRT Alternative.

Measure N-7 The Metro Project Engineer, during final design of the LRT Alternative, will conduct additional field testing and analysis for the specific identification of ground-borne noise impacts and will incorporate the vibration isolation system or systems to comply with FTA ground-borne noise level criteria. The vibration isolation systems could include one or a combination of the following systems:

- Highly resilient direct fixation (HRDF) fasteners (e.g., Egg Type DF fastener)
- Rail suspension fastener (RSF) system (an example of which is the Panguard fastener)
- Isolated slab track system (IST) – concrete slab poured on top of an continuous elastomeric mat
- Floating slab track system (FST) – concrete slab supported by discrete elastomeric pads

3.14.4.3 Measures for Noise Effects During Operation

In accordance with 23 CFR 772, noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures identified in the Caltrans *Traffic Noise Analysis Protocol* include the following:

- Avoid the impact by using design alternatives, such as altering the horizontal and vertical alignment of the project.
- Construct noise barriers.
- Acquire property to serve as a buffer zone.
- Use traffic management measures to regulate types of vehicles and speeds.
- Acoustically insulate public use or nonprofit institutional structures.

All these abatement options have been considered. However, because of the configuration and location of the Build Alternatives, abatement in the form of noise barriers is the only abatement that is considered feasible.

The *Noise Abatement Decision Report* (NADR) (2014) was approved by Caltrans to determine whether the considered noise abatement measures for the TSM/TDM Alternative (Preferred Alternative) would meet requirements to be recommended. Two determining factors are the feasibility and reasonableness of the noise barriers. The preliminary recommendation includes two noise barriers for the TSM/TDM Alternative. The final locations, heights, and lengths of noise barriers would be determined during final design.

Measure N-8

Abatement: Based on the studies completed to date, Metro/Caltrans intends to incorporate noise abatement in the form of sound walls listed as reasonable in Table 3.14.34 (refer to Appendix N), depending on the selected alternative. During final design, Metro/Caltrans will make the final decision on noise abatement to be included in the selected Build Alternative, based on the final design of the proposed project and the public involvement process. If during final design, conditions have substantially changed, noise abatement at some of the locations noted above may not be reasonable/feasible. Metro/Caltrans will incorporate the final noise abatement in the final project design and specifications.

Noise Barrier Feasibility

A minimum noise reduction of 5 dBA must be achieved at impacted receptors for a proposed noise abatement measure (i.e., noise barriers) to be considered feasible. The feasibility criterion is not a noise abatement design goal. Greater noise reductions are encouraged if they can be reasonably achieved. Feasibility may be restricted by the following factors:

- Geometric standards
- Safety
- Maintenance contracts with private property owners
- Security
- Underground utilities
- Drainage
- Geotechnical considerations

As shown in Tables 3.14.30 through 3.14.33 (refer to Appendix N), 46 noise barriers were determined to be feasible by reducing noise levels by 5 dBA or more at one or more receptor locations for the TSM/TDM, BRT, and Freeway Tunnel Alternatives. Tables 3.14.30 through 3.14.33 (refer to Appendix N) also list the height, approximate length, noise attenuation range, number of benefited receptors, total reasonable allowance, the construction cost associated with each height analyzed, and the reasonableness for each noise barrier that was considered feasible for those Build Alternatives.

As shown in Table 3.14.25 (refer to Appendix N) the daily operations of the light rail trains, prior to mitigation, will result in 12 receptors experiencing a moderate impact while 5 receptors will experience a severe noise impacts as defined by FTA noise criteria. With the addition of the noise barriers listed within the same table, noise impacts will be reduced to "no impact." Within the FTA Noise Criteria there is not a reasonable cost component from abatement to train operations.

Noise Barrier Reasonableness

All the noise barriers that were considered feasible were analyzed to determine their reasonableness. The overall reasonableness of noise abatement is determined by considering the noise reduction goal combined with the construction cost of the barrier. For a noise barrier to be considered reasonable, the noise level reduction design goal of 7 dBA must be achieved at one or more of the benefited receptors. For any noise barrier to be considered reasonable from a cost perspective, the estimated construction cost of the noise barrier would need to be equal to or less than the total cost allowance calculated for the barrier. The total reasonable allowance was determined based on the number of benefited receptors multiplied by the reasonable allowance per residence. The reasonable allowance per residence, established by Caltrans, at the time the noise studies were conducted was $55,000 per benefited unit/receptor. If the estimated noise barrier construction cost exceeds the total reasonable allowance, the noise barrier is determined to be not reasonable.

As shown in Tables 3.14.30 through 3.14.33 (refer to Appendix N), when the cost of construction was considered, 16 of the 46 feasible noise barriers were found to be reasonable. As part of the reasonable cost determination, it was requested by Caltrans to compare the reasonable allowance to the barrier cost with ROW costs included and with ROW donated as shown in Tables 3.14.30 through 3.14.33. The term "ROW donated" assumes that the resident or property owner would enter into an agreement to donate a portion of their property necessary to construct the noise barrier without receiving compensation for the property relinquished. Table 3.14.34 shows the summary of the reasonable barriers by alternative.

The following noise barriers were determined not to be feasible and/or reasonable for the TSM/TDM, BRT, and Freeway Tunnel Alternatives. The specific heights of the walls determined not to be feasible and/or reasonable are also provided below.

- TSM/TDM Alternative Noise Barriers (TNB)
  - T1/TNB No. 3, all heights
  - T1/TNB No. 4, all heights
- BRT Alternative Noise Barrier (BNB)
  - BNB No. 2, all heights
  - BNB No. 4, all heights
- Freeway Tunnel Alternative Noise Barrier (FTNB)
  - Single-Bore Design Variation
    - FTNB No. 2, all heights
    - FTNB No. 3A, all heights
    - FTNB No. 3B, all heights
    - FTNB No. 4, all heights
    - FTNB No. 6S, all heights
    - FTNB No. 7, for heights 6 to 10 ft and 14 to 20 ft
    - FTNB No. 8, for heights 16 to 20 ft
    - FTNB No. 10, for height 8 ft
    - FTNB No. 11, all heights
    - FTNB No. 12, all heights
    - FTNB No. 13A+B, all heights
    - FTNB No. 14, all heights
    - FTNB No. 15, all heights
  - Dual-Bore Design Variation
    - FTNB No. 2, all heights
    - FTNB No. 3A, all heights
    - FTNB No. 3B, all heights
    - FTNB No. 4, all heights
    - FTNB No. 6D, for heights 6 to 12 ft and 16 to 20 ft
    - FTNB No. 7, for heights 6 to 10 ft and 14 to 20 ft
    - FTNB No. 8, for heights 16 to 20 ft
    - FTNB No. 9, for heights 16 to 20 ft
    - FTNB No. 10, for heights 8 ft and 12 ft
    - FTNB No. 11, all heights
    - FTNB No. 12, all heights
    - FTNB No. 13A+B, all heights
    - FTNB No. 13B, all heights
    - FTNB No. 14, all heights
    - FTNB No. 15, all heights

Based on the studies completed to date and input from the public, Caltrans or Metro (as appropriate) intends to incorporate noise abatement in the form of barriers at the following locations for the TSM/TDM Alternative (Preferred Alternative).

- For the TSM/TDM Alternative L-3, calculations based on preliminary design data show that TNB No. 1 will reduce noise levels by 7 dBA to meet the design goal for 1 residence at a cost ranging from $27,120 to $33,600 with ROW donated and from $33,720 to $40,200 with ROW costs included. TNB No. 2 will reduce noise levels by 7 dBA (minimum design goal) to 18 dBA for 1 residence at a cost ranging from $10,178 to $31,913 with ROW donated and $49,053 to $52,158 with ROW costs included.
- For TSM/TDM Alternative L-5, calculations based on preliminary design data show that TNB No. 1 will reduce noise levels by 7 dBA (minimum design goal) to 10 dBA for 2 residences at a cost ranging from $52,811 to $107,351 with ROW donated.
- For TSM/TDM Alternative T-1, calculations based on preliminary design data show that TNB No. 1 will reduce noise levels by 7 dBA (minimum design goal) to 10 dBA for 18 residences at a cost of $921,009 with ROW donated and $981,972 with ROW costs included. TNB No. 2 will reduce noise levels by 5 dBA to 8 dBA (exceeding the minimum design goal of 7 dBA) for 15 to 16 residences at a cost ranging from $541,387 to $665,373.

If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision on noise abatement will be made upon completion of the project design.

Noise Barriers for the TSM/TDM Alternative

The analyzed noise barriers for the TSM/TDM Alternative are shown on Figure 3.14-3 in Appendix N. Preliminary abatement measures proposed for the TSM/TDM Alternative includes 5 noise barriers, they are described as follows:

The following noise barriers are proposed for Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10):

- L3/TNB No. 1 would be an approximately 48-foot (ft) long barrier along the perimeter of the private swimming pool area at the Atlantic Riviera Apartments located at 1417 South Atlantic Boulevard and would range in height from 16 to 20 ft. (Refer to Sheet 2 of Figure 3.14-3 in Appendix N for this TSM/TDM Alternative noise barrier.)
- L3/TNB No. 2 would be an approximately 46 ft long barrier along the private property line of 1721 South Atlantic Boulevard and would range in height from 6 to 20 ft. (Refer to Sheet 2 of Figure 3.14-3 in Appendix N for this TSM/TDM Alternative noise barrier.)

The following noise barrier is proposed for Local Street Improvement L-5 (Rosemead Boulevard from Lower Azusa Road to Marshall Street):

- L5/TNB No. 1 would be an approximately 202 ft long barrier along the private property line of 3955 Rosemead Boulevard and would range in height from 6 to 14 ft. (Refer to Sheet 4 of Figure 3.14-3 in Appendix N for this TSM/TDM Alternative noise barrier.)

The following noise barriers are proposed for Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road):

- T1/TNB No. 1 would be an approximately 1,247 ft long barrier along the Caltrans ROW/ private property line along the northbound side of SR 710 south of Valley Boulevard and would be 8 ft in height. (Refer to Sheet 7 of Figure 3.14-3 in Appendix N for this TSM/TDM Alternative noise barrier.)
- T1/TNB No. 2 would be an approximately 963 ft long barrier along the edge of shoulder on the southbound side of SR 710, south of Valley Boulevard, and would range in height from 16 to 20 ft. (Refer to Sheet 7 of Figure 3.14-3 in Appendix N for this TSM/TDM Alternative noise barrier.)

The following noise barriers were proposed for Other Road Improvement T-2 (SR 110/Fair Oaks Avenue Hook Ramps). However, subsequent to the circulation of the Draft EIR/EIS, and in an effort to minimize adverse visual effects to historic resources, the following noise barriers are no longer proposed:

- T2/TNB No. 1 would be an approximately 743 ft long barrier along the Caltrans ROW/private property line along the northbound side of State Route 110 (SR 110) and would range in height from 6 to 16 ft. (Refer to Sheet 8 of Figure 3.14-3 in Appendix N for this TSM/TDM Alternative noise barrier.)
- T2/TNB No. 2 would be an approximately 963 ft long barrier along the edge of shoulder on the southbound side of SR 110 and would range in height from 12 to 20 ft. (Refer to Sheet 8 of Figure 3.14-3 in Appendix N for this TSM/TDM Alternative noise barrier.)

Noise Barriers for the BRT Alternative

The analyzed noise barriers for the BRT Alternative are shown on Figure 3.14-4 in Appendix N. Preliminary abatement measures proposed for the BRT Alternative include three noise barriers, which are described as follows:

- BNB No. 1 would be a 340 ft long barrier along the private property line of the multifamily use along Atlantic Boulevard and De La Fuente Street and would range in height from 10 to 18 ft. (Refer to Sheets 6 and 7 of Figure 3.14-4 in Appendix N for this BRT Alternative noise barrier.)
- BNB No. 3 would be a 623 ft long barrier along the private property line of the multifamily use along Atlantic Boulevard and De La Fuente Street and would range in height from 6 to 20 ft. (Refer to Sheet 6 of Figure 3.14-4 in Appendix N for this BRT Alternative noise barrier.)
- BNB No. 5 would be a 623 ft long barrier along the private property line at the northeast corner of Atlantic Boulevard and San Marino Avenue and would range in height from 6 to 10 ft. (Refer to Sheet 9 of Figure 3.14-4 in Appendix N for this BRT Alternative noise barrier.)

Noise Barriers for the Freeway Tunnel Alternative

The analyzed noise barriers for the Freeway Tunnel Alternative single-bore design variation are shown on Figure 3.14-6, and the analyzed noise barriers for the dual-bore design variation are shown on Figure 3.14-7 (both figures are provided in Appendix N). Preliminary abatement measures proposed for the Freeway Tunnel Alternative include 6 noise barriers: 4 noise barriers are feasible and reasonable for both single- and dual-bore design variations, and an additional 2 noise barriers are feasible and reasonable for only the dual-bore design variation. They are described as follows:

The noise barriers proposed for both the single- and dual-bore design variations are:

- FTNB No. 5 would be a 1,801 ft long barrier along the Caltrans ROW/private property line on the east side of SR 710, between Hellman Avenue and Valley Boulevard that would shield multiple single-family homes and range in height from 6 to 20 ft. (Refer to Sheet 5 of Figure 3.14-6 and Sheet 5 of Figure 3.14-7 in Appendix N for the noise barriers for the Freeway Tunnel Alternative single- and dual-bore design variations, respectively).
- FTNB No. 7 would be a 673 ft long barrier along the Caltrans ROW/private property line on the west side of SR 710 south of Valley Boulevard, that would shield multiple single-family homes and would be built as a 12 ft high noise barrier if the private land is donated[1] by the property owners. (Refer to Sheet 5 of Figure 3.14-6 and Sheet 5 of Figure 3.14-7 in Appendix N for the noise barriers for the Freeway Tunnel Alternative single- and dual-bore design variations, respectively.)
- FTNB No. 8 would be a 406 ft long barrier along the Caltrans ROW/private property line on the west side of SR 710, south of Valley Boulevard, that would shield multiple single-family homes and range in height from 6 to 14 ft. (Refer to Sheet 5 of Figure 3.14-6 and Sheet 5 of Figure 3.14-7 in Appendix N for the noise barriers for the Freeway Tunnel Alternative single- and dual-bore design variations, respectively.)
- FTNB No. 10 would be a 1,207 ft long barrier along the Caltrans ROW/private property line at the northeast quadrant of the I-210/SR 134 interchange that would shield multiple single-family homes. For the single-bore design variation, FTNB No. 10 would range in height from 10 to 20 ft. For the dual-bore design variation, the height of FTNB No. 10 would be either 10 ft or would range from 14 to 20 ft. (Refer to Sheets 12, 13 and 15 of Figure 3.14-6 and Sheet 12, 13 and 15 of Figure 3.14-7 in Appendix N for the noise barriers for the Freeway Tunnel Alternative, single- and dual-bore design variations, respectively.)

One additional noise barrier is proposed only for the dual-bore design variation:

- FTNB No. 6D would be a 1,404 ft long barrier along the edge of shoulder of the SR 710 Valley Boulevard southbound on-ramp that would shield multiple single-family homes and would be 14 ft in height. (Refer to Sheet 5 of Figure 3.14-7 in Appendix N for the noise barriers for the Freeway Tunnel Alternative dual-bore design variation.)

The following noise barrier was proposed for the dual-bore design variation. However, subsequent to the circulation of the Draft EIR/EIS, and in an effort to minimize adverse visual effects to historic resources, the following noise barrier is no longer proposed:

- FTNB No. 9 would be an 84 ft long barrier along the private property line of the restaurant at the corner of Pasadena Avenue and Colorado Boulevard that would range in height from

[1] For a barrier for which the cost exceeds the reasonable allowance with the cost of right-of-way included, that barrier was also analyzed as if the resident(s) would be willing to donate the right-of-way for the barrier. This was to assess whether the barrier cost would be less than the total reasonableness allowance if the right-of-way was donated and no cost for right-of-way acquisition was included in the cost of the barrier. For noise barrier FTNB No. 7, the barrier became reasonable at some heights with donated right-of-way. For this barrier, a process will be carried out in which the affected residents are surveyed for their opinion on the proposed abatement (barrier), per the Protocol.

6 to 14 ft. (Refer to Sheet 11 of Figure 3.14-7 in Appendix N for the noise barriers for the Freeway Tunnel Alternative dual-bore design variation.)

Noise Abatement Summary for the TSM/TDM, BRT and Freeway Tunnel Alternatives

A summary of the reasonable barriers including the height in feet, noise attenuation range, number of benefitted units, total reasonable allowance, estimated noise barrier construction costs with ROW cost included, and estimated noise barrier construction costs with ROW donated is provided on the following pages.

Noise Barriers for the LRT Alternative

The analyzed noise barriers for the LRT Alternative are shown on Sheets 1, 2, and 6 of Figure 3.14-5 in Appendix N. Noise barriers ranging in height from 4.0 to 9.5 ft will be placed at the edge of track adjacent to the noise sensitive uses. Additionally, a noise barrier with a recommended height of 8 ft is proposed along the perimeter of the LRT Alternative maintenance yard.

Noise Abatement for the LRT Alternative

The calculations based on preliminary design data show that noise barriers constructed along the edge of the elevated track ranging in height from 4 to 9.5 feet would reduce noise levels from either a moderate or severe impact to no impact. With the majority of noise impacts being generated at the track elevation, all barrier heights will break the line of sight between source and receptor. A summary of the reasonable barriers is provided on the last page of this section.

Summary of Reasonable Noise Abatement – TSM/TDM, BRT, and Freeway Tunnel Alternatives

Noise Barrier No.	Height (ft)	Noise Attenuation Range (dBA)	Number of Benefited Units[1]	Total Reasonable Allowance	With ROW Costs		With ROW Donated	
					Estimated Noise Barrier Construction Cost[2,3]	Reasonable?[3]	Estimated Noise Barrier Construction Cost[2,3]	Reasonable?[3]
TSM/TDM Alternative L-3								
TNB No. 1	16	7	1	$55,000	$33,720	Yes	$27,120	Yes
	18	7	1	$55,000	$36,960	Yes	$30,360	Yes
	20	7	1	$55,000	$40,200	Yes	$33,600	Yes
TNB No. 2	6	7	1	$55,000	$49,053	Yes	$10,178	Yes
	8[4]	10	1	$55,000	$52,158	Yes	$13,283	Yes
	10	13	1	$55,000	$55,263	No	$16,388	Yes
	12	14	1	$55,000	$58,368	No	$19,493	Yes
	14	15	1	$55,000	$61,473	No	$22,598	Yes
	16	16	1	$55,000	$64,578	No	$25,703	Yes
	18	17	1	$55,000	$67,683	No	$28,808	Yes
	20	18	1	$55,000	$70,788	No	$31,913	Yes
TSM/TDM Alternative L-5								
TNB No. 1	6	7	2	$110,000	$111,936	No	$52,811	Yes
	8	9	2	$110,000	$125,571	No	$66,446	Yes
	10[4]	9	2	$110,000	$139,206	No	$80,081	Yes
	12	10	2	$110,000	$152,841	No	$93,716	Yes
	14	10	2	$110,000	$166,476	No	$107,351	Yes
TSM/TDM Alternative T-1								
TNB No. 1	8	7-10	18	$990,000	$981,972	Yes	$921,009	Yes
TNB No. 2	16	5-7	15	$825,000	$541,387	Yes	$541,387	Yes
	18	5-8	16	$880,000	$603,380	Yes	$603,380	Yes
	20[5]	5-8	16	$880,000	$665,373	Yes	$665,373	Yes
BRT Alternative								
BNB No. 1	10	9	12	$660,000	$567,613	Yes	$546,363	Yes
	12	11	12	$660,000	$590,308	Yes	$569,058	Yes
	14	12	12	$660,000	$613,003	Yes	$591,753	Yes
	16	13	12	$660,000	$635,698	Yes	$614,448	Yes
	18	14	12	$660,000	$660,688	No	$639,438	Yes
BNB No. 3	6	7-11	24	$1,320,000	$476,237	Yes	$359,612	Yes
	8[4]	8-13	24	$1,320,000	$519,699	Yes	$403,074	Yes
	10	8-14	24	$1,320,000	$563,161	Yes	$446,536	Yes
	12	9-14	24	$1,320,000	$606,624	Yes	$489,999	Yes
	14	9-15	24	$1,320,000	$650,086	Yes	$533,461	Yes
	16	9-15	24	$1,320,000	$693,548	Yes	$576,923	Yes
	18	9-16	24	$1,320,000	$741,209	Yes	$624,584	Yes
	20	9-16	24	$1,320,000	$785,138	Yes	$668,513	Yes
BNB No. 5	6	7	1	$55,000	$39,413	Yes	$33,788	Yes
	8	10	1	$55,000	$49,425	Yes	$43,800	Yes
	10[4]	12	1	$55,000	$59,438	No	$53,813	Yes

Summary of Reasonable Noise Abatement – TSM/TDM, BRT, and Freeway Tunnel Alternatives

Noise Barrier No.	Height (ft)	Noise Attenuation Range (dBA)	Number of Benefited Units[1]	Total Reasonable Allowance	With ROW Costs		With ROW Donated	
					Estimated Noise Barrier Construction Cost[2,3]	Reasonable?[3]	Estimated Noise Barrier Construction Cost[2,3]	Reasonable?[3]
Freeway Tunnel Alternative – Single-Bore Design Variation								
FTNB No. 5	6	5-12	19	$1,045,000	$606,188	No	$595,113	Yes
	8	6-13	19	$1,045,000	$751,245	No	$740,170	Yes
	10	5-15	22	$1,210,000	$981,960	No	$970,885	Yes
	12	5-16	32	$1,760,000	$1,027,590	No	$1,016,515	Yes
	14	5-17	33	$1,815,000	$1,048,043	No	$1,036,968	Yes
	16	5-18	39	$2,145,000	$1,163,265	No	$1,152,190	Yes
	18	5-19	42	$2,310,000	$1,462,560	No	$1,451,485	Yes
	20[4]	5-19	42	$2,310,000	$1,415,310	No	$1,404,235	Yes
FTNB No. 7	12	6-10	8	$440,000	$848,838	No	$418,504	Yes
FTNB No. 8	6	7-8	6	$330,000	$431,939	No	$201,468	Yes
	8	9-11	6	$330,000	$459,344	No	$228,873	Yes
	10	10-13	6	$330,000	$486,749	No	$256,278	Yes
	12	12-14	6	$330,000	$514,154	No	$283,683	Yes
	14	13-15	6	$330,000	$541,559	No	$311,088	Yes
FTNB No. 10	10	7-9	10	$550,000	$437,797	Yes	$437,797	Yes
	12	5-11	12	$660,000	$523,041	Yes	$523,041	Yes
	14[4]	5-12	18	$990,000	$608,286	Yes	$608,286	Yes
	16	5-13	22	$1,210,000	$693,530	Yes	$693,530	Yes
	18	6-14	22	$1,210,000	$778,774	Yes	$778,774	Yes
	20	6-15	22	$1,210,000	$864,019	Yes	$864,019	Yes
Freeway Tunnel Alternative – Dual-Bore Design Variation								
FTNB No. 5	6	5-13	21	$1,155,000	$606,188	Yes	$595,113	Yes
	8	5-14	21	$1,155,000	$751,245	Yes	$740,170	Yes
	10	5-15	21	$1,155,000	$981,960	Yes	$970,885	Yes
	12	5-16	25	$1,375,000	$1,027,590	Yes	$1,016,515	Yes
	14	5-17	34	$1,870,000	$1,048,043	Yes	$1,036,968	Yes
	16	5-18	40	$2,200,000	$1,163,265	Yes	$1,152,190	Yes
	18	5-19	40	$2,200,000	$1,462,560	Yes	$1,451,485	Yes
	20[4]	5-19	43	$2,365,000	$1,415,310	Yes	$1,404,235	Yes
FTNB No. 6D	14	5-12	15	$825,000	$698,929	Yes	$698,929	Yes
	16	6-12	15	$825,000	$789,311	Yes	$789,311	Yes
FTNB No. 7	12	7-12	8	$440,000	$848,838	No	$418,504	Yes
FTNB No. 8	6	7-8	6	$330,000	$431,939	No	$201,468	Yes
	8	8-11	6	$330,000	$459,344	No	$228,873	Yes
	10	10-13	6	$330,000	$486,749	No	$256,278	Yes
	12	11-15	6	$330,000	$514,154	No	$283,683	Yes
FTNB No. 9	6	7	1	$55,000	$26,985	Yes	$19,110	Yes
	8[4]	8	1	$55,000	$32,655	Yes	$24,780	Yes
	10	10	1	$55,000	$38,325	Yes	$30,450	Yes
	12	11	1	$55,000	$43,995	Yes	$36,120	Yes
	14	12	1	$55,000	$49,665	Yes	$41,790	Yes
	16	13	1	$55,000	$55,335	No	$47,460	Yes

Summary of Reasonable Noise Abatement – TSM/TDM, BRT, and Freeway Tunnel Alternatives

Noise Barrier No.	Height (ft)	Noise Attenuation Range (dBA)	Number of Benefited Units[1]	Total Reasonable Allowance	With ROW Costs		With ROW Donated	
					Estimated Noise Barrier Construction Cost[2,3]	Reasonable?[3]	Estimated Noise Barrier Construction Cost[2,3]	Reasonable?[3]
	18	14	1	$55,000	$61,005	No	$53,130	Yes
FTNB No. 10	10	8-9	10	$550,000	$437,797	Yes	$437,797	Yes
	12	9-11	10	$550,000	$523,041	Yes	$523,041	Yes
	14[4]	5-12	18	$990,000	$608,286	Yes	$608,286	Yes
	16	5-13	22	$1,210,000	$693,530	Yes	$693,530	Yes
	18	5-14	22	$1,210,000	$778,774	Yes	$778,774	Yes
	20	6-15	23	$1,265,000	$864,019	Yes	$864,019	Yes

Source: LSA Associates, Inc. (2014).
1 Number of units that are attenuated by 5 dBA or more by the modeled barrier.
2 Sound barrier construction cost information provided by CH2MHILL.
3 Shaded area represents barrier heights that have been determined to be not reasonable because the barrier would not reduce noise levels by 7 dBA or more.
4 Denotes the minimum wall height required to break the line of sight between the receiver and truck exhaust stack.
5 Denotes that the maximum feasible barrier height would not break the line of sight between the receptor and the truck exhaust stack.
BNB = BRT Noise Barrier
FTNB = Freeway Tunnel Noise Barrier
L-3 = Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10)
L-5 = Local Street Improvement L-5 (Rosemead Boulevard from Lower Azusa Road to Marshall Street)
T-1 = Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road)
TNB = TSM/TDM Noise Barrier

Summary of Reasonable Noise Abatement – LRT Alternative

Receptor Location	Existing Noise Level (L_{dn})	Train Operations Noise Level (L_{dn})	Noise Exposure Increase (dBA)	No Impact, Moderate, Severe[1]	Proposed Noise Barrier Height (ft)[2]	Train Noise Level With Abatement (dBA)	No Impact, Moderate, Severe After Abatement[1]
LR-01	54.6	63.6	9.5	Severe	6.0	54.4	No Impact
LR-02	54.6	57.2	4.5	Moderate	4.0	51.8	No Impact
LR-03	63.1	67.5	5.7	Severe	5.5	59.5	No Impact
LR-04	63.1	60.5	1.9	Moderate	4.0	55.8	No Impact
LR-05	64.6	63.7	2.6	Moderate	4.0	58.4	No Impact
LR-06	58.0	67.3	9.8	Severe	9.5	56.9	No Impact
LR-07 [3]	61.9	63.7	4.0	-	0.0	-	-
LR-08	61.9	68.3	7.3	Severe	10.0	58.7	No Impact
LR-09	60.0	59.1	2.6	Moderate	4.0	54.4	No Impact
LR-10	65.6	69.3	5.2	Severe	5.0	60.8	No Impact
LR-11	67.8	68.4	3.3	Moderate	4.0	61.4	No Impact
LR-12	67.6	67.9	3.2	Moderate	4.0	60.6	No Impact
LR-13	67.6	67.9	3.2	Moderate	4.0	60.6	No Impact
LR-14	67.6	67.3	2.9	Moderate	4.0	60.2	No Impact
LR-15	67.6	67.6	3.0	Moderate	4.0	60.4	No Impact
LR-16	67.7	60.5	0.8	No Impact	0.0	-	-
LR-17	61.7	54.7	0.8	No Impact	0.0	-	-
LR-18	67.0	56.3	0.4	No Impact	0.0	-	-
LR-19	64.4	55.9	0.6	No Impact	0.0	-	-
LR-20	61.9	61.9	3.0	Moderate	4.0	56.4	No Impact
LR-21	65.9	62.1	1.5	Moderate	4.0	56.5	No Impact
LR-22	61.8	62.0	3.1	Moderate	4.0	57.0	No Impact
LR-23	69.7	63.0	0.8	No Impact	0.0	-	-
LR-24	77.0	65.8	0.3	No Impact	0.0	-	-
LR-25	63.3	56.2	0.8	No Impact	0.0	-	-
LR-26	76.7	57.0	0.0	No Impact	0.0	-	-
LR-27	71.4	61.6	0.4	No Impact	0.0	-	-
LR-28	58.9	52.3	0.9	No Impact	0.0	-	-
LR-29	58.1	54.2	1.5	No Impact	0.0	-	-

[1] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Table 3-1.
[2] Proposed barrier height is relative to the track height level.
[3] Non-noise-sensitive active park. Only passive parks are classified as being noise sensitive. Level shown for reporting purposes only.
dBA = A-weighted decibels
ft = feet
L_{dn} = day-night average sound level

3.15 Energy

3.15.1 Regulatory Setting

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

The California Environmental Quality Act (CEQA) Guidelines, Appendix F, Energy Conservation, state that EIRs are required to include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

3.15.2 Affected Environment

The potential impacts of the proposed project related to energy resources are evaluated in detail in the *Energy Technical Report* (2014).

3.15.2.1 Energy Resources and Consumption

California is rich in conventional and renewable energy resources. It has large crude oil and substantial natural gas deposits in six geological basins located in the Central Valley and along the Pacific Coast. Most of those reserves are concentrated in the southern San Joaquin Basin. Seventeen of the 100 largest oil fields in the United States are located in California, including the Belridge South oil field (the third-largest oil field in the contiguous United States). In addition, federal assessments indicate that large undiscovered deposits of recoverable oil and gas lie offshore in the federally administered Outer Continental Shelf (OCS), which in 2008 was reopened for potential oil and gas leasing. California's renewable energy potential is extensive. The State's hydroelectric power potential ranks second in the United States behind Washington State, and substantial geothermal and wind power resources are found along the coastal mountain ranges and the State's eastern border with Nevada. High solar energy potential is found in southeastern California's sunny deserts.

California is the most populous State in the United States, and its total energy demand is second only to Texas. Although California is a leader in the energy-intensive chemical, forest products, glass, and petroleum industries, the State has one of the lowest per-capita energy consumption rates in the country. The California government's energy-efficiency programs have contributed to the low per-capita energy consumption. Driven by high demand from California's many motorists, major airports, and military bases, the transportation sector is the State's largest energy consumer. More motor vehicles are registered in California than in any other State, and worker commute times are among the longest in the country.

Petroleum

California is one of the top producers of crude oil in the United States, with output accounting for more than one-tenth of total United States production. Drilling operations are concentrated primarily in Kern County and the Los Angeles Basin, although substantial production also takes place offshore in both State and federal waters. Concerns regarding the cumulative impacts of offshore oil and gas development, combined with a number of major marine oil spills throughout the world in recent years, have led to a permanent moratorium on offshore oil and gas leasing in California waters. However, development on existing State leases is not affected and may still occur within offshore areas leased prior to the effective date of the moratorium. A moratorium on oil and gas leasing in federal OCS waters expired in 2008.

A network of crude oil pipelines connects production areas to refining centers in the Los Angeles area, the San Francisco Bay area, and the Central Valley. California refiners also process large volumes of Alaskan and foreign crude oil received at ports in Los Angeles, Long Beach, and the San Francisco Bay area. Crude oil production in California and Alaska is in decline, and California refineries have become increasingly dependent on foreign imports. Led by Saudi Arabia, Iraq, and Ecuador, foreign suppliers now provide more than two-fifths of the crude oil refined in California; however, California's dependence on foreign oil remains less than the national average.

California ranks third in the country in petroleum refining capacity and accounts for more than one-tenth of total United States capacity. California's largest refineries are highly sophisticated, capable of processing a wide variety of crude oil types, and designed to yield a high percentage of light products like motor gasoline. To meet strict federal and State environmental regulations, California refineries are configured to produce cleaner fuels, including reformulated motor gasoline and low-sulfur diesel.

Most California motorists are required to use a special motor gasoline blend called California Clean Burning Gasoline. In the ozone nonattainment areas of Imperial County and the Los Angeles metropolitan area, motorists are required to use California Oxygenated Clean Burning Gasoline. There are five ethanol production plants in Central and Southern California, but most of California's ethanol supply is transported by rail from corn-based producers in the Midwest. Some supply is also imported from abroad.

Due to the relative isolation and specific requirements of the California fuel market, California motorists are particularly vulnerable to short-term spikes in the price of motor gasoline. No pipelines connect California to other major refining centers in the United States, and California refineries often operate at near maximum capacity due to high demand for petroleum products. When an unplanned refinery outage occurs, replacement supplies must be brought in via marine tanker. Locating and transporting this replacement gasoline (which must conform to the State's strict fuel requirements) can take from 2 to 6 weeks.

Natural Gas

California natural gas production typically accounts for less than 2 percent of total United States production and satisfies less than one-fifth of the State's demand. Production takes place in basins located in Northern and Southern California, as well as offshore in the Pacific Ocean. As with crude oil production, California natural gas production is in decline. However, State supply has remained relatively stable due to increases in net receipts from pipelines that supply California with natural gas produced in the Rocky Mountains, the Southwest, and western Canada. California markets are served by two key natural gas trading centers (the Golden Gate Center in Northern California and the California Energy Hub in Southern California), and the State has a dozen natural gas storage facilities that help stabilize supply. In part to help meet California's demand for natural gas, an offshore liquefied natural gas (LNG) import terminal in Southern California was proposed to the Maritime Administration and the United States Coast Guard on August 18, 2006. If approved, this terminal could import up to 1.4 billion cubic feet of natural gas per day. Two additional potential Southern California LNG import facility sites have been identified by project sponsors (i.e., the Clearwater Port offshore of Oxnard was proposed in 2006, and the Esperanza Port offshore of the Port of Long Beach was proposed in 2008).

Biomethane

Biomethane (aka, BioGas) has been identified as a potentially viable alternative to natural gas. Biomethane has the same chemical makeup and can be made to have the same fuel specifications as the compressed natural gas (CNG) currently being used for vehicle power. Biomethane, however, has the lowest carbon intensity among alternative fuels (including natural gas) because it does not come from fossil fuel raw materials but instead from dairies, landfills, and wastewater treatment plants, among others. Consequently, the use of biomethane would significantly reduce carbon emissions with no change to the current Los Angeles County Metropolitan Transportation Authority (Metro) bus fleet and fueling infrastructure. Development for implementation and greater use of biomethane is still ongoing.

Coal, Electricity, and Renewables

Natural gas-fired power plants typically account for more than half of the State's electricity generation. California is one of the largest hydroelectric power producers in the United States, and with adequate rainfall, hydroelectric power typically accounts for close to one-fifth of State electricity generation. While the contribution of renewable generation has been increasing, the role of nuclear generation has dropped considerably since the shutdown of the two-unit San Onofre Nuclear Generating Station (SONGS) in January 2012. Due to strict emission laws, only a few small coal-fired power plants operate in California.

California leads the United States in electricity generation from nonhydroelectric renewable energy sources. California generates electricity using wind, geothermal, solar, fuel wood, and municipal solid waste/landfill gas resources. California is the top producer of geothermal energy in the country with over 2,500 megawatts (MW) of capacity. A facility known as "The Geysers" (located in the Mayacamas Mountains north of San Francisco) is the largest complex of geothermal power plants in the world, with more than 700 MW of installed capacity. California is also a leading producer of wind energy and holds nearly 10 percent of United States capacity. The world's largest solar power facility, completed in 1991, operates in California's Mojave Desert. Eleven projects in California, totaling 7,341 MW of solar generating capacity, have been approved by the United States Bureau of Land Management since 2010. To further boost renewable energy use, California's Energy Action Plan includes incentives that encourage Californians to install solar power systems on their rooftops.

Due to high electricity demand, California imports more electricity than any other state. States in the Pacific Northwest deliver power to California markets primarily from hydroelectric sources, while states in the Desert Southwest deliver power primarily from coal-fired sources. Hydroelectric power comes to California primarily through the Western United States of America interconnection, which runs from northern Oregon to Southern California. The system, also known as the Pacific Intertie, is the largest single electricity transmission program in the United States. Although the Pacific Intertie was originally designed to transmit electricity south during California's peak summer demand season, flow is sometimes reversed overnight and has occasionally been reversed during periods of reduced hydroelectric generation in the Northwest. California restricts the use of coal-fired generation within its boundaries. However, the Los Angeles Department of Water and Power (LADWP) operates the coal-fired Intermountain Power Plant in Utah (Intermountain), which delivers almost all of its output to LADWP and other California municipal utilities. A recent California law forbids utilities from entering into long-term contracts with conventional coal-fired power producers. Intermountain's existing contracts with Southern California cities are set to expire in 2027.

In 2000 and 2001, California suffered an energy crisis characterized by electricity price instability and four major blackouts that were caused by a supply-and-demand imbalance. Multiple factors contributed to this imbalance, including a heavy dependence on out-of-State electricity providers, drought conditions in the northwest that reduced hydroelectric power generation, a rupture on a major natural gas pipeline supplying California power plants, strong economic growth leading to increased electricity demand in the western United States, an increase in unplanned power plant outages, and unusually high temperatures that increased electricity demand for air-conditioning and other cooling uses. Following the energy crisis, the State government created an Energy Action Plan designed to eliminate outages and excessive price spikes. To achieve these goals, the Energy Action Plan calls for optimizing energy conservation, building sufficient new generation facilities, upgrading and expanding the electricity transmission and distribution infrastructure, and ensuring that generation facilities can quickly come online when needed.

In 2006, California amended its renewable portfolio standard to require investor-owned utilities, electric service providers, small and multijurisdictional utilities, and community choice aggregators to provide at least 20 percent of retail sales from renewable sources by the end of 2010 and 33 percent by the end of 2020. California has also adopted other policies to promote energy efficiency and renewable energy, including energy standards for public buildings, power source disclosure requirements for utilities, and net metering.

3.15.2.2 Energy Consumption in California and Los Angeles County

The following statistics have been provided by the California Energy Commission (CEC). Statistics are the most recent available as of October 2013.

Electricity

Fueled by population growth, the demand for electricity in California is increasing. At the same time, the State is mandating a decrease in greenhouse gas (GHG) emissions. California's electricity mix is generated by natural gas (approximately 53.4 percent), coal (approximately 1.7 percent), large hydroelectric (approximately 14.6 percent), nuclear (approximately 15.7 percent), and renewable (approximately 14.6 percent) sources. In 2011, California produced approximately 71 percent of the electricity it uses; the rest was imported from the Pacific Northwest (approximately 8 percent) and the United States Southwest (approximately 21 percent). Under the Renewables Portfolio Standard, California's goal was to increase the amount of electricity generated from renewable energy resources to 20 percent by 2010, and legislation passed in 2011 pushed that goal to 33 percent by 2020. Currently, California's in-State renewable generation consists of biomass, geothermal, small hydroelectric, wind, and solar generation sites that make up approximately 17 percent of the total in-State generational output. Los Angeles County electrical usage in 2011 is shown in Table 3.15.1.

TABLE 3.15.1:
Annual Electric Consumption in Los Angeles County in 2011

Type of Consumer	Millions of kWh
Residential	19,292
Nonresidential	44,607
Total	**63,899**

Source: *Energy Technical Report* (2014).
kWh = kilowatt-hours

Natural Gas Consumption

Only approximately 12 percent of the natural gas California used came from in-State production in 2010; the rest was delivered by pipeline from several production areas in the western United States and western Canada. California is at the stopping point of these pipelines, forcing the State to compete with other states for its natural gas supply. Once the gas arrives in California, it is distributed by the State's three major gas utility companies (San Diego Gas & Electric, Southern California Gas Company, and Pacific Gas and Electric), which together provide a collective total of approximately 98 percent of the State's natural gas. The Cities of Long Beach and Palo Alto are the only municipal utilities in California that operate City-owned utility services for natural gas customers.

Natural gas is the second most widely used energy source in California. Depending on yearly conditions, approximately 40 to 45 percent of the total amount used is burned for electricity generation, approximately 10 percent is consumed in facilitating the extraction of oil and gas, and the rest is used for everything from space heating to fuel for bus fleets. The residential sector in Los Angeles County uses approximately 44 percent of the natural gas consumed (Table 3.15.2).

TABLE 3.15.2:
Natural Gas Consumption in Los Angeles County in 2011

Land Use	Millions of Therms
Residential	1,369
Non-Residential	1,752
Total	**3,121**

Source: *Energy Technical Report* (2014).
therm = a unit of heat containing 100,000 British thermal units (BTUs).

Liquid Petroleum Gas/Propane

Liquefied petroleum gas (LPG) is a mixture of gaseous hydrocarbons (mainly propane and butane) that change into liquid form under moderate pressure. LPG (usually called propane) is commonly used as a fuel for rural homes for space and water heating, as a fuel for barbecues and recreational vehicles, and as a transportation fuel. It is normally created as a byproduct of petroleum refining and from natural gas production.

LPG is generally an unregulated fuel in California (except for storage and safety issues, which are regulated). Because it is an unregulated commodity, the State does not collect data on LPG sales or usage. The statistics for LPG in Alternatives to Traditional Transportation Fuels (provided later in this section) were provided by the United States Department of Energy, Energy Information Administration (EIA), Office of Coal, Nuclear, Electric, and Alternate Fuels. As such, statistics are unavailable for LPG as a fuel for rural homes, for space and water heating, or for barbecues, and none are provided in this section.

Traditional Transportation Fuels (Fossil Fuels)

Fossil fuels are energy resources that come from the remains of plants and animals that are millions of years old. There are three fossil fuels: petroleum oil, natural gas, and coal. These fossil fuels provide the energy that powers our lifestyles and our economy, and are overwhelmingly responsible for fueling our transportation system. Our country's entire transportation infrastructure of pipelines and gas stations is built around fossil fuels. They are the foundation that we base our energy mix upon, but they are a limited resource. Once these resources are depleted, they will no longer be part of our energy mix.

The main challenges with fossil fuels, in addition to their unsustainability, are related to their negative environmental impacts. The burning of fossil fuels is responsible for emissions that contribute to global climate change, acid rain, and ozone problems. As such, the development of alternatives to traditional transportation fuels is a priority.

Alternatives to Traditional Transportation Fuels

Alternatives to traditional transportation fuels are being developed and introduced into the consumer marketplace. Alternative fuels and vehicles currently in use in the United States are:

- Biodiesel and biogas
- CNG
- LNG
- LPG/propane
- Ethanol, 85 percent (E85) (used in flexible fuel vehicles)
- Hydrogen and fuel cell vehicles
- Electric vehicles

The following information was prepared by the EIA, the independent statistical and analytical agency within the United States Department of Energy. Each year, the EIA collects data on the number of alternative fuel vehicles (AFVs) supplied and, for a limited set of fleet user groups, the number of AFVs in use and the amount of alternative transportation fuel consumed. The user groups surveyed are the federal and State governments, alternative fuel providers, and transit companies.

Alternative Fuel in Vehicle Use

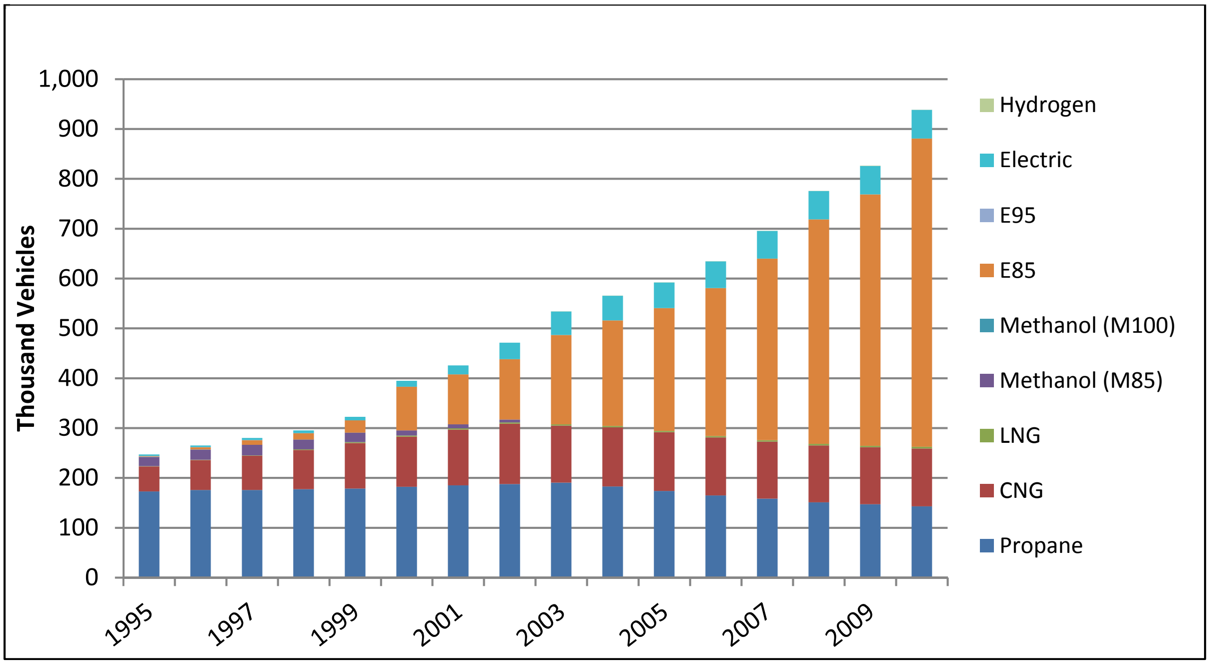
The use of AFVs in the United States has steadily increased between 1995 and 2010, as shown on Figure 3.15-1. Overall, an estimated 938,650 AFVs were in use in the United States in 2010. Total AFV use in California increased from 81,652 in 2004 to 136,409 in 2009.

Alternative Fuel Consumption

Overall consumption of alternative transportation fuels in the United States increased almost 13 percent in 2011 to a total of 515,920,000 gasoline gallon equivalents (GGEs), compared to 457,755,000 GGEs in 2010. The estimated consumption of alternative fuels (in million GGEs) in the United States from 1995 through 2010 is shown on Figure 3.15-2.

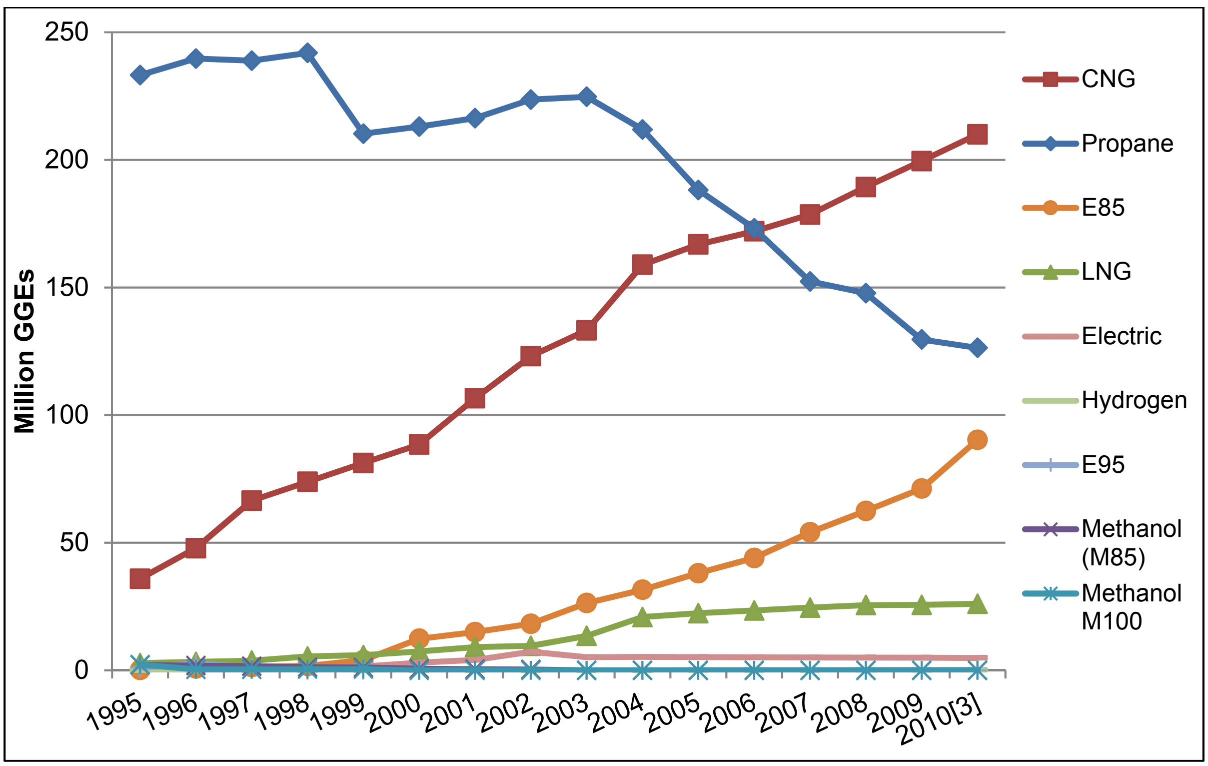
3.15.3 Environmental Consequences

Implementation of the project would result in the use of energy resources in Los Angeles County. The analysis of energy impacts is at the regional level and, therefore, by its nature, is an analysis of cumulative impacts. The energy analysis addresses three elements: indirect and direct energy consumption (each as temporary and permanent energy consumption) and service parameters. Indirect energy refers to energy associated with construction, maintenance, and operation of a transportation facility. Direct energy refers to the fuel consumed by vehicles using a transportation facility. Service parameters concern the actual transportation service versus the potential transportation service. Potential service of a vehicle would be the maximum rated capacity for passengers or cargo, and actual service is the real number it does carry. The ratio of actual service rendered versus potential service is called the "load factor."



Source: *Energy Technical Report* (2014).

Figure 3.15-1: Alternative Fueled Vehicles in Use in the U.S. – 1995 Through 2010



Source: *Energy Technical Report* (2014).

Figure 3.15-2: Estimated Consumption of Alternative Fuel by AFVs in the U.S. – 1995 Through 2010

The baselines used for the energy evaluation are existing conditions and the No Build conditions in the 2035 Build Out year. Comparison of the Build Alternatives to the 2035 No Build condition, as well as existing conditions, is appropriate because energy effects are considered for the projected future conditions. For long-term planning on their facilities, Caltrans uses a 20-year planning horizon, which is consistent with standard FHWA practice for transportation project planning.

Of the scenario years analyzed, estimated energy consumption in 2035 is expected to represent the most conservative (i.e., highest) energy consumption because population and employment are projected to be higher in that year than in any earlier year. In addition, this analysis does not reflect the benefit of energy efficiency and conservation measures that are likely to be adopted by 2035 and that would result in lower energy consumption than projected in these estimates (i.e., new California Environmental Protection Agency [Cal/EPA]/United States Environmental Protection Agency (EPA) fuel economy standards, bus rapid transit programs reducing personal vehicle use, and increased use of high-occupancy vehicles [HOVs]).

This energy analysis for the Bus Rapid Transit (BRT), Light Rail Transit (LRT), and Freeway Tunnel Alternatives described in this section includes the effects of the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative improvements that would be included in these Build Alternatives. These improvements include the complete TSM/TDM Alternative, minus the following portions:

- Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road), the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10), and enhancements to Route 762 would not be implemented with the BRT Alternative.
- Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) would not be implemented with the LRT Alternative.
- Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector) and T-3 (St. John Extension between Del Mar Boulevard and California Boulevard) would not be implemented with the Freeway Tunnel Alternative.

3.15.3.1 Temporary Indirect Impacts

Temporary indirect energy impacts result from the manufacture of vehicles that operate on the project and project construction. Indirect manufacturing energy effects involve the one-time, nonrecoverable energy costs associated with the manufacture of vehicles. Construction energy effects involve the one-time, nonrecoverable energy costs associated with construction of roads and structures. The indirect energy analysis for the project was conducted using the Caltrans Input-Output Method. Based on this method, indirect energy consumption related to vehicle manufacturing consists of: (1) materials and quantities, (2) manufacture energy, (3) useful life, (4) salvage energy.

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. However, the No Build Alternative would include the temporary indirect impacts from the manufacture of the vehicles that would continue to use the existing roadway system. Additionally, as this energy analysis is a cumulative analysis, the construction energy shown for all project alternatives, including the No Build Alternative, includes the energy necessary to build all the Southern California Association of Governments (SCAG) planned projects in the project study area and in all the SCAG region. The estimated study area and regional energy consumption for construction of the No Build Alternative are shown in Tables 3.15.3 and 3.15.4, respectively.

TABLE 3.15.3:
Study Area Temporary Indirect Energy Impacts

Scenario	Construction-Related Energy				Total Indirect Energy (billion BTUs)	% Change from No Build
	Manufacturing		Energy to Build (billion BTUs)	Build Cost[1] (billions)		
	Auto (billion BTUs)	Truck & Bus (billion BTUs)				
2013 Existing	11,700	775	–	–	23,300	–
2035 No Build Alternative	11,800	1,160	16,700	$0.10	41,400	–
2035 TSM/TDM Alternative	11,800	1,160	33,600	$0.21	58,300	40%
2035 BRT Alternative	11,800	1,170	55,300	$0.34	80,000	93%
2035 LRT Alternative	11,800	1,160	422,000	$2.62	447,000	980%
2035 Freeway Tunnel Alternative						
Single-Bore Operational Variations:						
2035 Single-Bore with Toll	11,900	1,180	523,000	$3.25	548,000	1,220%
2035 Single-Bore with Toll without Trucks	11,900	1,150	523,000	$3.25	548,000	1,220%
2035 Single-Bore with Toll (with and without Express Bus)	11,900	1,180	523,000	$3.25	548,000	1,220%
Dual-Bore Operational Variations:						
2035 Dual-Bore without Toll	12,000	1,180	926,000	$5.75	951,000	2,200%
2035 Dual-Bore without Toll without Trucks	12,100	1,130	926,000	$5.75	951,000	2,200%
2035 Dual-Bore with Toll (with and without Express Bus)	12,000	1,170	926,000	$5.75	951,000	2,200%

Source: *Energy Technical Report* (2014).
[1] Build cost in 2020 dollars, the earliest planned opening year.
BTUs = British thermal units

TABLE 3.15.4:
Regional Temporary Indirect Energy Impacts

Scenario	Construction-Related Energy				Total Indirect Energy (trillion BTUs)	% Change from No Build
	Manufacturing		Energy to Build (trillion BTUs)	Build Cost[1] (billions)		
	Auto (trillion BTUs)	Truck & Bus (trillion BTUs)				
2013 Existing	187	15	–	–	381	–
2035 No Build Alternative	216	28	84,400	$524.70	84,900	–
2035 TSM/TDM Alternative	216	28	84,400	$524.81	84,900	0%
2035 BRT Alternative	216	28	84,500	$524.94	85,000	0%
2035 LRT Alternative	216	28	84,800	$527.22	85,300	0.5%
2035 Freeway Tunnel Alternative:						
Single-Bore Operational Variations:						
2035 Single-Bore with Toll	216	28	84,900	$528.85	85,400	0.6%
2035 Single-Bore with Toll without Trucks	216	28	84,900	$528.85	85,400	0.6%
2035 Single-Bore with Toll (with and without Express Bus)	216	28	84,900	$528.85	85,400	0.6%
Dual-Bore Operational Variations:						
2035 Dual-Bore without Toll	216	28	85,300	$530.35	85,800	1.1%
2035 Dual-Bore without Toll without Trucks	216	28	85,300	$530.35	85,800	1.1%
2035 Dual-Bore with Toll (with and without Express Bus)	216	28	85,300	$530.35	85,800	1.1%

Source: *Energy Technical Report* (2014).
[1] Build cost in 2020 dollars, the earliest planned opening year.
BTUs = British thermal units

TSM/TDM Alternative

Because the TSM/TDM Alternative has essentially the same operational vehicle miles traveled (VMT) as the baseline No Build Alternative, the temporary indirect energy impacts from vehicle manufacturing for the TSM/TDM Alternative and the baseline No Build Alternative would be the same.

It is anticipated that the construction energy demands from the TSM/TDM Alternative would be accommodated by the LADWP and the Pasadena Water and Power Utility.

Table 3.15.3 shows that the TSM/TDM Alternative would have an approximately 40 percent increase in total temporary indirect energy consumption in the study area (entirely from construction energy use) compared to the baseline No Build Alternative. Table 3.15.4 shows that when including the construction energy use for all transportation projects for the region, the energy to build and the total indirect energy impacts for the TSM/TDM Alternative would be the same as the No Build Alternative.

BRT Alternative

Similar to the TSM/TDM Alternative discussed above, the BRT Alternative has essentially the same operational vehicle VMT as the baseline No Build Alternative. Thus, the temporary indirect energy impacts from vehicle manufacturing for the BRT Alternative and the baseline No Build Alternative would be the same.

It is anticipated that the construction energy demands from the BRT Alternative will be accommodated by the LADWP and the Pasadena Water and Power Utility.

Table 3.15.3 shows that the BRT Alternative would have an approximately 93 percent increase in total temporary indirect energy consumption in the study area (entirely from construction energy use) compared to the baseline No Build Alternative. Table 3.15.4 shows that when including the construction energy for all transportation projects for the region, the energy to build and the total indirect energy impacts for the BRT Alternative would each be approximately 100 trillion BTUs more than the No Build Alternative, which is nearly a 0 percent increase.

LRT Alternative

Similar to the TSM/TDM and BRT Alternatives discussed above, the LRT Alternative has essentially the same operational vehicle VMT as the baseline No Build Alternative. Thus, the temporary indirect energy impacts from vehicle manufacturing for the LRT Alternative and the baseline No Build Alternative would be the same. However, the LRT Alternative includes the construction of 4.5 mi of bored tunnels and supporting tunnel systems, which would require substantially more energy than either the TSM/TDM or BRT Alternatives. LADWP has indicated they would supply the necessary power to handle the electrical demands of the tunneling equipment for the tunnel portal south of Valley Boulevard. Thus, it is anticipated that the construction energy demands from the LRT Alternative would be accommodated by the LADWP.

Table 3.15.3 shows that the LRT Alternative would have an approximately 980 percent increase to total indirect energy consumption in the study area compared to the baseline No Build Alternative. The LRT Alternative would include construction energy demands for the tunnels and for the LRT stations and maintenance facilities. Table 3.15.4 shows that when including the construction costs for all transportation projects for the region, the energy to build and the total indirect energy costs for the LRT Alternative would each be approximately 400 trillion BTUs more than the No Build Alternative, or approximately 0.5 percent more.

Freeway Tunnel Alternative

All variations of the Freeway Tunnel Alternative have a greater operational vehicle VMT than the baseline No Build Alternative; therefore, the temporary indirect energy impacts from vehicle manufacturing for the Freeway Tunnel Alternative would be greater than the baseline No Build Alternative.

The LADWP and the Pasadena Water and Power Utility have indicated they could supply the necessary power to build electrical substations at each end of the freeway tunnel in any of the Freeway Tunnel Alternative design variations to handle the electrical demands of the tunneling equipment. The LADWP would supply power to the southern tunnel portal and the Pasadena Water and Power Utility would supply power to the northern tunnel portal for the Freeway Tunnel Alternative. Thus, it is anticipated that the construction energy demands from the Freeway Tunnel Alternative will be accommodated by both power utilities.

Table 3.15.3 shows that the single-bore design variation of the Freeway Tunnel Alternative would have an approximately 1,220 percent increase to total indirect energy consumption, and the dual-bore design variation would have an approximately 2,200 percent increase to total indirect energy consumption in the study area compared to the baseline No Build Alternative.

Table 3.15.4 shows that when including the construction energy impacts for all transportation projects for the region, the single-bore design variation of the Freeway Tunnel Alternative would have an approximately 0.6 percent increase compared to the No Build Alternative. The dual-bore design variation would have an approximately 1.1 percent increase compared to the No Build Alternative.

3.15.3.2 Permanent Indirect Impacts

Permanent indirect energy impacts consist principally of the ongoing, nonrecoverable energy costs associated with the maintenance of vehicles. This analysis was also conducted using the Caltrans Input-Output Method. Based on this method, the per-vehicle indirect energy impacts for the Build Alternatives and the existing condition would all be the same. These maintenance costs are borne by all users of the project, regardless of where they live and whether they actually pay the maintenance costs.

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any permanent indirect energy consumption impacts. However, the No Build Alternative would include the permanent indirect impacts from the maintenance of the vehicles that would continue to use the existing roadway system. Estimated permanent indirect energy consumption for the No Build Alternative (2035 baseline condition) is provided in Tables 3.15.5 and 3.15.6.

TSM/TDM Alternative

Table 3.15.5 shows that the TSM/TDM Alternative would result in a maintenance-related energy consumption increase of approximately 0.3 percent in the study area compared to the 2035 baseline condition (No Build Alternative). Table 3.15.6 shows that for the region, the TSM/TDM Alternative would not result in a measurable change in maintenance-related energy consumption from the 2035 baseline condition (No Build Alternative).

TABLE 3.15.5:
Study Area Permanent Indirect Energy Impacts

Scenario	Maintenance-Related Energy		
	Auto (billion BTUs)	Truck (billion BTUs)	% Change from No Build
2013 Existing	9,410	1,450	–
2035 No Build Alternative	9,530	2,170	–
2035 TSM/TDM Alternative	9,560	2,170	0.3%
2035 BRT Alternative	9,550	2,180	0.3%
2035 LRT Alternative	9,550	2,170	0.2%
2035 Freeway Tunnel Alternative			
Single-Bore Operational Variations:			
2035 Single-Bore with Toll	9,590	2,200	0.8%
2035 Single-Bore with Toll without Trucks	9,620	2,150	0.6%
2035 Single-Bore with Toll (with and without Express Bus)	9,590	2,200	0.8%
Dual-Bore Operational Variations:			
2035 Dual-Bore without Toll	9,680	2,210	1.6%
2035 Dual-Bore without Toll without Trucks	9,740	2,120	1.4%
2035 Dual-Bore with Toll (with and without Express Bus)	9,690	2,180	1.5%

Source: *Energy Technical Report* (2014).
[1] Build cost in 2020 dollars, the earliest planned opening year.
BTUs = British thermal units

TABLE 3.15.6:
Regional Permanent Indirect Energy Impacts

Scenario	Maintenance-Related Energy		
	Auto (trillion BTUs)	Truck (trillion BTUs)	% Change from No Build
2013 Existing	151	28	–
2035 No Build Alternative	174	53	–
2035 TSM/TDM Alternative	174	53	0%
2035 BRT Alternative	174	53	0%
2035 LRT Alternative	174	53	0%
2035 Freeway Tunnel Alternative			
Single-Bore Operational Variations:			
2035 Single-Bore with Toll	174	53	0%
2035 Single-Bore with Toll without Trucks	174	53	0%
2035 Single-Bore with Toll (with and without Express Bus)	174	53	0%
Dual-Bore Operational Variations:			
2035 Dual-Bore without Toll	174	53	0%
2035 Dual-Bore without Toll without Trucks	174	53	0%
2035 Dual-Bore with Toll (with and without Express Bus)	174	53	0%

Source: *Energy Technical Report* (2014).
[1] Build cost in 2020 dollars, the earliest planned opening year.
BTUs = British thermal units

BRT Alternative

Table 3.15.5 shows that the BRT Alternative would result in a maintenance-related energy consumption increase of approximately 0.3 percent in the study area compared to the 2035 baseline condition (No Build Alternative). Table 3.15.6 shows that for the region, the BRT Alternative would not result in a measurable change in maintenance-related energy consumption from the 2035 baseline condition (No Build Alternative).

LRT Alternative

Table 3.15.5 shows that the LRT Alternative would result in a maintenance-related energy consumption increase of approximately 0.2 percent in the study area compared to the 2035 baseline condition (No Build Alternative). The LRT Alternative would require a maintenance yard for cleaning, maintaining, and storing light rail vehicles (LRVs). The maintenance yard would include a car wash, a paint shop, and other support facilities, and would also have enough storage tracks to accommodate all of the LRVs required to operate the light rail line. The Caltrans handbook maintenance factors used in this analysis include maintenance activities such as these.

Table 3.15.6 shows that for the region, the LRT Alternative would not result in a measurable change in maintenance-related energy consumption from the 2035 baseline condition (No Build Alternative).

Freeway Tunnel Alternative

Table 3.15.5 shows that the Freeway Tunnel Alternative would result in a maintenance-related energy consumption increase ranging from 0.6 to 1.6 percent in the study area compared to the 2035 baseline condition (No Build Alternative). This increase in vehicle maintenance costs go up because there's more travel in the project (the freeway tunnel).

Table 3.15.6 shows that for the region, the Freeway Tunnel Alternative would not result in a measurable change in maintenance-related energy consumption from the 2035 baseline condition (No Build Alternative).

3.15.3.3 Permanent Direct Impacts

Local energy demand for transportation projects typically is dominated by vehicle fuel usage. Operational energy consumption was estimated for vehicles (autos; light-, medium-, and heavy-duty trucks; transit buses) and passenger rail traveling:

- Within the study area, which is bounded by Interstate 210 (I-210) on the north, Interstate 605 (I-605) on the east, Interstate 10 (I-10) on the south, and Interstate 5 (I-5) and State Route 2 (SR 2) on the west; and
- Within the six-county SCAG region.

Energy calculations are based on annual VMT for the 2013 base year and each of the year 2035 alternatives. In addition to VMT, travel conditions within the study area also influence fuel consumption rates. Without the capacity improvements proposed in the Build Alternatives, congested traffic conditions would be more prevalent throughout the study area and, to a lesser extent, the region. These conditions contribute to a higher energy consumption rate because vehicles use extra fuel while idling in stop-and-go traffic or moving at slow speeds through congested roadways. Both VMT and travel speeds were used to estimate the vehicle fuel consumption for each of the scenarios analyzed below.

For the energy consumption calculations, the fuel use percentages for each vehicle category were used to determine total gasoline and diesel fuel usage rates. For the buses, it was assumed that the transitway, express buses, and local buses would be 75 percent CNG fueled and 25 percent diesel, while the Rapid Buses would all be CNG fueled. For the passenger rail, it was assumed that all high-speed and light rail would be electric and that all commuter rail would be diesel. CNG is marketed in terms of diesel gallon equivalent (DGE), created to allow comparison of the cost and fuel economy of a natural gas vehicle to a comparable diesel vehicle. Data from the United States Department of Energy, Office of Energy Efficiency and Renewable Energy, lists the average energy use by commuter rail (diesel) engines as 92,474 BTUs per mile and by transit rail (electric) engines as 64,585 BTUs per mile.

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any effects related to energy consumption associated with improvements in the Build Alternatives. Estimated permanent direct energy consumption for the No Build Alternative (2035 baseline condition) is provided in Tables 3.15.7 through 3.15.10.

Tables 3.15.7 and 3.15.8 report annual energy use for cars and trucks (millions of gallons), buses (millions of DGE), and trains (millions of BTUs) for the study area and region, respectively. Tables 3.15.9 and 3.15.10 convert these measures of energy consumption into BTUs in order to provide a uniform metric to represent energy consumption for the comparison of the project alternatives.

TSM/TDM Alternative

Table 3.15.9 shows that in the study area, the TSM/TDM Alternative would result in the same approximately 6 percent increase in operational energy consumption from the 2013 existing condition as the baseline (No Build) alternative. Table 3.15.10 shows that all the Build Alternatives would result in the same approximately 22 percent increase in operational energy consumption in the region.

Similarly, Table 3.15.9 shows that in the study area, the TSM/TDM Alternative would result in no change in operational energy consumption compared to the 2035 baseline condition (No Build Alternative). Table 3.15.10 shows that none of the project alternatives would result in a measurable change in operational energy consumption in the region compared to the 2035 baseline condition (No Build Alternative).

BRT Alternative

Table 3.15.9 shows that in the study area, the BRT Alternative would result in the same approximately 6 percent increase in operational energy consumption from the 2013 existing condition as the baseline (No Build) alternative. Table 3.15.10 shows that all the Build Alternatives would result in the same approximately 22 percent increase in operational energy consumption in the region.

For operational energy consumption, the BRT Alternative will include new bus stops. The structures at these stops will only use light-emitting diode lighting, which would be only a very small amount of energy used annually by this alternative per year.

Similarly, Table 3.15.9 shows that in the study area, the BRT Alternative would result in no change in operational energy consumption compare to the 2035 baseline condition (No Build Alternative). Table 3.15.10 shows that none of the Build Alternatives would result in a measurable change in operational energy consumption in the region compared to the 2035 baseline condition (No Build Alternative).

TABLE 3.15.7:
Study Area Energy Consumption – Annual

Scenario	Annual Study Area Energy Consumption			
	Gasoline (millions of gallons)	**Diesel (millions of gallons)**	**CNG (millions of DGE)**	**Train Energy (billions of BTUs)**
2013 Existing	292	27	2.9	255
2035 No Build Alternative	301	37	2.9	347
2035 TSM/TDM Alternative	302	36	3.3	347
2035 BRT Alternative	302	36	3.2	347
2035 LRT Alternative	302	37	3.3	431
2035 Freeway Tunnel Alternative – Single-Bore Design Variations:				
2035 Single-Bore with Toll	299	36	3.2	347
2035 Single-Bore with Toll without Trucks	299	35	3.2	347
2035 Single-Bore with Toll (with and without Express Bus)	299	36	3.3	347
2035 Freeway Tunnel Alternative – Dual-Bore Design Variations:				
2035 Dual-Bore without Toll	301	37	3.2	347
2035 Dual-Bore without Toll without Trucks	303	35	3.2	347
2035 Dual-Bore with Toll (with and without Express Bus)	302	36	3.2	347

Source: *Energy Technical Report* (2014).
BTUs = British thermal units
CNG = Compressed Natural Gas
DGE = diesel gallon equivalent = 140 standard cubic feet of natural gas

TABLE 3.15.8:
Regional Energy Consumption – Annual

Scenario	Annual Regional Energy Consumption			
	Gasoline (millions of gallons)	**Diesel (millions of gallons)**	**CNG (millions of DGE)**	**Train Energy (billions of BTUs)**
2013 Existing	4,521	447	38.1	2,200
2035 No Build Alternative	5,297	739	38.3	3,831
2035 TSM/TDM Alternative	5,297	739	38.9	3,831
2035 BRT Alternative	5,297	740	38.9	3,831
2035 LRT Alternative	5,295	739	39.0	3,915
2035 Freeway Tunnel Alternative – Single-Bore Design Variations:				
2035 Single-Bore with Toll	5,298	739	38.9	3,831
2035 Single-Bore with Toll without Trucks	5,300	740	38.9	3,831
2035 Single-Bore with Toll (with and without Express Bus)	5,298	740	39.0	3,831
2035 Freeway Tunnel Alternative – Dual-Bore Design Variations:				
2035 Dual-Bore without Toll	5,303	739	38.9	3,831
2035 Dual-Bore without Toll without Trucks	5,302	738	38.9	3,831
2035 Dual-Bore with Toll (with and without Express Bus)	5,302	739	38.9	3,831

Source: *Energy Technical Report* (2014).
BTUs = British thermal units
CNG = Compressed Natural Gas
DGE = diesel gallon equivalent = 140 standard cubic feet of natural gas

TABLE 3.15.9:
Study Area Operational Energy Consumption – Percent Change

Scenario	Annual		
	Billion BTUs[1]	**% Change from 2013 Existing**	**% Change from 2035 Baseline**
2013 Existing	37,800	--	--
2035 No Build Alternative	40,200	6%	--
2035 TSM/TDM Alternative	40,200	6%	0.0%
2035 BRT Alternative	40,200	6%	0.0%
2035 LRT Alternative	40,500	7%	0.7%
2035 Freeway Tunnel Alternative – Single-Bore Design Variations:			
2035 Single-Bore with Toll	39,900	6%	-0.7%
2035 Single-Bore with Toll without Trucks	39,800	5%	-1.0%
2035 Single-Bore with Toll (with and without Express Bus)	39,900	6%	-0.7%
2035 Freeway Tunnel Alternative – Dual-Bore Design Variations:			
2035 Dual-Bore without Toll	40,200	6%	0.0%
2035 Dual-Bore without Toll without Trucks	40,200	6%	0.0%
2035 Dual-Bore with Toll (with and without Express Bus)	40,200	6%	0.0%

Source: *Energy Technical Report* (2014).
1 Assumes an energy content of 130,500 BTUs per gallon of diesel fuel, 115,000 BTUs per gallon of gasoline, and 1,020 BTUs per cubic foot of natural gas.
BTUs = British thermal units

TABLE 3.15.10:
Regional Operational Energy Consumption – Percent Change

Scenario	Annual		
	Billion BTUs[1]	**% Change from 2013 Existing**	**% Change from 2035 Baseline**
2013 Existing	586,000	--	--
2035 No Build Alternative	715,000	22%	--
2035 TSM/TDM Alternative	715,000	22%	0%
2035 BRT Alternative	715,000	22%	0%
2035 LRT Alternative	715,000	22%	0%
2035 Freeway Tunnel Alternative – Single-Bore Design Variations:			
2035 Single-Bore with Toll	715,000	22%	0%
2035 Single-Bore with Toll without Trucks	715,000	22%	0%
2035 Single-Bore with Toll (with and without Express Bus)	715,000	22%	0%
2035 Freeway Tunnel Alternative – Dual-Bore Design Variations:			
2035 Dual-Bore without Toll	716,000	22%	0%
2035 Dual-Bore without Toll without Trucks	715,000	22%	0%
2035 Dual-Bore with Toll (with and without Express Bus)	716,000	22%	0%

Source: *Energy Technical Report* (2014).
1 Assumes an energy content of 130,500 BTUs per gallon of diesel fuel, 115,000 BTUs per gallon of gasoline, and 1,020 BTUs per cubic foot of natural gas.
BTUs = British thermal units

LRT Alternative

Table 3.15.9 shows that in the study area, the LRT Alternative would result in an approximately 7 percent increase in operational energy consumption from the 2013 existing condition. Table 3.15.10 shows that all the Build Alternatives would result in the same 22 percent increase in operational energy consumption in the region.

For operational energy consumption, the seven new LRT stations are estimated to have a daily electrical demand of approximately 200 or 400 kilovolt-amperes (kVA) each for the elevated and underground stations, respectively, for a total additional daily electrical demand of 2,200 kVA.

Southern California Edison would supply the electricity for these LRT stations. This demand translates to approximately 0.11 billion BTUs per year for the LRT Alternative stations.

Table 3.15.9 shows that in the study area, the LRT Alternative would result in an approximately 0.7 percent increase in operational energy consumption from the 2035 baseline condition (No Build Alternative).

Table 3.15.10 shows that none of the project alternatives would result in a measurable change in operational energy consumption in the region compared to the 2035 baseline condition (No Build Alternative).

Freeway Tunnel Alternative

Table 3.15.9 shows that in the study area, the Freeway Tunnel Alternative variations would result in an approximately 5 to 6 percent increase in operational energy consumption from the 2013 existing condition. Table 3.15.10 shows that all the Build Alternatives would result in the same 22 percent increase in operational energy consumption in the region.

For operational energy consumption, the Freeway Tunnel Alternative would require approximately 48 MW for the daily operation of the tunnel(s). This demand translates to approximately 2.5 billion BTUs per year.

Table 3.15.9 shows that in the study area, the Freeway Tunnel Alternative single-bore design variation would result in a decrease in operational energy consumption from the 2035 baseline condition (No Build Alternative), ranging from approximately 0.7 to 1.0 percent. The dual-bore design variation would result in no change in operational energy consumption from the 2035 baseline condition (No Build Alternative).

Table 3.15.10 shows that none of the project alternatives would result in a measurable change in operational energy consumption in the region compared to the 2035 baseline condition (No Build Alternative).

Service Parameters

The difference between actual and potential transportation has been given careful consideration. Potential service of a vehicle would be the maximum rated capacity for passengers or cargo, and actual service is the real number it carries. The implications of this concept are vital in comparisons between different transportation modes. For example, a commuter bus may be filled to capacity in one direction while taking people to work or shopping, but may return nearly empty to complete the loop of its route. It has the potential to carry a full passenger load on the return trip, but it is unlikely that the return trips will carry the same volume of passengers carried in the other direction. Thus, although it consumes fuel for the complete loop, it actually provides transportation for fewer than the maximum rates of passenger-miles. The same holds true for a delivery truck that leaves a warehouse full and returns empty. The ratio of actual service rendered versus potential service is called the “load factor” and must be used in connection with an energy analysis.

Load factors also apply to private vehicles. For example, a passenger car rated for six seats and carrying only the driver has a load factor of 1/6th, whereas motorcycles, which are usually considered to be single-seaters in spite of their extra-long seat and foot pegs for a passenger, may actually be given a load factor of 2 when a passenger is carried.

The purpose of the proposed project is to effectively and efficiently accommodate regional and local north-south travel demands in the study area. Making this accommodation would not alter the ratio of the actual transportation service versus the potential transportation service within the project region; thus, the proposed project would have no effect on service parameters.

3.15.3.4 Total Energy Impacts

The combination of the direct and indirect energy impacts is summarized in Tables 3.15.11 and 3.15.12. An important criterion in any energy impact analysis is whether, or when, the energy savings a project would achieve would offset the energy cost to construct the project. If the energy savings would offset the energy costs, the project would have a payback period defined as the period of time taken to do so. As shown in Table 3.15.11, the estimated energy needed to construct the various Build Alternatives would range from approximately 33 trillion to 926 trillion BTUs. As is also shown in Table 3.15.11, there are very small or no direct or indirect energy savings associated with any of the Build Alternatives compared to the baseline (No Build) alternative, so the payback period for any of the Build Alternatives is not quantifiable.

TABLE 3.15.11:
Study Area Energy Consumption Summary

Scenario	Nonconstruction Energy		Construction Energy (Billion BTUs/yr)	Total Energy (Billion BTUs/yr)	% Change from Existing	% Change from No Build
	Direct Energy (Billion BTUs/yr)	Indirect Energy (Billion BTUs/yr)				
2013 Existing	37,800	12,500	--	50,300	--	--
2035 No Build Alternative	40,200	13,000	16,700	69,900	40%	--
2035 TSM/TDM Alternative	40,200	13,000	33,600	86,800	70%	20%
2035 BRT Alternative	40,200	13,000	55,300	108,500	120%	55%
2035 LRT Alternative	40,500	13,000	422,000	475,400	850%	580%
2035 Freeway Tunnel Alternative						
Single-Bore Operational Variations:						
2035 Single-Bore with Toll	39,900	13,100	523,000	576,000	1,050%	720%
2035 Single-Bore with Toll without Trucks	39,800	13,100	523,000	575,900	1,040%	720%
2035 Single-Bore with Toll (with and without Express Bus)	39,900	13,100	523,000	576,000	1,050%	720%
Dual-Bore Operational Variations:						
2035 Dual-Bore without Toll	40,200	13,200	926,000	979,400	1,850%	1,300%
2035 Dual-Bore without Toll without Trucks	40,200	13,200	926,000	979,400	1,850%	1,300%
2035 Dual-Bore with Toll (with and without Express Bus)	40,200	13,200	926,000	979,400	1,850%	1,300%

Source: *Energy Technical Report* (2014).
[1] A payback period of fewer than 5 years is considered an excellent investment, while a payback period of greater than 20 years will generally be beyond the foreseeable future of the project (Caltrans 1983).
Billion BTUs/yr = billion British thermal units per year

As shown in Table 3.15.11 for the study area, the temporary indirect energy impacts of constructing the Build Alternatives would be substantial. However, as shown in Table 3.15.12 for the region, none of the Build Alternatives would consume substantially more energy than the No Build Alternative. Thus, while none of the Build Alternatives would have a quantifiable payback period from energy savings, the project impact to regional energy supplies would be minor. Because the regional energy impacts from any of the Build Alternatives would be small, the three energy utilities (LADWP, Pasadena Water and Power Utility, and Southern California Edison) would not be impacted by the

TABLE 3.15.12:
Regional Energy Consumption Summary

Scenario	Nonconstruction Energy		Construction Energy (Trillion BTUs/yr)	Total Energy (Trillion BTUs/yr)	% Change from Existing	% Change from No Build
	Direct Energy (Trillion BTUs/yr)	Indirect Energy (Trillion BTUs/yr)				
2013 Existing	586	202	--	788	--	--
2035 No Build Alternative	715	244	84,400	85,400	10,740%	--
2035 TSM/TDM Alternative	715	244	84,400	85,400	10,740%	0%
2035 BRT Alternative	715	244	84,500	85,500	10,750%	0.12%
2035 LRT Alternative	715	244	84,800	85,800	10,790%	0.47%
2035 Freeway Tunnel Alternative:						
Single-Bore Operational Variations:						
2035 Single-Bore with Toll	715	244	84,900	85,900	10,800%	0.59%
2035 Single-Bore with Toll without Trucks	715	244	84,900	85,900	10,800%	0.59%
2035 Single-Bore with Toll (with and without Express Bus)	715	244	84,900	85,900	10,800%	0.59%
Dual-Bore Operational Variations:						
2035 Dual-Bore without Toll	716	244	85,300	86,300	10,850%	1.1%
2035 Dual-Bore without Toll without Trucks	715	244	85,300	86,300	10,850%	1.1%
2035 Dual-Bore with Toll (with and without Express Bus)	716	244	85,300	86,300	10,850%	1.1%

Source: *Energy Technical Report* (2014).
[1] A payback period of fewer than 5 years is considered an excellent investment, while a payback period of greater than 20 years will generally be beyond the foreseeable future of the project (Caltrans 1983).
Trillion BTUs/yr = trillion British thermal units per year

maintenance or operation energy demands of any of the proposed Build Alternatives. Thus, for the region, none of the three analysis elements, direct and indirect energy consumption and service parameters, would be substantially impacted by any of the Build Alternatives.

Additionally, while the vehicle mix operating on the project study area roadways is showing increasing numbers of passenger car EVs and AFVs, these vehicles use similar amounts of energy as gasoline-powered vehicles per mile. Therefore, this transition will not result in a large change to the energy use results shown in Tables 3.15.11 and 3.15.12.

3.15.3.5 Consistency with Energy Conservation Plans

In 2003, the CEC, the California Public Utilities Commission (CPUC), and the Consumer Power and Conservation Financing Authority (now defunct) approved the final State of California Energy Action Plan, which was proposed by a subcommittee of these three agencies. The Plan established shared goals and specific actions to ensure that adequate, reliable, and reasonably priced electrical power and natural gas supplies are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California’s consumers and taxpayers. In 2005, an updated Energy Action Plan was adopted by the CEC and the CPUC to reflect policy changes and actions after 2003.

The State’s energy policies have been substantially influenced by the passage of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. The CEC’s Integrated Energy Policy Report (IEPR) advances policies that would enable the State to meet its energy needs in a carbon-constrained world. That report also provides a comprehensive set of recommended actions to achieve these policies.

Rather than produce a new Energy Action Plan, the CEC and the CPUC have instead prepared the Energy Action Plan – 2008 Update, which examines the State's ongoing actions in the context of global climate change. The update was prepared using the information and analysis prepared for the 2007 IEPR as well as recent CPUC decisions.

As described in Sections 3.15.3.2 and 3.15.3.3, Permanent Indirect Impacts and Permanent Direct Impacts, while the temporary indirect energy impacts of the Build Alternatives would be substantial, the total indirect energy impacts would not be substantial at the regional level, and the total project impact to regional energy supplies would be minor. Therefore, none of the Build Alternatives would conflict with the California energy conservation plans.

3.15.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are required for maintenance or operation of any of the Build Alternatives.

The following measures would minimize energy use during construction of any of the Build Alternatives:

Measure E-1

Construction Efficiency Plan (applies to all four Build Alternatives): As part of the Plans, Specifications, and Estimates phase, the Project Engineer will prepare a construction efficiency plan, which may include the following:

- Reusing existing rail, steel, and lumber wherever possible, such as for falsework, shoring, and other applications during the construction process.
- Recycling of asphalt taken up from roadways, if practicable and cost-effective.
- Using newer, more energy-efficient equipment where feasible and maintenance of older construction equipment to keep it in good working order.
- Promoting scheduling of construction operations to efficiently use construction equipment (e.g., only haul waste when haul trucks are full and combine smaller dozer operations into a single comprehensive operation where possible).
- Promoting construction employee carpooling.

BIOLOGICAL ENVIRONMENT

3.16 Natural Communities

3.16.1 Regulatory Setting

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in the Threatened and Endangered Species Section 3.20. Wetlands and other waters are also discussed below in Section 3.17.

3.16.2 Affected Environment

The analysis of impacts of the State Route 710 (SR 710) North Project on natural communities is based on the *Natural Environment Study* (NES) (2014).

3.16.2.1 Biological Study Area

The Biological Study Area (BSA) for the proposed project is inclusive of, and substantially larger than, the area in which direct impacts to biological resources may occur as a result of construction and operation of the Build Alternatives. The BSA was defined to include an approximately 200-foot (ft) buffer around the limits of disturbance for each Build Alternative, including anticipated staging and equipment storage areas. The BSA, at approximately 3,410 acres (ac), is much larger than the area where ground-disturbing permanent and temporary impacts may occur (approximately 570 ac for all of the Build Alternatives combined). In some cases, the edge of the BSA is approximately 0.5 mile (mi) from the nearest temporary or permanent impact areas. The BSA is entirely within Los Angeles County and includes parts of the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, San Marino, and Monterey Park, as well as unincorporated parts of Los Angeles County. Figure 3.16-1 shows the location of the BSA. (Please note that the figures cited in this section are provided following the last page of text in this section.)

3.16.2.2 Plant Communities

In 2013, general reconnaissance surveys, protected tree surveys, and plant community mapping of the area in the BSA were conducted. An additional survey was conducted on December 11, 2017, that was specific to the white alder grove. The 11 plant communities and one non-vegetation cover type that were identified in the BSA are discussed in further detail below and are shown on Figure 3.16-2. The plant communities and cover types were classified using *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens, 2009).The acreages of the plant communities and cover types in the BSA are summarized in Table 3.16.1.

In general, very little natural vegetation remains in the area. The majority of vegetation in the BSA occurs as planted trees along sidewalks as well as ruderal and ornamental vegetation and trees planted along the edges of freeways and within freeway medians. As shown in Table 3.16.1, most common plant community/land cover type in the BSA is disturbed/developed, which, at 3,223.2 ac,

TABLE 3.16.1:
Acreages of Plant Communities and Cover Types in the BSA

Plant Communities	Acres
Disturbed/Developed	3,223.2
Nonnative Woodland	79.7
Nonnative Grassland	85.8
Nonnative Riparian Woodland	0.5
Wetland Complex	1.5
Giant Reed Semi-Natural Stand	0.2
White Alder Groves	1.0
Black Cottonwood Forest	0.8
Arroyo Willow Thickets	2.3
Laurel Sumac Scrub	5.0
Coast Live Oak Woodland	5.9
Streams[1]	4.4
Total	**3,410**

Source: *Natural Environment Study* (2014).
[1] "Streams" is a non-vegetation cover type. The area for this cover type has been calculated in a way to ensure zero overlap with vegetation cover types.
BSA = Biological Study Area

represents 95 percent of the area in the BSA. Additional plant communities in the BSA are nonnative woodland, nonnative grassland, nonnative riparian woodland, wetland complex, giant reed semi-natural stand, white alder groves, black cottonwood forest, arroyo willow thickets, laurel sumac scrub, and coast live oak woodland. The white alder groves, black cottonwood forest, and arroyo willow thickets are all riparian communities and are collectively referred to as riparian nonwetland habitat throughout the section.

Disturbed/Developed

The disturbed/developed cover type includes all areas of existing urbanization in the BSA (e.g., buildings, residences, yards, gardens, ornamental landscaping, and road surfaces) and covers approximately 3,223.2 ac. These cover types have very low potential for rare or native plant occurrence. Even naturalized weedy pests are in low diversity under this cover type. This cover type also includes concrete-lined channels that provide little opportunity for plant establishment. Aquatic and moderately moist vegetation were present in these channels, but vegetation development was not complex enough to qualify for any alliance-level classification.

Nonnative Woodland

Nonnative woodland is a generalized cover type that includes several semi-natural vegetation communities that cover approximately 79.7 ac in the BSA. Vegetation communities in this cover type in the BSA consist of *Eucalyptus* (*E. globulus, E. camaldulensis*) semi-natural woodland stands (eucalyptus groves), *Schinus* (*S. molle, S. terebinthifolius*)–*Myoporum laetum* semi-natural woodland stands (pepper tree or *Myoporum* groves), and stands without formal alliance status, dominated by any of the following: Chinese elm (*Ulmus parvifolia*), blackwood (*Acacia melanoxylon*), Aleppo pine (*Pinus halepensis*), Canary Island pine (*Pinus canariensis*), Mexican fan palm (*Washingtonia robusta*), and rosewood (*Tipuana tipu*).

The nonnative woodland cover type is generally less maintained than the disturbed/developed cover type and has a higher diversity of plant species, although native plant diversity is still low. Native trees were often intermixed in these stands, including coast live oak (*Quercus agrifolia*) and velvet ash (*Fraxinus velutina*). An understory shrub layer was typically present, indicating a low level of maintenance. This cover type was predominantly found along the margins of existing freeways in the BSA.

Nonnative Grassland

Nonnative grassland is a generalized cover type that includes several semi-natural vegetation communities. The nonnative grassland cover type covers approximately 85.8 ac in the BSA. Vegetation communities in this cover type in the BSA consist of *Bromus* (*B. diandrus, B. hordeaceus*)–*Brachypodium distachyon* semi-natural stands (annual brome grassland), *Lolium perenne* semi-natural stands (perennial rye grassfields), *Avena* (*A. barbata, A. fatua*) semi-natural stands (wild oats grasslands), *Brassica* (*B. nigra*) and other mustards semi-natural stands (upland mustards), and *Centaurea* (*C. solstitialis, C. melitensis*) semi-natural stands (yellow starthistle fields).

The nonnative grassland cover type is generally less maintained than the disturbed/developed cover type, although broad areas of it are generally found to be mowed late in the season for fire abatement. Naturalized species are in relative abundance in nonnative grassland fields, and native plants are often intermixed in small numbers. This cover type was predominantly found along the margins of existing freeways in the BSA. Rare plants can be present in this cover type; however, the landscape in the BSA is highly modified (e.g., along the banks of freeways), and the native soil and associated seed bank required for the presence of rare plants are likely absent.

Nonnative Riparian Woodland

Nonnative riparian woodland is a generalized cover type representing areas dominated by trees that occur in the riparian zone. Riparian habitats typically have higher biological productivity than nonriparian habitats and often have high habitat value for plants and wildlife. No recognized semi-natural communities occur in this cover type in the BSA. In the BSA, this cover type is dominated by an overstory of Mexican fan palm and is not regularly maintained. This cover type covers approximately 0.5 ac and occurs streamside in the south end of the BSA, along the Laguna Channel. Rare plants can be present in this cover type; however, the landscape in the BSA is highly modified, and the native soil and associated seed bank of rare plants are likely absent.

Wetland Complex

Wetland complex is a generalized cover type that includes several vegetation communities associated with wetland and riparian areas. The wetland complex cover type covers 1.5 ac in the BSA. As a riparian habitat, it typically has higher biological productivity than nonriparian habitats and high habitat value for plants and wildlife. Vegetation communities under this cover type in the BSA include *Typha* species (*T. angustifolia, T. domingensis, T. latifolia*), herbaceous alliances (cattail marshes), *Lolium perenne* semi-natural herbaceous stands (perennial rye grass fields), *Distichlis spicata* herbaceous alliance (salt grass flats), arroyo willow thickets, giant reed semi-natural herbaceous stands, and *Echinochloa* undetermined semi-natural stands (barnyard grass marshes).

The vegetation communities in the wetland complex cover type are usually associated with periodic flooding and are found in low-lying areas such as swales, ditches, and along low-gradient streams and channels. Both the landscape features and the presence of water can be either naturally occurring or the result of human activities. This cover type occurs in the BSA at an isolated manmade wetland (1.09 ac) associated with the Del Mar Pump Station and abutting the Laguna Channel (0.44 ac) at its southernmost location in the BSA. Vegetation communities at the Del Mar Pump Station include cattail marshes, perennial rye grass fields, salt grass flats, arroyo willow thickets, and barnyard grass marshes. Vegetation communities in the wetland at the Laguna

Channel include cattail marshes, arroyo willow thickets, giant reed breaks, and barnyard grass marshes. The native-dominated vegetation communities at both sites (cattail marsh, salt grass flats, and arroyo willow thicket) were all smaller than the minimum mapping unit of 0.1 ac and therefore were pooled into the wetland complex cover type. Rare plants can be present in this cover type; however, the landscape in the BSA is highly modified (e.g., along the banks of freeways), and the native soil and associated seed bank required for the presence of rare plants are likely absent.

Giant Reed Semi-Natural Stands

Giant reed (*Arundo donax*) is a large and fast-growing member of the grass family that can reach heights of 25 ft. This semi-natural vegetation community is characterized by at least 75 percent cover of giant reed. In riparian settings, giant reed often grows in dense, virtually monotypic stands. This cover type covers approximately 0.2 ac along the Laguna Channel in the southern end of the BSA. Rare plants can be present in this cover type; however, few native species can compete effectively with giant reed. In the BSA, the native soil and associated seed bank required for the presence of rare plants are likely absent.

White Alder Groves

White alder (*Alnus rhombifolia*) is a deciduous hardwood tree that can grow to over 100 ft in height. In California, white alder stands are a riparian plant community that generally occurs in the inland foothills and lower montane zones as a narrow strip along river bottoms. Stands typically occur on seasonally flooded stream banks, but they can also occur on floodplains or permanently saturated seeps. Other co-dominant trees in the stands can include big leaf maple (*Acer macrophylla*), western sycamore (*Platanus racemosa*), and Fremont cottonwood (*Populus fremontii*).

In 2013, during the reconnaissance survey, approximately 1 ac stand of white alder groves was identified in the BSA under a bridge where State Route 134 (SR 134) crosses the Arroyo Seco in Pasadena. Although the majority of this vegetation stand occurs underneath the wide SR 134 overpass, sunlight penetration appears to be adequate to maintain this riparian system. The Arroyo Seco here is not channelized in concrete, and a moderate riparian understory is present, including some of the following species: California rose (*Rosa californica*), mugwort (*Artemisia douglasiana*), and mulefat (*Baccharis salicifolia*). There is also a large component of nonnative species here that degrades habitat quality, including eupatory (*Ageratina adenophora*), cape ivy (*Delairea odorata*), veldtgrass (*Ehrharta erecta*), and smilo grass (*Stipa miliacea*). An additional survey was conducted in 2017 and only one white alder was identified.

Black Cottonwood Forest

Black cottonwood (*Populus trichocarpa*) is one of two species of cottonwood that commonly occur in riparian areas in Southern California. It is a fast-growing tree that can grow to over 150 ft in height. In California, black cottonwood forest is generally found in montane elevations or outer coastal regions but is replaced by Fremont cottonwood forests in hotter and drier climates. Like white alder groves, this is a riparian plant community. Other riparian trees that can be associated with this plant community can include Fremont cottonwood, willows (*Salix* sp.), and western sycamore.

Approximately 0.8 ac of black cottonwood forest was mapped in the BSA north of where SR 134 crosses the Arroyo Seco in Pasadena. This plant community abuts and intergrades with the white alder grove to the south. The river here is not channelized in concrete, and other riparian vegetation is present, including arroyo willow and white alder.

Arroyo Willow Thicket

Arroyo willow is a tall riparian shrub or tree that can grow to approximately 25 ft in height. In California, arroyo willow thickets occur in seasonally or intermittently flooded locations, which include riparian areas. This plant community can be dominated by arroyo willow growing as trees or shrubs. Other riparian trees that can be associated with this plant community can include black cottonwood and western sycamore.

Approximately 2.3 ac of arroyo willow thicket were mapped in riparian areas in the BSA. The vegetation appeared to have been planted as part of the Arroyo Seco habitat restoration area and is relatively young. A diversity of other plants were detected within this area, including Southern California black walnut (*Juglans californica*), white alder, narrow-leaved willow (*Salix exigua*), coast live oak, rose (*Rosa* spp.), and western sycamore. Understory was sparse in some areas as a result of trail maintenance and foot traffic, and was mostly dominated by nonnative plants. The only stands of arroyo willow thickets in the BSA occurred south of where SR 134 crosses the Arroyo Seco. A manmade dam helps maintain the community north of the Colorado Street Bridge, and the community continues through the area where water has been diverted.

Laurel Sumac Scrub

Laurel sumac (*Malosma laurina*) is a large evergreen shrub that can grow to approximately 15 ft in height. In California, laurel sumac scrub is generally found on temperate slopes near the coast, and its extent is largely limited by its frost sensitivity. This species is often found to grow in steep slopes with shallow soils among California sagebrush (*Artemisia californica*), California brittlebush (*Encelia californica*), California buckwheat, and toyon (*Heteromeles arbutifolia*), among others.

Approximately 5 ac of laurel sumac scrub were mapped in the BSA. California buckwheat was found to dominate the interspaces among the large shrubbery, and the prevalence of California sagebrush, toyon, and California brittlebush was relatively low. The stands of laurel sumac scrub in the BSA were found on a steep slope west of the SR 134/Interstate 210 (I-210) interchange in Pasadena, both north and south of the Colorado Street Bridge.

Coast Live Oak Woodland

Coast live oak is a drought-tolerant evergreen tree that can grow over 50 ft in height. In California, stands of coast live oak woodland occur in a range of settings, from upland savannas to bottomlands and riparian forests. The plant association for this plant community in the BSA is the *Quercus agrifolia*/chaparral community, which is dominated by chaparral shrub species in the understory of coast live oak. Shrub and herbaceous layers are sparse to intermittent, and chaparral species for this association include species that are more evergreen than typical coastal sage scrub species. Chaparral species can include California buckwheat, toyon, chamise (*Adenostoma fasciculatum*), and sugarbush (*Rhus ovata*).

Approximately 5.9 ac of coast live oak woodland were mapped in the BSA. Stands were present in the BSA where SR 134 crosses the Arroyo Seco. This community typically dominated areas between the riparian plant communities and more upland areas such as nonnative grasslands and laurel sumac scrub.

Streams

The streams cover type is a generalized non-vegetation cover type that includes flowing streams present within the BSA. This cover type includes water channels that are concrete-lined and provide little opportunity for plant establishment. Aquatic and mesic vegetation were present in these channels, but vegetation development was not complex enough to qualify for any alliance-level classification. This cover type also included earthen bottom streams.

The streams cover type comprises 4.4 ac of the BSA and consists of the Arroyo Seco and the Laguna Channel. The Arroyo Seco is an 80 ft wide, usually shallow stream with an earthen bottom that drains into the Los Angeles River and then into the Pacific Ocean. The Laguna Channel, which is also a tributary of the Los Angeles River, is mostly channelized in a concrete-lined box channel in the BSA. The only earthen bottom portion is associated with an abutting wetland.

3.16.2.3 Sensitive and Natural Communities of Special Concern

The California Department of Fish and Wildlife (CDFW) designates certain natural communities as being of special concern based on a State rarity ranking of S1 (the rarest), S2, or S3. Based on the CDFW designations, black cottonwood forest is the only natural community of special concern in the BSA, with a State ranking of S3. Riparian communities and habitats may be regulated by CDFW and would be addressed during State regulatory permitting under Fish and Game Code Section 2081 (California Endangered Species Act [CESA] permitting) or under Fish and Game Code Section 1600 for Lake and Streambed Alteration Agreement (SAA) permitting if CDFW determines jurisdiction over the resource.

Additional natural communities and habitats are considered sensitive based on other criteria and merit consideration when evaluating the potential impacts of projects on the environment as required by the California Environmental Quality Act (CEQA). The BSA contains small areas (less than 6 ac) of three other sensitive natural communities: coast live oak woodland, riparian wetland and nonwetland habitats (white alder groves and arroyo willow thickets), and black cottonwood forest. The only other identified area of natural vegetation included small areas of laurel sumac scrub.

3.16.2.4 Migration Corridors

There are no known migration corridors or wildlife linkages in the BSA; however, the area likely serves as a stopover site during bird migration. Trees and other vegetation in the BSA provide potential foraging and roosting sites for migrating birds, as do the trees and vegetation in the surrounding area. For example, some birds observed during focused avian surveys (e.g., California gull [*Larus californicus*], Townsend’s warbler [*Setophaga townsendii*], Vaux’s swift [*Chaetura vauxi*], and Wilson’s warbler [*Cardinella pusilla*]) were presumed to be using the project area during migration because the BSA does not overlap with their breeding grounds.

Historically, the Los Angeles River Watershed served as habitat for the federally endangered steelhead salmon (*Oncorhynchus mykiss*). However, due to the dramatic population decline of this species, as well as river modifications such as channelization and alterations associated with flood control and metropolitan development, it is very unlikely that the species is present in the BSA.

3.16.2.5 Significant Ecological Areas

There are no designated Significant Ecological Areas (SEAs) in the BSA. SEAs are identified as ecologically important land and water systems designated by the County of Los Angeles. The nearest SEAs are: the Puente Hills (approximately 2.5 mi to the east), Griffith Park (approximately 6 mi to the west), the Verdugo Mountains (approximately 4.3 mi to the northwest), the Altadena Foothills and Arroyos Proposed SEA (approximately 1.3 mi to the north), and the San Gabriel Canyon (approximately 8 mi to the northeast).

3.16.2.6 Natural Community Conservation Plan and Habitat Conservation Plan in BSA

The BSA and study area are within areas that are largely developed. There is no Natural Community Conservation Plan (NCCP), Habitat Conservation Plan (HCP), or any other approved local, regional, or State HCP located within or adjacent to the BSA.

3.16.3 Environmental Consequences

3.16.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any impacts related to natural communities associated with improvements in the Build Alternatives.

Build Alternatives

As shown in Table 3.16.2, the Build Alternatives would not result in direct or indirect temporary impacts to sensitive natural communities or natural communities of concern (specifically, no impacts on riparian nonwetland, coast live oak woodland, laurel sumac scrub, and wetland complex). However, the Build Alternatives would result in temporary impacts on three nonsensitive plant communities (nonnative grassland, nonnative woodland, and disturbed/developed) as shown in Table 3.16.2 and discussed below.

TABLE 3.16.2:
Temporary Impacts to Plant Communities and Cover Types by Build Alternative

Plant Communities within the BSA	Impacts by Build Alternative (acres)				
	TSM/TDM	BRT	LRT	Freeway Tunnel	
				Single-Bore Design Variation	Dual-Bore Design Variation
Natural Plant Communities					
Riparian Nonwetland	0	0	0	0	0
Coast Live Oak Woodland	0	0	0	0	0
Laurel Sumac Scrub	0	0	0	0	0
Other Plant Communities					
Wetland Complex	0	0	0	0	0
Nonnative Grassland	0.3	0	2.1	2.9	2.2
Nonnative Woodland	0	0	8.0	<0.1	1.1
Disturbed/Developed	0.5	0.6	29.7	53.4	51.7
Total	**0.8**	**0.6**	**39.8**	**56.4**	**55.0**

Source: *Natural Environment Study* (2014).
BRT = Bus Rapid Transit LRT = Light Rail Transit
BSA = Biological Study Area TSM/TDM = Transportation System Management/Transportation Demand Management

TSM/TDM Alternative

There are no sensitive natural communities or natural communities of concern within the limit of disturbance of the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative. Therefore, the TSM/TDM Alternative would not result in any temporary impacts to sensitive natural communities or natural communities of concern in the BSA as shown in Table 3.16.2. The TSM/TDM Alternative would result in temporary impacts to nonsensitive nonnative grassland (0.3 ac) and disturbed/developed (0.5 ac) communities as shown in Table 3.16.2. Temporary indirect impacts of the TSM/TDM Alternative to nonnative grassland and disturbed/developed communities would include construction noise, dust, lighting, litter, and vibration as well as personnel and vehicles traveling to and from the project area.

BRT Alternative

There are no sensitive natural communities or natural communities of concern within the limit of disturbance of the Bus Rapid Transit (BRT) Alternative. Therefore, the BRT Alternative would not result in any temporary impacts to sensitive natural communities or natural communities of concern in the BSA as shown in Table 3.16.2. When combined with the TSM/TDM Alternative, the BRT Alternative does not temporarily affect any sensitive natural communities. The BRT Alternative would result in 0.6 ac of temporary impacts to nonsensitive disturbed/developed communities as well as the 0.8 ac of total temporary impacts from the TSM/TDM Alternative on plant communities as shown in Table 3.16.1. Temporary indirect impacts of the BRT Alternative to nonnative grassland and disturbed/developed communities would include construction noise, dust, lighting, litter, and vibration, as well as personnel and vehicles traveling to and from the project area.

LRT Alternative

As shown in Table 3.16.2, the Light Rail Transit (LRT) Alternative would not result in any direct temporary impacts to sensitive natural communities or natural communities of concern. The LRT Alternative would result in temporary impacts to nonsensitive plant communities as discussed below. When combined with the TSM/TDM Alternative, the LRT Alternative does not result in direct temporary effects to any sensitive natural communities or natural communities of concern.

The LRT Alternative is approximately 180 ft away from the southern riparian habitat north of Floral Drive and adjacent to I-710, which consists of wetland complex and arroyo willow thicket. Construction of the LRT Alternative could potentially result in indirect temporary impacts to this habitat that could include construction noise, dust, lighting, litter, and vibration as well as personnel and vehicles traveling to and from the project area. No other temporary impacts to natural communities would occur as a result of the construction of the LRT Alternative. When combined with the TSM/TDM Alternative, the LRT Alternative does not result in any greater temporary indirect effect on sensitive natural communities than identified for the LRT Alternative. The LRT Alternative would result in temporary impacts to 2.1 ac of nonnative grassland, 8.0 ac of nonnative woodland, and 29.7 ac of disturbed/developed communities, all nonsensitive plant communities, as well as 0.8 ac of total temporary impacts from the TSM/TDM Alternative on plant communities as shown in Table 3.16.1. Temporary indirect impacts of the LRT Alternative to nonnative woodland, nonnative grassland, and disturbed/developed communities would include construction noise, dust, lighting, litter, and vibration as well as personnel and vehicles traveling to and from the project area.

Freeway Tunnel Alternative

The conceptual design of the Freeway Tunnel Alternative was refined to avoid and/or minimize impacts to riparian habitats, including the northernmost section of the Laguna Channel, near the tunnel portal. As shown in Table 3.16.2, the Freeway Tunnel Alternative would not result in any direct temporary impacts to sensitive natural communities or natural communities of concern. The Freeway Tunnel Alternative would result in temporary impacts to nonsensitive plant communities as discussed below. When combined with the TSM/TDM Alternative, the Freeway

Tunnel Alternative does not result in direct temporary effects to any sensitive natural communities.

The Freeway Tunnel Alternative single-bore design variation would result in temporary impacts to 2.9 ac of nonnative grassland, less than 0.1 ac of nonnative woodland, and 53.4 ac of disturbed/developed communities, all of which are nonsensitive plant communities. The Freeway Tunnel Alternative dual-bore design variation would result in temporary impacts to 2.2 ac of nonnative grassland, 1.1 ac of nonnative woodland and 51.7 ac of disturbed/developed communities. In addition, the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would result in 0.8 ac of total temporary impacts from the TSM/TDM Alternative on plant communities as shown in Table 3.16.2. Temporary indirect impacts of the Freeway Tunnel Alternative to nonnative woodland, nonnative grassland and disturbed/developed communities would include construction noise, dust, lighting, litter, and vibration, as well as personnel and vehicles traveling to and from the project area.

Construction of the Freeway Tunnel Alternative could potentially result in indirect temporary impacts to riparian habitats consisting of white alder groves, black cottonwood forest, and arroyo willow thicket located underneath SR 134. Temporary indirect impacts may include construction noise, dust, lighting, litter, and vibration, as well as personnel and vehicles traveling to and from the project area. However, the riparian habitats in the BSA are not considered to be of high quality due to the presence of invasive species, high human disturbance (foot traffic, litter, etc.), and minimal signs of reproduction (few saplings, seedlings, etc.), which is typical in an urban environment. No other temporary impacts to natural communities are anticipated as a result of the construction of the Freeway Tunnel Alternative. When combined with the TSM/TDM Alternative, the Freeway Tunnel Alternative does not result in any greater temporary indirect effect on natural communities than identified for the Freeway Tunnel Alternative.

3.16.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any effects related to natural communities associated with improvements in the Build Alternatives.

Build Alternatives

The potential effects of the Build Alternatives to plant and cover type communities are shown in Table 3.16.3 and are discussed in the following sections.

TSM/TDM Alternative

As shown in Table 3.16.3, the TSM/TDM Alternative would not result in any permanent impacts to sensitive natural communities or natural communities of concern but would result in permanent impacts to 0.6 ac of nonnative grassland, less than 0.1 ac of nonnative woodland, and 0.7 ac of disturbed/developed communities, all of which are nonsensitive plant communities. Permanent direct impacts of the TSM/TDM Alternative on these communities would include loss of habitat. Permanent indirect impacts of the TSM/TDM Alternative on these communities would include increased noise, dust, lighting, litter, and vibration as well as increased foot and vehicular traffic after construction.

TABLE 3.16.3:
Permanent Impacts to Plant Community and Cover Types by Build Alternative

Plant Communities within the BSA	Permanent Impacts by Build Alternative (acres)				
	TSM/TDM	BRT	LRT	Freeway Tunnel Single-Bore Design Variation	Freeway Tunnel Dual-Bore Design Variation
Natural Communities					
Riparian Nonwetland	0	0	0	0	0
Coast Live Oak Woodland	0	0	0	0	0
Laurel Sumac Scrub	0	0	0	0	0
Other Plant Communities					
Wetland Complex	0	0	0	1.09	1.09
Nonnative Grassland	0.6	1.9	12.6	25.2	25.2
Nonnative Woodland	<0.1	0	3.9	31.6	32.4
Disturbed/Developed	0.7	123.8	93.6	244.9	244.9
Total	**1.4**	**126.0**	**110.0**	**303.0**	**304.0**

Source: *Natural Environment Study* (2014).
BRT = Bus Rapid Transit
BSA = Biological Study Area
LRT = Light Rail Transit
TSM/TDM = Transportation System Management/Transportation Demand Management

BRT Alternative

As shown in Table 3.16.3, the BRT Alternative would not result in any permanent impacts to sensitive natural communities or natural communities of concern. When combined with the TSM/TDM Alternative, the BRT Alternative does not result in any permanent effect on sensitive natural communities. The BRT Alternative would result in permanent impacts to 1.9 ac of nonnative grassland and 123.8 ac of disturbed/developed communities; both of which are nonsensitive plant communities. The BRT Alternative would also result in the permanent impacts from the TSM/TDM Alternative on 0.6 ac of nonnative grassland, less than 0.1 ac of nonnative woodland, and 0.7 ac of disturbed/developed communities. Permanent direct impacts of the BRT Alternative on these communities would include loss of habitat. Permanent indirect impacts of the BRT Alternative on these communities would include increased noise, dust, lighting, litter, and vibration as well as increased foot and vehicular traffic after construction.

LRT Alternative

As shown in Table 3.16.3, the LRT Alternative would not result in any permanent impacts to sensitive natural communities or natural communities of concern. When combined with the TSM/TDM Alternative, the LRT Alternative does not result in any permanent effect on sensitive natural communities. The LRT Alternative would result in permanent impacts on 12.6 ac of nonnative grassland, 3.9 ac of nonnative woodland, and 93.6 ac of disturbed/developed communities, all of which are nonsensitive plant communities. The LRT Alternative would also result in the permanent impacts from the TSM/TDM Alternative on 0.6 ac of nonnative grassland, less than 0.1 ac of nonnative woodland, and 0.7 ac of disturbed/developed communities. Permanent direct impacts of the LRT Alternative on these communities would include loss of habitat. Permanent indirect impacts of the LRT Alternative on these communities would include increased noise, dust, lighting, litter, and vibration as well as increased foot and vehicular traffic after construction.

Freeway Tunnel Alternative

As shown in Table 3.16.3, the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would each result in permanent impacts to approximately 1.09 ac of disturbed, low-quality, sensitive, natural wetland complex vegetation due to the removal and disturbance of vegetation at the Del Mar Pump Station. The riparian nonwetland habitats and riparian wetland habitats in this part of the BSA are not considered to be of high quality due to the presence of invasive species, high human disturbance (foot traffic, litter, etc.), and minimal signs of reproduction (few saplings, seedlings, etc.), which is typical in an urban environment.

No other permanent impacts to sensitive natural communities or natural communities of concern are anticipated under the Freeway Tunnel Alternative. When combined with the TSM/TDM Alternative, the Freeway Tunnel Alternative does not result in any greater permanent effect on natural communities than previously identified for the Freeway Alternative.

The single-bore and dual-bore design variations would each result in permanent impacts to 25.2 ac of nonnative grassland and 244.9 ac of disturbed/developed communities, and would result in permanent impacts to 31.6 ac and 32.4 ac of nonnative woodland, respectively. These three plant communities are not considered sensitive communities. Permanent direct impacts of the Freeway Tunnel Alternative on these communities would include loss of habitat. Permanent indirect impacts of the Freeway Tunnel Alternative on these communities would include increased noise, dust, lighting, litter, and vibration as well as increased foot and vehicular traffic after construction.

3.16.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures would avoid, minimize, and/or compensate for temporary and/or permanent impacts to natural communities, including riparian habitats (riparian wetland, nonriparian wetland, white alder groves, black cottonwood forest, arroyo willow thickets) and the wetland complex in the BSA.

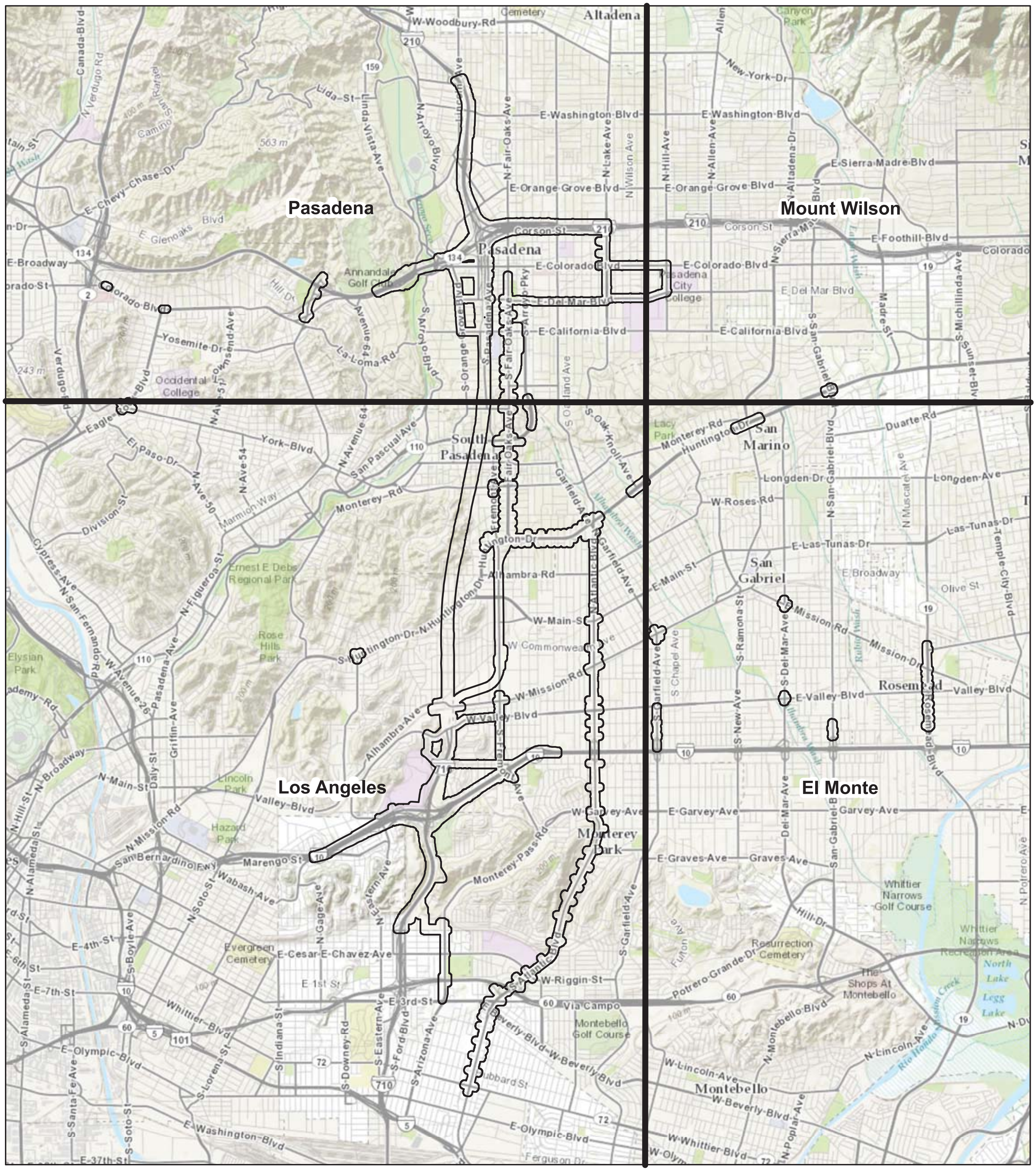
Measure NC-1 **Riparian/Riverine Habitat Protection (applies to the Freeway Tunnel Alternative):** Prior to any construction or ground-disturbing activities, the California Department of Transportation (Caltrans) will require the Construction Contractor to place a highly visible barrier such as Environmentally Sensitive Area (ESA) fencing or other marker around any riparian or riverine habitats to be preserved. No grading or fill activities will be authorized within the marked areas. No structures of any kind, or incidental storage of equipment or supplies, will be allowed within the marked areas. Silt fence barriers will be installed along the ESA boundary to prevent inadvertent deposition of fill in the ESAs.

Measure NC-2 **Construction Plan (applies to the Freeway Tunnel Alternative):** Caltrans will require the Construction Contractor to identify designated areas in developed or nonsensitive upland habitat areas on the construction plans for equipment maintenance, staging, fueling, and other related activities. Those areas will be selected such that spills and runoff would not enter riparian or riverine habitats or any fenced ESAs.

Measure NC-3 **Compliance Monitoring (applies to the Freeway Tunnel Alternative):** Caltrans will require the Construction Contractor to have a qualified biologist monitor on site during construction in the vicinity of riparian and riverine areas consistent with the Section 404 permit (refer to Measure WET-1) or Streambed Alteration Agreement (refer to Measure WET-2) issued for the project to ensure that all avoidance and minimization measures are properly applied and followed.

In addition to the measures described above for natural communities, the following measures would also protect natural communities:

- Measure WQ-1 in Section 3.9, Water Quality
- Measures WET-1, WET-2, and WET-3 in Section 3.17.4, Wetlands and Other Waters
- Measure IS-1 in Section 3.21, Invasive Species



LEGEND

7.5-minute Index

Biological Study Area

N

0 0.25 0.5 1 1.5

Miles

FIGURE 3.16-1

SR 710 North Project

Biological Study Area

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE:ESRI LSA (8/2013); Sapphos Environmental (9/2013)

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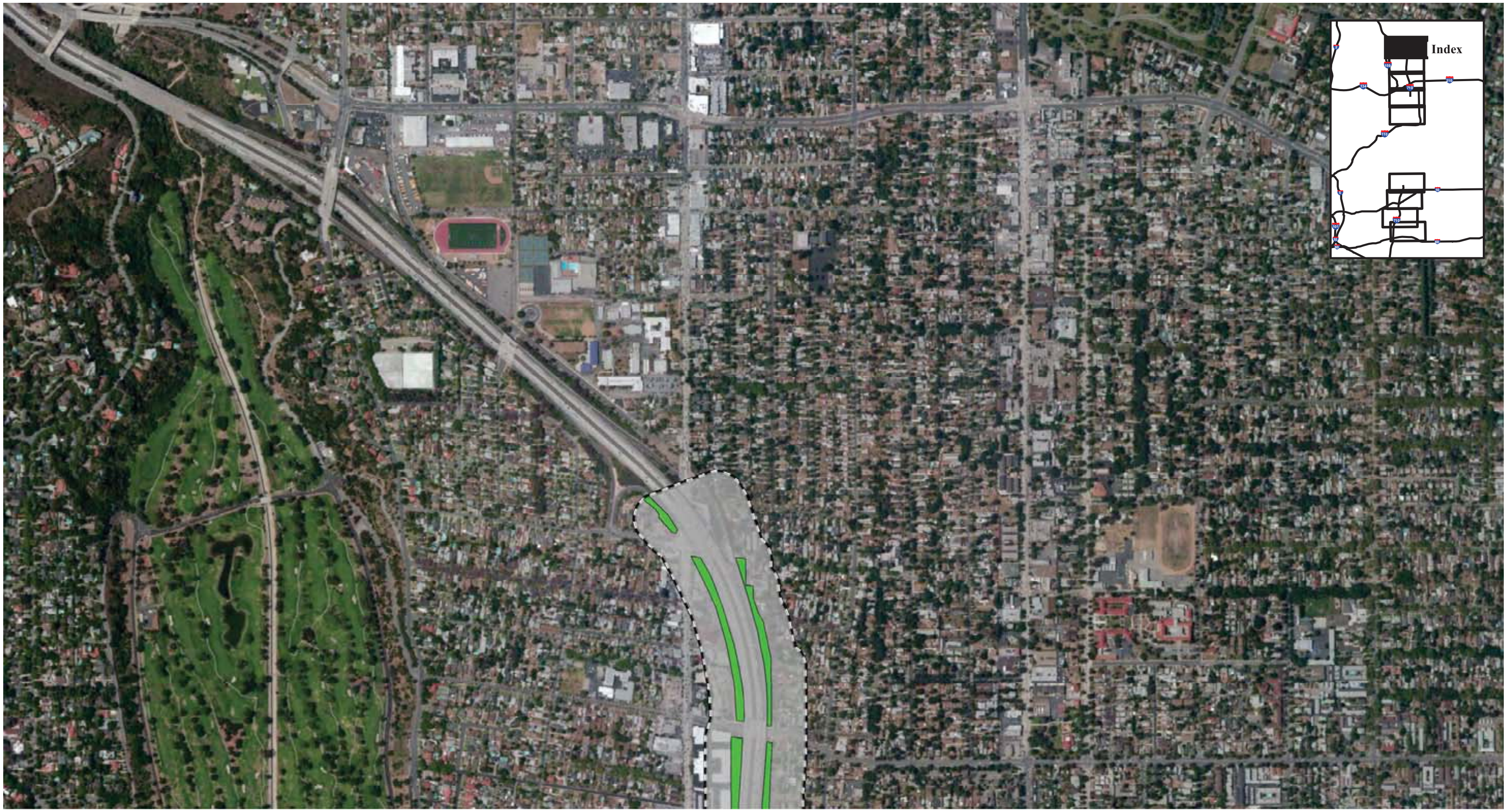

LEGEND

Stream

Biological Study Areas

Plant Communities

Arroyo Willow Thicket

Black Cottonwood Forest

Coast Live Oak Woodland

Disturbed/Developed

Giant Reed Breaks

Laurel Sumac Scrub

Non-Native Grassland

Non-Native Riparian Woodland

Non-Native Woodland

Wetland Complex

White Alder Groves

N

0 400 800 1600

Feet

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

FIGURE 3.16-2
Sheet 1 of 9

SR 710 North Project

Plant Communities

07-LA-710 (SR 710)
EA 187900
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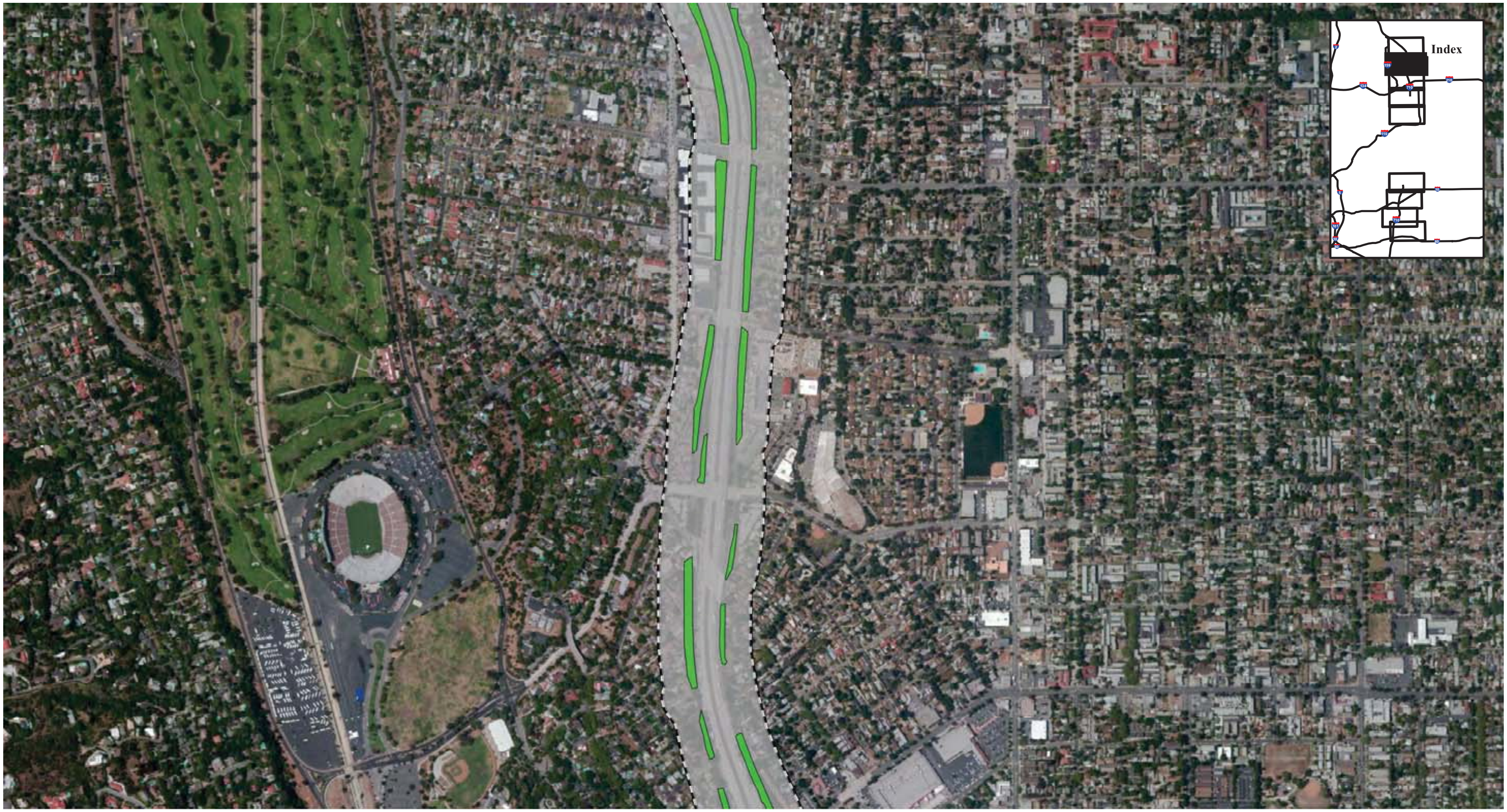

LEGEND

Stream

Biological Study Areas

Plant Communities

Arroyo Willow Thicket
Black Cottonwood Forest
Coast Live Oak Woodland
Disturbed/Developed
Giant Reed Breaks
Laurel Sumac Scrub
Non-Native Grassland
Non-Native Riparian Woodland
Non-Native Woodland
Wetland Complex
White Alder Groves

N

0 400 800 1600
Feet

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

FIGURE 3.16-2
Sheet 2 of 9

SR 710 North Project
Plant Communities
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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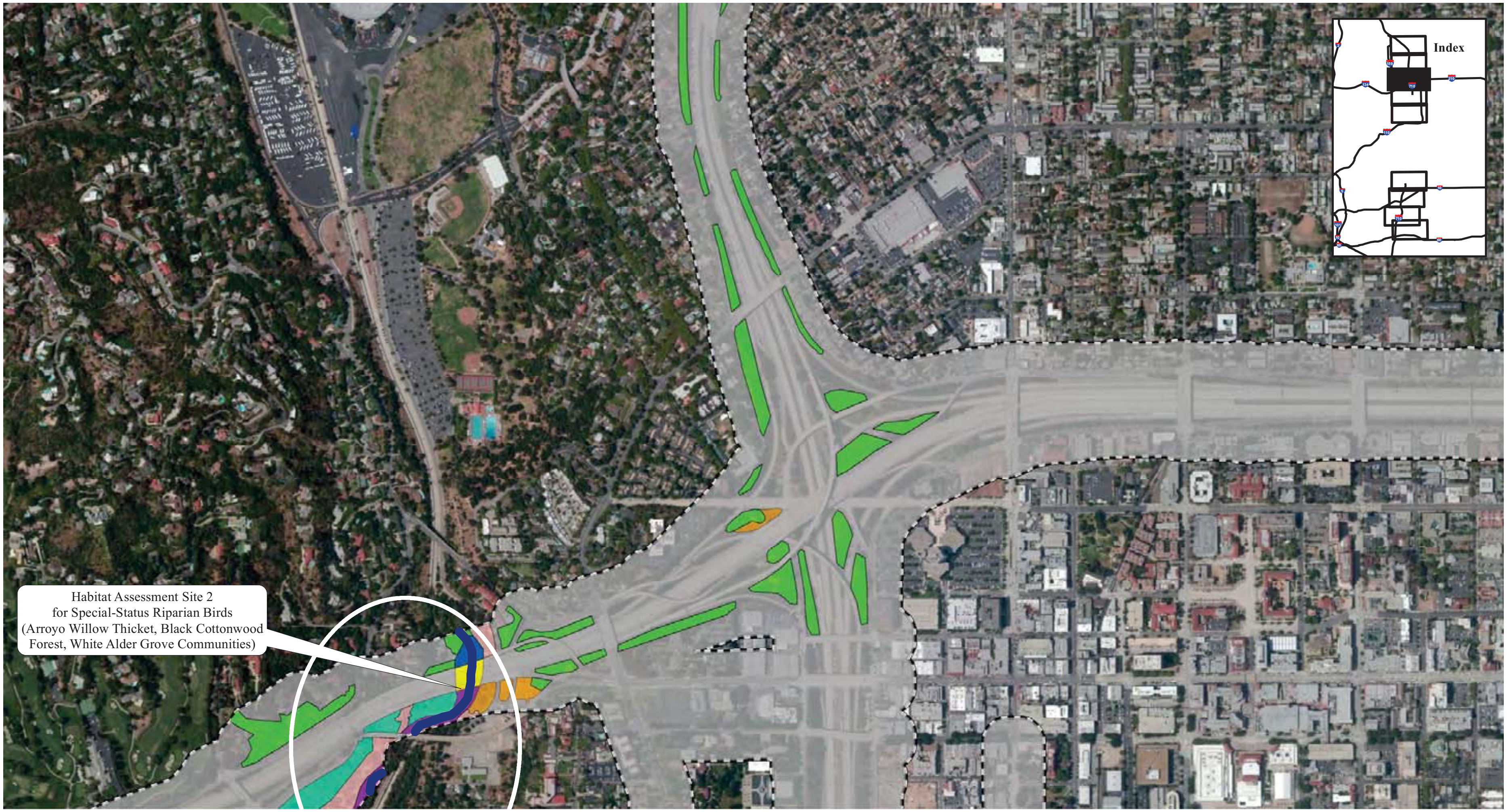

LEGEND

Stream

Biological Study Areas

Plant Communities

Arroyo Willow Thicket

Black Cottonwood Forest

Coast Live Oak Woodland

Disturbed/Developed

Giant Reed Breaks

Laurel Sumac Scrub

Non-Native Grassland

Non-Native Riparian Woodland

Non-Native Woodland

Wetland Complex

White Alder Groves

N

0 400 800 1600

Feet

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

FIGURE 3.16-2
Sheet 3 of 9

SR 710 North Project

Plant Communities

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

Stream

Biological Study Areas

Plant Communities

Arroyo Willow Thicket

Black Cottonwood Forest

Coast Live Oak Woodland

Disturbed/Developed

Giant Reed Breaks

Laurel Sumac Scrub

Non-Native Grassland

Non-Native Riparian Woodland

Non-Native Woodland

Wetland Complex

White Alder Groves

N

0 400 800 1600

Feet

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

FIGURE 3.16-2

Sheet 4 of 9

SR 710 North Project

Plant Communities

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

- Stream
- Biological Study Areas

Plant Communities

- Arroyo Willow Thicket
- Black Cottonwood Forest
- Coast Live Oak Woodland
- Disturbed/Developed
- Giant Reed Breaks
- Laurel Sumac Scrub
- Non-Native Grassland
- Non-Native Riparian Woodland
- Non-Native Woodland
- Wetland Complex
- White Alder Groves

N

0 400 800 1600
Feet

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

FIGURE 3.16-2
Sheet 5 of 9

SR 710 North Project
Plant Communities
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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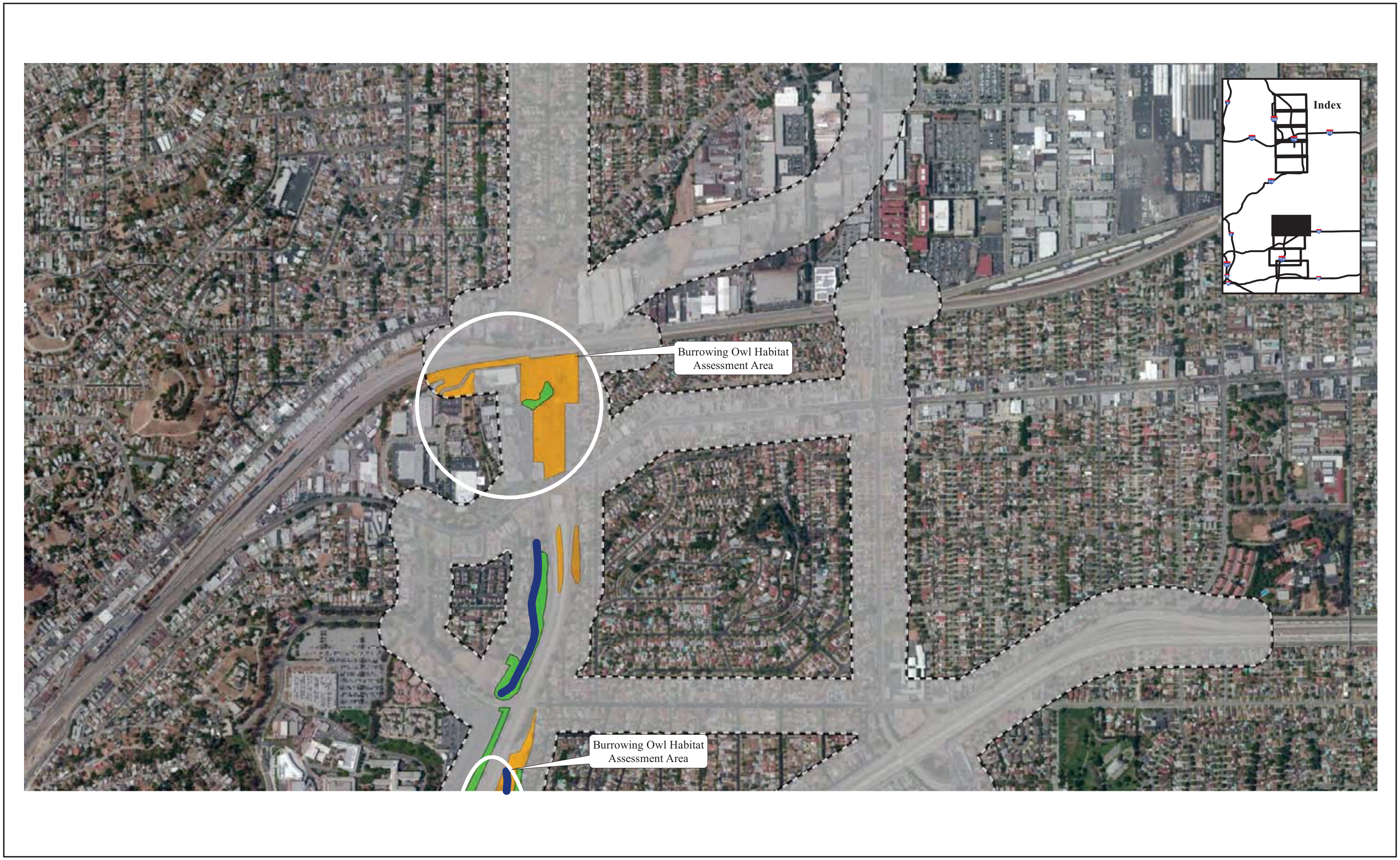

LEGEND

Stream

Biological Study Areas

Plant Communities

Arroyo Willow Thicket

Black Cottonwood Forest

Coast Live Oak Woodland

Disturbed/Developed

Giant Reed Breaks

Laurel Sumac Scrub

Non-Native Grassland

Non-Native Riparian Woodland

Non-Native Woodland

Wetland Complex

White Alder Groves

N

0 400 800 1600

Feet

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

FIGURE 3.16-2

Sheet 6 of 9

SR 710 North Project

Plant Communities

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

Stream

Biological Study Areas

Plant Communities

Arroyo Willow Thicket
Black Cottonwood Forest
Coast Live Oak Woodland
Disturbed/Developed
Giant Reed Breaks
Laurel Sumac Scrub
Non-Native Grassland
Non-Native Riparian Woodland
Non-Native Woodland
Wetland Complex
White Alder Groves

N

0 400 800 1600

Feet

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

FIGURE 3.16-2

Sheet 7 of 9

SR 710 North Project

Plant Communities

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

- Stream
- Biological Study Areas

Plant Communities

- Arroyo Willow Thicket
- Black Cottonwood Forest
- Coast Live Oak Woodland
- Disturbed/Developed
- Giant Reed Breaks
- Laurel Sumac Scrub
- Non-Native Grassland
- Non-Native Riparian Woodland
- Non-Native Woodland
- Wetland Complex
- White Alder Groves

N

0 400 800 1600
Feet

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

FIGURE 3.16-2
Sheet 8 of 9

SR 710 North Project
Plant Communities
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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LEGEND

- Stream
- Biological Study Areas

Plant Communities

- Arroyo Willow Thicket
- Black Cottonwood Forest
- Coast Live Oak Woodland
- Disturbed/Developed
- Giant Reed Breaks
- Laurel Sumac Scrub
- Non-Native Grassland
- Non-Native Riparian Woodland
- Non-Native Woodland
- Wetland Complex
- White Alder Groves

N

0 400 800 1600
Feet

FIGURE 3.16-2
Sheet 9 of 9

SR 710 North Project
Plant Communities
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: Bing Maps (circa 2008); CH2MHill (5/2013); AECOM (4/2013)

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3.17 Wetlands and Other Waters

3.17.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b) (1) Guidelines (U.S. EPA 40 Code of Federal Regulations [CFR] Part 230), and whether permit approval is in the public interest. The Section 404 (b) (1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less Adverse Effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practical alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCB) and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see the Water Quality section for more details.

3.17.2 Affected Environment

This section is based on the *Natural Environment Study* (NES) (2014), the *Jurisdictional Delineation Report: U.S. Army Corps of Engineers* (2014; Appendix I in the NES), and the *Jurisdictional Delineation Report: Agencies of the State of California* (2014, Appendix J in the NES). Detailed discussions and maps of identified jurisdictional features are provided in Appendices I and J and summarized in this section.

The Biological Study Area (BSA) is inclusive of, and substantially larger than, all areas that may be directly impacted by the construction and/or operation of the Build Alternatives. The BSA was created to include an approximately 200-foot (ft) buffer around all the areas included in the limits of disturbance for the Build Alternatives. The 200 ft buffer was established to ensure adequate analysis of project impacts to biological resources and to accommodate possible future minor refinements to the design of the proposed Build Alternatives. At approximately 3,410 acres (ac), the BSA is substantially larger than the anticipated area where ground-disturbing permanent and temporary impacts may occur under the Build Alternatives. The acreage potentially affected by each Build Alternative are as follows: approximately 2 ac by the Transportation System Management/ Transportation Demand Management (TSM/TDM) Alternative, 126 ac by the Bus Rapid Transit (BRT) Alternative, 150 ac by the Light Rail Transit (LRT) Alternative, and 359 ac each by the Freeway Tunnel Alternative single-bore and dual-bore design variations. In some cases, the edge of the BSA is approximately 0.5 mile (mi) from the nearest temporary or permanent areas of impacts. All potential drainages, wetlands, and riparian areas in the BSA were evaluated in the literature review, field surveys, and identification of potential jurisdictional areas.

Field surveys were conducted throughout the BSA between April and October 2013. Based on that fieldwork, it was determined there are jurisdictional features, including wetland areas, in the BSA that are subject to the jurisdiction of the United States Army Corps of Engineers (USACE), CDFW, and RWQCB. A total of 27 potential drainages and wetlands were evaluated for the State Route 710 (SR 710) North Project. Table 3.17.1 lists these potential jurisdictional drainage features in the BSA and the acreages that are subject to USACE jurisdiction. Table 3.17.2 lists the potential jurisdictional drainage features in the BSA and the acreages that are subject to CDFW and/or RWQCB jurisdiction.

TABLE 3.17.1:
Drainages and Wetland Features in the BSA and USACE Jurisdictional Areas

Feature Description					USACE CWA Jurisdictional Area (acres)	
No.	**Type[1]**	**Description**	**OHWM[2] Width (ft)**	**Length (ft)**	**Non-wetland**	**Wetland**
1	Ditch	4 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	1,077	—	—
2	Ditch	4 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	1,231	—	—
3	Ditch	4 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	509	—	—
4	Ditch	Unnamed surface drainage; 5 ft wide; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	915	—	—
5-A	Stream	Arroyo Seco; 80 ft wide; earthen-lined; blue-line; riparian vegetation; no flowing water during survey; standing water at 1 ft depth on 10/4/13; drains to Los Angeles River.	80	1,076	1.98	—
5-B	Stream	Arroyo Seco alternate channel; 10 ft wide; earthen-lined; drains waters diverted from main channel of Arroyo Seco; flowing water present during visit on 10/4/13; originates from culvert at the northern end; flows into Arroyo Seco main channel.	10	287	0.07	—
7	Ditch	4 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	1,894	—	—
8	Wetland	At Del Mar Pump Station; up to 90 ft wide; earthen bottom; riparian vegetation present immediately around the pump station; isolated; does not flow into or have any connection to a TNW or TNW tributary. Excluded under CWA because it is a storm water treatment system.	—	—	—	—
9	Ditch	8 ft wide; concrete-lined cobble ditch; unvegetated; no OHWM or riparian/wetland characteristics; drains commercial runoff; does not flow into or have any connection to a TNW or TNW tributary.	—	89	—	—
10	Ditch	8 ft wide; concrete-lined ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	1,308	—	—
11-A	Stream	Laguna Channel; 20 ft wide; concrete-lined channel and rock-lined channel; blue-line; mostly unvegetated; drains surface water runoff, water flowing during all site visits; drains south into Los Angeles River.	20	1,419	0.65	—

TABLE 3.17.1:
Drainages and Wetland Features in the BSA and USACE Jurisdictional Areas

Feature Description					USACE CWA Jurisdictional Area (acres)	
No.	**Type[1]**	**Description**	**OHWM[2] Width (ft)**	**Length (ft)**	**Non-wetland**	**Wetland**
12	Ditch	4 ft wide; concrete lined v-ditch; unvegetated; no OHWM or riparian/wetland characteristics; drains road and hillside runoff; does not flow into or have any connection to a TNW or TNW tributary.	—	920	—	—
13	Ditch	5 to 8 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	983	—	—
11-B	Stream	Laguna Channel; OHWM 10–24 ft wide; concrete bottom and riprap sides; drains south into Los Angeles River.	10-24	1,740	0.57	—
14	Detention Basin	Laguna Channel (Feature 11-B) runs the length of this detention basin in a north-south orientation; earthen bottom; no OHWM or riparian/wetland characteristics; terminus of ditch Feature 13; named the Laguna Regulating Basin; created as a flood control basin.	—	—	—	—
11-C	Stream	Laguna Channel; 12 ft wide; concrete-lined channel below grade; drains south into Los Angeles River.	12	189	0.05	—
11-D	Stream	Laguna Channel; 12 ft wide; concrete-lined open rectangular channel below grade; drains south into Los Angeles River.	12	170	0.05	—
15	Ditch	4 ft wide; concrete-lined v-ditch; unvegetated; no OHWM or riparian/wetland characteristics; drains hillside runoff; does not flow into or have any connection to a TNW or TNW tributary.	—	717	—	—
16	Ditch	3 ft wide; concrete-lined v-ditch; unvegetated; no OHWM or riparian/wetland characteristics; drains hillside runoff; does not flow into or have any connection to a TNW or TNW tributary.	—	528	—	—
17	Ditch	3 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	867	—	—
18	Ditch	Unnamed surface drainage; 5 to 25 ft wide; concrete- and earthen-lined ditch; native and nonnative vegetation; no OHWM or riparian/wetland characteristics; originates from commercial runoff and precipitation events; also received flows from Feature 19; water flowing during site visit (10/2/13); flows into Laguna Channel occasionally.	—	1,754	—	—
19	Ditch	Unnamed surface drainage; 4 ft wide; three separate, roughly parallel sections; concrete- and earthen-lined v-ditch; mostly unvegetated; no OHWM or riparian/wetland characteristics; drains hillside runoff into Feature 18 and then into Laguna Channel.	—	882	—	—
11-E	Stream	Laguna Channel; 18 ft wide; concrete-lined open rectangular channel below grade; drains south into Los Angeles River.	18	2,104	0.87	—

TABLE 3.17.1:
Drainages and Wetland Features in the BSA and USACE Jurisdictional Areas

Feature Description					USACE CWA Jurisdictional Area (acres)	
No.	**Type[1]**	**Description**	**OHWM[2] Width (ft)**	**Length (ft)**	**Non-wetland**	**Wetland**
20	Ditch	Unnamed surface drainage; 2 to 8 ft wide; concrete-lined ditches; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; flows drain into 12 ft wide concrete box channel; does not flow into or have any connection to a TNW or TNW tributary.	—	11,027	—	—
21	Ditch	5 to 25 ft wide; concrete-lined ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	1,100	—	—
11-F	Stream	Laguna Channel; 6 ft wide; earthen bottom; drains south into Los Angeles River; abutted by wetland (Feature 22) and riparian nonwetland woodland (Feature 23); surrounded by detention basin (Feature 24).	6	1,387	0.19	—
22	Wetland	Abuts Laguna Channel (Feature 11-F); riparian vegetation; surrounded by detention basin (Feature 24).	—	—	—	0.44
24	Detention Basin	Laguna Channel (Feature 11-F) runs the length of this detention basin in a north to south orientation; earthen bottom; no OHWM or riparian/wetland characteristics; surrounds Features 11-F, 22, and 23; outfall located to the south; created as a flood control basin.	—	—	—	—
25	Ditch	3 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	202	—	—
26	Ditch	3 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	645	—	—
27	Ditch	Unnamed surface drainage; 3 ft wide; drains hillside runoff; unvegetated; no OHWM or riparian/wetland characteristics; does not flow into or have any connection to a TNW or TNW tributary.	—	1,736	—	—
				Total	**4.43**[3]	**0.44**[3]

Source: *Jurisdictional Delineation Report: U.S. Army Corps of Engineers* (2014) (Appendix I in the *Natural Environment Study* [2014]).
Note: Features 6 and 23 are not listed in this table because they were used to label features that only have the potential to be considered jurisdictional by CDFW and/or the RWQCB. Because the scope of this table is limited to the potential jurisdiction of the USACE, these features are not shown in the table.

1 Features need an OHWM or wetland vegetation as an indicator of USACE jurisdiction. Features classified as ditches and detention basins that did not exhibit an OHWM or were not delineated as a wetlands under the USACE criteria.
2 USACE jurisdictional features would need an OHWM to be delineated as a wetland under the USACE criteria.
3 Sums vary due to rounding.

BSA = Biological Study Area
CDFW = California Department of Fish and Wildlife
CWA = Clean Water Act
ft = feet
OHWM = ordinary high water mark
RWQCB = Regional Water Quality Control Board
TNW = Traditional Navigable Water
USACE = United States Army Corps of Engineers

TABLE 3.17.2:
Drainages, Wetlands, and Riparian Features in the BSA and CDFW/RWQCB Jurisdictional Areas

Feature Description					Jurisdictional Area (acres)	
No.	**Type**	**Description**	**OHWM[1] Width (ft)**	**Length (ft)**	**CDFW**	**RWQCB**
1	Ditch	4 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	1,077	—	—
2	Ditch	4 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	1,231	—	—
3	Ditch	4 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	509	—	—
4	Ditch	Unnamed surface drainage; 5 ft wide; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	915	—	—
5-A	Stream	Arroyo Seco; 80 ft wide; earthen-lined; blue-line; riparian vegetation; no flowing water during survey; standing water at 1 ft depth on 10/4/13; drains to Los Angeles River; abutted by riparian nonwetland habitat; provides fish and wildlife habitat.	80	1,076	5.16	1.98
5-B	Stream	Arroyo Seco alternate channel; 10 ft wide; earthen-lined; drains waters diverted from main channel of Arroyo Seco; flowing water present during visit on 10/4/13; originates from culvert at the northern end; flows into Arroyo Seco main channel; abutted by riparian nonwetland habitat; provides fish and wildlife habitat.	10	287	1.01	0.07
7	Ditch	4 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	1,894	—	—
8	Wetland	At Del Mar Pump Station; up to 90 ft wide; earthen bottom; riparian vegetation present immediately around the pump station; isolated; provides fish and wildlife habitat.	—	—	—	—
9	Ditch	8 ft wide; concrete-lined cobble ditch; unvegetated; drains commercial runoff; does not provide fish habitat but does provide minimal wildlife habitat.	—	89	—	—
10	Ditch	8 ft wide; concrete-lined ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	1,308	—	—
11-A	Stream	Laguna Channel; 20 ft wide; concrete-lined channel and rock-lined channel; blue-line; mostly unvegetated; drains surface water runoff; water flowing during all site visits; drains south into Los Angeles River; provides fish habitat and minimal wildlife habitat.	20	1,419	0.65	0.65
12	Ditch	4 ft wide, concrete-lined v-ditch; unvegetated; drains road and hillside runoff; does not provide fish habitat but does provide minimal wildlife habitat.	—	920		
13	Ditch	5 to 8 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	983	—	—
11-B	Stream	Laguna Channel; OHWM 10–24 ft wide; concrete bottom and riprap sides; drains south into Los Angeles River; provides fish habitat and minimal wildlife habitat.	10-24	1,740	0.57	0.57

TABLE 3.17.2:
Drainages, Wetlands, and Riparian Features in the BSA and CDFW/RWQCB Jurisdictional Areas

Feature Description					Jurisdictional Area (acres)	
No.	**Type**	**Description**	**OHWM[1] Width (ft)**	**Length (ft)**	**CDFW**	**RWQCB**
14	Detention Basin	Surrounds Laguna Channel (Feature 11-B); earthen bottom; no OHWM or riparian/wetland characteristics; terminus of ditch Feature 13; named Laguna Regulating Basin; does not provide fish habitat but does provide minimal wildlife habitat.	—	—	—	—
11-C	Stream	Laguna Channel; 12 ft wide; concrete-lined channel below grade; drains south into Los Angeles River; provides fish habitat and minimal wildlife habitat.	12	189	0.05	0.05
11-D	Stream	Laguna Channel; 12 ft wide; concrete-lined open rectangular channel below grade; drains south into Los Angeles River; provides fish habitat and minimal wildlife habitat.	12	170	0.05	0.05
15	Ditch	4 ft wide; concrete-lined v-ditch; unvegetated; drains hillside runoff; does not provide fish habitat but does provide minimal wildlife habitat.	—	717	—	—
16	Ditch	3 ft wide; concrete-lined v-ditch; unvegetated; drains hillside runoff; does not provide fish habitat but does provide minimal wildlife habitat.	—	528	—	—
17	Ditch	3 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	867	—	—
18	Ditch	Unnamed surface drainage; 5 to 25 ft wide; concrete- and earthen-lined ditch; native and nonnative vegetation; originates from commercial runoff and precipitation events; also received flows from Feature 19; water flowing during site visit (10/2/13); flows into Laguna Channel occasionally; does not provide fish habitat but does provide minimal wildlife habitat.	—	1,754	—	—
19	Ditch	Unnamed surface drainage; 4 ft wide; three separate, roughly parallel sections; concrete- and earthen-lined v-ditch; mostly unvegetated; drains hillside runoff into Feature 18 and then into Laguna Channel; does not provide fish habitat but does provide minimal wildlife habitat.	—	882	—	—
11-E	Stream	Laguna Channel; 18 ft wide; concrete-lined, open rectangular channel below grade; drains south into Los Angeles River; provides fish habitat and minimal wildlife habitat.	18	2,104	0.87	0.87
20	Ditch	Unnamed surface drainage; 2 to 8 ft wide; concrete-lined ditch; drains hillside runoff; unvegetated; flows drain into 12 ft wide concrete box channel; does not provide fish habitat but does provide minimal wildlife habitat.	—	11,027	—	—
21	Ditch	5 to 25 ft wide; concrete-lined ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	1,100	—	—
11-F	Stream	Laguna Channel; 6 ft wide; earthen bottom; drains south into Los Angeles River; abutted by wetland (Feature 22) and riparian nonwetland woodland; surrounded by detention basin (Feature 24); provides fish habitat and minimal wildlife habitat.	6	1,387	0.98	0.19

TABLE 3.17.2:
Drainages, Wetlands, and Riparian Features in the BSA and CDFW/RWQCB Jurisdictional Areas

Feature Description					Jurisdictional Area (acres)	
No.	**Type**	**Description**	**OHWM[1] Width (ft)**	**Length (ft)**	**CDFW**	**RWQCB**
22	Wetland	Abuts Laguna Channel (Feature 11-F); riparian vegetation; surrounded by detention basin (Feature 24); does not provide fish habitat but does provide wildlife habitat.	—	—	0.44	0.44
24	Detention Basin	Laguna Channel (Feature 11-F) runs the length of this detention basin in a north-to-south orientation; earthen bottom; no OHWM or riparian/wetland characteristics; surrounds Features 11-F, 22, and 23; does not provide fish habitat but does provide minimal wildlife habitat; outfall located to the south; created as a flood control basin.	—	—	—	—
25	Ditch	3 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	202	—	—
26	Ditch	3 ft wide; concrete-lined v-ditch; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	645	—	—
27	Ditch	Unnamed surface drainage; 3 ft wide; drains hillside runoff; unvegetated; does not provide fish habitat but does provide minimal wildlife habitat.	—	1,736	—	—
				Total	**9.78**[2]	**4.87**[2]

Source: *Jurisdictional Delineation Report: Agencies of the State of California* (2014) (Appendix J in the *Natural Environment Study* [2014]).
[1] Features classified as ditches and detention basins did not exhibit an OHWM or riparian vegetation.
[2] Sums vary due to rounding.
BSA = Biological Study Area
CDFW = California Department of Fish and Wildlife
ft = feet
OHWM = ordinary high water mark
RWQCB = Regional Water Quality Control Board

As part of the jurisdictional delineation, analysis of the functions and values of the drainages in the project area was conducted. All wetlands and other waters have some degree of functionality, and no single wetland can perform all the functions considered below. The following functions are analyzed at low, moderate, or high value levels based on feature conditions. Each water feature category is analyzed in detail in Table 1 in Appendix M of the NES (2014) and is based on the following criteria:

- **Hydrologic Regime:** This function is the ability of a wetland or stream to absorb and store water below ground. The degree of this saturation is dependent on the soil composition and is affected by prior flooding events. For example, clay soils possess more pore space than sandy soils. However, the smaller pore size slows the rate at which water is absorbed and released; therefore, clay soil has a lower capacity to store water than sandy soils. The storage of water below ground allows for the fluctuation between anaerobic and aerobic conditions that benefits environmental conditions necessary for microbial cycling.
- **Flood Storage and Flood Flow Modification:** This function is determined based on the ability of a wetland or stream at which the peak flow in a watershed can be attenuated during major storm events and during peak domestic flows to take in surface water that may otherwise cause flooding. This is dependent on the size of the wetland or stream, the amount of water it can hold, and its location in the watershed. For instance, larger wetlands or streams that have a greater capacity to receive waters have a greater ability to reduce flooding. In addition, areas high in the watershed may have more ability to reduce flooding in downstream areas, but areas

lower in the watershed may have greater benefits to a specific area. Vegetation, shape, and the configuration of the wetland or stream may also affect flood storage by dissipating the energy of flows during flood events.

- **Sediment Retention:** Removal of sediment is the process that keeps sediments from migrating downstream. This is accomplished through the natural processes of sediment retention and entrapment. This function is dependent on the sediment load being delivered by runoff into the watershed. The vegetation, shape, and configuration of a wetland will affect sediment retention if water is detained for long durations, as would be the case with dense vegetation, a bowl-shaped watershed, or slow-moving water. This function would be demonstrated (i.e., high) if the turbidity of the incoming water is greater than that of the outgoing water.
- **Nutrient Retention and Transformation:** Nutrient cycling consists of two variables: uptake of nutrients by plants and detritus turnover, in which nutrients are released for uptake by plants downstream. Wetland systems in general are much more productive with regard to nutrients than upland habitats. The regular availability of water associated with the wetland or stream may cause the growth of plants (nutrient uptake) and associated detritivores and generate nutrients that may be used by a variety of aquatic and terrestrial wildlife downstream.
- **Toxicant Trapping:** The major processes by which wetlands remove nutrients and toxicants are by trapping sediments rich in nutrients and toxicants, absorption to soils high in clay content or organic matter, and nitrification and denitrification in alternating oxic and anoxic conditions. Removal of nutrients and toxicants is closely tied to the processes that provide for sediment removal.
- **Social Significance:** This is a measure of the probability that a wetland or stream will be used by the public because of its natural features, economic value, official status, and/or location. This includes being used by the public for recreational uses, such as boating, fishing, birding, walking, and other passive recreational activities. In addition, a wetland or stream used as an outdoor classroom, as a location for scientific study, or near a nature center would have a higher social significance standing.
- **Wildlife Habitat:** General habitat suitability is the ability of a wetland to provide habitat for a wide range of wildlife. Vegetation is a large component of wildlife habitat. As plant community diversity increases along with connectivity with other habitats, so does potential wildlife diversity. In addition, a variety of open water, intermittent ponding, and perennial ponding is also an important habitat element for wildlife.
- **Aquatic Habitat:** The ability of a wetland or stream to support aquatic species requires that there be ample food supply, pool and riffle complexes, and sufficient soil substrate. Food supply is typically in the form of aquatic invertebrates and detrital matter from nearby vegetation. Pool and riffle complexes provide a variety of habitats for species diversity as well as habitat for breeding and rearing activities. Species diversity is directly related to the complexity of the habitat structure.

Table 3.17.3 summarizes the existing functions and values of the jurisdictional water features in the Laguna Channel and the wetland at the Del Mar Pump Station.

TABLE 3.17.3:
Functions and Values of Laguna Channel and the Del Mar Pump Station

Feature Type	Feature Name	Feature Nos.	Hydrologic Regime	Flood Storage	Sediment Retention	Nutrient Retention	Toxicant Trapping	Social Significance	Wildlife Habitat	Aquatic Habitat
Stream	Laguna Channel	11	Low to Moderate	Low to Moderate	Low to Moderate	Low to Moderate	Low	Low to Moderate	Low	Moderate
Wetland	Del Mar Pump Station	8	Low	Low	Low	Low	Low	Low	Low	Low

Source: *Jurisdictional Delineation Report: Agencies of the State of California* (2014) (Appendix J of the *Natural Environment Study* [2014]).

3.17.2.1 USACE Jurisdiction

Two drainages, the Arroyo Seco and the Laguna Channel, are located in the BSA and identified as meeting the USACE criteria for jurisdiction. Both drainages drain directly into the Los Angeles River, a traditional navigable water, outside the BSA.

The Arroyo Seco is subject to USACE jurisdiction because it has relatively permanent waters that flow into the Los Angeles River, a traditional navigable water. The total acreage of the Arroyo Seco likely subject to USACE jurisdiction in the BSA is approximately 2 ac.

The Del Mar Pump Station is not subject to USACE jurisdiction because it was created as part of a storm water system that is considered to be a wastewater treatment facility (33 USC 1251 §218(a)) and is excluded from jurisdiction under Section 404 (33 CFR 328.3(b)(8)).

The Laguna Channel is a channelized drainage that includes both aboveground and belowground culvert segments in the BSA. The total acreage of the aboveground segments of the Laguna Channel in the BSA likely subject to USACE jurisdiction is approximately 2.8 ac (approximately 2.4 ac of nonwetland waters and 0.4 ac of wetlands). The belowground culvert segments of the Laguna Channel are not likely subject to USACE jurisdiction. The Laguna Channel runs through two different detention basins that are not under USACE jurisdiction because they were created as flood control features.

The total area of wetland and nonwetland areas meeting the criteria for USACE jurisdiction in the BSA is approximately 4.8 ac, of which 0.4 ac is wetlands and 4.4 ac are nonwetland waters of the United States. The locations of these waters are shown on Figures 3.17-1 and 3.17-2. (Please note that the figures cited in this section are provided following the last page of text in this section.)

3.17.2.2 CDFW Jurisdiction

All the areas identified as meeting the criteria for USACE jurisdiction also meet the criteria for CDFW jurisdiction.

The Arroyo Seco is subject to CDFW jurisdiction because it has a defined bed and bank. The total acreage of the Arroyo Seco likely subject to CDFW jurisdiction in the BSA is approximately 2 ac. Along the Arroyo Seco, one area consisting of nonwetland riparian vegetation (white alder groves, black cottonwood forest, and arroyo willow thicket) totaling approximately 4 ac was identified as meeting the criteria for CDFW jurisdiction.

The total acreage of the aboveground segments of the Laguna Channel likely subject to CDFW jurisdiction is approximately 3.6 ac (approximately 3.2 ac of nonwetland stream and adjacent nonwetland riparian habitat and 0.4 ac of wetlands and adjacent nonwetland riparian habitat). The belowground culvert segments of the Laguna Channel are not likely subject to CDFW jurisdiction as they do not provide habitat for wildlife species. The total area meeting the criteria for CDFW jurisdiction is approximately 9 ac, of which 4 ac are nonwetland waters. The locations of these waters are shown on Figures 3.17-3 and 3.17-4.

3.17.2.3 RWQCB Jurisdiction

All the areas meeting the criteria for CDFW jurisdiction, except for the nonwetland riparian vegetation areas (approximately 5 ac), meet the criteria for RWQCB jurisdiction. The RWQCB may or may not elect to assert jurisdiction over the wetland at the Del Mar Pump Station because it is an entirely manmade storm water facility that depends on actively pumped storm water to maintain existing conditions.

The total area potentially subject to RWQCB jurisdiction is approximately 4 ac of nonwetland waters. The locations of these waters are shown on Figures 3.17-3 and 3.17-4.

3.17.2.4 Nonjurisdictional

All the areas that do not fall under either the jurisdiction of the USACE, CDFW, or RWQCB are classified as nonjurisdictional and include those classified as ditches and detention basins. As such, nonjurisdictional features are excluded from rule by the USACE under Section 401 of the CWA, by the RWQCB under Section 404 of the CWA, or by CDFW due to the absence of lake or stream with habitat value for fish and wildlife.

The wetland at the Del Mar Pump Station (Feature 8) is excavated exclusively in uplands and depends on water actively pumped onto the site. The wetland contains suitable habitat for fish and wildlife is dominated by broadleaf cattain (*Typha latifolia*) and saltgrass (*Distichlis spicata*). Feature 8 is isolated and drains into the groundwater without a connection to streams or lakes. The Del Mar Pump Station detention basin, lacking bed, bank, and channel, does not fall under the jurisdiction of the 1600 Lake and Streambed Alteration Program.

Two associated detention basins (Features 14 and 24) were recorded along the Laguna Channel. One of the detention basins (Feature 14) had small amounts of opportunistic vegetation both above and below the ordinary high water mark (OHWM) (e.g., Mexican fan palm [*Washingtonia robusta*]), but there were no wetland indicators at this site or riparian habitat. The other detention basin (Feature 24) encompassed the main Laguna Channel (Feature 11-F), a small wetland buffering the channel itself (Feature 22), and riparian nonwetland habitat (Feature 23). At these locations, the Laguna Channel and wetland were considered jurisdictional. Neither detention basin was identified as jurisdictional due to the lack of wetland indicators, lack of relatively permanent waters, and lack of OHWM.

3.17.3 Environmental Consequences

The potential permanent and temporary impacts to nonwetland waters and wetland waters under USACE, CDFW, and RWQCB jurisdiction are summarized in Table 3.17.4 and discussed in detail in the following sections. As shown in Table 3.17.4, only the Freeway Tunnel Alternative would impact jurisdictional nonwetland waters. The TSM/TDM, BRT, and LRT Alternatives would not impact jurisdictional waters and therefore are not included in Table 3.17.4.

TABLE 3.17.4:
Jurisdictional Impacts of the Freeway Tunnel Alternative Design Variations

Design Variation[1]	Jurisdiction	Acres of Impacts				
		Nonwetland Waters		Wetland Waters		Riparian Habitats
		Permanent	Temporary	Permanent	Temporary	
Single Bore	USACE	0.06	0.02	0	0	NA
	CDFW	0.06	0.02	0	0	0
	RWQCB	0.06	0.02	0	0	NA
Dual Bore	USACE	0.51	0.22	0	0	NA
	CDFW	0.51	0.22	0	0	0
	RWQCB	0.51	0.22	0	0	NA

Source: *Natural Environment Study* (2014).
Note: The TSM/TDM, BRT, and LRT Alternatives are not listed in the table because those Build Alternatives would not result in any temporary or permanent impacts to nonwetland or wetland waters under USACE, CDFW, or RWQCB jurisdiction.
CDFW = California Department of Fish and Wildlife
NA = Not Applicable
RWQCB = Regional Water Quality Control Board
USACE = United States Army Corps of Engineers

The Preferred Alternative is the TSM/TDM Alternative and does not impact any State jurisdictional wetlands or any Federal or Regional jurisdictional drainages. Therefore, no standard permit (individual permit) would be required and Section 404(b)(1) requirements do not apply.

3.17.3.1 Temporary Impacts

As shown in Table 3.17.4, only the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would potentially have temporary impacts to jurisdictional nonwetland and wetland waters. Since none of the TSM/TDM improvements affect jurisdictional waters, there would be no additional impacts to waters with the TSM/TDM improvements included in the BRT, LRT, or Freeway Tunnel Alternatives. Therefore, the following discussion focuses on the potential temporary effects of the Freeway Tunnel Alternative.

No Build Alternative

The No Build Alternative does not include the construction any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any impacts related to wetlands and other waters associated with improvements in the Build Alternatives.

Freeway Tunnel Alternative

Temporary impacts include physical impacts from construction activities (e.g., grading and vegetation removal) that would cease once construction of that phase is complete. Temporary impacts will be restored, as necessary, through agency coordination and executed permits, including a Section 404 Dredge and Fill Permit, a Section 401 Water Quality Certification, and a Streambed Alteration Agreement. The single-bore design variation of the Freeway Tunnel Alternative would result in approximately 0.02 ac of temporary impacts to nonwetland waters under USACE, CDFW, and RWQCB jurisdiction, as shown on Figure 3.17-5. The dual-bore tunnel design variation of the Freeway Tunnel Alternative would result in approximately 0.2 ac of temporary impacts to nonwetland waters under USACE, CDFW, and RWQCB jurisdiction as shown on Figure 3.17-5. The single-bore and dual-bore design variations would not result in any temporary impacts to wetland waters under USACE, CDFW, or RWQCB jurisdiction.

3.17.3.2 Permanent Impacts

As shown in Table 3.17.4, only the single-bore and dual-bore design variations of the Freeway Tunnel Alternative would potentially have permanent impacts to nonwetland jurisdictional waters. Since none of the TSM/TDM improvements affect jurisdictional waters, there would be no additional impacts to waters with the TSM/TDM improvements included in the BRT, LRT, or Freeway Tunnel Alternatives. Therefore, the following discussion focuses on the Freeway Tunnel Alternative.

No Build Alternative

The No Build Alternative does not include the operation any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any impact related to wetlands and other waters associated with improvements in the Build Alternatives.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative would result in permanent impacts on waters of the United States as a result of widening, modifying, or otherwise improving drainages and culverts to accommodate the proposed improvements in this alternative. Permanent impacts include physical impacts caused by permanently filling jurisdictional areas from road widening and new structures. The single-bore design variation would result in approximately 0.06 ac of permanent nonwetland waters impacts under USACE, CDFW, and RWQCB jurisdiction at the Laguna Channel (Feature 11). The dual-bore design variation would result in approximately 0.5 ac of permanent nonwetland water impacts under USACE, CDFW, and RWQCB jurisdiction to the Laguna Channel (Feature 11). The potential impacts of the Freeway Tunnel Alternative on those waters are shown on Figure 3.17-5. The impacts of the Freeway Tunnel Alternative would not permanently alter the values and functions of those jurisdictional features, listed earlier in Table 3.17.3. The primary function of the identified features is the conveyance of urban runoff and storm water flows. As such, impacts from the Freeway Tunnel Alternative will not affect these functions and values of the jurisdictional features because they will continue to serve their primary function after construction of the project.

The Freeway Tunnel Alternative would result in permanent impacts on the Laguna Channel but would not impact the Arroyo Seco.

3.17.4 Avoidance, Minimization, and/or Mitigation Measures

The single-bore and dual-bore design variations of the Freeway Tunnel Alternative were refined during design development to avoid and minimize impacts to wetlands and other waters in the northernmost segment of the Laguna Channel, near the south tunnel portal. Additional design modifications to the Freeway Tunnel Alterative have resulted in avoidance of impacts to the Laguna Channel within the BSA.

The following measures would avoid, minimize and/or compensate for temporary and permanent impacts of the Freeway Tunnel Alternative on wetlands and other jurisdictional waters and are anticipated to offset those impacts such that there would be no net loss of those types of resources.

Measure WET-1 **United States Army Corps of Engineers (USACE) Section 404 Dredge and Fill Permit (applies to the Freeway Tunnel Alternative):** Areas identified as being under the jurisdiction of the USACE will be avoided wherever possible.

The California Department of Transportation (Caltrans) will obtain a Dredge and Fill Permit from the USACE if any USACE jurisdictional areas are to be impacted and prior to approval of Plans, Specifications, and Estimates (PS&E). The measures specified in the Dredge and Fill Permit would minimize temporary and permanent project impacts to drainages and habitats subject to USACE jurisdiction. In addition, commonly used Best Management Practices (BMPs) will be used to minimize project impacts. For streams, compensatory mitigation at a minimum 1:1 ratio would be required to meet the "no net loss" national goal. Compensatory measures may include restoration of previously existing waters, enhancement of the functions of existing waters, establishment of new waters, preservation of existing aquatic sites, participation in an in-lieu fee program, and/or participation in a mitigation bank approved by the USACE.

Measure WET-2

Streambed Alteration Agreement (SAA) (applies to the Freeway Tunnel Alternative): Areas identified as being under the jurisdiction of the California Department of Fish and Wildlife (CDFW) will be avoided wherever possible.

Caltrans will obtain an SAA from the CDFW under Section 1600 of the Department of Fish and Game Code if any CDFW jurisdictional areas are to be impacted and prior to approval of PS&E. The measures specified in the SAA would minimize temporary and permanent project impacts to drainages and habitats subject to CDFW jurisdiction. In addition, commonly used BMPs will be used to minimize project impacts. Those measures may include restoration of previously existing waters, enhancement of the functions of existing waters, establishment of new waters, preservation of existing aquatic sites, and/or participation in a mitigation bank approved by the CDFW.

Measure WET-3

Section 401 Water Quality Certification (applies to the Freeway Tunnel Alternative): Areas identified as being under the jurisdiction of the Regional Water Quality Control Board (RWQCB) will be avoided wherever possible.

Caltrans will obtain a Section 401 Water Quality Certification from the RWQCB if any RWQCB jurisdictional areas are to be impacted and prior to approval of PS&E. In addition, commonly used BMPs will be used to minimize project impacts. Compensatory mitigation may be identified to offset temporary and permanent impacts to RWQCB jurisdictional waters. The RWQCB has published preliminary draft compensatory mitigation requirements to ensure achievement of the RWQCB no net loss and long-term net gain policy for aquatic resources. Mitigation ratios would be determined in consultation with the RWQCB at the time of issuance of the certification. The measures specified in the Section 401 Water Quality Certification would minimize project impacts to drainages and habitats subject to RWQCB jurisdiction. Those measures may include restoration of previously existing waters, enhancement of the functions of existing waters, establishment of new waters, preservation of existing aquatic sites, and/or participation in a mitigation bank approved by the RWQCB.

The following measures described elsewhere in Chapter 3 would also provide protection and mitigation benefits to wetlands and other waters:

- Measures NC-1 through NC-3 provided in Section 3.17, Natural Communities
- Measures WQ-1 through WQ-6 provided in Section 3.9, Water Quality and Storm Water Runoff
- Measure IS-1 provided in Section 3.21, Invasive Species

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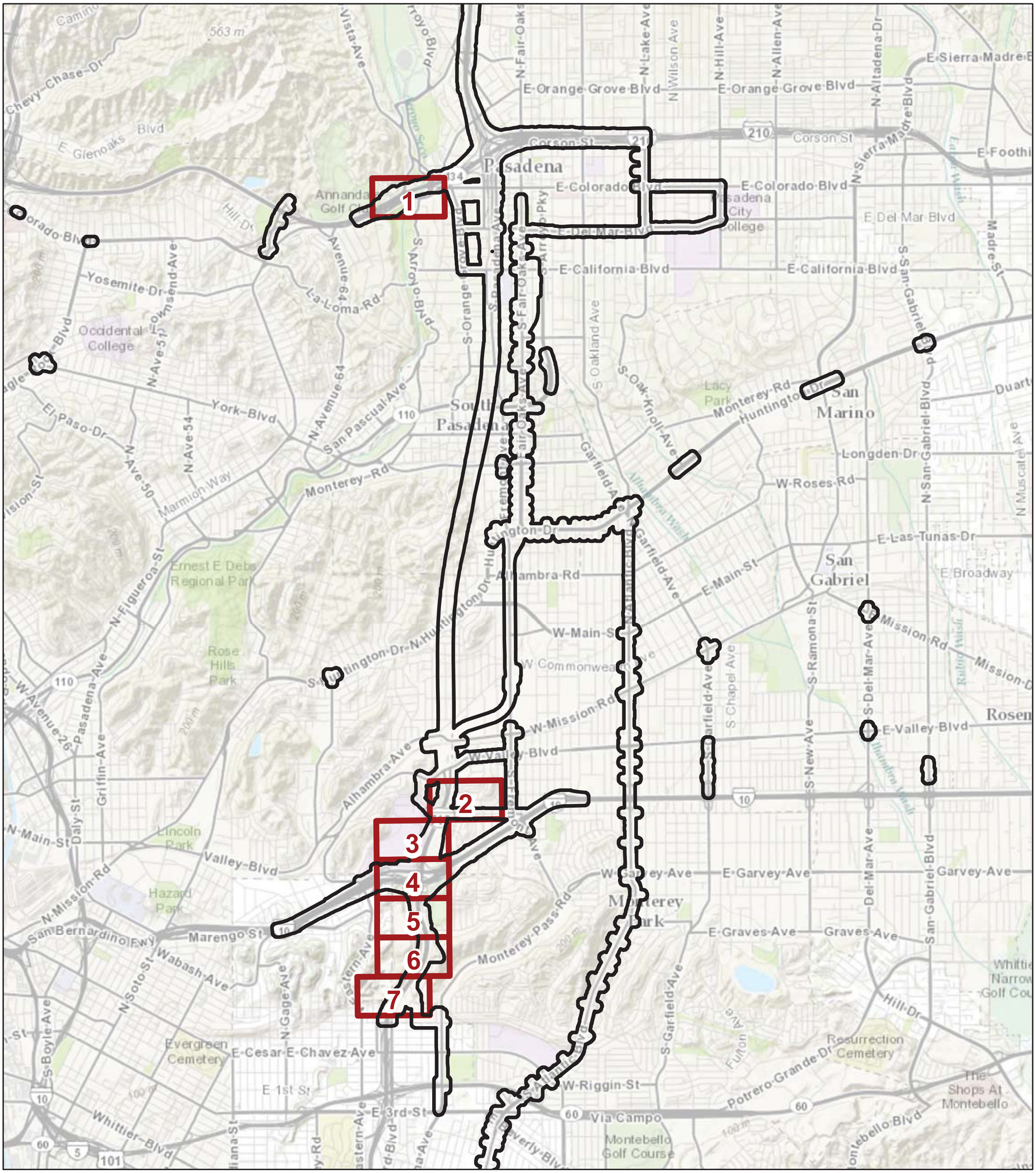

FIGURE 3.17-1

LEGEND

Biological Study Area

Extent Boxes

N

0 0.25 0.5 1 1.5

Miles

SR 710 North Project

Extent Indicators for Potential
USACE Jurisdictional Features Map

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE:ESRI LSA (8/2013); Sapphos Environmental (9/2013); California InterAgency Watershed Map (1999)

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LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

USACE Jurisdiction

Non-Wetland

Wetland

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-2
Sheet 1 of 7

SR 710 North Project

Potential USACE Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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N

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

USACE Jurisdiction

Non-Wetland

Wetland

FIGURE 3.17-2

Sheet 2 of 7

SR 710 North Project

Potential USACE Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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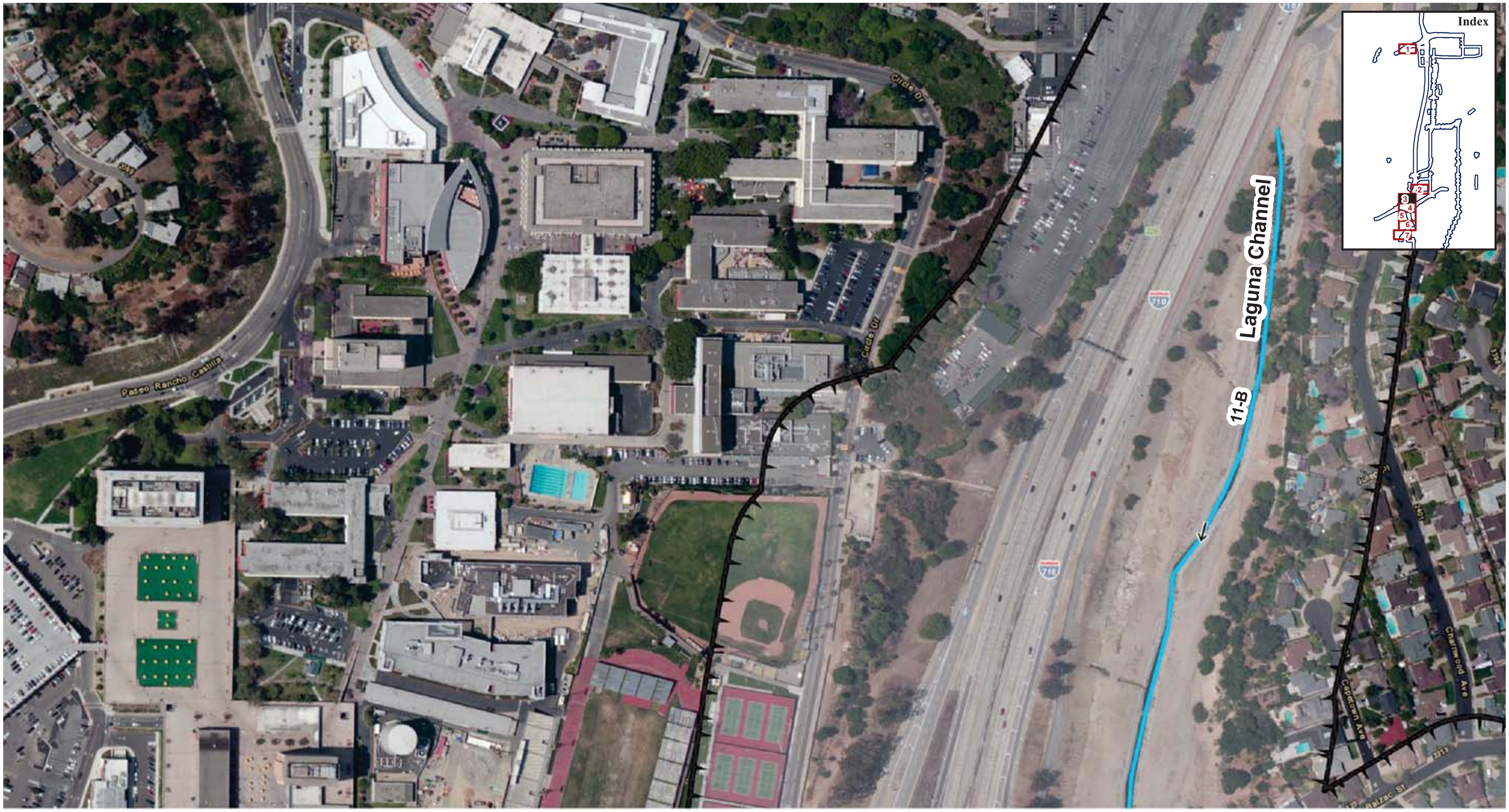

N

0 50 100 200 400
Feet

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

USACE Jurisdiction

Non-Wetland

Wetland

FIGURE 3.17-2
Sheet 3 of 7

SR 710 North Project
Potential USACE Jurisdictional Features
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

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LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

USACE Jurisdiction

Non-Wetland

Wetland

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-2

Sheet 4 of 7

SR 710 North Project

Potential USACE Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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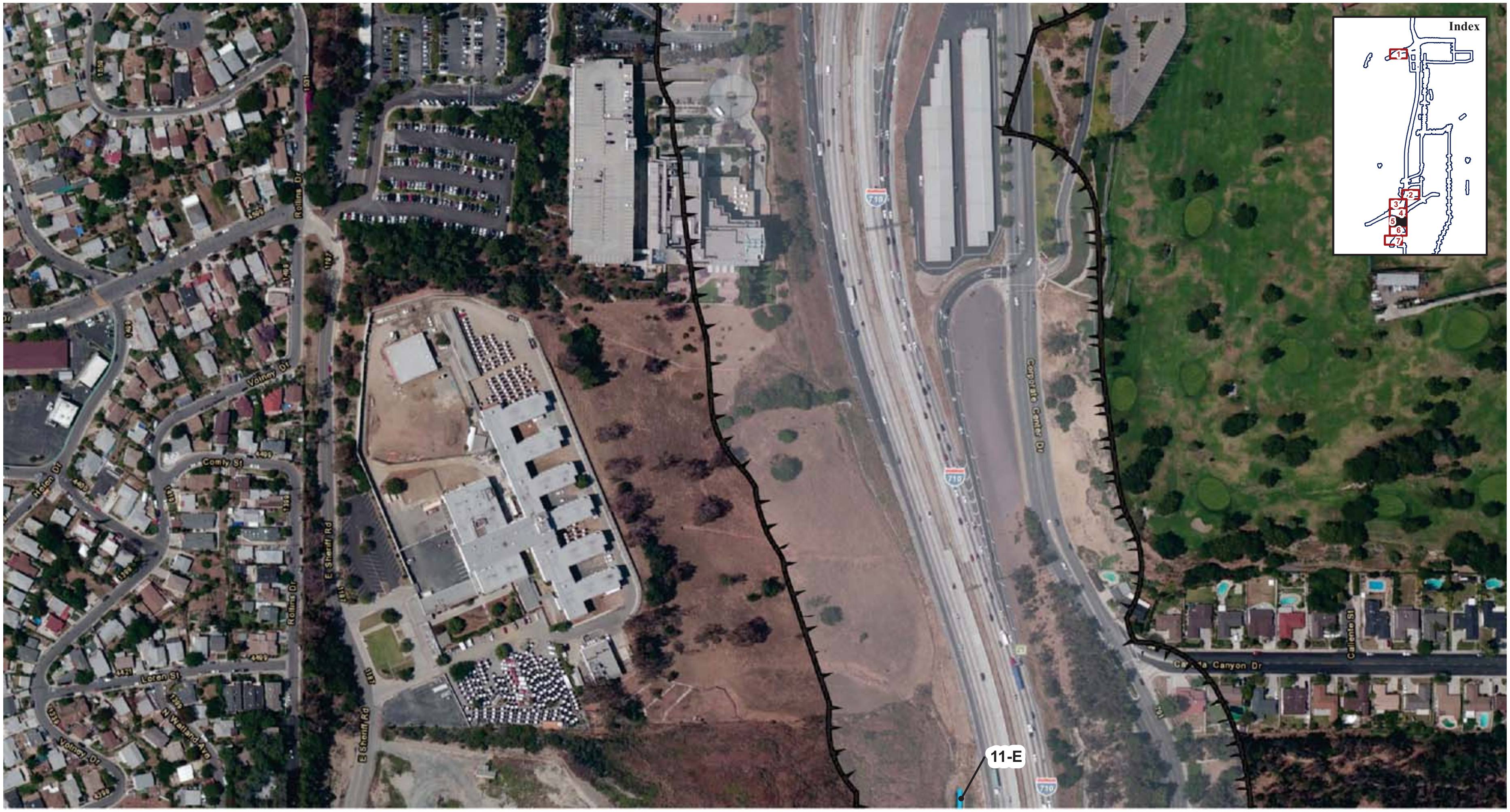

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

USACE Jurisdiction

Non-Wetland

Wetland

N

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-2
Sheet 5 of 7

SR 710 North Project

Potential USACE Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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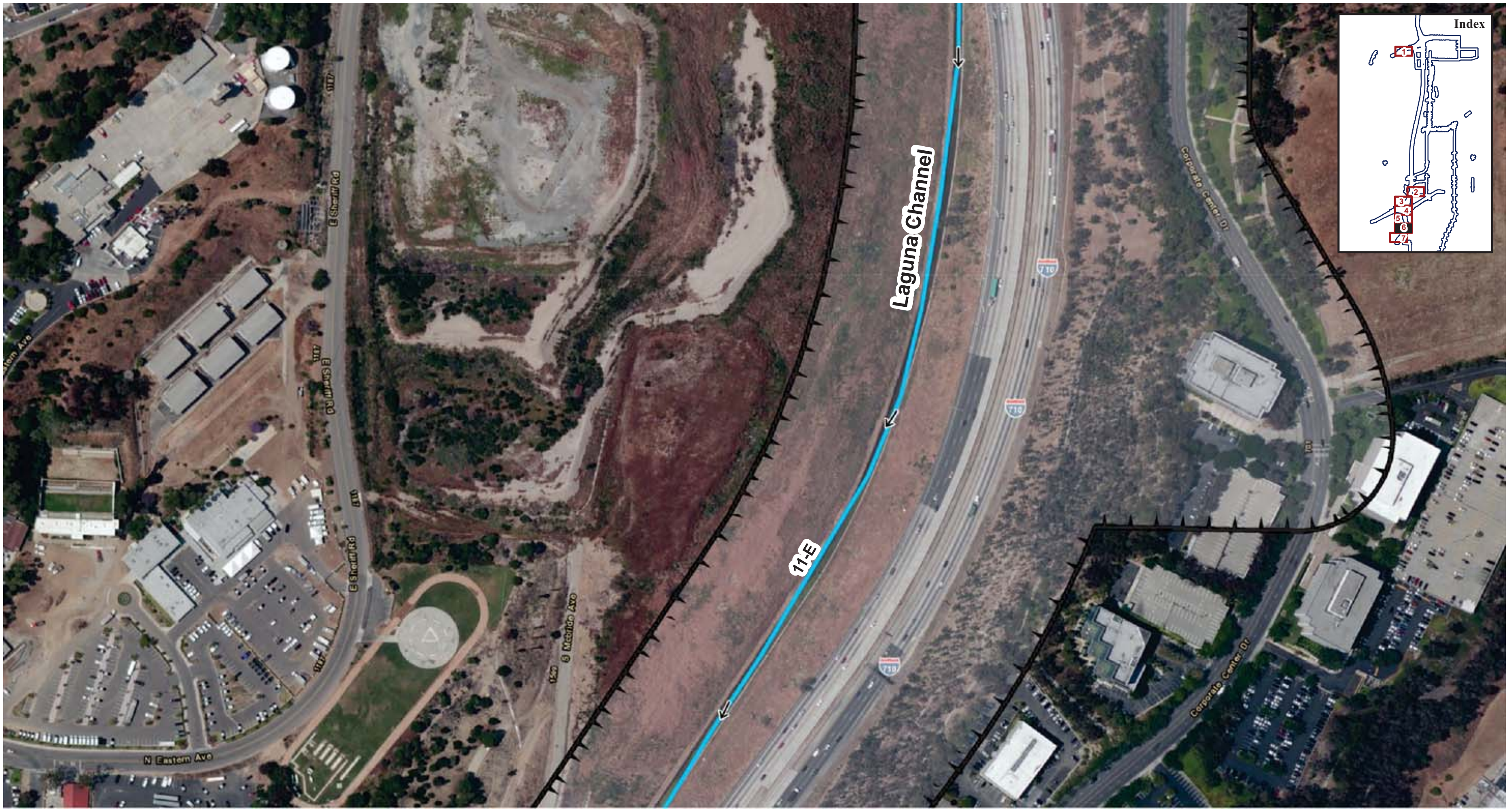

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

USACE Jurisdiction

Non-Wetland

Wetland

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-2
Sheet 6 of 7

SR 710 North Project

Potential USACE Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

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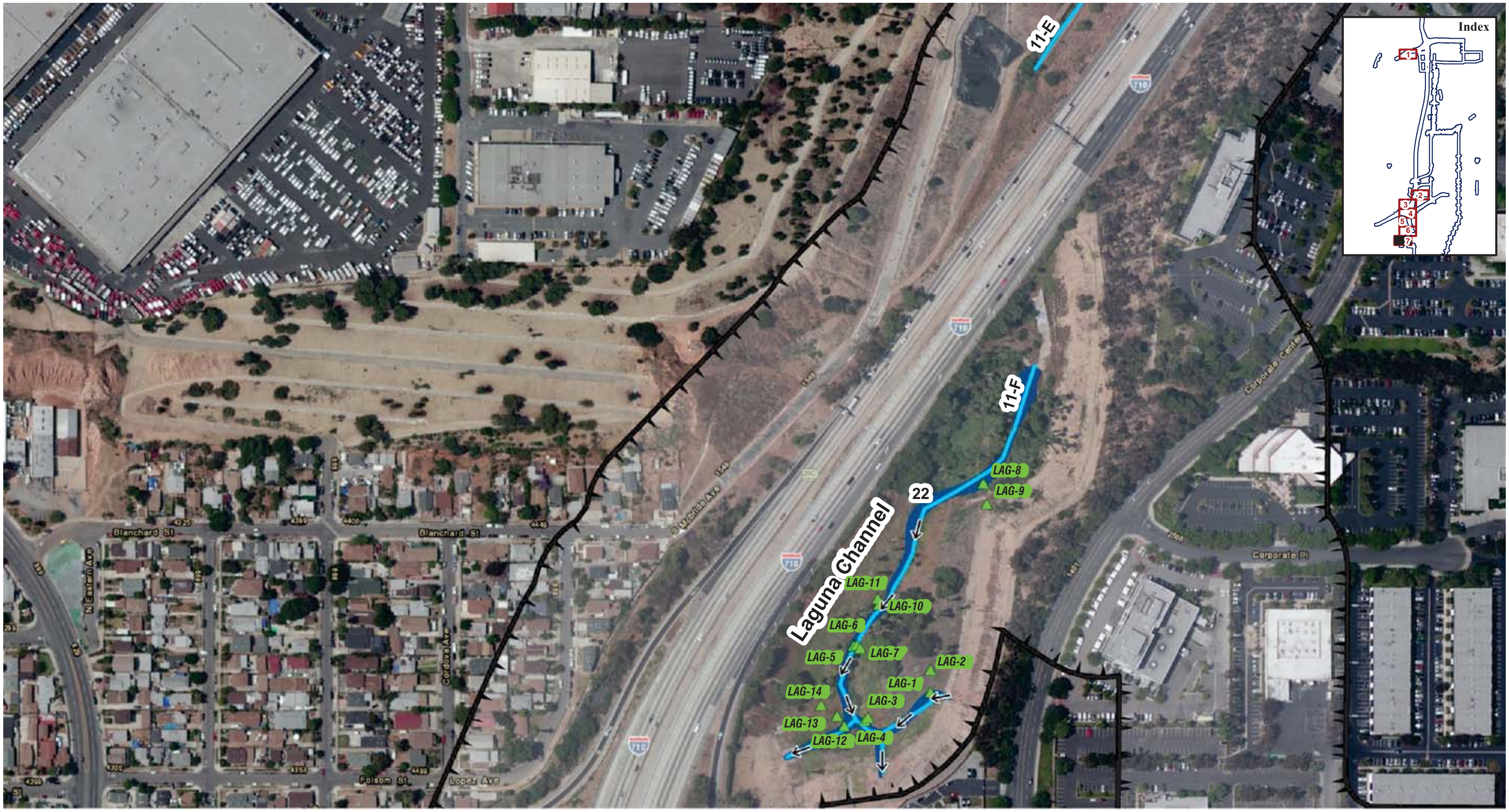

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

USACE Jurisdiction

Non-Wetland

Wetland

N

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-2
Sheet 7 of 7

SR 710 North Project

Potential USACE Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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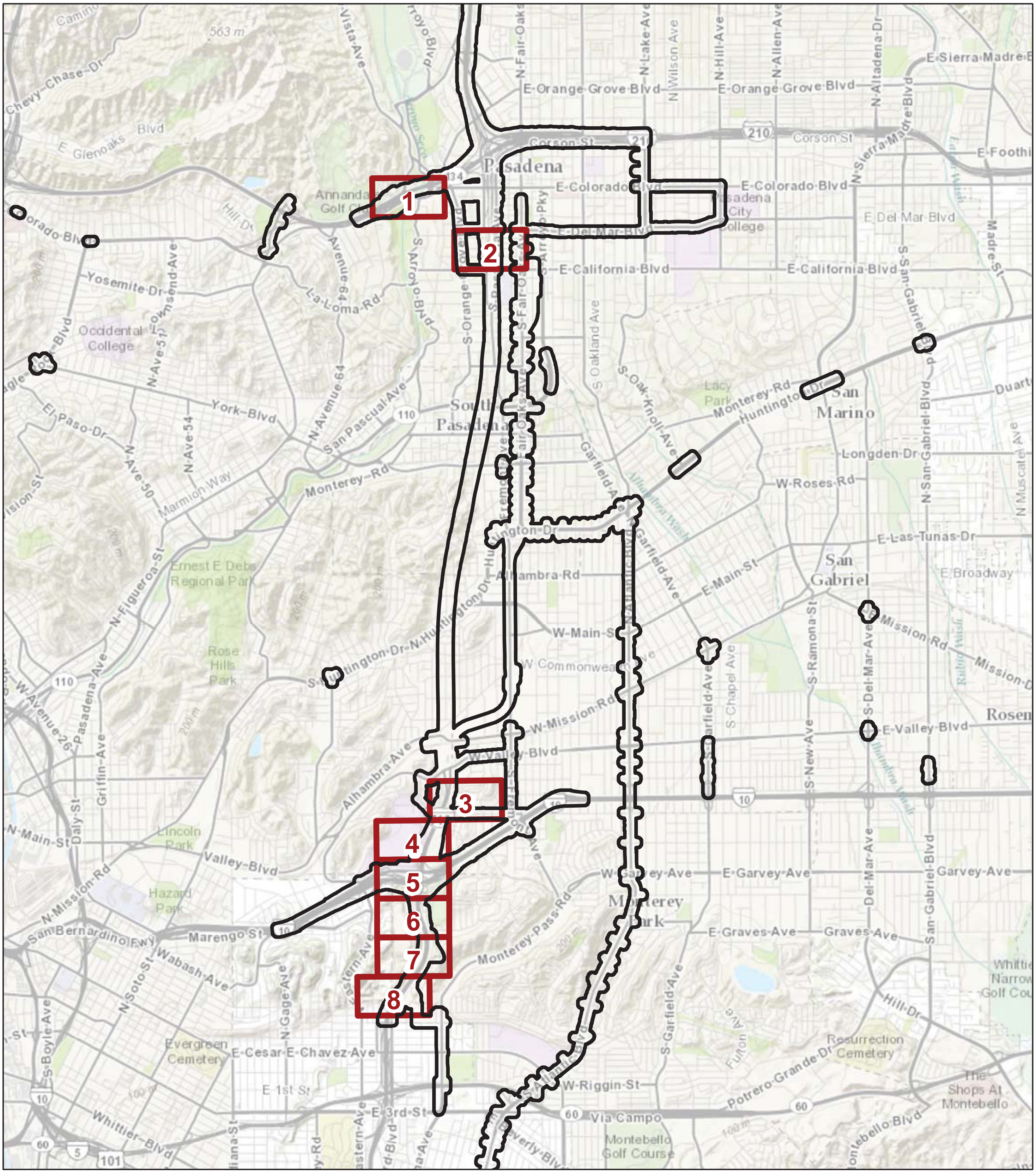

FIGURE 3.17-3

LEGEND

Biological Study Area

Extent Boxes

N

0 0.25 0.5 1 1.5

Miles

SR 710 North Project

Extent Indicators for Potential CDFW and RWQCB Jurisdictional Features Map

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE:ESRI LSA (8/2013); Sapphos Environmental (9/2013); California InterAgency Watershed Map (1999)

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N

LEGEND

↑ Stream Flow Direction

Soil Test Pit

Biological Study Area

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

White Alder Groves

Wetland

Wetland Complex

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-4

Sheet 1 of 8

SR 710 North Project

Potential CDFW and RWQCB Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

White Alder Groves

Wetland

Wetland Complex

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

I:\CHM1105\G\Wetlands\Potential CDFW JD Features.cdr (1/12/2018)

FIGURE 3.17-4

Sheet 2 of 8

SR 710 North Project

Potential CDFW and RWQCB Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

White Alder Groves

Wetland

Wetland Complex

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-4

Sheet 3 of 8

SR 710 North Project

Potential CDFW and RWQCB Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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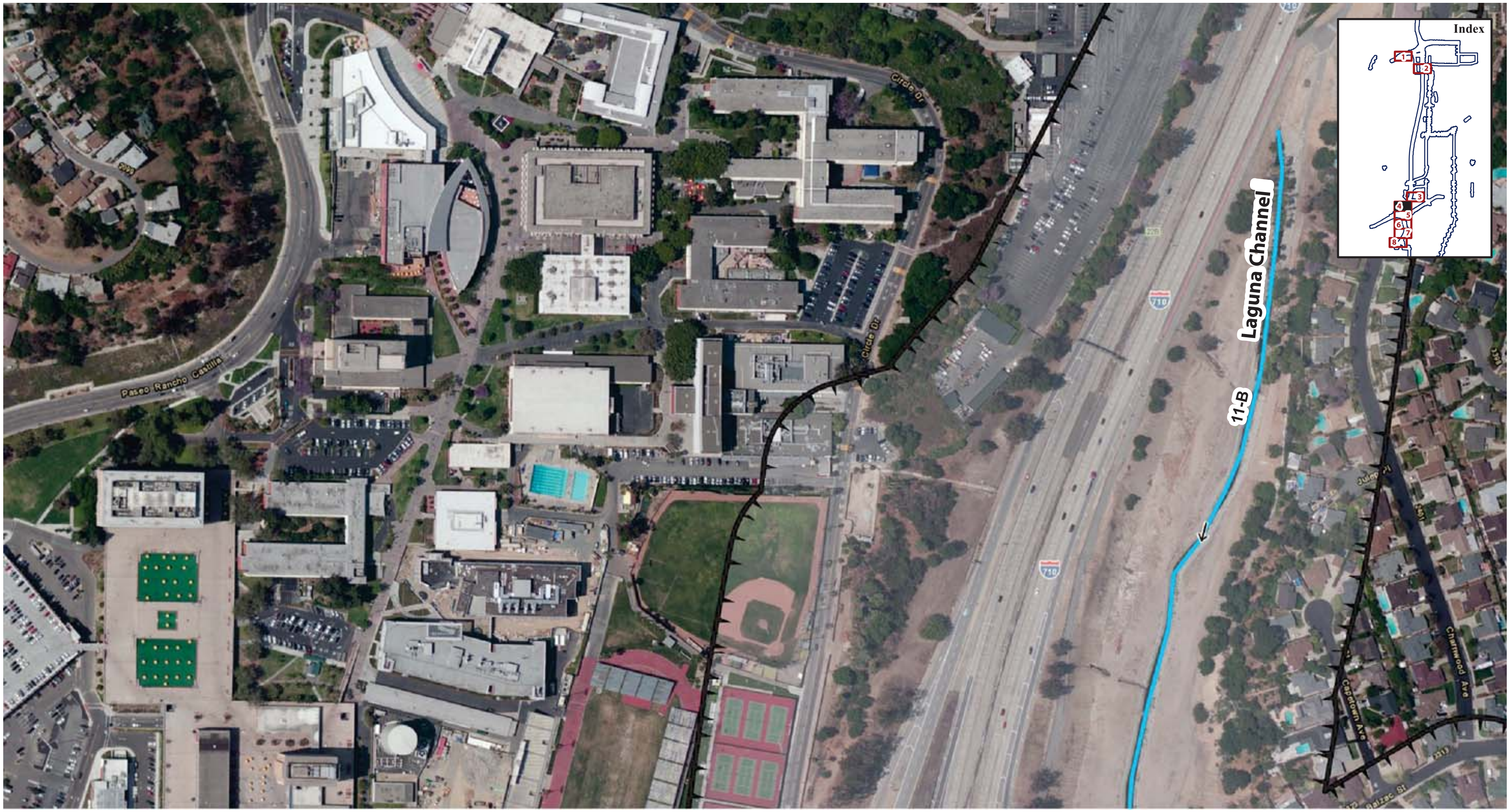

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

White Alder Groves

Wetland

Wetland Complex

N

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-4

Sheet 4 of 8

SR 710 North Project

Potential CDFW and RWQCB Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

- Stream Flow Direction
- Soil Test Pit
- Biological Study Area

Potential Jurisdiction

- Non-Wetland

Riparian Communities and Wetland Areas

- Arroyo Willow Thicket
- Black Cottonwood Forest
- Giant Reed Breaks
- Non-Native Riparian Woodland
- White Alder Groves
- Wetland
- Wetland Complex

N

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-4

Sheet 5 of 8

SR 710 North Project

Potential CDFW and RWQCB Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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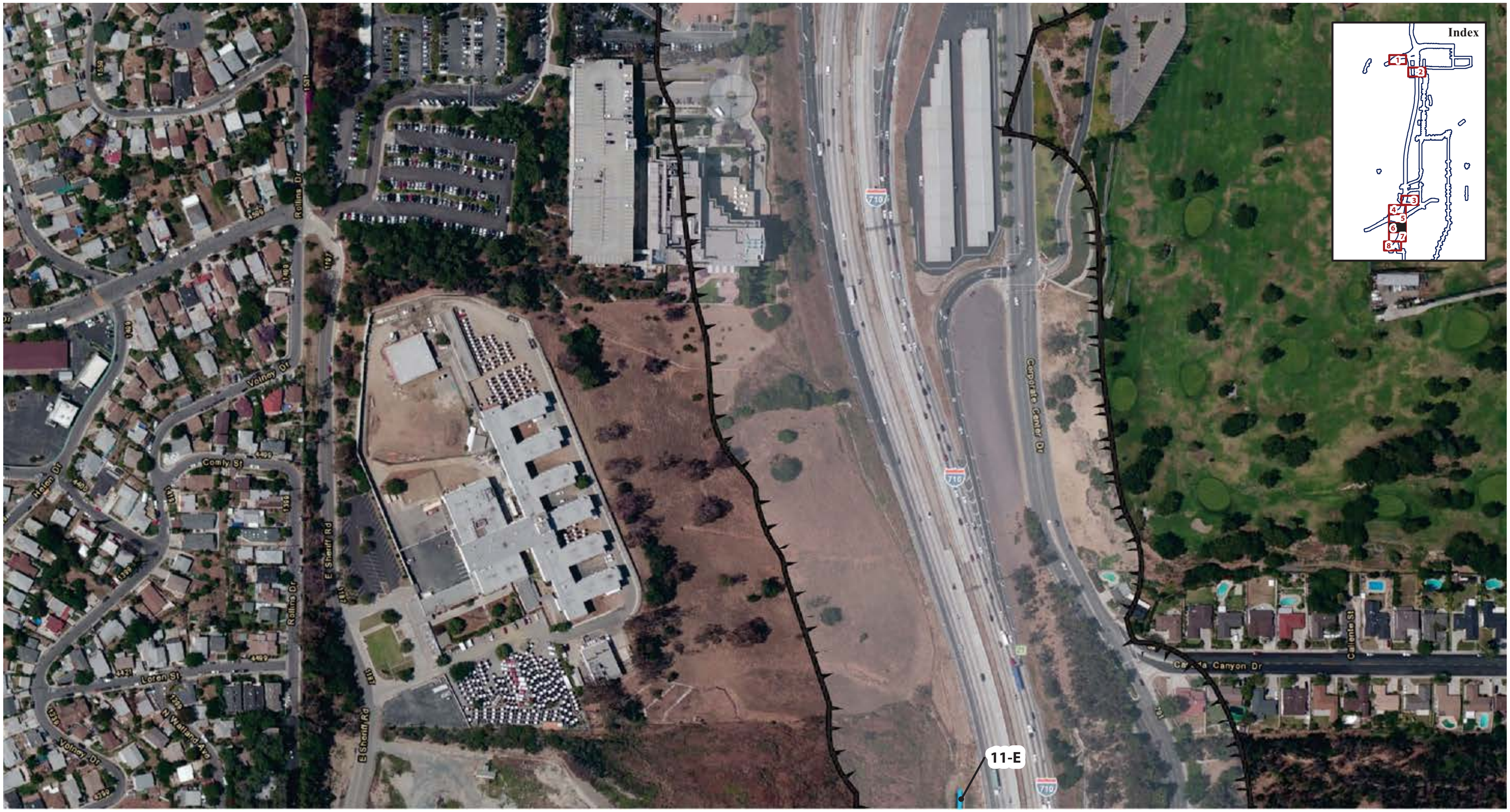

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

White Alder Groves

Wetland

Wetland Complex

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-4

Sheet 6 of 8

SR 710 North Project

Potential CDFW and RWQCB Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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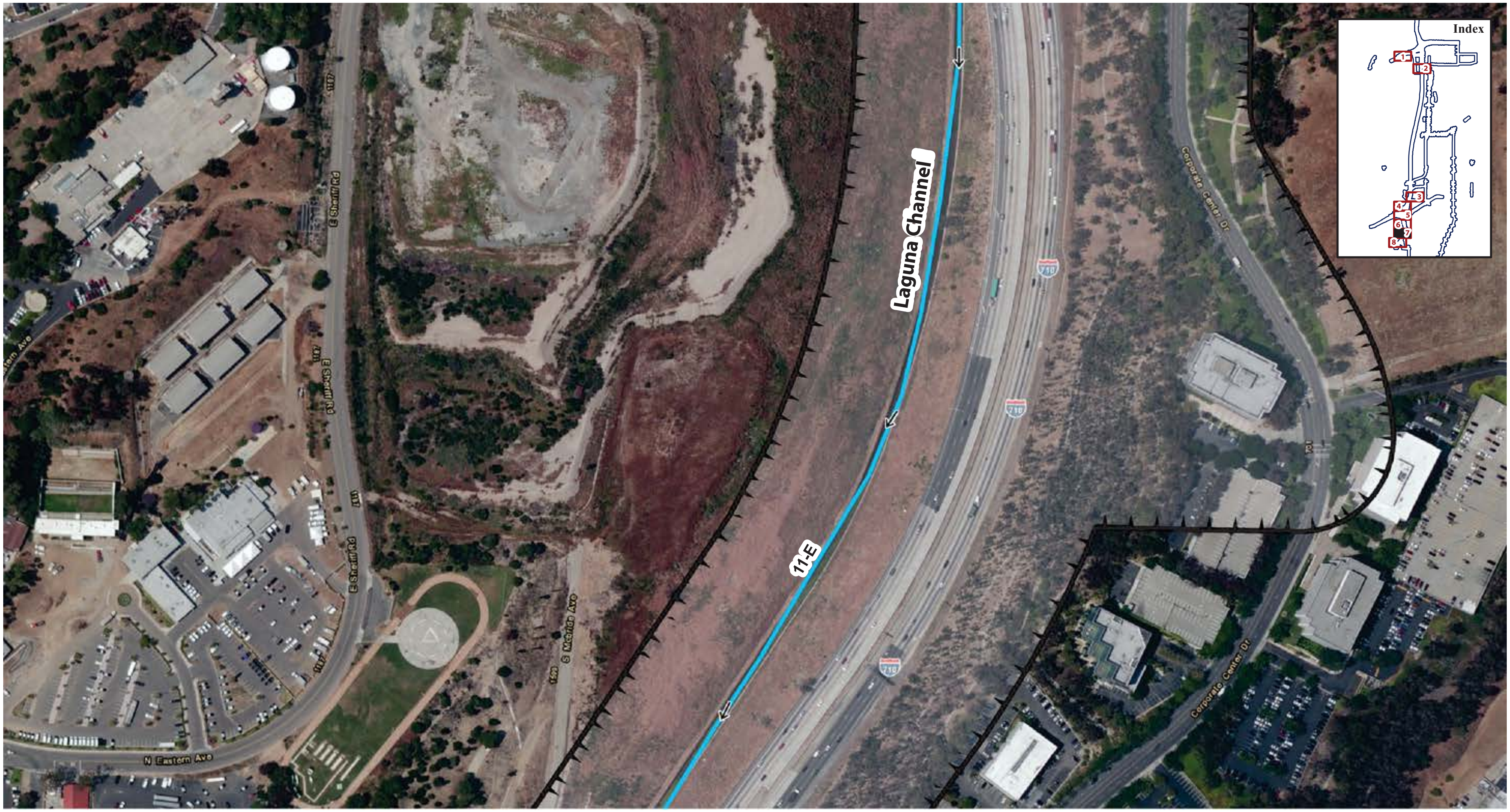

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

White Alder Groves

Wetland

Wetland Complex

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

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FIGURE 3.17-4

Sheet 7 of 8

SR 710 North Project

Potential CDFW and RWQCB Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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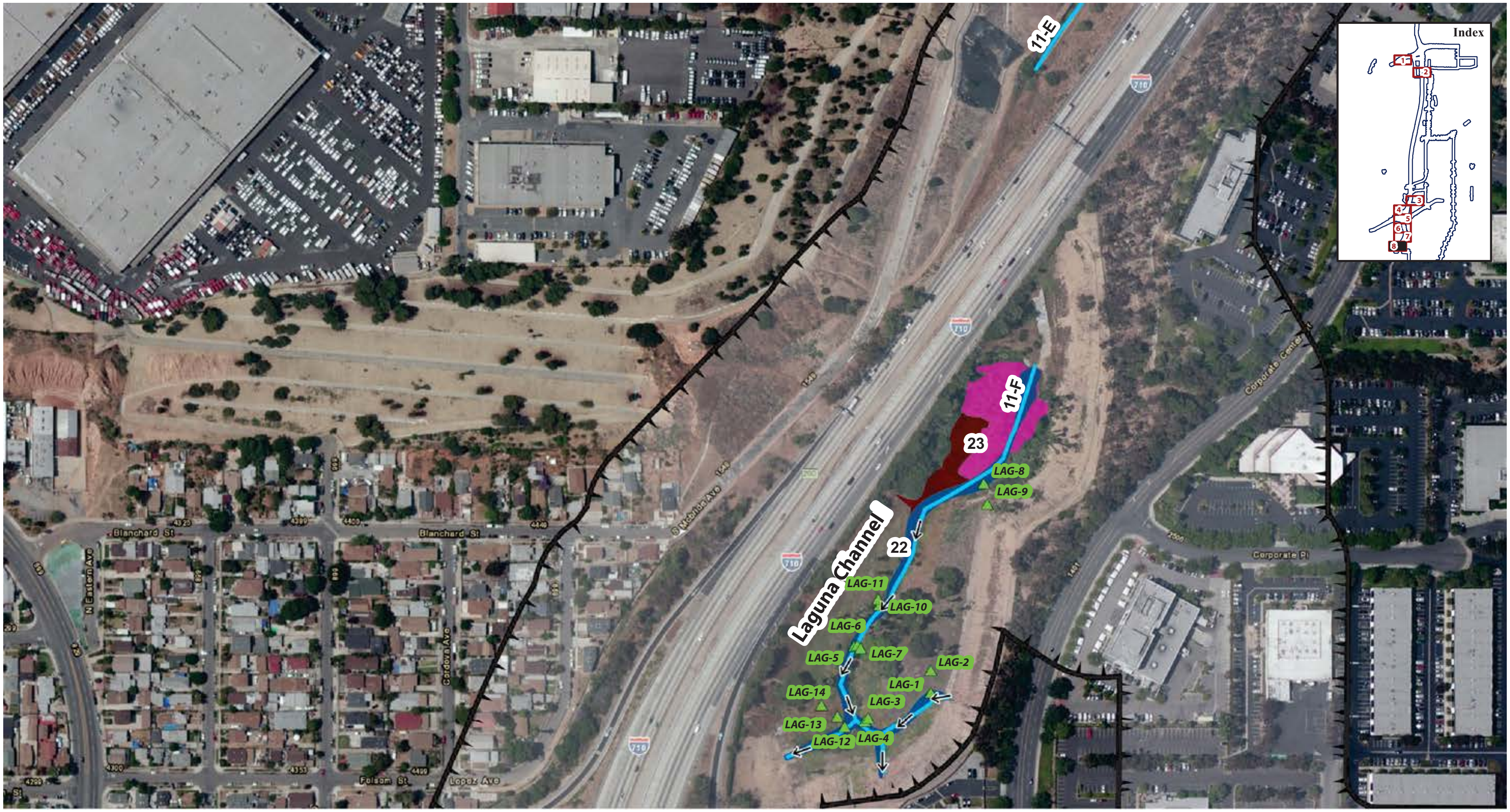

LEGEND

Stream Flow Direction

Soil Test Pit

Biological Study Area

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

White Alder Groves

Wetland

Wetland Complex

0 50 100 200 400

Feet

SOURCE: ESRI (3/2014); Sapphos Environmental (11/2013)

FIGURE 3.17-4

Sheet 8 of 8

SR 710 North Project

Potential CDFW and RWQCB Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

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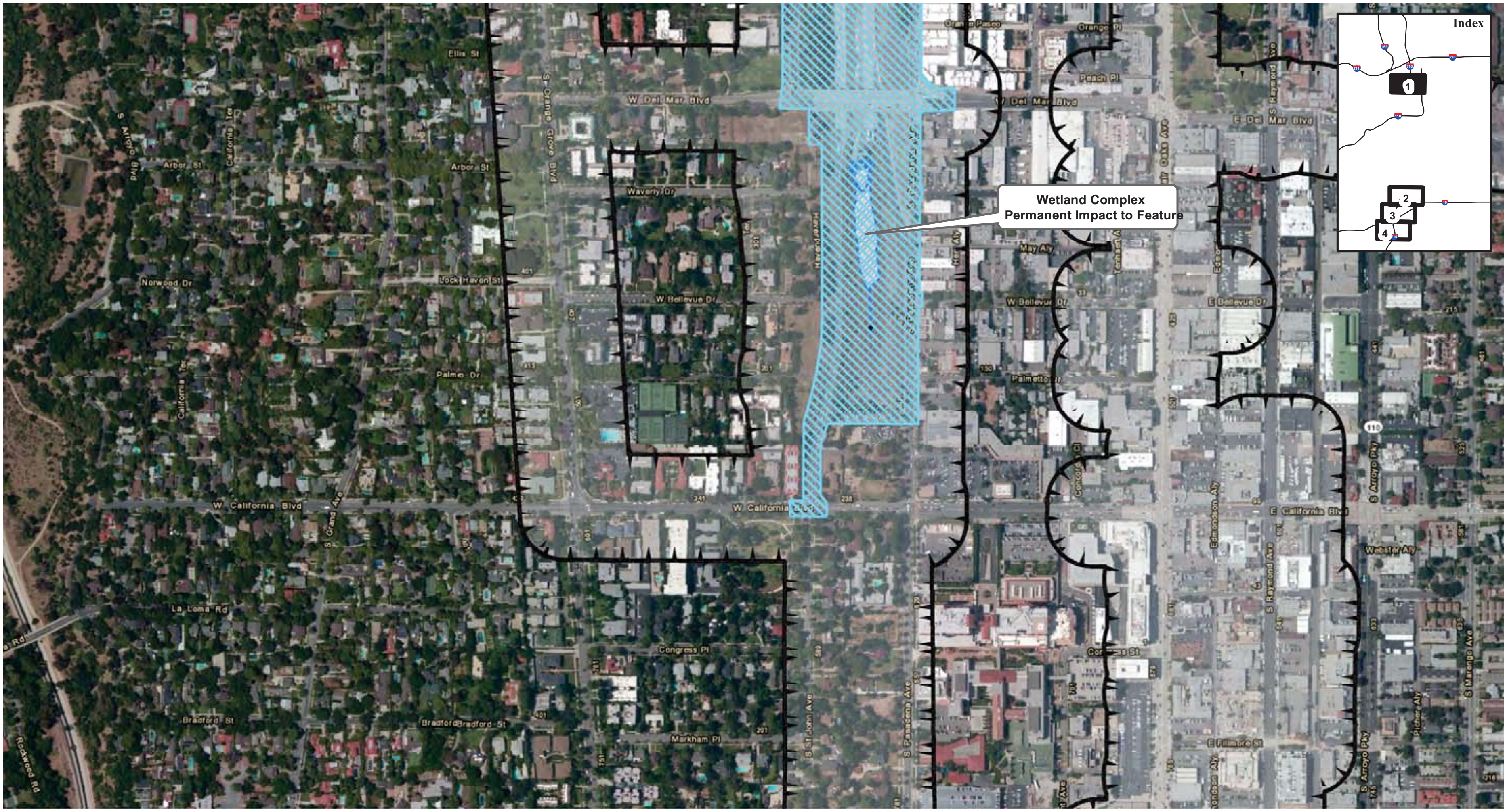

LEGEND

Stream Flow Direction

Biological Study Area

Freeway Tunnel Alternative Impacts

Permanent

Temporary

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

Wetland Complex

White Alder Groves

0 100 300 500 700

Feet

SOURCE: Microsoft(Imagery date: 5-8-2010); Sapphos Environmental (10/2013)

FIGURE 3.17-5

Sheet 1 of 4

SR 710 North Project

Freeway Tunnel Alternative Impacts to Potentially Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

Stream Flow Direction

Biological Study Area

Freeway Tunnel Alternative Impacts

Permanent

Temporary

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

Wetland Complex

White Alder Groves

N

0 100 300 500 700

Feet

SOURCE: Microsoft(Imagery date: 5-8-2010); Sapphos Environmental (10/2013)

FIGURE 3.17-5

Sheet 2 of 4

SR 710 North Project

Freeway Tunnel Alternative Impacts to Potentially Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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LEGEND

↑ Stream Flow Direction

Biological Study Area

Freeway Tunnel Alternative Impacts

Permanent

Temporary

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

Wetland Complex

White Alder Groves

0 100 300 500 700
Feet

SOURCE: Microsoft(Imagery date: 5-8-2010); Sapphos Environmental (10/2013)

FIGURE 3.17-5
Sheet 3 of 4

SR 710 North Project

Freeway Tunnel Alternative Impacts to Potentially Jurisdictional Features

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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N

LEGEND

Stream Flow Direction

Biological Study Area

Freeway Tunnel Alternative Impacts

Permanent

Temporary

Potential Jurisdiction

Non-Wetland

Riparian Communities and Wetland Areas

Arroyo Willow Thicket

Black Cottonwood Forest

Giant Reed Breaks

Non-Native Riparian Woodland

Wetland Complex

White Alder Groves

0 100 300 500 700

Feet

SOURCE: Microsoft(Imagery date: 5-8-2010); Sapphos Environmental (10/2013)

FIGURE 3.17-5

Sheet 4 of 4

SR 710 North Project

Freeway Tunnel Alternative Impacts to Potentially Jurisdictional Features

07-LA-710 (SR 710)

EA 187900

EFIS 0700000191

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3.18 Plant Species

3.18.1 Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) have regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species section 3.20 in this document for detailed information about these species.

This section of the document discusses all the other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants. The regulatory requirements for FESA can be found at 16 United States Code (USC), Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act (CEQA), CA Public Resources Code, Sections 2100-21177.

The County of Los Angeles and local cities within the Biological Study Area (BSA) have ordinances that protect designated trees within their jurisdictions. The Los Angeles County Oak Tree Ordinance requires a permit prior to the cutting, removing, destroying, relocating, inflicting damage on, or encroaching into a protected zone of any tree within the oak genus. The Cities of Los Angeles, Rosemead, Pasadena, and South Pasadena also have tree protection ordinances.

3.18.2 Affected Environment

The analysis of the potential for the proposed project to result in impacts to special-status plant species is described in detail in the *Natural Environment Study* (NES) (2014). The findings of the NES are discussed in this section. The BSA was described earlier in this Environmental Impact Report/Environmental Impact Statement (EIR/EIS) in Section 3.16.2.1, Biological Study Area.

The 11 plant communities in the BSA are disturbed/developed, nonnative woodland, nonnative grassland, nonnative riparian woodland, wetland complex, giant reed semi-natural stand, white alder groves, black cottonwood forest, arroyo willow thickets, laurel sumac scrub, and coast live oak woodland. Also in the BSA is one non-vegetation cover type identified as Streams. In general, very little natural vegetation remains in the BSA; the majority of vegetation present in the BSA is planted trees along sidewalks, and ruderal and ornamental vegetation and trees planted along the edges of freeways and within freeway medians.

The natural communities in the BSA have the potential to support a variety of plant species considered sensitive by federal, State, and/or local governments and organizations regulating and/or monitoring their development; limited distributions; and/or habitat requirements. The BSA supports suitable habitat for a variety of special-status plant species. Based on literature and database reviews, it was determined that a total of 54 sensitive plant species have the potential to occur within the BSA or in the vicinity of the BSA (refer to Table 10, Listed, Proposed, and Special-

Status Plants Potentially Occurring or Known to Occur within and in the Vicinity of the BSA). Eleven of those sensitive plant species are federally and/or State-listed endangered, threatened, or candidate species, and are discussed in detail later in this EIR/EIS in Section 3.20, Threatened and Endangered Species. Five special-status plant species occur or potentially occur in the BSA: Coulter's goldfields, Southern California black walnut, Engelmann oak, Parish's gooseberry, and slender mariposa-lily. Table 10 in the NES describes the habitat and potential for occurrence for these species. That information is also discussed in the following sections.

A botanical survey was conducted to identify plant species in the BSA, document any rare plant occurrences, and identify suitable habitat for plants potentially present. The survey was conducted in late July and early August 2013, during the blooming period for the majority of the sensitive plants considered potentially present in the BSA. Species that were observed or have habitat present in the BSA are discussed further below. Additional sensitive plants may have the potential to occur in the BSA but were not discovered during the literature and database review or the botanical survey.

3.18.2.1 Coulter's Goldfields

Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*) has no State or federal listing status; however, it has a California Rare Plant Rank (CRPR) of 1B.1, indicating that it is seriously threatened in California. CRPR is the CNPS ranking system that was created to categorize various levels of concern for plant species. Coulter's goldfields is an annual herb in the sunflower family (Asteraceae) that is generally found in saline places, such as on the margins of marshes, playas, and vernal pools. Coulter's goldfields blooms from February to June. This species is typically found in Southern California from Bakersfield to San Diego in areas below 3,281 feet (ft) above mean sea level (amsl). Coulter's goldfields is occasionally found outside of its typical habitat due to its inclusion in native wildflower seed mixes distributed by certain seed suppliers (e.g., Theodore Payne Foundation). As a result, some populations occurring in revegetated areas may be cultivated and not naturally occurring, and therefore, may not meet the definition of a "…native plant…" pursuant to California Fish and Game Code Section 1901, which is limited to plants "…growing in a wild uncultivated state."

The 2013 botanical surveys resulted in the identification of a small population (approximately 300 individuals) of Coulter's goldfields within Caltrans right of way (ROW) along Interstate 10 (I-10) near the Interstate 710 (I-710)/I-10 interchange. Individuals of the population were blooming out of season with other spring annuals near a leaking irrigation system in an area that appeared to have been recently hydroseeded, most likely during highway landscape maintenance. The wetland complex, riparian, and other mesic habitats within the BSA do not contain the alkaline features required for naturally occurring populations of this species. There is no other suitable habitat for Coulter's goldfields in the BSA.

3.18.2.2 Southern California Black Walnut

Southern California black walnut (*Juglans californica*) has no federal or State listing status but has a CRPR of 4.2, indicating that it is uncommon and moderately threatened in California. In addition, this tree is protected by the City of Pasadena Trees and Tree Protection Ordinance.

Southern California black walnut is a relatively small deciduous tree in the walnut family (Juglandaceae) that is generally found on hillsides and canyons in the coastal and inland valleys in Southern California. This species blooms from March to August and is usually found at elevations between 64 and 2,953 ft amsl.

During the 2013 botanical surveys, a single young Southern California black walnut was observed growing in the understory of a stand of unmaintained Aleppo pine (*Pinus halepensis*) woodland, upslope from westbound Interstate 210 (I-210) in the Caltrans ROW. Other associated species in the vicinity were coast live oak (*Quercus agrifolia*) and blackwood (*Acacia melanoxylon*). No other Southern California black walnut individuals were identified in the BSA. Due to the conspicuous nature of trees such as the Southern California black walnut during botanical surveys, the potential for the species to be present but not observed is low. Therefore, with the exception of the individual tree described above, the species is considered absent from the BSA.

3.18.2.3 Engelmann Oak

Engelmann oak (*Quercus engelmannii*) has no federal or State listing status but has a CRPR of 4.2, indicating that it is uncommon and moderately threatened in California. In addition, this tree is protected by the City of Pasadena City Trees and Tree Protection Ordinance. Engelmann oak is an evergreen tree in the oak family (Fagaceae) that is generally found on foothill slopes below 4,265 ft in elevation. It typically blooms between March and June. Engelmann oak is known only from the coastal and inland valleys of Southern California south of the Transverse Ranges and from Baja California.

During the 2013 botanical survey of the entire BSA, a single Engelmann oak individual was found within the BSA, in the City of Pasadena. The individual was found along Arroyo Boulevard, just west of the State Route 134 (SR 134) overpass, and appears to potentially be a planted street tree among several coast live oak trees. No other individuals of this species were identified within the BSA. Due to the conspicuous nature of trees such as the Engelmann oak during botanical surveys, the potential for the species to be present but not observed is low. Therefore, with the exception of the individual described above, the species is considered absent from the BSA.

3.18.2.4 Parish's Gooseberry

Parish's gooseberry (*Ribes divaricatum* var. *parishii*) has no State or federal listing status; however, it has a CRPR of 1A, indicating that it is presumed extirpated in California but may occur elsewhere in its range. Parish's gooseberry is a perennial deciduous shrub in the currant family (Grossulariaceae) that is generally found in moist riparian woodlands. Parish's gooseberry blooms from February to April. This species is typically found in areas between 213 and 984 ft amsl. The last known population of Parish's gooseberry was observed in 1980 at the Whittier Narrows Nature Center, approximately 3 miles (mi) southeast of the BSA.

Parish's gooseberry was not found in the BSA during the 2013 botanical survey of the entire BSA. However, surveys were conducted outside the appropriate blooming period for this species. Marginally suitable habitat for Parish's gooseberry is present in the BSA in the riparian nonwetland habitat at the SR 134 bridge over the Arroyo Seco, within the white alder grove, black cottonwood forest, and arroyo willow thicket plant communities. Because surveys were not conducted within the appropriate blooming period for Parish's gooseberry and marginally suitable habitat for this species was determined to be present, Parish's gooseberry is considered to be potentially present in the BSA.

3.18.2.5 Slender Mariposa-Lily

Slender mariposa-lily (*Calochortus clavatus* var. *gracilis*) has no State or federal listing status; however, it has a CRPR of 1B.2, indicating that it is fairly threatened in California. Slender mariposa-lily is a perennial bulbiferous herb in the lily family (Liliaceae) that is generally found in chaparral, coastal scrub, and valley and foothill grassland habitats. Slender mariposa-lily blooms from March to June. This species is typically found in areas on the slopes of the Transverse Range between 1,050 ft and 3,281 ft amsl.

Slender mariposa-lily was not found in the BSA during the 2013 botanical survey of the entire BSA. However, surveys were conducted outside of the appropriate blooming period for this species. Marginally suitable chaparral/coastal scrub habitat for slender mariposa-lily is present in the BSA in the laurel sumac scrub plant community on a steep slope west of the SR 134/I-210 interchange. Because surveys were not conducted within the appropriate blooming period for slender mariposa-lily, and marginally suitable habitat for this species was determined to be present, slender mariposa-lily is considered to be potentially present in the BSA.

3.18.2.6 Other Special-Status Plants

There were 37 other special-status plant species identified with the potential to occur within or in the vicinity of the BSA. No suitable habitat for 25 of these species is present in the BSA (see *Natural Environment Study* [2014] Table 10, Listed, Proposed, and Special-Status Plants Potentially Occurring or Known to Occur within and in the Vicinity of the BSA).

Focused botanical surveys during 2013 determined that suitable habitat was present in the BSA for the following special-status plants: California muhly (*Muhlenbergia californica*), California saw-grass (*Cladium californicum*), Davidson's bush-mallow (*Malacothamnus davidsonii*), Greata's aster (*Symphyotrichum greatae*), Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*), Parish's gooseberry (*Ribes divaricatum* var. *parishii*), Peruvian dodder (*Cuscuta obtusiflora*), Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*), San Bernardino aster (*Symphyotrichum defoliatum*), Santa Barbara morning-glory (*Calystegia sepium* ssp. *binghamiae*), slender mariposa-lily (*Calochortus clavatus* var. *gracilis*), Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*), southern tarplant (*Hemizonia parryi australis*), and white rabbit-tobacco (*Pseudognaphalium leucocephalum*).

None of those species were found in the BSA during the 2013 botanical surveys. Those botanical surveys were conducted during the appropriate blooming period for all these plants with the exception of Santa Barbara morning-glory. Therefore, California muhly, California saw-grass, Davidson's bush-mallow, Greata's aster, Los Angeles sunflower, Peruvian dodder, Robinson's pepper-grass, San Bernardino aster, Santa Barbara morning glory, Sonoran maiden fern, southern tarplant, and white rabbit-tobacco are considered absent from the BSA (see *Natural Environment Study* [2014] Table 10, Listed, Proposed, and Special-Status Plants Potentially Occurring or Known to Occur within and in the Vicinity of the BSA). Although not likely blooming, Santa Barbara morning-glory has readily identifiable parts aboveground year-round and is therefore also considered absent from the BSA.

3.18.2.7 Other Protected Trees

Pedestrian surveys were conducted from June through August of 2013 to provide the numbers and locations of trees protected by county and city ordinances in the BSA. A total of 5,459 trees were identified in accordance with the applicable cities' tree ordinances and the Los Angeles County Oak Tree Ordinance, including 811 oaks (*Quercus sp.*) and 113 other ordinance-protected California native trees. The majority of trees identified were nonnative ornamental trees located along city streets and within State-owned ROW, and therefore, were likely planted and not naturally occurring.

Table 3.18.1 summarizes the numbers of surveyed trees in the BSA for each Build Alternative by jurisdiction.

TABLE 3.18.1:
Surveyed Trees by Build Alternative and City

Jurisdictions that Protect Trees[1]	Number of Protected Trees by Alternative			
	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
Los Angeles	19	0	15	21
Rosemead	11	0	0	0
Pasadena	220	732	0	3,462
South Pasadena	120	767	139	0
Unincorporated Los Angeles County	0	6	2	4
Total	**370**	**1,505**	**156**	**3,487**

Source: *Natural Environment Study* (2014).
[1] Alhambra, Monterey Park, and San Marino are not listed because no trees protected under city ordinance were identified in those cities.

3.18.3 Environmental Consequences

3.18.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction any of the improvements in the State Route 710 (SR 710) North Project Build Alternatives. As a result, the No Build Alternative would not result in any impacts related to plant species associated with improvements in the Build Alternatives.

Build Alternatives

TSM/TDM Alternative

The Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative would not result in temporary construction impacts to any special-status plant species or trees potentially subject to local tree ordinances (see Table 3.18.2).

The riparian nonwetland and laurel sumac scrub plant communities in which suitable habitat for Parish's gooseberry and slender mariposa-lily are present will not be temporarily impacted by the TSM/TDM Alternative (see Section 3.16, Natural Communities, Table 3.16.2). The limit of disturbance of the TSM/TDM Alternative is approximately 0.5 mi away from suitable habitat for these species. As such, indirect impacts from construction are not anticipated. Therefore, the TSM/TDM Alternative would not result in direct or indirect temporary construction impacts to these species.

BRT Alternative

The Bus Rapid Transit (BRT) Alternative would not result in temporary construction impacts to any special-status plant species or trees potentially subject to local tree ordinances (see Table 3.18.2).

The riparian nonwetland and laurel sumac scrub plant communities in which suitable habitat for Parish's gooseberry and slender mariposa-lily are present will not be temporarily impacted by the BRT Alternative (see Section 3.16, Natural Communities, Table 3.16.2). The limit of

TABLE 3.18.2:
Impacts to Protected and Other Trees Affected by the Build Alternatives

Number of Trees by Jurisdiction[1]	Number of Impacted Protected and Other Trees by Alternative							
	TSM/TDM		BRT		LRT		Freeway Tunnel Alternative Single- and Dual-Bore	
	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.
Trees Protected by Local Ordinance								
Pasadena	0	0	73	0	0	0	11	36
South Pasadena	0	0	63	0	15	0	0	0
Unincorporated Los Angeles County	0	0	0	0	2	0	0	0
Trees Not Protected by Local Ordinance								
Caltrans ROW	0	0	0	0	4	8	73	0
Total	**0**	**0**	**136**	**0**	**21**	**8**	**84**	**36**

Source: *Natural Environment Study* (2014).
1 Alhambra, Monterey Park, Rosemead, San Gabriel, and San Marino are not listed because no trees protected under city ordinances outside of Caltrans ROW were identified in those cities.
Perm. = permanent
ROW = right of way
Temp. = temporary

disturbance of the BRT Alternative is approximately 0.8 mi away from suitable habitat for these species. As such, indirect impacts from construction are not anticipated. Therefore, the BRT Alternative would not result in direct or indirect temporary construction impacts to these species.

The improvements included in the TSM/TDM Alternative would also be constructed as part of the BRT Alternative with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). As discussed above, the TSM/TDM Alternative would not result in temporary impacts to special-status plant species. Therefore, the TSM/TDM Alternative component of the BRT Alternative would not result in additional temporary impacts to special-status plant species.

LRT Alternative

The Coulter's goldfields population is within approximately 170 ft of the temporary impact area for the Light Rail Transit (LRT) Alternative. Therefore, the LRT Alternative has the potential to result in indirect temporary impacts to this population, which may include construction noise, dust, lighting, litter, and vibration, as well as personnel and vehicle activities outside designated construction areas. Individuals of the population were blooming out of season with other spring annuals near a leaking irrigation system. The apparent seeding of this population and the fact that the population is being sustained by a non-natural water source suggest that these individuals would not meet the definition of a "native plant" pursuant to California Fish and Game Code Section 1901, which is limited to plants "growing in a wild uncultivated state." However, unless documentation is provided that the population was planted, the assumption and treatment would be that it is a naturally occurring population. For this population to be excluded from consideration for avoidance, minimization, and/or mitigation, documentation such as the bill of lading for the seed mix, the date(s) of seeding, and the contents and supplier of the seed mix used must be verified.

The riparian nonwetland and laurel sumac scrub plant communities in which suitable habitat for Parish's gooseberry and slender mariposa-lily are present will not be impacted by the LRT Alternative (see Section 3.16, Natural Communities, Table 3.16.2). The limit of disturbance of the LRT Alternative is approximately 1.1 mi away from suitable habitat for these species. As such, indirect impacts from construction are not anticipated. Therefore, the LRT Alternative would not result in direct or indirect temporary construction impacts to these species.

The LRT Alternative including the TSM/TDM Alternative improvements would not result in any temporary impacts to Southern California black walnut, Engelmann oak, or any other special-status plant species.

The part of the BSA along the LRT Alternative contained the fewest ordinance-protected trees, and nearly all appeared to be planted and/or nonnative. Construction of the LRT Alternative would result in temporary impacts to an estimated eight (8) trees located within the Caltrans ROW in the City of Los Angeles as shown in Table 3.18.2. Tree removal within Caltrans ROW is exempt from local regulations. The TSM/TDM Alternative improvements would not result in temporary construction impacts to trees potentially subject to local tree ordinances.

The improvements included in the TSM/TDM Alternative would also be constructed as part of the LRT Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) because it would conflict with the LRT Alternative maintenance yard near Mission Road. As discussed above, the TSM/TDM Alternative improvements would not result in temporary construction impacts to special-status plant species. Therefore, the TSM/TDM Alternative component of the LRT Alternative would not result in additional temporary impacts to special-status plant species.

Freeway Tunnel Alternative

The Freeway Tunnel Alternative would not result in temporary construction impacts to any special-status plant species in the BSA. The riparian nonwetland and laurel sumac scrub plant communities in which suitable habitat for Parish's gooseberry and slender mariposa-lily are present will not be impacted by the Freeway Tunnel Alternative (see Section 3.16, Natural Communities, Table 3.16.2). The limit of disturbance of the Freeway Tunnel Alternative is approximately 850 ft away from suitable habitat for these species. These habitats may experience effects resulting from non-ground-disturbing construction. Non-ground-disturbing construction activities that may occur within 850 ft of these habitats include lane restriping, installation of temporary signage, and other daytime work within the existing highway ROW on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on SR 134. As such, indirect impacts from construction are not anticipated. Therefore, the Freeway Tunnel Alternative would not result in direct or indirect temporary construction impacts to these species. Permanent loss of Coulter's goldfields and a single Southern California black walnut are discussed below.

The Freeway Tunnel Alternative covers the largest area of all the Build Alternatives, with almost half of the area of that alternative in the City of Pasadena, which has protection for all public trees. The part of the BSA along the Freeway Tunnel Alternative includes areas of nonnative woodland and grassland in and around the freeway interchanges and white alder groves and laurel sumac scrub along and underneath SR 134. Construction of the Freeway Tunnel Alternative single-bore and dual-bore design variations would each result in temporary impacts to an estimated 36 trees located outside of the Caltrans ROW in the City of Pasadena protected by the City of Pasadena City Trees and Tree Protection Ordinance (Municipal Code 8.52) as shown in Table 3.18.2. As discussed above, the TSM/TDM Alternative would not result in temporary construction impacts to special-status plant species. Therefore, the TSM/TDM

Alternative component of the Freeway Tunnel Alternative would not result in additional temporary impacts to special-status plant species.

The improvements included in the TSM/TDM Alternative would also be constructed as part of the Freeway Tunnel Alternative (including either of the dual-bore or single-bore design variations) with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Extension between Del Mar Boulevard and California Boulevard). As discussed above, the TSM/TDM Alternative improvements would not result in temporary construction impacts to trees potentially subject to local tree ordinances.

3.18.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any impacts related to special-status plant species associated with improvements in the Build Alternatives.

Build Alternatives

TSM/TDM Alternative

The TSM/TDM Alternative would not result in permanent impacts to any special-status plant species or trees potentially subject to local tree ordinances. In addition, the operation activities associated with the TSM/TDM Alternative would not result in indirect permanent impacts to any special-status plant species or trees potentially subject to local tree ordinances.

BRT Alternative

The BRT Alternative would not result in any permanent impacts to any special-status plant species.

The protected trees in the BSA along the BRT Alternative are almost entirely planted trees along city streets. As shown in Table 3.18.2, the BRT Alternative would result in the permanent removal of an estimated 136 trees as follows:

- 73 trees located outside the Caltrans ROW in the City of Pasadena (protected by the City of Pasadena City Trees and Tree Protection Ordinance, Municipal Code 8.52)
- 63 trees located outside the Caltrans ROW in the City of South Pasadena (protected by the City of South Pasadena Municipal Code 34, Trees and Shrubs)

The operation activities associated with the BRT Alternative would not result in indirect permanent impacts to any special-status plant species or trees potentially subject to local tree ordinances. As discussed above, the TSM/TDM Alternative would not result in permanent impacts to special-status plant species. Therefore, the TSM/TDM Alternative component of the BRT Alternative would not result in additional permanent impacts to special-status plant species.

LRT Alternative

Because the Coulter's goldfields population is within approximately 250 ft of the permanent impact area for the LRT Alternative, that alternative has the potential to result in indirect permanent impacts to this population. This population already experiences indirect effects associated with I-10 and adjacent urban land uses. Indirect permanent impacts include edge effects such as future development, exotic plant and animal infestations, litter, fire, and pollutants associated with vehicle use of the transportation facility. The LRT Alternative would further exacerbate these indirect effects by constructing another urban use within this setting. These indirect impacts are not anticipated to result in a permanent loss of this population. As noted earlier, this population may not meet the definition of a "native plant" pursuant to California Fish and Game Code Section 1901. However, unless documentation is provided that the population was planted, the assumption and treatment would be that it is a naturally occurring population. For this population to be excluded from consideration for avoidance, minimization, and mitigation measures, sufficient documentation of the anthropogenic origin of the population must be verified.

The riparian nonwetland and laurel sumac scrub plant communities in which suitable habitat for Parish's gooseberry and slender mariposa-lily are present will not be impacted by the LRT Alternative (see Section 3.16, Natural Communities, Table 3.16.2). Therefore, the LRT Alternative would not result in permanent impacts to these species.

The LRT Alternative would not result in any permanent impacts to Southern California black walnut, Engelmann oak, or any other special-status plant species.

The BSA along the LRT Alternative contained the fewest ordinance-protected trees, and nearly all appeared to be planted and/or nonnative. Tree removal within Caltrans ROW is exempt from local regulations. As shown in Table 3.18.2, the LRT Alternative would result in the permanent removal of an estimated 21 protected trees as follows:

- 15 trees in the City of South Pasadena (protected by the City of South Pasadena Municipal Code 34, Trees and Shrubs)
- 2 trees in unincorporated Los Angeles County (protected by the Los Angeles County Oak Tree Ordinance)
- 4 trees in the Caltrans ROW

The operation activities associated with the LRT Alternative (including the TSM/TDM Alternative improvements) would not result in indirect permanent impacts to any special-status plant species or trees potentially subject to local tree ordinances. As discussed above, the TSM/TDM Alternative would not result in permanent impacts to special-status plant species; therefore, the TSM/TDM Alternative component of the LRT Alternative would not result in additional permanent impacts to special-status plant species.

Freeway Tunnel Alternative

The Coulter's goldfields population is within the permanent impact area of the single-bore and dual-bore tunnel design variations of the Freeway Tunnel Alternative and would be permanently impacted by the Freeway Tunnel Alternative through the removal of the population. As a species with a CRPR of 1B.1, Coulter's goldfields is considered seriously threatened in California. This population of Coulter's goldfields is currently highly impacted by the level of development (freeways, infrastructure, etc.) within its vicinity. There are over 130 records of this plant in Southern California that occur after 1930 (Calflora), and this plant may be included in hydroseed mixes applied to highway margins, as appears to be the case with this population. As such, the removal of this population would not constitute a substantial effect to the Southern California regional population of this subspecies. As discussed earlier, if it is determined that this population exists as a result of the species' inclusion in a seed mix during planting, then this species would not be considered impacted by the Freeway Tunnel Alternative because it would not be considered a naturally occurring population.

A Southern California black walnut is approximately 4 ft outside the permanent impact area for the Freeway Tunnel Alternative. Parts of the canopy and root system of the tree likely overlap with the Freeway Tunnel Alternative permanent impact zone; therefore, direct permanent impacts to all or part of the tree would be expected. Southern California black walnut is not a federally or State-listed species but has a CRPR of 4.2, indicating it is uncommon and moderately threatened in California. Over 280 records of individuals and/or populations of Southern California black walnut exist in Los Angeles County after 1940 (Calflora). As only one individual was determined to be present within the BSA, the impacts to this individual are not likely to warrant compensatory mitigation. The cumulative impacts resulting from the removal of this individual tree would not reduce the viability of the local or global population of this species.

The riparian nonwetland and laurel sumac scrub plant communities in which suitable habitat for Parish's gooseberry and slender mariposa-lily are present will not be impacted by the Freeway Tunnel Alternative (see Section 3.16, Natural Communities, Table 3.16.2).

The Freeway Tunnel Alternative would not result in any permanent impacts to Engelmann oak or any other special-status plant species in the BSA.

The BSA along the Freeway Tunnel Alternative covered the largest area for all the Build Alternatives, with almost half of the area in the City of Pasadena, which has protection for all public trees. Tree removal within Caltrans ROW is exempt from local regulations. As shown in Table 3.18.2, the Freeway Tunnel Alternatives single-bore and dual-bore design variations would each result in the permanent removal of an estimated 84 trees, as follows:

- 11 trees in the City of Pasadena (protected by the City of Pasadena City Trees and Tree Protection Ordinance, Municipal Code 8.52)
- 73 trees in the Caltrans ROW

The operation activities associated with the Freeway Tunnel would not result in indirect permanent impacts to any special-status plant species or trees potentially subject to local tree ordinances.

As discussed above, the TSM/TDM Alternative would not result in permanent impacts to special-status plant species. Therefore, the TSM/TDM component of the Freeway Tunnel Alternative would not result in additional permanent impacts to special-status plant species.

3.18.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures would be implemented to address impacts to special-status plant species.

Measure PS-1	**Coulter's Goldfields (applies to the LRT Alternative):** Should the Light Rail Transit (LRT) Alternative be selected and documentation of the planting efforts of the population of Coulter's goldfields in the Biological Study Area (BSA) be unavailable, the Los Angeles County Metropolitan Transportation Authority (Metro) will address

the effects of the LRT Alternative on the Coulter's goldfields population as follows:

- The disturbance of this population will be avoided to the greatest extent possible during final design. Prior to any construction or ground-disturbing activities near the population, the Resident Engineer will require the construction contractor to plan a highly visible barrier such as Environmentally Sensitive Area (ESA) fencing or other marker near or around any part of the population that will not be directly impacted to avoid effects on that part of the population. No access or work will be authorized within the ESA.
- The Resident Engineer will require the Construction Contractor to have a qualified biologist monitor construction in the vicinity of the ESA for the duration of any ground-disturbing activities in the vicinity of the ESA to ensure that indirect effects to the population are minimized.

Measure PS-2

Coulter's Goldfields (applies to Freeway Tunnel Alternative): Should the Freeway Tunnel Alternative be selected and documentation of the planting efforts of the population of Coulter's goldfields in the BSA be unavailable, the California Department of Transportation (Caltrans) will address the effects of the Freeway Tunnel Alternative on the Coulter's goldfields population as follows:

- The removal of this population will be avoided to the greatest extent possible during final design. If during Plans, Specifications and Estimates (PS&E), direct impacts to Coulter's goldfields is avoided by project design, prior to any construction or ground-disturbing activities near the population, the Resident Engineer will require the construction contractor to plan a highly visible barrier (e.g., Environmentally Sensitive Area [ESA] fencing or other marker) near or around any part of the population that will not be directly impacted to avoid effects on that part of the population. No access or work will be authorized within the ESA.
- The Resident Engineer will require the Construction Contractor to have a qualified biologist monitor construction in the vicinity of the ESA for the duration of any ground-disturbing activities in the vicinity of the ESA to ensure that indirect effects to the population are minimized.
- Should removal of the Coulter's goldfields population be required, Caltrans will consult with the California Department of Fish and Wildlife (CDFW) to determine the appropriate mitigation-to-impact ratio for this population. Mitigation may include replacement within a State-owned right of way (ROW). Caltrans will coordinate with the CDFW prior to construction to

determine the appropriate mitigation actions required and to ensure the actions are carried out.

Measure PS-3

Southern California Black Walnut (applies to the Freeway Tunnel Alternative): The Caltrans Resident Engineer will require the Construction Contractor to implement the following to address the effects of the Freeway Tunnel Alternative on the Southern California black walnut:

- The removal and/or disturbance of this individual tree will be avoided to the greatest extent possible during final design and construction. A qualified arborist will establish the dripline of this tree, which will be identified on the design plans, and an ESA will be established.
- Prior to any construction or ground-disturbing activities, the Resident Engineer will require the Construction Contractor to plan a highly visible barrier (e.g., ESA fencing or other marker) near or around any part of the population that will not be directly impacted to avoid effects on that part of the population. No access or work will be authorized within the ESA.
- The Resident Engineer will require the Construction Contractor to have a qualified arborist monitor construction within the vicinity of any established ESA for the duration of any ground-disturbing activities.

Measure PS-4

Trees Protected by City and/or County Ordinances (applies to the four Build Alternatives): The following will be required to address project effects on protected trees:

- Prior to construction or ground-disturbing activities, the Resident Engineer will require the Construction Contractor to plan a highly visible barrier (e.g., ESA fencing or other marker) near or around any part of the population that will be placed around the dripline or trunk of protected trees within and adjacent to the limits of disturbance such that no work will occur within the protected area. If this is infeasible, the Resident Engineer will require the Construction Contractor to obtain appropriate tree removal permits for each impacted protected tree from the appropriate local agency (i.e., Cities of Los Angeles, Pasadena, South Pasadena, and Rosemead, or Los Angeles County).
- Compensatory mitigation may be required at the discretion of the agency with jurisdiction over protected trees; therefore, the compensatory mitigation would vary by jurisdiction. Compensation will be provided consistent with the requirements of the appropriate local agency's tree protection ordinance.

3.19 Animal Species

3.19.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service), and the California Department of Fish and Wildlife (CDFW) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in Section 3.20, Threatened and Endangered Species, below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species. The term special-status also includes wildlife that appears on the CDFW California Natural Diversity Database (CNDDB) Special Animals List (2018a). Animals that are included in this list are those that the CNDDB is interested in tracking, regardless of their legal or protection status. CDFW considers the taxa on this list to be those of greatest conservation need. These species are included on the list due to identification by other governmental agencies and/or non-governmental conservation organizations as being of conservation concern.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Section 4150 and 4152 of the California Fish and Game Code
- Section 86 of the California Fish and Game Code

3.19.2 Affected Environment

The analysis of the effects of the proposed project on special-status animal species is based on the *Natural Environment Study* (NES) (2014). The findings of the NES are summarized in this section. A description of the Biological Study Area (BSA) was provided earlier in this Environmental Impact Report/Environmental Impact Statement (EIR/EIS) in Section 3.16.2.1, Biological Study Area.

Wildlife species that occur in the BSA are generally limited to species that are well adapted to human-modified environments and are typically associated with urbanized habitats. Common mammal species observed or expected to be present in the BSA were raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), eastern fox squirrel (*Sciurus niger*), house mouse (*Mus musculus*), brown rat (*Rattus norvegicus*), black rat (*Rattus rattus*), (feral) domestic cat (*Felis catus*), and striped skunk (*Mephitis mephitis*). Common reptiles observed or expected to be present in the BSA were western fence lizard (*Sceloporus occidentalis*) and common side-blotched lizard (*Uta stansburiana*). A number of bird species were observed in the BSA during focused bird surveys. The dominant bird species present in the BSA were house finch (*Haemorhous mexicanus*), house sparrow, northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), rock pigeon, and American crow (*Corvus brachyrhynchos*). A full list of wildlife identified and expected to be present in the BSA is provided in the Faunal Compendium in Appendix K of the NES.

Based on literature and database reviews, it was determined that 71 special-status wildlife species had the potential to occur in the BSA. Of these 71 species, 15 are federally and/or State-listed as endangered, threatened, or candidate species. Further information on those 15 species, including status, habitat requirements, and potential for occurrence, is provided in detail in the NES and summarized in Section 3.20, Threatened and Endangered Species.

General reconnaissance surveys, focused avian surveys, focused burrowing owl (*Athene cunicularia*) and special-status riparian bird habitat assessments, and focused bat surveys were conducted in 2013.

Animal species that were observed or have habitat present in the BSA are discussed in this section. Additional sensitive wildlife species may have the potential to occur in the BSA but were not discovered during the literature and database reviews or the field surveys.

3.19.2.1 Special-Status Riparian Bird Species

Riparian obligate birds depend on riparian habitat types. Three State- and/or federally listed riparian obligate birds have the potential to occur, as migrants, in the BSA; those species are discussed later in Section 3.20. Two riparian obligate California Species of Special Concern, yellow-breasted chat (*Icteria virens*) and yellow warbler (*Setophaga petechial*), have the potential to be present in the BSA and are discussed below.

A habitat assessment for riparian obligate birds was conducted in March and August 2013 to determine whether suitable habitat for special-status riparian birds was present in the BSA. Two areas of potentially suitable streamside vegetation in the BSA were identified during pedestrian surveys and plant community mapping and were then the subject of the focused habitat assessment. One area is the Laguna Channel adjacent to the eastern edge of Interstate 710 (I-710) and north of Floral Drive in the City of Monterey Park. This channel, described in detail in Section 3.17, aligns with the historic drainage alignment of the Arroyo Rosa de Castillo, based on historical aerials and the United States Geological Survey (USGS) 7.5-minute series topographic map for the Los Angeles quadrangle (Figure 3.17-2; Figure 3.17-4; Figure 3.17-5). Historically, this drainage is thought to have started near Huntington Drive, east of Portal Avenue, and traveled southerly through the BSA and continued south into East Los Angeles. A substantial portion of this drainage, and its visible signs, has been eliminated over time by undergrounding or development. The vegetation at this location was classified as wetland complex, nonnative riparian woodland, and giant reed semi-natural stands. Avian surveys were conducted throughout the BSA including along the Laguna Channel. Of the 21 point counts for the focused avian surveys, six (6) were located within the vicinity of the Laguna Channel. Of the four (4) transect surveys conducted during the focused avian surveys, three (3) were located within close vicinity of the Laguna Channel. Most of the birds that were observed were birds commonly found in urban areas. Vegetation at this site was determined to be unsuitable for use by breeding riparian obligate birds. However, this location was determined to be suitable for use during the nonbreeding season on occasion by riparian obligate birds.

The second location was along the Arroyo Seco drainage, where it is spanned by State Route 134 (SR 134) in the northern part of the BSA. This location consisted of contiguous native-dominated vegetation, including stands of arroyo willow thicket, black cottonwood forest, and white alder groves. This location was determined to be unsuitable for use by breeding riparian obligate birds but suitable for use outside the breeding season.

Two individual yellow warblers were observed on May 15, 2013, in disturbed/developed habitat at the California State University, Los Angeles (Cal State LA) easternmost parking lot adjacent to the existing SR-710 freeway during the transect surveys of the focused avian survey. However, those individuals were not observed in the marginally suitable habitat previously identified. No yellow-breasted chats were observed during the habitat assessment or any other surveys. Because optimal suitable breeding habitat is not present and there is only minor substandard riparian habitat for breeding in the BSA, yellow warbler and yellow-breasted chat are not expected to nest or breed in and/or adjacent to the BSA, although sporadic use outside the breeding season by non-territorial individuals likely does occur.

3.19.2.2 Burrowing Owl

The burrowing owl is classified as a California Species of Special Concern and is also covered under the federal MBTA. The burrowing owl is a year-round resident throughout much of Southern California, with an incursion of visitors retreating from higher elevations and more northerly latitudes in the winter months. In the past, burrowing owls nested in small numbers throughout southern Los Angeles County south of the San Gabriel Mountains, but this species is now nearly extirpated as breeders in that part of the County. Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation and flat to moderate slopes with less than 30 percent canopy cover of trees and shrubs. Burrows are the essential component of burrowing owl habitat. Both natural and artificial burrows provide protection, shelter, and nests for burrowing owls. Burrowing owls typically use burrows made by mammals, such as ground squirrels or badgers, but also may use manmade structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings under cement or asphalt pavement.

Surveys were conducted in June and July 2013 to determine whether the burrowing owl occurs, or has the potential to occur, in the BSA. Habitat in the BSA was assessed for burrowing owl suitability. Three sites included expanses of open low vegetation and were considered to have the potential to be suitable for burrowing owls. These sites were visited to evaluate their potential to provide habitat. The habitat assessment resulted in the determination that there is no suitable burrowing owl habitat present in the BSA. Although the areas were open grassy areas with few trees and shrubs, there was no evidence of small mammal burrows or colonies that would provide a suitable prey base. Further, no burrowing owls, suitable burrows, or burrowing owl sign were observed during surveys. It is unlikely that burrowing owls occur in and adjacent to the BSA; therefore, burrowing owl is considered absent from the BSA.

3.19.2.3 Special-Status Bat Species

One potentially present bat species, Townsend's big-eared bat (*Corynorhinus townsendii*), was recently listed as a State candidate threatened species and is discussed later in Section 3.20. There are 13 special-status bat species with the potential to occur in the BSA. The following six of those bat species are designated as California Species of Special Concern: pallid bat (*Antrozous pallidus*), pocketed free-tailed bat (*Nyctinomops femorosacca*), western mastiff bat (*Eumops perotis*), western yellow bat (*Lasiurus xanthinus*), big free-tailed bat (*Nyctinomops macrotis*), and western red bat (*Lasiurus blossevillii*). The following seven bat species are designated as California Special Animals due to their local importance: fringed myotis (*Myotis thysanodes*), hoary bat (*Lasiurus cinereus*), long-legged myotis (*Myotis volans*), silver-haired bat (*Lasionycteris noctivagans*), long-eared myotis (*Myotis evotis*), western small-footed myotis (*Myotis ciliolabrum*), and Yuma myotis (*Myotis yumanensis*). Locally important species are species that are not monitored by the resource agencies but are monitored by local municipal governments or private organizations such as the Western Bat Working Group. However, all bat species in California are protected from unlawful take in accordance with Section 86 of the California Fish and Game Code. All these potentially occurring bat species primarily roost in caves, rock crevices, and/or trees. All but the western yellow bat and western red bat have been reported to use human-developed structures such as bridges and buildings for roosting.

Focused bat habitat assessment surveys and passive and active nighttime acoustic monitoring surveys were conducted in 2013 to determine whether any bat species were roosting on or within, or have the potential to roost on or within, 14 bridges in the BSA (see NES, Appendix G, Bat Surveys). Five of the bridges and one nearby foraging area were identified as having characteristics suitable for bat roosting, and passive and active acoustic bat surveys were conducted at those locations to determine bat presence. All five bridges were identified as providing marginally suitable roosting habitat. The most valuable foraging habitat near the four bridges in the southern part of the BSA was a golf course approximately 0.25 mi to the southeast where there are water bodies and bright lights that attract insects. The most valuable foraging habitat near the bridge in the northern part of the BSA was the wetland associated with the Del Mar Pump Station, which is immediately adjacent to the bridge, due to the presence of standing water. These two foraging locations were identified to be the most valuable foraging locations in close proximity to the bridges in the BSA; however, bats may forage elsewhere throughout the BSA. In addition, large trees throughout the entire BSA may provide roosting sites for tree-roosting bat species.

Passive acoustic bat surveys were also conducted at a reference bridge (a non-impacted bridge that is partly inside and partly outside the BSA) to determine what species may potentially be foraging in the BSA. While bats were detected acoustically near all five project bridges, no evidence of roosting bat use at those bridges was observed. None of the bat species positively identified via acoustic surveys near the five project bridges were special-status species. One California Species of Special Concern, the western red bat, was detected at the reference bridge. Bat calls recorded at the five project bridges that were identified to the phonic group level indicated that the following special-status species may be foraging near those bridges: hoary bat, long-legged myotis, Yuma myotis, pocketed free-tailed bat, and silver-haired bat. Based on the surveys, there is no indication that the bridges that would be widened or demolished as part of the Build Alternatives are used for special-status bat roosting. However, due to the positive detection of bats during acoustic surveys, bats are likely roosting and foraging elsewhere in the BSA.

3.19.2.4 Other Special-Status and Protected Wildlife Species

There were 40 other special-status wildlife species identified with the potential to occur in the BSA or in the vicinity of the BSA. There is no suitable habitat for 20 of those species in the BSA (see Table 11, Listed, Proposed, and Special-Status Wildlife Potentially Occurring or Known to Occur within and in the Vicinity of the BSA, of the NES). There is potential habitat in the BSA for the remaining 20 special-status wildlife species. Migratory birds protected under the MBTA and birds of prey protected under California Fish and Game Code Sections 3503 and 3503.5 are also expected to occur in the BSA.

The American peregrine falcon (*Falco peregrinus*) was listed as endangered pursuant to the Federal Endangered Species Act (FESA) but was delisted in 2009 due to its recovered populations. It is currently listed as Fully Protected in California. It is covered under the federal Migratory Bird Treaty Act (MBTA), as are most native North American birds. The range of the American peregrine falcon extends throughout most of the western United States. It occurs in cliff, shrubland/chaparral, urban/edificarian (habitats that are dominated by buildings with little vegetation), conifer woodland, hardwood woodland, mixed woodland, estuarine, bay/sound, herbaceous wetland, lagoon, river mouth/tidal river, and tidal flat/shore habitats. American peregrine falcons typically nest on cliff ledges, but other nesting sites can include electricity transmission towers, tall buildings, and bridges. Breeding pairs exhibit high fidelity to nesting sites used previously and rarely establish new nesting sites.

No American peregrine falcons were observed in the BSA during focused bird surveys conducted in 2013. The nearest previously observed nesting location of this species was at the AT&T building in Pasadena at the northwest corner of East Colorado Boulevard and South Marengo Avenue, approximately 0.3 mile (mi) from the Bus Rapid Transit (BRT) Alternative, approximately 0.8 mi from the Light Rail Transit (LRT) Alternative, and approximately 0.4 mi from the Freeway Tunnel Alternative (eBird, Pasadena Audubon Society Yahoo Group 2013; Los Angeles Times 2005). This nest site has been used repeatedly for several years. In general, the BSA includes tall buildings in downtown Pasadena that provide additional potential nesting habitat for American peregrine falcons. Nonetheless, unrecorded pairs are not anticipated to occur in the BSA.

Plant community mapping, focused avian surveys, and general reconnaissance surveys conducted in 2013 determined that suitable habitat was present in the BSA for the following special-status wildlife species: monarch butterfly (*Danaus plexippus*), coast range newt (*Taricha torosa torosa*), western spadefoot (*Spea hammondii*), coast horned lizard (*Phrynosoma coronatum*), coast patch-nosed snake (*Salvadora hexalepis virgultea*), two-striped garter snake (*Thamnophis hammondii*), San Bernardino ring-necked snake (*Diadophis punctatus modestus*), western pond turtle (*Actinemys marmorata*), California legless lizard (*Anniella pulchra pulchra*), rosy boa (*Lichanura trivirgata*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), south coast garter snake (*Thamnophis sirtalis infernalis*), Allen’s hummingbird (*Selasphorus sasin*), Costa’s hummingbird (*Calypte costae*), Lawrence’s goldfinch (*Carduelis lawrencei*), merlin (*Falco columbarius*), Nuttall’s woodpecker (*Picoides nuttallii*), oak titmouse (*Baeolophus inornatus*), and Cooper’s hawk (*Accipiter cooperii*). For monarch butterfly, the habitat for winter roosting aggregations was considered marginal because all known monarch wintering sites are closer to the coast where winter weather is moderated by the oceanic influence. Overnight fall roosts, which occur during migration, could occur in trees in the BSA.

Of the special-status wildlife species mentioned above, only Allen’s hummingbird, Nuttall’s woodpecker, oak titmouse, and Cooper’s hawk were observed in the BSA during the 2013 surveys, although none of these four species were observed nesting during the 2013 surveys. Nuttall's woodpecker, oak titmouse, and Cooper’s hawk are year-round residents within the BSA and can nest in urban, riparian woody areas. Although these species were not observed nesting during 2013 surveys, it is possible for these species to nest within the BSA during subsequent nesting seasons.

In addition to the special-status species discussed above, the following seven special-status bird species were observed incidentally and during focused avian surveys in the BSA: black-crowned night heron, California gull (*Larus californicus*), double-crested cormorant (*Phalacrocorax auritus*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), sharp-shinned hawk (*Accipiter striatus*), and Vaux’s swift (*Chaetura vauxi*). The BSA is outside the nesting/breeding range for black-crowned night heron, California gull, double-crested cormorant, great blue heron, great egret, and Vaux’s swift. The occurrences of those species in the BSA were transient, and no nesting resources would be used in the BSA by these species. The BSA is within the wintering grounds of sharp-shinned hawk but is well outside of its breeding/nesting grounds; therefore, this species is not expected to nest in the BSA. Two pairs of red-tailed hawks (*Buteo jamaicensis*), which are not considered to be special-status but are protected under California Fish and Game Code Sections 3503 and 3503.5 and the MBTA, exhibited territorial and breeding behavior at two locations in or adjacent to the BSA. One pair, seen repeatedly near the south end of the BSA, was observed mating and a potential nest location was discovered in a eucalyptus tree approximately 500 feet (ft) outside the BSA. No fledglings were noted at any time in or around that nest despite subsequent visits to this area, so it was assumed that the nesting attempt was not successful. A second pair of red-tailed hawks was repeatedly noted as acting territorial near the Del Mar Pump Station in the north part of the BSA, but no nest site was documented in that area. In addition to the special-status species mentioned above, 78 additional avian species not considered to be special-status or included on the CNDDB Special Animals List but still protected under the MBTA were identified incidentally and during focused avian surveys in the BSA (see Appendix F, Avian Surveys, of the NES).

3.19.3 Environmental Consequences

3.19.3.1 Temporary Impacts

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any effects related to animal species associated with improvements in the Build Alternatives.

Build Alternatives

Temporary impacts to animal species may occur during construction where habitats are temporarily disturbed during grading or other construction-related activities. Temporary indirect construction effects to animal species are expected as a result of construction noise, light, vibration, dust, and human encroachment. Table 3.19.1 describes the potential temporary impacts on animal species by the Build Alternatives.

3.19.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any effects related to animal species associated with improvements in the Build Alternatives.

Build Alternatives

Permanent impacts to animal species may occur as a result of implementation of the Build Alternatives through direct loss of habitat. Other direct impacts to animal species and/or suitable habitat may result from increased night lighting, headlamp glare, and noise. Indirect impacts may result from edge effects such as future development, exotic plant and animal infestations, litter, fire, unauthorized recreational use, and pollutants associated with vehicle use of the transportation facility. Table 3.19.2 describes the potential permanent impacts on animal species by the Build Alternatives.

TABLE 3.19.1:
Temporary Impacts to Animal Species by Build Alternative

Animal Species	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
Riparian Obligate Bird Species (yellow warbler and yellow-breasted chat)	The TSM/TDM Alternative would not result in direct or indirect temporary impacts to known populations of yellow warbler or yellow-breasted chat. While habitat suitable for use by these species outside the breeding season is present in the BSA and may be used by riparian obligate species sporadically during migration in winter months, no construction activities would occur in those areas. In addition, the birds may leave the vicinity during construction in winter months and forage elsewhere. Therefore, the TSM/TDM Alternative would not result in direct or indirect temporary impacts to yellow warblers or yellow-breasted chats.	Similar to the TSM/TDM Alternative, the BRT Alternative would not result in direct or indirect adverse temporary impacts to yellow warblers or yellow-breasted chats. Therefore, combined with the TSM/TDM component, the BRT Alternative would not result in temporary impacts to riparian obligate birds.	The LRT Alternative would result in indirect temporary impacts to riparian obligate bird species from noise, lighting, vibration, dust, etc., due to the proximity of the potential nonbreeding habitat provided by the riparian areas to construction areas for the LRT Alternative. Site 1, which has potential nonbreeding riparian habitat along the Laguna Channel, is approximately 180 ft from the LRT Alternative and, as a result, could experience indirect impacts during the construction of this alternative. Riparian obligate birds may use Site 1 sporadically during migration in winter months. Specifically, non-ground-disturbing construction activities during winter months (such as lane restriping, installation of temporary signage, and other daytime work within the existing highway right of way) could result in indirect Adverse Effects on riparian obligate bird species. Construction activities near Site 1 would be a sufficient distance away so that Site 1 would not experience indirect Adverse Effects greater than what currently occurs as a result of I-710. In addition, no suitable nesting habitat was identified at Site 1. Therefore, any nonbreeding riparian birds occupying the site would not experience direct temporary construction impacts. The TSM/TDM Alternative would not result in temporary impacts to riparian obligate birds; therefore, the TSM/TDM component of the LRT Alternative would not result in temporary impacts in addition to those discussed above.	The Freeway Tunnel Alternative would result in indirect temporary impacts to riparian obligate bird species from noise, lighting, vibration, dust, etc., during construction in winter months due to the proximity of the potential nonbreeding habitat provided by the riparian areas to the construction areas for this alternative. Site 2 has potential nonbreeding riparian habitat along the Arroyo Seco more than 850 ft away from the Freeway Tunnel Alternative. Riparian obligate birds may use Site 2 sporadically during migration in winter months. As result, Site 2 would not experience any direct impacts during construction. Site 2 is a sufficient distance from the Freeway Tunnel Alternative; thus, it would not experience indirect effects greater than what currently exists as a result of SR 134. In addition, no suitable nesting habitat was identified at Site 2. Therefore, any nonbreeding riparian birds occupying the site would not experience direct temporary construction impacts. The TSM/TDM Alternative would not result in temporary impacts to riparian obligate birds; therefore, the TSM/TDM component of the Freeway Tunnel Alternative would not result in temporary impacts in addition to those discussed above.
Burrowing Owl	The TSM/TDM Alternative would not result in direct or indirect temporary impacts on habitat for, or known populations of, burrowing owl because this species is absent from the BSA.	The BRT Alternative with the TSM/TDM component would not result in direct or indirect temporary impacts on habitat for, or known populations of, burrowing owl because this species is absent from the BSA.	The LRT Alternative with the TSM/TDM component would not result in direct or indirect temporary impacts on habitat for, or known populations of, burrowing owl because this species is absent from the BSA.	The Freeway Tunnel Alternative with the TSM/TDM component would not result in direct or indirect temporary impacts on habitat for, or known populations of, burrowing owl because this species is absent from the BSA.
Special-Status Bat Species	The TSM/TDM Alternative would not result in direct temporary impacts to any known special-status bat populations due to the absence of roosting bat detections at the bridge proposed for demolition and/or widening. Should bats begin using the bridge prior to project construction, those construction activities under the TSM/TDM Alternative could have the potential to result in temporary, indirect impacts through the loss of the roosting location, construction noise, light, and vibration. Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc., if nighttime construction activities take place. However, the bats may leave the vicinity during instances of nighttime construction and forage elsewhere.	The BRT Alternative does not include the widening or demolition of bridges that could serve as potential sites for bat roosting. However, the BRT Alternative does contain trees with the potential for removal that may serve as roosting locations for tree-roosting bat species. Should bats begin using trees in the BRT Alternative impact area prior to project construction, those construction activities under the BRT Alternative could have the potential to result in temporary, indirect impacts through the loss of the roosting location, construction noise, light, and vibration. Indirect temporary impacts to foraging bats may occur from noise, lighting, vibration, dust, etc., if nighttime construction activities take place. However, the bats may leave the vicinity during instances of nighttime construction and forage elsewhere. In addition, the improvements included in the TSM/TDM Alternative would also be constructed as part of the BRT Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The temporary impacts to bats that could potentially	The LRT Alternative does not include the widening or demolition of bridges that could serve as potential sites for bat roosting. However, the LRT Alternative does contain trees with the potential for removal that may serve as roosting locations for tree-roosting bat species. Should bats begin using trees in the LRT Alternative impact area prior to project construction, those construction activities under the LRT Alternative could have the potential to result in temporary, indirect impacts through the loss of the roosting location, construction noise, light, and vibration. Additionally, the LRT Alternative does include the construction of a new bridge, which could potentially result in additional bat roosting habitat. Indirect temporary impacts to foraging bats may occur from noise, lighting, dust, etc. if nighttime construction activities take place. However, the bats may leave the vicinity during instances of nighttime construction and forage elsewhere. In addition, the improvements included in the TSM/TDM Alternative would also be constructed as part of the LRT Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road).	Under the Freeway Tunnel Alternative, the temporary adverse impacts to special-status bat species would be similar to those discussed for the TSM/TDM and LRT Alternatives. In addition, the improvements included in the TSM/TDM Alternative would also be constructed as part of the Freeway Tunnel Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) and Other Road Improvement T-3 (St. John Extension between Del Mar Boulevard and California Boulevard). The temporary impacts to bats that could potentially occur during bridge widening for the Freeway Tunnel Alternative would also occur for the LRT Alternative.

TABLE 3.19.1:
Temporary Impacts to Animal Species by Build Alternative

Animal Species	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
		occur during bridge widening for the TSM/TDM Alternative would also occur for the BRT Alternative.	The temporary impacts to bats that could potentially occur during bridge widening for the TSM/TDM Alternative would also occur for the LRT Alternative.	
Other Special-Status and Protected Wildlife Species	The TSM/TDM Alternative would not result in direct or indirect temporary impacts on potentially suitable habitat for coast horned lizard, coast patch-nosed snake, coast range newt, California legless lizard, two-striped garter snake, western pond turtle, South Coast garter snake, rosy boa, and coastal whiptail as the TSM/TDM Alternative would not have temporary impacts on the plant communities that provide habitat for these species (riparian nonwetland, coast live oak woodland, laurel sumac scrub, or wetland complex). The TSM/TDM Alternative would impact a negligible amount of nonnative grasslands that may support suitable habitat for western spadefoot and San Bernardino ring-necked snake. Therefore, there is the potential for construction of the TSM/TDM Alternative to result in indirect temporary impacts to these species through noise, lighting, vibration, dust, etc. The TSM/TDM Alternative would result in temporary impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake. Therefore, there is the potential for construction of the TSM/TDM Alternative to result in indirect temporary impacts to San Bernardino ring-necked snake as a result of noise, lighting, vibration, dust, etc. For monarch butterfly eggs, caterpillars, and pupae, the TSM/TDM Alternative would impact a negligible amount of nonnative grasslands that may support milkweed plants required by these life stages. Although Cooper's hawk, Allen's hummingbird, oak titmouse, Nuttall's woodpecker, and other bird species protected under the MBTA were observed in the BSA, they are not expected to remain in the area during construction. Nonetheless, indirect temporary impacts on these species may include disturbance of nesting habitat through noise, lighting, vibration, dust, etc.	The BRT Alternative would not result in direct or indirect temporary impacts on potential suitable habitat for coast horned lizard, coast patch-nosed snake, coast range newt, California legless lizard, two-striped garter snake, western pond turtle, western spadefoot, South Coast garter snake, rosy boa, and coastal whiptail as the BRT Alternative would not have temporary impacts on the plant communities that provide habitat for these species (riparian nonwetland, coast live oak woodland, laurel sumac scrub, or wetland complex). The BRT Alternative would not result in temporary impacts to nonnative grasslands. Therefore, there would be no indirect temporary impacts to animal species through loss of nonnative grasslands habitat. Under the BRT Alternative, temporary impacts to the disturbed/developed community would be the same as those discussed for the TSM/TDM Alternative. Under the BRT Alternative, temporary impacts to the nesting birds would be the same as those discussed for the TSM/TDM Alternative. The improvements included in the TSM/TDM Alternative would also be constructed as part of the BRT Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The temporary impacts to other special-status and protected wildlife species discussed for the TSM/TDM Alternative would also occur for the BRT Alternative.	The LRT Alternative would not result in direct or indirect temporary impacts on potential suitable habitat for coast horned lizard, coast patch-nosed snake, coast range newt, California legless lizard, two-striped garter snake, western pond turtle, South Coast garter snake, rosy boa, and coastal whiptail as the LRT Alternative would not have temporary impacts on the plant communities that provide habitat for these species (riparian nonwetland, coast live oak woodland, laurel sumac scrub, or wetland complex). The LRT Alternative would result in temporary impacts (noise, lighting, vibration, dust, etc.) to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies. Under the LRT Alternative, temporary adverse impacts to nonnative grasslands and the disturbed/developed community would be the same as those discussed for the TSM/TDM Alternative. Under the LRT Alternative, temporary impacts to the nesting birds would be the same as those discussed for the TSM/TDM Alternative. The improvements included in the TSM/TDM Alternative would also be constructed as part of the LRT Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). The temporary impacts to other special-status and protected wildlife species discussed for the TSM/TDM Alternative would also occur for the LRT Alternative.	The Freeway Tunnel Alternative would not result in direct or indirect temporary impacts on potential suitable habitat for coast horned lizard, coast patch-nosed snake, coast range newt, California legless lizard, two-striped garter snake, western pond turtle, South Coast garter snake, rosy boa, and coastal whiptail because the Freeway Tunnel Alternative would not have temporary impacts on the plant communities that provide habitat for these species (riparian nonwetland, coast live oak woodland, laurel sumac scrub, or wetland complex). The Freeway Tunnel Alternative would result in temporary impacts (noise, lighting, vibration, dust, etc.) to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies. Under the Freeway Tunnel Alternative, adverse impacts to nonnative grasslands and the disturbed/developed community would the same as those discussed for the TSM/TDM Alternative. Under the Freeway Tunnel Alternative, temporary impacts to the nesting birds would be the same as those discussed for the TSM/TDM Alternative. The improvements included in the TSM/TDM Alternative would also be constructed as part of the Freeway Tunnel Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) and Other Road Improvement T-3 (St. John Extension between Del Mar Boulevard and California Boulevard). The temporary impacts to other special-status and protected wildlife species discussed for the TSM/TDM Alternative would also occur for the Freeway Tunnel Alternative.

Source: *Natural Environment Study* (2014).
MBTA = Migratory Bird Treaty Act

TABLE 3.19.2:
Permanent Impacts to Animal Species by Build Alternative

Animal Species	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
Riparian Obligate Bird Species (yellow warbler and yellow-breasted chat)	The TSM/TDM Alternative would not result in direct or indirect permanent impacts to known populations of yellow warbler or yellow-breasted chat. While there is habitat suitable for use outside the breeding season in the BSA, the birds may leave the vicinity during operation and forage elsewhere. Therefore, the TSM/TDM Alternative would not result in direct or indirect permanent impacts to yellow warblers or yellow-breasted chats.	Similar to the TSM/TDM Alternative, the BRT Alternative would not result in direct or indirect permanent impacts to yellow warblers or yellow-breasted chats. Therefore, combined with the TSM/TDM component, the BRT Alternative would not result in permanent impacts to riparian obligate birds.	The LRT Alternative would not result in any direct temporary impacts to any listed riparian obligate bird species because no suitable nesting habitat was identified within the BSA, and no riparian habitat will be permanently impacted by the LRT Alternative. The TSM/TDM Alternative would not result in permanent impacts to riparian obligate birds; therefore, the TSM/TDM component of the LRT Alternative would not result in permanent impacts in addition to those discussed above.	The Freeway Tunnel Alternative would not result in any direct temporary impacts to any listed riparian obligate bird species because no suitable nesting habitat was identified in the BSA and no riparian habitat will be permanently impacted by the Freeway Tunnel Alternative. The TSM/TDM Alternative would not result in permanent impacts to riparian obligate birds; therefore, the TSM/TDM component of the Freeway Tunnel Alternative would not result in additional permanent impacts than those discussed above.
Burrowing Owl	The TSM/TDM Alternative would not result in direct or indirect permanent impacts on habitat for, or known populations of, burrowing owl due to the absence of the species from the BSA.	The BRT Alternative with the TSM/TDM component would not result in direct or indirect permanent impacts on habitat for, or known populations of, burrowing owl due to the absence of the species from the BSA.	The LRT Alternative with the TSM/TDM component would not result in direct or indirect permanent impacts on habitat for, or known populations of, burrowing owl due to the absence of the species from the BSA.	The Freeway Tunnel Alternative with the TSM/TDM component would not result in direct or indirect permanent impacts on habitat for, or known populations of, burrowing owl due to the absence of the species from the BSA.
Special-Status Bat Species	The TSM/TDM Alternative would not result in direct permanent impacts on any known bat populations due to the absence of roosting bat detections at the bridge proposed for demolition and/or widening. While suitable foraging habitat for bats is present, no appreciable amount of habitat would be permanently removed as a result of the TSM/TDM Alternative. Permanent indirect impacts to nearby roosting and foraging bats resulting from the operation of the TSM/TDM Alternative may include increased traffic, invasive species, storm water runoff, road noise, lighting, and vibration.	The BRT Alternative does not include the widening or demolition of bridges that could serve as potential sites for bat roosting. Therefore, the BRT Alternative would not result in any direct permanent impacts to special-status bat species. Therefore, combined with the TSM/TDM component, the BRT Alternative would not result in permanent direct impacts to special-status bat species. Permanent indirect impacts to nearby roosting and foraging bats resulting from the operation of the BRT Alternative may include increased traffic, invasive species, storm water runoff, road noise, lighting, and vibration.	The LRT Alternative does not include the widening or demolition of bridges that could serve as potential sites for bat roosting. Therefore, implementation of the LRT Alternative would not result in any direct or permanent impacts to special-status bat species. However, the LRT Alternative does include a new bridge, which could potentially result in additional bat roosting habitat. Construction of the LRT Alternative could result in the removal of large trees that may be used by tree-roosting bat species. These sites are typically used only by solitary bats at low densities, and individual trees are not often used repeatedly by a single bat. Due to the frequent switching of roost trees by tree-roosting bats, it is unlikely that the construction of the LRT Alternative would have a substantial permanent impact on tree-roosting bats. Therefore, construction of the LRT Alternative would not result in direct or permanent impacts to special-status bat species. Permanent indirect impacts to nearby roosting and foraging bats resulting from the operation of the LRT Alternative may include increased traffic, invasive species, storm water runoff, road noise, lighting, and vibration. The TSM/TDM Alternative would not result in permanent impacts to special-status bat species; therefore, the TSM/TDM component of the LRT Alternative would not result in permanent impacts in addition to those discussed above.	Under the Freeway Tunnel Alternative, the temporary adverse impacts to special-status bat species would be the same as those discussed for the LRT Alternatives. Permanent indirect impacts to nearby roosting and foraging bats resulting from the operation of the Freeway Tunnel Alternative may include increased traffic, invasive species, storm water runoff, road noise, lighting, and vibration. The TSM/TDM Alternative would not result in permanent impacts to special-status bat species; therefore, the TSM/TDM component of the Freeway Tunnel Alternative would not result in permanent impacts in addition to those discussed above.
Other Special-Status and Protected Wildlife Species	The TSM/TDM Alternative would not result in direct or indirect permanent impacts on potentially suitable habitat for coast horned lizard, coast patch-nosed snake, coast range newt, California legless lizard, two-striped garter snake, western pond turtle, South Coast garter snake, rosy boa, and coastal whiptail because the TSM/TDM Alternative would not have permanent impacts on the plant communities that provide habitat for these species (riparian nonwetland, coast live oak woodland, laurel sumac scrub, or wetland complex).	The BRT Alternative would not result in permanent impacts to potentially suitable habitat for coast horned lizard, coast patch-nosed snake, coast range newt, California legless lizard, two-striped garter snake, western pond turtle, South Coast garter snake, rosy boa, and coastal whiptail because the BRT Alternative would not have permanent impacts on the plant communities that provide habitat for these species (riparian nonwetland, coast live oak woodland, laurel sumac scrub, or wetland complex).	The LRT Alternative would not result in permanent impacts to potentially suitable habitat for coast horned lizard, coast patch-nosed snake, coast range newt, California legless lizard, two-striped garter snake, western pond turtle, South Coast garter snake, rosy boa, and coastal whiptail because the LRT Alternative would not have permanent impacts on the plant communities that provide habitat for these species (riparian nonwetland, coast live oak woodland, laurel sumac scrub, or wetland complex)..	The Freeway Tunnel Alternative would not result in a permanent impact to potentially suitable habitat for coast horned lizard, coast patch-nosed snake, California legless lizard, rosy boa, or coastal whiptail because the Freeway Tunnel Alternative would not have permanent impacts on the plant communities that provide habitat for these species (riparian nonwetland, coast live oak woodland, or laurel sumac scrub). For monarch butterfly adults, the Freeway Tunnel

TABLE 3.19.2:
Permanent Impacts to Animal Species by Build Alternative

Animal Species	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
	For monarch butterfly eggs, caterpillars, and pupae, the TSM/TDM Alternative would result in permanent Adverse Effects to the nonnative grasslands that may support milkweed plants required by these life stages. Furthermore, the nonnative grassland community provides suitable habitat for western spadefoot and San Bernardino ring-necked snake and, therefore, has the potential to result in permanent Adverse Effects to these species through habitat loss. The TSM/TDM Alternative would result in permanent impacts to the disturbed/developed community, which may contain suitable habitat for the San Bernardino ring-necked snake. Although Cooper's hawk, Allen's hummingbird, oak titmouse, Nuttall's woodpecker, and other bird species protected under the MBTA were observed in the BSA, they are not expected to remain in the area. Even though there is nearby suitable habitat for these species outside of the BSA, the TSM/TDM Alternative would not result in any major nesting habitat changes in the region.	Under the BRT Alternative, permanent impacts to potentially suitable habitat for coast horned lizard, coast patch-nosed snake, California legless lizard, rosy boa, and coastal whiptail would be the same as those discussed for the TSM/TDM Alternative. Under the BRT Alternative, permanent adverse impacts to nonnative grasslands and the disturbed/developed community would be the same as discussed for the TSM/TDM Alternative. Similar to the TSM/TDM Alternative, the BRT Alternative would not result in any major nesting habitat changes in the region. The improvements included in the TSM/TDM Alternative would also be constructed as part of the BRT Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The permanent impacts to other special-status and protected wildlife species discussed for the TSM/TDM Alternative would also occur for the BRT Alternative.	The LRT Alternative would result in permanent adverse impacts to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies. Under the LRT Alternative, permanent adverse impacts to nonnative grasslands and the disturbed/developed community would be the same as those discussed for the TSM/TDM Alternative. Similar to the TSM/TDM Alternative, the LRT Alternative would not result in any major nesting habitat changes in the region. The improvements included in the TSM/TDM Alternative would also be constructed as part of the LRT Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). The permanent impacts to other special-status and protected wildlife species discussed for the TSM/TDM Alternative would also occur for the LRT Alternative.	Alternative would result in permanent impacts to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of monarch butterflies. The Freeway Tunnel Alternative would result in permanent impacts to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies. Under the Freeway Tunnel Alternative, permanent impacts to nonnative grasslands and the disturbed/developed community would the same as those discussed for the TSM/TDM Alternative. Similar to the TSM/TDM Alternative, the Freeway Tunnel Alternative would not result in any major nesting habitat changes in the region. The improvements included in the TSM/TDM Alternative would also be constructed as part of the Freeway Tunnel Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) and Other Road Improvement T-3 (St. John Extension between Del Mar Boulevard and California Boulevard). The permanent impacts to other special-status and protected wildlife species discussed for the TSM/TDM Alternative would also occur for the Freeway Tunnel Alternative.

Source: *Natural Environment Study* (2014).
MBTA = Migratory Bird Treaty Act

3.19.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures would avoid and/or minimize impacts to special-status animal species.

Measure AS-1

Bats (applies to all Build Alternatives). Due to the presence of marginally suitable bridge roosting habitat within the TSM/TDM and Freeway Tunnel Alternatives, the following avoidance and minimization efforts will be implemented:

- The Los Angeles County Metropolitan Transportation Authority (Metro) (TSM/TDM Alternative) or the California Department of Transportation (Caltrans) (Freeway Tunnel Alternative) will have preconstruction bat surveys conducted by a qualified bat biologist prior to ground-disturbing and/or bridge construction activities. The surveys will be conducted at least 30 days prior to the start of project construction activities regardless of the time of year. The most effective dates to determine the presence of day or maternity roosts is during the breeding season (March–September). If it is determined during the preconstruction bridge surveys that a structure is being used as a bat roost site (day or night roost), work will be avoided within 100 feet (ft) of the roost site. If any active night roosts are present on site, no work will take place between 10:00 p.m. and sunrise, and airspace access to the bridge will be restricted. Lights will not be used under the structure, foot traffic and equipment use will not be allowed under the structure, and combustion equipment will not be parked or operated under the structure. If a structure is determined to be used by roosting bats, a qualified bat biologist will be on site for the duration of construction activities that may impact bats. If it is determined that the above activities cannot be avoided, bats will be excluded from the bridge using California Department of Fish and Wildlife (CDFW) approved exclusionary devices to the extent necessary to prevent mortality to the colony. Exclusion will take place prior to April 15. If a structure is determined to be in use by roosting bats, CDFW will be contacted to determine additional, appropriate avoidance and minimization measures, including exclusionary measures.

Due to the presence of potentially impacted trees that may provide roosting habitat within the BRT, LRT, and Freeway Tunnel Alternatives the following avoidance and minimization efforts will be implemented:

- Metro (TSM/TDM Alternative, BRT Alternative, and LRT Alternative) or Caltrans (Freeway Tunnel Alternative) will have preconstruction bat surveys conducted by a qualified bat biologist prior to the removal of any large trees containing cavities that may be suitable for roosting. A qualified bat biologist will inspect the tree for roosting bats prior to tree removal. If a bat is found, tree removal will be postponed until the bat has vacated the tree, at least 24 hours. As tree-roosting bats often switch roosting trees from night to night, clearance of the tree by a qualified bat biologist immediately prior to tree removal would serve to avoid and minimize any direct impact or mortality to tree roosting bat species.

Measure AS-2

Monarch Butterfly (applies to all four Build Alternatives): Metro (TSM/TDM, Bus Rapid Transit [BRT], and Light Rail Transit [LRT] Alternatives) or Caltrans (Freeway Tunnel Alternative) will require the Construction Contractor to implement the following avoidance and minimization measures in areas of potentially suitable habitat for winter roosting aggregations of monarch butterfly and the species' egg, caterpillar, and pupal stages:

- If eucalyptus trees are to be removed or trimmed between October and March, preconstruction surveys for winter roosting aggregations of monarchs will be conducted by a qualified biologist.
- If a winter roosting aggregation is discovered, the area will be flagged and posted with Environmentally Sensitive Area (ESA) signs. If practicable, activities within this area will be avoided until the aggregation disperses in spring.
- If any mature trees are to be removed or trimmed between September and October, preconstruction surveys for overnight fall roosts of monarchs will be conducted by a qualified biologist.
- If an overnight fall roost is discovered, the area will be flagged and posted with ESA signs by a qualified biologist. If practicable, activities within this area will be avoided until the fall roosting group disperses (during the day).
- Preconstruction surveys for milkweed plants that may support monarch eggs, caterpillars, or pupae will be conducted within grassland and riparian areas by a qualified biologist.
- Any milkweed plants found that may support monarch eggs, caterpillars, or pupae will be flagged and ESA signs posted by a qualified biologist. Construction in the area will be avoided and minimized.

Measure AS-3

Amphibian and Reptile Avoidance and Minimization Measures (applies to all four Build Alternatives): Metro (TSM/TDM, BRT, and LRT Alternatives) will require the Construction Contractor to implement the following avoidance and minimization measures in areas of potentially suitable nonnative grassland and disturbed/

developed habitat for western spadefoot and San Bernardino ring-necked snake:

- Potentially suitable habitat for these species will be avoided to the greatest extent possible during construction and design. Staging areas will be confined to existing disturbed areas to the greatest extent possible.
- Preconstruction surveys will be conducted in areas of potentially suitable habitat by a qualified biologist.
- If any individuals of these species are determined to be present during the preconstruction surveys, CDFW will be notified and translocation will be conducted by a qualified biologist.
- The translocation process will be conducted in accordance with the guidelines outlined by CDFW.

Caltrans (Freeway Tunnel Alternative) will require the Construction Contractor to implement the following avoidance and minimization measures in areas of potentially suitable wetland complex, nonnative grassland, and disturbed/developed habitat for coast range newt, western spadefoot, two-striped garter snake, western pond turtle, San Bernardino ring-necked snake, and South Coast garter snake:

- Potentially suitable habitat for these species will be avoided to the greatest extent possible during construction and design. Staging areas will be confined to existing disturbed areas to the greatest extent possible.
- Preconstruction surveys will be conducted in areas of potentially suitable habitat by a qualified biologist.
- If any individuals of these species are determined to be present during the preconstruction surveys, CDFW will be notified and translocation will be conducted by a qualified biologist.
- The translocation process will be conducted in accordance with the guidelines outlined by CDFW.

Measure AS-4

Other Special-Status Bird Avoidance and Minimization Measures (applies to all four Build Alternatives): Metro (TSM/TDM, BRT, and LRT Alternatives) or Caltrans (Freeway Tunnel Alternative) will require the Construction Contractor to implement the following avoidance and minimization efforts for Cooper's hawk, Allen's hummingbird, Costa's hummingbird, Lawrence's goldfinch, merlin, Nuttall's woodpecker, oak titmouse, and any nesting or breeding birds of prey protected under California Fish and Game Code Sections 3503 and 3503.5, and any other nesting or breeding birds protected under the Migratory Bird Treaty Act (MBTA):

- The removal and/or disturbance of trees or suitable roosting shrubbery will be minimized to the greatest extent possible.
- Any activities in which tree or native vegetation trimming/ removal or construction on bridges may occur will take place outside of the nesting bird season (February 1–August 31) where feasible.
- Should bridge construction be required during the nesting season, a qualified biologist will be required to inspect the construction site prior to February 1 and be present during bird nest removal. The presence of a qualified biologist is required to inspect the construction site and confirm that any nests potentially occurring are unoccupied or inactive prior to nest removal, because removing active nests violates State and federal law.
- If avoidance of these activities during this period is not possible, preconstruction surveys by a qualified biologist will be conducted to identify any existing nests or breeding birds within 200 ft of and including the area scheduled for construction. The survey will be completed no more than 48 hours prior to the start of project activities. Additional surveys will be conducted if more than 3 days pass between preconstruction nesting bird surveys and the start of construction.
- If breeding/nesting birds are located within 300 ft of the limits of disturbance, a buffer will be flagged around the nest by a qualified biologist and ESA signs posted. Any work within 300 ft of the flagged area will require a qualified biologist to monitor the birds and ensure that the construction activities do not negatively impact the birds.
- If the biologist identifies signs of stress to any bird species, the biologist will halt activities in the immediate area until the birds resume their normal behavior or until the nest has been determined to be no longer active. This intervention will provide adequate protection to native nesting bird species under the MBTA and the California Fish and Game Code.
- Should breeding/nesting birds of prey be located within the area scheduled for construction, the buffer will be extended to 500 ft as birds of prey are typically more sensitive to disturbance.
- Unoccupied nests will be removed from bridges prior to the colony returning to the nesting site to begin nesting (February 1–August 31). During the period of time between the removal of unoccupied nests and the start of bridge construction, bridges will be checked often and unoccupied nests that are under construction will be removed. The removal of unoccupied nests will be monitored by a qualified biologist

through the duration of construction. These efforts will continue until September or until the completion of construction in order to keep the structures free of nesting birds. Nest removal will not take place for nests found in trees or other vegetation.

- The construction buffer limits may be modified at the discretion of a qualified biologist familiar with the specific circumstances of the situation. Coordination with CDFW will be conducted to confirm appropriate buffers and determine when it is safe to remove the buffers. If there are no breeding/nesting birds, no further action is necessary.

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3.20 Threatened and Endangered Species

3.20.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC), Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (FHWA), are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement or a Letter of Concurrence. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species; and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The California Department of Fish and Wildlife (CDFW) is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both the FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

3.20.1.1 Federal Endangered Species Act Consultation

Under provisions of Section 7(a)(2) of FESA, a federal agency that permits, licenses, funds, or otherwise authorizes a project activity must consult with USFWS to ensure that its actions would not jeopardize the continued existence of any listed species or destroy or adversely modify critical habitat. Formal Section 7 consultation is not anticipated to be required because adverse effects to federally threatened and/or endangered species and habitats are not anticipated. No FESA consultation with USFWS has been initiated to date.

3.20.1.2 California Endangered Species Act Consultation

CESA protects plant and animal species listed as threatened or endangered and candidates for listing. Take of listed and candidate species is authorized by CDFW through the provisions of Sections 2081 and 2081.1 of the California Fish and Game Code. No impacts to listed or candidate species are anticipated to result from implementation of the proposed project. Formal consultation with CDFW pursuant to Section 2081 of the California Fish and Game Code and request of authorization for an Incidental Take Permit are not expected to be required. No CESA consultation with CDFW has been initiated to date.

3.20.2 Affected Environment

The analysis of the potential effects of the proposed project on threatened and/or endangered species is based on the *Natural Environment Study* (NES) (2014). The findings of the NES are summarized in this section; detailed information, including the methodology for this analysis, is provided in the NES.

The Biological Study Area (BSA) is highly developed and disturbed. However, the BSA does contain small areas (less than 6 acres [ac]) of sensitive natural communities that could support threatened and/or endangered species. Refer to Section 3.16, Natural Communities, for further discussion on sensitive naturally occurring communities within the BSA.

Federally or State-listed endangered, threatened, proposed endangered, or threatened species; California Species of Special Concern (CSC); or otherwise sensitive species that may occur within or in the immediate vicinity of the project were queried in the California Natural Diversity Database (CNDDB) for the four United States Geological Survey (USGS) 7.5-minute series topographical quadrangles of Pasadena, Los Angeles, El Monte, and Mt. Wilson that encompass the BSA; and the surrounding 12 USGS 7.5-minute series topographical quadrangles of Burbank, Chilao Flat, Condor Peak, Waterman Mountain, Azusa, Baldwin Park, La Habra, Hollywood, Inglewood, South Gate, Sunland, and Whittier. However, as previously noted, the BSA's habitats are degraded to such a degree that they provide little value for native plants or wildlife. Most of the species identified by the CNDDB within the relevant quadrangles are not likely to be present due to a lack of species-specific habitat requirements. In addition, many of these species are not tolerant of the types of disturbances or proximity to human activities that currently occur in the BSA. Furthermore, the CNDDB search included quadrangles that extend into areas of the Angeles National Forest up to 7,100 feet (ft) in elevation, which support plant and wildlife species unlikely to be present within the BSA, which is primarily within the alluvial fan of the Los Angeles Basin. The USFWS provided an Endangered Species Act Species List for the SR 710 North Project. A copy of that letter is provided in Appendix K. That list identified a total of three (3) wildlife species and two (2) plant species. The letter also indicated that no designated Critical Habitats could occur in the project area. No Critical Habitats are within the BSA or in the vicinity of the BSA and, therefore, they are not discussed further in this section. There is no NOAA Fisheries Service regulated listed fish species and/or designated Critical Habitat present within the BSA. A species list generated through National Marine Fisheries Service (NMFS) resources lists steelhead as "may be present" (Appendix K). Historically, the Los Angeles River Watershed served as habitat for the federally endangered steelhead salmon (Oncorhynchus mykiss). However, due to the dramatic population decline of this species, as well as river modifications such as channelization and alterations associated with flood control and metropolitan development, it is very unlikely that the species is present in the BSA. Therefore, the project will have no effect to all species listed on the NMFS species list contained in Appendix K.

Because no impacts or effects to National Marine Fisheries Service (NMFS) species are anticipated, steelhead is not further discussed.

3.20.2.1 Threatened and/or Endangered Plant Species

After a thorough literature and database review, it was determined that a total of 54 special-status plant species (refer to Table 10 of the NES) have the potential to occur within or in the vicinity of the BSA; special-status plant species are a combination of federal or State-listed endangered or threatened, proposed endangered or threatened, California Species of Special Concern (CSC), and/or other special designations. Of the 54 special-status plant species with the potential to occur within the BSA, 10 have federal and/or State-listed designations (Table 3.20.1). After further analysis, it was determined that suitable habitat and soil requirements are not present within the BSA for 7 of these 10 plant species; therefore, those 7 plant species are not discussed further in this evaluation. Discussion of the other 3 federally and State-listed plant species that have the potential to occur in the BSA (marsh sandwort, slender-horned spineflower, and Gambel's watercress) is provided below.

TABLE 3.20.1:
Federally and/or State-Listed Endangered, Threatened, and Candidate Plant Species

Species	State Listed Status	Federally Listed Status	Effect Finding[3]	Effect Finding for Critical Habitat[3]
Plant Species on the USFWS FESA Species List				
Gambel's watercress *(Rorippa gambelii)* (aka: *Nasturtium gambelii)*	Threatened	Endangered	No effect	No effect
Slender-horned spineflower *(Dodecahema leptoceras)*	Endangered	Endangered	No effect	No effect
Nevin's barberry,[1,2] (*Berberis nevinii)*	Endangered	Endangered	No effect	No effect
Braunton's milk-vetch[1,2] (*Astragalus brauntonii)*	No status	Endangered	No effect	No effect
Other Plant Species Evaluated in the Current Study				
Marsh sandwort (*Arenaria paludicola*)	Endangered	Endangered	No effect	No effect
Brand's star phacelia[2] (*Phacelia stellaris*)	No status	Removed from Federal list on 11-22-2013	No effect	No effect
California Orcutt grass[2] (*Orcuttia californica*)	Endangered	Endangered	No effect	No effect
Coastal dunes milk-vetch[2] (*Astragalus tener* var. *titi*)	Endangered	Endangered	No effect	No effect
San Fernando Valley spineflower[2] (*Chorizanthe parryi* var. *fernandina*)	Endangered	Federal Candidate for listing	No effect	No effect
Spreading navarretia[2] (*Navarretia fossalis*)	No status	Threatened	No effect	No effect

Sources: United States Fish and Wildlife Service Species List for the Project, dated August 13, 2018; State of California, State and Federally Listed Endangered and Threatened Animals of California and State and Federally Listed Endangered, Threatened and Rare Plants of California Lists, March 2018. Website: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/. Accessed August 13, 2018; and the NES.

1 It was determined during the analysis conducted for the project, that these species are not present in the BSA because the area lacks the soil requirements and habitat types for these species. Therefore, these species are not discussed further in this evaluation.
2 There is no suitable habitat for these species in the BSA; therefore, these species are not discussed further in this evaluation.
3 Build Alternative: TSM/TDM Alternative

BSA = Biological Study Area NES = Natural Environment Study

Marsh Sandwort

Marsh sandwort is federally and State-listed as endangered. It also has a California Rare Plant Rank (CRPR) of 1B.1, indicating that it is seriously threatened in California. CRPR is the California Native Plant Society's ranking system that was created in order to categorize various levels of concern for plant species. Marsh sandwort is a perennial stoloniferous herb in the family Caryophyllaceae that blooms from May to August. This species occurs in freshwater marsh, marsh and swamp, and wetland habitats. It is often found in openings on sandy soils between 10 and 558 ft in elevation.

Botanical surveys conducted within the BSA in 2013, during the appropriate blooming period for this species, were negative. Only one other plant in the family Caryophyllaceae, red sandspurry (*Spergularia rubra*), which is readily distinguishable from marsh sandwort, was observed during the surveys. Neither blooming nor seeded individuals were observed as a result of the surveys. The wetland complex habitat present in the BSA was marginally suitable for this species due to its low quality. The CNDDB includes one recorded observation of marsh sandwort in this area from 1900 in the Cienega community (near Beverly Hills) of Los Angeles County, approximately 8.5 to 9.5 miles (mi) southwest of the BSA, in an area that is now urban with no remaining habitat. Because there was only marginally suitable habitat, there are no known occurrences of this species proximate to the BSA, and the species was not observed as a result of focused surveys during the appropriate blooming period, the potential for the species to be present but not observed is low. Therefore, the species is considered absent from the BSA and is not discussed further in this section.

Slender-Horned Spineflower

Slender-horned spineflower is federally and State-listed as endangered. It also has a CRPR of 1B.1, indicating that it is seriously threatened in California. This species is an annual herb in the family Polygonaceae that blooms from April to June. Slender-horned spineflower occurs in chaparral, cismontane woodland, and coastal scrub habitats. It is often found on alluvial fans in sandy soils between 656 and 2,493 ft in elevation.

Botanical surveys conducted within the BSA in 2013 were negative for this species. Neither blooming nor seeded individuals were observed as a result of the surveys. However, as the surveys were conducted approximately 1 month later than the appropriate flowering period for slender-horned spineflower, it is possible that individuals were present but not seen or were unidentifiable. There is marginally suitable habitat within the BSA within the laurel sumac scrub and coast live oak woodland areas of the BSA. The CNDDB includes five records of slender-horned spineflower observations near the BSA. The closest occurrence was documented in 1920 near the Rubio Wash in Altadena, approximately 3 mi northeast of the BSA; this population has since been extirpated as a result of urbanization. The most recent occurrence was documented in 2006 at the Big Tujunga Wash near Sunland, approximately 11.5 mi northwest of the BSA. This species is normally associated with Riversidean or Venturan coastal sage scrub on alluvial terraces adjacent to natural rivers and streams. There are no known extant occurrences of this species proximate to the BSA and it was not observed as a result of focused surveys; therefore, the potential for the species to be present is low. However, due to botanical surveys being conducted outside of the appropriate blooming period for this species, the absence of slender-horned spineflower from the BSA cannot be confirmed.

Gambel's Watercress

Gambel's watercress is federally listed as endangered and State-listed as threatened. It also has a CRPR of 1B.1, indicating that it is seriously threatened in California. This species is a perennial rhizomatous herb in the family Brassicaceae that blooms from April to October. Gambel's watercress occurs in brackish marsh, freshwater marsh, marsh and swamp, and wetland habitats. It occurs between 6 and 1,083 ft in elevation.

Botanical surveys conducted within the BSA in 2013, during the appropriate blooming period for this species, were negative. Neither blooming nor seeded individuals were observed as a result of the surveys. The two wetland complex habitats present within the BSA in Pasadena and Monterey Park were marginally suitable but not ideal habitat due to high human disturbance. This species is nearly extinct in the United States. The CNDDB includes one recorded observation of Gambel's watercress in this area from 1904 in the Cienega community (near Beverly Hills) of Los Angeles County, approximately 8.5 to 9.5 mi southwest of the BSA, in an area that is now urban with no remaining habitat. Because there is only low-quality, marginally suitable habitat present in the BSA, there are no known occurrences of this species proximate to the BSA, and the species was not observed as a result of focused surveys during the appropriate blooming period, the potential for Gambel's watercress to be present but not observed is low. Therefore, the species is considered absent from the BSA and is not discussed further in this section.

3.20.2.2 Threatened and/or Endangered Animal Species

After a thorough literature and database review, it was determined that 70 special-status wildlife species (refer to Table 11 in the NES) have the potential to occur within the BSA; special-status wildlife species are a combination of federal or State-listed endangered or threatened, proposed endangered or threatened, CSC, and/or other special designations. Of the 70 wildlife species with the potential to occur within the BSA, 11 have federal and/or State-listed designations (Table 3.20.2). The analysis determined that 7 of these 11 wildlife species are not present in the BSA due to lack of suitable habitat types; therefore, those 7 wildlife species are not discussed further in this evaluation. Discussion of the other 4 federally and/or State-listed wildlife species that have the potential to occur within the BSA (i.e., least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, and Townsend's big-eared bat) is provided below.

Riparian Obligate Bird Species

Riparian obligate birds depend on riparian habitat types, which are a limited resource in California. Three State- and/or federally listed riparian obligate birds (least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo) have the potential to occur, as migrants, in the BSA. Least Bell's vireo and southwestern willow flycatcher are both federally and State listed as endangered; western yellow-billed cuckoo is listed as a federally threatened and State endangered species. All three species are protected pursuant to the federal Migratory Bird Treaty Act (MBTA).

Least Bell's vireo is a riparian obligate during the breeding season and is typically associated with early successional riparian habitat that is structurally diverse. This species can occupy a range of riparian vegetation types (e.g., cottonwood willow and oak woodland) and vegetation age classes but is most often associated with a dense understory. The southwestern willow flycatcher requires riparian woodland habitats for all, or portions, of its lifecycle; during the breeding season, it is a riparian obligate. Southwestern willow flycatcher breeding habitat generally has vegetation that includes dense tree or shrub cover, dense twig structure, and high levels of live green foliage. The western yellow-billed cuckoo's habitat criteria includes: large blocks of riparian woodlands (particularly those composed of cottonwoods and willows), sufficient patch size (10 ac average in California), and presence of low woody vegetation.

TABLE 3.20.2:
Federally and/or State Listed Endangered, Threatened and/or Candidate Wildlife Species

Species	State Listed Status	Federally Listed Status	Effect Finding[2]	Effect Finding for Critical Habitat[2]
Wildlife Species on the USFWS Species List				
Bird Species				
California Condor (*Gymnogyps californianus*)[1]	No status	Endangered	No effect	No effect
Coastal California gnatcatcher[1] *(Polioptila californica californica)*	No status	Threatened	No effect	No effect
Least Bell's vireo *(Vireo bellii pusillus)*	Endangered	Endangered	No effect	No effect
Southwestern willow flycatcher *(Empidonax traillii extimus)*	State Candidate Endangered	Endangered	No effect	No effect
Fish Species				
Santa Ana sucker[1] *(Catostomus santaanae)*	No status	Threatened	No effect	No effect
Amphibian Species				
Arroyo toad[1] *(Anaxyrus californicus)*	No status	Endangered	No effect	No effect
Mountain yellow-Legged frog, Southern California distinct population segment[1] *(Rana muscosa)*	State Candidate Endangered	Endangered	No effect	No effect
Other Wildlife Species Evaluated in the Current Study				
Bird Species				
Bank swallow[1] (*Riparia riparia*)	Threatened	No status	No effect	No effect
Western yellow-billed cuckoo *(Coccyzus americanus)*	Endangered	Threatened	No effect	No effect
Mammal Species				
Townsend's big-eared bat (*Corynorhinus townsendii*)	State Candidate Threatened	No status	No effect	No effect
Amphibian Species				
California red-legged frog [1] (*Rana draytonii*)	No status	Threatened	No effect	No effect

Sources: United States Fish and Wildlife Service Species List for the Project, dated August 13, 2018; State of California, State and Federally Listed Endangered and Threatened Animals of California and State and Federally Listed Endangered, Threatened and Rare Plants of California Lists, March 2018. Website: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/. Accessed August 13, 2018; and the NES.

1 It was determined during the analysis conducted for the project that these species are not present in the BSA because the area lacks the soil requirements and/or habitat types for these species. Therefore, these species are not discussed further in this evaluation.

2 Build Alternative: TSM/TDM Alternative

BSA = Biological Study Area
NES = Natural Environment Study

A habitat assessment for riparian obligate birds was conducted in March and August 2013 to determine whether suitable habitat for threatened and/or endangered riparian birds was present within the BSA. Two areas of potentially suitable streamside vegetation within the BSA were identified during pedestrian surveys and plant community mapping and were then the subject of the focused habitat assessment. Site 1 was located along the Laguna Channel stream adjacent to the eastern edge of Interstate 710 (I-710) and north of Floral Drive in the City of Monterey Park, and the vegetation at Site 1 was classified as wetland complex, nonnative riparian woodland, and giant reed semi-natural stands. Vegetation at this site was determined to be unsuitable for use by breeding riparian obligate birds. However, Site 1 was determined to be suitable for use during the nonbreeding season on occasion by riparian obligate birds.

Site 2 was located along the Arroyo Seco drainage, where it is spanned by State Route 134 (SR 134) on the northern end of the BSA. Site 2 consisted of contiguous native-dominated vegetation alliances, including stands of arroyo willow thicket, black cottonwood forest, and white alder groves. Site 2 was determined to be unsuitable for use by breeding riparian obligate birds. However, the site was determined to be suitable for use outside the breeding season.

Focused avian surveys (including point-counts and transect surveys) were conducted between March and May 2013. No listed riparian obligate bird species were observed during these surveys.

The CNDDB does not include any records for least Bell's vireo, southwestern willow flycatcher, or western yellow-billed cuckoo in or close to the BSA within the past 50 years. However, eBird, a database aimed at compiling casual observations of all bird species, includes several records of least Bell's vireo and willow flycatcher (records do not identify whether it is southwestern or a different subspecies) in the area, including locations along the Arroyo Seco both upstream and downstream of the BSA. These records were closest to Site 2 in the BSA; however, there were no records near Site 1. There are no records of western yellow-billed cuckoo near the BSA and only three recorded in Los Angeles County. It is unlikely that least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo breed within and/or adjacent to the BSA, although sporadic use outside the breeding season by non-territorial individuals likely does occur.

Townsend's Big-Eared Bat

Townsend's big-eared bat has recently been listed as a State candidate threatened species. This bat species has a very low potential to be present within the BSA since it is normally found in undisturbed areas and roosts in abandon mines and caves. However, focused bat habitat assessment surveys and passive and active nighttime acoustic monitoring surveys were conducted in 2013 to determine whether this bat species was roosting on or within, or has the potential to roost on or within, any of the bridges in the BSA that may be affected by the Build Alternatives. Habitat at and near 14 bridge locations was assessed for bat-use suitability. Five of the project bridges and one nearby foraging area were identified as having characteristics suitable for bat roosting, and passive and active acoustic bat surveys were conducted at these locations to determine bat presence. All five project bridges were identified as providing marginally suitable roosting habitat. The foraging habitat nearest to the four bridges in the southern portion of the BSA was a golf course approximately 0.25 mi to the southeast. The foraging habitat nearest to the bridge in the northern portion of the BSA was the wetland associated with the Del Mar Pump Station immediately adjacent to the bridge. Passive acoustic bat surveys were also conducted at a reference bridge (a non-impacted bridge that is partly inside and partly outside the BSA) to determine whether this species has the potential to be foraging in the BSA. While bats were detected acoustically near all five project bridges, no evidence of roosting bat use at those bridges was observed. Townsend's big-eared bat was not positively identified via acoustic surveys near the five project bridges. Based on the surveys, there is no indication that the bridges that would be widened or demolished as part of the Build Alternatives are used for Townsend's big-eared bat roosting.

3.20.3 Environmental Consequences

3.20.3.1 Temporary Impacts

Temporary impacts to threatened and/or endangered species may occur during construction, where habitats are temporarily disturbed during grading or other construction-related activities. Temporary construction impacts to listed species are expected as a result of construction noise, light, vibration, dust, and human encroachment. Refer to Table 3.20.2 for a discussion of potential temporary impacts to threatened and endangered species that could potentially occur in the BSA by

Build Alternative. (Please note that the remaining tables cited in this section are provided following the last page of text in this section.) Table 3.20.3 does not discuss temporary impacts on plant and animal species that do not have the potential to occur in the BSA, as described in Table 3.20.1.

No Build Alternative

The No Build Alternative does not include the construction of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any direct or indirect temporary impacts related to threatened and/or endangered species associated with improvements in the Build Alternatives.

Build Alternatives

Table 3.20.1 discusses the temporary impacts to listed species by Build Alternative. As shown in Table 3.20.1, all Build Alternatives were determined: (1) to have no direct or indirect temporary impacts on federally listed threatened or endangered species, (2) to not result in take of State-listed threatened or endangered species, and (3) to have a preliminary no effect on all species identified in Tables 3.20-1 and 3.20-2 as well as on any other species or critical habitat listed in the USFWS species list (Appendix K).

TABLE 3.20.3:
Temporary Impacts to Threatened and/or Endangered Species By Build Alternative

Species	Status	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
Plant Species					
Slender-horned spineflower	Federally listed as endangered, State-listed as endangered	Marginally suitable habitat for the slender-horned spineflower was identified within the BSA in the laurel sumac scrub and coast live oak woodland plant communities. However, no temporary construction activities associated with the TSM/TDM Alternative are planned within this habitat. The limits of disturbance of the TSM/TDM Alternative are approximately 0.5 mile away from the suitable habitat for this species, so no indirect impacts are anticipated to occur. Therefore, the TSM/TDM Alternative would not result in direct or indirect temporary impacts on any known populations or habitat of this species.	The BRT Alternative, including the TSM/TDM Alternative components, would not result in direct or indirect temporary impacts on any known populations or habitat of this species. The limits of disturbance of the BRT Alternative are approximately 0.8 mile away from the suitable habitat for this species, so no indirect impacts are anticipated to occur.	The LRT Alternative, including the TSM/TDM components, would not result in direct or indirect temporary impacts on any known populations or habitat of this species. The limits of disturbance of the LRT Alternative are approximately 1.1 mile away from the suitable habitat for this species, so no indirect impacts are anticipated to occur.	The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in direct or indirect temporary impacts on any known populations or habitat of this species. The limit of disturbance of the Freeway Tunnel Alternative is approximately 850 feet away from suitable habitat for this species. This habitat may experience effects resulting from non-ground-disturbing construction. Non-ground-disturbing construction activities that may occur within 850 feet of this habitat includes lane restriping, installation of temporary signage, and other daytime work within the existing highway right of way on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on SR 134. As such, indirect impacts from construction are not anticipated. Therefore, the Freeway Tunnel Alternative would not result in direct or indirect temporary construction impacts to this species.
Bird Species (listed riparian obligate)					
Least Bell's vireo	Federally listed as endangered, State-listed as endangered	The TSM/TDM Alternative would not result in direct or indirect temporary impacts to any known populations of least Bell's vireo or its habitat. While habitat suitable for use outside the breeding season is present within the BSA and may be used by least Bell's vireo sporadically during migration in winter months, no construction activities are planned in those areas. The nearest TSM/TDM Alternative impact area is approximately 1.9 miles away from Riparian Site 1 and 0.6 mile away from Site 2. In addition, the birds may leave the vicinity during construction in winter months and forage elsewhere.	The BRT Alternative, including the TSM/TDM components, would not result in direct or indirect temporary impacts on any known populations or habitat of this species. The nearest BRT Alternative impact area is approximately 1.2 miles away from Riparian Site 1 and 0.8 mile away from Site 2. The nearest TSM/TDM component impact area is approximately 1.9 miles away from Riparian Site 1 and 0.6 mile away from Site 2.	The LRT Alternative, including the TSM/TDM components, would not result in direct temporary impacts to this species because no suitable nesting habitat was identified within the BSA. The LRT Alternative, including the TSM/TDM components, could result in limited indirect, temporary noise, lighting, dust, etc., impacts to this species at one location. However, that location is approximately 180 feet away from potential non-breeding riparian habitat and would experience effects resulting from non-ground-disturbing construction. Non-ground-disturbing construction activities include lane restriping, installation of temporary signage, and other daytime work within the existing highway right of way on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on I-710.	The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in direct temporary impacts to this species because no suitable nesting habitat was identified within the BSA. The Freeway Tunnel Alternative could result in limited indirect, temporary noise, lighting, dust, etc., impacts to this species at one location. However, that location is approximately 850 feet away from potential nonbreeding riparian habitat and would experience effects resulting from non-ground-disturbing construction. Non-ground-disturbing construction activities include lane restriping, installation of temporary signage, and other daytime work within the existing highway right of way on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on SR 134.
Southwestern willow flycatcher	Federally listed as endangered, State-listed as endangered	The TSM/TDM Alternative would not result in direct or indirect temporary impacts to any known populations of southwestern willow flycatcher or its habitat. While habitat suitable for use outside the breeding season is present within the BSA and may be used by southwestern willow flycatcher sporadically during migration in winter months, no construction activities are planned in those areas. The nearest TSM/TDM Alternative impact area is approximately 1.9 miles away from Riparian Site 1 and 0.6 mile away from Site 2. In addition, the birds may leave the vicinity during construction in winter months and forage elsewhere.	The BRT Alternative, including the TSM/TDM components, would not result in direct or indirect temporary impacts on any known populations or habitat of this species. The nearest BRT Alternative impact area is approximately 1.2 miles away from Riparian Site 1 and 0.8 mile away from Site 2.	The LRT Alternative, including the TSM/TDM components, would not result in direct temporary impacts to this species because no suitable nesting habitat was identified within the BSA. The LRT Alternative could result in limited indirect, temporary noise, lighting, dust, etc., impacts to this species at one location However, that location is approximately 180 feet away from potential non-breeding riparian habitat and would experience effects resulting from non-ground-disturbing construction. Non-ground-disturbing construction activities include lane restriping, installation of	The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in direct temporary impacts to this species because no suitable nesting habitat was identified within the BSA. The Freeway Tunnel Alternative could result in limited indirect, temporary noise, lighting, dust, etc., impacts to this species at one location. However, that location is approximately 850 feet away from potential nonbreeding riparian habitat and would experience effects resulting from non-ground-disturbing construction. Non-ground-disturbing construction activities include lane restriping,

TABLE 3.20.3:
Temporary Impacts to Threatened and/or Endangered Species By Build Alternative

Species	Status	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
				temporary signage, and other daytime work within the existing highway right of way on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on I-710.	installation of temporary signage, and other daytime work within the existing highway right of way on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on SR 134.
Western yellow-billed cuckoo	Federally listed as threatened, State-listed as endangered	The TSM/TDM Alternative would not result in direct or indirect temporary impacts to any known populations of western yellow-billed cuckoo or its habitat. While habitat suitable for use outside the breeding season is present within the BSA and may be used by western yellow-billed cuckoo sporadically during migration in winter months, no construction activities are planned in those areas. The nearest TSM/TDM Alternative impact area is approximately 1.9 miles away from Riparian Site 1 and 0.6 mile away from Site 2. In addition, the birds may leave the vicinity during construction in winter months and forage elsewhere.	The BRT Alternative, including the TSM/TDM components, would not result in direct or indirect temporary impacts on any known populations or habitat of this species. The nearest BRT Alternative impact area is approximately 1.2 miles away from Riparian Site 1 and 0.8 mile away from Site 2.	The LRT Alternative, including the TSM/TDM components, would not result in direct temporary impacts to this species because no suitable nesting habitat was identified within the BSA. Construction of the LRT Alternative improvements could result in limited indirect, temporary noise, lighting, dust, etc., impacts to this species at one location. However, that location is approximately 180 feet away from potential non-breeding riparian habitat and would experience effects resulting from non-ground-disturbing construction. Non-ground-disturbing construction activities include lane restriping, installation of temporary signage, and other daytime work within the existing highway right of way on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on I-710.	The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in direct temporary impacts to this species because no suitable nesting habitat was identified within the BSA. Construction of the Freeway Tunnel Alternative improvements could result in limited indirect, temporary noise, lighting, dust, etc., impacts to this species at one location. However, that location is approximately 850 feet away from potential nonbreeding riparian habitat and would experience effects resulting from non-ground-disturbing construction. Nonground-disturbing construction activities include lane restriping, installation of temporary signage, and other daytime work within the existing highway right of way on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on SR 134.
Mammal Species					
Townsend's big-eared bat	State candidate as threatened	The TSM/TDM Alternative would not result in direct impacts to any known Townsend's big-eared bat individuals during construction due to the absence of roosting bat detections at the Garfield Avenue Bridge, which is proposed for widening. Although no evidence of roosting was found during surveys, Townsend's big-eared bats may establish day or night roosts in the interim between surveys and the start of construction. If Townsend's big-eared bats begin using the bridge, the TSM/TDM Alternative would have the potential to result in temporary indirect impacts during the bridge widening. Indirect temporary impacts to foraging or roosting Townsend's big-eared bat may occur from noise, lighting, dust, vibration, etc., if nighttime construction activities take place. However, the bats may leave the vicinity during instances of nighttime construction and forage elsewhere; therefore, there would be no take of Townsend's big-eared bat pursuant to the definition of take in CESA regarding "hunt, pursue, catch, captive, or kill" of a species. Townsend's big-eared bat is known to rarely roost in very large (ex. Redwood sp.) trees in old-growth forests within basal holes that are several meters tall. No trees within the BSA exhibit these characteristics. Further, Townsend's big-eared bat is highly susceptible to human disturbance and would be	The BRT Alternative does not include the widening or demolition of bridges that could serve as potential sites for Townsend's big-eared bat roosting. Therefore, construction of the BRT Alternative would not result in direct or indirect temporary impacts to Townsend's big-eared bat or its habitat. Indirect temporary impacts to foraging Townsend's big-eared bat may occur from noise, lighting, dust, vibration, etc., if nighttime construction activities take place. However, the bats may leave the vicinity during instances of nighttime construction and forage elsewhere; therefore, there would be no take of Townsend's big-eared bat pursuant to the definition of take in CESA regarding "hunt, pursue, catch, captive, or kill" of a species. In addition, the improvements included in the TSM/TDM Alternative would also be constructed as part of the BRT Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to I-10). The temporary impacts to bats that could potentially occur during widening of the Garfield Avenue Bridge for the TSM/TDM Alternative would also occur for the BRT Alternative. Townsend's big-eared bat is known to rarely roost in	The LRT Alternative does not include the widening or demolition of bridges that could serve as potential sites for Townsend's big-eared bat roosting. Therefore, construction of the LRT Alternative would not result in direct or indirect temporary impacts to Townsend's big-eared bat or its habitat. However, the LRT Alternative does include the construction of a new bridge over SR 60 that could adversely affect the existing bridge on Mednik Avenue, as well as potentially result in additional bat roosting habitat. Indirect temporary impacts to foraging or roosting Townsend's big-eared bat may occur from noise, lighting, dust, vibration, etc., if nighttime construction activities take place. However, the bats may leave the vicinity during instances of nighttime construction and forage elsewhere; therefore, there would be no take of Townsend's big-eared bat pursuant to the definition of take in CESA regarding "hunt, pursue, catch, captive, or kill" of a species. In addition, the improvements included in the TSM/TDM Alternative would also be constructed as part of the LRT Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road). The temporary impacts to bats that could potentially occur during widening of the Garfield Avenue Bridge for the	The Freeway Tunnel Alternative includes the widening and removal of five bridges (Ramona Boulevard UC Bridge, SR 710/I-10 Separation Bridge, Hellman Avenue OC Bridge, Del Mar Boulevard OC Bridge, and Green Street OC Bridge). However, due to the absence of roosting bat detections at these bridges, the Freeway Tunnel Alternative would not result in direct temporary impacts to any known Townsend's big-eared bat individuals. Although no evidence of roosting was found during surveys, Townsend's big-eared bats may establish day or night roosts in the interim between surveys and the start of construction. If bats begin using any of the bridges, the Freeway Tunnel Alternative would have the potential to result in temporary indirect impacts through disturbance and the loss of the roosting location. Indirect temporary impacts to foraging or roosting Townsend's big-eared bat may occur from noise, lighting, dust, vibration, etc., if nighttime construction activities take place. However, the bats may leave the vicinity during instances of nighttime construction and forage elsewhere; therefore, there would be no take of Townsend's big-eared bat pursuant to the definition of take in CESA regarding "hunt, pursue, catch, captive, or kill" of a species. In addition, the improvements included in the TSM/TDM Alternative would also be constructed as

TABLE 3.20.3:
Temporary Impacts to Threatened and/or Endangered Species By Build Alternative

Species	Status	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
		highly unlikely to roost in ornamental trees within the urban BSA that have a high level of human disturbance.	very large (ex. Redwood sp.) trees in old-growth forests within basal holes that are several meters tall. No trees within the BSA exhibit these characteristics. Further, Townsend's big-eared bat is highly susceptible to human disturbance and would be highly unlikely to roost in ornamental trees within the urban BSA that have a high level of human disturbance.	TSM/TDM Alternative would also occur for the LRT Alternative. Townsend's big-eared bat is known to rarely roost in very large (ex. Redwood sp.) trees in old-growth forests within basal holes that are several meters tall. No trees within the BSA exhibit these characteristics. Further, Townsend's big-eared bat is highly susceptible to human disturbance and would be highly unlikely to roost in ornamental trees within the urban BSA that have a high level of human disturbance.	part of the Freeway Tunnel Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) and Other Road Improvement T-3 (St. John Extension between Del Mar Boulevard and California Boulevard). The temporary impacts to bats that could potentially occur during widening of the Garfield Avenue Bridge for the Freeway Tunnel Alternative would also occur for the LRT Alternative. Townsend's big-eared bat is known to rarely roost in very large (ex. Redwood sp.) trees in old-growth forests within basal holes that are several meters tall. No trees within the BSA exhibit these characteristics. Further, Townsend's big-eared bat is highly susceptible to human disturbance and would be highly unlikely to roost in ornamental trees within the urban BSA that have a high level of human disturbance.

Source: *Natural Environment Study* (2014).
CESA = California Environmental Quality Act
BSA = Biological Study Area

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3.20.3.2 Permanent Impacts

Permanent impacts to threatened and/or endangered species may occur as a result of implementation of the proposed project through direct loss of habitat. In addition to direct loss of habitat, other direct impacts to listed species and/or suitable habitat may result from increased lighting at night, headlamp glare, and noise. Indirect impacts may result from edge effects such as future development, exotic plant and animal infestations, litter, fire, unauthorized recreational use, and pollutants associated with vehicle use of the transportation facility. Refer to Table 3.20.4 for a discussion of potential permanent impacts to specific threatened and endangered species by Build Alternative. Table 3.20.4 does not discuss temporary impacts on plant and animal species that do not have the potential to occur in the BSA, as described in Table 3.20.2.

No Build Alternative

The No Build Alternative does not include the operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in any direct or indirect permanent impacts related to threatened and/or endangered species associated with improvements in the Build Alternatives.

Build Alternatives

Table 3.20.2 includes a discussion of permanent impacts to listed species by Build Alternative within the BSA. As shown in Table 3.20.2, all Build Alternatives were determined: (1) to have no direct or indirect permanent impacts on federally listed threatened or endangered species, (2) to not result in take of State-listed threatened or endangered species, and (3) to have a preliminary no effect on all species identified in Tables 3.20-1 and 3.20-2 as well as on any other species or critical habitat listed in the USFWS species list (Appendix K).

3.20.3.3 Avoidance, Minimization, and/or Mitigation Measures

Measures NC-1 through NC-3 (provided previously in Section 3.16, Natural Communities) and Measure AS-1 (provided previously in Section 3.19, Animal Species) would protect threatened and/or endangered species.

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TABLE 3.20.4:
Permanent Impacts to Threatened and/or Endangered Species By Build Alternative

Species	Status	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
Plant Species					
Slender-horned spineflower	Federally listed as endangered, State-listed as endangered	Marginally suitable habitat for the slender-horned spineflower was identified within the BSA in the laurel sumac scrub and coast live oak woodland plant communities. However, no TSM/TDM Alternative improvements are planned in this habitat. The limits of disturbance of the TSM/TDM Alternative are approximately 0.5 mile away from the suitable habitat for this species, so no indirect impacts are anticipated to occur. Therefore, the TSM/TDM Alternative would not result in direct or indirect permanent impacts on any known populations or habitat of this species.	The BRT Alternative, including the TSM/TDM components, would not result in direct or indirect permanent impacts on any known populations or habitat of this species. The limits of disturbance of the BRT Alternative are approximately 0.8 mile away from the suitable habitat for this species, so no indirect impacts are anticipated to occur.	The LRT Alternative, including the TSM/TDM components, would not result in direct or indirect permanent impacts on any known populations or habitat of this species. The limits of disturbance of the LRT Alternative are approximately 1.1 miles away from the suitable habitat for this species, so no indirect impacts are anticipated to occur.	The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in direct or indirect permanent impacts on any known populations or habitat of this species. The limit of disturbance of the Freeway Tunnel Alternative is approximately 850 feet away from suitable habitat for this species. This habitat may experience effects resulting from non-ground-disturbing construction. Non-ground-disturbing construction activities that may occur within 850 feet of this habitat includes lane restriping, installation of temporary signage, and other daytime work within the existing highway right of way on existing pavement. These construction activities would not create a disturbance level greater than what currently exists on SR 134. As such, indirect impacts from construction are not anticipated. Therefore, the Freeway Tunnel Alternative would not result in direct or indirect temporary construction impacts to this species.
Bird Species (listed riparian obligate)					
Least Bell's vireo	Federally listed as endangered, State-listed as endangered	Improvements included in the TSM/TDM Alternative would not result in direct or indirect permanent impacts to any known populations of least Bell's vireo. While habitat suitable for use outside the breeding season is present within the BSA, there would be no permanent impacts to this habitat.	The BRT Alternative, including the TSM/TDM components, would not result in direct or indirect permanent impacts on any known populations or habitat of this species.	The LRT Alternative, including the TSM/TDM components, would not result in direct permanent impacts to this species because no suitable nesting habitat was identified within the BSA. The LRT Alternative, including the TSM/TDM components, would not result in indirect permanent impacts to this species because implementation of the LRT Alternative would not create a disturbance level greater than what currently exists on I-710.	The Freeway Tunnel Alternative, including the TSM/TDM Alternative components, would not result in direct permanent impacts to this species because no suitable nesting habitat was identified within the BSA. The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in indirect permanent impacts to this species because implementation of the Freeway Tunnel Alternative would not create a disturbance level greater than what currently exists on SR 134.
Southwestern willow flycatcher	Federally listed as endangered, State-listed as endangered	Improvements included in the TSM/TDM Alternative would not result in direct or indirect permanent impacts to any known populations of southwestern willow flycatcher. While habitat suitable for use outside the breeding season is present within the BSA, there would be no permanent impacts to this habitat.	The BRT Alternative, including the TSM/TDM components, would not result in direct or indirect permanent impacts on any known populations or habitat of this species.	The LRT Alternative, including the TSM/TDM components, would not result in direct permanent impacts to this species because no suitable nesting habitat was identified within the BSA. The LRT Alternative, including the TSM/TDM components, would not result in indirect permanent impacts to this species because implementation of the LRT Alternative would not create a disturbance level greater than what currently exists on I-710.	The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in direct permanent impacts to this species because no suitable nesting habitat was identified within the BSA. The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in indirect permanent impacts to this species because implementation of the Freeway Tunnel Alternative would not create a disturbance level greater than what currently exists on SR 134.
Western yellow-billed cuckoo	Federally listed as threatened, State-listed as endangered	Improvements included in the TSM/TDM Alternative would not result in direct or indirect permanent impacts to any known populations of western yellow-billed cuckoo. While habitat suitable for use outside the breeding season is present within the BSA, there would be no permanent impacts to this habitat.	The BRT Alternative, including the TSM/TDM components, would not result in direct or indirect permanent impacts on any known populations or habitat of this species.	The LRT Alternative, including the TSM/TDM components, would not result in direct permanent impacts to this species because no suitable nesting habitat was identified within the BSA. The LRT Alternative, including the TSM/TDM components, would not result in indirect	The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in direct permanent impacts to this species because no suitable nesting habitat was identified within the BSA. The Freeway Tunnel Alternative, including the TSM/TDM components, would not result in

TABLE 3.20.4:
Permanent Impacts to Threatened and/or Endangered Species By Build Alternative

Species	Status	TSM/TDM Alternative	BRT Alternative	LRT Alternative	Freeway Tunnel Alternative
				permanent impacts to this species because implementation of the LRT Alternative would not create a disturbance level greater than what currently exists on I-710.	indirect permanent impacts to this species because implementation of the Freeway Tunnel Alternative would not create a disturbance level greater than what currently exists on SR 134.
Mammal Species					
Townsend's big-eared bat	State candidate as threatened	The TSM/TDM Alternative improvements would not result in direct permanent impacts on any known Townsend's big-eared bat individuals due to the absence of roosting bat detections at the Garfield Avenue Bridge, which is proposed for widening. While suitable foraging habitat for bats is present, no habitat would be permanently removed as a result of implementation of the TSM/TDM Alternative. Therefore, the TSM/TDM Alternative would not result in take of Townsend's big-eared bat as defined under CESA.	The BRT Alternative does not include the widening or demolition of bridges that could serve as potential sites for Townsend's big-eared bat roosting. Therefore, implementation of the BRT Alternative would not result in take of Townsend's big-eared bat as defined under CESA. Therefore, combined with the TSM/TDM component, the BRT Alternative would not result in permanent impacts to Townsend's big-eared bats.	The LRT Alternative does not include the widening or demolition of bridges that could serve as potential sites for Townsend's big-eared bat roosting. Therefore, implementation of the LRT Alternative would not result in take of Townsend's big-eared bat as defined under CESA. Therefore, combined with the TSM/TDM component, the LRT Alternative would not result in permanent impacts to Townsend's big-eared bats.	The Freeway Tunnel Alternative includes the widening and removal of five bridges (Ramona Boulevard UC Bridge, SR 710/10 Separation Bridge, Hellman Avenue OC Bridge, Del Mar Boulevard OC Bridge, and Green Street OC Bridge). Due to the absence of roosting bat detections at these bridges, the Freeway Tunnel Alternative would not result in direct permanent impacts to any known Townsend's big-eared bat individuals. While suitable foraging habitat for bats is present, no substantial amount of habitat would be removed as a result of the removal of the bridges. Therefore, implementation of the Freeway Tunnel Alternative would not result in take of Townsend's big-eared bat as defined under CESA. Therefore, combined with the TSM/TDM component, the Freeway Tunnel Alternative would not result in permanent impacts to Townsend's big-eared bats.

Source: *Natural Environment Study* (2014).
CESA = California Endangered Species Act

3.21 Invasive Species

3.21.1 Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council, to define the invasive plants that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

3.21.2 Affected Environment

This section is based on the *Natural Environment Study* (NES) (2014) for the proposed project. Invasive plant species were categorized following the classifications provided in the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory and were cross-checked with the Invasive Species Council of California (ISCC) invasive species list, which lists noxious weeds and invasive plants in California. The Inventory provides ratings (high, moderate, and limited) designated for invasive plant species. Plants with a high rating have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure, and have reproductive biology and other attributes that are conducive to moderate to high rates of dispersal and establishment. Plants with a moderate rating have substantial and apparent, but not severe, ecological impacts. Plants with a limited rating are invasive, but their ecological impacts are minor on a statewide level. These ratings reflect the view of the Cal-IPC on the statewide importance of the invasive species, the likelihood that eradication or control efforts would be successful, and the present distribution of invasive species in the State.

The State Route 710 (SR 710) North Project area provides habitat for a variety of plant and animal species. Several plant communities and numerous plant species were observed during the 2013 surveys in the Biological Study Area (BSA). A complete list of the plant and animal species observed in the BSA is provided in the NES.

Invasive plants are prominent in the BSA and primarily span areas in the BSA along the edges of freeways and within freeway medians. Invasive species are primarily found within the alignment of the Freeway Tunnel Alternative and within the non-native grassland, non-native woodland, and disturbed/developed plant communities. Common invasive plants found in the BSA are: ripgut brome (*Bromus diandrus*), wild oat (*Avena fatua*), slender oat (*Avena barbata*), hottentot fig (*Carpobrotus edulis*), castor bean (*Ricinus communis*), Italian plumeless thistle (*Carduus pycnocephalus*), Brazilian peppertree (*Schinus terebinthifolius*), and tree of heaven (*Ailanthus altissima*). A full list of invasive plants identified in the BSA is provided in Appendix E in the NES. A total of 81 exotic plant species, subspecies, and/or varieties in the Cal-IPC Invasive Plant Inventory and/or on the watch list were identified in the BSA. Of these species, 13 have an overall high rating, 30 have a moderate rating, 26 have a limited rating, and 12 have been evaluated but not listed. Species identified in the BSA that have a high rating are giant reed (*Arundo donax*), red brome (*Bromus madritensis* ssp. *rubens*), hottentot fig, spotted knapweed (*Centaurea stoebe* ssp. *micranthos*), purple pampas grass (*Cortaderia jubata*), Uruguayan pampas grass (*C. selloana*), cape ivy (*Delairea odorata*), sweet fennel (*Foeniculum vulgare*), Himalayan blackberry (*Rubus* *armeniacus*), saltcedar (*Tamarix ramosissima*), scotch broom (*Cytisus scoparius*), Algerian ivy (*Hedera helix*), and Uruguay water primrose (*Ludwigia hexapetala*).

3.21.3 Environmental Consequences

3.21.3.1 Temporary Impacts

Impacts related to invasive species are considered permanent adverse impacts because the introduction of invasive species into previously undisturbed areas during construction would result in permanent adverse impacts to the habitat rather than just a temporary impact that would cease when construction is complete. Therefore, adverse impacts related to invasive species are described below under Permanent Impacts.

3.21.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative does not include the construction or operation of any of the improvements in the SR 710 North Project Build Alternatives associated with improvements in the SR 710 corridor, and therefore, would not result in any effects related to invasive species associated with the Build Alternatives.

Build Alternatives

TSM/TDM Alternative

Construction of the TSM/TDM Alternative has the potential to spread invasive species by the entering and exiting of construction vehicles and equipment contaminated by invasive species, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species. In the long term, continued introduction of new and existing species could occur as a result of seeds carried on the body and tires of vehicles utilizing roadways associated with the TSM/TDM Alternative improvements. Invasive species are abundant in the BSA, primarily within the non-native grassland, non-native woodland, and disturbed/developed plant communities. Construction activities within these communities may result in the local spread of invasive plant species. The TSM/TDM Alternative would impact approximately 1 ac of non-native grassland, <0.1 ac of non-native woodland, and 1 ac of disturbed/developed habitat. The spread of invasive species within areas of the disturbed/developed habitat that lack available soil and open space and are entirely developed (i.e., city streets, sidewalks, etc.) would be minimal.

BRT Alternative

Construction of the BRT Alternative has the potential to spread invasive species by the entering and exiting of construction vehicles and equipment contaminated by invasive species, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species. In the long term, continued introduction of new and existing species could occur as a result of seeds carried on the body and tires of buses and other vehicles using roadways associated with the BRT Alternative facility. Invasive species are abundant in the BSA, primarily within the non-native grassland, non-native woodland, and disturbed/developed plant communities. Construction activities within these communities may result in the local spread of invasive plants. The BRT Alternative would impact approximately 2 ac of non-native grassland and 124 ac of disturbed/ developed habitat.

The improvements included in the TSM/TDM Alternative would also be constructed as part of the BRT Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement

L-3 (Atlantic Boulevard from Glendon Way to I-10). The BRT Alternative including the TSM/TDM Alternative improvements would impact approximately 3 ac of non-native grassland, <0.1 ac of non-native woodland, and 125 ac of disturbed/developed habitat. The spread of invasive species within areas of the disturbed/developed habitat that lack available soil and open space and are entirely developed (i.e., city streets, sidewalks, etc.) would be minimal.

LRT Alternative

Construction of the LRT Alternative has the potential to spread invasive species by the entering and exiting of construction vehicles and equipment contaminated by invasive species, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species. In the long term, continued introduction of new and existing species could occur as a result of seeds carried on the train and rail cars on the LRT Alternative rail line. Invasive species are abundant in the BSA, primarily within the non-native grassland, non-native woodland, and disturbed/developed plant communities. Construction activities within these communities may result in the local spread of invasive plants species. The LRT Alternative would impact approximately 15 ac of non-native grassland, 12 ac of non-native woodland, and 123 ac of disturbed/developed habitat.

The improvements included in the TSM/TDM Alternative would also be constructed as part of the LRT Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) because it would conflict with the LRT Alternative maintenance yard near Mission Road. The LRT Alternative including the TSM/TDM Alternative improvements would impact approximately 16 ac of non-native grassland, 12 ac of non-native woodland, and 124 ac of disturbed/developed habitat. The spread of invasive species within areas of the disturbed/developed habitat that lack available soil and open space and are entirely developed (i.e., city streets, sidewalks, etc.) would be minimal.

Freeway Tunnel Alternative

Construction of the Freeway Tunnel Alternative has the potential to spread invasive species by the entering and exiting of construction vehicles and equipment contaminated by invasive species, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species. In the long term, continued introduction of new and existing species could occur as a result of seeds carried in tires and auto bodies for this alternative. Invasive species are abundant in the BSA, primarily within the non-native grassland, non-native woodland, and disturbed/developed plant communities. Construction activities within these communities during construction may result in the local spread of invasive species. The Freeway Tunnel Alternative would impact approximately 27 ac of non-native grassland, 34 ac of non-native woodland, and 297 ac of disturbed/developed habitat.

The improvements included in the TSM/TDM Alternative would also be constructed as part of the Freeway Tunnel Alternative with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector) and Other Road Improvement T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard). The Freeway Alternative including the TSM/TDM Alternative improvements would impact approximately 28 ac of non-native grassland, 34 ac of non-native woodland, and 298 ac of disturbed/developed habitat. The spread of invasive species within areas of the disturbed/developed habitat that lack available soil and open space and are entirely developed (i.e. city streets, sidewalks, etc.) would be minimal.

3.21.4 Avoidance, Minimization, and/or Mitigation Measures

In compliance with EO 13112 on Invasive Species, the following measures would be implemented with all four Build Alternatives to minimize the introduction and spread of invasive species:

Measure IS-1

Weed Abatement Program (applies to all four Build Alternatives): During final design, the Los Angeles County Metropolitan Transportation Authority (Transportation System Management/ Transportation Demand Management, Bus Rapid Transit, and Light Rail Transit Alternatives) or the California Department of Transportation (Freeway Tunnel Alternative) Project Engineer will develop a weed abatement program and will include it in the Plans, Specifications, and Estimates package. The intent of this program is to minimize the introduction and spread of nonnative plant material during construction of the selected Build Alternative. This program will include, but not be limited to, the following monitoring and eradication measures during and after construction:

- Preconstruction surveys will be conducted to identify populations of invasive species within the project disturbance limits with the potential to be encouraged by construction activities such as exposure or tilling of bare ground, disturbance of adjacent habitats that are not highly invaded, and/or enhanced distribution of pollen or seeds. Such populations will be controlled by mechanical or chemical means prior to construction.
- Revegetation of soils will occur as soon as practical after completion of construction activities in those areas. To prevent the spread of invasive species on the project site, invasive species-free products will be exclusively used for all activities; including, but not limited to, landscaping materials and soil erosion materials (i.e., mulch, soil mats, straw fencing, or wattles).
- Any disturbance in any construction area not containing existing infestations of exotic plants will be monitored for 1 year postconstruction to ensure that establishment of invasive plant species in the area has not occurred. If evidence of invasive plant species establishment is found, invasive species control measures will be implemented immediately.

3.22 Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Project implementation will result in attainment of short-term and long-term transportation goals and economic benefits at the expense of some short-term and long-term social, aesthetic, biological, noise, air quality, visual, and/or other land use impacts.

3.22.1 No Build Alternative

The No Build Alternative would do nothing to improve the efficiency of the existing regional freeway and transit network or to reduce congestion on local arterials in the study area beyond the projects already programmed in the Regional Transportation Plan/Sustainable Communities Strategy and the Federal Transportation Improvement Program. There would continue to be out-of-direction traffic using local streets and the freeway network to access destinations inside and outside the study area. Additionally, the No Build Alternative would not result in the generation of short-term jobs and revenues during construction, and is not expected to result in the potential environmental effects of some or all of the Build Alternatives (e.g., long-term losses of property taxes, parkland, paleontological resources, and plant and wildlife resources; increases in noise, vibration, and air quality; effects on community character and cohesion; business displacements; visual impacts; and the permanent use of construction materials and energy).

3.22.2 TSM/TDM Alternative

Short-term losses would include: construction impacts such as noise, air quality, and motorized and non-motorized traffic delays or detours.

Short-term benefits would include: increased jobs and revenue generated during construction.

Long-term losses would include: permanent loss of wildlife resources, permanent impacts on one historic property, noise increases, and use of construction materials and energy.

Long-term gains include: improvement of the transportation network in the region and the project vicinity, improved efficiency of the existing regional transit network, and reduced congestion on local arterials in the study area.

3.22.3 BRT Alternative

Short-term losses would include: construction impacts such as noise, air quality, and motorized and non-motorized traffic delays or detours.

Short-term benefits would include: increased jobs and revenue generated during construction.

Long-term losses would include: permanent loss of plant and wildlife resources, permanent impacts on one historic property, noise increases, use of construction materials and energy, and loss of parkland.

Long-term gains include: improvement of the transportation network in the region and the project vicinity, improved efficiency of the existing regional transit network, and reduced congestion on local arterials in the study area.

3.22.4 LRT Alternative

Short-term losses would include: economic losses experienced by businesses that relocate and construction impacts such as noise, air quality, and motorized and non-motorized traffic delays or detours.

Short-term benefits would include: increased jobs and revenue generated during construction.

Long-term losses would include: property tax loss, permanent loss of plant and wildlife resources, visual impacts, community character and cohesion impacts, permanent impacts on one historic property and one historical resource, noise and vibration increases, use of construction materials and energy, businesses displaced from the community, and loss of paleontological resources.

Long-term gains include: improvement of the transportation network in the region and the project vicinity, improved efficiency of the existing regional transit network, and reduced congestion on local arterials in the study area.

3.22.5 Freeway Tunnel Alternative

Short-term losses would include: economic losses experienced by businesses that relocate and construction impacts such as noise, air quality, and motorized and non-motorized traffic delays or detours.

Short-term benefits would include: increased jobs and revenue generated during construction.

Long-term losses would include: property tax loss, permanent loss of plant and wildlife resources, visual impacts, permanent impacts on one historic property and four historical resources, noise increases, use of construction materials and energy, businesses displaced from the community, and loss of paleontological resources.

Long-term gains include: improvement of the transportation network in the region and the project vicinity, improved efficiency of the existing regional freeway and transit network, and reduced congestion on local arterials in the study area.

3.23 Irreversible and Irretrievable Commitments of Resources That Would Be Involved in the Proposed Project

3.23.1 No Build Alternative

The No Build Alternative does not include the construction or operation of any of the improvements in the SR 710 North Project Build Alternatives. As a result, the No Build Alternative would not result in the irretrievable commitment of the resources required to construct the Build Alternatives. The No Build Alternative would also not provide the benefits of the reduced travel time and improved transportation system efficiency for the movement of vehicles and people that would occur under the Build Alternatives. There would continue to be out-of-direction traffic that would use local streets, which would result in more frequent street maintenance that requires ongoing irretrievable commitments of construction materials and labor resources.

3.23.2 Build Alternatives

The Build Alternatives involve a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the period that the land is used for a transportation facility. However, if a greater need arises for use of the land or if the transportation facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion would ever be necessary or desirable.

Considerable amounts of fossil fuels and construction materials such as cement, aggregate, and bituminous material are expected to be used for construction of the Build Alternatives, particularly for the Light Rail Transit (LRT) and Freeway Tunnel Alternatives. Fossil fuels and natural resources are used in the making of construction materials such as cement and steel. These materials are generally not retrievable. However, they are not in short supply and their use would not have an Adverse Effect on the continued availability of these resources in the region. The project construction would also require a substantial one-time use of local, State, and/or federal funds, which are not retrievable; however, the savings in travel time and improved transportation system efficiency would offset this effect to some degree. In addition to the costs of construction and right of way (ROW), there would be operations-related costs for facility maintenance (e.g., pavement, roadside, litter/sweeping, signs and markers), electrical and storm drain maintenance, and operation of buses and light rail transit vehicles.

Excavation associated with the LRT and Freeway Tunnel Alternatives could reach depths where paleontological resources could be encountered. That excavation could result in permanent irretrievable adverse impacts to paleontological resources in the following sediments: Old Alluvial Fan Deposits, Old Alluvium, the Fernando Formation, the Puente Formation, and the Topanga Group.

Construction of the four Build Alternatives will adversely affect historic properties. Although some of those effects can be mitigated to below a level of significance, the remaining Adverse Effects on historic properties would represent permanent irreversible and irretrievable adverse impacts on those properties.

The Freeway Tunnel Alternative would result in an irreversible commitment of riparian/riverine habitats, including wetland and non-wetland waters, to transportation uses.

The commitment of these resources is based on the concept that people in the study area, region, and State would benefit from the improved quality of the transportation system. These benefits would consist of improved accessibility and mobility, which are a trade-off to the commitment of these resources.

3.24 Construction Impacts

This section summarizes the potential construction-related impacts considered for the Build Alternatives. Some construction-related impacts are considered temporary impacts for some resources, such as the use of temporary construction easements (TCEs) on parcels of land, but for some resources, construction-related impacts can be a permanent impact on a resource, such as Paleontological resources. These impacts are discussed in detail in the corresponding sections in Chapter 3 (Sections 3.1 through 3.21). The environmental impacts described below for the Build Alternatives would not occur under the No Build Alternative because the No Build Alternative does not include construction of any of the improvements in the Build Alternatives.

The following technical studies provided the analysis for the discussion of each environmental parameter provided in the sections in Chapter 3: *Community Impact Assessment* (2014), *Draft Relocation Impact Report* (2014), *Final Relocation Impact Report* (2017), *Transportation Technical Report* (2014), Errata to *Transportation Technical Report* (2017), *Visual Impact Assessment* (2014), *Historic Property Survey Report* (2015), *Supplemental Historic Property Survey Report* (2017), *Summary Floodplain Encroachment Report* (2014), the *Location Hydraulic Study* (2014), *Water Quality Assessment Report* (2014), *Geologic Hazard Evaluation to Support Environmental Studies Documentation* (2014), *Preliminary Geotechnical Report* (2014), *Paleontological Identification and Evaluation Report* (2014), *Phase I Initial Site Assessment* (2014), *Air Quality Assessment Report* (2015), *Supplemental Air Quality Assessment Report* (2017), *Noise Study Report* (2014), the *Groundborne Noise and Vibration Impacts* (2014), *Noise Abatement Decision Report* (2014), *Energy Technical Report* (2014), *Natural Environment Study* and *Jurisdictional Delineations* (2014), *Cumulative Impact Assessment* (2015), and the *Finding of Adverse Effect for the State Route 710 North Project* (2018).

Construction activities for each of the Build Alternatives are described, in detail, in Chapter 2.0. The sections titled *Construction Activities* in Chapter 2 provide additional details for each alternative and describe grading, excavation, and construction staging and phasing. In general, during construction of the Build Alternatives, the improvements of the alternatives are anticipated to be constructed within existing publicly owned rights-of-way (ROWs). However, it is anticipated that the Build Alternatives would require temporary construction easements (TCEs) where there is not sufficient room within the public ROWs to accommodate the construction activities and/or storage of materials or equipment for those improvements. Any land used as a TCE during construction of improvements under the Build Alternatives would be returned to its original or better condition prior to the return of that land to its original owner following completion of the construction activities requiring that TCE. No permanent project features would be constructed within the boundaries of the TCEs used during construction of the Build Alternatives. For the Freeway Tunnel Alternative construction staging and storage is anticipated to be conducted within the existing State right-of-way.

3.24.1 Land Use

All the Build Alternatives would result in direct, temporary, construction-related effects on existing land uses, including business and neighborhood disruptions during construction that may include disruption of local traffic patterns, access to homes and businesses, and increased traffic congestion, noise, vibration, and dust, as described in Section 3.1. Temporary land use impacts would also include the use of privately owned properties for TCEs. At the completion of construction, land used for TCEs would be returned to its original condition prior to return of the land to the original owners.

As a result, the TCEs are not expected to adversely affect existing or planned land uses on those parcels.

Construction of the Transportation System Management/Transportation Demand Management (TSM/TDM) and Bus Rapid Transit (BRT) would not result in short-term impacts to on- or off-street parking. Construction of the Light Rail Transit (LRT) Alternative improvements would result in the temporary loss of approximately 240 parking spaces in East Los Angeles, Monterey Park, Pasadena, and South Pasadena. These include approximately 128 on-street parking spaces along Mednik Avenue in East Los Angeles, approximately 26 on-street parking spaces along Floral Drive in Monterey Park and East Los Angeles, approximately 30 on-street parking spaces along Huntington Drive and Fair Oaks Avenue in the vicinity of the Huntington Station site in South Pasadena, approximately 30 on-street parking spaces in the vicinity of the South Pasadena Station site in South Pasadena, and approximately 26 on-street parking spaces on Raymond Avenue in the vicinity of the Fillmore Station site in Pasadena. Once construction is completed, each of the approximately 240 parking spaces would be restored and available for use during all hours. Construction of both design variations of the Freeway Tunnel Alternative would result in the temporary loss of approximately 17 parking spaces on the Green Street Bridge over Interstate 210 (I-210) in the City of Pasadena while that bridge is being reconstructed. Once the bridge reconstruction is complete, each of the approximately 17 parking spaces would be restored and available for use during all hours.

Based on their distance from the nearest construction of any improvements in the Build Alternatives and the presence of intervening land uses, none of the parks, recreation resources, and bikeways that are more than 500 feet (ft) from the physical improvements in the Build Alternatives would experience temporary air quality, noise, traffic/access, or parking effects during construction of the Build Alternatives. No TCEs would be required at any resources more than 500 ft from the physical improvements in the Build Alternatives. Temporary air quality, noise, and/or traffic impacts could occur on parks, recreation resources, and bikeways within 500 ft of improvements in the Build Alternatives.

Construction of the TSM/TDM, LRT, and Freeway Tunnel Alternatives would not require the use of land from any parks, recreation resources, or bikeways for TCEs and would not adversely impact parking at any of those resources. In some cases, on-street bikeways in the vicinity of the Build Alternative improvements may need to be temporarily rerouted around construction zones. Detoured on-street bikeways would be restored to their original conditions on completion of construction, and no Adverse Effects are anticipated.

As discussed in detail in Appendix B, the TSM/TDM, LRT, and Freeway Tunnel Alternatives would not temporarily occupy any land from any park, recreation area, or wildlife refuge discussed in Appendix B and would not result in constructive use of any of those resources. As a result, the TSM/TDM, LRT, and Freeway Tunnel Alternatives would not trigger the requirements for protection of those resources under Sections 4(f) and 6(f).

The BRT Alternative would use 0.02 acres (ac) of land from Cascades Park in the City of Monterey Park for TCEs during construction. The land being used for the TCEs would be returned to a condition that is at least as good as that which existed prior to the project at the completion of the construction of the BRT Alternative in this area. The existing sidewalks will be replaced within the boundary of Cascades Park, and the grass/turf areas affected by project construction would be re-landscaped and returned to a condition at least as good as prior to the project. The temporary occupancy of approximately 0.02 ac of land from Cascades Park would not adversely affect the qualities or activities that give the property protection under Section 4(f). No Section 6(f) funds were used at Cascades Park and, as a result, the BRT Alternative would not trigger the requirements under Section 6(f) at Cascades Park.

Measures Parks-1, Cascades-1, and Cascades-2, as outlined in Section 3.1, would be implemented during construction of the Build Alternatives to address potential effects to parks associated with construction activities.

3.24.2 Growth

Impacts related to growth would result from operation of any of the Build Alternatives, but not from construction of the project itself as described in Section 3.2. Therefore, construction activities associated with the Build Alternatives would not result in growth-related effects.

3.24.3 Community Impacts

All of the Build Alternatives would result in temporary impacts to community character and cohesion from air quality, noise, traffic/access, and/or parking effects to community facilities within 500 ft of the Build Alternatives, as described in Section 3.3. For all the Build Alternatives, construction traffic impacts that could affect community character and cohesion range from minor temporary lane restrictions to overnight closures and detours. All of the Build Alternatives would require TCEs on between 13 and 53 parcels, with the TSM/TDM Alternative requiring the fewest TCEs and the single-bore design variation of the Freeway Tunnel Alternative requiring the most. The Build Alternatives would all result in an increase in person-year jobs and employment earnings. Environmental justice and non-environmental justice populations across the study area would experience short-term air quality, noise, and traffic impacts during construction of the Build Alternatives. As discussed in Section 3.3, those short-term effects on all populations, including environmental justice populations, can be substantially reduced through implementation of the avoidance, minimization, and/or mitigation measures discussed in Sections 3.5, Traffic/ Transportation and Pedestrian and Bicycle Facilities; 3.13, Air Quality; and 3.14, Noise and Vibration. With implementation of those measures, the construction of the Build Alternatives would not result in impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the effects experienced by non-environmental justice populations.

A majority of the TSM/TDM improvements were designed within the existing right-of-way, which is consistent with the approach for this alternative. Minor street improvements, such as adding turning lanes or through lanes may require street widening, raised median removal, and restriping. It is anticipated that these types of improvements would result in minimal construction related impacts and require minimal import and/or export of material.

Excavation and construction for the local street and intersection improvements involve multiple components that vary in degree of ground disturbance. Examples of these components include changes to signs and lane striping; rehabilitation of traffic signals; removal of medians; and installation of new medians, sidewalks, pavement, noise barriers, and overhead cantilever signs for the reversible lanes. The majority of improvements within the TSM/TDM Alternative include one or more of these components. In addition to these smaller-scale components, a few improvements in this Alternative include more substantial changes such as new alignments for roads, on-ramps, and off-ramps.

Other Road Improvement T-1 would require a temporary shoofly track in order to construct the Valley Boulevard to Mission Road Connector Road underpass at the UPRR corridor. The shoofly (temporary) track would take approximately 30 days to construct and 15 days to remove, and would remain in place approximately 12 months. It is anticipated that the proposed roundabout of T-1 at Mission Road would be constructed in two stages.

Other Road Improvement T-2 would require widening of the existing SR 110 northbound off ramp at Fair Oaks Ave. and a retaining wall would be placed along the outside shoulder of the ramp. Construction in this area may require night or weekend closures along the off ramp. Similarly, the relocated SR 110 southbound off and ramp at State Street and the proposed SR 110 SB on ramp from State Street may require a weekend or night closure of the ramps during construction.

Other Road Improvement T-3 would extend St. John Ave from Del Mar Blvd. to California Ave. A majority of this work would be completed within Caltrans ROW and it is anticipated that sufficient space is available for storage of equipment and materials within Caltrans property. Additional space beyond the ROW boundary needed for construction is minimal and will be acquired as temporary construction easement (TCE).

Additional detail on construction impacts are described in Chapter 2.0, construction of the Build Alternatives.

3.24.4 Utilities/Emergency Services

During construction of the Build Alternatives, some impairment to the delivery of emergency services, including fire and police response times, may occur as a result of lane restrictions, ramp closures, road closures, and/or detours. The proposed improvements could result in traffic delays to travelers and emergency service providers when traveling in and around construction areas and to/from emergency scenes when lane restrictions, ramp closures, road closures, and/or detours are in effect. Specific locations where lane restrictions, ramp closures, road closures and/or detours are identified in Section 3.4. Also, please refer to discuss under 3.24.5 below regarding potential effects to local circulation.

Measure T-1, provided in Section 3.5, Transportation and Traffic/Pedestrian and Bicycle Facilities, addresses short term transportation impacts during construction of the Build Alternatives, including potential delays for emergency service providers. Measure T-1 requires the preparation of a Transportation Management Plan (TMP) during final design, including coordination of the development of the TMP with emergency services providers. The TMP would be implemented during project construction.

Construction activities under the Build Alternatives would affect various underground and overhead utilities through removal or relocation, which may result in temporary service disruptions to some utility users in the vicinity of those removals/relocations. The utilities that would not need to be relocated would be protected in-place.

3.24.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

Construction of the Build Alternatives could result in temporary impacts to vehicular, bicycle, and pedestrian traffic circulation due to lane-width reductions, lane restrictions, and traffic diversions from temporary closures to local roadways, sidewalks and bikeways, and freeway lanes and ramps, as described in Section 3.5. As a result, construction activities associated with construction of the Build Alternative could result in delays for the traveling public. Construction of the Build Alternatives may require temporary closures of sidewalks, crosswalks, and bicycle facilities to protect the safety of pedestrians, bicyclists, and construction workers. Many sidewalks on the local streets in the vicinity of and/or crossed by improvements in the Build Alternatives are compliant with the Americans with Disabilities Act (ADA). Because local streets, sidewalks, and crosswalks would be closed temporarily during construction of the Build Alternatives, ADA accessibility would also be affected during those closures.

Under the TSM/TDM Alternative, lane restrictions during construction of the improvements may include lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours. In general, these improvements are minor, and no detours are anticipated to be needed. Construction activities associated with the improvements under the TSM/TDM Alternative would result in temporary delays for the traveling public. However, some travelers may choose alternate routes around the area to avoid construction activity and traffic delays.

Under the BRT Alternative, where widening or improvements are proposed along Atlantic Boulevard, Huntington Drive, and Fair Oaks Avenue in Alhambra, East Los Angeles, Monterey Park, and South Pasadena, temporary lane restrictions (including lane width reductions, reductions in the number of lanes, and restrictions on the number of lanes during off-peak hours) would be required. Temporary ramp closures are also anticipated at the State Route 60 (SR 60) on-ramps to reconstruct parts of the ramps to widen and accommodate BRT service on Atlantic Boulevard. In general, these improvements are minor and would not result in major travel delays. However, some travelers may choose alternate routes around the area to avoid construction activity and traffic delays.

Construction of the LRT Alternative would require lane closures at nine locations. None of these closures are anticipated to require signed detour routes; however, the road closures described below would require advance public and driver notification to use alternative routes. Where the elevated alignment of the LRT would cross SR 60, Interstate 710 (I-710)/SR 710, or other roads, overnight closures would be required to accommodate the placement of concrete barriers adjacent to the median and the construction of falsework. Other than these overnight closures, the roads below the aerial LRT alignment would remain open during construction of the LRT Alternative. The falsework would be designed so there are no vertical clearance impairments for vehicles traveling under the falsework.

The single-bore design variation of the Freeway Tunnel Alternative could result in delays at 5 locations and detours in 7 locations in Alhambra, El Sereno, and Monterey Park in the vicinity of the south tunnel portal, as well as delays at 8 locations and detours in 11 locations in Pasadena in the vicinity of the north tunnel portal. The dual-bore design variation of the Freeway Tunnel Alternative would result in delays at 4 locations and detours in 9 locations in Alhambra, El Sereno, and Monterey Park in the vicinity of the south tunnel portal, as well as delays at 8 locations and detours in 11 locations in Pasadena in the vicinity of the north tunnel portal.

Construction of the improvements in the vicinity of the north and south portals for the single-bore and dual-bore design variations would take place in several stages. The stages at the north and south tunnel portals would not necessarily coincide. Some construction stages would occur in phases to maintain traffic lanes. Prior to the estimated time of construction, coordination would take place to ensure that the proposed closures and/or detours would be coordinated with other transportation improvement projects in the area that may be impacted and that potential traffic impacts during the construction of this alternative are adequately addressed.

As described in Chapter 2.0, construction of the Build Alternatives has the potential to require import and export of soil material. A majority of the TSM/TDM improvements were designed within the existing right-of-way, which is consistent with the approach for this alternative. Minor street improvements, such as adding turning lanes or through lanes may require street widening, raised median removal, and restriping. It is anticipated that these types of improvements would result in minimal construction related impacts and require minimal import and/or export of material. It is anticipated that these types of improvements would result in minimal construction-related impacts and would require minimal import and/or export of material. Improvements T-1, T-2, T-3, and I-16 have the potential to generate more substantial amounts of import and/or export material. As discussed in Section 2.2.3.1, excavated materials resulting from these improvements would be reused on site to the extent feasible, and any remaining material would be transported to a Class I landfill and/or sold to a soil broker.

TBM manufacturers can design TBMs in a way such that they are transported in pieces and assembled at the construction site. The TBM manufacturers take transportation restrictions into consideration when designing the TBMs, and the TBMs are routinely delivered in urban areas using existing infrastructure. The specific needs of this project and local jurisdictional permit requirements for transporting the TBMs or other equipment for this project would be considered when the TBM is fabricated for both the LRT and Freeway Tunnel Alternatives.

As described in Sections 2.2.3.3 and 2.2.3.4, construction of the bored segment of the LRT Alternative and the bored and cut-and cover tunnel segments of both design variations of the Freeway Tunnel Alternative would generate excess excavated soil and other materials that cannot be reused within the project limits. That material is proposed to be disposed of at the Manning and Olive Pits in Irwindale. If the Manning and Olive Pits are unavailable, other Class I landfills and/or sale to a soil broker are also options for disposing of the excavated material would be considered.

The preliminary routes for hauling the excavated material from the LRT Alternative tunneling would include segments on Fair Oaks Avenue (from the South Pasadena and Fillmore Station sites) and Fremont Avenue (from the Huntington and Alhambra Station sites), on Arrow Highway and Live Oak Avenue (to/from I-605 at the disposal end of the haul trips), and on Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit). Those haul routes would be used only during construction of the LRT Alternative tunnel segments and underground stations (refer to Figure 2-5 in Chapter 2).

For the Freeway Tunnel Alternative, the preliminary route for hauling excavated material generated at the south tunnel portal and at the north tunnel portal would be via the existing SR 710. Haul trucks would enter SR 710 without traveling on local streets. The preliminary route at the disposal end of the trip under both design variations includes Live Oak Canyon and Arrow Highway (to/from I-605 at the disposal end of the haul trips), and Azusa Canyon Road (to access the Olive Pit) and Vincent Avenue (to access the Manning Pit) (refer to Figure 2-9 in Chapter 2).

A Traffic Management Plan (TMP) as outlined in Measure T-1 (in Section 3.5) would be implemented during construction in order to construct the project in a cost-efficient and timely manner with minimal interference to the traveling public. The TMP will also address changes in pedestrian and bicycle circulation and provide measures to minimize the effects of construction activities on pedestrian and bicycle travel within the study area.

3.24.6 Visual/Aesthetics

Short-term visual impacts would occur to viewer groups during construction of the Build Alternatives, as described in Section 3.6. Those effects would include views of demolition of existing structures; removal of existing mature vegetation; grading of cut-and-fill slopes; construction of tunnel, bridge, and road structures; construction vehicles; construction staging areas; temporary roadside barriers; and construction lighting and signage. The effects of vegetation clearing would gradually cease over time as landscaping for the Build Alternatives matures. New plantings can reasonably be expected to reach mature growth within a 1- to 3-year period (depending on the species and initial planting size). Some tree species could take longer to reach mature growth.

Measure V-7, as outlined in Section 3.6, would be implemented during construction of the Build Alternatives to address potential visual effects associated with construction activities.

3.24.7 Cultural Resources

The construction of the Build Alternatives would adversely impact documented historic properties and could potentially impact previously undocumented cultural resources, as described in Section 3.7. Any such impacts during construction of the Build Alternatives would be considered permanent (not temporary) impacts of the Build Alternatives.

There is potential for previously undocumented cultural materials or human remains to be unearthed during site preparation, grading, or excavation. Because there are no Native American sacred sites/traditional cultural properties in the Area of Potential Effects (APE) for the Build Alternatives, the construction and operation of a Build Alternative would not result in adverse impacts on those types of resources. However, several Native American Tribal representatives have indicated the overall study area is sensitive for unknown cultural resources. As a result, construction of a Build Alternative could potentially impact those types of cultural resources.

Detailed measures provided in Section 3.7 would be implemented prior to, during, and after construction to address the potential effects of the construction of the Build Alternatives on historic properties and previously undocumented cultural material and human remains.

3.24.8 Hydrology and Floodplain

Construction activities associated with the TSM/TDM, BRT, and LRT Alternatives would not result in impacts to floodplains because they would not encroach into any floodplains, as described in Section 3.8. The Freeway Tunnel Alternative dual-bore and single-bore design variations require widening State Route 710 (SR 710) along its east side, which is along the Laguna Regulating Basin western boundary. Therefore, construction activities for the dual-bore and single-bore design variations of the Freeway Tunnel Alternative would encroach in the Laguna Regulating Basin floodplain.

The Freeway Tunnel Alternative dual-bore design variation also requires widening SR 710 along its west side, which is along Dorchester Channel's eastern boundary, and replacing portions of an existing reinforced concrete channel with a reinforced concrete box. Therefore, construction activities for the dual-bore design variation of the Freeway Tunnel Alternative would encroach in the Dorchester Channel floodplain.

Construction equipment would be operated along the Laguna Regulating Basin western boundary and along the Dorchester Channel eastern boundary. Potential temporary impacts could occur during the widening of the road, construction of the bridge structure, excavation under the new bridge structure, and reconstruction of the existing maintenance road. Land and vegetation would be cleared, exposing soil to the potential for erosion and downstream transport of sediments to occur. Under the Construction General Permit, preparation of a Storm Water Pollution Prevention Plan (SWPPP) and implementation of construction Best Management Practices (BMPs) aimed at reducing pollutants of concern in storm water runoff would be required. Therefore, the Freeway Tunnel Alternative would not result in temporary impacts related to the floodplains of the Laguna Regulating Basin or Dorchester Channel.

In addition, the Laguna Regulating Basin and Dorchester Channel have limited value to support fish, wildlife, and plant habitat. Furthermore, the open space, natural beauty, and outdoor recreational values of the Laguna Regulating Basin and Dorchester Channel are limited. Therefore, implementation of the Freeway Tunnel Alternative would not result in adverse impacts to the natural and beneficial floodplain values of the Laguna Regulating Basin and Dorchester Channel.

3.24.9 Water Quality and Storm Water Runoff

Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions, as described in Section 3.9. Additionally, during a storm event, soil erosion could occur at an accelerated rate. Chemicals, liquid products, and petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked during construction and thereby have the potential to be transported via storm runoff into receiving waters.

During construction of the TSM/TDM Alternative, BRT Alternative, LRT Alternative, Freeway Tunnel Alternative single-bore design variation, or Freeway Tunnel Alternative dual-bore design variation, a total of approximately 21 ac, 56 ac, 44 ac, 90 ac, or approximately 102 ac, respectively, of soil would be disturbed. Soil disturbance exposes soils and increases the potential for soil erosion, which could be a source of downstream sediment. When sediment enters a receiving water body, it can increase turbidity, smother bottom dwelling organisms, and suppress aquatic vegetation growth. When new structures are installed or modified (e.g., street and on-/off-ramp improvements), concrete and/or asphalt applications could be a source of fine sediment, metals, and chemicals that could change the pH levels in downstream water bodies. Grading and other earth-moving activities during construction could be a source of petroleum products and heavy metals if the equipment engines leak. Furthermore, temporary or portable sanitary facilities provided for construction workers could be a source of sanitary waste.

Groundwater dewatering during construction of the TSM/TDM and BRT Alternatives would not be required. Groundwater dewatering during construction at the tunnel portals may be required for the LRT and Freeway Tunnel Alternatives. Discharge of the dewatered groundwater has the potential to introduce pollutants to receiving surface waters.

Tunnel boring activities associated with construction the LRT and Freeway Tunnel Alternatives are not expected to affect groundwater levels or quality because: (a) the bored tunnels would be excavated with pressurized-face tunnel boring machines (TBMs) that would control the groundwater inflows into the tunnel, and (b) the concrete lining would be designed and constructed to be watertight. After excavation, the space between the outside of the tunnel lining and the soil is typically grouted to prevent groundwater flow along the tunnel bores. In addition, the soil conditioners that may be injected into the ground at the face of the excavation would be non-toxic and biodegradable and, therefore, would not adversely impact groundwater quality.

Measures WQ-1 through WQ-7, as outlined in Section 3.9, would be implemented during construction of the Build Alternatives to address potential effects to water quality during construction.

3.24.10 Geology

Each of the Build Alternatives will alter existing landforms due to grading and construction activities as described in Section 3.10. Temporary impacts also include soil compaction and increased possibility of soil erosion due to exposure of excavated soil. Additionally, during a storm event, soil erosion could occur at an accelerated rate. The Build Alternatives will be required to adhere to the requirements of the General Construction Permit and implement erosion and sediment control BMPs specifically identified in a project SWPPP in order to keep sediment from moving off site into receiving waters.

The construction activities associated with the proposed build alternatives could be impacted by ground motion, liquefaction, and possibly ground rupture (deformation) to some degree if an earthquake were to occur during construction. Implementation of safe construction practices and compliance with Caltrans and the California Division of the Occupational Safety and Health Administration (Cal-OSHA) requirements will minimize the impacts of these conditions.

Naturally occurring gas could be encountered in any of the geologic formations in the study area. However, based on historic experience with the construction of other tunnels in Los Angeles, naturally occurring gas is most likely to be encountered within the Puente Formation. Encountering naturally occurring gas during construction activities poses risk of ignition and hazard to construction worker's health.

Most of the TSM/TDM and BRT Alternative improvements would be located either at or close to the ground surface (generally less than 10 feet below ground surface); therefore, the potential to encounter naturally occurring oil or gas during construction is low. However, naturally occurring oil and gas could be encountered during construction of the deep foundations for the bridge structure supports associated with Improvements I-16 and T-1 of the TSM/TDM Alternative.

The LRT and Freeway Tunnel Alternatives would require earthwork that would extend below the ground surface. There is potential for naturally occurring gas to be encountered during construction of these alternatives. During tunneling, the hazard of encountering gas is related to the volume and concentration of the gas in the working environment of the tunnel during construction and in the tunnel during operation. Gas concentrations in the tunnel are not the same as those in the surrounding soil because the presence of the tunnel lining limits the flow of gas into the tunnel - the tunnels are immediately supported with gasketed concrete liners that serve as both initial and final lining support and prevent inflow of gas and water into the tunnel both during the construction period as well as over the life of the project. Also, the tunnels are expected to be excavated with closed, pressurized-face TBMs that have previously been successfully used to limit inflow of gas and water into the tunnel face of the excavation during construction. Additionally, ventilation would be required during construction which can dilute and remove gases that enter the tunnel to provide a tenable working environment during construction. The presence of naturally occurring oil and/or gas is not unusual, especially in the Los Angeles region, and tunnels have been excavated through these conditions previously.

All appropriate measure prescribed by Cal/OSHA would be incorporated into the design and construction specifications for I-16, T-1, LRT Alternative and the Freeway Tunnel Alternatives to protect worker health and against potential ignition.

All improvements in the Build Alternatives would be designed, constructed, and operated in accordance with all applicable standards, including the following design and safety standards:

- Caltrans Memo to Designers 20-1, Seismic Design Methodology for the seismic design of the Freeway Tunnel Alternative (2010 or more current).
- Federal Highway Administration (FHWA) tunnel design standards (for tunnel-related highway improvements included in the Freeway Tunnel Alternative) in the FHWA Technical Manual for Design and Construction of Road Tunnels – Civil Elements (2009 or more current).
- Metro’s Rail Design Criteria (for light rail improvements included in the LRT Alternative) in the Rail Transit Design Criteria and Standards (2013 or more current). Includes Metro Supplementary SDC appended to Section 5 in 2013.
- Metro design criteria for BRT systems (2008 or more current) for roadway and other improvements for the BRT Alternative.
- Local jurisdiction design and safety standards (for local roadway improvements included in the Build Alternatives)
- Cal/OSHA related to worker safety during construction and operation in Title 8, Chapter 3.2, California Safety and Health Regulations, California Code of Regulations.

Additionally, with implementation of Measures GEO-1, GEO-2, GEO-3 and GEO-4 (identified in Section 3.10) appropriate engineering design and construction methods to address potential geological effects described above during construction of the Build Alternatives.

3.24.11 Paleontology

Direct impacts to paleontological resources will result from construction of any of the Build Alternatives but not from operation of the facility itself, as described in Section 3.11. Impacts to paleontological resources are considered permanent, not temporary. Therefore, construction of the Build Alternatives would result in permanent impacts to paleontological resources. Specifically, potential direct impacts to paleontological resources could result from ground-disturbing activities associated with the construction of the Build Alternatives. Although the construction would be short-term, the loss of some fossils and fossil-bearing rocks would be a permanent impact of the Build Alternatives based on the scientific significance of potential paleontological resources in formations in the project area. Measure PAL-1, as outlined in Section 3.11, would be implemented during construction of the Build Alternatives where there is potential for encountering paleontological resources during construction.

3.24.12 Hazardous Waste/Materials

All of the Build Alternatives involve soil disturbance and the demolition of existing structures and bridges, which could release hazardous materials such as lead and asbestos-containing materials (ACMs) during construction, as described in Section 3.12. Additionally, all of the Build Alternatives are within the vicinity of subject properties that may result in potential exposure to hazards or hazardous materials during construction. The TSM/TDM and Freeway Tunnel Alternatives would require widening or demolition of bridges constructed prior to 1989 (when the federal ban on asbestos use was implemented); therefore, ACMs may be present in these structures. The presence of these materials would pose a potential hazardous waste risk if the removal of materials for the widening or demolition of bridges is required. Most of the improvements under the TSM/TDM and BRT Alternatives do not require ground-disturbing activities during construction and therefore have less potential to result in hazardous materials impacts than the LRT and Freeway Tunnel Alternatives, which require substantial ground-disturbing activity. In addition, during construction of both the tunnel segment of the LRT Alternative and the Freeway Tunnel Alternative single-bore and dual-bore design variations, the TBM could potentially pass through soil or groundwater impacted by hazardous materials. During tunnel construction for the LRT and Freeway Tunnel Alternatives, a temporary stockpiling area would be set up at the construction portal so that excavated material and any encountered water could be sampled. Water would be treated to meet sewer discharge requirements or disposed of at a designated off-site disposal location. Disposal of all materials would need to meet all local, State, and federal regulations, where applicable. Measures HW-1 through HW-10, as outlined in Section 3.12, would be implemented during construction of the Build Alternatives where there is potential for encountering hazardous waste/materials and use/disposal of hazardous materials during construction.

3.24.13 Air Quality

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction, as described in Section 3.13. Emissions from construction equipment also are anticipated and would include carbon monoxide (CO), nitrogen oxides (NO_X), volatile organic compounds (VOCs), directly-emitted particulate matter less than 10 microns and 2.5 microns in size (PM_{10} and $PM_{2.5}$, respectively), and toxic air contaminants (TACs) such as diesel exhaust particulate matter. Ozone (O_3) is a regional pollutant that is derived from NO_X and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. These activities would temporarily generate PM_{10}, $PM_{2.5}$, and small amounts of CO, sulfur dioxide (SO_2), NO_X, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} and $PM_{2.5}$ emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} and $PM_{2.5}$ emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles (PM_{10}) would settle near the source, while fine particles ($PM_{2.5}$) would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the United States Environmental Protection Agency (EPA) to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs, and some soot particulate (PM_{10}

and $PM_{2.5}$) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain up to 5,000 parts per million (ppm) of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and California Air Resources Board (ARB) regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO_2-related issues due to diesel exhaust would be minimal. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would be quickly dispersed below detectable thresholds as distance from the site(s) increases.

The TSM/TDM Alternative, BRT Alternative, LRT Alternative, Freeway Tunnel Alternative single-bore design variation, and Freeway Tunnel Alternative dual-bore design variation would result in a maximum construction emission of reactive organic gases (ROGs) of approximately 49 pounds/day (lbs/day), 12 lbs/day, 119 lbs/day, 214 lbs/day, and 237 lbs/day, respectively. Maximum construction emissions of CO would be approximately 548 lbs/day, 123 lbs/day, 1,335 lbs/day, 2,167 lbs/day, and 2,284 lbs/day, respectively. Maximum construction emissions of NO_X would be approximately 935 lbs/day, 206 lbs/day, 2,242 lbs/day, 4,337 lbs/day, and 4,926 lbs/day, respectively. Maximum concentrations of PM_{10} would be approximately 513 lbs/day, 327 lbs/day, 720 lbs/day, 1,116 lbs/day, and 1,460 lbs/day, respectively. Finally, maximum construction emission of $PM_{2.5}$ would be approximately 130 lbs/day, 74 lbs/day, 207 lbs/day, 330 lbs/day, and 411 lbs/day, respectively.

Measures AQ-1 through AQ-5, as outlined in Section 3.13, would be implemented during construction of the Build Alternatives to address pollutant emissions associated with construction activities and equipment.

The SR 710 North Project is in Los Angeles County, which is among the counties listed as containing serpentine and ultramafic rock. However, the part of the County that is known to contain serpentine or ultramafic rock is limited to the Island of Santa Catalina. Therefore, the impact from naturally occurring asbestos (NOA) during project construction would be minimal to none.

3.24.14 Noise and Vibration

3.24.14.1 Construction Noise

Two types of short-term noise impacts would occur during construction of the improvements in the Build Alternatives, as described in Section 3.14. The first type of construction noise would be from construction crew commutes and the transport of construction equipment and materials to the project site, which would incrementally raise noise levels on access roads leading to the project site. The pieces of heavy equipment for grading and construction activities would be moved onto the project site, would remain for the duration of each construction phase, and would not add to the daily traffic volumes in the project vicinity. A high single-event noise exposure potential at a maximum instantaneous noise level of 87 A-weighted decibels (dBA L_{max}) from trucks passing at 50 ft would occur as a result of trucks traveling on roads leading to/from project construction areas. The projected traffic volumes from construction crew commutes would be minimal compared to existing traffic volumes on existing freeways and major arterials, and the change in noise level as a result of the increased traffic associated with construction worker commutes would not be perceptible. Therefore, there would not be a substantial increase in noise associated with short-term, construction-related worker commutes and equipment transport.

The second type of short-term noise impact is related to noise generated during excavation, grading, and facility construction. Construction is performed in discrete steps, each of which has its own mix of equipment and consequently its own noise characteristics. These various sequential phases would change the character of the noise generated and, consequently, the noise levels in the vicinity of the improvements in each Build Alternative as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 3.14.20 (refer to Appendix N) lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments based on a distance of 50 ft between a piece of construction equipment and a noise receptor.

Typical noise levels at 50 ft from an active construction area range up to 91 dBA L_{max} during the noisiest construction phases. The site preparation phase, which includes grading and paving, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving and compacting equipment include excavating machinery such as backfillers, bulldozers, and front loaders as well as compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Construction of the improvements in the Build Alternatives is expected to require the use of a variety of construction equipment, depending on the specific improvement. Noise associated with pile driving activities, if necessary, is estimated to approach 93 dBA L_{max} at 50 ft from the center of activity. Noise associated with the use of construction equipment for the grading phase is estimated to be between 79 dBA L_{max} and 89 dBA L_{max} at 50 ft from the active construction area. The maximum noise level generated by a scraper is estimated to be approximately 87 dBA L_{max} at 50 ft from the scraper. A bulldozer would generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by water and pickup trucks is approximately 86 dBA L_{max} at 50 ft from these vehicles.

Each doubling of a sound source with equal strength increases the noise level by 3 dBA. Each piece of construction equipment operates as an individual point source. The worst-case composite noise level at the nearest residence during this phase of construction would be 93 dBA L_{max} at a distance of 50 ft between the residences and an active construction area.

Measures N-1 through N-4, as outlined in Section 3.14, would be implemented during construction of the Build Alternatives to address short-term noise associated with construction operations, materials handling and storage, and TBM operations, including limitations on construction operations.

3.24.14.2 Ground-Borne Noise and Vibration

Construction activities can result in varying degrees of ground vibration, depending on the equipment, the type of construction operation being performed, the location of construction equipment inside a construction zone, and the distance to the nearest sensitive receptor, as described in Section 3.14.

Based on the types of improvements in the TSM/TDM and BRT Alternatives and the construction methods and equipment, the construction of those improvements would not include pile driving or other activities that could generate high levels of vibration. As a result, the construction of the TSM/TDM and BRT Alternatives would not result in adverse short-term ground-borne noise or vibration effects.

The ground-borne noise and vibration analysis indicated that the following construction activities associated with construction of the LRT and Freeway Tunnel Alternatives could result in short-term ground-borne noise and vibration: tunnel excavation, supply and muck train movements, and excavation and construction of tunnel portal and underground stations, including pile driving.

The LRT and Freeway Tunnel Alternatives would require tunnel boring that could result in ground-borne vibration. During tunnel excavation activities, the bored tunnels are expected to be excavated with TBMs, and no blasting is anticipated. However, if higher strength bedrock is expected in the cut-and-cover sections or in the excavation cross passages, controlled blasting methods may be evaluated. This would be determined when more detailed geotechnical information is evaluated for these areas. During tunnel boring, there would be short-term construction vibration impacts which have the potential to be greater for the LRT Alternative because it is generally shallower than the Freeway Tunnel Alternative. The impacts could last as long as 3 days when the tunnel is being constructed directly below sensitive receptors, and is based on how quickly the TBM advances under the sensitive receptor. The Category 2 (residential) vibration criterion for Infrequent Events is 80 VdB and for Occasional Events it is 75 VdB. Consequently, there may be a very short-term vibration impact (up to 3 days) \due to TBM operation, when the tunnel is being constructed directly below a sensitive receiver. This level of vibration would not be capable of producing damage to structures. There would also be longer-term construction vibration impacts associated with supply and muck train movements; however, it is not certain that trains would be used in the tunnels to deliver supplies or remove excavated material. A conveyor system could be used to remove spoils, in place of the muck trains, and there would be no vibration impact from this activity. A conveyor is simply a moving conveyor belt onto which soil and rock are placed to be carried along to the point of removal from the tunnel. The belt would run continuously and would produce very little vibration compared to a muck train.

If a muck train is used to remove spoils, the installation of an under-track mat (commonly referred to as a ballast mat) at the track level would reduce ground-borne noise. This method has been used successfully to reduce vibration for muck trains in the past. Ballast mats are elastomeric sheets that can be placed under the muck train tracks to reduce vibration. These mats are typically 1 inch or more thick. Construction of previous Metro rail tunnel projects has shown ballast mats to be effective at substantially reducing ground-borne noise impacts. The tunnel for the LRT Alternative would be developed at shallower depths than the single-bore or dual-bore design variations of the Freeway Tunnel Alternative. As a result, tunnel boring and other construction activities for the LRT Alternative would be more likely to cause short-term, construction-related vibration impacts than the Freeway Tunnel Alternative.

There may be short-term construction vibration impacts at station sites where residential receptors are within 200 ft of pile driving and other vibration-producing activities. BMPs and vibration monitoring to limit vibration at these receptors can be used to minimize, if not eliminate, vibration impacts. Where vibration impacts cannot be avoided, there may be short-term construction impacts around the stations sites. Other methods of construction could be used to avoid impacts from pile driving. Pre-drilling holes for soldier piles and, where feasible, the use of soil mix wall for excavation are some of the vibration control measures that could be applied to reduce ground-borne vibration impacts in these areas.

Measures N-5 through N-7 specifically address the potential for ground-borne noise and vibration during construction of the LRT and Freeway Tunnel Alternatives. Potential short-term vibration effects were assessed at the Grifols laboratory facility. At a distance of 450 ft, a conservative estimate of the ground vibration during tunnel boring is approximately 0.0018 inch/second root-mean-square (RMS). This is equivalent to a vibration level of 65 VdB. There is no published industry criterion available to evaluate the vibration level necessary for dust inside a clean room to become airborne. For a dust particle to become airborne, the vibration would need to accelerate the particle enough to overcome adhesion factors such as Van der Waals forces, which act at the molecular level and involve electrostatic interactions. A level of 66 vibration velocity decibels (VdB) (0.002 inch/second), although very conservative, is sometimes used as an unofficial criterion in the micro-electronics industry as a threshold to evaluate the potential for generation of airborne dust due to vibration. The reason for this is that micro-electronic clean rooms are designed to a vibration level that is substantially less than this. More recently, higher levels are being evaluated as possible criteria for limiting vibration as it relates to dust in clean rooms. Based on this analysis, it would appear there would be no impact from tunnel boring vibration. Vibration-sensitive manufacturing or research of the type that Grifols engages in will require a more detailed evaluation to define the acceptable vibration level to avoid causing dust in their clean rooms to become airborne. As required in Measure N-6, during the engineering phase of the project, this issue would be examined in more detail based on information to be provided by Grifols about ambient levels of dust in their laboratory and refinement of vibration predictions based on identification of the TBM and specific soil conditions between the tunnel alignment and the Grifols laboratory.

3.24.15 Energy

Temporary indirect energy impacts result from the manufacture of vehicles that operate on the project and project construction, as described in Section 3.15. Indirect manufacturing energy effects involve the one-time, nonrecoverable energy costs associated with the manufacture of vehicles. Construction energy effects involve the one-time, nonrecoverable energy costs associated with construction of roads and structures.

It is anticipated that the large construction energy demands from the Build Alternative would be accommodated by the Los Angeles Department of Water and Power (LADWP) and the Pasadena Water and Power Utility.

The TSM/TDM Alternative would have an approximately 40 percent increase to total indirect energy consumption in the study area with relatively minor construction costs. When including the construction costs for all transportation projects for the region, the energy to build and the total indirect energy costs for the TSM/TDM Alternative would be the same as the No Build Alternative.

The BRT Alternative would have an approximately 94 percent increase to total indirect energy consumption in the study area with relatively minor construction costs. When including the construction costs for all transportation projects for the region, the energy to build and the total indirect energy costs for the BRT Alternative would each be approximately 100 trillion British thermal units (BTUs) more than the No Build Alternative.

The LRT Alternative would have an approximately 980 percent increase in total indirect energy consumption in the study area. The LRT Alternative would have greater construction costs for the LRT stations and maintenance facilities. When including the construction costs for all transportation projects for the region, the energy to build and the total indirect energy costs for the LRT Alternative would each be approximately 300 trillion BTUs more than the No Build Alternative.

The single-bore design variation of the Freeway Tunnel Alternative would have an approximately 1,220 percent increase to total indirect energy consumption, and the dual-bore design variation would have an approximately 1,220 percent increase to total indirect energy consumption in the study area. The Freeway Tunnel Alternative would have greater construction costs than the other Build Alternatives.

When including the construction costs for all transportation projects for the region, the energy to build and the total indirect energy costs for the single-bore design variation of the Freeway Tunnel Alternative would each be approximately 500 trillion BTUs more than the No Build Alternative. The energy to build and the total indirect energy costs for the dual-bore design variation would each be approximately 400 trillion BTUs more than the No Build Alternative.

Based on the estimated costs to construct the TSM/TDM Alternative, it would take approximately 33,600 billion British thermal units (BTUs) to construct the TSM/TDM Alternative, approximately 55,300 billion BTUs to construct the BRT Alternative, approximately 422,000 billion BTUs to construct the LRT Alternative, 523,000 billion BTUs to construct the single-bore design variation of the Freeway Tunnel Alternative, and approximately 926,000 billion BTUs to construct the dual-bore design variation of the Freeway Tunnel Alternative. There are very small or no direct energy savings associated with the Build Alternatives, so the payback period for the energy consumed during construction is not quantifiable.

3.24.16 Natural Communities

There are no natural communities in the construction impact zone of the TSM/TDM or BRT Alternatives, as described in Section 3.16. Therefore, the TSM/TDM and BRT Alternatives would not result in any temporary impacts to natural plant communities.

The LRT Alternative is approximately 180 ft away from the southern riparian habitat north of Floral Drive and adjacent to Interstate 710 (I-710), which consists of wetland complex and arroyo willow thicket. Construction activities such as noise, dust, lighting, litter, and vibration, as well as personnel and vehicles traveling to and from the project area could potentially result in indirect temporary impacts to the southern riparian habitat north of Floral Drive and adjacent to I-710, which consists of wetland complex and arroyo willow thicket habitat that could include construction. For the Freeway Tunnel Alternative, similar temporary construction impacts could occur to riparian habitats consisting of white alder groves, black cottonwood forest, and arroyo willow thicket located underneath State Route 134 (SR 134). Measures NC-1 through NC-5, WQ-1, and IS-1, as outlined in Section 3.16, would be implemented during construction of the Build Alternatives to address potential short-term construction effects to natural communities.

3.24.17 Wetlands and Other Waters

Temporary impacts to wetlands and other waters include physical impacts from construction activities that would cease once construction of that phase is complete. The improvements in the TSM/TDM, BRT, and LRT Alternatives are not located in the vicinity of any wetlands and other waters in the Biological Study Area (BSA); therefore, the TSM/TDM, BRT, and LRT Alternatives would not result in any temporary impacts to nonwetland waters or wetland waters under the jurisdiction of the United States Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), or Regional Water Quality Control Board (RWQCB), as described in Section 3.17.

The single-bore design variation of the Freeway Tunnel Alternative would result in approximately 0.02 ac of temporary impacts to nonwetland waters under USACE, CDFW, and RWQCB jurisdiction. The dual-bore design variation of the Freeway Tunnel Alternative would result in approximately 0.22 ac of temporary impacts to nonwetland waters under USACE, CDFW, and RWQCB jurisdiction. The single-bore and dual-bore design variations would not result in any temporary or permanent impacts to wetland waters under USACE, CDFW, or RWQCB jurisdiction, as described in Section 3.17. Measures WET-1 through WET-3, WQ-1 through WQ-6, and IS-1, as outlined in Section 3.17, would be implemented during construction of the Build Alternatives to address potential short-term construction effects to wetlands and other waters.

3.24.18 Plant Species

The TSM/TDM and BRT Alternatives would not result in any temporary impacts to special-status plant species or trees subject to local tree protection ordinances due to construction activities, as described in Section 3.18. However, both the LRT and Freeway Tunnel Alternatives may result in temporary impacts from noise, dust, lighting, litter, and vibration, as well as personnel and vehicle activities outside designated construction areas. The LRT Alternative would result in indirect temporary impacts to a Coulter's goldfields population and temporary impacts to approximately 8 trees within the Caltrans right of way (ROW) that are not protected by a local ordinance. The Freeway Tunnel Alternative would result in temporary impacts to approximately 36 trees in the City of Pasadena that are protected by the City's Trees and Tree Protection Ordinance. Measures PS-1 through PS-4, as outlined in Section 3.18, would be implemented during construction of the Build Alternatives to address potential short-term construction effects to plant species.

3.24.19 Animal Species

Temporary construction impacts to animal species are expected as a result of construction noise, light, vibration, dust, and human encroachment. All of the Build Alternatives would result in temporary impacts to the disturbed/developed community during construction, as described in Section 3.19. The TSM/TDM, LRT, and Freeway Tunnel Alternative would result in temporary indirect impacts to special-status bat populations if these bats begin using bridges proposed for demolition or widening as roosting habitat. Additionally, if nighttime construction activities occur for any of the Build Alternatives, indirect temporary impacts to foraging bats may occur. The LRT and Freeway Tunnel Alternatives would result in temporary impacts to riparian obligate bird species due to the proximity of project construction areas to potential nonbreeding habitat provided by the riparian areas and to nonnative woodlands that may contain eucalyptus trees with winter roosting aggregations of adult monarch butterflies. Measures AS-1 through AS-4, as outlined in Section 3.19, would be implemented during construction of the Build Alternatives to address potential short-term construction effects to animal species.

3.24.20 Threatened and Endangered Species

Temporary construction impacts to threatened and/or endangered species may occur as a result of construction noise, light, vibration, dust, and human encroachment, as described in Section 3.20. The TSM/TDM Alternative would result in potential temporary indirect impacts through habitat loss if Townsend's big-eared bats begin using bridges proposed for widening as roosting habitat, and temporary indirect impacts to foraging bats may occur if nighttime construction activities take place. In addition, the LRT and Freeway Tunnel Alternatives could result in limited indirect temporary impacts to listed riparian obligate bird species due to the proximity of potential nonbreeding riparian habitat to project construction areas. Measures NC-1 through NC-3 and AS-1, as outlined in

Section 3.20, would be implemented during construction of the Build Alternatives to address potential short-term construction effects to threatened and endangered species.

3.24.21 Invasive Species

Impacts related to invasive species are considered permanent impacts because the introduction of invasive species into previously undisturbed areas during construction would result in permanent impacts to the habitat rather than just a temporary impact that would cease when construction is complete, as described in Section 3.21. Therefore, no temporary impacts related to invasive species would occur as a result of construction of the Build Alternatives. Measure IS-1, as outlined in Section 3.21, would be implemented during construction of the Build Alternatives to address potential short-term construction effects associated with invasive species.

3.25 Cumulative Impacts

3.25.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the study area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the Council on Environmental Quality (CEQ) Regulations.

3.25.2 Methodology

This section is based on the *Cumulative Impact Assessment* (2015). The cumulative impacts analysis for the State Route 710 (SR 710) North Project was developed by following the eight-step process as set forth in the Caltrans *Guidance for Preparers of Cumulative Impact Analysis* (June 2005), posted on the Caltrans Standard Environmental Reference (SER) website (http://www.dot.ca.gov/ser/cumulative_guidance/downloads/Approach_and_Guidance.pdf). The eight-step process is as follows:

1. Identify the resources to consider in the cumulative impacts analysis by gathering input from knowledgeable individuals and reliable information sources. This process is initiated during project scoping and continues throughout the National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) analysis.
2. Define the geographic boundary or Resource Study Area (RSA) for each resource to be addressed in the cumulative impacts analysis.
3. Describe the current health and historical context of each resource.
4. Identify the direct and indirect impacts of the proposed project that might contribute to a cumulative impact on the identified resources.
5. Identify a set of other current and reasonably foreseeable future actions or projects and their associated environmental impacts to include in the cumulative impacts analysis.
6. Assess cumulative impacts.

7. Report the results of the cumulative impacts analysis.
8. Assess the need for mitigation and/or recommendations for actions by other agencies to address a cumulative impact.

As specified in the Caltrans guidance, if the proposed project would not result in a direct or indirect impact to a resource, it would not contribute to a cumulative impact on that resource. This cumulative impacts analysis includes resources that would be substantially impacted by the proposed project, as well as resources that are currently in poor or declining health or that would be at risk even if proposed project impacts were not substantial.

The reasonably foreseeable actions used in this cumulative impacts analysis were based on information obtained from the websites of the cities within the study area and the County of Los Angeles, which identified approved and pending developments proposed in the proximity of the study area. These files were cross-checked against files maintained by the State of California, Office of Planning and Research. Information on future transportation projects was provided by Caltrans, the Southern California Association of Governments (SCAG), the Los Angeles County Metropolitan Transportation Authority (Metro), the California High Speed Rail Authority, the Federal Railroad Administration, and the Alameda Corridor-East Construction Authority. The reasonably foreseeable actions are listed in Table 3.25.1 and shown on Figure 3.25-1. This list may not be exhaustive of every planned project within the study area cities/communities, but it contains projects that have the possibility of contributing to a cumulative effect (due to size, location, etc.)

3.25.3 Resources Excluded from Cumulative Impact Analysis

The SR 710 North Project involves improving the efficiency of the existing regional freeway and transit networks, reducing congestion on local arterials affected due to accommodating regional traffic volumes, and minimizing environmental impacts related to mobile sources. Based on the scope of the SR 710 North Project, the affected environment of the study area, and the technical studies prepared for the SR 710 North Project, the following resources would not be substantially impacted by the SR 710 North Project and are not at risk:

- **Farmlands and Timberlands:** There are no timberlands or prime, unique, or soils of local significance for farmlands within the study area. Therefore, there are no recognized environmental concerns related to farmlands and timberlands for any of the SR 710 North Project Build Alternatives (Build Alternatives).

3.25.4 Resources Evaluated for Cumulative Impact Analysis

Given the level of effect identified in the technical studies, potential cumulative effects related to the following resources and environmental topics may result from implementation of the Build Alternatives. Each of these topics is discussed below. Reasonably foreseeable actions for the study area are listed in Table 3.25.1. For each environmental topic, relevant projects are listed along with the project identification number shown on Figure 3.25-1. The source documents for the environmental impact information for these major projects are provided in Table 3.25.1. For each environmental topic listed below, the RSA is described.

TABLE 3.25.1:
Summary Table

Project ID No.	Project Title	Lead Agency	Project Description	Project Status	Relevant Cumulative Environmental Factors
1	I-710 South Corridor Project	Caltrans	The project would improve I-710 in Los Angeles County between Ocean Boulevard and SR 60. Major features include widening I-710 up to 10 general-purpose lanes (five lanes in each direction); modernizing and reconfiguring I-405, SR 91, and a portion of the I-5 interchanges with I-710; modernizing and reconfiguring most local arterial interchanges along I-710; and providing a separated four-lane freight corridor to be used by conventional or zero-emission trucks.	A DEIR/DEIS was circulated in summer 2012. In July 2017, a RDEIR/SDEIS was prepared to analyze a revised set of Build Alternatives completed and was released for public review and comment. Construction is anticipated to begin in 2020. Source: http://www.metro.net/projects/i-710-corridor-project/, accessed October 15, 2017.	Community Impacts Traffic/Transportation Hydrology/Floodplain Air Quality Source: *I-710 Corridor Project Draft EIR/EIS* (June 2012).
2	I-5 Corridor Improvement Project (I-605 to I-710)	Caltrans	The project would widen I-5 from I-605 to I-710 (a total of 8 mi). An alternative may include modifications to the I-605 and I-710 interchanges.	A DEIR/DEIS will be prepared. Construction is anticipated to begin in winter 2025. Source: http://www.dot.ca.gov/dist07/travel/projects/I-5/, accessed May 16, 2014.	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment.
3	I-5 Improvement Project between SR 118 to SR 170	Caltrans	The project involved constructing an HOV lane in each direction on I-5, between the Hollywood Freeway (SR 170) and SR 118, a distance of 6.8 mi (3.4 mi in each direction). The project also involved widening four undercrossings, replacing sections of pavement, and building a direct HOV connector at the I-5/SR 170 interchange. A direct HOV connector allows for freeway-to-freeway transfers without exiting the carpool lane.	Work began in August 2010, and the project was completed in Spring 2015. Source: http://my5la.com/ronald-reagan-freeway-sr-118-to-hollywood-freeway-sr-170/, accessed October 15, 2017.	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment. Source: *Initial Study Environmental Assessment Negative Declaration/Finding of No Significant Impact I-5 HOV 134 to 118 Lane Improvement Project* (December 2000).
4	I-5 North Improvement Projects from SR 134 to SR 170	Caltrans	The project involves constructing four segments of improvements on I-5 between SR 134 and SR 170 as follows: • **Western Avenue Interchange:** Realignment of the northbound I-5 Western Avenue on- and off-ramps. • **SR 134 to Magnolia Boulevard:** Addition of one HOV lane in each direction. • **Magnolia Boulevard to Buena Vista Street:** Addition of HOV lanes, Empire Avenue interchange modification, railroad realignment and relocation, Burbank Boulevard bridge reconstruction and on- and off-ramp modifications. • **SR 170 to Buena Vista Street:** Addition of one HOV lane in each direction and pavement replacement.	• **Western Avenue Interchange:** Completed March 2012. • **SR 134 to Magnolia Boulevard:** In construction, with completion anticipated late 2017. Source: http://i-5info.com/ventura-freeway-sr-134-to-magnolia-boulevard/, accessed October 15, 2017. • **Magnolia Boulevard to Buena Vista Street:** Construction started mid-2014, with completion anticipated in 2019. Source: http://i-5info.com/magnolia-boulevard-to-buena-vista-street/, accessed October 15, 2017. • **SR 170 to Buena Vista Street:** Construction began in late 2010, and the project was completed in July 2015 Source: http://i-5info.com/hollywood-freeway-sr-170-to-buena-vista-street/, accessed October 15, 2017. Source: http://i-5info.com/wp/wp-content/uploads/2011/05/SR134-SR170-MapPoster10-18-12FINAL.jpg, accessed September 19, 2013.	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment. Source: *Initial Study/Environmental Assessment Negative Declaration/Finding of No Significant Impact I-5 HOV 134 to 118 Lane Improvement Project* (December 2000).
5	I-5/Western Avenue Interchange Improvements	Caltrans	The project involved widening of the two-lane northbound Western Avenue off-ramps to four lanes at Flower Street. Cosmic Way (south of the northbound off-ramp) was converted to a cul-de-sac, eliminating through traffic.	Construction was completed in summer 2012.	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment.
6	San Bernardino Freeway (I-10)/ San Gabriel River Freeway (I-605) Direct Connector Project	Caltrans	The project involved the addition of a fly-over connector to provide a direct connection between southbound I-605 and eastbound I-10 and eliminate weaving at this connector, providing for improved goods movement and enhanced safety and mobility throughout the region. Source: http://www.dot.ca.gov/dist07/travel/projects/details.php?id=27, accessed May 28, 2014.	An IS was prepared in October 2008, and an MND/FONSI was issued in January 2009. Construction began fall 2012 and was completed in early 2016. Source: http://www.dot.ca.gov/d7/env-docs/, accessed October 15, 2017.	According to the MND/FONSI (January 2009), this project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment. Source: http://www.dot.ca.gov/dist07/resources/envdocs/docs/10-605_connector_MND_FONSI_040309.pdf, accessed May 29, 2014.

TABLE 3.25.1:
Summary Table

Project ID No.	Project Title	Lead Agency	Project Description	Project Status	Relevant Cumulative Environmental Factors
7	San Bernardino Freeway (I-10) Add One HOV Lane from I-605 to SR 57/71 and I-210	Caltrans	The project would construct one HOV lane in each direction on I-10 between I-605 and the SR 57/SR 71/I-210 interchange. The segment between Puente Avenue and SR 57 will be constructed in two segments: Puente Avenue to Citrus Street, and Citrus Street to SR 57.	An IS/EA MND was prepared for this project in October 2002. Construction began in October 2009 and has an anticipated completion date of summer 2021. Construction of the Baldwin Park Boulevard bridge and freeway median barrier work has been completed. Bridge work on Athol Street is complete. The Bess Avenue pedestrian bridge overcrossing is currently being replaced to accommodate the freeway widening. Sound wall and retaining wall work is continuing along with freeway lane construction. Construction for the segment between Puente Avenue in Baldwin Park and Citrus Street in West Covina began in 2014 and is anticipated to complete in summer 2019. Construction for the segment between Citrus Street in West Covina and SR-57 began in 2016 and is anticipated to complete in summer 2021. Source: http://www.dot.ca.gov/d7/projects/details.php?id=54, accessed October 15, 2017.	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment. Source: *I-10 HOV Lane Project EIR* (November 2011).
8	I-10 HOT Lanes	Caltrans	This project is located on I-10 and converted the HOV lanes on I-10 to HOT lanes from Alameda Street to I-605 in Los Angeles County. Other project features included installation of signs, toll infrastructure, and restriping of the existing lanes to add an additional HOT lane.	Tolling began on I-10 on February 23, 2013. Source: http://www.metro.net/projects/expresslanes/, accessed September 17, 2013.	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment. Source: *The Interstate 10 (San Bernardino Freeway/El Monte Busway) High Occupancy Toll Lanes Project* (February 2010).
9	The I-110 (Harbor Freeway)/ Transitway HOT Lanes Project (182nd Street to Adams Boulevard) and on I-105 from Crenshaw Boulevard to Compton Avenue	Caltrans	The project involved building a flyover structure from the northbound I-110 HOV off-ramp directly to Figueroa Street and on I-110 from 182nd Street/Artesia Transit Center to Adams Boulevard.	An FEIR/EA/FONSI was prepared for this project in April 2010. Construction began in 2010 and was completed in 2012. Source: http://www.metro.net/projects_studies/expresslanes/images/notice_2012_1112.pdf	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment. Source: *The Interstate 10 (San Bernardino Freeway/El Monte Busway) High Occupancy Toll Lanes Project Final EIR/FONSI* (April 2010).
10	I-110 Widening and Rehabilitation Project	Caltrans	The project limits extend from 0.5 mi south of Washington Boulevard to north of Wilshire Boulevard, and include West 6th and 8th Streets, and Olympic, Pico, and Venice Boulevards. The project widened lanes in both directions, widened bridge structures and ramps, realigned and reconstructed ramps, added merge and auxiliary lanes and a concrete median barrier, and improved the I-110/I-10 interchange connector. Source: http://www.dot.ca.gov/dist07/Publications/Inside7/story.php?id=703, accessed September 20, 2013.	Construction of the project was completed in 2012.	Although the environmental document is not available for this project, it is anticipated that this project would not result in substantial cumulative impacts because construction is complete.
11	San Gabriel Trench Grade Separation Project	Alameda Corridor-East Construction Authority	The Alameda Corridor-East Construction Authority proposes to eliminate four at-grade railroad crossings along the UPRR in the City of San Gabriel. These improved crossings would occur at Ramona Street, Mission Drive, Del Mar Avenue, and San Gabriel Boulevard. Currently the 2.2 mi stretch of railroad includes four at-grade crossings with no grade separations between the railroad and vehicles or pedestrians. The proposed project would lower the existing railroad from its current at-grade condition into a trench. Although the actual trench would be located in the City of San Gabriel, construction activities and some limited track work would take place in the Cities of Alhambra and Rosemead, and the County of Los Angeles. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK=648346.	The San Gabriel Trench construction contract was awarded in July 2012. Early construction activities and utility relocations began in July 2013. The anticipated completion date is early 2018. Source: http://www.theaceproject.org/san_gabriel_trench.php, accessed October 15, 2017.	Community Impacts Utilities Cultural Resources Paleontological Resources Air Quality Source: *San Gabriel Trench Grade Separation Project EIR/FONSI* (November 2010).

TABLE 3.25.1:
Summary Table

Project ID No.	Project Title	Lead Agency	Project Description	Project Status	Relevant Cumulative Environmental Factors
12	Rosemead Boulevard Safety Enhancement & Beautification Project	Temple City	The project is a safety enhancement and beautification project that was intended to establish consistency along the entire length of Rosemead Boulevard (approximately 2 mi) from Callita Street (north) to the south side of the UPRR railroad tracks (south) in Temple City. The project removed and replaced concrete sidewalks and constructed new sidewalk, curb, and gutter (incidental under-sidewalk drain extensions); installed new and reconfigure raised, irrigated, and landscaped roadway medians; and re-sloped and reconfigured (as well as minor removal/ relocation and replacement of) driveways and curbs to meet ADA requirements. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 658604.	Construction began March 2013 and was completed in spring 2014. Source: http://thesource.metro.net/tag/rosemead-blvd, accessed May 16, 2014. /. An IS/MND was prepared in January 2012. Source: http://www.templecity.us/Rosemead%20Blvd/ Rosemead%20Blvd,%20IS-MND.pdf, accessed May 16, 2014. Source: http://rosemeadblvd.com/blog/, accessed September 17, 2013.	Paleontological Resources Source: *Rosemead Boulevard Safety Enhancement and Beautification Project IS/MND* (January 2012).
13	Washington Boulevard Improvement Project	City of Commerce	Widen and reconstruct Washington Boulevard (from two lanes to three lanes in each direction) from the western City boundary at Vernon (350 ft west of Indiana Street) to I-5 at Telegraph Road. The project will also increase turn radius and medians, upgrade traffic signals and street lighting, and improve sidewalks.	Construction began in early 2015 and is ongoing. Source: City of Commerce – email correspondence with Alex Hamilton, November 7, 2013. Source: http://www.washingtonblvdcommerce.com/about-project/, accessed October 15, 2017. Source: http://www.transtech.org/the-washington-boulevard-groundbreaking-at-city-of-commerce, accessed October 15, 2017.	Although the environmental document is not available for this project, it is anticipated that this project would not result in substantial cumulative impacts because of its distance from the Build Alternatives.
14	San Fernando Road Widening Between Elm Street and Eagle Rock Boulevard	City of Los Angeles	The project would widen San Fernando Road between Elm Street and Eagle Rock Boulevard to install one additional northbound lane. The intersection of San Fernando Road, Eagle Rock Boulevard, Verdugo Road, and Cypress Avenue would be reconfigured. Sidewalks throughout the project would be expanded to a width of 10 ft. Improvements are also proposed for San Fernando Road at SR 2. A new southbound San Fernando Road to northbound freeway on-ramp would be constructed by cutting into the adjacent slope and constructing a retaining wall approximately 100 ft in length and up to 10 ft in height. This new on-ramp would join the existing northbound on-ramp. The off-ramp from southbound SR 2 would be widened. The east side of San Fernando Road, between this off-ramp and Roswell Street to the north, would also be widened. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 638029.	IS/ND – November 2009. Construction was scheduled to begin in November 2011 and last approximately 1 year. Information regarding the start of construction is not available.	Paleontological Resources Source: *San Fernando Road Widening Between Elm Street and Eagle Rock Boulevard IS/ND* (November 2009)
15	Riverside Drive Bridge and Grade Separation Replacement Project	City of Los Angeles	The City of Los Angeles replaced the existing Riverside Drive Bridge (known as the Riverside-Figueroa Bridge) over the Los Angeles River and Riverside Drive Viaduct/Grade Separation Structure with an integrated two-lane, standard-curvature bridge and grade separation structure. Source: http://eng.lacity.org/docs/dpw/agendas/2006/200604/ 20060426/ce/20060426_ag_br_ce_1_tr.pdf, accessed September 20, 2013.	An IS/ND was completed in January 2006, and construction was completed in early 2017. Source: www.dot.ca.gov/hq/LocalPrograms/CWA/documents/cycle.../ hrcsa.xlsx, accessed September 20, 2013. Source: https://la.curbed.com/2017/1/30/14441772/riverside-drive-figueroa-bridge-river-roundabout-cypress-park, accessed October 15, 2017	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment. Source: *Riverside Drive Bridge/Grade Separation Replacement IS/ND* (January 2006).

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16	Valley Boulevard/I-605 Project	City of Industry	Reconfiguration of the Valley Boulevard on- and off-ramps to I-605 to improve mobility and circulation and to relieve the current congestion at Valley Boulevard. Includes: right turn from Valley Boulevard onto existing southbound on-ramp; construction of dual westbound to southbound lanes to southbound on-ramp and reconstruction of entire southbound on-ramp; improvements at Valley/Temple/northbound I-605 off-ramp intersection; and widening of eastbound Valley Boulevard to three lanes in advance of the southbound ramps. Source: http://www.scag.ca.gov/FTIP/pdf/draft/2013/D2013-FTIP-StateLA.pdf, accessed September 20, 2013.	Status not available.	Although the environmental document is not available for this project, it is anticipated that this project would not result in substantial impacts because it involves minor improvements to an existing interchange.
17	Regional Connector Transit Corridor	Metro	The Metro Regional Connector Project extends from the Metro Gold Line Little Tokyo/Arts District Station to the 7th Street/Metro Center Station in downtown Los Angeles, allowing passengers to transfer to Blue, Expo, Red, and Purple Lines, bypassing Union Station. Source: http://www.metro.net/projects/connector/.	A DEIR was prepared in September 2010 and an FEIR was completed in January 2012. Construction began on September 30, 2014. The project is anticipated to open in 2021. Source: http://media.metro.net/projects_studies/connector/images/deis-deir/Cover.pdf, accessed May 16, 2014. Source: http://www.metro.net/projects/connector/connector-final-eiseir/, accessed May 16, 2014. Source: http://www.metro.net/projects/connector/, accessed October 15, 2017	Community Impacts Utilities Traffic/Transportation Paleontological Resources Air Quality Source: *Regional Connector Transit Corridor Draft EIS/EIR* (September 2010).
18	Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension	Metro	The project would connect with and extend the Gold Line Eastside Extension light rail line, which runs between Union Station in downtown Los Angeles and Pomona and Atlantic Boulevard in East Los Angeles to communities farther east. The project's goals include improving mobility in the study area and planning for future growth in a sustainable manner. Metro is leading this study effort in conjunction with the FTA.	The DEIS/DEIR document was completed in September 2014. The Metro Board of Directors directed staff to produce a technical study to address major areas of concern raised by Cooperating Agencies, corridor cities, and stakeholders, as well as incorporate a new alternative. In May 2017, the Metro Board of Directors approved the updated project definition upon receiving the completed Eastside Transit Corridor Phase 2 Technical Study. A Supplemental/Recirculated Draft EIS/EIR is anticipated to be available for public review in mid-2020. Funding for the project would come from Measure M and has been programmed in two cycles: Cycle 1 allocates $3 billion in 2029 and Cycle 2 allocates $3 billion in 2053. Source: https://www.metro.net/projects/eastside_phase2/, accessed October 15, 2017.	Land Use Community Impacts Utilities Visual Hydrology Paleontological Resources Hazardous Waste Source: *Eastside Transit Corridor Phase 2 Alternatives Analysis Report* (October 2009).
19	Metro Gold Line Foothill Extension	Metro/Foothill Extension Authority	The proposed extension consists of two phases. The first phase continues east from Sierra Madre Villa in Pasadena over 11 mi, with stops in the Cities of Arcadia, Duarte, Irwindale, and Monrovia, and two stops in Azusa. The second phase will continue east from Azusa to Montclair, a distance of 12.3 mi, with stops in the cities of Glendora, San Dimas, La Verne, Pomona, Claremont, and Montclair.	The FEIR for the first phase (Sierra Madre Villa to Azusa) was certified in 2007. Construction was completed in September 2015 and Metro began safety testing in November 2015. The Metro Gold Line Extension to Azusa opened March 5, 2016. An FEIR was certified in March 2013 for the Azusa to Montclair segment. Groundbreaking for the Azusa to Montclair segment is scheduled for December 2, 2017. Source: http://www.foothillextension.org/construction_phases/construction-updates/, accessed September 20, 2013. Source: http://www.foothillextension.org/construction_phases/azusa_to_montclair/metro-gold-line-foothill-extension-azusa-to-montclair-draft-environmental-impact-report-1/, accessed May 16, 2014. Source: https://www.metro.net/projects/foothill-extension/, accessed	Community Impacts (acquisitions) Traffic/Transportation Paleontological Resources Air Quality Source: *Metro Gold Line Foothill Extension – Pasadena to Azusa Final Environmental Impact Report* (February 2007). Source: *Metro Gold Line Foothill Extension – Azusa to Montclair Final Environmental Impact Report* (February 2013).

TABLE 3.25.1:
Summary Table

Project ID No.	Project Title	Lead Agency	Project Description	Project Status	Relevant Cumulative Environmental Factors
				October 15, 2017. Source: http://foothillgoldline.org/, accessed October 15, 2017.	
20	Wilshire Boulevard Bus Rapid Transit Project – Phases I and II	Metro	The project consists of a 12.5 mi corridor with a 7.7 mi peak-period bus lane on Wilshire Boulevard from Valencia Street in the City of Los Angeles to the City of Santa Monica. Phase I included street widening, curb lane repaving/reconstruction, improved traffic signal timing, and bus signal priority. Phase II included enhanced shelters and landscaping, street repair/ reconstruction, concrete bus pads, and park-and-ride facilities.	A FONSI was issued in August 2011. The first segment of the bus lanes between South Park View Street and Western Avenue was scheduled to open June 2013. All remaining segments of the project were completed in April 2015. Source: http://www.metro.net/projects/wilshire/, accessed September 20, 2013. Source: http://media.metro.net/projects_studies/wilshire/images/ Finding_No_Significant_Impact.pdf, accessed May 27, 2014. Source: http://thesource.metro.net/2015/04/07/longest-segment-of-wilshire-brt-bus-lanes-set-to-open-on-wednesday/, accessed October 15, 2017.	Traffic/Transportation Source: *Wilshire Bus Rapid Transit Project Draft EIR/EA* (June 2010).
21	California High Speed Rail Project	Authority and Federal Railroad Administration	The project would develop an 800 mi statewide system of high-speed trains from Southern to Northern California, with potential crossing of the I-710 corridor between Washington Boulevard and Bandini Boulevard and just north of Washington Boulevard.	A Supplemental Alternatives Analysis Report was completed for the Palmdale to Los Angeles section in April 2012. Community Open Houses for the Palmdale to Los Angeles section were held in spring 2014. A Supplemental Alternatives Analysis Report was completed for the Los Angele to Anaheim section in July 2010. A Preliminary Alternatives Analysis was completed for the Los Angeles to San Diego section in March 2011. Also underway in Southern California is continued work on the Book End projects. Developed as a joint effort between the Authority, SCAG, Metro, Metrolink, SANDAG, City of Anaheim, RCTC, and SANBAG, the Book End projects represent early investments that clear the way for high-speed rail by completing required local infrastructure projects early in order to minimize local impacts during construction of the high-speed rail system. High-speed rail service connecting the Bay Area and Los Angeles Basin is anticipated by 2029. Source: http://www.hsr.ca.gov/docs/newsroom/fact%20sheets/ Statewide%20Rail%20Modernization%20Plan.pdf, accessed May, 2014. Source: http://www.hsr.ca.gov/docs/brdmeetings/2013/brdmtg_ item3_status_rpt_southern_cal_project_sections.pdf, accessed November 7, 2013. Source: http://www.hsr.ca.gov/docs/programs/statewide_rail/ proj_sections/Palmdale_LA/Palmdale_to_LA_Central_Hollywood_ Neighborhood_Council_presentation_4_23_12.pdf, April 23, 2012; High Speed Rail Website, http://www.hsr.ca.gov/,- accessed July 2013. Source: http://www.hsr.ca.gov/Programs/Statewide_Rail_ Modernization/Project_Sections/palmdale_losangeles.html, accessed May 27, 2014. Source: http://www.hsr.ca.gov/docs/programs/statewide_rail/ proj_sections/LA_Anaheim/Supplemental_Alternatives_Analysis_ Report_July_2010_7_17_10.pdf, accessed May 27, 2014.	Traffic/Transportation Source: *California High-Speed Train Final Program EIR/EIS* (August 2005).
22	Gold Line Transit Plaza	City of Arcadia	This project involved the design and construction of a transit plaza adjacent to the Gold Line Arcadia Station. The transit plaza includes	Construction closures for the Transit Plaza began in September 2014. The Transit Plaza was dedicated in November 2014. The Metro Gold	Community Impacts Traffic/Transportation

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			hardscape, softscape, street furniture (e.g., benches, trash receptacles and lighting fixtures), way-finding signage, and public art features. Source: http://arcadiasbest.com/2012/07/gold-line-station-design/, accessed July 2013.	Line Extension to Azusa opened March 5, 2016. Source: City of Arcadia website – http://www.ci.arcadia.ca.us/docs/final_adopted_cip_equipment_budget_fy13-18.pdf, accessed July 2013. Source: http://thesource.metro.net/tag/arcadia/, accessed May 27, 2014. Source: http://thesource.metro.net/2014/11/10/transit-plaza-dedicated-at-gold-line-station-in-arcadia/, accesses October 15, 2017. Source: https://www.metro.net/projects/foothill-extension/, accessed October 15, 2017.	Paleontological Resources Source: *Metro Gold Line Foothill Extension – Pasadena to Azusa Final Environmental Impact Report* (February 2007). Source: *Metro Gold Line Foothill Extension - Azusa to Montclair Final Environmental Impact Report* (February 2013)
23	Station Square Transit Village	City of Monrovia	The project will provide a transportation facility for satellite parking for the Sierra Madre Villa Gold Line Station, park-and-ride for commuters, and a Foothill Transit store. The center will have three bus bays and at least four shelters. The shelters will all have benches, with a seating capacity of at least 10 people in each shelter. The area will have lighting for safety and security, trash receptacles, drinking fountains, and information kiosks. Additional traffic signals and a right-hand bus-only turn lane will also be provided.	Gold Line Operations Facility on Evergreen Avenue between California and Shamrock Avenues: October 2012 to January 2015. All grade crossing improvements were completed prior to the opening of the Station Square Transit Village in March 2016. Grade crossings: • **California Boulevard:** Work began on improvements at this grade crossing on March 9, 2013. • **Mayflower Avenue:** Work was completed in late November 2013. • **Myrtle Avenue:** Work began on the Myrtle Avenue crossing following the reopening of California Boulevard in early 2014. • **Mountain Avenue:** Utility relocation work began in July 2013 and occurred on an intermittent basis through early 2014. The full closure of Mountain Avenue began following Myrtle Avenue reopening to through traffic. • **Magnolia Avenue:** Work was completed in 2014 • **Monrovia (Center Platform):** Work began in February 2013 and was completed prior to March 2016. The Metro Gold Line Extension to Azusa opened March 5, 2016. Source: http://www.foothillextension.org/cities-stations/monrovia/, accessed May 16, 2014. Source: https://www.metro.net/projects/foothill-extension/, accessed October 15, 2017.	Traffic/Transportation Paleontological Resources Source: *Metro Gold Line Foothill Extension – Pasadena to Azusa Final Environmental Impact Report* (February 2007). Source: *Metro Gold Line Foothill Extension – Azusa to Montclair Final Environmental Impact Report* (February 2013).
24	Alhambra Bicycle Master Plan	City of Alhambra	The project involves the planned development of a comprehensive network of bike paths, lanes, and routes while integrating this system with homes, jobs, public transit, recreational resources, and adjacent communities. The project would also implement a bicycle parking policy.	A series of prioritized bikeway projects will be implemented over the next 10 years. A Draft Master Plan was published in February 2013. Source: Alhambra Bicycle Master Plan (February 2013). Source: Alhambra Administrative Draft Plan (November 14, 2012). Source: http://www.cityofalhambra.org/imagesfile/file/201311/bikeplan_03_13.pdf, accessed May 16, 2014.	Land Use Traffic/Transportation Source: *Findings of Fact Regarding the Final Program Environmental Impact Report for County of Los Angeles Bicycle Master Plan* (accessed May 2014).

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Project ID No.	Project Title	Lead Agency	Project Description	Project Status	Relevant Cumulative Environmental Factors
25	Lincoln Avenue Specific Plan	City of Pasadena	The Lincoln Avenue Specific Plan changed land uses as well as established new development standards within the Lincoln Avenue corridors. The Specific Plan will gradually convert existing industrial and auto-related land uses to a neighborhood-serving retail/commercial district. Build out of the Lincoln Avenue Specific Plan would allow up to an additional 500,000 sf of commercial/office/retail uses and 91 additional residential units. Mixed-use opportunities (commercial/residential) would also be introduced along the corridor. Additionally, two Opportunity Sites are identified in the Specific Plan that are underutilized and have the potential for redevelopment. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK=660685.	The Specific Plan was adopted in October 2013 and will guide future development in the Lincoln Avenue Corridor. Source: http://cityofpasadena.net/Lincoln_Avenue_Specific_Plan.aspx, accessed May 16, 2014.	Land Use Utilities Traffic/Transportation Visual Paleontological Resources Air Quality Source: *Lincoln Avenue Specific Plan Environmental Impact Report* (March 2013).
26	Crown City Medical Center	City of Pasadena	The project allows for the development of a 112,252 sf, five-story medical office and retail building over a six-level parking garage (one level at-grade and five subterranean levels). Excavation for the parking garage would be to an approximate depth of approximately 56 ft and would require a total of 80,000 cy of export. The project will provide 476 parking spaces. Access to and from the parking structure would be from Converse Alley. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK=665413.	A DEIR was completed in November 2012. A public hearing to consider approval of the proposed land use approvals and the SEIR, and to consider adoption of a Statement of Overriding Considerations, was held April 24, 2013. Information regarding the start of construction is not available. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK=665413, accessed May 27, 2014.	Traffic/Transportation Visual Paleontological Resources Source: *Crown City Medical Center Subsequent Draft EIR* (Executive Summary) (October 2012).
27	16 East California Project	City of Pasadena	The proposed project includes demolition of the three existing on-site structures totaling approximately 12,635 sf and surface parking areas in order to develop a four-story, 113,200 gross square feet of office building with 255 parking spaces provided within a two-level subterranean parking garage. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK=630765.	Demolition of three existing buildings for construction of a four-story, 100,000 sf office building occurred in 2008. Information regarding the start of construction is not available. Source: Personal conversation – City of Pasadena Planning Desk, June 27, 2014.	Although the environmental document is not available for this project, the following impacts are expected to occur: Visual Paleontological Resources
28	Magellan Gateway Project	City of El Monte	The Magellan Gateway Project (formerly Temple Palms Business Park) constructed 502,020 sf of light industrial, commercial, and warehousing facilities on a vacant 26.8 ac site. The business park includes a total of five buildings ranging in size from 54,800 to 164,330 sf in a business park setting. All five buildings are arranged to take access from a central driveway traversing the project site in an east to west orientation, with a secondary driveway located at the northeast corner of the project boundary. Building heights range between 35 and 40 ft to the top of the parapet. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK=651589.	An NOD for the Magellan Gateway Project (formerly Temple Palms Business Park), an Addendum to the EIR No. 1, was issued in February 2014. Construction commenced in June 2015 and was completed in 2016. Source: http://www.magellangateway.com/in-the-news/, accessed October 16, 2017. Source: http://www.marketwatch.com/story/the-magellan-group-completes-55-million-magellan-gateway-industrial-development-2016-10-17-11160016, accessed October 16, 2017. Source: http://www.ceqanet.ca.gov/NODdescription.asp?DocPK=678717, accessed May 27, 2014.	Traffic/Transportation Hydrology/Floodplain Air Quality Source: *Temple Palms Business Park Environmental Impact Report* (May 2011).

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Project ID No.	Project Title	Lead Agency	Project Description	Project Status	Relevant Cumulative Environmental Factors
29	El Monte Walmart	City of El Monte	The project proposes 182, 429 sf of new retail/commercial uses within an approximately 15.41 ac site located in the northwestern portion of the City of El Monte near the intersection of Valley Boulevard and Arden Drive. The project includes the proposed El Monte Walmart, all facilities proposed within the project site, on-and off-site supporting improvements, and associated discretionary actions. Source: http://www.ceqanet.ca.gov/ProjDocList.asp?ProjectPK= 630100, accessed May 27, 2014.	An NOP was published in March 2014. The Final EIR was completed in May 2015, and El Monte City Council approved the project in September 2015.In November 2016, a Los Angeles Superior Court judge ruled that the original report failed to adequately address the project's impacts on traffic and air quality. Walmart appealed the decision in March 2017. Source: http://www.ceqanet.ca.gov/ProjDocList.asp?ProjectPK= 630100, accessed May 27, 2014. Source: http://www.sgvtribune.com/2016/11/30/el-monte-violated-state-environmental-laws-in-walmart-project-judge-rules/,accessed October 15, 2017. Source: http://www.sgvtribune.com/2017/03/23/walmart-appeals-court-ruling-that-stopped-new-location-in-el-monte/, accessed October 15, 2017.	Traffic/Circulation Paleontological Resources Energy
30	Olive Pit Mining and Reclamation Operations and Long Term Reuse Project	City of Irwindale	The City of Irwindale owns and maintains an inactive mining site referred to as the "Olive Pit." The City's long term goal for the property is to use a portion of the site for development and the remainder for long-term use as a storm water retention area. The City intends to enter into a License and Mining Agreement with United Rock Products to extract of all economically recoverable mineral resources from the Olive Pit and to reclaim the eastern 32 ac by filling to street level for future development. The remainder of the property will be reclaimed for storm water retention. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 679402, accessed May 28, 2014.	An NOP was published in March 2014. Irwindale City Council approved the project in December 2014. Construction is anticipated to begin summer 2015 and be completed in 2020. Source: http://www.pasadenastarnews.com/2015/01/29/irwindale-stands-by-decision-to-reopen-olive-pit-mining-quarry/, accessed October 15, 2017.	Air Quality Hydrology/Floodplain Traffic/Circulation
31	Huntington Memorial Hospital Master Development Plan Amendment	City of Pasadena	Huntington Memorial Hospital, located at 100 West California Boulevard, is a 29.11 ac site. The hospital proposes to amend its existing 20-year Master Plan to reconfigure its physical boundaries, rehabilitate existing facilities, and construct new facilities, in order to meet State seismic requirements for acute-care facilities and to ensure the uninterrupted provision of safe, efficient medical care. Development would occur in eight phases over the next 20 years. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 654053.	An IS was prepared in July 2011. The Final EIR was completed in December 2016. The Project encompasses eight non-consecutive phases beginning upon project approval, with completion anticipated by 2032. Source: http://cityofpasadena.net/Planning/Huntington_Memorial_ Hospital/, accessed October 15, 2017.	Land Use Traffic/Transportation Visual Paleontological Resources Air Quality Source: *Huntington Memorial Hospital Master Development Plan Amendment and Zone Change Initial Study* (July 2011).
32	Devil's Gate Reservoir Sediment Removal and Management Project	Los Angeles County Flood Control District	This project will remove sediment from Devil's Gate Reservoir to restore capacity and to protect the dam and its valves to reduce the risk of flooding in the communities located downstream along the Arroyo Seco. This effort will include removal of approximately 2.9 million cy of existing excess sediment in the reservoir in addition to any additional sediment that accumulates during construction. The purpose of the proposed annual management is to reduce buildup of sediment in the reservoir management area and eliminate or substantially reduce the occurrence of another large-scale sediment removal project in the future. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 675267, accessed June 4, 2014.	Sediment removal activities are expected to occur over the course of approximately 3-5 years beginning in the summer of 2018. Reservoir management is expected to start after 2022. An NOP was published in September 2011, and a DEIR was published in October 2013. Recirculated Portions of the Final EIR were completed in July 2017. Source: http://dpw.lacounty.gov/wrd/Projects/DevilGate/DEIR/ Devils_Gate_DEIR_2013_10_23_Executive_Summary.pdf - Accessed June 19, 2014. Source: http://dpw.lacounty.gov/wrd/Projects/DevilGate/Notice_ of_Availability_Notice_of_Completion_of_the_Recirculated_	Traffic/Circulation

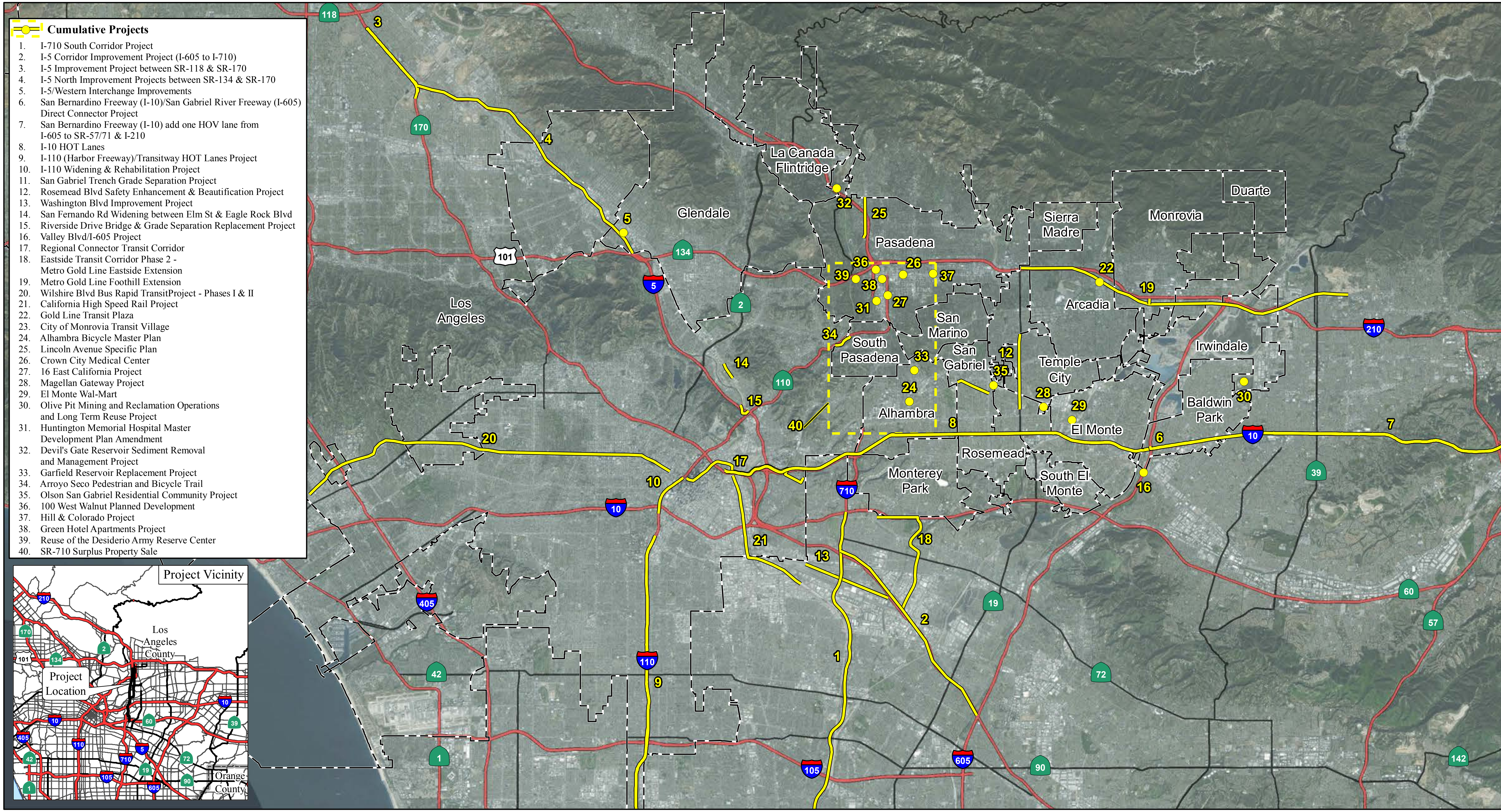
TABLE 3.25.1:
Summary Table

Project ID No.	Project Title	Lead Agency	Project Description	Project Status	Relevant Cumulative Environmental Factors
				Portions_of_the_Final_EIR.pdf, accessed October 16, 2017.	
33	Garfield Reservoir Replacement Project	City of South Pasadena	The City of South Pasadena proposes the construction of a replacement for the Garfield Reservoir. The Garfield Reservoir is a 6.25-million-gallon reservoir constructed of concrete and covered by a metal roof supported on a wood frame. A replacement reservoir is needed to bring the Garfield Reservoir up to current seismic standards. The proposed project includes demolition of the existing Garfield Reservoir and pump station and construction of two replacement reservoirs, a pump station, an inlet/outlet vault, a re-chlorination room, and a Water Distribution support yard on the project site. The proposed project also includes the replacement of a storm drain within an existing easement through the adjacent Blair High School athletic field. Source: http://www.ceqanet.ca.gov/NODdescription.asp?DocPK= 676082, accessed May 28, 2014.	An MND was completed in November 2011 and an NOD issued in October 2013. Construction of the proposed project commenced in April 2015 and is expected to last approximately 27 months. Source: http://www.ci.south-pasadena.ca.us/modules/ showdocument.aspx?documentid=7669, accessed October 16, 2017.	Air Quality
34	Arroyo Seco Pedestrian and Bicycle Trail	City of South Pasadena	Construction of a pedestrian and bicycle trail (approximately 0.65 mi), which will be an extension of the existing Arroyo Seco Bike Trail located in the City of Los Angeles. The proposed trail is planned to begin at the western limit of the City of South Pasadena, run north through the City's Nature Park and the Arroyo Seco Golf Course, continue north along Lohman Lane, and terminate at Stoney Drive. The project will require the removal of a 20 ft wide section from the driving range of the golf course, the replacement of driving range facilities, and an encroachment into the golf course parking lot. Proposed trail elements include landscaping, irrigation, benches, trash cans, drinking fountains, educational displays, information and directional signage to amenities and other trails, and an enhanced pedestrian and bicycle entry gate at golf course entrance. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 674681, accessed May 28, 2014.	An MND was completed in September 2013. Construction commenced in June 2017. Source: http://www.southpasadenaca.gov/index.aspx?page= 20&recordid=4260, accessed October 16,2017	This project would not have substantial impacts relevant to the SR 710 North Study Cumulative Impact Assessment.
35	Olson San Gabriel Residential Community Project	City of San Gabriel	The proposed project consists of 88 new condominium residential units occupying 5.4 ac and demolition of a portion of a 170,000 sf warehouse building that overlaps the Cities of San Gabriel and Rosemead. The entire property occupies 9.18 ac, spans both sides of the Rubio Wash (a Los Angeles County flood control channel), and is just south of the UPRR line. The existing warehousing use in Rosemead will continue and is being processed as Categorical Exemption (Class I – Existing Facilities), but the EIR will examine the cumulative effects of both discretionary actions. The portion of the building located west of the Rubio Wash in the City of San Gabriel will be demolished and the remaining 77,000 sf building located in Rosemead will be converted to a freestanding warehouse building. Source: http://www.ceqanet.ca.gov/ProjDocList.asp?ProjectPK= 628538, accessed May 28, 2014.	An NOP was published in December 2013. A DEIR was prepared in March 2014 and an FEIR was prepared in May 2014. The project was approved by the City Council in June 2014. Construction was anticipated to begin in late 2014 and be completed by early 2017. Information regarding the start of construction is not available. Source: Draft EIR (April 2014). Personal conversation – LSA Associates, Inc.	Archaeological/Historic Resources Land Use
36	100 West Walnut Planned Development	City of Pasadena	The proposed 100 West Walnut development is a mixed-use development that would complement the existing office buildings on the site with the proposed development of 620,000 sf of office uses, of which up to 30,000 sf could be used for ancillary retail uses, 10,000 sf of restaurant uses, and 475 residential units. The proposed development would be located on the paved parking area on the site, and parking for this project would be provided via a multi-level subterranean parking structure offering a minimum of 3,760 parking spaces, which includes	An NOP and IS were prepared in July 2013. Construction is anticipated to be completed by 2020.	Visual/Aesthetics Air Quality Archaeological/Historic Resources Traffic/Circulation Land Use Utilities/Emergency Services

TABLE 3.25.1:
Summary Table

Project ID No.	Project Title	Lead Agency	Project Description	Project Status	Relevant Cumulative Environmental Factors
			replacement spaces lost with the removal of the existing surface parking areas at the project site. All proposed development would occur within the portion of the project site located north of Holly Street. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 672184, accessed May 28 2014.	Source: http://cityofpasadena.net/Parsons.aspx, accessed October 16, 2017.	
37	Hill and Colorado Project	City of Pasadena	The proposed project involves the establishment of a Planned Development District for two sites on opposite sides of Colorado Boulevard in the City of Pasadena. The proposed project involves the establishment of a Planned Development District that delineates development standards relative to building setbacks, heights, form, mass, scale, and other design considerations for future development at the site. Based on the proposed development standards, which can be considered to constitute a "development envelope," the project proponent proposes a potential development concept that would provide approximately 438,685 sf of building space at the project site for uses currently allowed under the existing zoning, specifically hotel development and commercial/retail uses. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 675165, accessed May 28, 2014.	An NOP and IS were prepared in October 2013. The Final EIR was completed in April 2016 and updated in August 2016. Information regarding the start of construction is not available. Source: http://cityofpasadena.net/Hill-Colorado.aspx, accessed October 16, 2017.	Visual/Aesthetics Air Quality Archaeological/Historic Resources Hydrology/Floodplain Traffic/Circulation Land Use Utilities/Emergency Services
38	Green Hotel Apartments Project	City of Pasadena	The proposed project involved construction of a six-story mixed-use building with 64 residential units and 5,000 sf of commercial space on an existing surface parking lot at 86 South Fair Oaks Avenue in Pasadena. The project site is 32,362 sf and the proposed mixed-use building is 76,980 sf in size and 75 ft high. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 677874, accessed May 28, 2014.	A DEIR was circulated in January 2014. Construction was completed as of 2017.	Traffic/Circulation
39	Reuse of the Desiderio Army Reserve Center	City of Pasadena	The 5.1 ac site was formerly the grounds and recreation area of the Vista del Arroyo Hotel and Resort complex built in 1903. The proposed project includes two primary components: a 3.87 ac City park and nine single-family detached bungalow homes in a courtyard formation. The southeast portion of the site would be developed into nine bungalow homes by Habitat for Humanity encompassing a total of 1.29 ac. Source: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK= 680110, accessed May 27, 2014.	An NOP was published in September 2013 and the Final EIR was completed in August 2014. The EIR was certified by City Council in October 2014. Construction of the project began in May 2016 and is anticipated to be completed in mid-2018. Source: https://ww5.cityofpasadena.net/planning/desiderio-army-reserve-center/, accessed October 16, 2017. Source: https://www.sgvhabitat.org/programs/home-ownership/current-projects/, accessed October 16, 2017.	Archaeological/Historical Resources Transportation
40	SR 710 Surplus Property Sale	Caltrans	Caltrans proposes to sell surplus properties originally acquired for a surface freeway project on SR 710 in the Cities of Los Angeles, Pasadena, and South Pasadena, in Los Angeles County. Some of the properties are listed on, or eligible for, the National Register of Historic Places, the California Register of Historic Resources, and/or designated locally significant.	An NOP was issued on June 27, 2014. The DEIR was completed in July 2015. The property sales are taking place in three phases: Phase I from 2016-2017; Phase II from 2017-2020; and Phase III is to be determined. Source: http://www.dot.ca.gov/dist07/resources/envdocs/docs/SR-710_Surplus-Property-Sale_DEIR_July-2015.pdf, accessed October 16, 2017. Source: http://www.dot.ca.gov/d7/business/710sales/docs/SR-710%20Property%20Sales%20Flyer.pdf, accessed October 16, 2017.	Historic resources Growth Inducement Land Use Hazardous Waste Fiscal Impacts Population/ Housing Balance Cumulative Effects.

FTA = Federal Transit Administration
HOT = high-occupancy toll
HOV = high-occupancy vehicle
NOD = Notice of Determination
NOP = Notice of Preparation
RCTC = Riverside County Transportation Commission
RDEIR = Revised Draft Environmental Impact Report
RFP = Request for Proposal
SANBAG = San Bernardino Associated Governments
SANDAG = San Diego Association of Governments
SCAG = Southern California Association of Governments
SDEIS = Supplemental Draft Environmental Impact Statement
SEIR = Supplemental Environmental Impact Report



LEGEND

Cities within Project Area

FIGURE 3.25-1

0 1.5 3
Miles

SOURCE: US-CA-LosAngeles-S (05/25/2010)

SR 710 North Project

Cumulative Projects

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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The cumulative impact analysis considered the effects of the Build Alternatives on each environmental topic and then considered which other projects listed in Table 3.25.1 might contribute to cumulative effects on that environmental parameter. It is acknowledged that the majority of the projects in Table 3.25.1 may result in some level of effects for most of the environmental parameters discussed in this chapter although many of those effects would be expected to be minor or relatively limited. Nonetheless, the cumulative impacts analyses consider the additive effect of impacts of all projects in an area on a specific environmental parameter. The analyses in the following sections considered the effects of the projects in Table 3.25.1 and also specifically identify individual projects from Table 3.25.1 that would potentially contribute substantially to cumulative effects for the identified parameter. Those analyses do not exclude potential effects of the other projects, but rather highlight those projects with the greatest potential to contribute to cumulative effects.

It should be noted that some analyses by their nature are cumulative. For example, the assumptions for project-specific traffic modeling and analyses include approved and planned projects (based on adopted local General Plans and adopted traffic forecasting model assumptions). As a result, traffic forecasts for future with and without project improvements include traffic associated with the existing circulation systems and land uses as well as approved and planned land use and transportation projects. Therefore, the traffic analysis for the SR 710 North Project is a cumulative impacts analysis. In addition, because the air quality and noise analyses are based on the traffic forecasts, they would also be cumulative analyses. Similarly, because land use impacts analyses are based on adopted General Plans, they consider the effects of both existing and future land uses and are also cumulative impacts analyses.

3.25.4.1 Land Use

The information in this section is based on the *Community Impact Assessment* (2014) prepared for the SR 710 North Project.

Resource Study Area

Because land use impacts would occur in the area where the Build Alternatives would be operating, the study area is used as the RSA for the purpose of the land use cumulative analysis. The study area is bounded by Interstate 210 (I-210) on the north, Interstate 605 (I-605) on the east, Interstate 10 (I-10) on the south, and Interstate 5 (I-5) and State Route 2 (SR 2) on the west. The study area includes portions of the Cities and communities of Alhambra, Arcadia, Commerce, Duarte, El Monte, Glendale, Irwindale, La Cañada Flintridge, Los Angeles, Monrovia, Montebello, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South Pasadena, and Temple City.

Health and Historical Context

The study area for the SR 710 North Project consists of a mixture of residential, commercial, industrial, open space, transportation, and agricultural land uses. Areas of mixed commercial and industrial uses are mainly located along the major freeways in the Cities/communities of Pasadena, Lincoln Heights, El Sereno, El Monte, and Irwindale. Overall, the study area cities are older, substantially urbanized communities where existing development and land use patterns have been in place for many years.

According to the local General Plans, substantial new growth in the area is no longer occurring, or projected to occur, with the exception of redevelopment projects in selected areas. Three generalizations about the study area cities emerge from the General Plans. First, most of the cities seek a more transit-oriented transportation system. Second, most cites would prefer an integrated system of walking, bicycling, and equestrian trails. Last, an efficient roadway system is a common goal among the study area cities.

Project Impacts

Future and Existing Land Uses

As stated in Section 3.1, Land Use, the Build Alternatives would permanently convert between approximately 1.0 acre (ac) (Bus Rapid Transit [BRT] Alternative) and 50 ac (Light Rail Transit [LRT] Alternative) of General Plan-designated non-transportation land uses to transportation land uses. Additionally, the Build Alternatives would result in inconsistencies with the Circulation/Transportation Elements of various local jurisdictions' General Plans, Specific Plans, and community plans (Valley Boulevard Corridor). If any of the Build Alternatives are selected for implementation, these inconsistencies would exist until that local General Plan is amended by the local jurisdiction to reflect the transportation improvements for the selected Build Alternative.

Please refer to Section 3.1, Land Use, for more detail regarding the SR 710 North Project's effects on future and existing land uses.

Consistency with State, Regional, and Local Plans

The Build Alternatives would not conflict with any project that would close the SR 710 freeway gap as described in the SCAG 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and would be generally consistent with the goals, objectives, and policies in the local jurisdictions' General Plans and Specific Plans. However, as stated previously under Future and Existing Land Uses, the Build Alternatives would result in inconsistencies with various Circulation/Transportation Elements of local jurisdictions' General Plans, Specific Plans, and community plans. Please refer to Section 3.1, Land Use, for more detail regarding the SR 710 North Project's effects on consistency with State, regional, and local plans.

Parks and Recreation

As described in the *Cumulative Impacts Assessment* (2014), the Build Alternatives would have both temporary and permanent impacts on park and recreation facilities. However, the impacts would not affect the ability of these parks and recreation facilities to serve their communities. The TSM/TDM (Preferred Alternative) does not impact parks and recreational facilities and does not contribute to cumulative effects. Please refer to Section 3.1, Land Use, for more detail regarding these impacts.

Of the resources mentioned above, only Cascades Park, under the BRT Alternative, triggers the requirements for protection under Section 4(f). Please refer to Section 3.1, Land Use, and Appendix B, Section 4(f) Evaluation, for more detail regarding this facility relative to Section 4(f).

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. The 39 projects listed in Table 3.25-1, have some potential to result in changes in land use and potentially contribute to cumulative impacts related to land use, consistency with plans, and parks and recreation. The following 7 projects have the potential to result in substantial changes in land use as described below and, therefore, contribute to a cumulative land use impact:

- Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension
- Alhambra Bicycle Master Plan
- Lincoln Avenue Specific Plan
- Huntington Memorial Hospital Master Development Plan Amendment
- Olson San Gabriel Residential Community
- 100 West Walnut Planned Development
- Hill and Colorado Project

The cumulative impacts of these seven projects in relation to the Build Alternatives are discussed below.

Cumulative Impacts

Future and Existing Land Uses

As discussed previously, all of the Build Alternatives would permanently convert General Plan-designated single-family residential, multifamily residential, commercial and services, educational institution, and mixed urban uses to transportation uses, with the LRT Alternative converting the most (approximately 50ac). Metro and Caltrans will request the applicable local jurisdictions to amend their General Plans and/or other local land use plans to reflect the improvements if a Build Alternative is selected as the Preferred Alternative.

According to the Initial Studies (ISs) prepared for the Huntington Memorial Hospital Master Development Plan Amendment and the 100 West Walnut Planned Development, and the environmental documents prepared for the Olson San Gabriel Residential Community, Eastside Transit Corridor Project, the Alhambra Bicycle Master Plan, and the Lincoln Avenue Specific Plan amendments and zone changes will be processed to incorporate these projects/plans. Although an environmental document is not available for the Eastside Transit Corridor Project, the Alhambra Bicycle Master Plan, the Lincoln Avenue Specific Plan, Hill and Colorado Project, implementation of avoidance, minimization, and/or mitigation measures would be required to comply with CEQA and/or NEPA.

While land use amendments and zoning changes would occur as part of the SR 710 North Project and cumulative projects, none of the Build Alternatives would convert a substantial amount of land to transportation uses. Therefore, the Build Alternatives would not contribute to a cumulative land use impact.

Consistency with State, Regional, and Local Plans

As discussed previously, the Build Alternatives would result in inconsistencies between the project improvements and several local jurisdictions' General Plans. Additionally, the cumulative projects listed above would require land use changes, which would result in inconsistencies with local General Plans. As with the SR 710 North Project, these projects will require that the local jurisdictions amend their General Plans to reflect these changes.

With regard to State and regional plans, the SR 710 North Project is also consistent with the SCAG 2012 RTP/SCS. The other cumulative transportation projects listed above are also included in, and are therefore consistent with, the SCAG 2012 RTP/SCS. The land development projects listed above are consistent with the advisory and voluntary 2008 Regional Comprehensive Plan (RCP) policies and applicable 2012 RTP/SCS goals. Therefore, the SR 710 North Project would not contribute to a cumulative impact related to State or regional plans.

As local General and Specific Plans will be amended to reflect the appropriate land use, no cumulative impact to State, regional, and/or local plans will occur.

Parks and Recreation

As discussed previously, the Build Alternatives would result in temporary and permanent increases in noise as well as short-term traffic/access impacts at some study area parks. The SR 710 North Project BRT Alternative would also require acquisition of a nominal amount of land from Cascades Park in Monterey Park. The Eastside Transit Corridor Phase 2 project's State Route 60 (SR 60) LRT Alternative may have potential impacts to Whittier Narrows Recreation Center. In the event that the BRT Alternative is selected as the Preferred Alternative for the SR 710 North Project, measures will be necessary under CEQA/NEPA to mitigate for these impacts. There would be no substantial impacts to park and recreation facilities as a result of the remaining cumulative projects. Therefore, there is no cumulative effect to parks and recreation facilities in the RSA.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.1, Land Use, and Section 3.14, Noise, avoid, minimize, and/or mitigate the land use, noise, access, and property acquisition impacts of the Build Alternatives, thereby reducing the cumulative effects discussed above.

3.25.4.2 Growth

Resource Study Area

Since growth occurs on a regional level, the SCAG region is used as the RSA for the purpose of the growth cumulative impact analysis.

Health and Historical Context

At the regional level, much of Los Angeles County is built out and urbanized, with little redevelopment opportunities, especially within the study area. However, SCAG anticipates population, housing, and employment growth to occur through 2035. At the local level (within the study area), SCAG anticipates that most of the cities and communities will experience increases in population, ranging from 0.9 percent in Sierra Madre to 42.9 percent in Irwindale. The lower percentages typically reflect cities and communities that are largely built out with relatively little land available for development, including residential uses.

All but one of the study area cities and communities are forecast to experience increases in the number of households from 2008 to 2035. No increase in households is forecast in San Marino, and Commerce and South Pasadena are both forecast to experience only a 2.9 percent increase in households between 2008 and 2035. Similar to the population forecasts, the lower forecasts of households typically reflect cities and communities that are largely built out with relatively little land available for development.

All but two of the study area cities and communities are forecast to experience increases in the number of employees from 2008 to 2035. Employment in Irwindale and South El Monte is forecast to decline by 8.2 and 1.9 percent, respectively, which is reflective of the addition of housing and reduction of non-residential uses in those cities over the forecast period. Similar to the population and household forecasts, the lower employment forecasts typically reflect cities and communities that are largely built out with relatively little land available for development.

In summary, the study area cities and communities are forecast to experience various rates of growth in population, households, and employment between 2008 and 2035.

Project Impacts

As stated in Section 3.2, Growth, the Build Alternatives would not result in growth pressures in the study area. Additionally, the Build Alternatives are expected to accommodate existing, approved, and planned growth in the area but are not expected to influence the amount, timing, or location of growth in the area. Please refer to Section 3.2, Growth, for more detail regarding the SR 710 North Project's effects on growth.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. There are 39 reasonably foreseeable actions in the RSA with particular relevance to impacts related to growth. None of these projects are anticipated to contribute to a cumulative growth-inducing impacts because they have been accounted for in the regional land use and transportation planning by SCAG.

Cumulative Impact

The Build Alternatives and/or cumulative projects are expected to accommodate existing, approved, and planned growth in the area but are not expected to influence the amount, timing, or location of growth in the area. Therefore, there would not be a cumulative growth-inducing effect.

Avoidance, Minimization, and/or Mitigation Measures

Because neither the SR 710 North Project nor any of the cumulative projects are anticipated to be growth inducing, no avoidance, minimization, and/or mitigation measures are necessary.

3.25.4.3 Community Impacts

Resource Study Area

The SR 710 North Project area is used as the RSA for the purpose of the community impact cumulative analysis. The study area is bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west. The study area includes portions of the Cities and communities of Alhambra, Arcadia, Commerce, Duarte, El Monte, Glendale, Irwindale, La Cañada Flintridge, Los Angeles, Monrovia, Montebello, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South Pasadena, and Temple City.

Health and Historical Context

The County of Los Angeles was established on February 18, 1850, as one of the 27 original counties of California. In 1852, a five-member Board of Supervisors was created, and the County continued to grow over the next few decades, establishing more schools (1852), the first library (1859), a Board of Health (1863), a Board of Education (1869), and the first publication of the *Los Angeles Times* (1881). In 1905, the County approved the Owens Valley water project to build an aqueduct from the Owens Valley, and by 1913, the aqueduct began delivering water to the County. Over the next century, the area continued to grow in population and became a major regional economic center. Infrastructure needs grew (e.g., ports, highways, the Colorado River Aqueduct) and regulatory agencies were formed (e.g., Los Angeles County Flood Control District, Los Angeles Air Pollution Control Board).

At the time of the 2010 Census, racial minorities accounted for approximately 52 to 86 percent of the population in the study area cities. Education, Health & Social Services is the largest County industry sector in terms of employment, comprising approximately 20.2 percent of the total employed population, followed by Professional and Technical Services (approximately 12.1 percent) and Manufacturing (approximately 11.2 percent).

The base property tax rate in Los Angeles County is 1 percent of the assessed property value, while the total property tax includes additional district assessments that vary by tax rate area. Effective April 1, 2013, the sales tax rate in the County of Los Angeles is 9 percent, of which 6.5 percent is allocated to the State, 0.75 percent is allocated to the County for public services, 1.25 percent is allocated to the County transportation fund, and 0.5 percent is used to fund transportation improvements in Los Angeles County (Metro Measure R). The State Board of Equalization tabulates taxable sales transactions for each city and county in California and reports them on a quarterly and yearly basis. According to the latest published report, the 266,868 permitted sales tax-producing businesses in Los Angeles County generated approximately $126,440,737 in taxable sales in 2011. Based on the sales tax rate in effect in April 2013, the County of Los Angeles average sales tax revenue per business in 2011 was $42,642.

According to preliminary data issued by the State Employment Development Department in August 2013, there were 4,486,400 persons employed in the civilian labor force in the County, and 510,200 persons (approximately 10.2 percent) were unemployed. The County's unemployment rate is higher than that of the State, which is 8.8 percent.

During Fiscal Year (FY) 2012–2013, Los Angeles County collected a total of $11 billion in property tax revenue. The County allocates 15.04 percent of its property tax revenue to incorporated cities, 40.97 percent to school districts, 7.05 percent to special districts, and 12.79 percent to redevelopment agencies. Based on information provided by the Los Angeles County Department of Auditor-Controller, an estimated 22.8 percent of the 1 percent property tax collected is distributed to the County's General Fund.

The study area includes numerous parks and recreational resources as well as other community facilities (fire stations, police stations, schools, libraries, transit stations, etc.).

Project Impacts

Community Character and Cohesion

As stated in Section 3.3, Community Impacts, the LRT Alternative would result in permanent impacts on community cohesion in East Los Angeles. Please refer to Section 3.3., Community Impacts, for more detail regarding the SR 710 North Project's effects on community character and cohesion.

Environmental Justice

As stated in Section 3.3, Community Impacts, the construction of the Build Alternatives would not result in temporary impacts that are appreciably more severe or greater in magnitude on environmental justice populations than the impacts experienced by non-environmental justice populations.

Additionally, the operation of the Build Alternatives would not result in impacts that would be appreciably more severe or greater in magnitude on environmental justice populations than the impacts experienced by non-environmental justice populations after taking offsetting benefits such as improved mobility into account. Please refer to Section 3.3., Community Impacts, for more detail regarding the SR 710 North Project's effects on environmental justice.

Relocations

As stated in Section 3.3, Community Impacts, the Build Alternatives would result in the relocation of between approximately 1 and 100 businesses and the displacement of between approximately 5 and 725 employees.

Although the Transportation System Management/Transportation Demand Management (TSM/TDM), LRT, and Freeway Tunnel (both single- and dual-bore design variations) Alternatives would result in non-residential displacements, it would not negatively affect the character or cohesion of the communities in which the improvements would be located because local residents would still be able to receive goods and services similar to those currently provided by the displaced businesses. Further, there is an adequate supply of replacement properties available in the study area to relocate these displaced businesses. For the TSM/TDM and Freeway Tunnel (both single- and dual-bore design variations) Alternatives, it is anticipated that these displaced businesses could be relocated near their current locations, but for the LRT Alternative, some businesses may not be able to be relocated near their current locations. However, all businesses displaced by these alternatives would receive relocation assistance under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act). Due to the number of properties unable to be relocated near their current locations, overall these alternatives would not cause disruption to the social fabric of the communities in which they are located. Please refer to Section 3.3, Community Impacts, for more detail on relocations.

Community Facilities

As stated in Section 3.3, Community Impacts, short-term noise level increases and traffic impacts during construction and permanent noise increases during operation would occur at several community facilities in the study area cities/communities. However, these noise levels would not affect the ability of these facilities to serve their communities because they are active-use facilities.

Additionally, the BRT Alternative would require the permanent acquisition of approximately 0.011 ac of land from Cascades Park in the City of Monterey Park, and the LRT and Freeway Tunnel (both single- and dual-bore design variations) Alternatives would permanently acquire approximately 3 ac and 1 ac of land, respectively, on the California State University, Los Angeles (Cal State LA) campus. Additionally, the Freeway Tunnel Alternative would permanently require an approximately 0.6 ac permanent easement on the Cal State LA campus.

Regarding air quality, while the Build Alternatives would result in a small increase in localized Mobile Source Air Toxics (MSAT) emissions in comparison to the No Build Alternative, the United States Environmental Protection Agency's (EPA) vehicle and fuel regulations, coupled with fleet turnover, will cause substantial reductions over time that will cause regionwide MSAT levels to be substantially lower than they are today. Please refer to Section 3.3, Community Impacts, for more detail regarding the SR 710 North Project's effect on community facilities.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Many of the 39 projects listed in Table 3.25-1, have some potential to contribute to cumulative impacts related to community character and cohesion, environmental justice, relocations, and community facilities. The following 4 projects have the potential to result in substantial changes related to community impacts as described below and, therefore, contribute to a cumulative community impact:

- Interstate 710 (I-710) South Corridor Project
- San Gabriel Trench Grade Separation
- Regional Connector Transit Corridor
- Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension

The cumulative impacts of the cumulative projects in relation to the Build Alternatives are discussed below.

Cumulative Impact

Community Character and Cohesion

As stated previously, the Build Alternatives are anticipated to have temporary traffic, air quality, and noise impacts during construction. All the cumulative projects within the RSA are anticipated to have these types of temporary impacts. Nine projects are anticipated to be constructed concurrent with the SR 710 North Project. Four of these projects are located far enough away from the SR 710 North Project or would create such nominal impacts that they would not contribute to a temporary cumulative traffic, air quality, and/or noise effect. Five of the cumulative projects (Regional Connector Transit Corridor, Crown City Medical Center, Devil's Gate Reservoir Sediment Removal and Management, Olson San Gabriel Residential Community, and 100 West Walnut Planned Development) are located very near the SR 710 North Project and have the potential to contribute to a temporary cumulative traffic, air quality, and/or noise effect. However, these projects would implement their own best management practices (BMPs) during construction to minimize these impacts. Therefore, it is not anticipated that these projects, in combination with the SR 710 North Project, would contribute to temporary traffic, air quality, and/or noise impacts.

Additionally, although the Build Alternatives would result in minor changes in access or circulation, they would also provide the traveling public with improvements in mobility and increase the efficiency of the existing circulation system without dividing or otherwise affecting the character of the communities in which they would be located. However, as stated below in the "Relocation" subsection, displacement of neighborhood-oriented businesses in East Los Angeles would negatively affect the community character and cohesion of that neighborhood. The I-710 South Corridor Project would have a negative effect on community character and cohesion in the communities of Commerce, Bell Gardens, and Compton. However, these communities are not the same communities affected by the SR 710 North Project and will therefore not contribute to a cumulative effect on community and cohesion.

Environmental Justice

The I-710 South Corridor Project would have near-roadway noise and air quality impacts. Additionally, the Regional Connector Transit Corridor would have temporary access and relocation impacts as well as permanent visual and noise impacts to environmental justice communities. However, as stated above in the "Project Impacts" subsection, operation of the Build Alternatives would not result in temporary or permanent impacts that would be appreciably more severe or greater in magnitude on environmental justice populations than the impacts experienced by non-environmental justice populations after taking offsetting benefits into account. Therefore, the SR 710 North Project would not contribute to a cumulative effect on environmental justice communities.

Relocation

As stated previously under the "Relocation" subsection, within the unincorporated community of East Los Angeles, the LRT Alternative would result in the displacement of approximately 17 adjacent neighborhood-oriented businesses that are not likely to be relocated in the immediate vicinity of their current location. Therefore, their displacement would negatively affect the community of East Los Angeles. Additionally, three of the cumulative projects would also require both residential and non-residential relocations. However, it is anticipated that these properties would be able to be relocated within their communities. Additionally, none of these relocations would occur in the community of East Los Angeles and therefore will not contribute to a cumulative effect on the community.

Community Facilities

The Build Alternatives would result in temporary traffic, air quality, and noise impacts on various community facilities during construction. Additionally, minor acquisitions of land from community facilities would be required that range from approximately 0.011 ac to 3 ac, depending on the Build Alternative. The Build Alternatives would also result in permanent noise level increases at as few as approximately two or as many as approximately nine community facilities, depending on the Build Alternative. However, these increases in noise levels would be barely perceptible to the human ear and would not affect the ability of the facilities to serve their communities. The I-710 South Corridor Project is anticipated to have direct and indirect operational impacts to approximately seven community facilities, and the Metro Gold Line Foothill Extension Project would have noise impacts on adjacent schools. However, impacts to these community facilities would be minimized and/or mitigated to comply with CEQA/NEPA and therefore would not contribute to a cumulative effect on community facilities.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.3, Community Impacts, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thereby reducing the cumulative effects discussed above.

3.25.4.4 Utilities and Emergency Services

Resource Study Area

The direct physical impacts of the Build Alternatives related to emergency services and utilities would be largely limited to the proposed right of way (ROW) and the areas adjacent to the proposed improvements. The specific locations of public services and utilities were identified based on information provided by the respective providers. As a result, the discussion of the affected environment focuses on utilities either within the ROW or close enough to the ROW to be impacted by the Build Alternatives. Services such as fire and police protection are, however, generally provided to fairly large geographic areas (e.g., a city or service area), and for this reason the cumulative RSA for emergency services would correspond to the geographic area serviced by the given service provider. Emergency service providers in the study area include various city police and fire departments, as well as the Los Angeles County Sheriff's and Fire Departments. In addition, approximately 40 different utility owners were identified that operate facilities within the study area.

Health and Historical Context

The study area is located in the largest population concentration on the west coast of the United States. Large-scale urban growth has and will continue to put pressure on emergency services and require prudent land use, hazard abatement, and risk management programs. Intensification of land uses throughout an urban area also requires a coordinated emergency response network like the one that exists throughout Los Angeles County.

Regional utility facilities critical to national and regional interests are located throughout the study area. These regional facilities are proprietary in nature and are regulated under State and federal jurisdictions. Those identified within the study area include power transmission systems, petroleum transmission pipelines, gas transmission pipelines, water aqueducts, sewer interceptor trunk lines, and telecommunication systems. Historically, utility corridors have been engineered for the purpose of accommodating sewer, water, and other utility lines and providing access for their maintenance.

Project Impacts

Utilities

As described in Section 3.4, Utilities/Emergency Services, the Build Alternatives would require the relocation and/or protection in place of utilities in various study area cities/communities. However, this would not result in additional negative effects to these utility facilities. Please refer to Section 3.4, Utilities/Emergency Services, for more detail regarding the SR 710 North Project's effects on utilities.

Emergency Services

As described in Section 3.4, Utilities/Emergency Services, emergency services throughout the study area could experience short-term traffic effects during construction of the Build Alternatives. However, operation of the Build Alternatives would not degrade emergency response times or require the construction of new police or fire facilities within the study area. Please refer to Section 3.4, Utilities/Emergency Services, for more detail regarding the SR 710 North Project's effects on emergency services.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. The 39 cumulative projects listed in Table 3.25-1, have some potential to result in impacts related to utilities and emergency services and potential to contribute to cumulative impacts related utilities and emergency services. The following 6 projects have the potential to result in substantial changes related to utilities and emergency services as described below and, therefore, to contribute to a cumulative impact on utilities and emergency services:

- San Gabriel Trench Grade Separation
- Regional Connector Transit Corridor
- Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension
- Lincoln Avenue Specific Plan

- 100 West Walnut Planned Development
- Hill and Colorado Project

The cumulative impacts of these six projects in relation to the Build Alternatives are discussed below.

Cumulative Impact

Utilities

All of the Build Alternatives would require the relocation and protection in place of utilities throughout the study area. Additionally, eight of the cumulative projects would either protect in place or require the relocation of affected utilities. One project would require improvements to existing utilities, six projects would require new infrastructure, and one alternative for the Eastside Transit Corridor Phase 2 Project would conflict with a Southern California Edison (SCE) facility. At this time, it is not known how the potential impact to this SCE facility would be avoided, minimized, and/or mitigated. However, because all impacts would be minimized and/or mitigated by relocation, protection in place, or fee payment, the SR 710 North Project would not contribute to a cumulative impact on utilities.

Emergency Services

Under the Build Alternatives as well as the cumulative projects, fire and police stations in the Cities/communities of Alhambra, Eagle Rock, El Monte, San Marino, South Pasadena, Pasadena, and San Gabriel could experience short-term traffic effects during construction. Although this impact would be temporary and would be minimized by implementation of a Transportation Management Plan, there is a potential for the SR 710 North Project, the Regional Connector Transit Corridor Project, the Arroyo Seco Pedestrian and Bicycle Trail, the Olson San Gabriel Residential Community Project, the 100 West Walnut Planned Development, and the Green Hotel Apartments Project to be under construction concurrently, thus causing a temporary cumulative impact to emergency service response times in the community of East Los Angeles, the neighborhood of El Sereno, the Cities of South Pasadena and Pasadena, and adjacent cities. Additionally, the Build Alternatives would require minimal amounts of land from the San Gabriel Police Station. None of the other cumulative projects require land from emergency facilities; therefore, the SR 710 North Project does not contribute to a permanent cumulative impact on emergency services.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.4, Utilities/Emergency Services, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thereby reducing the cumulative effects discussed above.

3.25.4.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

Resource Study Area

For the purpose of the traffic and transportation/pedestrian and bicycle facilities cumulative impacts analysis, the RSA is the area analyzed in the *Transportation Technical Report*. The traffic operations analysis used a focus area slightly larger than the study area. The traffic operations analysis study area was selected to capture all freeway segments with potential changes in overall traffic for the Build Alternatives. Traffic operations analysis was conducted on a defined set of freeway segments and intersections for evaluation. A total of 156 intersections were identified for the intersection analysis.

Health and Historical Context

There are seven major east-west routes and seven major north-south routes located in the central portion of the Los Angeles-Long Beach-Santa Ana Metropolitan Statistical Area (MSA). Of the seven north-south routes, four are located partially within the study area (I-5, State Route 110 [SR 110], I-710, and I-605), and two of them (SR 110 and SR 710) terminate within the study area without connecting to another freeway. As a result, a substantial amount of north-south regional travel demand is concentrated on a few freeways or diverted to local streets within the study area. This effect is exacerbated by the overall southwest-to-northeast orientation of I-605, which makes it an unappealing route for traffic between the southern part of the region and the urbanized areas to the northwest in the San Fernando Valley, the Santa Clarita Valley, and the Arroyo-Verdugo region. As a result, there is a lack of continuous north-south transportation facilities in the study area.

In 2012, the daily vehicle miles traveled (VMT) in the study area was 24,150,000 miles (mi), and the daily vehicle hours traveled (VHT) in the study area was 660,000 hours. The sum of VMT on the arterial system in the study area was 7,645,000 mi. The percentage of total daily person trips that use transit was approximately 3.5 percent, and the percentage of study area population and employment located within 0.25 mi of a transit stop with high-frequency service was approximately 80.8 percent.

In 2013, there was an average of approximately 45 pedestrians per hour in the AM peak hour, and 56 pedestrians per hour in the PM peak hour at intersections with the RSA. The highest-volume pedestrian intersections were at the Daly Street/Broadway intersection in Los Angeles (374 pedestrians per hour), the Los Robles Avenue/Colorado Boulevard intersection in Pasadena (338 pedestrians per hour), and the Atlantic Boulevard/Whittier Boulevard intersection in East Los Angeles (330 pedestrians per hour). Additionally, there was an average of approximately 9 bicycles per hour in the AM peak hour and 13 bicycles per hour in the PM peak hour. The highest-volume bicycle intersections were at Atlantic Boulevard/Pomona Boulevard in Los Angeles (40 bicycles per hour), Baldwin Avenue/Valley Boulevard in El Monte (39 bicycles per hour), and Fair Oaks Avenue/Orange Grove Boulevard in Pasadena (also 39 bicycles per hour).

Project Impacts

As described in Section 3.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, the SR 710 North Project would have direct and indirect effects on active transportation users, including bicyclists and pedestrians. However, in general, the forecasts show mobility improvements for all Build Alternatives compared to the No Build Alternative. Please refer to Section 3.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, for more detail regarding the SR 710 North Project's effects on traffic, transportation, and bicycle/pedestrian facilities.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. The 39 projects listed in Table 3.25-1, have some potential to result in traffic impacts and potential to contribute to cumulative traffic impacts. The following 19 projects have the potential to contribute to result in substantial changes in traffic conditions as described below and, therefore, to a cumulative impact on traffic and transportation/pedestrian and bicycle facilities:

- I-710 South Corridor Project
- Regional Connector Transit Corridor
- Metro Gold Line Foothill Extension
- Wilshire Boulevard Bus Rapid Transit Project – Phases I and II
- California High Speed Rail Project
- Gold Line Transit Plaza
- Station Square Transit Village
- Alhambra Bicycle Master Plan
- Lincoln Avenue Specific Plan
- Crown City Medical Center
- Magellan Gateway Project
- El Monte Walmart
- Olive Pit Mining and Reclamation Operations and Long Term Reuse Project
- Huntington Memorial Hospital Master Development Plan Amendment
- Devil's Gate Reservoir Sediment Removal and Management Project
- 100 West Walnut Planned Development
- Hill and Colorado Project
- Green Hotel Apartments Project
- Reuse of the Desiderio Army Reserve Center

The cumulative impacts of these 19 projects in relation to the Build Alternatives are discussed below.

Cumulative Impact

Traffic and Transportation

The SR 710 North Project would have temporary and permanent direct and indirect effects on active transportation users, including bicyclists and pedestrians. Temporary impacts during construction would include delays and the temporary loss of on-street parking. Additionally, truck traffic related to the hauling of construction waste would occur. It is possible that the I-5 Improvement projects (SR 118 to SR 130), the Regional Connector Project, the California High Speed Rail Project, and the Devil's Gate Dam Project would be constructed concurrent with the SR 710 North Project. However, it is anticipated that these projects would not be depositing their waste at the same location as the SR 710 North Project (Olive Pits), and would therefore not have the same haul routes. The cumulative project with the most anticipated spoils (dirt) to be removed is the Devil's Gate Reservoir Sediment Removal and Management Project. However, it is anticipated that construction of this project would not overlap with the portions of construction on the SR 710 North Project related to the hauling of dirt.

Operationally, SR 710 North Project is anticipated to result in improved mobility within the study area. Additionally, nine of the cumulative projects would have or are anticipated to have unavoidable impacts that cannot be mitigated. However, since the SR 710 North Project's *Transportation Technical Report* included these cumulative projects in its analysis and the project would improve mobility in the study area, the SR 710 North Project would not contribute to a cumulative traffic and transportation impact.

Pedestrian and/or Bicycle Facilities

The SR 710 North Project would not have a negative impact on pedestrian and/or bicycle facilities. As for the cumulative projects, one project, the Huntington Memorial Hospital Master

Development Plan Amendment, would have an impact on pedestrian and/or bicycle facilities. Although there is an impact, it occurs in a small portion of the study area and, in combination with the SR 710 North Project (which does not have impacts to pedestrian and/or bicycle facilities), would not result in a cumulative impact.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects discussed above.

3.25.4.6 Visual/Aesthetics

Resource Study Area

The study area is used as the RSA for the purpose of the visual/aesthetics cumulative impacts analysis. The study area is bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west. The study area includes portions of the Cities and communities of Alhambra, Arcadia, Commerce, Duarte, El Monte, Glendale, Irwindale, La Cañada Flintridge, Los Angeles, Monrovia, Montebello, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South Pasadena, and Temple City.

Health and Historical Context

Los Angeles County is heavily urbanized, and most of the undeveloped land that remains is within unincorporated areas. Unincorporated areas within the County are climatically and ecologically diverse and include coastal, mountain, forest, and desert ecosystems.

The Arroyo Seco watershed begins in the San Gabriel Mountains and passes through the Cities of Pasadena and South Pasadena, and the unincorporated areas of Los Angeles County. The Arroyo Seco watershed unites a highly diverse region and serves as the focal point of a shared identity. The Arroyo Seco watershed proceeds on, passing under State Route 134 (SR 134), and crosses at the southern boundary of Pasadena. The channel continues along the western boundary of South Pasadena and then into northeast Los Angeles, flowing southeast of the Verdugo Mountains and Mount Washington.

The landscape units within the RSA include residential, recreation, education, industrial, commercial/retail, and freeway.

While the County of Los Angeles has three State-designated Scenic Highways and eight County-designated Scenic Highways, none are within the SR 710 North Project’s viewshed. The Arroyo Seco Parkway, which runs through Pasadena, South Pasadena, and Los Angeles, was awarded National Scenic Byway status in 2002. The City of Los Angeles has designated several scenic corridors; however, only the San Gabriel/Verdugo Mountains Scenic Preservation Area falls within the viewshed of the SR 710 North Project. Monterey Park, Alhambra, South Pasadena, and Pasadena have not designated any local scenic roads or areas within the SR 710 North Project viewshed.

Project Impacts

As described in Section 3.6, Visual/Aesthetics, the LRT Alternative has the most substantial visual effects since the majority of the alignment in East Los Angeles, Monterey Park, and Alhambra is above ground and visible to the communities. Additionally, the Freeway Tunnel Alternative would result in visual impacts only in areas where the entrances and exits are visible. Please refer to Section 3.6, Visual/Aesthetics, for more detail regarding the SR 710 North Project's visual effects.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. The 39 cumulative projects listed in Table 3.25-1, have some potential to result in visual changes and potential to contribute to cumulative visual changes. The following 7 projects have the potential to result in substantial visual changes as described below and, therefore, to contribute to an impact on visual/aesthetics:

- Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension
- Lincoln Avenue Specific Plan
- Crown City Medical Center
- 16 East California Project
- Huntington Memorial Hospital Master Development Plan Amendment
- 100 West Walnut Planned Development
- Hill and Colorado Project

The cumulative impacts of these seven projects in relation to the Build Alternatives are discussed below.

Cumulative Impact

The TSM/TDM Alternative does not contribute to negative visual impacts in the study area; therefore, it would not contribute to a cumulative visual impact.

Five reasonably foreseeable projects in combination with the BRT Alternative have the potential to contribute to a cumulative visual impact in the study area. This is due mostly to the distance of these cumulative projects to the BRT Alternative improvements (mainly the addition of bus stations on Atlantic Boulevard between Pomona Boulevard and Beverly Boulevard and at Fair Oaks Avenue and California Boulevard) and the elevated features of the Eastside Transit Corridor Project. Additionally, the new buildings proposed as part of the 16 East California Project and the Huntington Memorial Hospital Master Development Plan Amendment and the addition of new buildings as a result of the 100 West Walnut Planned Development and the Hill Colorado Project add to the cumulative visual impact in the study area. However, the bus stations under the BRT Alternative will be small shelters with seating and signage that would not create a substantial visual impact and would not result in a change in visual quality from the existing condition. Also, it is anticipated that the new features constructed as part of the cumulative projects will be visually compatible with the surrounding areas, and visual impacts would be lessened due to minimization and/or mitigation measures proposed in the environmental documents of these projects.

Three of the reasonably foreseeable projects in combination with the LRT Alternative have the potential to contribute to a cumulative visual impact in the study area. This is due mostly to the proximity of the Eastside Transit Corridor Project to the elevated portions of the LRT Alternative. The LRT Alternative proposes an elevated track alignment and stations in unincorporated East Los Angeles and the Eastside Transit Corridor proposes at-grade segments and stations in East Los Angeles and aerial segments and stations just to the east in the City of Monterey Park. Although it is anticipated that the new features constructed as part of these projects will be visually compatible with the surrounding areas to the extent feasible, they would still result in a large visual change to the area and visual impacts would occur.

Five of the reasonably foreseeable projects in combination with the Freeway Tunnel Alternative have the potential to contribute to a cumulative visual impact in the SR 710 North Project area. This is due mostly to the distance of the Huntington Memorial Hospital Master Development Plan Amendment and the 100 West Walnut Planned Development to the northern entrance/exit of the Freeway Tunnel Alternative in the City of Pasadena. However, the Freeway Tunnel Alternative would result in visual impacts only in areas where the entrances and exits are visible. Since the remaining cumulative projects in this area are near the areas in which the Freeway Tunnel Alternative is below ground, there will not be a cumulative visual impact in those areas. Therefore, the Freeway Tunnel Alternative does not contribute to a cumulative visual impact.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.6, Visual/Aesthetics, avoid, minimize, and/or mitigate the effects of the Build Alternatives.

3.25.4.7 Cultural[AL1] Resources

Resource Study Area

The Area of Potential Effects (APE) used in the Historic Property Survey Report (HPSR), Supplemental HPSR, Historical Resources Evaluation Report (HRER), and Archaeological Survey Report (ASR) is used as the RSA for the purpose of the cultural resources cumulative impacts analysis. The APE for this project is a combination of the areas of direct and indirect effects, including, but not limited to: existing and proposed ROW, temporary construction easements, staging areas, and areas where there are potential impacts to the visual setting of some historic resources. It also contains several discontiguous areas to cover numerous intersection improvements over a wide geographic area.

Health and Historical Context

The APE is located within the Los Angeles Basin in the alluvial fan of the San Gabriel Mountains and areas of steep vegetated canyons and hillsides in Pasadena. Eight geologic units may be encountered within the APE of this project.

The APE is densely developed with a wide range of primarily historic-period (pre-1971) property types, including single-family and multifamily residences, commercial businesses, offices, medical facilities, religious and educational institutions, industrial facilities, government and quasi-public facilities, and parks.

Approximately 11 previously documented archaeological sites are located within 0.5 mi of the APE. No archaeological resources were identified within or adjacent to the APE, including at the locations of the two village sites. However, based on ethnographic accounts and archival research, there is potential for archaeological resources to be present in native soils at two sites (the Horatio Rust and Otsungna prehistoric village sites) in the APE.

Of approximately 2,200 properties in the project APE, a total of 74 properties are listed in or eligible for listing in the National Register. This includes 67 properties previously listed in or determined eligible for listing in the National Register including 8 residential historic districts, 3 commercial historic districts, 2 other landscape and cultural historic districts, 9 religious, educational, municipal, and institutional buildings, 3 theatres and performing arts centers, 7 commercial buildings, 5 multi-family residential buildings, 25 single-family residential buildings, 1 park (Jardin Del Encanto and Cascades Park), 2 historic waiting station properties (comprised of 3 structures), 1 linear feature (Arroyo Seco Parkway Historic District), and 1 object (Bekins Storage Company Roof Sign). In addition to these 67 properties previously listed or determined eligible for listing, 7 properties (Horatio Rust Prehistoric Village Site, Otsungna Prehistoric Village Site, segments of Route 66, 318 Fairview Avenue, 2020 Fremont Avenue, 904 Monterey Road, and the Library Neighborhood Historic District) that are being considered eligible for listing in the National Register for purposes of this study only.

Ten CEQA-only resources were also identified, seven do not meet the National Register criteria, but are historic resources as defined by CEQA and three properties that were identified through public participation that are presumed historically significant pursuant to CEQA.

Fifteen bridges were also identified in the APE (HPSR, Attachment B). Of these, the Fair Oaks Overcrossing Bridge #53 0440 is eligible for listing in the National Register as a contributing element of the Arroyo Seco Parkway Historic District. The remaining bridges in the APE are Category 5 (not eligible for the National Register). All other historic-period resources within the APE have been determined exempt from further evaluation per the 2014 Section 106 PA.

Project Impacts

As discussed in Section 3.7, Cultural Resources:

- The TSM/TDM Alternative would result in No Effect on 1 historic property, a No Adverse Effect on 8 historic properties, an Adverse Effect on 1 historic property, and a Significant Impact on 1 historic resource.
- The BRT Alternative would result in No Effect on 1 historic property, a No Adverse Effect on 8 historic properties, a Conditional No Adverse Effect on 8 historic properties, an Adverse Effect on 1 property as a result of the TSM/TDM components, and a Significant Effect on 1 historic resource as a result of the TSM/TDM components.
- The LRT Alternative would result in No Effect on 1 historic property, a No Adverse Effect on 14 historic properties, a Conditional No Adverse Effects on 4 historic properties, an Adverse Effect on 1 historic property as a result of the TSM/TDM components, and a Significant Impact on 1 historic resource as a result of the TSM/TDM components.
- The single bore and dual bore Freeway Tunnel Alternatives would result in No Effect on 33 historic properties, No Adverse Effect on 7 historic properties, a Conditional No Adverse Effect on 7 historic properties, an Adverse Effect on 4 historic properties, an Adverse Effect on 1 historic property as a result of the TSM/TDM components, a Significant Impact on 4 historic resources, and a Significant Impact on 1 historic resource as a result of the TSM/TDM components.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. The majority of the 39 projects listed in Table 3.25-1, have no or limited potential to result in effects on cultural resources and, therefore, limited potential to contribute to cumulative effects on cultural resources. The following 4 projects have the potential to result in substantial effects on cultural resources and, therefore, contribute to a cumulative impact on cultural resources:

- San Gabriel Trench Grade Separation Project
- 100 West Walnut Planned Development

- Hill and Colorado Project
- Reuse of the Desiderio Army Reserve Center

The cumulative impacts of these four projects in relation to the Build Alternatives are discussed below.

Cumulative Impact

Four projects—the San Gabriel Trench Grade Separation Project, the 100 West Walnut Planned Development, the Hill and Colorado Project, and the Reuse of the Desiderio Army Reserve Center—would result in impacts to cultural resources. The SR 710 North Project (TSM/TDM, LRT and Freeway Tunnel Alternatives) would result in a cumulative impact to historic properties and historical resources. Therefore, the SR 710 North Project would contribute to a cumulative impact on cultural resources. It should be noted that any of the projects listed above, including the SR 710 North Project, have the potential to encounter buried undiscovered resources, including human remains. Typical measures would be implemented if this were to occur. However, with the implementation of measures (which include monitoring during construction), these projects would not contribute to cumulative effects on cultural resources.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.7, Cultural Resources, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects described above.

3.25.4.8 Hydrology and Floodplains

Resource Study Area

The project study area is located in Los Angeles County in the Los Angeles River Watershed. Therefore, the Los Angeles River Watershed is the RSA for the hydrology and floodplains cumulative impacts analysis.

Health and Historical Context

Approximately two floodplains are affected by the SR 710 North Project: the Laguna Regulating Basin and the Dorchester Channel. The Laguna Regulating Basin collects runoff from the watersheds north of I-10, including the Cities and communities of Alhambra, Monterey Hills, and South Pasadena. The Dorchester Channel collects runoff from the watersheds north of I-10, including the Cities and communities of Alhambra, Monterey Hills, and South Pasadena, and drains into the Laguna Regulating Basin. The Laguna Regulating Basin drains through several channel systems and eventually discharges into the Los Angeles River in the City of Vernon.

As designated by the Los Angeles Regional Water Quality Control Board (LARWQCB) Region 4, the study area is located within the Los Angeles-San Gabriel Hydrologic Unit (HU), Raymond Hydrological Area (HA), Pasadena Hydrologic Subarea (HSA) (405.31); the Coastal Plain HA, Central HSA Split (405.15); and the San Fernando HA, Eagle Rock HSA (405.25). The Los Angeles-San Gabriel HU covers approximately 1,608 square miles in Los Angeles County and small areas in Ventura County (LARWQCB 2007c).

The major receiving waters to the study area are the Los Angeles River in the west and the Rio Hondo in the east. The Rio Hondo drains to the Los Angeles River, which drains to the Pacific Ocean. The San Gabriel River drains directly to the Pacific Ocean. The major drainages in the study area include the Arroyo Seco, San Gabriel River, and Dorchester Channel (also referred to as Laguna Channel). The Arroyo Seco and Dorchester Channel both drain to the Los Angeles River.

Project Impacts

As described in Section 3.8, Hydrology and Floodplain, the TSM/TDM, BRT, and LRT Alternatives do not encroach into any floodplains. The Freeway Tunnel Alternative single-bore design variation alignment crosses the Laguna Regulating Basin floodplain, and the dual-bore design variation alignment crosses the Laguna Regulating Basin floodplain and Dorchester Avenue Storm Drain (Dorchester Channel) floodplain.

Additionally, both the single-bore and dual-bore tunnel design variations of the Freeway Tunnel Alternative would encroach into the Laguna Regulating Basin and the dual-bore design variation would encroach into the Dorchester Channel. However, the single- and dual-bore design variations would not have the potential to negatively affect the flood control functions of the Laguna Regulating Basin or the Dorchester Channel. Therefore, neither the single-bore nor the dual-bore tunnel design variations of the Freeway Tunnel Alternative would have the potential to substantially affect the flood control functions of surface waters or storm drain facilities in or downstream of the study area. Please refer to Section 3.8, Hydrology and Floodplain, for the SR 710 North Project's effects regarding hydrology and floodplains.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. The majority of the 39 projects in Table 3.25.1, have no or limited potential to result in effects related to hydrology and floodplains and, therefore, limited potential to contribute to cumulative effects on hydrology and floodplains. The following 6 projects have the potential to result in substantial effects related to hydrology and floodplains and, therefore, contribute to a cumulative impact on hydrology and floodplains:

- I-710 South Corridor Project
- Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension
- Magellan Gateway Project
- Olive Pit Mining and Reclamation Operations and Long Term Reuse Project
- 100 West Walnut Planned Development
- Hill and Colorado Project

The cumulative impacts of these six projects in relation to the Build Alternatives are discussed below.

Cumulative Impact

Four projects—the I-710 South Corridor Project, the Olive Pit Mining and Reclamation Operations and Long Term Reuse Project, the 100 West Walnut Planned Development, and the Hill and Colorado Project—are anticipated to impact to both hydrology and floodplains. Additionally, the Eastside Transit Corridor Project is anticipated to have an impact on the floodplain. Last, the Temple Palms Business Park, which was completed in 2012, had impacts to area hydrology. The SR 710 North Project is anticipated to result in an approximately 1.1 to 16.4 ac increase in impervious surface area (depending on the alternative) that would result in an increase in the volume of storm water runoff and pollutants over existing conditions. The LRT Alternative would result in the greatest increase of impervious area and the BRT Alternative with the least.

Additionally, both design variations of the Freeway Tunnel Alternative cross floodplains and would involve a horizontal encroachment within floodplains of the Laguna Regulating Basin. However, under the single-bore Freeway Tunnel Alternative design variation, the base floodplain elevation would not change. The dual-bore Freeway Tunnel Alternative design variation would encroach into the Dorchester Channel, which would result in a narrowing of the floodplain boundary. The dual-bore Freeway Tunnel Alternative design variation minimizes the horizontal encroachment within the floodplain of the Dorchester Channel. Other design variations considered for this alternative would have required geometric modifications to the horizontal or vertical alignment, or realignment of the freeway mainline. Those design variations would result in more severe impacts to existing ROW, land uses, and hydrology east of the freeway. Therefore, alternatives to the horizontal encroachment are not feasible.

Based on the above analysis, the SR 710 North Project, when combined with the cumulative projects, is not anticipated to result in substantial a cumulative impact to hydrology and floodplains.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.8, Hydrology/Floodplains, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects discussed above.

3.25.4.9 Water Quality and Storm Water Runoff

Resource Study Area

The project study area is located in Los Angeles County, in the Los Angeles River Watershed. Therefore, the Los Angeles River Watershed is the RSA for the water quality and storm water runoff cumulative impacts analysis.

Health and Historical Context

Pollutants from dense clusters of residential, industrial, and other urban activities have impaired water quality in the middle and lower Los Angeles River watersheds. Added to this complex mixture of pollutant sources (particularly pollutants associated with urban and storm water runoff) is the high number of point-source discharges. Water quality issues in the Los Angeles River Watershed include protection and enhancement of fish and wildlife habitat, removal of exotic vegetation, enhancement of recreational areas, attaining a balance between water reclamation and minimum flows to support habitat, management of storm water quality, assessment of other nonpoint sources (e.g., horse stables, golf courses, and septic systems), pollution from contaminated groundwater, groundwater recharge with reclaimed water, contamination of groundwater by volatile organic compounds (VOCs), leakage of methyl tertiary-butyl ether (MTBE) from underground storage tanks, groundwater contamination with heavy metals (particularly hexavalent chromium), and contaminated sediments in the Los Angeles River estuary.

Groundwater is impaired by VOCs from industry and nitrates from subsurface sewage disposal and past agricultural activities. These are the primary pollutants in much of the groundwater through the Los Angeles Coastal Plain Central Basin, the San Fernando Valley Groundwater Basin, the San Gabriel Valley Groundwater Basin, and the Raymond Groundwater Basin.

On the 2010 California 303(d) List, Los Angeles River Reach 2 (Carson Street to Figueroa Street) is listed as impaired for ammonia, coliform bacteria, copper, lead, nutrients (algae), oil, and trash; Arroyo Seco Reach 1 (Los Angeles River to West Holly Avenue) is listed as impaired for benthic-macroinvertebrate bioassessments, coliform bacteria, and trash; and Rio Hondo Reach 2 (at Spreading Grounds) is listed as impaired for coliform bacteria and cyanide.

Project Impacts

As stated in Section 3.9, Water Quality and Storm Water Runoff, with implementation of BMPs, pollutants of concern during construction would be retained in the study area and would not reach receiving waters; therefore, there is low potential for water quality impacts during construction of any of the Build Alternatives.

Additionally, because the Build Alternatives would implement effective BMPs that would treat the proposed new impervious surface area as well as portions of the existing impervious surface area, there is a low potential for the Build Alternatives to have a permanent effect on the physical/chemical characteristics of the on-site or downstream aquatic environment. Please refer to Section 3.9, Water Quality and Storm Water Runoff, for more detail regarding the SR 710 North Project's effect on water quality.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the 39 projects listed in Table 3.25-1, none have the potential to contribute to an impact on water quality because they all implement BMPs and other avoidance, minimization, and/or mitigation measures.

Cumulative Impact

The SR 710 North Project, in combination with the cumulative projects, would have temporary construction-related pollution and waste discharge effects. However, during the construction stage, all disturbed slopes would be vegetated and surface water from the project site would be diverted to designed collection and permanent treatment facilities. This work would minimize the effects of erosion and downstream siltation on any of the receiving waters once these projects become operational. Therefore, the SR 710 North Project, in combination with the cumulative projects, would not contribute to a cumulative impact on water quality.

With implementation of BMPs and other avoidance, minimization, and/or mitigation measures, the cumulative projects would not result in a substantial impact on water quality and storm water runoff. Additionally, compliance with requirements such as obtaining a National Pollutant Discharge Elimination System permit and implementing BMPs would ensure that the SR 710 North Project would result in a low potential for the Build Alternatives to have a substantial effect on water quality.

Based on the above analysis in combination with the reasonably foreseeable actions in the RSA with particular relevance to water quality and storm water runoff, the SR 710 North Project would not have an cumulative impact on water quality, thus reducing the cumulative effects discussed above.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.9, Water Quality, avoid, minimize, and/or mitigate the effects of the Build Alternatives.

3.25.4.10 Geology/Soils/Seismic/Topography

Resource Study Area

The SR 710 North Project area is used as the RSA for the purpose of this cumulative impacts assessment because impacts related to geology/soils/seismic and/or topography would occur in close proximity to any given project. The study area is bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west. The study area includes portions of the Cities and communities of Alhambra, Arcadia, Commerce, Duarte, El Monte, Glendale, Irwindale, La Cañada Flintridge, Los Angeles, Monrovia, Montebello, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South Pasadena, and Temple City.

Health and Historical Context

The SR 710 North Project area encompasses portions of the San Gabriel Valley, the southern San Rafael Hills, the Elysian Hills, and the Repetto Hills. These areas are within a transition zone between the northwest-southeast-trending Peninsular Ranges physiographic province to the south and the east-west-trending Transverse Ranges province to the north. Geologic units/formations in the study area include young alluvium, old alluvium, Fernando, Puente (which includes Monterey, Modelo, and an unnamed shale), Topanga, and Basement Rocks/Wilson Quartz Diorite. The geologic structure of the area is a result of ongoing compressional geologic forces that have resulted in the uplift of the San Gabriel Mountains and folding of the rocks within the hills present in the SR 710 North Project area. These compressional geologic forces have yielded active, potentially active, and inactive faults across the study area. The only confirmed active fault identified in the SR 710 North Project area that could produce ground rupture is the Raymond fault. The Raymond fault crosses the BRT (at the surface), LRT (at the surface), and Freeway Tunnel Alternatives (at tunnel depth), and is considered to be an active fault and has the potential for causing surface rupture in the area of the Build Alternatives. In addition, two potentially active faults are present in the study area: the Eagle Rock and San Rafael faults. For the purposes of this study, it is assumed that the Eagle Rock and San Rafael faults are also active. Strong ground shaking may occur in the SR 710 North Project area as the accumulated strain on these and other regional faults is released.

Project Impacts

As described in Section 3.10, Geology/Soils/Seismic/Topography, the Build Alternatives will be designed, constructed, and operated in accordance with applicable Metro, Caltrans, and local (city and County) standards to account for geologic hazards. Therefore, the Build Alternatives would not have a substantial geology-related impact. Please refer to Section 3.10, Geology/Soils/Seismic/ Topography, for more detail regarding the SR 710 North Project's effect on geology.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the 39 reasonably foreseeable actions in the RSA, none have the potential to contribute to an impact on geology/soil/seismic/topography.

Cumulative Impact

The cumulative projects, which are all required to comply with regulations, agency permits, and BMPs, would not have a substantial impact related to geology/soils/seismicity and/or topography. These improvements will be designed and constructed in accordance with applicable Caltrans, Metro, and/or local (city and county) standards to account for the geologic hazards. Therefore, the

SR 710 North Project, in combination with the cumulative projects, would not contribute to cumulative impacts related to geologic hazards.

Avoidance, Minimization, and/or Mitigation Measures

As no impacts would occur related to geologic hazards, no avoidance, minimization, and/or mitigation measures are necessary.

3.25.4.11 Paleontological Resources

Resource Study Area

The area studied in the Paleontological Identification Report/Paleontological Evaluation Report (PIR/PER) for each Build Alternative included all areas in the alternative's alignment where project activities will occur. However, cumulative impacts to paleontological resources may reach beyond this area; therefore, the RSA for the purpose of the paleontological resources cumulative impacts analysis is the SR 710 North Project area. The study area is bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west. The study area includes portions of the Cities and communities of Alhambra, Arcadia, Commerce, Duarte, El Monte, Glendale, Irwindale, La Cañada Flintridge, Los Angeles, Monrovia, Montebello, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South Pasadena, and Temple City.

Health and Historical Context

The SR 710 North Project borders the western edge of the San Gabriel Valley, running from north to south along the San Rafael Hills and through the Repetto Hills. These hills contain exposures of marine sedimentary rocks that were deposited in the ancient Los Angeles Basin approximately 16 to 2.6 million years ago (Ma). It is from these sedimentary rocks that most of the petroleum in the Los Angeles Basin has been produced, and for this reason, oil wells have been drilled throughout the San Rafael and Repetto Hills. Also present within the project area are sediments that eroded from the San Rafael Hills, the Repetto Hills, and the San Gabriel Mountains. These deposits accumulated in the valleys and range in age from approximately 800,000 to 10,000 years ago.

There are eight geologic units within the project areas for the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives. In addition to native deposits, there are areas of artificial fill that were placed during construction of interstates, freeways, and other roads. Artificial fill does not have the potential to contain scientifically significant paleontological resources because of its disturbed context. Although there are no known fossil localities within the boundaries of the project areas, paleontological resources have been recovered near the project areas and elsewhere in the region. These deposits have high paleontological sensitivity based on their age, composition, and depositional environment as well as the scientifically significant fossil remains they have produced in other areas.

Project Impacts

As described in Section 3.11, Paleontology, the Build Alternatives have the potential to encounter paleontologically sensitive sediments and may impact nonrenewable paleontological resources. Please refer to Section 3.11, Paleontology, for more detail regarding the SR 710 North Project's effect on paleontological resources.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. A number of the 39 projects listed in Table 3.25-1, have the potential to result in effects on paleontological resources. The following 15 projects have the potential to result in substantial effects on paleontological resources and, therefore, to contribute to a cumulative impact on paleontological resources:

- San Gabriel Trench Grade Separation
- Rosemead Boulevard Safety Enhancement & Beautification
- San Fernando Road Widening Between Elm Street and Eagle Rock Boulevard
- Regional Connector Transit Corridor
- Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension
- Metro Gold Line Foothill Extension
- Gold Line Transit Plaza
- Station Square Transit Village
- Lincoln Avenue Specific Plan
- Crown City Medical Center
- 16 East California Project
- El Monte Walmart
- Huntington Memorial Hospital Master Development Plan Amendment
- Olson San Gabriel Residential Community Project
- 100 West Walnut Planned Development

The cumulative impacts of these 15 projects in relation to the Build Alternatives are discussed below.

Cumulative Impact

The Build Alternatives as well as the 15 cumulative projects have the potential to encounter paleontologically sensitive sediments and may impact scientifically significant, nonrenewable paleontological resources. However, all of these projects, including the SR 710 North Project, will include a Paleontological Mitigation Plan (PMP) that includes measures such as preconstruction field surveys, full-time monitoring by a qualified paleontologist, and the recovery, identification, and appropriate storage of any paleontological resources found. Because these cumulative projects include this requirement, the cumulative projects' contribution to cumulative paleontological impacts would not be considerable.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.11, Paleontology, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects discussed above.

3.25.4.12 Hazardous Waste

Resource Study Area

The RSA for the purpose of the hazardous waste cumulative impacts analysis is the SR 710 North Project area. The study area is bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west. The study area includes portions of the Cities and communities of Alhambra, Arcadia, Commerce, Duarte, El Monte, Glendale, Irwindale, La Cañada Flintridge, Los

Angeles, Monrovia, Montebello, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South Pasadena, and Temple City.

Health and Historical Context

The study area primarily consists of the western San Gabriel Valley, the southernmost San Rafael Hills, the Repetto Hills, and the northern portion of the Central Basin between the Repetto Hills and the Merced Hills. The San Gabriel Valley includes two groundwater basins: the Raymond Basin, which is in the northwest portion of the San Gabriel Valley; and the San Gabriel Basin, which encompasses the rest of the San Gabriel Valley. These areas are in the transition zone between the northwest-southeast-trending Peninsular Ranges physiographic/geological province to the south and the east-west-trending Transverse Ranges province to the north.

Land uses within the study area can be described as a mix of residential, commercial, and industrial. More than 1,000 known hazardous waste sites with environmental impacts were identified within a 1 mi radius of the SR 710 North Project area. Many of these sites were eliminated as posing an environmental threat due to the extent/intensity of their environmental impact, the media of impact (soil, soil vapor, and/or groundwater), or existing environmental regulatory case status. Based on the available information, six sites were determined to potentially pose an environmental impact.

Project Impacts

As described in Section 3.12, Hazardous Waste/Materials, six sites were identified as having hazardous waste concerns that could potentially impact the Build Alternatives. Additionally, because part of the study area includes freeways that have been in existence for over 50 years, there is a high potential for encountering aerially deposited lead (ADL) associated with exhaust from former leaded-gas combustion motor vehicles along the sides of these older freeways. However, a Phase II investigation for off-site soil and groundwater impacts would be conducted prior to any construction activities. Therefore, the Build Alternatives are not anticipated to have a substantial impact related to hazardous waste. Please refer to Section 3.12, Hazardous Waste/Materials, for more detail regarding the SR 710 North Project's effect related to hazardous waste.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the 39 projects listed in Table 3.25-1, 1 has the potential to contribute to an impact on hazardous waste:

- Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension

The cumulative impact of this project in relation to the Build Alternatives is discussed below.

Cumulative Impact

Only one cumulative project, the Eastside Transit Corridor Phase 2 – Metro Gold Line Eastside Extension, would potentially have a substantial impact related to hazardous waste. The Gold Line Eastside Extension is in the initial phases of environmental development, and although it is not known at this time, it is anticipated that any impact related to hazardous waste would be able to be avoided, minimized, and/or mitigated. All other cumulative projects would implement avoidance, minimization, and/or mitigation measures to ensure no substantial impact related to hazardous waste. Additionally, six sites have been identified within the SR 710 North Project area as having a potential hazardous waste impact on the project. However, a Phase II investigation would be conducted prior to any construction activities for these sites and would provide appropriate minimization, avoidance, and mitigation measures to prevent unnecessary exposure to contaminants during construction activities. Depending on the results of the Phase II, subsequent sampling to determine the presence and/or absence of contaminated soil and/or groundwater or to characterize the extent of contamination on site may be required. The results of these studies will be used as part of the evaluation of any property to be acquired. Additionally, measures to avoid and or minimize construction-related impacts from the removal of yellow thermoplastic paint and/or soil contaminated with ADL would be implemented. Therefore, the SR 710 North Project, in combination with the cumulative projects, would not contribute to a cumulative impact related to hazardous waste.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.12, Hazardous Waste/Materials, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects discussed above.

3.25.4.13 Air Quality

Resource Study Area

For the purpose of the air quality cumulative impacts analysis, the RSA for air quality impacts includes all areas adjacent to the study area that would be affected by construction emissions and vehicle emissions from operation of the completed project. The RSA includes portions of the Cities and communities of Alhambra, Arcadia, Commerce, Duarte, El Monte, Glendale, Irwindale, La Cañada Flintridge, Los Angeles, Monrovia, Montebello, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South Pasadena, and Temple City that are adjacent to the study area.

Regionally, the RSA is within a portion of the South Coast Air Basin (Basin) in Los Angeles County. The study area and the other past, present, and future projects considered in the analysis are located in Los Angeles County, which is within the Basin. A single RSA would not effectively consider the appropriate areas for potential short-term air quality impacts during construction of the SR 710 North Project. Short-term air quality impacts can result from equipment operations as well as from dust generated during grading or travel on unpaved surfaces. An RSA for short-term air quality impacts would focus on a specific area under construction at the time, the roads and intersections in the vicinity of the construction zone, and other projects under construction at the same time in the same area. As a result, an RSA for short-term air quality impacts focuses on areas in proximity to active construction areas for the proposed SR 710 North Project and other nearby cumulative projects under construction at the same time.

Health and Historical Context

The RSA is located in a largely urbanized area. The health of the resource changes with emission levels in the area surrounding the project. Over time, as the RSA has become more urbanized, the air quality in the Basin has been substantially degraded by short- and long-term emissions of pollutants and dust generated by a wide variety of land uses, including agricultural, urban, industrial, and manufacturing uses. However, it should be noted that with implementation of federal and State emission regulations and improvements in stationary- and mobile-source emission control technology, air quality has improved in the Basin compared to the frequent Stage 2 and Stage 3 smog alerts that occurred in the 1960s and 1970s.

The SR 710 North Project is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD maintains ambient air quality monitoring stations throughout the Basin. The closest monitoring station to the project area is the South Wilson Avenue Pasadena Station, and the next closest station is the North Main Street Los Angeles Station. The following air quality information briefly describes the various types of pollutants monitored in the vicinity of the project study area:

- **Carbon Monoxide:** The Basin is in attainment and in attainment/maintenance for the State and federal carbon monoxide (CO) standards, respectively. The State and federal standards were not exceeded at either monitoring station between 2010 and 2012.
- **Ozone:** The Basin is a nonattainment area for both the federal and State ozone (O_3) standards. The State 1-hour standard was exceeded at both monitoring stations. The State and federal 8-hour standards were exceeded at both monitoring stations.
- **Nitrogen Dioxide:** The Basin is in nonattainment and in attainment/maintenance for the State and federal Nitrogen Dioxide (NO_2) standards, respectively. The State standards were not exceeded at either monitoring station. The federal 1-hour standard was exceeded at both monitoring stations in 2011.
- **Sulfur Dioxide:** The entire Basin is in attainment for both the federal and State sulfur dioxide (SO_2) standards. The State and federal standards were not exceeded at either monitoring station between 2010 and 2012.
- **Respirable Particulate Matter:** The Basin is a nonattainment area for the State respirable particulate matter (particulate matter less than 10 microns in diameter, or PM_{10}) standards and a maintenance/attainment area for the federal standards. The State 24-hour standard was exceeded at the Los Angeles Station in 2011 and 2012. The federal 24-hour standard was not exceeded between 2010 and 2012. The average annual concentrations exceeded the State standard in each of the past 3 years.
- **Fine Particulate Matter:** The Basin is a nonattainment area for both the federal and State fine particulate matter (particulate matter less than 2.5 microns in diameter, or $PM_{2.5}$) standards. The federal 24-hour standard was exceeded at both stations. The State annual standard was exceeded in each of the past 3 years at the Los Angles Station. The average annual concentrations did not exceed the federal standard in the past 3 years.
- **Lead:** The Los Angeles County portion of the Basin is in nonattainment for the federal and State lead standards.

Project Impacts

As stated in Section 3.13, Air Quality, compliance with SCAQMD Rule 403 and Caltrans Standard Specifications Sections 14.9-02 and 14-9.03 during construction will reduce construction-related air quality impacts from fugitive dust emissions and construction equipment emissions. These measures would address public health concerns related to airborne dust (e.g., Valley Fever). Additionally, it was determined that the SR 710 North Project will not result in any exceedances of the 1-hour or 8-hour CO standards.

The tolled operational variations of the Freeway Tunnel Alternative dual- bore design variation is consistent with the scope of the design concept of the RTP and FTIP. Therefore, the tolled operational variation of the Freeway Tunnel Alternative dual-bore design variation is in conformance with the SIP. The RTP and FTIP would have to be amended should one of the following be selected: TSM/TDM Alternative, BRT Alternative, LRT Alternative, Freeway Tunnel Alternative single-bore design variation, or the non-tolled operational variations of the Freeway Tunnel Alternative dual-bore design variation. The project would also comply with all SCAQMD requirements.

A $PM_{2.5}$ and PM_{10} hot-spot form (May 20th) was submitted to and reviewed by the Transportation Conformity Working Group (TCWG) on May 27, 2014, and additional requested information was provided in June 2014. The primary TCWG members are GPA, FHWA, and Caltrans Headquarters. On October 29, 2014, the TCWG determined that the TSM/TDM, BRT, and LRT Alternatives are not Projects of Air Quality Concern (POAQC). The Freeway Tunnel Alternative single-and dual-bore design variations are POAQC. If the Freeway Tunnel Alternative with either the single-bore or dual-bore design variation is identified as the preferred alternative, a quantitative PM hot-spot analysis will be conducted to demonstrate that the project would not delay attainment of or worsen existing violation of or cause an exceedance of the $PM_{2.5}$ or PM_{10} NAAQS and meets certain conformity requirements. While the Build Alternatives would result in a small increase in localized MSAT emissions in comparison to the No Build Alternative, the EPA's vehicle and fuel regulations, coupled with fleet turnover, will cause substantial reductions over time that will cause regionwide MSAT levels to be substantially lower than they are today. It is expected that there would be similar MSAT emissions in the study area under the Build Alternatives relative to the No Build Alternative in the design year.

Please refer to Section 3.13, Air Quality, for more detail regarding the SR 710 North Project's effect on air quality.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Most of the 39 projects listed in Table 3.25-1, have the potential to result in air quality impacts and could contribute to cumulative air quality impacts. The following 11 projects have the potential to result in substantial air quality impacts and could contribute to a cumulative impact on air quality:

- I-710 South Corridor Project
- San Gabriel Trench Grade Separation Project
- Regional Connector Transit Corridor
- Metro Gold Line Foothill Extension
- Lincoln Avenue Specific Plan
- Magellan Gateway Project
- Olive Pit Mining and Reclamation Operations and Long Term Reuse Project
- Huntington Memorial Hospital Master Development Plan Amendment
- Devil's Gate Reservoir Sediment Removal and Management Project
- 100 West Walnut Planned Development
- Hill and Colorado Project

The cumulative impacts of these 11 projects in relation to the Build Alternatives are discussed below.

Cumulative Impact

Nine of the cumulative projects would have a temporary substantial and unavoidable impact related to air quality during construction. Three of these nine projects—the Regional Connector Transit

Corridor, the Devil's Gate Reservoir Sediment Removal and Management Project, and the 100 West Walnut Planned Development—could be constructed concurrently with the SR 710 North Project. However, compliance with SCAQMD Rule 403 and Caltrans Standard Specifications Sections 14.9-02 and 14-9.03 during construction will reduce the SR 710 North Project's construction-related air quality impacts from fugitive dust emissions and construction equipment emissions. Therefore, the SR 710 North Project, in combination with these projects, would not contribute to a cumulative air quality impact.

Seven of the cumulative projects would contribute to a permanent air quality impact in the RSA. For the SR 710 North Project, implementation of the proposed Build Alternatives would result in a small decrease in MSAT emissions within the project study area. This follows, the EPA's vehicle and fuel regulations, coupled with fleet turnover, which will cause substantial reductions over time that will cause regionwide MSAT levels to be substantially lower than they are today.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.13, Air Quality, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects described above.

3.25.4.14 Noise and Vibration

Resource Study Area

For the purpose of the noise and vibration cumulative impacts analysis, the RSA for noise impacts includes all areas adjacent to the study area where there are sensitive land uses that would be affected by construction noise and traffic noise generated by operation of the completed project. The study area focuses on those areas in the vicinity of the Build Alternatives with potential noise-sensitive uses, including residential uses, parks, and open space uses, or areas of frequent human activity.

Health and Historical Context

The study area is located in a largely urbanized area. Noise in this area is generated by traffic on the freeways and area roads, equipment operations, urban uses, aircraft, and other noise sources typical in urban and developed areas. The health of the resource is affected by noise from I-710, I-210, I-10, SR 110, State Route 19 (SR 19), local arterial roadways, and surrounding noise-generating land uses such as large commercial or industrial operations. As the study area has become more densely developed over time and traffic volumes have increased, the levels of background noise in much of the RSA have increased and, in some areas, already exceed the applicable noise standards.

Land uses in the vicinity of the BRT Alternative include single-family and multifamily residences, two schools, two preschools, a daycare center, seven churches, two parks, three hotels, hospitals/ medical centers, a museum, and office, industrial, and commercial uses.

Land uses in the vicinity of the LRT Alternative project area include single-family and multifamily residences, vacant land, and office, commercial, and recreational uses.

Land uses in the vicinity of the Freeway Tunnel Alternative include single-family and multifamily residences, four schools and Cal State LA, two churches, a hospital, a museum with gardens, a golf course, vacant land, and office, commercial, and recreational uses. In addition, a planned office development is located within the project area.

Project Impacts

As described in Section 3.14, Noise and Vibration, the Build Alternatives result in potential long-term noise impacts. However, noise abatement measures were evaluated for receptors located in the project limits that would be or would continue to be exposed to traffic noise levels approaching or exceeding the Noise Abatement Criteria. Please refer to Section 3.14, Noise and Vibration, for more detail regarding the SR 710 North Project's noise effects.

Reasonably Foreseeable Actions and Their Impacts

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. The land uses and circulation improvements in some of the 39 projects listed in Table 3.25.1 have the potential to result in localized short-term noise increases and/or vibration during construction and long-term changes in noise levels. The following projects have the potential to result in changes in noise levels that have the potential to contribute to a cumulative impact related to noise and vibration:

- Regional Connector Transit Corridor Project
- Olson San Gabriel Residential Community
- 100 West Walnut Planned Development
- Green Hotel Apartments
- I-10 High-Occupancy Toll (HOT) Lanes

The cumulative impact of this project in relation to the Build Alternatives is discussed below.

Cumulative Impact

The Build Alternatives as well as the cumulative projects could result in short-term noise effects during construction. Although this impact would be temporary and would be minimized by implementation of minimization measures, there is the potential that the SR 710 North Project, the Regional Connector Transit Corridor Project, the Olson San Gabriel Residential Community, the 100 West Walnut Planned Development, and the Green Hotel Apartments would be under construction concurrently, thus causing a temporary cumulative noise impact in the Cities/communities of East Los Angeles, El Sereno, Pasadena, and South Pasadena, as well as adjacent cities. However, each project would be responsible for following applicable noise ordinances during construction, thereby reducing this temporary impact.

Additionally, neither the I-10 HOT Lanes, nor the SR 710 North Project Build Alternatives would result in substantial unmitigable long-term noise impacts. Abatement measures are proposed and none of the receptors reach a noise level that exceeds 12 A-weighted decibels (dBA). Therefore, the SR 710 North Project would not contribute to a cumulative noise impact.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.14, Noise and Vibration, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects described above.

3.25.4.15 Energy

Resource Study Area

Because energy consumption is typically tracked on a regional or State level, consideration of cumulative effects related to energy consumption is considered in the context of the SCAG planning region.

Health and Historical Context

California is rich in conventional and renewable energy resources. It has large crude oil and substantial natural gas deposits in six geological basins located in the Central Valley and along the Pacific Coast. Most of those reserves are concentrated in the southern San Joaquin Basin. A total of 17 of the 100 largest oil fields in the United States are located in California, including the Belridge South oil field (the third largest oil field in the contiguous United States). In addition, federal assessments indicate that large undiscovered deposits of recoverable oil and gas lie offshore in the federally administered Outer Continental Shelf, which in 2008 was reopened for potential oil and gas leasing. California's renewable energy potential is extensive. The State's hydroelectric power potential ranks second in the United States behind Washington State, and substantial geothermal and wind power resources are found along the coastal mountain ranges and the State's eastern border with Nevada. High solar energy potential is found in southeastern California's sunny deserts.

California is the most populous State in the United States, and its total energy demand is second only to Texas. Although California is a leader in the energy-intensive chemical, forest products, glass, and petroleum industries, the State has one of the lowest per-capita energy consumption rates in the country. The California government's energy-efficiency programs have contributed to the low per-capita energy consumption.

Much of the energy consumed in the SCAG region is for residential, commercial, and transportation purposes. Driven by high demand from California's many motorists, major airports, and military bases, the transportation sector is the State's largest energy consumer. More motor vehicles are registered in California than in any other state, and worker commute times are among the longest in the country. Transportation-related activities account for approximately half of all the petroleum products consumed in California. While State and federal policies (e.g., the California Low-Emission Vehicle Program and the Federal Energy Policy Act of 1992) are increasing the use of alternative fuel and low-emission vehicles, the consumption of nonrenewable resources (e.g., fossil fuels) remains high.

Project Impacts

As described in Section 3.15, Energy, construction energy effects involve the one-time, nonrecoverable energy costs associated with construction of roads and structures. It is anticipated that the construction energy demands from any of the Build Alternatives, will be accommodated by the three energy utilities (LADWP, Pasadena Water and Power, and SCE). Compared to the baseline No Build Alternative, the construction of any of the Build Alternatives would result in substantial increases in total indirect energy consumption (entirely from construction energy use) in the study area. However, for the region, indirect energy consumption would not be substantially impacted by any of the Build Alternatives.

For operational energy consumption in the region, all SR 710 North Project alternatives (including the No Build Alternative) would result in the same approximately 22 percent increase in operational energy consumption compared to existing conditions. Compared to the No Build Alternative, none of the Build Alternatives would result in a measurable change in operational energy consumption in the region. Please refer to Section 3.15, Energy, for more detail regarding the SR 710 North Project's effect on energy.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. The 39 reasonably foreseeable actions have no or limited potential to result in effects related to energy and, therefore, limited potential to contribute to cumulative effects related to energy with particular relevance to energy. Of those projects, only one has the potential to result in substantial effects related to energy and, therefore, to contribute to a cumulative impact on energy:

- El Monte Walmart

The cumulative impact of this project in relation to the Build Alternatives is discussed below.

Cumulative Impact

All the transportation and transit cumulative projects will reduce energy consumption by either easing congestion or providing public transit and taking vehicles off the study area local arterials and highways. Although the cumulative land development projects listed above would result in additional energy consumption, it is anticipated that they would be designed to reduce energy consumption and would comply with the energy standards in the California Energy Code, Part 6 of the California Building Standards Code (Title 24), and applicable city regulations/codes. Additionally, all the SR 710 North Project alternatives (including the No Build Alternative) would result in an approximately 22 percent increase in operational energy consumption compared to existing conditions. However, for operational energy consumption in the region, none of the SR 710 North Project Build Alternatives would result in a measurable change. Therefore, the SR 710 North Project, in combination with the cumulative projects, would not contribute to a cumulative energy effect.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.15, Energy, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects described above.

3.25.4.16 Natural Communities

Resource Study Area

The RSA for natural communities is consistent with the Biological Study Area (BSA) established for the SR 710 North Project. The BSA is an approximately 3,410 ac area that includes portions of the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, San Marino, and Monterey Park, as well as unincorporated portions of Los Angeles County. Existing land uses in and adjacent to the BSA primarily include: transportation, residential, commercial, industrial, infrastructure, and recreational land uses.

Health and Historical Context

Much of the SR 710 North Project area is intensively developed for urban and suburban uses. The natural vegetation of the area prior to urbanization consisted primarily of chaparral and coastal sage scrub. Most of the current natural vegetation within the BSA occurs in scattered, isolated patches on hillsides or in other areas not easily developed (e.g., freeway edges and medians). The SR 710 North

Project is located entirely in Los Angeles County and is generally focused between the areas of the existing I-710/I-10 and I-210/SR 134 freeway interchanges.

The BSA contains primarily disturbed/developed habitats with small, isolated areas of natural vegetation. Natural communities in the BSA that are considered sensitive include: (1) riparian wetland habitats, (2) riparian non-wetland habitats, (3) coast live oak woodland, and (4) black cottonwood forest. In addition to the riparian habitats and coast live oak woodland, only one native-dominated plant community (laurel sumac scrub) was identified in the BSA.

Additionally, three types of riparian and riverine communities are present in the BSA: (1) riparian non-wetland habitats, (2) wetlands, and (3) riverine (streams).

A total of approximately 4.1 ac of riparian non-wetland habitats (white alder groves, black cottonwood forest, and arroyo willow thickets), approximately 1.5 ac of wetlands, and approximately 4.4 ac of stream habitats were identified in the BSA. The riparian and riverine communities present in the BSA are not considered to be of high quality due to the presence of invasive species, high human disturbance (foot traffic, litter, etc.), and minimal signs of reproduction (few saplings and seedlings, etc.), as is typical in an urban environment. Additionally, one small area (approximately 5.9 ac) of the coast live oak woodland community was identified within the BSA.

The SR 710 North Project is not located within any Significant Ecological Areas, which are identified as ecologically important land and water systems by the County of Los Angeles. Other protected lands (i.e., wildlife refuges, State Parks) that occur within or adjacent to the BSA include several recreational city parks and the Lower Arroyo Seco Park in Pasadena, which is a city park that contains native and naturalized vegetation that provides habitat for local wildlife.

Project Impacts

As described in Section 3.16, Natural Communities, measures would be required to avoid, minimize, and/or compensate temporary and permanent impacts to natural communities in the BSA. Please refer to Section 3.16, Natural Communities, for more detail regarding the SR 710 North Project's effect on natural communities.

Reasonably Foreseeable Actions and Their Impacts

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the projects listed in Table 3.25-1, none have the potential to contribute to an impact on natural communities.

Cumulative Impact

The cumulative projects either would have no impact to natural communities or, upon implementation of avoidance, minimization, and/or mitigation measures, would not have a substantial impact on natural communities.

Implementation of the SR 710 North Project, specifically the Freeway Tunnel Alternative (single-bore and dual-bore design variations) and the LRT Alternative, would result in effects on riparian and riverine habitats in the BSA. However, compensatory mitigation would result in the creation or restoration of more habitat than is lost and is likely to completely offset any impacts from the SR 710 North Project, especially considering that the functions and values of the habitats that would be impacted are relatively low. Therefore, the SR 710 North Project would not likely contribute incrementally to cumulative effects on riparian, wetland, or riverine communities.

Based on the above discussion in combination with the reasonably foreseeable actions in the SR 710 North Project BSA with particular relevance to natural communities, the SR 710 North Project would not contribute to a cumulative impact on natural communities in the RSA.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.16, Natural Communities, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the SR 710 North Project's contribution to any cumulative effects to natural communities.

3.25.4.17 Wetlands and Other Waters

Resource Study Area

The RSA for wetlands and other waters is consistent with the BSA established for the SR 710 North Project. The BSA is an approximately 3,410 ac area that includes portions of the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, San Marino, and Monterey Park, as well as unincorporated portions of Los Angeles County. Existing land uses within and adjacent to the BSA primarily include: transportation, residential, commercial, industrial, infrastructure, and recreational land uses.

Health and Historical Context

The entire BSA is located within the Los Angeles River Watershed, called the Los Angeles River HU. Two drainages, the Arroyo Seco and the Laguna Channel (sometimes called the Dorchester Channel, or Laguna Channel), occur within the BSA and include riverine, wetland, and riparian drainages and habitats. Most of the drainages within the BSA are channelized and provide relatively limited habitat value for terrestrial and aquatic species.

Approximately two wetlands, two areas of non-wetland riparian habitat, and several ditch features were identified. In all, approximately 27 features were identified in the BSA. The streams provide the only potential habitat value in the BSA for fish and other riparian aquatic species. However, habitat quality is limited by the fact that large portions of these streams have been channelized for flood control, like most streams and rivers in the Los Angeles region.

Riparian plant communities occur along the Arroyo Seco within the BSA, providing potential habitat for riparian-associated plants and animals. The Laguna Channel, which is also a tributary of the Los Angeles River, is mostly channelized in a concrete-lined rectangular channel in the BSA. The sole earthen-bottom portion of this stream in the BSA is associated with an abutting wetland that provides potential habitat for plants and wildlife with riparian non-wetland habitats.

A second approximately 1.09 ac wetland, which is associated with the Del Mar Pump Station, was also identified. This apparently isolated wetland is man-made due to the pumping of storm water into the area, and the vegetation lacks a shrub or canopy layer. Habitat for plants and wildlife is present but limited due to the artificial and maintained (mowed) nature of the habitat.

A number of excavated ditches were identified in the BSA that were created to drain storm water, hillside runoff, and nuisance flows, most of which were concrete lined. These features rarely carry water, support little vegetation, and have very limited habitat value. None of these ditch features were identified as subject to the jurisdiction of the United States Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), or Regional Water Quality Control Board (RWQCB).

Waters and wetlands potentially subject to USACE jurisdiction included the abovementioned Arroyo Seco and Laguna Channel, totaling approximately 4.42 jurisdictional acres, and an abutting 0.44 ac wetland. Areas potentially subject to CDFW jurisdiction included those subject to USACE jurisdiction as well as approximately 4.12 ac of non-wetland riparian plant communities associated with the Arroyo Seco and approximately 0.79 ac of non-wetland riparian plant communities associated with the Laguna Channel. Waters and wetlands potentially subject to RWQCB jurisdiction included all of the above, with the exception of nonwetland riparian plant communities.

Project Impacts

As described in Section 3.17, Wetlands and Other Waters, the SR 710 North Project has been refined to avoid and minimize impacts to wetlands and other waters. Specifically, the Freeway Tunnel Alternative single-bore and dual-bore design variations have minimized impacts to the northernmost section of the Laguna Channel, near the tunnel portal. Additional segments of the Laguna Channel have been completely eliminated from the impact areas. Please refer to Section 3.17, Wetlands and Other Waters, for more detail regarding the SR 710 North Project's effect on wetlands and other waters.

Impacts to drainages and habitats potentially subject to CDFW jurisdiction varied among the Build Alternatives, with the TSM/TDM, BRT, and LRT Alternatives having no anticipated substantial impacts and the Freeway Tunnel Alternative single-bore and dual-bore design variations having both permanent impacts (approximately 0.06 ac and 0.51 ac, respectively) and temporary impacts (approximately 0.02 ac and 0.22 ac, respectively).

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the 39 projects listed in Table 3.25-1, none have the potential to contribute to an impact on wetlands and other waters.

Cumulative Impact

The cumulative projects would either have no impact to wetlands or other waters or, upon implementation of avoidance, minimization, and/or mitigation measures, would not have a substantial impact on wetlands and other waters.

The Freeway Tunnel Alternative (both single-bore and dual-bore design variations) would have both permanent and temporary impacts to non-wetland and wetland areas subject to USACE, CDFW, and/or RWQCB jurisdiction. However, with the avoidance, minimization, and/or mitigation/ compensation measures outlined below, impacts would not be substantial.

Based on the above discussion in combination with the reasonably foreseeable actions in the RSA with particular relevance to wetlands and other waters, the SR 710 North Project would not contribute to a cumulative impact on wetlands and other waters in the RSA.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.17, Wetlands and Other Waters, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the SR 710 North Project's contribution to any cumulative effects on wetlands and other waters.

3.25.4.18 Plant Species

Resource Study Area

The RSA for plant species is consistent with the BSA established for the SR 710 North Project. The BSA is an approximately 3,410 ac area that includes portions of the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, San Marino, and Monterey Park, as well as unincorporated portions of Los Angeles County. Existing land uses in and adjacent to the BSA primarily include: transportation, residential, commercial, industrial, infrastructure, and recreational land uses.

Health and Historical Context

The South Coast and San Gabriel Mountains subregions within the BSA are characterized by valleys and small hills extending from the coast inland to the foothills of the Western Transverse Ranges. Much of the area is intensively developed for urban and suburban uses. The natural vegetation of the subregion prior to urbanization consisted primarily of chaparral and coastal sage scrub. Most of the current natural vegetation within the BSA in these subregions occurs in scattered, isolated patches on hillsides or in other areas not easily developed, such as freeway edges and medians.

The BSA contains primarily disturbed/developed habitats with small isolated areas of natural vegetation. By far the most common plant community/land cover type present is disturbed/developed, which represents more than 95 percent of the BSA. Additional plant communities identified included nonnative grassland, nonnative woodland, nonnative riparian woodland, wetland complex, giant reed semi-natural stands, laurel sumac scrub, coast live oak woodland, white alder groves, black cottonwood forest, and arroyo willow thickets. The only sensitive plant community that could be impacted is wetland complex, which would be permanently impacted by the Freeway Tunnel Alternative. A total of approximately 53 sensitive plant species have the potential to occur on or within the vicinity of the BSA. Approximately two non-listed special-status species that might be directly impacted are Coulter’s goldfields and Southern California black walnut.

A small population (approximately 300 individuals) of Coulter’s goldfields was identified within a freeway edge along I-10 near the I-710/I-10 interchange. No other suitable habitat for Coulter’s goldfields occurs within the BSA.

A single young Southern California black walnut was observed growing in the understory of a stand of unmaintained Aleppo pine woodland upslope from westbound I-210 in the City of Pasadena. No other individuals of this species were identified within the BSA. Due to the conspicuous nature of trees such as the Southern California black walnut during botanical surveys, the potential for the species to be present but not observed is low. Therefore, with the exception of the individual described above, the species is considered absent from the BSA.

Focused botanical surveys during 2013 determined that suitable habitat was present for the following additional approximately 14 special-status plants: California muhly, California saw-grass, Davidson’s bush-mallow, Greata’s aster, Los Angeles sunflower, Parish’s gooseberry, Peruvian dodder, Robinson’s pepper-grass, San Bernardino aster, Santa Barbara morning-glory, slender mariposa-lily, Sonoran maiden fern, southern tarplant, and white rabbit-tobacco. None of these species were found in the BSA during botanical surveys conducted throughout the entire BSA in 2013.

Project Impacts

As described in Section 3.18, Plant Species, the Freeway Tunnel Alternative's (single-bore and dual-bore design variations) and LRT Alternative's potential impacts to special-status plant species would be prevented by implementation of avoidance and minimization efforts. No other Build Alternatives would have any substantial direct, indirect, temporary, or permanent impacts on special-status plant species. Please refer to Section 3.18, Plant Species, for more detail regarding the SR 710 North Project's effect on plant species.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the projects listed in Table 3.25-1, none have the potential to contribute to an impact on plant species.

Cumulative Impact

The cumulative projects either would have no substantial impact to plant species or, upon implementation of avoidance, minimization, and/or mitigation measures, would not have a substantial impact on plant species.

Additionally, with implementation of the suggested avoidance and minimization measures, the Build Alternatives would not have any temporary or indirect substantial impacts on the Coulter's goldfields population. However, even with implementation of avoidance and minimization measures, the Southern California black walnut and the Coulter's Goldfields population does have the potential to be impacted by the Freeway Tunnel Alternative (single- and dual-bore variations). Impacts on Southern California black walnut from the Freeway Tunnel Alternative construction activities would be limited to the existing tree discovered during botanical surveys. Additionally, if it is determined that the Coulter's Goldfields population exists as a result of the species' inclusion in a seed mix during planting, then this species would not be considered impacted by the Freeway Tunnel Alternative because it would not be considered a naturally occurring population. The contribution to cumulative impacts to this species takes into account the avoidance and minimization efforts described below. Therefore, cumulative impacts resulting from the removal of this individual tree would not likely reduce the viability of the local or global population of this species.

Based on the above discussion in combination with the reasonably foreseeable actions in the RSA with particular relevance to plant species, the SR 710 North Project would not contribute to a cumulative impact on most plant species in the RSA. Depending on the plant mix, the SR 710 North Project may contribute to a cumulative impact to Coulter's Goldfields.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.18, Plant Species, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the SR 710 North Project's contribution to any cumulative effects on plant species.

3.25.4.19 Animal Species

Resource Study Area

The RSA for animal species is consistent with the BSA established for the SR 710 North Project. The BSA is an approximately 3,410 ac area that includes portions of the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, San Marino, and Monterey Park, as well as unincorporated portions of Los Angeles County. Existing land uses within and adjacent to the BSA primarily include: transportation, residential, commercial, industrial, infrastructure, and recreational land uses.

Health and Historical Context

The South Coast and San Gabriel Mountains subregions within the BSA are characterized by valleys and small hills extending from the coast inland to the foothills of the Western Transverse Ranges. Much of the area is intensively developed for urban and suburban uses. The natural vegetation of the subregion prior to urbanization consisted primarily of chaparral and coastal sage scrub. Most of the current natural vegetation within the BSA in these subregions occurs in scattered, isolated patches on hillsides or in other areas not easily developed, such as freeway edges and medians.

Wildlife species that occur within the BSA are generally limited to species that are well adapted to human-modified environments and are species typically associated with urbanized habitats.

There are no known migration corridors or wildlife linkages within the BSA; however, the area likely serves as a stopover site during bird migration. Trees and other vegetation within the BSA provide potential foraging and roosting sites for migrating birds, as do the trees and vegetation in the surrounding area. Historically, the Los Angeles River Watershed served as habitat to the federally endangered steelhead salmon (*Oncorhynchus mykiss*). However, due to the dramatic population decline of this species, as well as river modifications such as channelization and alterations associated with flood control and metropolitan development, it is very unlikely to be present within the BSA.

Aquatic resources within the BSA were identified during the jurisdictional delineation and plant community mapping efforts. All aquatic resources have some value for biological resources even when highly degraded because of their relative scarcity in the Arid West region. The streams provide the only potential habitat value in the BSA for fish and other riparian aquatic species. However, habitat quality is limited by the fact that large portions of these streams (like most streams and rivers in the Los Angeles region) have been channelized for flood control.

A total of approximately 71 special-status wildlife species have the potential to occur within the BSA. Of these sensitive animal species, approximately 15 are federally and/or State-listed endangered, threatened, rare, or proposed endangered or threatened, or are considered Fully Protected Species by the State of California. These species are discussed in Section 3.20, Threatened and Endangered Species. Additional protected or special-status animal species have the potential to occur in the BSA and are discussed below.

No American peregrine falcons were observed in the BSA during focused bird surveys conducted in 2013. Approximately two areas of potentially suitable streamside vegetation for riparian obligate birds were identified within the BSA and were then the subject of the focused habitat assessment. It is unlikely that yellow warbler and/or yellow-breasted chat breed within and/or adjacent to the BSA, although sporadic use outside the breeding season by non-territorial individuals of yellow warbler and yellow-breasted chat likely does occur.

Three sites included expanses of open low vegetation and were considered to have the potential to be suitable for burrowing owls. It was determined that no suitable burrowing owl habitat is present within the BSA. Therefore, it is unlikely that burrowing owls occur within and adjacent to the BSA. Therefore, burrowing owl is considered absent from the BSA.

Five bridges and one nearby foraging area within the BSA were identified as having characteristics suitable for bat roosting, It was determined that the following special-status species are potentially using the BSA as foraging habitat near the bridges: hoary bat, long-legged myotis, Yuma myotis, pocketed free-tailed bat, and silver-haired bat.

Suitable habitat is present in the BSA for other special-status wildlife species. Of these species, only the Allen's hummingbird, Nuttall's woodpecker, oak titmouse, and Cooper's hawk were observed within the BSA during the 2013 surveys. None of these four species were observed nesting during the 2013 surveys. In addition, approximately two pairs of red-tailed hawks exhibited territorial and breeding behavior at approximately two locations within or adjacent to the BSA. In addition to the species mentioned above, 78 avian species protected under the Migratory Bird Treaty Act (MBTA) were identified within the BSA.

Project Impacts

As described in Section 3.19, Animal Species, impacts related to animal species as a result of the TSM/TDM, LRT, and Freeway Tunnel Alternatives would be reduced with implementation of avoidance and minimization measures. Please refer to Section 3.19, Animal Species, for more detail regarding the SR 710 North Project's effect on animal species.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the 39 projects listed in Table 3.25-1, none have the potential to contribute to an impact on animal species.

Cumulative Impact

The cumulative projects would either have no impact to animal species or, upon implementation of avoidance, minimization, and/or mitigation measures, would not have a substantial impact on animal species.

Suitable habitat for monarch butterfly, coast range newt, western spadefoot toad, two-striped garter snake, western pond turtle, south coast garter snake, San Bernardino ring-necked snake, Cooper's hawk, Allen's hummingbird, Costa's hummingbird, Lawrence's goldfinch, merlin, Nuttall's woodpecker, oak titmouse, any nesting or breeding birds of prey protected under California Fish and Game Code Sections 3503 and 3503.5 (e.g., red-tailed hawk), and any other nesting or breeding birds protected under the MBTA has the potential to be impacted by the SR 710 North Project even after avoidance and minimization efforts. Therefore, the SR 710 North Project has the potential to contribute to a cumulative impact on nesting or breeding birds under the MBTA.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.19, Animal Species, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the cumulative effects discussed above.

3.25.4.20 Threatened and Endangered Species

Resource Study Area

The RSA for threatened and endangered species is consistent with the BSA established for the SR 710 North Project. The BSA is an approximately 3,410 ac area that includes portions of the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, San Marino, and

Monterey Park, as well as unincorporated portions of Los Angeles County. Existing land uses within and adjacent to the BSA primarily include: transportation, residential, commercial, industrial, infrastructure, and recreational land uses.

Health and Historical Context

The South Coast and San Gabriel Mountains subregions within the BSA are characterized by valleys and small hills extending from the coast inland to the foothills of the Western Transverse Ranges. Much of the area is intensively developed for urban and suburban uses. The natural vegetation of the subregion prior to urbanization consisted primarily of chaparral and coastal sage scrub. Most of the current natural vegetation within the BSA in these subregions occurs in scattered, isolated patches on hillsides or in other areas not easily developed, such as freeway edges and medians.

Although no federally listed or candidate species were observed, habitat suitable for nonbreeding use by least Bell's vireo (approximately 180 feet [ft] from the nearest planned ground-disturbing activities), southwestern willow flycatcher, and western yellow-billed cuckoo was determined to be present within the BSA.

The wetland complex habitat present in the BSA is marginally suitable for the marsh sandwort due to its low quality. The California Natural Diversity Database (CNDDB) includes approximately one recorded observation of marsh sandwort. Therefore, the potential for the species to be present but not observed is low.

There is marginally suitable habitat present on site within the laurel sumac scrub and coast live oak woodland areas of the BSA for the slender-horned spineflower. The CNDDB includes five records of slender-horned spineflower observations near the BSA. However, due to urbanization of this area the potential for the species to be present is low.

The approximately two wetland complex habitats present within the BSA in Pasadena and Monterey Park are marginally suitable for Gambel's watercress but not ideal habitat due to high human disturbance. The CNDDB includes approximately one recorded observation of Gambel's watercress in this area, which is an area that is now urban with no remaining habitat. Because there is only low-quality, marginally suitable habitat present in the BSA and there are no known occurrences of this species within 8.5–9.5 mi of the BSA, the potential for the species to be present but not observed is low.

Due to the timing of botanical surveys it is possible that thread-leaved brodiaca individuals were present within the BST, but not seen or were unidentifiable. There is marginally suitable habitat present on site within the laurel sumac scrub and coastal live oak woodland acres of the BSA. The CNDDB includes six records of thread leaved brodiaca observations near the BSA. Although the potential for species to be present is low, the absence of this species from the BSA cannot be confirmed.

Limited marginally suitable foraging habitat for the Townsend's big-eared bat is present within the BSA primarily within nonnative woodland, laurel sumac scrub, and oak woodland habitats. No suitable roosting habitat is present within the BSA.

Project Impacts

As described in Section 3.20, Threatened and Endangered Species, the Build Alternatives were determined to have no direct or indirect permanent impacts on federally-listed or endangered species and would not result in take of State-listed threatened or endangered species.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the 39 projects listed in Table 3.25-1, none have the potential to contribute to an impact on threatened or endangered species.

Cumulative Impact

The cumulative projects would either have no effect on threatened and/or endangered species or, upon implementation of avoidance, minimization, and/or mitigation measures, would not likely have a substantial effect on threatened and/or endangered species. The cumulative projects would not result in take of any State-listed threatened and/or endangered species.

The SR 710 North Project would have no effect on threatened and/or endangered species, and would not result in take of any State-listed threatened and/or endangered species.

Based on the above discussion in combination with the 17 reasonably foreseeable actions in the RSA with particular relevance to threatened and/or endangered species, the SR 710 North Project would not contribute to a cumulative impact on threatened and/or endangered species in the RSA.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.20, Threatened and Endangered Species, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the SR 710 North Project's contribution to any cumulative impacts to threatened and/or endangered species.

3.25.4.21 Invasive Species

Resource Study Area

The RSA for invasive species is consistent with the BSA established for the SR 710 North Project. The BSA is an approximately 3,410 ac area that includes portions of the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, San Marino, and Monterey Park, as well as unincorporated portions of Los Angeles County. Existing land uses within and adjacent to the BSA primarily include: transportation, residential, commercial, industrial, infrastructure, and recreational land uses.

Health and Historical Context

The South Coast and San Gabriel Mountains subregions within the BSA are characterized by valleys and small hills extending from the coast inland to the foothills of the Western Transverse Ranges. Much of the area is intensively developed for urban and suburban uses. The natural vegetation of the subregion prior to urbanization consisted primarily of chaparral and coastal sage scrub. Most of the current natural vegetation within the BSA in these subregions occurs in scattered, isolated patches on hillsides or in other areas not easily developed, such as freeway edges and medians.

Exotic plant species are present throughout the BSA and are primarily found within the Freeway Tunnel Alternative. A total of approximately 81 exotic plant species, subspecies, and/or varieties occurring on the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory and/or watchlist were identified within the BSA. Of these species, there are approximately 13 with an overall high rating, 30 with a moderate rating, 26 with a limited rating, and 12 that have been evaluated but not listed. Invasive species that have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure, and have reproductive biology and other attributes that are conducive to moderate to high rates of dispersal and establishment are given a "high" rating (Cal-IPC 2013). Species with a high rating identified within the BSA were: (1) giant reed, (2) red brome (*Bromus madritensis* ssp. *rubens*), (3) hottentot fig, (*Carpobrotus edulis*) (4) spotted knapweed (*Centaurea maculosa*), (5) purple pampas grass (*Cortaderia jubata*), (6) Uruguayan pampas grass (*C. selloana*), (7) cape ivy, (8) sweet fennel (*Foeniculum vulgare*), (9) Himalayan blackberry (*Rubus armeniacus*), (10) salt cedar (*Tamarix ramosissima*), (11) scotch broom (*Cytisus scoparius*), (12) Algerian ivy (*Hedera helix*), and (13) Uruguay water primrose (*Ludwigia hexapetala*).

Project Impacts

As described in Section 3.21, Invasive Species, with implementation of the avoidance and minimization measures listed in Section 3.21.4, the SR 710 North Project is not anticipated to have a substantial effect related to invasive species. Please refer to Section 3.21, Invasive Species, for more detail regarding the SR 710 North Project's effect on invasive species.

Reasonably Foreseeable Actions

The reasonably foreseeable actions would occur in the areas that are planned for development or redevelopment. Of the 39 projects listed in Table 3.25-1, none have the potential to contribute to an impact on invasive species.

Cumulative Impact

Upon implementation of avoidance, minimization, and/or mitigation measures, the cumulative projects would not have a substantial impact related to invasive species.

With implementation of the avoidance and minimization measures listed below, the SR 710 North Project is not anticipated to have an effect related to invasive species. Based on the above discussion, in combination with the reasonably foreseeable actions with particular relevance to invasive species, the SR 710 North Project would not contribute to a cumulative impact related to invasive species in the RSA.

Avoidance, Minimization, and/or Mitigation Measures

The measures identified in Section 3.21, Invasive Species, avoid, minimize, and/or mitigate the effects of the Build Alternatives, thus reducing the SR 710 North Project's contribution to any cumulative impacts related to invasive species.

4. California Environmental Quality Act (CEQA) Evaluation

4.1 Determining Significance Under CEQA

The State Route 710 (SR 710) North Project (proposed project) is a joint project by Caltrans and the Federal Highway Administration (FHWA) and is subject to State and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both CEQA and the National Environmental Policy Act (NEPA). FHWA's responsibility for environmental review, consultation, and any other action required in accordance with NEPA and other applicable federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 United States Code (USC) 327. Caltrans is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an Environmental Impact Statement (EIS), or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) as a *whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated, and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an Environmental Impact Report (EIR) must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated, if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance that also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

4.2 Effects of the Proposed Project

This section discusses the level of significance of the impacts of the Build Alternatives under CEQA. To aid with comparison between the Build Alternatives, this chapter is organized by topic, and the levels of significance for each Build Alternative are discussed under each subheading. More detailed analyses can be found in the respective sections within Chapter 3 of this document.

The evaluation of the potential impacts of the Build Alternatives under CEQA provided in this chapter was conducted by comparing the Build Alternatives to the baseline conditions, which in most cases are the existing conditions in the study area. For some resources, this is a different baseline than what was used in the NEPA analysis in Chapter 3. Existing conditions are the appropriate baseline per the State CEQA Guidelines Section 15125(a), which states "An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. The environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." Collection of data for the technical studies, field surveys, and preparation of the technical studies were initiated after the publication of the Notice of Preparation (NOP) in March 2011. As a result, the existing conditions are based on the conditions in 2012/2013, when the information was collected. This baseline is also appropriate because the 2012/2013 conditions are more current than the conditions in 2011.

However, for several environmental topics, the evaluation compared the Build Alternative to the future No Build conditions (2020/2025 Opening Year and/or 2035 Build Out) and the existing conditions because those comparisons provide for the most appropriate consideration of effects of the Build Alternatives. This is appropriate for these topics because the impacts are analyzed for when the improvements will first be operational as well as the 20-year build-out conditions (which is the closest forecast model year for the traffic data on which these studies are based). Caltrans has a 20-year planning horizon and sizes its facilities based on travel demand projections, which is consistent with standard FHWA practice for transportation project planning. This approach ensures that the improvements will meet the need for the project in the future as well as in the opening year. Additionally, where impacts will occur with or without the project, they are not attributable to the project.

As discussed in Chapter 2, Project Alternatives, the majority of improvements included as part of the Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative would also be constructed as part of the Bus Rapid Transit (BRT), Light Rail Transit (LRT), and Freeway Tunnel Alternatives. Specifically, the following improvements in the TSM/TDM Alternative would not be included in the other Build Alternatives:

- The BRT Alternative would include all the improvements in the TSM/TDM Alternative, with the exception of Local Street Improvement L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of Local Street Improvement L-3 (Atlantic Boulevard from Glendon Way to Interstate 10 [I-10]).
- The LRT Alternative would include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road).
- The Freeway Tunnel Alternative would include all the improvements in the TSM/TDM Alternative, with the exception of Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard).

As a result, these Build Alternatives would include the effects of the improvements in the TSM/TDM Alternative with the exception of the individual improvements noted above. Therefore, all impacts discussed as part of the TSM/TDM Alternative would also apply to the other three Build Alternatives.

4.2.1 Aesthetics

I. AESTHETICS: **Would the project:**	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Have a substantial adverse effect on a scenic vista?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	No impact	No impact	No impact	No impact
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	Less than significant impact	Less than significant impact	Potentially significant impact	Less than significant impact
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact

Discussion: As mentioned in Section 4.1, NEPA determines the impact of the proposed Build Alternative as a whole, and not per specific resources. The potential for the Build Alternatives to result in visual impacts was assessed in the *Visual Impact Assessment* (VIA) (2014). The results of this report are presented in Section 3.6, Visual/Aesthetics, of this EIR/EIS. The following discussion is based on that information, where applicable.

I(a). Scenic Vistas. As discussed in the VIA, distant views of the Verdugo Mountains, the San Gabriel Mountains, and the Santa Ana Mountains can be found within the project viewshed. However, the project viewshed is already highly developed with existing man-made elements such as street lights. Key View 21 and Key View 26 shows views to these mountains. Key View 21 would actually reveal more of the view to the mountains, while Key View 26 would have little to no encroachment into the view of the mountains. Because the Build Alternatives would place structures in already developed areas, impacts related to scenic vistas would be less than significant and no mitigation is required. The Build Alternatives would be similar in nature to the existing setting and there are no designated scenic vistas in the project study area. Therefore, no impacts to a scenic vista would result from the proposed Build Alternatives.

I(b). Scenic Resources. As discussed in the VIA, a State Scenic Highway is any freeway, highway, road, or other public right of way (ROW) designated by Caltrans that traverses an area of exceptional scenic quality. Suitability for designation as a State Scenic Highway is based on the visual concepts of vividness, intactness, and unity. None of the freeways or roads in the proposed project's viewshed are designated as State Scenic Highways. Therefore, the Build Alternatives would not result in impacts to scenic resources within a State Scenic Highway.

Noise barriers have been proposed as preliminary noise abatement measures. These barriers may be optional and determined during the public input process. Therefore, the barrier impacts were assessed separately from the other potential visual effects of the Build Alternatives. In general, these noise barriers would be out of scale with the neighboring residences and commercial businesses. They would entirely eliminate and/or partially obscure views and sunlight. In several cases, these barriers would replace 5- to 6-foot (ft) tall wood or chainlink property line fences, or screening vegetation adjacent to residences, with up to 20 ft tall concrete walls. These would be drastic changes in visual quality and character, but for a relatively small number of viewers. The Build Alternatives would not result in impacts related to scenic resources within a state scenic highway.

I(c). Visual Character and Quality. As discussed in Section 3.6, Visual/Aesthetics, short-term visual impacts would occur to sensitive viewers during the construction period. Overall, construction activities would be temporary and the visual impacts related to construction activities would cease after completion of construction. Therefore, construction impacts would be less than significant and no mitigation is required.

The TSM/TDM Alternative involves only minor improvements to existing roads and intersections without substantive changes in physical facilities or views to/from those improvements. In addition, due to the low-profile (ground-level) nature of these improvements and the low perspective of potential viewers, permanent visual impacts associated with the TSM/TDM Alternative would be minimal.

The BRT Alternative includes new dedicated bus lanes that would generally be created within the existing street ROW. Buses would share existing lanes with other traffic in cases where there is not sufficient ROW to accommodate a dedicated bus lane. The BRT Alternative also includes BRT stations, some of which would be combined with existing stops. However, these stations would be small shelters with seating and signage that would create only minimal visual impacts.

The Freeway Tunnel Alternative would result in visual impacts only in areas where tunnel entrances and exits are visible. For example, the area near northbound SR 710 north of Paseo Rancho Castilla in the City of Alhambra would experience a decrease in visual quality with the view of the entrance tunnels. Since single-bore tunnels would create smaller openings, the single-bore design variation of the Freeway Tunnel Alternative would lessen the impact of these changes.

The LRT Alternative would include a passenger rail that is operated along a dedicated guideway, similar to other Los Angeles County Metropolitan Transportation Authority (Metro) light rail lines. The LRT Alternative alignment is approximately 7.5 miles (mi) long, with 3 mi of aerial segments and 4.5 mi of bored tunnel segments. The LRT Alternative would result in a significant visual impact since the majority of the alignment in East Los Angeles, Monterey Park, and Alhambra is above ground and visible to the communities.

As specified in Measures V-1 through V-7, design features would be incorporated into the Build Alternatives to reduce visual impacts. With implementation of these measures, the visual impacts of the TSM/TDM, BRT, and Freeway Tunnel Alternatives would be less than significant. Although it is anticipated that, to the extent feasible, the new features constructed as part of these projects would be visually compatible with the surrounding areas, the LRT Alternative would still result in a large visual change to the area, and visual impacts would remain significant and unavoidable after mitigation. Generally, the TSM/TDM, BRT and Freeway Tunnel Alternatives would be consistent with the visual landscape and character of the surrounding area. Therefore, no impacts to existing visual character or quality would result from these Build Alternatives. If any of the impacts lower any of the three criteria ratings (i.e., vividness, intactness and unity), then avoidance and minimization measures would be implemented.

I(d). Light and Glare. As discussed in Section 3.6, Visual/Aesthetics, the TSM/TDM Alternative would include features to minimize light spillage onto adjacent land uses. Glare impacts associated with the TSM/TDM Alternative would be negligible. Changes in the timing and duration of the traffic control cycles would not noticeably create or lessen glare. In addition, glare from new automotive traffic on new roads would be dissipated by means of distance from source to viewer.

The BRT Alternative would slightly increase vehicle lights along the bus route, although this would represent only a very minor increase in lighting along those routes. Glare impacts associated with the BRT Alternative would be negligible because vehicles operating along the bus routes would be similar to the existing vehicles on those routes. The BRT Alternative bus stops would have shielded lighting to direct glare away from the surrounding land uses.

In the LRT Alternative, traffic light fixtures installed along the elevated LRT facility would add increased night lighting to some surrounding neighborhoods. The effects of this new light would be reduced based on the use of light control appliances on the light fixtures. Glare from the elevated segment of the LRT Alternative would be minimized by the distance of the viewer from the LRT vehicles and through the implementation of various screening and use of light shields on the new light fixtures.

With the headlights of automobiles traveling at a horizontal line of sight, it is anticipated that the vehicle light under the Freeway Tunnel Alternative would not impact the surrounding land uses. In addition, the new light fixtures in the Freeway Tunnel Alternative would be placed at a far enough distance from the surrounding neighborhoods that they would result in no impacts. The new non-tunnel segments of the Freeway Tunnel Alternative would be built below the existing grade level that leads to the tunnel portals; therefore, vehicle headlight glare would be minimal. In addition, light fixtures will be designed to direct light onto the freeway facilities and away from adjacent land uses.

For the reasons discussed above, the impacts of the Build Alternatives related to light and glare would be less than significant, and no mitigation is required.

4.2.2 Agriculture and Forest Resources

II. AGRICULTURE AND FOREST RESOURCES: Would the project:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	No impact	No impact	No impact	No impact
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	No impact	No impact	No impact	No impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	No impact	No impact	No impact	No impact
d) Result in the loss of forest land or conversion of forest land to non-forest use?	No impact	No impact	No impact	No impact
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	No impact	No impact	No impact	No impact

II(a)–(e). Farmlands and Timberlands. As discussed in Chapter 3, the study area does not include any farmlands or timberlands. Therefore, the Build Alternatives would not result in any impacts related to agricultural or timberland resources.

4.2.3 Air Quality

III. AIR QUALITY: Would the project:	TSM/TDM	BRT	LRT	Freeway Tunnel
a) Conflict with or obstruct implementation of the applicable air quality plan?	Less than significant impact	Less than significant impact	Less than significant impact	No impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
d) Expose sensitive receptors to substantial pollutant concentrations?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
e) Create objectionable odors affecting a substantial number of people?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact

Discussion: The potential for the Build Alternatives to result in air quality impacts was assessed in the *Air Quality Assessment Report* (2014) and *Supplemental Air Quality Assessment Report* (2018). The results of these reports are presented in Section 3.13, Air Quality, of this EIR/EIS. The following discussion is based on that information, where applicable.

III(a). Conflict with Air Quality Plans. As discussed in Sections 3.1, Land Use, and 3.13, Air Quality, the TSM/TDM Alternative (Preferred Alternative), is included in the financially constrained 2017 FTIP, Amendment 17-19, which was determined to conform to applicable SIP by FHWA and FTA on May 25, 2018. . Therefore, the TSM/TDM Alternative would not conflict with or obstruct implementation of the air quality plans. No mitigation is required.

III(b). Violation of Air Quality Standards. The study area is in nonattainment for the following criteria pollutants under California Ambient Air Quality Standards (CAAQS): ozone (O_3), particulate matter less than 2.5 microns in size ($PM_{2.5}$), nitrogen dioxide (NO_2), and lead. The area is in nonattainment for ozone and $PM_{2.5}$ under National Ambient Air Quality Standards (NAAQS), and is in maintenance for CO and particulate matter less than 10 microns in size (PM_{10}). As discussed in Section 3.13, Air Quality, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other construction activity emissions from construction equipment, which would include carbon monoxide (CO), nitrogen oxides (NO_X), volatile organic compounds (VOCs), directly emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants (TACs) such as diesel particulate matter (DPM). The project will comply with SCAQMD rules to minimize temporary emissions during project construction. Implementation of Measures AQ-1 through AQ-5 would further reduce construction-related air quality impacts from fugitive dust and construction equipment emissions.

As discussed in Section 3.13, Air Quality, it was determined that the Build Alternatives would not result in any exceedance of the 1-hour or 8-hour CO standards. EPA's vehicle and fuel regulations, coupled with fleet turnover, would result in substantial reductions over time that would cause regionwide air pollutants emission levels to be lower than they are today. As a result, the 2025 criteria pollutant emissions for the No Build, TSM/TDM, BRT, and LRT Alternatives, and all the Freeway Tunnel Alternative design variations would be lower than the existing conditions. The TSM/TDM Alternative has been identified as the Preferred Alternative. The TSM/TDM Alternative would improve traffic conditions and would have minimal effects on traffic volumes in the study area; therefore, the project would not delay attainment of or cause an exceedance of the NAAQS and CAAQS.

The Build Alternatives would have lower MSAT emissions within the project study area in comparison to existing conditions. The Build Alternatives would result in a small decrease in localized MSAT emissions in comparison to the No Build Alternative, and MSAT emissions would be expected to decrease from other roadways in the area due to the redistribution of vehicle traffic and improved travel efficiency. Therefore, based on the analysis above, impacts related to violations of air quality standards would be less than significant, and no mitigation is required.

III(c). Cumulative Increase in Criteria Pollutants in Nonattainment Areas. The study area is in nonattainment for O_3, $PM_{2.5}$, PM_{10}, NO_2, and lead for the CAAQS, and in nonattainment for O_3 and $PM_{2.5}$ for the NAAQS. Project impacts related to criteria pollutants are discussed above in III(b). As discussed in Section 3.24, Cumulative Impacts, nine of the cumulative projects would have a temporary substantial and unavoidable impact related to air quality during construction. Three of these nine projects—the Regional Connector Transit Corridor, Devil's Gate Reservoir Sediment Removal, and 100 West Walnut Planned Development projects—could be constructed concurrently with the SR 710 North Project. The project would comply with the state and local regulations to minimize equipment exhaust and dust emissions during construction. Implementation of Measures AQ-1 through AQ-5 would further reduce construction-related air quality impacts from fugitive dust emissions and construction equipment emissions of the Build Alternatives. Therefore, the Build Alternatives, in combination with these projects, would not contribute to a cumulatively significant temporary short-term air quality impact.

As discussed in Section 3.25, Cumulative Impacts, seven of the cumulative projects would contribute to a permanent adverse air quality impact. For the SR 710 North Project, the Build Alternatives would have an overall lower criteria pollutant emissions in comparison to the existing conditions. Therefore, cumulative air quality impacts related to criteria pollutant for which the project region is in nonattainment would be less than significant with construction of the Build Alternatives in combination with these projects. No mitigation is required.

III(d). Exposure of Sensitive Receptors to Substantial Pollutant Concentrations. The Build Alternatives are intended to improve efficiency of the regional freeway and transit networks and to reduce congestion on local arterials. Improved traffic conditions would increase vehicle travel speeds and, in general, reduce vehicle emissions in the area. As discussed above in III(b) and III(c) and based on the *Health Risk Assessment* (HRA) (2014) and *Supplemental Health Risk Assessment* (2018), the Build Alternatives would not result in a significant increase or significant cumulative increase in criteria pollutants that are in nonattainment. In addition, because vehicle emissions in the area would be lower than existing conditions, the Build Alternatives would result in overall reduced cancer and noncancer chronic and acute risks in the region.

The following is a summary of the results of the HRA. The detailed analysis is provided in the HRA.

The HRA was conducted to understand the localized and regional health risk impacts and benefits of the project. The 2012 existing condition was used as the baseline and compared the health risks of the No Build and Build Alternatives of the project to the health risks of the existing condition.

Cancer risks were evaluated starting at the project baseline of 2012 and extended to 2081. For informational purposes, cancer risks of 10 in 1 million were used as a reference level when evaluating potential health risks associated with the project.

Cancer Risks. The HRA indicated the project would result in substantial regional benefits that reduce health risks from exposure to MSATs in the majority of the study area. Compared to the 2012 existing condition, there would be a net benefit in the entire study area under the No Build Alternative and all the Build Alternatives.

The No Build Alternative and all the Build Alternatives would have lower cancer risks than the 2012 existing condition everywhere in the study area, including locations at the point of maximum impact (PMI), maximally exposed individual resident (MEIR), and maximally exposed individual worker (MEIW) receptors. There are no substantial differences between the incremental cancer risks of the Build and No Build Alternatives in comparison to existing conditions. The cancer risks would be approximately 5.4 in 1 million lower at the MEIR locations for the No Build and Build Alternatives and 0.4 in 1 million lower at the MEIW locations in comparison to existing conditions. The overall lower cancer risks of the Build and No Build Alternatives in comparison to the existing condition is consistent with the FHWA forecasted nationwide DPM emission decrease trend in future years attributed to the implementation of more stringent emission standards, the improvements in vehicle emission control technologies, and improved fuel efficiency regardless of the regional vehicle miles traveled (VMT) increase projected in future years.

The majority of the cancer risks near the freeways are attributed to DPM emissions from vehicle travel. Due to the installation of the PM control system in the tunnel ventilation system, vehicle emissions from the tunnel ventilation towers would contribute minimally to the cancer risks at the MEIR and MEIW locations.

Chronic and Acute Risks. The Hazard Index (HI), both chronic (HIC) and acute (HIA), for the No Build and all the Build Alternatives would be lower than the HIC and HIA for the existing condition.

Naturally Occurring Asbestos. The project is located in Los Angeles County (County), which is among the counties listed as containing serpentine and ultramafic rock. However, the portion of the County known to contain serpentine or ultramafic rock is limited to the island of Santa Catalina. Therefore, the impact from naturally occurring asbestos (NOA) during project construction would be minimal to none.

Based on the above analysis, impacts of the Build Alternatives related to exposure of sensitive receptors to substantial pollutant concentrations would be less than significant, and no mitigation is required.

III(e). Odors. As discussed in Section 3.13, Air Quality, some phases of construction of the Build Alternatives (particularly asphalt paving) would result in short-term odors in the immediate area of each paving site(s). Such odors would be quickly dispersed below detectable thresholds as distance from the site(s) increases. Therefore, impacts related to odors would be less than significant, and no mitigation is required.

4.2.4 Biological Resources

IV. BIOLOGICAL RESOURCES: Would the project:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	Less than significant impact	Less than significant impact	Less than significant impact with mitigation	Less than significant impact with mitigation
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	No impact	No impact	No impact	Less than significant with mitigation
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	No impact	No impact	No impact	Less than significant with mitigation
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	No impact	No impact	No impact	No impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	No impact	Less than significant with mitigation	Less than significant with mitigation	Less than significant with mitigation
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts to biological resources was assessed in the *Natural Environment Study* (NES) (2014), the *Jurisdictional Delineation Report: U.S. Army Corps of Engineers* (2014; Appendix I in the NES), and the *Jurisdictional Delineation Report: Agencies of the State of California* (2014, Appendix J in the NES). The results of these reports are presented in Sections 3.16 through 3.21 of this EIR/EIS. The following discussion is based on that information, where applicable.

IV(a). Candidate, Sensitive, and Special-Status Species.

Animal Species. Impacts to threatened, endangered, and special-status animal species are discussed in detail in Sections 3.19, Animal Species, and 3.20, Threatened and Endangered Species, specifically Table 3.19.2. As discussed in these sections and table, all four Build Alternatives would impact suitable habitat for the following special-status species: western spadefoot, San Bernardino ring-necked snake, monarch butterfly, Cooper's hawk, Allen's hummingbird, oak titmouse, Nuttall's woodpecker, and other bird species protected under the federal Migratory Bird Treaty Act (MBTA).

In addition, construction at bridges for the TSM/TDM and Freeway Tunnel Alternatives has the potential to impact bats. The TSM/TDM and Freeway Tunnel Alternatives are not anticipated to result in any direct permanent impacts on any known threatened, endangered, or special-status bat species due to the absence of roosting bat detections at the bridge proposed for demolition and/or widening. However, should bats begin utilizing the bridge, the TSM/TDM and Freeway Tunnel Alternatives would have the potential to result in temporary indirect impacts through the loss of roosting location and foraging habitat if nighttime construction occurs. In addition, construction at bridges also has the potential to impact bridge- and crevice-nesting birds. With implementation of Measures AS-1 (which requires preconstruction bat surveys) and AS-4 (which requires bridge work to occur outside the nesting season or preconstruction surveys), impacts to bats and bridge- and crevice-dwelling birds from construction of the TSM/TDM, LRT, and Freeway Tunnel Alternatives would be less than significant.

The LRT and Freeway Tunnel Alternatives would not result in indirect temporary noise and dust impacts during construction activities on potential nonbreeding riparian habitat for least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, yellow warbler, and yellow-breasted chat because the construction activities would be more than 850 ft from that potential non-breeding riparian habitat. As such, the riparian habitats are a sufficient distance from the construction activities that they wouldn't experience indirect effects greater than what currently exists as a result of the proximity of SR 134 and I-710.

Please refer to Section 3.19.4 to see detailed mitigation measures for each of the sensitive animal species with the potential to be impacted by the proposed Project which would be considered less than significant with implementation of Measures AS-1 through AS-4.

Plant Species. Impacts to threatened, endangered, and special-status plant species are discussed in Sections 3.18, Plant Species, and Section 3.20, Threatened and Endangered Species. As discussed in these sections, the TSM/TDM and BRT Alternatives would not result in direct impacts to threatened, endangered, and special-status plant species.

The LRT Alternative has the potential to result in indirect impacts to Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*) from construction noise, dust, lighting, litter, and vibration, as well as personnel and vehicle activities outside designated areas. Measure PS-1 requires that disturbance of this population be avoided to the greatest extent possible during final design. Prior to any construction or ground-disturbing activities near the population, the Resident Engineer will require the construction contractor to plan a highly visible barrier such as Environmentally Sensitive Area (ESA) fencing or other marker near or around any part of the population that will not be directly impacted to avoid effects on that part of the population. No access or work will be authorized within the ESA. With implementation of Measure PS-1, impacts to Coulter's goldfields under the LRT Alternative would be less than significant under CEQA.

The Freeway Tunnel Alternative has the potential to have a permanent impact on a population of Coulter's goldfields. Measure PS-2 requires this population to be avoided to the maximum extent practicable. However, should the removal of this population of Coulter's goldfields be necessary, coordination with the California Department of Fish and Wildlife (CDFW) would take place to ensure appropriate mitigation actions are taken. With implementation of Measure PS-2, impacts to Coulter's goldfields would be less than significant.

The Freeway Tunnel Alternative has the potential to have a permanent impact on one Southern California black walnut (*Juglans californica*) individual through disturbance of the tree. Measure PS-3 requires that this tree be avoided to the maximum extent practicable. However, should the removal of this Southern California black walnut individual be necessary, coordination with CDFW would take place to ensure appropriate mitigation actions are required and to ensure that such actions are carried out. With implementation of Measure PS-3, impacts to Southern California black walnut would be less than significant. No further mitigation is required.

IV(b). Riparian Habitat and Natural Communities. As discussed in Section 3.16, Natural Communities, there are no sensitive natural communities within the construction impact zone of the TSM/TDM, BRT, and LRT Alternatives. Therefore, the TSM/TDM, LRT, and BRT Alternatives would not result in direct temporary or permanent impacts to natural plant communities or riparian habitat. The LRT Alternative would potentially result in temporary indirect impacts on riparian habitat that could include construction noise dust, lighting, litter and vibration. Measures NC-1 through NC-3 require the establishment and monitoring of Environmentally Sensitive Areas (ESAs) to exclude construction activities and staging from the riparian and riverine habitat areas. As described in Measures NC-1 through NC-3, the ESA would be fenced off from grading and construction areas, and non-sensitive upland habitat would be used to store and maintain equipment. These measures limit the indirect effects of construction activities on riparian habitat. With implementation of these measures, the potential indirect impacts of the LRT Alternative on riparian and riverine habitats would be reduced to a less than significant level under CEQA.

The Freeway Tunnel Alternative single-bore and dual-bore design variations would result in temporary and permanent impacts to riparian and/or riverine habitats as a result of the disturbance and/or removal of existing wetland vegetation. Measures NC-1 through NC-3 require establishment and monitoring of Environmentally Sensitive Areas (ESAs) to exclude construction activities and staging from the riparian and riverine areas. In addition, Measures WET-1 through WET-3 requires compensatory mitigation for impacts to waters and habitats. With implementation of Measures NC-1 through NC-3, WET-1 through WET-3, and IS-1, impacts of the Freeway Tunnel Alternative to riparian habitat or sensitive natural communities would be reduced to a less than significant level.

IV(c). Wetlands. As discussed in Section 3.17, Wetlands and Other Waters, there are no wetlands or other jurisdictional waters within the construction impact zone of the TSM/TDM, BRT, and LRT Alternatives. Therefore, the TSM/TDM, BRT, and LRT Alternatives would not result in direct temporary or permanent impacts to CDFW, United States Army Corps of Engineers (USACE), or Regional Water Quality Control Board (RWQCB) jurisdiction. No mitigation is required.

The Freeway Tunnel Alternative single-bore and dual-bore design variations would result in temporary and permanent impacts to CDFW, USACE, or RWQCB nonwetland waters. Measure WET-1 requires a Dredge and Fill Permit to be obtained from the USACE and compensatory mitigation for impacts to USACE jurisdiction. Measures WET-2 and WET-3 require a Streambed Alteration Agreement and Section 401 Water Quality Certification to be obtained from the CDFW and RWQCB. With implementation of Measures WET-1 through WET-3, impacts of the Freeway Tunnel Alternative to nonwetland and other waters would be reduced to a less than significant level.

IV(d). Migratory Corridors. As discussed in Sections 3.16 (Natural Communities), 3.19 (Animal Species), and 3.20 (Threatened and Endangered Species), there are no known migratory fish, migration corridors, or wildlife linkages within the BSA. Therefore, the Build Alternatives would not result in impacts related to migratory corridors. No mitigation is required.

IV(e). Tree Ordinances. As discussed in the NES (2014) prepared for the project, in accordance with the Los Angeles County Oak Tree Ordinance, any project work that occurs in unincorporated Los Angeles County outside of Caltrans ROW within 5 ft of the dripline of a protected oak tree whose diameter is at least 8 inches at 4.5 ft above natural grade or a multi-trunk oak tree with a combined diameter of 12 inches, or within 15 ft from the trunk of the oak, whichever distance is greater, constitutes an impact to the oak tree. Additional trees outside of Caltrans ROW and within the

Biological Study Area (BSA) that are not covered under the Los Angeles County Oak Tree Ordinance are protected under individual city ordinances.

The TSM/TDM Alternative would not impact any trees protected by the County or city ordinances.

The BRT Alternative would potentially result in the removal of approximately 136 trees protected by local tree ordinances. The LRT Alternative would result in temporary impacts to approximately 8 trees and result in the permanent removal of approximately 21 trees protected by various local tree ordinances. The Freeway Tunnel Alternative single-bore and dual-bore design variations would result in temporary impacts to approximately 36 trees that are protected by the City's trees and tree protection ordinance. The single-bore and dual-bore design variations would each result in the removal of approximately 84 trees protected by local tree ordinances. Measure PS-4, which is discussed in Section 4.4, requires ESA fencing to be placed around protected oak trees, as feasible. If this is not feasible, an Oak Tree Permit will be obtained from the Los Angeles County Forester and Fire Warden. The project would comply with any compensatory mitigation required by the agency with jurisdiction over the impacted tree. With implementation of Measure PS-4, impacts related to tree protection ordinances for the BRT, LRT, and Freeway Tunnel Alternatives would be reduced to a less than significant level.

IV(f). Habitat Conservation Plans. The study area is within areas that are largely developed and is not located within a Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or any other approved local, regional, or State HCP. Therefore, the Build Alternatives would not conflict with any biological resource habitat plans. No mitigation is required.

4.2.5 Cultural Resources

V. CULTURAL RESOURCES: Would the project:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	Potentially significant impact	Potentially significant impact	Potentially significant impact	Potentially significant impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	Less than significant with mitigation	Less than significant with mitigation	Less than significant with mitigation	Less than significant with mitigation
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Less than significant with mitigation	Less than significant with mitigation	Potentially significant impact	Potentially significant impact
d) Disturb any human remains, including those interred outside of formal cemeteries?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact

Discussion: Cultural resources in the Area of Potential Effects (APE) were identified in the *Historic Property Survey Report* (HPSR) (2014), which includes the *Historical Resources Evaluation Report* (HRER) (2014), the *Archaeological Survey Report* (ASR) (2014), and the *Supplemental Historic Property Survey Report* (SHPSR) (2017). The potential effects of the Build Alternatives on National Register of Historic Places (National Register) listed and eligible historic properties, historical resources under CEQA, and conditions to address those effects are documented in the *Finding of Adverse Effect for the State Route 710 North Project* (FOAE) (2017). The potential for the SR 710 North Project Build Alternatives to affect historical resources is summarized in this section.

Paleontological resources were identified and potential effects of the Build Alternatives evaluated in the *Paleontological Identification and Evaluation Report* (PIR/PER) (2014).

The results of these reports are presented in Sections 3.7, Cultural Resources, and 3.11, Paleontology, of this EIR/EIS. The following discussion is based on that information, where applicable.

V(a). Historical Resources. The HPSR and the SHPSR identified 84 properties in the Area of Potential Effects (APE) that were determined to be historical resources for the purposes of CEQA because they meet the California Register of Historical Resources criteria and/or are locally designated under a local government ordinance or were identified as significant in a survey that meets the Office of Historic Preservation standards. This includes National Register-listed and eligible historic properties, and California Register-listed and eligible historical resources, California Register-listed or eligible resources per State Historical Resources Commission determination resources, resources identified as significant in surveys that meet Office of Historic Preservation standards, or resources that are designated landmarks under local ordinances.

In accordance with CEQA, Caltrans has analyzed the potential impacts of the Build Alternatives on the 84 historical resources located within the APE and, as summarized below, determined that 40 of those historical resources will not be impacted by the Build Alternatives. In addition to the mitigation measures listed below, Section 3.7 includes avoidance and minimization measures that would be implemented to historical resources as appropriate. In addition, Measures CUL-1 (Pre-Construction Surveys) and CUL-13 (Post-Construction Building Surveys) would apply to all historical resources impacted by the project, excluding archaeological sites (Horatio Rust Site and Otsungna Village Site).

Caltrans further determined that the construction and operation of the TSM/TDM Alternative would:

- Cause a significant impact to the following historical resource: the Arroyo Seco Parkway Historic District. Impacts would remain significant after mitigation (Measures CUL-2 [Arroyo Seco Parkway Historic District) and CUL-12 [Property-Specific Protection Plans]);
- Cause a less than significant impact to the following historical resources: Rialto Theatre, Fair Hope Building, Markham Place Historic District, Neighborhood Church/Sequoyah School, Ambassador West Cultural Landscape Historic District, Ambassador College Dining Hall, Ambassador Auditorium Performing Arts Center, Route 66; and
- Not impact one historical resource: the San Marino Municipal Building.

Caltrans also determined that the BRT Alternative would:

- Cause a significant impact on the following historical resources: Arroyo Seco Parkway Historic District (due to the TSM/TDM component of the BRT Alternative). Impacts would remain significant after mitigation (Measures CUL-2 [Arroyo Seco Parkway Historic District] and CUL-12 [Property-Specific Protection Plans]);
- Cause a significant impact that could be reduced to a less than significant level with mitigation incorporated on the following historical resources: Jardin del Encanto and Cascades Park (Measure CUL-3 [Jardin Del Encanto and Cascades Park – SOIS Plan]), Dr. Henry K. Kawamoto Office Building, Rialto Theatre, Fair Hope Building, Oaklawn Historic District, Oaklawn Bridge and

Waiting Station, the Old Pasadena Historic District, Substation No. 2 PERC (Measure CUL-6 [Vibratory Effects of Demolition]), and the Horatio Rust Site (Measure CUL-14 [Post-Review Discovery and Monitoring Plan]);

- Cause a less than significant impact to the following historical resources: Golden Gate Theater, Saint Alphonsus Church, South Pasadena Middle School, Community Facilities Planners Building, War Memorial Building, Raymond Hill Waiting Station, Glenarm Building and Electric Fountain (counted as one historical resource), and Route 66; and
- Not impact one historical resource: the Bekins Storage Company Roof Sign.

Caltrans also determined that the LRT Alternative would:

- Cause a significant impact to two historical resources: the Maravilla Handball Court and El Centro Grocery, and the Arroyo Seco Parkway Historic District (due to the TSM/TDM component of the LRT Alternative). Impacts would remain significant after mitigation (Measures CUL-2 [Arroyo Seco Parkway Historic District], CUL-9 [Indirect Visual Effects Maravilla Handball Court and El Centro Grocery], and CUL-12 [Property-Specific Protection Plans]);
- Cause a significant impact that could be reduced to a less than significant level with mitigation incorporated to the following historical resources: Rialto Theatre and 100 North Fremont Avenue (Measure CUL-11 [Groundborne Noise Effects – 100 North Fremont and Rialto Theatre]), the Raymond Florist Historic District (Measures CUL-4 [Settlement Monitoring Plan], CUL-5 [SOIS Plan – Settlement], CUL-7 [Vibration Management and Monitoring Plan – Raymond Florist Historic District], and CUL-8 [SOIS Plan – Raymond Florist Historic District]), and the Otsungna Village Site (Measure CUL-14 [Post-Review Discovery and Monitoring Plan]);
- Cause a less than significant impact to the following historical resources: Edward R. Roybal Comprehensive Health Center, 4777 East Cesar E. Chavez Avenue, 2020 Fremont Avenue, South Pasadena Middle School, Community Facilities Planners Building, Fair Hope Building, Oaklawn Historic District, Oaklawn Bridge and Waiting Station (counted as one historical resource), War Memorial Building, Raymond Hill Waiting Station, Glenarm Building and Electric Fountain (counted as one historical resource), Hospital Veterinary, Route 66, Substation No. 2 PERC; and
- Not impact one historical resource: the Horatio Rust Site.

Caltrans also determined that the Freeway Tunnel Alternative would:

- Cause a significant impact on the following historical resources: Markham Place Historic District, Caroline Walkley House and Small Apartment, Driscoll House, the Neighborhood Church/ Sequoyah School, and the Arroyo Seco Parkway Historic District (due to the TSM/TDM component of the Freeway Tunnel Alternative). Impacts would remain significant after mitigation (Measures CUL-2 [Arroyo Seco Parkway Historic District], CUL-4 [Settlement Monitoring Plan], CUL-5 [SOIS Plan – Settlement], and CUL-12 [Property-Specific Protection Plans]);
- Cause a significant impact that could be reduced to a less than significant level with mitigation incorporated to the following historical resources: 801 South Pasadena Avenue, Tompkins House, Page House, Miss Markham House, Caroline Walkley/Alice and Robert Wood House (dual-bore design variation only), 206-216 West California Boulevard, and the Old Pasadena Historic District (Measures CUL-4 [Settlement Monitoring Plan] and CUL-5 [SOIS Plan – Settlement]);

- Cause a less than significant impact to the following historical resources: Pasadena Avenue Historic District, Hurlbut Street Fire Station No. 5, Reverend Hiram Hill/Alonzo Beal House, Ambassador West Cultural Landscape Historic District, Ambassador College Dining Hall, Ambassador Auditorium Performing Arts Center, and the Colorado Street Auto Row; and
- Not impact 41 historical resources (i.e., 30 that are included in Appendix E of the FOAE, 9 that are included in Appendix F of the FOAE, Route 66, and the Horatio Rust Site.

The HPSR also identified and evaluated 710 properties that were determined not to be historical resources for the purposes of CEQA. Because these resources do not meet the California Register of Historical Resources criteria and/or are locally designated under a local government ordinance or identified as significant in a survey that meets the Office of Historic Preservation standards, they are not considered significant under CEQA. No further analysis of these properties is required.

Potential impacts to unknown historical resources encountered during construction would be avoided and/or minimized through compliance with the measures provided in Section 3.7.4 and are considered less than significant.

V(b). Archaeological Resources. As discussed in Section 3.7, Cultural Resources, no archaeological resources are documented in the APE. However, based on ethnographic accounts and archival research, there is potential for archaeological resources to be present in native soils at two sites (the Otsungna Village Site and the Horatio Rust Site) in the APE. These two archaeological sites have been assumed eligible for the National Register for this project only. As they have been assumed eligible for the National Register they are also considered eligible for the California Register, for the purposes of this project only. Improvements proposed under the LRT and Freeway Tunnel Alternatives may occur within the boundaries of the Otsungna and Horatio Rust sites. Although it is not likely that the proposed improvements would result in physical destruction or damage to these resources, the potential exists to alter or damage character-defining features that qualify these properties for inclusion in the National Register. With implementation of the Post-Review Discovery and Monitoring Plan (PRDMP) described in Section 3.7.4, potential effects to these two sites would be avoided and/or minimized and are considered less than significant. The PRDMP will guide archaeological monitoring and data recovery for any work conducted within the construction areas of the LRT and Freeway Tunnel Alternatives.

In addition, there is potential for previously undocumented archaeological materials to be unearthed during site preparation, grading, or excavation. Because there are no Native American sacred sites/traditional cultural properties identified in the APE, the construction and operation of the Build Alternatives would not impact those types of resources. However, as noted in Section 3.7, several Native American Tribal representatives have indicated the overall study area is sensitive for cultural resources. As specified in Section 3.7.4, if cultural materials are discovered during ground disturbance and earthmoving, construction activities would halt in the vicinity of the find until a qualified archaeologist can assess the nature and significance of the find. As specified in the PRDMP, experienced and certified Native American monitors would be on site during all ground-disturbing and earthmoving activities in areas identified as sensitive for cultural resources.

With implementation of the measures cited above, impacts to known and unknown archaeological resources would be less than significant. No further mitigation is required.

V(c). Paleontological Resources. As discussed in Section 3.11, Paleontology, the TSM/TDM and BRT Alternatives involve relatively minor ground disturbance. Most of the area within the TSM/TDM and BRT Alternatives has been previously disturbed for the existing roads, sidewalks, and landscaping and is likely underlain by some amount of Artificial Fill. During excavation and grading for the TSM/TDM or BRT Alternatives, fossils would be able to be recovered.

The LRT and Freeway Tunnel Alternatives include bored tunnel sections that would be excavated using a tunnel boring machine (TBM) that prevents access to the rock face and grinds the rock. The size of the pieces of rock recovered would vary from cobble size to small particles, depending on the specific type of boring machine used. During the tunnel boring, the amount of fossil recovery would depend on the type of equipment used. However, during excavation of the cut-and-cover tunnel, there would be more opportunity for the complete recovery of larger fossil specimens.

To reduce impacts to paleontological resources that may be present in the areas proposed for grading and excavation for the Build Alternatives, Measure PAL-1 in Section 3.11, Paleontology, requires the preparation during final design and implementation during construction of a detailed Paleontological Mitigation Plan (PMP) for the Freeway Tunnel Alternative or a Paleontological Resources Impact Mitigation Program (PRIMP) for the TSM/TDM, BRT, and LRT Alternatives. Measure PAL-1 requires monitoring during construction, collection of fossils, documentation and recording of the fossils, and curation of the fossils in a permanent repository. Measure PAL-1 requires preconstruction training for construction workers.

With implementation of PAL-1, fossils would be able to be recovered and impacts to paleontological resources from construction of the TSM/TDM and BRT Alternatives would be reduced to a less than significant level. However, even with implementation of Measure PAL-1, the loss of fossil remains and the fossil-bearing rocks from the tunnel boring would be a permanent, significant unavoidable impact of the LRT and Freeway Tunnel Alternatives based on the scientific significance of formations in the study area.

V(d). Human Remains. As discussed in Section 3.7, Cultural Resources, there are no documented locations of human remains in or adjacent to the disturbance limits of the Build Alternatives. However, as specified in Section 3.7.4, if human remains are discovered during construction of the Build Alternatives, State Health and Safety Code Section 7050.5 states that further disturbances and activities will cease in any nearby area suspected to overlie remains and the County Coroner will be contacted. Pursuant to Public Resources Code (PRC) Section 5097.98, if the remains are thought to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC), which will then notify the Most Likely Descendant (MLD). At that time, the Caltrans District 7 Environmental Branch Chief will be contacted so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable. With implementation of the measures provided in Section 3.7.4, impacts related to the discovery of human remains would be less than significant. No further mitigation is required.

4.2.6 Geology and Soils

VI. GEOLOGY AND SOILS: Would the project:	TSM/TDM	BRT	LRT	Freeway Tunnel
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
ii) Strong seismic ground shaking?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
iii) Seismic-related ground failure, including liquefaction?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
iv) Landslides?	No impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Result in substantial soil erosion or the loss of topsoil?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	No impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to geology and soils was assessed in the *Geologic Hazard Evaluation to Support Environmental Studies Documentation, State Route 710 (SR 710) North Study, Los Angeles County, California* (2014), and the *Preliminary Geotechnical Report, SR 710 North Study, Los Angeles County, California* (2014). The results of these reports are presented in Section 3.10, Geology/Soils/Seismic/Topography, of this EIR/EIS. The following discussion is based on that information, where applicable.

VI(a)(i). Rupture of a Known Earthquake Fault. As discussed in Section 3.10, Geology/Soils/Seismic/ Topography, the BRT, LRT, and Freeway Tunnel Alternatives cross the Raymond and San Rafael Faults. The Freeway Tunnel Alternative also crosses the Eagle Rock Fault. Within the study area, only the Raymond Fault is identified as an active fault under the Alquist-Priolo Earthquake Fault Zone, although the Eagle Rock Fault and San Rafael Fault are considered potentially active faults. Future studies may reveal that the San Rafael and Eagle Rock faults are inactive. However, for design purposes for the SR 710 North Project Build Alternatives, all three faults (i.e., the Raymond Fault, Eagle Rock Fault, and San Rafael Fault) are considered active. Typically, at-grade roadway improvements, are not protected against fault-induced ground rupture. If the roadway is damaged due to fault rupture, the damage is expected to be minor and easily repaired.

There is the potential for substantial effects due to fault rupture along the LRT and Freeway Tunnel Alternatives. Effects could include damage or collapse of the tunnel(s) where it crosses the fault. To minimize such damage, special design features must be incorporated to accommodate the anticipated ground offsets and minimize the impact of the potential fault rupture across the tunnel.

Metro Supplemental Seismic Design Criteria (Revision 5, 2013) will be used for the LRT. It uses "Important Transit Facility" for LRT classification. Two levels of seismic event, consisting of Maximum Design Earthquake (MDE) and Operating Design Earthquake (ODE), must be considered for LRT tunnel design in accordance with the Metro Supplemental Seismic Design Criteria. The MDE is defined as ground motion with a 2,500-year return period; the performance under the MDE event is as follows: No collapse and structures are allowed to behave in an inelastic manner. The ODE is defined as ground motion with a 150-year return period; the performance under the ODE event is as follows: tunnel remains serviceable; no interruption in rail service during or after ODE, and structures behave essentially elastic. The Metro MDE and ODE requirements would have to be satisfied for fault displacements that have an average return period of 2,500 years and 150 years, respectively.

An enlarged vault section with a robust lining system has been chosen as one viable preliminary design concept for the LRT Alternative fault crossing. Based on the anticipated fault offset, the LRT Alternative would require an oversized vault section be excavated in the fault zone after the completion of the bored tunnels. The vault section would require over-excavating the section of tunnel within the fault zone large enough so that a 36-inch-thick cast-in-place lining section could be constructed. The cast-in-place lining will be designed to accommodate the expected fault offsets. In this option, structural rings with circumferential joints between them are designed to allow slippage in the fault zone, and the enlarged cross section would accommodate the anticipated fault offset.

For this design phase to support the environmental documentation, the Freeway Tunnel Alternative uses the Caltrans seismic design criteria for an Ordinary Nonstandard facility. This facility classification is equivalent to Recovery Route classification. Two levels of seismic event, consisting of Safety Evaluation Earthquake (SEE) and Functional Evaluation Earthquake (FEE), should be considered for the Freeway Tunnel design. The SEE is defined as ground motion with a 1,000-year return period; the performance under the SEE event is as follows: minimal to moderate damage may occur, as long as moderate damage is confined to local areas; and the ductility of the tunnel should be between 2.5 and 3.0, similar to the ductility used in bridge capacity design. The FEE is defined as ground motion with a 100-year return period; the performance under FEE is to ensure that the tunnel is fully functional with minimal damage. The Caltrans SEE and FEE requirements would have to be satisfied for fault displacements that have an average return period of 1,000 years and 100 years, respectively.

The concept for the Freeway Tunnel Alternative at an active fault crossing would consist of installing high-strength steel segments with a thickness of 20 inches in the fault zone, as compared to the 30-inch-thick precast concrete segments used for the remainder of the bored tunnel. The difference in the thickness is large enough to accommodate both the horizontal and vertical components of the fault offset, whilst still providing a stronger section.

These requirements for the LRT and Freeway Tunnel Alternatives at the fault crossings would be satisfied via the implementation of Measures GEO-1, GEO-2, GEO-3, and GEO-4 and are considered less than significant. No mitigation is required.

VI(a)(ii). Strong Seismic Ground Shaking. Moderate to severe seismic shaking (an earthquake) may occur in the study area during the life of the improvements under the Build Alternatives. The potential to experience substantial seismic ground shaking is a common hazard for every project in Southern California, and the hazard cannot be avoided. Earthquakes can result in human loss or injury and loss or damage to structures.

For the LRT Alternative, all design work will be based on the latest version of the Los Angeles County Metropolitan Transportation Authority (Metro) Rail Design Criteria. The seismic design for the LRT Alternative will follow Metro's Supplemental SDC. The Metro Supplemental SDC also provides the performance requirements for LRT structures.

Earthquakes are prime considerations in the design and retrofit of structures. The Caltrans Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. Structures are designed using the Caltrans Seismic Design Criteria (SDC). The Caltrans SDC also provides the performance requirements for Freeway Tunnel Alternative structures.

In general, the Build Alternatives can be designed to accommodate the ground accelerations expected to occur along each Build Alternative's alignment through compliance with the applicable Caltrans, FHWA, Metro, and/or local jurisdiction seismic design standards for construction and operation of the Build Alternatives. Measures GEO-1, GEO-2, and GEO-3 would address potential impacts related to seismic shaking and impacts are considered less than significant. No mitigation is required.

VI(a)(iii). Seismic-Related Ground Failure, Including Liquefaction. As shown on Figure 3.10-4 in Section 3.10, Geology/Soils/Seismic/Topography, parts of the TSM/TDM, LRT, and Freeway Tunnel Alternatives are located within mapped Liquefaction Hazard Zones. Liquefaction Hazard Zones have either experienced liquefaction during historical times or are in areas where local geologic conditions indicate a potential for liquefaction. Therefore, these Build Alternatives may be more susceptible to seismic-related ground failure than the BRT Alternative.

The occurrence of liquefaction could lead to loss of foundation support, reduction in lateral support of deep foundations, flow and lateral spreading, and liquefaction-induced settlement. Where these mechanisms could result in unacceptable soil or structural response, ground improvements such as dynamic compaction, stone columns, jet grouting, cement deep soil mixing, and compaction grouting, among others, would reduce the potential for liquefaction induced settlement to levels acceptable to the owning agency of the selected alternative.

Areas most susceptible to seismically induced settlement would generally be similar to Liquefaction Hazard Zones, but would include the sediments above the groundwater table. Seismic settlement remediation would be similar to that indicated above for liquefaction. If the problematic soils are near the ground surface, removal and recompaction of the soils can also be considered.

Similar to control of excessive seismic ground shaking, compliance with applicable building and seismic design standards, combined with Measures GEO-1 and GEO-2, would address impacts related to seismically-induced ground failure and liquefaction and these impacts are considered less than significant. No mitigation is required.

VI(a)(iv). Landslides. As shown on Figure 3.10-4, in Section 3.10, Geology and Soils, parts of the BRT, LRT, and Freeway Tunnel Alternatives alignments are within Landslide Hazard Zones. Therefore, there is a potential for substantial Adverse Effects related to landslides (both seismically and statically triggered) in areas within or adjacent to these zones. Therefore, these Build Alternatives are more susceptible to seismically induced landsliding than the TSM/TDM Alternative.

There are numerous geotechnical methods available to address this hazard. These methods can include the construction of buttress fills or shear keys, drainage systems, and the installation of deep foundations or retaining wall systems, among others.

Similar to control of excessive seismic ground shaking and ground failure, compliance with applicable building and seismic design standards, when combined with Measures GEO-1 and GEO-2, potential impacts related to landslides are considered less than significant l. No mitigation is required.

VI(b). Soil Erosion or Loss of Topsoil. The surficial soils present along the alignments of the Build Alternatives have a moderate susceptibility to erosion. Construction of the Build Alternatives would result in ground surface disturbance during site clearance, excavation, and grading, which could create the potential for soil erosion to occur. Site preparation may require removal of vegetation, any unsuitable fill, and asphalt and concrete paving, exposing pervious surfaces to erosion by wind, rain and runoff. Since the area of the Build Alternatives is primarily developed and the native ground surface has been disturbed by human activities, an intact topsoil layer is not expected to be present.

Soil erosion can be successfully controlled by implementing engineered designs developed in accordance with standard Best Management Practices (BMPs) to reduce storm water flows and scour. Please see Section 4.2.9, Item XI(c) regarding erosion control measures for the Build Alternatives.

VI(c) and (d). Unstable Soils or Geologic Unit and Expansive Soils. Parts of all of the Build Alternatives overlie alluvial soils which may be prone to expansion, settlement and collapse.

Soil collapse or settlement can result in differential movement beneath foundations potentially causing structural distress. Detrimental ground settlement from new structures or earth loads can be alleviated by removal and replacement of the settlement- or collapse-prone soils, implementation of ground improvement methods (similar to those methods indicated for liquefaction (see item VI(a)(iii) of this Section), and structural support systems.

Ground settlement also can occur as a result of ground loss during deep excavations, such as tunneling. Construction of a tunnel utilizing a pressurized-face TBM would actively control ground loss at the tunnel heading during construction. In addition, systematic ground improvement measures on a localized basis could be implemented, including a combination of dewatering, permeation grouting, or jet grouting to stabilize the deposits and reduce the loss of ground.

Geotechnical design recommendations for expansive material typically consists of removal and replacement with non-expansive soils, utilizing chemical treatment, or designing the proposed improvements to be able to withstand the shrink-swell forces anticipated based on the expansion potential of the material.

Subsidence is not considered a geologic hazard for the Build Alternatives. With compliance with applicable building and seismic design standards, when combined with Measures GEO-1, GEO-2, GEO-3 and GEO-4, potential impacts related to unstable soils or geologic units are considered less than significant. No mitigation is required.

VI(e). Septic Tanks or Alternative Wastewater Disposal Systems. No septic tanks or alternative wastewater disposal systems are included in the Build Alternatives, and soil issues related to these facilities would not be encountered. Therefore, the Build Alternatives would not result in impacts related to alternative wastewater disposal and soils. No mitigation is required.

4.2.7 Greenhouse Gas Emissions

VII. GREENHOUSE GAS EMISSIONS: Would the project:	
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Caltrans has used the best available information based to the extent possible on scientific and factual information, to describe, calculate, or estimate the amount of greenhouse gas emissions that may occur related to this project. The analysis included in the climate change section of this document provides the public and decision-makers as much information about the project as possible. It is Caltrans' determination that in the absence of statewide-adopted thresholds or GHG emissions limits, it is too speculative to make a significance determination regarding an individual project's direct and indirect impacts with respect to global climate change. Caltrans remains committed to implementing measures to reduce the potential effects of the project. These measures are outlined in the climate change section that follows the CEQA checklist and related discussions.
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	

Discussion: For a detailed discussion of greenhouse gas (GHG) emissions, refer to Section 4.3, Climate Change.

4.2.8 Hazards and Hazardous Materials

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less than significant impact with mitigation	Less than significant impact with mitigation	Less than significant impact with mitigation	Less than significant impact with mitigation
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Less than significant impact with mitigation	Less than significant impact with mitigation	Less than significant impact with mitigation	Less than significant impact with mitigation
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	No impact	No impact	No impact	No impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	Less than significant impact with mitigation	Less than significant impact with mitigation	Less than significant impact with mitigation	Less than significant impact with mitigation
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	No impact	No impact	No impact	No impact
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	No impact	No impact	No impact	No impact
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	Less than significant impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to hazardous waste and hazardous materials was assessed in the *Initial Site Assessment* (ISA) (2014). The results of this report are presented in Section 3.12, Hazardous Waste/Materials, of this EIR/EIS. The following discussion is based on that information, where applicable.

VIII(a), (b), and (d). Routine Transport, Use, or Disposal of Hazardous Materials, Upset or Accident Conditions, and Government Code Section 65962.5 Sites. As discussed in Section 3.12, Hazardous Waste/Materials, during construction, there is the potential to encounter hazardous materials in the soils and existing road materials. The majority of the proposed improvements under the TSM/TDM and BRT Alternatives do not involve substantial ground-disturbing activities during construction; therefore, potential hazardous materials impacts would be less than those associated with the LRT or Freeway Tunnel Alternatives. The Build Alternatives would involve disturbance of soils and demolition of existing buildings and structures; therefore, hazardous soil contaminants (such as aerially deposited lead [ADL]) and structural materials (e.g., polychlorinated biphenyls [PCBs], creosote and other wood-treating chemicals, lead chromate, lead-based paint [LBP], and asbestos-containing materials [ACMs]) may be encountered during construction. In addition, soil and/or groundwater impacted by petroleum hydrocarbons, halogenated compounds, or other hazardous materials could be encountered at the properties that would be partially or fully acquired for the Build Alternatives. The LRT and Freeway Tunnel Alternatives have the potential to be impacted by methane (CH_4) in subsurface soils.

Measures HW-1 through HW-6 and HW-10 include the standard regulatory procedures to be followed when handling and disposing of hazardous waste found on properties. Measure HW-7 requires additional site investigations for the properties within the alignments of the Build Alternatives that have a history of hazardous waste, listed pursuant to Government Code Section 65962.5, or are otherwise a recognized environmental concern. The results of the investigations will determine the steps to be followed with respect to handling and disposal of hazardous waste on these properties prior to project disturbance in these areas, consistent with local, State, and federal regulations. Adherence to regulatory requirements and Measure HW-7 would avoid substantial impacts related to transport, use, or disposal of hazardous materials.

Typical hazardous materials used during construction (e.g., solvents, paints, fuels) would be handled in accordance with standard procedures. California regulates hazardous materials, waste, and substances under the authority of the California Health and Safety Code. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts the disposal of wastes and requires the cleanup of wastes that are below hazardous waste concentrations but that could impact ground and surface water quality. California regulations that address waste management and prevention and clean up contamination include: Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste; Title 23 Waters; and Title 27 Environmental Protection. These are standard regulations that must be followed with respect to the use, storage, handling, disposal, and transport of potentially hazardous materials during construction of any of the Build Alternatives to protect human health and the environment from upsets or accidents.

Routine maintenance activities during operation would be required to follow applicable regulations with respect to the use, storage, handling, transport, and disposal of potentially hazardous materials. For the Freeway Tunnel Alternative, vehicles carrying flammable or hazardous materials would be restricted from using the tunnel. The handling and storage of hazardous materials is not anticipated during project operation; therefore, project operation would not result in significant impacts related to hazardous waste or materials.

VIII(c). Hazardous Emissions within 0.25 Mile of a School. There are several schools within 0.25 mi of each of the Build Alternatives. Standard regulations such as Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection, would be followed with respect to the use, storage, handling, disposal, and transport of potentially hazardous materials during construction of any of the Build Alternatives to protect human health and the environment from upsets or accidents. Adherence to regulatory requirements and Measure HW-7 would avoid substantial impacts related to transport, use, or disposal of hazardous materials. The Build Alternatives are project alternatives for a transportation project; therefore, they do not involve the potential for release of hazardous emissions or handling of acutely hazardous materials. It should be noted that vehicles carrying flammable or hazardous materials would be restricted from using the tunnel under all design variations for the Freeway Tunnel Alternative. No mitigation is required.

VIII(e) and VIII(f). Airport or Airstrip. The closest public airport to the study area is the El Monte Airport, which is located just over 2 mi from any of the Build Alternative improvements. The closest private airstrip to the study area is the Goodyear Blimp Base Airport, which is located over 12 mi away. Because the Build Alternatives are not within the vicinity of an airport, the project would not pose a safety hazard related to airports to people residing or working in the study area. No mitigation is required.

VIII(g). Emergency Response or Evacuation. As discussed in Section 3.4, Utilities/Emergency Services, project-related construction activities could result in traffic delays that could affect the ability of fire and emergency service providers to meet response time goals under all of the Build Alternatives. Medical emergencies could increase with the presence of construction workers and heavy machinery during construction. In addition, in the case of emergencies, construction activities could potentially limit or block emergency service access. Also, as discussed in Chapter 2, during a fire, the tunnel ventilation system is designed to remove smoke and harmful gases. This would maintain a safe environment for the evacuation of motorists and the safe entry into the tunnel by firefighters. Measure T-1, detailed in Section 3.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, requires development of a Transportation Management Plan (TMP). As part of the TMP, all closures and detours would be coordinated with the affected emergency service providers. Additionally, an approved Emergency Response Plan for tunnel operations will be prepared in coordination with the applicable agencies. As a result, emergency response and evacuation impacts would be less than significant.

VIII(h). Wildland Fires. Based on a review of the General Plan Safety Elements for Los Angeles County, the Cities of Alhambra, Los Angeles, Montebello, Monterey Park, Pasadena, South Pasadena, San Gabriel, and San Marino, there are areas designated in some of the plans as wildfire fire hazards, fire hazard zones, and areas of high fire hazard. Within Los Angeles County, a large part of the SR 710 study area is in an area designated by the County as "…additional areas of high fire hazard" (shown on the Los Angeles County General Plan Safety Element, Plate 7, *Wildland and Urban Fire Hazards Map*). For the unincorporated areas of Los Angeles County, the Los Angeles County General Plan fire hazards map was used for review.

TSM/TDM Alternative. As shown on the City of Los Angeles General Plan Safety Element, Exhibit D, *Selected Wildfire Hazard Areas in the City of Los Angeles Map* (April 1996), a segment of the TSM/TDM Alternative Local Street Improvement L-1 (Figueroa Street from SR 134 to Colorado Boulevard) is in the Fire Buffer/Mountain Fire District Zones. Intersection Improvements I-1 (West Broadway/Colorado Boulevard) and I-45 (Eagle Rock Boulevard/Colorado Boulevard) are adjacent to the Fire Buffer Zone adjacent to Colorado Boulevard.

As shown on the City of Pasadena's General Plan Safety Element, Plate P-2, *Summary of Hazards Map (II)* (June 2002), Other Road Improvement T-2 (State Route 110 [SR 110]/Fair Oaks Avenue Hook Ramps, the eastern improvement) is in an area depicted as a moderate fire hazard zone.

BRT Alternative. As shown on the City of Pasadena's General Plan Safety Element, Plate P-2, *Summary of Hazards Map (II)*, the BRT Alternative alignment (on Fair Oaks Avenue, at the southern City boundary) is in an area depicted by the City as a moderate fire hazard zone.

As shown on the Los Angeles County General Plan Safety Element, Plate 7 map, the BRT Alternative alignment on Atlantic Boulevard, from the southern terminus of the alignment south of Whittier Boulevard to Hellman Avenue, is in an area designated by the County as additional area of high fire hazard.

LRT Alternative. Within East Los Angeles, the aerial alignment of the LRT Alternative is in an area designated by the County as additional area of high fire hazard. The tunnel segment of the LRT Alternative would not be at risk for wildland fires.

Freeway Tunnel Alternative. The at-grade areas at the southern and northern portals (SR 710 stub/Valley Boulevard and the SR 134/SR 710/I-210 interchange, respectively) for the Freeway Tunnel Alternative are not in areas designated as wildland fire areas. The tunnel segments of the Freeway Tunnel Alternative would not be at risk for wildland fires.

Because the alignments of the Build Alternatives are in urban and developed areas, wildland fires are not likely to occur. During the short-term construction activities for the TSM/TDM and BRT Alternatives, the Construction Contractor would comply with local City, County, and State regulations for fire control. Operations of the TSM/TDM Alternative improvements would not have any fire control requirements. The operation of the BRT Alternative would comply with Metro's safety policies for transit providers.

During construction activities for the LRT and Freeway Tunnel Alternatives, the Construction Contractor would comply with local City jurisdictions and County fire ordinances, permits, or other regulations. Compliance with the California Uniform Building Code requirements would also be required. During operation of the LRT and Freeway Tunnel Alternatives, the operator would also comply with the California Uniform Building Code and with local City, County, and State regulations and permits for maintaining fire safety equipment at the proper locations for the LRT aerial and tunnel segments and stations, and at the Freeway Tunnel Alternative Operations and Maintenance Buildings at the southern and northern portals. Compliance with fire ordinances, permits, and other local and County required regulations and implementation of the safety plans for the LRT and Freeway Tunnel Alternatives would ensure that adverse impacts related to wildland fires would not be significant, and no mitigation is required.

4.2.9 Hydrology and Water Quality

IX. HYDROLOGY AND WATER QUALITY: Would the project:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Violate any water quality standards or waste discharge requirements?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	No impact	No impact	Less than significant impact	Less than significant impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
f) Otherwise substantially degrade water quality?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	No impact	No impact	No impact	No impact
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	No impact	No impact	No impact	Less than significant impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
j) Inundation by seiche, tsunami, or mudflow	No impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to hydrology and water quality was assessed in the *Water Quality Assessment Report* (2014), the *Summary Floodplain Encroachment Report* (2014), and the *Location Hydraulic Study* (2014). The results of these reports are presented in Sections 3.8, Hydrology and Floodplain, and 3.9, Water Quality and Storm Water Runoff, of this EIR/EIS. The following discussion is based on that information, where applicable.

IX(a) and IX(f). Violation of Water Quality Standards. As discussed in Section 3.9.3.1, Water Quality and Storm Water Runoff, during construction activities, excavated soil would be exposed and there would be an increased potential for soil erosion and spills compared to existing conditions.

Pollutants of concern during operation of the Build Alternatives include nutrients, pesticides, suspended solids/sediments, heavy metals, oil and grease, toxic organic compounds, and trash and debris. The Build Alternatives would result in a permanent net increase in impervious surface area, which would increase the volume of runoff during a storm, which in turn would more effectively transport pollutants to receiving waters.

As detailed in Section 3.9.4, Water Quality and Stormwater Runoff, the Build Alternatives would be required to comply with applicable National Pollutant Discharge Elimination System (NPDES) permit requirements for construction and operation to protect the beneficial uses of waters. In addition, BMPs would be implemented during construction and operation of the Build Alternatives.

As specified in Measure WQ-1, construction activities would be required to implement construction BMPs aimed at reducing pollutants of concern in storm water runoff in compliance with the requirements of the Construction General Permit. The construction BMPs would include Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site and Good Housekeeping BMPs designed to prevent and/or contain spills.

Groundwater dewatering during construction at the tunnel portals may be required for the LRT and Freeway Tunnel Alternatives. Discharge of the dewatered groundwater has the potential to introduce pollutants to receiving surface waters. As specified in Measure WQ-2, dewatering activities would comply with the RWQCB's Los Angeles and Ventura County groundwater dewatering permit. The groundwater dewatering permit requires monitoring of discharges from groundwater extraction waste during construction to ensure groundwater effluent that is pumped and ultimately discharged to surface water does not exceed surface water effluent limitations for particular pollutant constituents; therefore, it is not anticipated that surface water would be impacted during construction activities as a result of site dewatering so long as the groundwater discharge meets the RWQCB dewatering permit requirements.

For operation, BMPs would be implemented to treat stormwater runoff and remove pollutants. As specified in Measures WQ-4 through WQ-7, improvements within Caltrans ROW would comply with the requirements of the Caltrans MS4 Permit. As specified in Measure WQ-5, improvements outside of Caltrans ROW would comply with the Los Angeles County MS4 permit. The BMPs included in the design of the TSM/TDM, BRT, and LRT Alternatives would include Caltrans-approved treatment BMPs such as biofiltration swales inside Caltrans ROW. The Freeway Tunnel Alternative would include Caltrans-approved treatment BMPs such as biofiltration swales, gross solid removal devices (GSRDs), and rock mulch. Outside of Caltrans ROW, the BMPs would meet or exceed the Los Angeles County MS4 permit requirements (e.g., tree box filters, catch basin screens, new inlets with filter inserts, and rock mulch for the TSM/TDM and BRT Alternatives and tree box filters, rock mulch, catch basin screens and filter inserts at new inlet locations, bioretention facilities for the proposed parking lot areas, and media filters in the ballast areas) for the LRT Alternative).

Measures WQ-1 through WQ-7, provided in Section 3.9.4, Water Quality and Storm Water Runoff, are regulatory requirements that would minimize project impacts to water quality. Compliance with the applicable NPDES permits that require implementation of construction and operational BMPs to target and reduce pollutants of concern in stormwater runoff and require treatment of dewatered groundwater, if necessary, would ensure that impacts related to violation of water quality standards and waste discharge permits and degradation of water quality would be less than significant. No further mitigation is required.

IX(b). Groundwater Supplies. As detailed in the *Water Quality Assessment Report* (2014), neither construction nor operational activities for the TSM/TDM or BRT Alternatives would require groundwater dewatering. In addition, because infiltration is very low in existing conditions, replacing low-infiltrating soils with impervious pavement would not substantially decrease infiltration. Therefore, no impact to groundwater supplies would occur under the TSM/TDM or BRT Alternatives. No mitigation is required.

Groundwater dewatering may be required during construction/excavation of the LRT Alternative and the Freeway Tunnel Alternative. During tunnel excavation, groundwater could flow into the tunnel through the face of the excavation; however, it would be mitigated by the use of a pressurized-face TBM. The TBM provides face pressure as it excavates to counterbalance earth and hydrostatic loads so groundwater does not enter the excavation. In addition, as the ground is excavated, a bolted and double-gasketed (with appropriate cross gasket) segmental lining would be installed immediately behind the TBM that would prevent any groundwater from entering the tunnel during the construction phase. Additionally, during excavation, groundwater monitoring wells would be used to monitor local groundwater levels.

Permanent groundwater dewatering or extraction for the LRT and Freeway Tunnel Alternatives would not be required. In addition, because infiltration is very low in existing conditions, replacing low-infiltrating soils with impervious pavement would not substantially decrease infiltration. During the operational phase of the proposed tunnels, there are two potential ways for the tunnels to affect the groundwater: (1) infiltration of water into the tunnel, and (2) the flow of water along the excavated tunnel. The LRT and Freeway Tunnel Alternatives would have a lining of bolted, double-gasketed (with appropriate cross gasket) precast-concrete segments installed as the final lining. The segmental lining would be designed for the anticipated ground and hydrostatic loads. Infiltration along the segmental lining would be negligible, precluding groundwater intrusion into the tunnel so as not to cause drawdown of the local groundwater tables. (The rubber gaskets between the tunnel segments would help prevent water leakage into the tunnel.) If unexpected infiltration occurs, grouting can be performed to stop the unexpected leakage. Another possible operational effect on groundwater is water flowing along the tunnel lining. Backfill grouting operations performed during the construction phase would mitigate potential groundwater migration by filling gaps between the tunnel lining and the excavated ground around the tunnel that could be used for groundwater migration. As such, the potential for the LRT Alternative and Freeway Tunnel Alternative to deplete groundwater supplies or interfere with groundwater recharge is low. Therefore, impacts related to groundwater supplies would be less than significant for the LRT and Freeway Tunnel Alternatives. No mitigation is required.

IX(c) and IX(d). Erosion or Siltation and Flooding. During construction activities, drainage patterns would be altered and soil would be exposed, increasing the potential for soil erosion and flooding compared to existing conditions. The Build Alternatives would result in a permanent net increase in impervious surface area, which would increase the volume of runoff during a storm, which in turn can lead to increased erosion and flooding. As detailed in the *Water Quality Assessment Report* (2014) and summarized above in the response to thresholds IX(a) and IX(f), the Build Alternatives include BMPs in compliance with the requirements of the Construction General Permit and Caltrans and Los Angeles County MS4 permits that would provide flow volume and duration control functions that minimize increases in velocity and volume of runoff, reduce the movement of sediment to downstream receiving waters, and minimize erosion and flooding. Because the Build Alternatives would include measures to offset increases in velocity and volume of runoff and to minimize erosion and flooding, there is a low potential for the BRT Alternative to adversely affect downstream erosion and accretion patterns or result in flooding. Therefore, with implementation of Measures WQ-1 and WQ-4 through WQ-7, which require implementation of BMPs, impacts related to erosion or siltation would be less than significant. No further mitigation is required.

IX(e). Storm Water Facility Capacity. As discussed in Chapter 2.0, Project Alternatives, the Build Alternatives include modifications to existing storm water drainage facilities, as well as new storm water management features to accommodate increased storm water flows from the Build Alternatives. The Build Alternatives also include BMPs, discussed above in the response to questions IX(a) and IX(f), that would provide flow volume and duration control functions to minimize increases in velocity and runoff. Specifically, the TSM/TDM Alternative includes relocation of existing catch basins to the new curb and gutter, as well as new gutters and catch basins. The BRT Alternative includes relocation of existing gutters and catch basins to the new curb. The LRT Alternative includes installation of deck drains near each column on the elevated train decks and underdrains, swales, catch basins, and pipes in the rail yard. The Freeway Tunnel Alternative would include a series of pipes in the southern cut-and-cover section to convey runoff to a proposed pump station near Valley Boulevard which would in turn convey runoff to the Dorchester Channel. In addition, a storm water drainage system located outside of the north portal would be modified. The existing pump station and storage chamber south of Del Mar Boulevard would be relocated north of Del Mar Boulevard. Water from the storage chamber would be conveyed via a reinforced concrete pipe to the existing pipe in Del Mar Boulevard. The dual-bore design variation of the Freeway Tunnel Alternative would relocate segments of the Dorchester Channel north and south of Hellman Avenue. The affected segments of the existing reinforced concrete channel would be replaced with a double reinforced concrete box along the original channel alignment. With implementation of the proposed drainage facilities and BMPs to reduce and convey stormwater runoff, impacts to storm water facilities would be less than significant, and no mitigation is required.

IX(g). Placement of Housing in 100-Year Floodplain. The Build Alternatives do not include housing. Therefore, the Build Alternatives would not place housing within a 100-year flood hazard area. No mitigation is required.

IX(h). Placement of Structures in 100-Year Floodplain. As discussed in Section 3.8, Hydrology and Floodplain, the TSM/TDM, BRT, and LRT Alternatives would not result in impacts to floodplains because they would not encroach into any floodplains. The Freeway Tunnel Alternative dual-bore design variation alignment would encroach into the Laguna Regulating Basin floodplain and Dorchester Avenue Storm Drain (Dorchester Channel) floodplain. The Freeway Tunnel Alternative single-bore design variation alignment would encroach into only the Laguna Regulating Basin floodplain. The encroachment would not increase the water surface elevation in the Laguna Regulating Basin and would result in only a minor increase in water surface elevation in the Dorchester Channel. Therefore, impacts related to impeding or redirecting flood flows would be less than significant, and no mitigation is required.

IX(i). Flooding as a Result of a Levee or Dam. As discussed in Section 3.10.2, Geology/Soils/Seismic/ Topography, and shown on Figure 3.10-5, parts of the study area are within potential dam inundation areas. No physical improvement in the BRT Alternative would occur in the dam inundation zones. TSM/TDM Intersection Improvement I-2 (Eagle Rock Boulevard/York Boulevard) and parts of the LRT Alternative and Freeway Tunnel Alternative near I-10 would be constructed within dam inundation zones. These physical improvements would be exposed to inundation in the event of a dam failure. Based on compliance with applicable building codes combined with Measures GEO-1 and GEO-2, impacts related to dam inundation would be less than significant. No mitigation is required.

All of the Build Alternatives would change the distribution of traffic within the study area and would potentially shift additional traffic into the dam inundation zones. Although traffic would be redistributed and some physical improvements would occur within the dam inundation zones, the

Build Alternatives would not increase the chance of inundation from failure of any of the dams. All the dams are maintained and inspected to ensure their integrity and to ensure that risks are minimized. Because the Build Alternatives would not increase the risk of dam failure, the impact related to exposure of people or structures to loss, injury, or death involving flooding (including flooding as a result of the failure of a levee or dam) would be less than significant. No mitigation is required.

IX(j). Seiche, Tsunamis, and Mudflow. Seiching is a phenomenon that occurs when seismic groundshaking induces standing waves (seiches) inside water retention facilities such as reservoirs and water tanks. Such waves can cause retention structures to fail and flood downstream properties. There are no water retention facilities in proximity to the study area. Tsunamis are generated wave trains generally caused by tectonic displacement of the seafloor associated with shallow earthquakes, seafloor landslides, rockfalls, or volcanic eruptions. The study area is more than 18 mi from the ocean shoreline and is not within a tsunami inundation area. Mudslides and slumps are described as a shallower type of slope failure, usually affecting the upper soil mantle or weathered bedrock underlying natural slopes and triggered by surface or shallow subsurface saturation. The study area is within a largely developed area with a low risk for mudflows. The risk associated with seiche, tsunamis, and mudflow is therefore not considered a potential hazard or a potentially significant impact, and no mitigation is required.

4.2.10 Land Use and Planning

X. LAND USE AND PLANNING: **Would the project:**	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Physically divide an established community?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	Potentially significant impact	Potentially significant impact	Potentially significant impact	Potentially significant impact
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	No impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to land use was assessed in the *Community Impact Assessment* (CIA) (2014). The results of this report are presented in Section 3.1, Land Use, of this EIR/EIS. The following discussion is based on that information, where applicable.

X(a). Division of an Established Community. The Build Alternative improvements would result in minor changes in access and circulation; however, they would also provide the traveling public with improvements in mobility and increase the efficiency of the existing circulation system without dividing the communities in which they would be located. None of the Build Alternatives would introduce permanent, physical barriers that would inhibit or otherwise affect community interaction. The tunnels associated with the LRT and Freeway Tunnel Alternatives would not be visible to residents of the communities above them. While the northern and southern roadway approaches to the Freeway Tunnel Alternative would be visible, they would be located in existing trenches that have divided neighborhoods for decades.

As discussed in Section 3.3.1.3, Community Impacts, in this EIR/EIS, the aerial segment of the LRT Alternative would introduce an elevated LRT structure above Floral Drive and Mednik Avenue in

Monterey Park and East Los Angeles, respectively. A raised median constructed in the center of Mednik Avenue along this segment would modify the intersections of Mednik Avenue/Dozier Street and Mednik Avenue/Fisher Street to establish right-turn only access into and out of Dozier Street and Fisher Street. Although this improvement would limit direct access between Mednik Avenue and the residential neighborhoods along Dozier Street and Fisher Street, the traveling public would still be able to make left turns to and from Mednik Avenue via Hammel Street and Cesar Chavez Avenue. In addition, the existing crosswalks on Mednik Avenue at Floral Drive, Hammel Street, Cesar Chavez Avenue, First Street, Civic Center Way, and Third Street would remain open during operation of the LRT Alternative. Because the proposed LRT line would be located on an elevated structure in East Los Angeles and Monterey Park and would not impede circulation in the area, the LRT Alternative would not create any new barriers in or physically divide an existing community.

With the exception of Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road), all of the TSM/TDM improvements involve upgrades to existing roadways that already divide communities. Other Road Improvement T-1 would be located on land between Valley Boulevard and Mission Road that has been largely undeveloped, with the exception of a parking lot, for decades and already serves as a de facto barrier between residential areas in Alhambra and industrial uses in Los Angeles. Therefore, that improvement would not create a new physical barrier between those communities.

As described in Section 3.14, Noise and Vibration, of this EIR/EIS, all of the proposed noise barriers would be located along existing roadways or property boundary lines, which already serve as natural barriers in those communities. Further, many of the proposed noise barriers would be less than 250 feet in length and would be located where walls and fences already exist. Therefore, none of the proposed noise barriers would divide an existing community.

Therefore, based on the information provided above, impacts related to dividing an established community would be less than significant, and no mitigation is required.

X(b). Conflict with Land Use Plans. As discussed in Section 3.1.1.2, Land Use, and specifically in Table 3.1.3, each Build Alternative would result in the permanent acquisition and conversion of land currently planned for non-transportation uses into transportation uses, which would result in inconsistencies with land use designations in local jurisdictions' General Plans. If a Build Alternative is selected for implementation, those inconsistencies would exist until the applicable local General Plans are amended to reflect the use of the affected land for transportation improvements in the selected Build Alternative. Neither Metro nor Caltrans has land use planning authority, and neither has authority to require local jurisdictions to amend their General Plans. Therefore, it will be the decision of the affected local jurisdictions on how and when to address the identified General Plan land use inconsistencies. However, because it is generally desirable that the General Plans be consistent with existing conditions, Metro and Caltrans will request that the applicable local jurisdictions amend their General Plans to reflect the permanent use of land for the improvements included in the selected Build Alternative, as specified in Measure LU-1. Coordination with local and regional jurisdictions has and would continue to occur during project planning, and it is anticipated that these amendments could occur in the normal course of General Plan updates required in accordance with California law (e.g., a special amendment process specifically to address the SR-710 North Project would not be necessary). The timing of preparation and processing of such amendments would be at the discretion of each local jurisdiction. However, compliance with the standards in municipal codes of the Cities of Alhambra and Los Angeles was considered when making the significance determination.

X(c). Conflict with Habitat Conservation Plans. The study area is within areas that are largely developed and is not located within an HCP or NCCP. Therefore, the Build Alternatives would not conflict with an HCP or an NCCP. No mitigation is required.

4.2.11 Mineral Resources

XI. MINERAL RESOURCES: Would the project:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact

Discussion: The potential for the Build Alternatives to impact mineral resources was based on information in the Generalized Mineral Land Classification Map of Los Angeles County – South Half, Aggregate Resources Only, Plate 1b (Miller 1994).

XI(a)-(b). Mineral Resources. In 1975, the California Legislature enacted the Surface Mining and Reclamation Act (SMARA) which, among other things, provided guidelines for the classification and designation of mineral lands. Areas are classified on the basis of geologic factors without regard to existing land use and land ownership. The areas are categorized into four Mineral Resource Zones (MRZs):

- **MRZ-1:** An area where adequate information indicates no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence
- **MRZ-2:** An area where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence
- **MRZ-3:** An area containing mineral deposits, the significance of which cannot be evaluated
- **MRZ-4:** An area where available information is inadequate for assignment to any other MRZ zone

Of the four categories, lands classified as MRZ-2 are of the greatest importance. Such areas are underlain by demonstrated mineral resources or are located where geologic data indicate significant measured or indicated resources are present. MRZ-2 areas are designated by the Mining and Geology Board as being “regionally significant.” Such designations require that a Lead Agency’s land use decisions involving designated areas be made in accordance with its mineral resource management policies and that it consider the importance of the mineral resource to the region or the State as a whole, not just to the Lead Agency’s jurisdiction.

The SR 710 North Project area is located within the San Gabriel Valley Production-Consumption Region. Prior to 2010, all of the lands within the San Gabriel Valley Production-Consumption Region were classified by the State of California as containing notable aggregate resources and designated as MRZ-2. MRZ-2 is defined generally as an area where notable mineral deposits are or may be present. However, due to urbanization of the region, the California Geological Survey in 2010 updated the mineral land classification for aggregate in the San Gabriel Valley Production-

Consumption Region and reduced the MRZ-2 designations for the entire consumption region into smaller sectors. The SR 710 North Project Build Alternatives are located within the following MRZs, according to the California Geological Survey.

- **TSM/TDM Alternative:** MRZ-1, MRZ-2, MRZ-3, and MRZ-4
- **BRT Alternative:** MRZ-1 and MRZ-3
- **LRT Alternative:** MRZ-1 and MRZ-3
- **Freeway Tunnel Alternative:** MRZ-1, MRZ-2, and MRZ-3

The study area is largely built out and there are no mineral extraction activities currently occurring along the alignments of the Build Alternatives. In addition, the improvements for all Build Alternatives at the location where significant mineral deposits are potentially present would be at or just below the ground surface and would not affect the availability of a known mineral resource.

In summary, any impacts related to the loss of a known commercially valuable mineral resources would be less than significant, and no mitigation is required.

4.2.12 Noise

XII. NOISE: Would the project result in:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?	No impact	No impact	Less than significant	Less than significant impact
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No impact	No impact	No impact	No impact
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	No impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to noise and vibration was assessed in the *Noise Study Report* (NSR) (2014), the *Groundborne Noise and Vibration Impacts Report* (2014), and the *Noise Abatement Decision Report* (NADR) (2014). The results of these reports are presented in Section 3.14, Noise and Vibration, of this EIR/EIS. The following discussion is based on that information, where applicable.

XII(a), XII(c), and XII(d). Exceedance of Noise Level Standards and Increases in Noise Levels.

Construction Impacts. Noise levels during construction of the Build Alternatives may impact commercial, industrial, and noise-sensitive receptors. Typical construction noise levels may reach 88 A-weighted decibels (dBA) maximum instantaneous noise level (L_{max}) at a distance of 50 ft from the noise sources. Measures N-1 and N-2, described in detail in Section 3.14.4, require compliance with the Caltrans Standard Specifications (2015), the County Code, and the city Municipal Codes as applicable. During the final design of the proposed project, a specific construction noise analysis will be completed in order to create the required Noise Monitoring and Noise Control Plan which will require compliance with the noise standard of 86 dBA at 50 feet. Noise minimization features would include, but are not limited to, quieter equipment, temporary barriers and reduced operation times. Implementation of Measures N-1 and N-2 would reduce construction noise impacts under the Build Alternatives to a less than significant level.

In addition to the construction activities associated with all the Build Alternatives, there would be a considerable number of haul truck trips associated with exporting materials for the Freeway Tunnel and LRT Alternatives. (The haul routes are described in detail in Section 2.2.3.4 for the Freeway Tunnel Alternative and Section 2.2.3.3 for the LRT Alternative in Chapter 2.) The total number of delivery trucks per day is also a very small percentage of the existing daily volumes on the haul route roadways. Based on the project long-haul truck trip information provided in Table 3.5.6 of the Traffic and Transportation/Pedestrian and Bicycle Facilities section for the dual-bore design variation of the Freeway Tunnel Alternative, the number of haul trucks calculated during peak activity periods would be approximately 620 pass-bys per day. As shown in Table 4.1, it is expected that the noise increase associated with haul routes for excavation activities for the LRT and Freeway Tunnel Alternatives would range from 0.5 to 0.9 dBA CNEL which is considered not perceptible (less than a 3.0 dBA CNEL increase), and therefore, would be less than significant. No mitigation is required.

TABLE 4.1:
Haul Truck-Related Noise Impacts

Roadway Segment	Existing Conditions		Existing Plus Haul Trucks		Increase Due to Haul Trucks CNEL (dBA)
	ADT	CNEL (dBA) at 50 feet	ADT[1]	CNEL (dBA) at 50 feet	
I-10 between SR 710 Interchange East Termini and Rosemead Boulevard	110,500	77.9	111,120	78.7	0.8
I-10 between Rosemead Boulevard and I-605 Interchange West Termini	98,000	77.8	98,620	78.6	0.8
I-210 between I-605 Interchange East Termini and I-605 Interchange West Termini	74,100	78.1	74,720	78.9	0.8
I-210 between I-605 Interchange West Termini and Rosemead Boulevard	102,200	79.6	102,820	80.2	0.6
I-210 between Rosemead Boulevard and San Gabriel Boulevard	118,200	79.1	118,820	79.7	0.6
I-210 between San Gabriel Boulevard and I-710 Interchange East Termini	128,700	79.4	129,320	79.9	0.5
I-605 between I-210 Interchange South Termini and Los Angeles Street	72,700	77.8	73,320	78.7	0.9
I-605 between Los Angeles Street and I-10 Interchange North Termini	87,200	78.5	87,820	79.3	0.8

Source: LSA Associates, 2015
[1] Increase in ADT assumes 360 total truck trips or 720 pass-bys spread out over a 24-hour period evenly.
I-10 = Interstate 10
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels

Long-Term Stationary Noise Impacts. To assess the significance of noise impacts associated with operations at the LRT Alternative maintenance yard, compliance with the standards in the municipal codes of the Cities of Alhambra and Los Angeles was used as a threshold of significance. The City of Alhambra Municipal Code, Section 18.02.050, Noise Standards, specifies that interior noise levels inside residential uses should not exceed 55 dBA with windows and doors closed. To convert the interior noise level to an exterior noise level, an assumed exterior-to-interior reduction of 15 dBA was added to the interior noise standard, which results in a 70 dBA exterior noise level standard for residential uses.

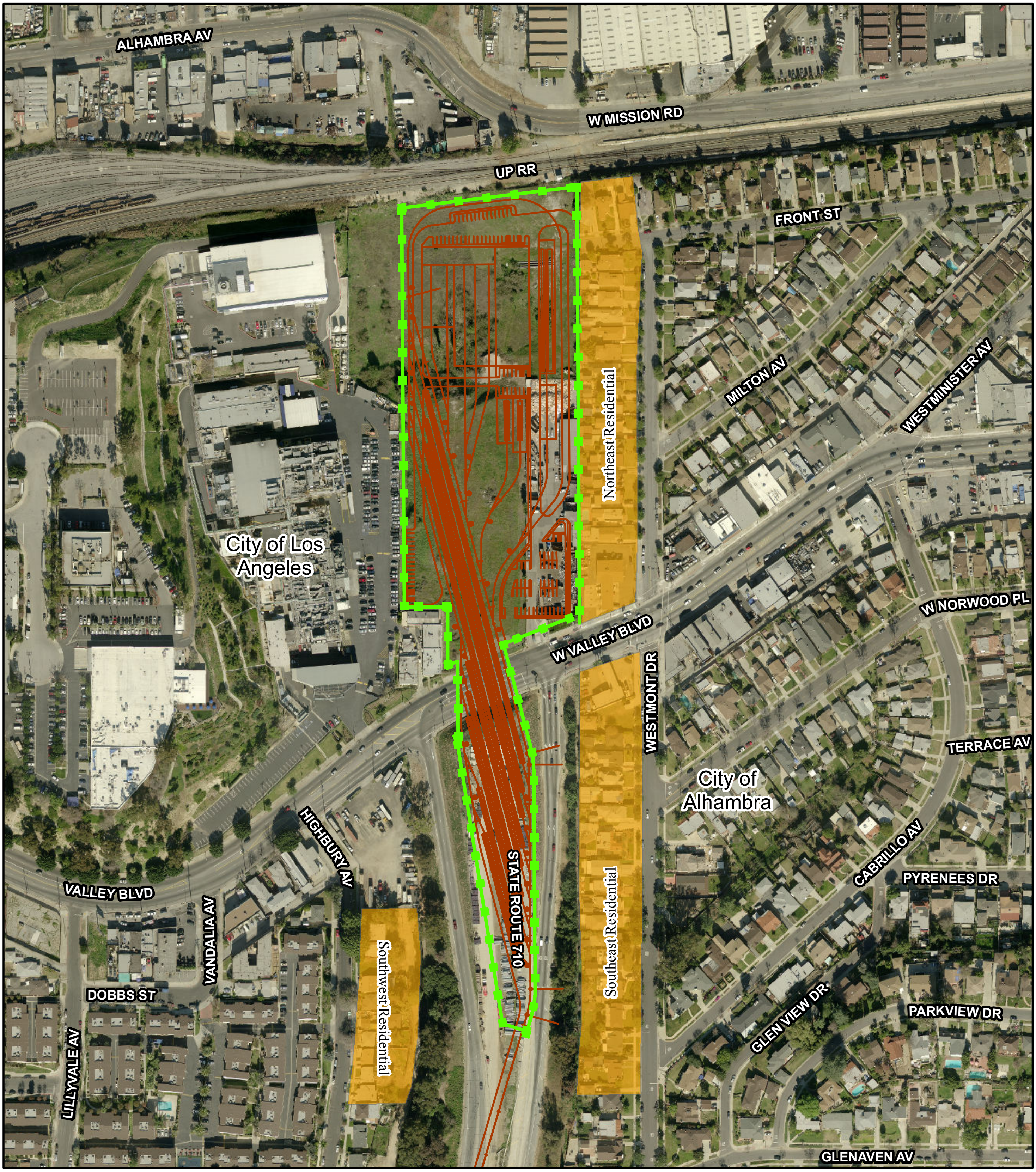
The City of Los Angeles Municipal Code, Section 12.04 (b), specifies:

> "Except as to the equipment and operations specifically mentioned and related elsewhere in this Chapter or for emergency work as that term is defined in Section 111.01(d), and except as to aircraft, tow tractors, aircraft auxiliary power units, trains and motor vehicles in their respective operations governed by State and federal regulations, no person shall operate or cause to be operated any machinery, equipment, tolls, or other mechanical or electrical device, or engage in any other activity in such manner as to create any noise which would cause the noise level on the premises of any other occupied property, or, if a condominium, apartment house, duplex, or attached business, within any adjoining unit, to exceed the ambient noise level by more than five (5) decibels."

As part of the LRT Alternative, a maintenance yard would be constructed within the existing Caltrans ROW and would be bisected by Valley Boulevard. The majority of the activities that would occur at this facility, including washing the trains, painting the trains, and mechanical work, would occur inside buildings. The movement of the trains in the maintenance yard would be the activity most likely to potentially impact nearby noise-sensitive receptors. As a project feature, a sound wall has been planned around the perimeter of the LRT maintenance yard, as shown on Figure 4-1.

The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (2006) (FTA Manual) provides a source level at 50 ft of 118 dBA Single Event Level (SEL) for train movements and shops, assuming 20 train movements for peak-hour activity. While it is expected that this is a conservative number of movements, calculations would be performed based on this reference level. The reference SEL noise level was then converted to an hourly equivalent continuous sound level (L_{eq}) for comparison with peak traffic noise levels. The reference noise level of peak-hour activities in a rail yard at 50 ft is 82.4 dBA.

Table 4.2 presents the ambient noise levels without the proposed LRT Alternative, the LRT maintenance yard reference noise level, the distance from the center of activities to the sound wall, the distance from the center of activities to the receptor, noise levels from the maintenance yard activities without the planned sound wall, sound wall heights, and noise levels from the maintenance yard activities with the planned sound wall. With the construction of an 8 ft high sound wall, as shown on Figure 4-1, the noise impacts to the surrounding noise-sensitive uses from the LRT maintenance yard would comply with the City of Alhambra and City of Los Angeles Noise Ordinances and therefore would be less than significant. No further mitigation is required.



LEGEND

FIGURE 4-1

LRT Maintenance Yard Sound Walls - 8 feet tall

LRT Maintenance Yard

Surrounding Residential Areas

N

0 150 300
FEET

SR 710 North Study

LRT Maintenance Yard Sound Walls

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: AECOM (2014); LAR-IAC (2010)

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TABLE 4.2:
LRT Maintenance Yard/Shop Noise Analysis

Receptor	Peak-Hour Noise Level Without Project (dBA)	Maintenance Yard Reference Noise Level (dBA)[1]	Center of Activities Distance to Barrier (ft)	Center of Activities Distance to Receptor (ft)	Maintenance Yard Unmitigated Noise Level (dBA)	Barrier Height (ft)	LRT Noise Level With Barrier (dBA)
Northeast Residential	59.0	82.4	195	200	70.4	8	60.4
Southeast Residential	56.0	82.4	60	175	71.5	8	63.2
Southwest Residential	66.0	82.4	130	325	66.1	8	54.2

[1] LSA Associates, Inc. (2014).
dBA = A-weighted decibels
ft = foot/feet
LRT = Light Rail Transit

Long-Term Transportation Noise Impacts. Some residents in the vicinity of the limits of the Build Alternative improvements are currently, and would continue to be, exposed to traffic noise levels approaching or exceeding the Noise Abatement Criteria (NAC). However, because the Build Alternatives would not result in substantial increase of 12 dB or more in the study area compared to the existing noise levels as shown in Tables 3.14-8 through 3.14-19 in Appendix N and long-term operational noise impacts for CEQA purposes are determined under 23 CFR 772, no significant noise impact would occur under CEQA. Noise abatement measures, including noise barriers, have been evaluated to reduce the noise impacts. With implementation of the noise abatement measures, the noise levels would be further reduced. Therefore, long-term noise impacts are considered less than significant.

Due to the nature of this project, additional long-term traffic-related noise impacts were analyzed for the freeways within the study area but not within the limits of physical improvements. This analysis utilizes the FHWA Traffic Noise Model and was completed to assess the increase in noise level due to the project only. Tables 4.3 through 4.7 show the noise level increases at these segments for the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives. Since the Build Alternatives would not result in any perceptible increases in noise levels, less than 3 dB, in the study area outside the limits of physical improvement, long-term noise impacts would be less than significant under CEQA. No mitigation is required. The inputs for the FHWA model runs are provided in Appendix N.

XII(b). Vibration. Based on the types of improvements in the TSM/TDM and BRT Alternatives and the construction methods and equipment required to construct those improvements (i.e., no pile driving or other activities that generate high levels of vibration), there would be no short-term ground-borne noise or vibration effects during construction of the TSM/TDM or BRT Alternatives.

Construction activities associated with the Freeway Tunnel and LRT Alternatives (e.g., tunnel boring, supply and muck train movements, and excavation and construction of the tunnel portals and underground stations) would result in ground-borne vibration. Measures N-3 through N-5, provided in Section 3.14, Noise and Vibration, require compliance with FTA and local vibration regulations, minimization of vibration during tunneling, maintenance of the TBM, ballast mats, and speed limits for supply and muck trains. In addition, Measure N-6 requires a site-specific evaluation of potential airborne dust at the Grifols facility due to vibration from construction of the Freeway Tunnel Alternative. With implementation of Measures N-3 through N-6, vibration impacts from construction would be minimized; however, there could still be short-term vibration impacts from tunnel boring.

TABLE 4.3:
TSM/TDM Alternative Study Area Traffic Noise Analysis

Roadway	Segment Description	Existing CNEL, dBA	2035 No Build CNEL, dBA	2035 TSM/TDM CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA
SR 2	I-210 to SR 134 Interchange North Termini	76.8	77.3	77.3	0.5	0.0
SR 2	SR 134 Interchange North Termini to SR 134 Interchange South Termini	75.5	76.2	76.0	0.5	-0.2
SR 2	SR 134 Interchange South Termini to I-5 Interchange North Termini	77.6	78.1	78.0	0.4	-0.1
SR 2	I-5 Interchange North Termini to I-5 Interchange South Termini	72.5	72.8	72.8	0.3	0.0
SR 110	Glenarm Street to S Avenue 52	74.1	74.2	74.2	0.1	0.0
SR 110	S Avenue 52 to I-5 Interchange North Termini	75.6	75.6	75.6	0.0	0.0
SR 110	I-5 Interchange North Termini to I-5 Interchange South Termini	74.6	74.7	74.7	0.1	0.0
SR 134	SR 134 start at I-210/I-710 Interchange to SR 134/I-210/SR 710 Interchange West Termini	77.5	78.6	78.5	1.0	-0.1
SR 134	SR 134/I-210/SR 710 Interchange West Termini to North Figueroa Street	78.3	79.0	79.0	0.7	0.0
SR 134	North Figueroa Street to SR 2 Interchange East Termini	78.2	79.1	79.1	0.9	0.0
SR 134	SR 2 Interchange East Termini to SR 2 Interchange West Termini	77.1	78.1	78.0	0.9	-0.1
I-5	SR 2 Interchange North Termini to SR 2 Interchange South Termini	79.4	80.3	80.4	1.0	0.1
I-5	SR 2 Interchange South Termini to SR 110 Interchange North Termini	80.4	81.3	81.3	0.9	0.0
I-5	SR 110 Interchange North Termini to SR 110 Interchange South Termini	79.8	80.7	80.7	0.9	0.0
I-5	SR 110 Interchange South Termini to I-10 Interchange North Termini	79.8	80.7	80.7	0.9	0.0
I-5	I-10 Interchange North Termini to I-10 Interchange South Termini	78.2	79.2	79.3	1.1	0.1
I-5	I-10 Interchange South Termini to East Cesar Chavez Avenue Ramps	79.8	80.8	80.9	1.1	0.1
I-10	I-5 Interchange West Termini to I-5 Interchange East Termini	72.9	73.6	73.7	0.8	0.1
I-10	I-5 Interchange East Termini to SR 710 Interchange West Termini	78.2	79.1	78.9	0.7	-0.2
I-10	SR 710 Interchange East Termini to Rosemead Boulevard	77.9	78.5	78.5	0.6	0.0
I-10	Rosemead Boulevard to I-605 Interchange West Termini	77.8	78.5	78.6	0.8	0.1
I-210	I-605 Interchange East Termini to I-605 Interchange West Termini	78.1	79.3	79.3	1.2	0.0
I-210	I-605 Interchange West Termini to Rosemead Boulevard	79.6	80.7	80.7	1.1	0.0
I-210	Rosemead Boulevard to San Gabriel Boulevard	79.1	80.2	80.2	1.1	0.0
I-210	San Gabriel Boulevard to I-710 Interchange East Termini	79.4	80.5	80.4	1.0	-0.1
I-210	I-710 Interchange North Termini to Lincoln Avenue	77.3	78.6	78.7	1.4	0.1
I-210	Lincoln Avenue to SR 2	76.9	78.2	78.2	1.3	0.0
I-210	SR 2 to La Crescenta Avenue	76.7	78.0	77.9	1.2	-0.1
I-605	I-210 Interchange South Termini to Los Angeles Street	77.8	79.5	79.5	1.7	0.0
I-605	Los Angeles Street to I-10 Interchange North Termini	78.5	80.1	80.1	1.6	0.0

Source: Refer to the FHWA noise modeling results provided in Appendix N in this EIR/EIS.
Note: CNEL is at 50 feet from nearest travel lane.

CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
EIR/EIS = Environmental Impact Report/Environmental Impact Statement
FHWA = Federal Highway Administration
I-5 = Interstate 5
I-10 = Interstate 10
I-210 = Interstate 210
I-605 = Interstate 605
I-710 = Interstate 710
SR 2 = State Route 2
SR 110 = State Route 110
SR 134 = State Route 134
SR 710 = State Route 710
TDM = Transportation Demand Management
TSM = Transportation System Management

TABLE 4.4:
BRT Alternative Study Area Traffic Noise Analysis

Roadway	Segment Description	Existing CNEL, dBA	2035 No Build CNEL, dBA	2035 BRT CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA
SR 2	I-210 to SR 134 Interchange North Termini	76.8	77.3	77.3	0.5	0.0
SR 2	SR 134 Interchange North Termini to SR 134 Interchange South Termini	75.5	76.2	76.1	0.6	-0.1
SR 2	SR 134 Interchange South Termini to I-5 Interchange North Termini	77.6	78.1	78.0	0.4	-0.1
SR 2	I-5 Interchange North Termini to I-5 Interchange South Termini	72.5	72.8	72.7	0.2	-0.1
SR 110	Glenarm Street to S Avenue 52	74.1	74.2	74.2	0.1	0.0
SR 110	S Avenue 52 to I-5 Interchange North Termini	75.6	75.6	75.6	0.0	0.0
SR 110	I-5 Interchange North Termini to I-5 Interchange South Termini	74.6	74.7	74.6	0.0	-0.1
SR 134	SR 134 start at I-210/I-710 Interchange to SR 134/I-210/SR 710 Interchange West Termini	77.5	78.6	78.6	1.1	0.0
SR 134	SR 134/I-210/SR 710 Interchange West Termini to North Figueroa Street	78.3	79.0	79.0	0.7	0.0
SR 134	North Figueroa Street to SR 2 Interchange East Termini	78.2	79.1	79.1	0.9	0.0
SR 134	SR 2 Interchange East Termini to SR 2 Interchange West Termini	77.1	78.1	78.0	0.9	-0.1
I-5	SR 2 Interchange North Termini to SR 2 Interchange South Termini	79.4	80.3	80.3	0.9	0.0
I-5	SR 2 Interchange South Termini to SR 110 Interchange North Termini	80.4	81.3	81.3	0.9	0.0
I-5	SR 110 Interchange North Termini to SR 110 Interchange South Termini	79.8	80.7	80.6	0.8	-0.1
I-5	SR 110 Interchange South Termini to I-10 Interchange North Termini	79.8	80.7	80.7	0.9	0.0
I-5	I-10 Interchange North Termini to I-10 Interchange South Termini	78.2	79.2	79.2	1.0	0.0
I-5	I-10 Interchange South Termini to East Cesar Chavez Avenue Ramps	79.8	80.8	80.8	1.0	0.0
I-10	I-5 Interchange West Termini to I-5 Interchange East Termini	72.9	73.6	73.8	0.9	0.2
I-10	I-5 Interchange East Termini to SR 710 Interchange West Termini	78.2	79.1	79.0	0.8	-0.1
I-10	SR 710 Interchange East Termini to Rosemead Boulevard	77.9	78.5	78.5	0.6	0.0
I-10	Rosemead Boulevard to I-605 Interchange West Termini	77.8	78.5	78.6	0.8	0.1
I-210	I-605 Interchange East Termini to I-605 Interchange West Termini	78.1	79.3	79.3	1.2	0.0
I-210	I-605 Interchange West Termini to Rosemead Boulevard	79.6	80.7	80.7	1.1	0.0
I-210	Rosemead Boulevard to San Gabriel Boulevard	79.1	80.2	80.2	1.1	0.0
I-210	San Gabriel Boulevard to I-710 Interchange East Termini	79.4	80.5	80.4	1.0	-0.1
I-210	I-710 Interchange North Termini to Lincoln Avenue	77.3	78.6	78.7	1.4	0.1
I-210	Lincoln Avenue to SR 2	76.9	78.2	78.2	1.3	0.0
I-210	SR 2 to La Crescenta Avenue	76.7	78.0	78.0	1.3	0.0
I-605	I-210 Interchange South Termini to Los Angeles Street	77.8	79.5	79.6	1.8	0.1
I-605	Los Angeles Street to I-10 Interchange North Termini	78.5	80.1	80.1	1.6	0.0

Source: Refer to the FHWA noise modeling results provided in Appendix N in this EIR/EIS.
Note: CNEL is at 50 feet from nearest travel lane.

BRT = Bus Rapid Transit
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
EIR/EIS = Environmental Impact Report/Environmental Impact Statement
FHWA = Federal Highway Administration

I-5 = Interstate 5
I-10 = Interstate 10
I-210 = Interstate 210
I-605 = Interstate 605
I-710 = Interstate 710

SR 2 = State Route 2
SR 110 = State Route 110
SR 134 = State Route 134
SR 710 = State Route 710

TABLE 4.5:
LRT Alternative Study Area Traffic Noise Analysis

Roadway	Segment Description	Existing CNEL, dBA	2035 No Build CNEL, dBA	2035 LRT CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA
SR 2	I-210 to SR 134 Interchange North Termini	76.8	77.3	77.2	0.4	-0.1
SR 2	SR 134 Interchange North Termini to SR 134 Interchange South Termini	75.5	76.2	76.0	0.5	-0.2
SR 2	SR 134 Interchange South Termini to I-5 Interchange North Termini	77.6	78.1	77.9	0.3	-0.2
SR 2	I-5 Interchange North Termini to I-5 Interchange South Termini	72.5	72.8	72.7	0.2	-0.1
SR 110	Glenarm Street to S Avenue 52	74.1	74.2	74.2	0.1	0.0
SR 110	S Avenue 52 to I-5 Interchange North Termini	75.6	75.6	75.6	0.0	0.0
SR 110	I-5 Interchange North Termini to I-5 Interchange South Termini	74.6	74.7	74.7	0.1	0.0
SR 134	SR 134 start at I-210/I-710 Interchange to SR 134/I-210/SR 710 Interchange West Termini	77.5	78.6	78.5	1.0	-0.1
SR 134	SR 134/I-210/SR 710 Interchange West Termini to North Figueroa Street	78.3	79.0	79.0	0.7	0.0
SR 134	North Figueroa Street to SR 2 Interchange East Termini	78.2	79.1	79.1	0.9	0.0
SR 134	SR 2 Interchange East Termini to SR 2 Interchange West Termini	77.1	78.1	78.1	1.0	0.0
I-5	SR 2 Interchange North Termini to SR 2 Interchange South Termini	79.4	80.3	80.4	1.0	0.1
I-5	SR 2 Interchange South Termini to SR 110 Interchange North Termini	80.4	81.3	81.3	0.9	0.0
I-5	SR 110 Interchange North Termini to SR 110 Interchange South Termini	79.8	80.7	80.7	0.9	0.0
I-5	SR 110 Interchange South Termini to I-10 Interchange North Termini	79.8	80.7	80.7	0.9	0.0
I-5	I-10 Interchange North Termini to I-10 Interchange South Termini	78.2	79.2	79.3	1.1	0.1
I-5	I-10 Interchange South Termini to East Cesar Chavez Avenue Ramps	79.8	80.8	80.8	1.0	0.0
I-10	I-5 Interchange West Termini to I-5 Interchange East Termini	72.9	73.6	73.7	0.8	0.1
I-10	I-5 Interchange East Termini to SR 710 Interchange West Termini	78.2	79.1	79.0	0.8	-0.1
I-10	SR 710 Interchange East Termini to Rosemead Boulevard	77.9	78.5	78.6	0.7	0.1
I-10	Rosemead Boulevard to I-605 Interchange West Termini	77.8	78.5	78.7	0.9	0.2
I-210	I-605 Interchange East Termini to I-605 Interchange West Termini	78.1	79.3	79.3	1.2	0.0
I-210	I-605 Interchange West Termini to Rosemead Boulevard	79.6	80.7	80.7	1.1	0.0
I-210	Rosemead Boulevard to San Gabriel Boulevard	79.1	80.2	80.2	1.1	0.0
I-210	San Gabriel Boulevard to I-710 Interchange East Termini	79.4	80.5	80.4	1.0	-0.1
I-210	I-710 Interchange North Termini to Lincoln Avenue	77.3	78.6	78.6	1.3	0.0
I-210	Lincoln Avenue to SR 2	76.9	78.2	78.2	1.3	0.0
I-210	SR 2 to La Crescenta Avenue	76.7	78.0	77.9	1.2	-0.1
I-605	I-210 Interchange South Termini to Los Angeles Street	77.8	79.5	79.5	1.7	0.0
I-605	Los Angeles Street to I-10 Interchange North Termini	78.5	80.1	80.1	1.6	0.0

Source: Refer to the FHWA noise modeling results provided in Appendix N in this EIR/EIS.
Note: CNEL is at 50 feet from nearest travel lane.

CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
EIR/EIS = Environmental Impact Report/Environmental Impact Statement
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I-5 = Interstate 5
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I-210 = Interstate 210
I-605 = Interstate 605
I-710 = Interstate 710
LRT = Light Rail Transit
SR 2 = State Route 2
SR 110 = State Route 110
SR 134 = State Route 134
SR 710 = State Route 710

TABLE 4.6:
Freeway Tunnel Alternative Single-Bore Design Variations Study Area Traffic Noise Analysis

Roadway	Segment Description	Existing CNEL, dBA	2035 No Build CNEL, dBA	2035 Single Bore V1[1] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA	2035 Single Bore V6[2] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA	2035 Single Bore V7[3] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA
SR 2	I-210 to SR 134 Interchange North Termini	76.8	77.3	76.3	-0.5	-1	76.2	-0.6	-1.1	77	0.2	-0.3
SR 2	SR 134 Interchange North Termini to SR 134 Interchange South Termini	75.5	76.2	74.7	-0.8	-1.5	74.7	-0.8	-1.5	75.5	0.0	-0.7
SR 2	SR 134 Interchange South Termini to I-5 Interchange North Termini	77.6	78.1	77.2	-0.4	-0.9	77.2	-0.4	-0.9	77.8	0.2	-0.3
SR 2	I-5 Interchange North Termini to I-5 Interchange South Termini	72.5	72.8	72.3	-0.2	-0.5	72.3	-0.2	-0.5	72.4	-0.1	-0.4
SR 110	Glenarm Street to S Avenue 52	74.1	74.2	74.1	0.0	-0.1	74.1	0.0	-0.1	74.1	0.0	-0.1
SR 110	S Avenue 52 to I-5 Interchange North Termini	75.6	75.6	75.5	-0.1	-0.1	75.5	-0.1	-0.1	75.5	-0.1	-0.1
SR 110	I-5 Interchange North Termini to I-5 Interchange South Termini	74.6	74.7	74.6	0.0	-0.1	74.6	0.0	-0.1	74.6	0.0	-0.1
SR 134	SR 134 start at I-210/I-710 Interchange to SR 134/I-210/SR 710 Interchange West Termini	77.5	78.6	78.6	1.1	0	78.5	1.0	-0.1	78.6	1.1	0.0
SR 134	SR 134/I-210/SR 710 Interchange West Termini to North Figueroa Street	78.3	79.0	79.2	0.9	0.2	79.2	0.9	0.2	79.0	0.7	0.0
SR 134	North Figueroa Street to SR 2 Interchange East Termini	78.2	79.1	79.3	1.1	0.2	79.3	1.1	0.2	79.1	0.9	0.0
SR 134	SR 2 Interchange East Termini to SR 2 Interchange West Termini	77.1	78.1	78.4	1.3	0.3	78.4	1.3	0.3	78.1	1.0	0.0
I-5	SR 2 Interchange North Termini to SR 2 Interchange South Termini	79.4	80.3	80.1	0.7	-0.2	80.1	0.7	-0.2	80.5	1.1	0.2
I-5	SR 2 Interchange South Termini to SR 110 Interchange North Termini	80.4	81.3	80.8	0.4	-0.5	80.9	0.5	-0.4	81.4	1.0	0.1
I-5	SR 110 Interchange North Termini to SR 110 Interchange South Termini	79.8	80.7	80.2	0.4	-0.5	80.2	0.4	-0.5	80.7	0.9	0.0
I-5	SR 110 Interchange South Termini to I-10 Interchange North Termini	79.8	80.7	80.2	0.4	-0.5	80.2	0.4	-0.5	80.8	1.0	0.1
I-5	I-10 Interchange North Termini to I-10 Interchange South Termini	78.2	79.2	79.1	0.9	-0.1	79.1	0.9	-0.1	79.6	1.4	0.4
I-5	I-10 Interchange South Termini to East Cesar Chavez Avenue Ramps	79.8	80.8	80.8	1.0	0.0	80.7	0.9	-0.1	81.1	1.3	0.3
I-10	I-5 Interchange West Termini to I-5 Interchange East Termini	72.9	73.6	73.7	0.8	0.1	73.7	0.8	0.1	73.6	0.7	0.0

TABLE 4.6:
Freeway Tunnel Alternative Single-Bore Design Variations Study Area Traffic Noise Analysis

Roadway	Segment Description	Existing CNEL, dBA	2035 No Build CNEL, dBA	2035 Single Bore V1[1] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA	2035 Single Bore V6[2] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA	2035 Single Bore V7[3] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA
I-10	I-5 Interchange East Termini to SR 710 Interchange West Termini	78.2	79.1	78.5	0.3	-0.6	78.5	0.3	-0.6	78.8	0.6	-0.3
I-10	SR 710 Interchange East Termini to Rosemead Boulevard	77.9	78.5	78.5	0.6	0.0	78.5	0.6	0.0	78.5	0.6	0.0
I-10	Rosemead Boulevard to I-605 Interchange West Termini	77.8	78.5	78.6	0.8	0.1	78.6	0.8	0.1	78.6	0.8	0.1
I-210	I-605 Interchange East Termini to I-605 Interchange West Termini	78.1	79.3	79.3	1.2	0.0	79.3	1.2	0.0	79.3	1.2	0.0
I-210	I-605 Interchange West Termini to Rosemead Boulevard	79.6	80.7	80.6	1.0	-0.1	80.6	1.0	-0.1	80.7	1.1	0.0
I-210	Rosemead Boulevard to San Gabriel Boulevard	79.1	80.2	80.1	1.0	-0.1	80.1	1.0	-0.1	80.2	1.1	0.0
I-210	San Gabriel Boulevard to I-710 Interchange East Termini	79.4	80.5	80.3	0.9	-0.2	80.3	0.9	-0.2	80.4	1.0	-0.1
I-210	I-710 Interchange North Termini to Lincoln Avenue	77.3	78.6	79.8	2.5	1.2	79.8	2.5	1.2	79.1	1.8	0.5
I-210	Lincoln Avenue to SR 2	76.9	78.2	79.1	2.2	0.9	79.2	2.3	1.0	78.5	1.6	0.3
I-210	SR 2 to La Crescenta Avenue	76.7	78	78.6	1.9	0.6	78.6	1.9	0.6	78.1	1.4	0.1
I-605	I-210 Interchange South Termini to Los Angeles Street	77.8	79.5	79.3	1.5	-0.2	79.4	1.6	-0.1	79.5	1.7	0.0
I-605	Los Angeles Street to I-10 Interchange North Termini	78.5	80.1	79.9	1.4	-0.2	79.9	1.4	-0.2	80.1	1.6	0.0

Source: Refer to the FHWA noise modeling results provided in Appendix N in this EIR/EIS.
Note: CNEL is at 50 feet from nearest travel lane.
[1] V1 = Operational Variation with Toll and with Express Bus Lane
[2] V6 = Operational Variation with Toll
[3] V7 = Operational Variation with Toll and No Trucks
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
EIR/EIS = Environmental Impact Report/Environmental Impact Statement
FHWA = Federal Highway Administration
I-5 = Interstate 5
I-10 = Interstate 10
I-210 = Interstate 210
I-605 = Interstate 605
I-710 = Interstate 710
SR 2 = State Route 2
SR 110 = State Route 110
SR 134 = State Route 134
SR 710 = State Route 710

TABLE 4.7:
Freeway Tunnel Alternative Dual-Bore Design Variations Study Area Traffic Noise Analysis

Roadway	Segment Description	Existing CNEL, dBA	2035 No Build CNEL, dBA	Dual Bore V2[1] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA	2035 Dual Bore V4[2] CNEL, dBA	Change from Existing Level, dBA	2035 Change from No Build Level, dBA	Dual Bore V5[3] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA
SR 2	I-210 to SR 134 Interchange North Termini	76.8	77.3	75.9	-0.9	-1.4	75.1	-1.7	-2.2	76.5	-0.3	-0.8
SR 2	SR 134 Interchange North Termini to SR 134 Interchange South Termini	75.5	76.2	74.1	-1.4	-2.1	73.2	-2.3	-3.0	74.8	-0.7	-1.4
SR 2	SR 134 Interchange South Termini to I-5 Interchange North Termini	77.6	78.1	76.9	-0.7	-1.2	76.2	-1.4	-1.9	77.4	-0.2	-0.7
SR 2	I-5 Interchange North Termini to I-5 Interchange South Termini	72.5	72.8	71.9	-0.6	-0.9	71.7	-0.8	-1.1	72.2	-0.3	-0.6
SR 110	Glenarm Street to S Avenue 52	74.1	74.2	73.8	-0.3	-0.4	73.8	-0.3	-0.4	73.8	-0.3	-0.4
SR 110	S Avenue 52 to I-5 Interchange North Termini	75.6	75.6	75.3	-0.3	-0.3	75.3	-0.3	-0.3	75.3	-0.3	-0.3
SR 110	I-5 Interchange North Termini to I-5 Interchange South Termini	74.6	74.7	74.6	0.0	-0.1	74.6	0.0	-0.1	74.6	0.0	-0.1
SR 134	SR 134 start at I-210/I-710 Interchange to SR 134/I-210/SR 710 Interchange West Termini	77.5	78.6	78.4	0.9	-0.2	78.3	0.8	-0.3	78.4	0.9	-0.2
SR 134	SR 134/I-210/SR 710 Interchange West Termini to North Figueroa Street	78.3	79.0	79.2	0.9	0.2	79.1	0.8	0.1	79.1	0.8	0.1
SR 134	North Figueroa Street to SR 2 Interchange East Termini	78.2	79.1	79.3	1.1	0.2	79.2	1.0	0.1	79.1	0.9	0.0
SR 134	SR 2 Interchange East Termini to SR 2 Interchange West Termini	77.1	78.1	78.3	1.2	0.2	78.3	1.2	0.2	78.1	1.0	0.0
I-5	SR 2 Interchange North Termini to SR 2 Interchange South Termini	79.4	80.3	80.2	0.8	-0.1	80.0	0.6	-0.3	80.8	1.4	0.5
I-5	SR 2 Interchange South Termini to SR 110 Interchange North Termini	80.4	81.3	80.9	0.5	-0.4	80.5	0.1	-0.8	81.5	1.1	0.2
I-5	SR 110 Interchange North Termini to SR 110 Interchange South Termini	79.8	80.7	80.2	0.4	-0.5	79.8	0.0	-0.9	80.9	1.1	0.2
I-5	SR 110 Interchange South Termini to I-10 Interchange North Termini	79.8	80.7	80.2	0.4	-0.5	79.8	0.0	-0.9	80.8	1.0	0.1
I-5	I-10 Interchange North Termini to I-10 Interchange South Termini	78.2	79.2	79.3	1.1	0.1	78.9	0.7	-0.3	79.9	1.7	0.7
I-5	I-10 Interchange South Termini to East Cesar Chavez Avenue Ramps	79.8	80.8	80.9	1.1	0.1	80.6	0.8	-0.2	81.4	1.6	0.6
I-10	I-5 Interchange West Termini to I-5 Interchange East Termini	72.9	73.6	73.8	0.9	0.2	73.9	1	0.3	73.7	0.8	0.1

TABLE 4.7:
Freeway Tunnel Alternative Dual-Bore Design Variations Study Area Traffic Noise Analysis

Roadway	Segment Description	Existing CNEL, dBA	2035 No Build CNEL, dBA	Dual Bore V2[1] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA	2035 Dual Bore V4[2] CNEL, dBA	Change from Existing Level, dBA	2035 Change from No Build Level, dBA	Dual Bore V5[3] CNEL, dBA	Change from Existing Level, dBA	Change from No Build Level, dBA
I-10	I-5 Interchange East Termini to SR 710 Interchange West Termini	78.2	79.1	78.4	0.2	-0.7	78.3	0.1	-0.8	78.5	0.3	-0.6
I-10	SR 710 Interchange East Termini to Rosemead Boulevard	77.9	78.5	78.5	0.6	0	78.5	0.6	0.0	78.5	0.6	0.0
I-10	Rosemead Boulevard to I-605 Interchange West Termini	77.8	78.5	78.6	0.8	0.1	78.6	0.8	0.1	78.6	0.8	0.1
I-210	I-605 Interchange East Termini to I-605 Interchange West Termini	78.1	79.3	79.3	1.2	0.0	79.3	1.2	0.0	79.3	1.2	0.0
I-210	I-605 Interchange West Termini to Rosemead Boulevard	79.6	80.7	80.5	0.9	-0.2	80.5	0.9	-0.2	80.6	1.0	-0.1
I-210	Rosemead Boulevard to San Gabriel Boulevard	79.1	80.2	80.0	0.9	-0.2	80	0.9	-0.2	80.1	1.0	-0.1
I-210	San Gabriel Boulevard to I-710 Interchange East Termini	79.4	80.5	80.3	0.9	-0.2	80.2	0.8	-0.3	80.3	0.9	-0.2
I-210	I-710 Interchange North Termini to Lincoln Avenue	77.3	78.6	79.9	2.6	1.3	80.3	3.0	1.7	78.7	1.4	0.1
I-210	Lincoln Avenue to SR 2	76.9	78.2	79.3	2.4	1.1	79.8	2.9	1.6	78.4	1.5	0.2
I-210	SR 2 to La Crescenta Avenue	76.7	78.0	78.7	2.0	0.7	79.2	2.5	1.2	78.1	1.4	0.1
I-605	I-210 Interchange South Termini to Los Angeles Street	77.8	79.5	79.3	1.5	-0.2	79.2	1.4	-0.3	79.4	1.6	-0.1
I-605	Los Angeles Street to I-10 Interchange North Termini	78.5	80.1	79.9	1.4	-0.2	79.8	1.3	-0.3	80	1.5	-0.1

Source: Refer to the FHWA noise modeling results provided in Appendix N in this EIR/EIS.
Note: CNEL is at 50 feet from nearest travel lane.
[1] V2 = Operational Variation with Toll
[2] V4 = Operational Variation with No Toll
[3] V5 = Operational Variation with No Toll and No Trucks

CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
EIR/EIS = Environmental Impact Report/Environmental Impact Statement
FHWA = Federal Highway Administration
I-5 = Interstate 5
I-10 = Interstate 10
I-210 = Interstate 210
I-605 = Interstate 605
I-710 = Interstate 710
SR 2 = State Route 2
SR 110 = State Route 110
SR 134 = State Route 134
SR 710 = State Route 710
TDM = Transportation Demand Management
TSM = Transportation System Management

The Category 2 (residential) vibration criterion for Infrequent Events is 80 VdB and for Occasional Events it is 75 VdB. There is greater potential for the LRT Alternative to cause impact because it is generally shallower than the Freeway Tunnel Alternative. The impacts could last as long as 3 days when the tunnel is being constructed directly below sensitive receptors. The actual duration would depend on how quickly the TBM advances under the sensitive receptor.

TBM vibration would not be capable of producing damage to structures. The FTA criterion for "buildings that are extremely susceptible to vibration" is 0.12 in/sec PPV which equates to roughly 90 VdB; the FTA criterion for "non-engineered timber and masonry buildings" is 0.20 in/sec PPV which equates to roughly 94 VdB. TBM vibration levels are not expected to exceed these criteria.

As discussed in Section 3.14, Noise and Vibration, the TSM/TDM, BRT, and Freeway Tunnel Alternatives would not result in excessive ground-borne noise and vibration during operations. No mitigation is required. This result is primarily due to the fact that all three of these alternatives utilize pneumatic, rubber-tired vehicles which are inherently resilient and which do not produce high levels of ground-borne noise or vibration.

The LRT Alternative could result in ground-borne noise and vibration effects associated with rail operations in the tunnel segment of the alignment at 454 residential buildings and 1 commercial office building. For the residences, the FTA ground-borne noise criterion is 35 dBA and the vibration criterion is 72 VdB. For the commercial office building, the ground-borne noise criterion is 40 dBA and the vibration criterion is 75 VdB.

With the implementation of Measure N-7, the ground-borne noise and vibration levels would be less than significant during operation of the LRT Alternative. Mitigation Measure N-7 would require the detailed study LRT vibration levels and, as necessary, the incorporation of track-based vibration isolation such as highly-resilient fasteners, rail-suspension fasteners, isolated slab track, and/or floating slab track. The amount of vibration reduction provided by these various technologies ranges from 5 to 30 dB, so a properly designed system would reduce operational vibration to less-that-significant levels. No further mitigation would be required.

XII(e) and XII(f). Airport Noise. The closest airport to the study area is the El Monte Airport, which is just over 2 mi from any of the Build Alternative improvements. The closest private airstrip to the study area is the Goodyear Blimp Base Airport, which is over 12 mi away. Because the Build Alternatives are not located in the vicinity of an airport, the project would not expose people residing or working in the project area to excessive noise levels related to airports. No mitigation is required.

4.2.13 Population and Housing

XIII. POPULATION AND HOUSING: Would the project:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	No impact	No impact	No impact	No impact
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	No impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to population and housing was assessed in the CIA (2014), *Draft Relocation Impact Report* (DRIR) (2014) and in the *Final Relocation Impact Report* (FRIR) (2017). The results of these reports are presented in Sections 3.2, Growth, and 3.3, Community Impacts, of this EIR/EIS. The following discussion is based on that information, where applicable.

XIII(a). Population Growth. As discussed in detail in Section 3.2.3, Growth, although the Build Alternatives would improve mobility and accessibility in the study area, the study area is largely built out and none of the project improvements in the Build Alternatives would add access to and/or from the area that would result in growth pressures in areas where such access does not presently exist. Because no new access to and/or from the area would be provided, there would be no impacts associated with the Build Alternatives creating access to currently inaccessible areas.

While the improvements in the Build Alternative would contribute to reducing congestion and improving mobility in the overall transportation system, they are not expected to substantially influence growth in the study area.

In the case of the TSM/TDM Alternative, the improvements are relatively modest and focused and are intended to improve circulation at specific intersections or street segments. As such, they would not be expected to increase system efficiency to a level that would substantially increase the overall capacity of the transportation system or the attractiveness of certain areas for development. As a result, it is unlikely that the improved mobility and accessibility resulting from the TSM/TDM Alternative improvements themselves would be sufficient to attract new development to an area not already proposed for development or to modify the type, location, or timing of development in those areas.

The transit service improvements in the BRT Alternative are focused on increasing the number of bus routes and the frequency of service on bus routes throughout the study area. The bus stations for the dedicated bus lanes would be modest facilities with shelters, buses, real-time transit information, and other typical passenger amenities. The stations would not be locations where large numbers of people would congregate or pass through. Further, 12 of the proposed 17 locations for BRT stations have been served by a limited-stop bus service similar to the BRT line proposed as part of the BRT Alternative (Metro Rapid Route 762) since June 2008. Although Metro Rapid Route 762 has been in operation for several years, that service has not resulted in new development (transit-oriented or non-transit-oriented) in the vicinity of the locations for the proposed BRT stations. As a result, the stations in the BRT Alternative would not increase the attractiveness of the areas around the bus stations for development. The new bus routes and increased service levels on bus routes in the area would provide a benefit for the traveling public that would be spread across many roadways within a number of cities in the study area. As a result, it is unlikely that the improved mobility and accessibility resulting from the BRT improvements themselves would be sufficient to attract new development to an area not already proposed for development or to modify the type, location, or timing of development in those areas.

While the areas around light rail stations can be attractive locations for development because they enjoy improved access to the regional public transportation system, the proposed stations would be located in areas that are generally already developed. Although the presence of those stations could result in some pressure for alternative land uses or increased densities in the areas around the stations, that type of development would be largely dependent on a number of factors other than the presence of the LRT Alternative stations. Those factors include the local and regional economic conditions, local support for those types of land uses in the areas around the stations, and the existing General Plan and zoning designations. As a result, it is unlikely that the improved mobility and accessibility resulting from the presence of the light rail stations themselves and the availability of both light rail service and increased bus services would be sufficient to attract new development to an area not already proposed for development or to modify the type, location, or timing of development in those areas.

The Freeway Tunnel Alternative would improve north-south travel in the study area and the efficiency of the regional freeway network; however, adjacent land uses along the majority of the alignment (the tunnel segment) would not be visible, the freeway would not provide any new interchanges with local arterials that would provide increased visibility for adjacent land uses, and the freeway would not substantially increase the visibility of adjacent land uses in the vicinity of the existing interchanges. As a result, the Freeway Tunnel Alternative would not provide sufficient visibility or access improvements to attract new development to an area not already proposed for development or to modify the amount, type, location, or timing of development in those areas.

Therefore, based on the information presented above and discussed in detail in Section 3.2.3, Growth, the Build Alternatives are not considered to be growth inducing, project impacts related to population growth would be less than significant, and no mitigation is required.

XIII(b) and XIII(c). Displacement of People and Housing. As discussed in Section 3.3.2, Relocations and Real Property Acquisition, the Build Alternatives would not require the acquisition of any residential properties and therefore would not displace residents. As a result, the construction of replacement housing would not be required, no impact would occur, and no mitigation is required.

4.2.14 Public Services

XIV. PUBLIC SERVICES:	TSM/TDM	BRT	LRT	Freeway Tunnel
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
ii) Police protection?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
iii) Schools?	No impact	No impact	No impact	No impact
iv) Parks?	No impact	No impact	No impact	No impact
v) Other public facilities?	No impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to public services was assessed in the CIA (2014). The results of this report are presented in Sections 3.4, Utilities/ Emergency Services, and 3.2, Growth, of this EIR/EIS. The following discussion is based on that information, where applicable.

XIV(a)(i)-(ii). Fire and Police Protection. As discussed in Section 3.4.2.1, Utilities/Emergency Services and in the Community Impact Assessment (2014), during construction of the Build Alternatives, some impairment to the delivery of emergency services, including fire and police response times, may occur as a result of lane restrictions, ramp closures, roadway closures, and/or detours. However, Measure T-1, detailed in Section 3.5 (Traffic and Transportation/Pedestrian and Bicycle Facilities), requires development of a TMP. As part of the TMP, all closures and detours would be coordinated with the affected emergency service providers to avoid and minimize potential effects on their services. With implementation of Measure T-1, impacts related to fire and police services during construction would be less than significant, and no further mitigation is required.

The increased bus service included as part of the Build Alternatives could result in a minor increase in the number of traffic collisions and other safety risks associated with additional bus service. The LRT service included as part of the LRT Alternative could result in additional safety risks associated with additional transit service, and the Freeway Tunnel Alternative could result in a minor increase in the number of traffic collisions and other safety risks associated with additional lane-miles being added to the regional freeway system.

All bus and train operations would comply with all safety requirements established for those services and would operate in accordance with adopted safety and security procedures. Each LRT tunnel would feature emergency evacuation cross passages for pedestrians, fire detection and suppression systems, communications and surveillance systems, and 24-hour monitoring, similar to the existing LRT system. Both tunnel design variations of the Freeway Tunnel Alternative would include the following tunnel support systems: emergency evacuation cross passages for pedestrians and vehicles, fire detection and suppression systems, communications and surveillance systems, and 24-hour monitoring. In addition, an operations and maintenance building would be constructed at both the northern and southern ends of the tunnel, which could be staffed by the California Highway Patrol and local fire responders.

Although operation of the Build Alternative improvements and related bus service enhancements may result in an increase in the number of calls for emergency services in the study area, any increase in calls for service would be minor and would not exceed the existing response capacity of local emergency service providers. As discussed in detail in Section 3.2, Growth, and in the response to checklist question XIII(a), above, the Build Alternatives are not considered to be growth inducing. While the improvements in the Build Alternatives would contribute to reducing congestion and improving mobility in the overall transportation system, they are not expected to substantially influence growth in the study area. This is because they would not attract new development to an area not already proposed for development or modify the amount, type, location, or timing of development in those areas. As such, the Build Alternatives would not result in new unplanned development that would increase the demand for police and fire services in the study area. Therefore, operation of the Build Alternative improvements would not degrade emergency response times or require the addition of new fire or police stations or the expansion, consolidation, or relocation of an existing facility to maintain adequate service levels. Therefore, impacts related to fire and police services during operation would be less than significant, and no mitigation is required.

XIV(a)(iii)-(v). Schools, Parks, and Other Public Facilities. The project is proposed in response to existing and forecast traffic congestion as a result of past and forecasted growth. As discussed in Section 3.2.3, Growth, and in the response to checklist question XIII(a), above, the Build Alternatives would not result in growth-inducing impacts. In addition, the Build Alternatives do not include the construction of residential or nonresidential uses that would increase the number of households in the study area. Therefore, the Build Alternatives would not increase the population or the number of people in the study area that rely on the services provided by public facilities (e.g., libraries, schools, and parks). As such, the Build Alternatives would not require the construction of new or expanded public facilities. Therefore, the Build Alternatives would not result in impacts related to school services and facilities, and no mitigation is required.

4.2.15 Recreation

XV. RECREATION:	TSM/TDM	BRT	LRT	Freeway Tunnel
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	No impact	Less than significant impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to recreational facilities was assessed in the CIA (2014) and Appendix B, *Section 4(f) Evaluation*, of this EIR/EIS. The results of these reports are presented in Section 3.1, Land Use, of this EIR/EIS. The following discussion is based on that information, where applicable.

XV(a). Increased Use of Parks and Recreational Facilities. The Build Alternatives would provide improved transportation facilities in the study area, which may reduce localized congestion near park and recreational facilities and improve accessibility to parks and recreational facilities in the study area which could increase their use. However, it is not expected that the Build Alternatives would substantially increase use of parks and recreational facilities. As a result, the Build Alternatives would result in a less than significant impact relative to increased use of existing parks and recreational facilities. No mitigation is required.

XV(b). Construction or Expansion of Recreational Facilities. As discussed in Section 3.1.3.3, Land Use, the Build Alternatives do not include the construction of any new recreation resources and would not result in the need to expand any existing recreation resources. The TSM/TDM, LRT, and Freeway Tunnel Alternatives would not require the temporary or permanent use of land from any parks. Therefore, there would be no impacts to recreational facilities from the TSM/TDM, LRT, and Freeway Tunnel Alternatives, and no mitigation is required.

The BRT Alternative would require the temporary occupancy and permanent use of very minor amounts of land (0.2 acre and 0.011 acre, respectively, out of a total park size of 2.0 acres) from Cascades Park in the City of Monterey Park. The land that would be permanently acquired from Cascades Park is protected by the Public Park Preservation Act. As a result, sufficient compensation or land, or both, must be provided to the City of Monterey Park during the property acquisition process for the BRT Alternative. Implementation of Measure Parks-1 would provide compensation for the acquisition of land from Cascades Park, under the Park Preservation Act, by the BRT Alternative.

4.2.16 Transportation/Traffic

XVI. TRANSPORTATION/TRAFFIC: Would the project:	TSM/TDM	BRT	LRT	Freeway Tunnel
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	Potentially significant impact	Potentially significant impact	Potentially significant impact	Potentially significant impact
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	No impact	No impact	No impact	No impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	No impact	No impact	No impact	No impact
e) Result in inadequate emergency access?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	No impact	No impact	No impact	No impact

Discussion: The potential for the Build Alternatives to result in impacts related to transportation and traffic was assessed in the *Transportation Technical Report* (2014). The results of this report are presented in Section 3.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, of this EIR/EIS. The following discussion is based on that information, where applicable.

XVI(a). Conflict with Transportation Plans. As discussed in Sections 3.1, Land Use, and 3.13, Air Quality, the proposed project is listed in the 2016 financially constrained RTP/SCS which was approved by SCAG on April 7, 2016. FHWA and FTA made a regional conformity determination finding on December 16, 2016. The project is also included in the financially constrained 2017 FTIP, Amendment 17-19, which was approved on May 25, 2018 by FHWA and FTA.

The current project description in the 2016 RTP is inconsistent with the Preferred Alternative (Project ID: 1M0101 SR-710 NORTH PROJECT STUDY ALTERNATIVES (ALIGNMENT TBD)). As with other projects included within the Project List, when the SR-710 North Study EIR/EIS process is complete, the 2016 RTP/SCS will be updated to reflect the Preferred Alternative as identified in this Final EIR/EIS and would be consistent with the proposed RTP amendment. The TSM/TDM Alternative is consistent with the current 2017 FTIP.

Therefore, the TSM/TDM Alternative would not conflict with or obstruct implementation of the RTP/SCS or FTIP. No mitigation is required.

XVI(b). Conflict with Congestion Management Programs. As discussed in Section 3.5, the Build Alternatives would result in Adverse Effects to intersections and freeway segments based on the following metrics:

- If the intersection is projected to operate at level of service (LOS) E under a Build Alternative, and the increase in delay over the No Build Alternative is 5 seconds or more; or

- If the intersection is projected to operate at LOS F under a Build Alternative, and the increase in delay over the No Build Alternative is 2 seconds or more.
- The freeway segment is projected to operate at LOS F under a Build Alternative, and the increase in traffic demand compared to the No Build Alternative is 2 percent or more.

These measures have also been used to identify impacts under CEQA.

The traffic analysis includes operational analysis for 156 intersections and 606 freeway segments in an extended study area. Detailed analyses were conducted for existing conditions (2012) and future conditions (i.e., 2020, 2025, and 2035 for the No-Project, TSM/TDM, BRT, LRT, and six variations of the Freeway Tunnel Alternatives). The operations of the freeway segments and intersections for the horizon year (2035) Build Alternatives were compared to the existing conditions (2012).

For existing conditions, 14 of the 156 intersections operate at LOS E in one or both peak periods, and 5 of the 156 intersections operate at LOS F. On the freeway, 113 of the 606 segments operate at LOS E, and 165 of the 606 segments operate at LOS F (*Transportation Technical Report*, 2014).

Table 4.8 is a summary of the number of intersections and freeway segments that meet the metric described above for the Build Alternatives in the horizon year compared to those that meet the metric in the existing conditions and the No Build Alternative. For the “Existing” analysis, the primary reason that the intersection totals listed in Table 4.8 meet the metric is because the traffic growth associated with future increases in population and employment results in an increase in delay between existing conditions and 2035. There is a similar reason for the freeways. The criterion for freeways (a 2 percent increase in volume), occurs on nearly every freeway segment when comparing between 2012 and 2035. There are many more LOS F freeway segments than intersections, regardless of the scenario. The “Future No Build” analysis was described in Section 3.5. It is a direct evaluation of project effects because it compares Build and No Build Alternatives for the same horizon year. Therefore, this comparison of the Build vs. Future No Build is the most reasonable basis for the determination of impacts and mitigation strategies because it is independent of background growth.

As shown in Tables 3.5.15 and 3.5.16 in Section 3.5, the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives would result in impacts to study area intersections and freeway segments. Improvements were considered to address the potentially significant impacts at the identified intersections and freeway segments. However, mitigation measures are not proposed at all the impacted intersections and freeway segments for reasons detailed in Tables 3.5.15 and 3.5.16. As a result, the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives would all result in significant adverse impacts on study area intersections and freeway segments that cannot be mitigated to below a level of significance.

XVI(c). Air Traffic Patterns. The closest public airport to the study area is the El Monte Airport, which is just over 2 mi from any of the Build Alternative improvements. The closest private airstrip to the study area is the Goodyear Blimp Base Airport, which is over 12 mi away. The Build Alternatives would not include any elevated structures in designated air space that could interfere with air traffic patterns. The Build Alternatives would not result in any changes in demand for air travel or any changes that would result in substantial safety risks associated with air travel. Therefore, the Build Alternatives would not result in a change in air traffic patterns, and no mitigation is required.

TABLE 4.8:
Comparison of Build Alternatives to Existing and Horizon Year (2035) No Build Scenarios

Scenario	Number of Intersections[1]		Number of Freeway Segments[2]	
	Existing [3]	Future No Build[4]	Existing [3]	Future No Build[4]
TSM/TDM Alternative	30	18	107	8
BRT Alternative	26	13	105	13
LRT Alternative	30	13	126	17
Freeway Tunnel Alternative				
Single-Bore Operational Variations				
-- With Tolls	23	9	111	18
-- With Tolls and No Trucks	19	8	105	18
-- With Tolls and Express Bus	19	6	104	19
Dual-Bore Operational Variations				
-- No Tolls	19	11	102	31
-- No Tolls and No Trucks	17	9	98	30
-- With Tolls	19	11	102	28

Source: Table 3.5.20 and *Transportation Technical Report* (2014)
[1] There are 156 intersections in the study area.
[2] There are 606 freeway segments in the study area.
[3] Comparison of 2035 Build Alternative to 2013 Existing Conditions
[4] Comparison of 2035 Build Alternative to 2035 No-Build Alternative

XVI(d). Increased Hazards Due to Design Features. All the structures and features included in the Build Alternatives would be designed and constructed in compliance with Caltrans, Metro, local jurisdiction, and/or FTA standards and other applicable professional, design, and construction standards. As a result, the Build Alternatives would not include any hazardous design features or incompatible uses. For the Freeway Tunnel Alternative, vehicles carrying flammable or hazardous materials would be restricted from using the tunnel. Therefore, the Build Alternatives would not substantially increase traffic or transportation hazards due to a design feature or incompatible uses. No mitigation is required.

XVI(e). Emergency Access. As discussed in Section 3.4, Utilities/Emergency Services, during construction of the Build Alternatives, some impairment to the delivery of emergency services, including fire and police response times, may occur as a result of lane restrictions, ramp closures, roadway closures, and/or detours. However, Measure T-1, detailed in Section 3.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, requires development of a TMP. As part of the TMP, all closures and detours would be coordinated with the affected emergency service providers. With implementation of Measure T-1, impacts related to emergency access during construction would be less than significant, and no further mitigation is required.

After completion of construction, the elements included in the Build Alternatives could help to reduce congestion in the future and consequently reduce response times of emergency vehicles. The tunnels that are proposed as part of the LRT and Freeway Tunnel Alternatives would include fire suppression systems to control a fire until emergency responders arrive. In addition, the Freeway Tunnel Alternative would include emergency evacuation for pedestrians and vehicles, as well as medians and shoulders that emergency responders could utilize in the event of an emergency. Therefore, impacts related to emergency access during operation would be less than significant, and no mitigation is required.

XVI(f). Conflict with Public Transit, Bicycle, or Pedestrian Facility Plans. As discussed in Chapter 2.0, Project Alternatives, the TSM/TDM Alternative, which is included as part of all the Build Alternatives, includes expanded bus service, bus service improvements, and bicycle facility improvements. These facilities would be designed consistent with the local General Plan Circulation Elements and will comply with Americans with Disabilities Act of 1990 (ADA) requirements. The project would improve pedestrian facilities (sidewalks) by replacing the existing ones that would be removed during construction. Because public transit, bicycle, or pedestrian facilities would be maintained or improved, the Build Alternatives would not conflict with adopted plans regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. No mitigation is required.

4.2.17 Utilities and Service Systems

XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:	**TSM/TDM**	**BRT**	**LRT**	**Freeway Tunnel**
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	No impact	No impact	No impact	No impact
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
g) Comply with federal, state, and local statutes and regulations related to solid waste?	No impact	No impact	No impact	No impact

XVII(a) Wastewater Treatment Requirements. The Build Alternatives would not generate wastewater that would be disposed of in the municipal sewer system. As discussed in Sections 2.2.3.3 and 2.2.3.4, Drainage Facilities, water in the LRT Alternative and Freeway Tunnel Alternative tunnels (e.g., during a fire or to clean a spill) would drain to a low point in the tunnel where a sump would be located. The water would then be pumped up to a storage tank and hauled away and disposed of as hazardous waste. As a result, the Build Alternatives would not result in impacts related to exceedances of the ability of local wastewater treatment providers to treat wastewater generated in their service areas. No mitigation is required.

XVII(b). Construction of New or Expanded Water or Wastewater Facilities. The Build Alternatives would not result in substantial demand for water supplies. Some water may be needed during project construction and as landscaping is planted to allow the landscaping to become established. During construction of the Build Alternatives, water would need to be provided for potable use and for dust control. However, the demand for water during construction of the Build Alternatives would represent only a very small percentage of total demand for water in the area.

During operation of the LRT and Freeway Tunnel Alternatives, water would be required for fire suppression in the event of a fire. The fire suppression system for the Freeway Tunnel Alternative would be served by one 92,000-gallon tank that would be filled at the start of operation and then only intermittently as needed. The fire suppression system for the LRT Alternative would be connected to two independent water supply connections to ensure adequate water supply is available to maintain the required pressure and flow rate in case of a fire. However, the demand for water during construction and operation of the Build Alternatives would be intermittent, would represent only a very small percentage of total demand for water in the area, and would not exceed existing entitlements.

As discussed in XVII(a), above, the Build Alternatives would not generate wastewater that would be disposed of in the municipal sewer system. Therefore, the Build Alternatives would not result in impacts related to the need for additional water or wastewater treatment capacity and/or facilities. No mitigation is required.

XVII(c). Construction of New Storm Drain Facilities. As discussed in Sections 2.2.3.1, 2.2.3.2, 2.2.3.3, and 2.2.3.4, Drainage Facilities, the Build Alternatives include modifications to existing storm water drainage facilities as well as new storm water management features to accommodate increased storm water flows from the Build Alternatives. Those facilities would not result in substantial impacts related to the human and natural environments because they would not result in the need for expanded or new storm water facilities beyond those that are proposed as part of the Build Alternatives. Therefore, impacts related to storm drain facilities would be less than significant, and no mitigation is required.

XVII(d). Water Supplies. As discussed in XVII(b), above, the demand for water during construction and operation of the Build Alternatives would represent only a very small percentage of total demand for water in the area and would not exceed existing entitlements. Therefore, impacts related to water supply would be less than significant, and no mitigation is required.

XVII(e). Wastewater. As discussed in XVII(a) above, the Build Alternatives would not generate wastewater that would be disposed of in the municipal sewer system. Therefore, the Build Alternatives would not result in impacts related to the capacity of local wastewater treatment providers to treat wastewater generated in their service areas. No mitigation is required.

XVII(f). Landfill Capacity. Waste materials generated during construction of the Build Alternatives would include materials from demolished structures such as rebar, wood, concrete, and other similar materials, as well as vegetation removed from construction areas. Waste generated during operation of the Build Alternatives would be limited to trash picked up along the transportation facilities and vegetation from landscaping maintenance. All waste materials will be properly disposed of by the Construction Contractor during construction and by the agency with jurisdiction during operation (Caltrans, Metro, or the cities), including diversion from area landfills for reduction, recycling, reuse, and composting (green waste). Waste materials generated during construction and operation of the Build Alternatives that cannot be or are not diverted would be disposed of at the Puente Hills or Scholl Canyon Landfills. The amount of waste materials generated during construction and operation of the Build Alternatives that would be disposed of in landfills would represent only a very small percentage of the total amount of waste generated in the region and disposed of at the landfills.

As discussed in Sections 2.2.3.3 and 2.2.3.4, Disposal Sites and Haul Routes, excavated soil would be disposed of at the Manning and Olive Pits in the City of Irwindale. These pits are former rock quarries that have been previously environmentally cleared and licensed to accept clean soil from construction projects. The Manning Pit has a total capacity of 5,000,000 cubic yards (cy). The Olive

Pit has a total capacity of 50,000,000 cy. The total quantity of excavation would be 140,000 cy for the TSM/TDM Alternative, 16,000 cy for the BRT Alternative, 2,600,000 cy for the LRT Alternative, 5,000,000 cy for the single-bore design variation of the Freeway Tunnel Alternative, and 10,000,000 cy for the dual-bore design variation of the Freeway Tunnel Alternative. Based on the total capacity of these two pits, it is anticipated they have sufficient capacity to accept soil waste generated in the future during construction of the LRT and Freeway Tunnel Alternatives. Therefore, impacts related to landfill capacity would be less than significant, and no mitigation is required.

XVII(g). Compliance with Solid Waste Regulations. As noted in the response to checklist question XVII(f), above, waste materials generated during construction and operation of the Build Alternatives would be properly disposed during construction and operation at landfills, materials recycling facilities, green waste collection stations, and the Manning and Olive Pits. As a result, the construction and operation of the Build Alternatives would not result in impacts related to compliance with federal, State, and local solid waste statutes and regulations. No mitigation is required.

4.2.18 Mandatory Findings of Significance

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE	TSM/TDM	BRT	LRT	Freeway Tunnel
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	Less than significant with mitigation	Less than significant with mitigation	Potentially significant impact	Potentially significant impact
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	Potentially significant impact	Potentially significant impact	Potentially significant impact	Potentially significant impact
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	Potentially significant impact	Potentially significant impact	Potentially significant impact	Potentially significant impact

XVIII(a). Degradation of the Quality of the Environment. As described earlier in Section 4.2.4, Biological Resources, the Build Alternatives have the potential to result in adverse impacts on habitats and natural communities; threatened, endangered, and special-status species; and protected waters. These potential impacts would be substantially avoided, minimized, or mitigated to below a level of significance under CEQA based on implementation of the avoidance, minimization, and mitigation measures described in Section 4.4 of this CEQA chapter and in detail in Sections 3.16 through 3.21 of this EIR/EIS.

As discussed in Section 4.2.5, Cultural Resources, construction of the Build Alternatives will result in adverse impacts on historical resources, including two prehistoric village sites. Some of those impacts, including the impacts on prehistoric resources, can be mitigated to below a level of significance based on implementation of measures provided in Section 3.7.4. The remaining significant impacts on historical resources would represent adverse impacts on those resources. However, the Build Alternatives would not result in the elimination of any important examples of the major periods of California prehistory or history.

As discussed in Section 3.11, Paleontology, the sediments in the study area have a high sensitivity for the presence of paleontological resources. Therefore, the Build Alternatives may impact unique paleontological resources during construction. During excavation and grading for the TSM/TDM or BRT Alternatives, fossils would be able to be recovered. During tunnel boring for the LRT and Freeway Tunnel Alternatives, there would be limited recovery of fossils; however, during excavation of the cut-and-cover tunnel, fossils would be able to be recovered.

To reduce impacts to paleontological resources that may be present in the areas proposed for grading and excavation for the Build Alternatives, Measure PAL-1 in Section 3.11, Paleontology, requires the preparation during final design and implementation during construction of a detailed PMP for the Freeway Tunnel Alternative or a PRIMP for the TSM/TDM, BRT, and LRT Alternatives. Measure PAL-1 requires monitoring during construction, collection of fossils, documentation/ recording of the fossils, and curation of the fossils in a permanent repository.

With implementation of Measure PAL-1, impacts to paleontological resources from construction of the TSM/TDM and BRT Alternatives would be reduced to a less than significant level. However, even with implementation of Measure PAL-1, the loss of fossil remains and the fossil-bearing rocks from the tunnel boring would be a permanent, significant unavoidable impact of the LRT and Freeway Tunnel Alternatives based on the scientific significance of formations in the study area.

XVIII(b). Cumulative Impacts. As discussed in detail in Section 3.25, Cumulative Impacts, the environmental topics for which the Build Alternatives, when combined with other cumulative projects, would contribute to adverse impacts that are not fully mitigated or offset and that were determined to contribute to significant cumulative adverse impacts are:

- Visual (LRT Alternative only—visual impacts from elevated track alignments and stations in the community of East Los Angeles); and
- Animal Species (nesting birds protected under the MBTA).

XVIII(c). Adverse Effects on Human Beings. As described above, the short- and long-term direct and indirect effects of the Build Alternatives, when combined with the effects of other cumulative projects, would potentially contribute to cumulative impacts for some environmental topics. The Build Alternatives also have the potential to result in substantial Adverse Effects on human beings, particularly as a result of the several significant unavoidable adverse impacts described in the following section.

4.2.19 Unavoidable Significant Environmental Effects

Even with implementation of the proposed mitigation measures, some of the impacts identified would still remain significant, as summarized below.

4.2.19.1 Cultural Resources

As discussed in Section 4.2.5, Cultural Resources, construction of the Build Alternatives will result in significant adverse impacts on one or more historical resources. Even with implementation of the measures provided in Section 3.7.4, some of those impacts cannot be mitigated to below a level of significance. Those significant adverse impacts on historic resources would represent permanent changes to the affected properties.

4.2.19.2 Paleontological Resources

The LRT and Freeway Tunnel Alternatives include bored tunnel sections that would be excavated using a TBM that prevents access to the rock face and grinds the rock. The sizes of the pieces of rock recovered will vary from cobble size to small particles, depending on the specific type of TBM used. During the tunnel boring, the amount of fossil recovery will depend on the type of equipment used. However, during excavation of the cut-and-cover tunnel, there would be more opportunity for the complete recovery of larger fossil specimens. To reduce impacts to paleontological resources that may be present in the areas proposed for grading and excavation for the Build Alternatives, Measure PAL-1 in Section 3.11, Paleontology, requires the preparation during final design and implementation during construction of a detailed PMP for the Freeway Tunnel Alternative or a PRIMP for the TSM/TDM, BRT, and LRT Alternatives. Measure PAL-1 requires monitoring during construction, collection of fossils, documentation/recording of the fossils, and curation of the fossils in a permanent repository.

Although construction would be a short-term activity, even with implementation of Measure PAL-1, the loss of fossil remains and the fossil-bearing rocks from the tunnel boring would be a permanent, significant unavoidable impact of the LRT and Freeway Tunnel Alternatives based on the scientific significance of formations in the study area.

4.2.19.3 Land Use and Planning

Conflict with Land Use Plans

As discussed in Section 3.1.1.2, Land Use and Response X(b) above, the four Build Alternatives would result in the permanent acquisition and conversion of land currently planned for nontransportation uses into transportation uses, which would result in inconsistencies with land use designations in General Plans for local jurisdictions. If a Build Alternative is selected for implementation, those inconsistencies would exist until the applicable local General Plans are amended to reflect the use of the affected land for transportation improvements in the selected Build Alternative. Neither Metro nor Caltrans has land use planning authority, and neither has authority to require local jurisdictions to amend their General Plans. Therefore, it will be the decision of the affected local jurisdictions on how and when to address the identified General Plan land use inconsistencies. However, because it is generally desirable that the General Plans be consistent with existing conditions, Metro and Caltrans will request that the applicable local jurisdictions amend their General Plans to reflect the permanent use of land for the improvements included in the selected Build Alternative, as specified in Measure LU-1. However, because Metro and Caltrans have no authority to require a General Plan amendment, a significant unavoidable impact would remain until the General Plans are amended.

4.2.19.4 Transportation and Traffic

As shown in Tables 3.5.12 and 3.5.13 in Section 3.5 (Traffic and Transportation/Pedestrian and Bicycle Facilities), the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives would result in adverse impacts to study area intersections and freeway segments. Improvements to address those impacts are not proposed at all the impacted intersections and freeway segments for reasons detailed in Tables 3.5.17 through 3.5.34. As a result, the TSM/TDM, BRT, LRT, and Freeway Tunnel Alternatives would all result in significant adverse impacts on study area intersections and freeway segments that cannot be mitigated to below a level of significance.

4.2.19.5 Visual/Aesthetics

As discussed in Section 3.6, Visual/Aesthetics, and as shown on Figure 3.6-12, Key View 9-LRT, in Appendix M, the I-710 corridor has an open view with vegetation and office buildings to the east and an undeveloped steep slope to the west. However, under the LRT Alternative, the elevated light rail line would run diagonally across the freeway at a height of approximately 25 ft above the road. The proposed visual quality of this view would be reduced because the LRT Alternative facility would block most of the view to the San Gabriel Mountains in the distance as it crosses over the freeway.

Additionally, Key View 13-LRT (Figure 3.6-16 in Appendix M) would experience a major decrease in visual quality because a narrow concrete median would be installed to accommodate the concrete columns for the LRT Alternative overhead. A safety railing would also be built on top of the elevated track, resulting in the view being dominated by high retaining walls and the LRT Alternative overpass. The overall visual change would be major. Therefore, the proposed visual quality would decrease due to the installation of the elevated LRT Alternative facility.

Based on the above discussion, the LRT Alternative, specifically for Key Views 9-LRT and 13-LRT, would have a significant visual impact.

4.2.19.6 Cumulative Impacts

The Build Alternatives, when combined with other cumulative projects, would contribute to adverse impacts that are not fully mitigated or offset and that were determined to contribute to unavoidable significant cumulative adverse impacts to:

- **Visual (LRT Alternative only):** The LRT Alternative and the Eastside Transit Corridor Project propose elevated track alignments and stations in the community of East Los Angeles, which would contribute to a cumulative visual impact in the area. Although it is anticipated that, to the extent feasible, the new features constructed as part of these projects will be visually compatible with the surrounding areas, it would still result in a large visual change to the area, and cumulative visual impacts would be significant and unavoidable.

4.2.20 Significant Irreversible Environmental Changes

Significant irreversible environmental changes are discussed in Section 3.23, Irreversible and Irretrievable Commitments of Resources That Would be Involved in the Proposed Project, of this EIR/EIS.

4.2.21 Growth-Inducing Impacts

As discussed in detail in Section 3.2, Growth and in the response to checklist question XIII(a), above, the Build Alternatives are not considered to be growth inducing. While the improvements in the Build Alternatives would contribute to reducing congestion and improving mobility in the overall transportation system, they are not expected to substantially influence growth in the study area. This is because they would not attract new development to an area not already proposed for development or modify the amount, type, location, or timing of development in those areas.

4.3 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to GHG emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and the World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), fluoroform (HFC-23), 1,1,1,2-tetrafluoroethane (HFC-134a), and difluoroethane (HFC-152a).

In the United States, the main source of GHG emissions is electricity generation, followed by transportation.[1] In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) are the largest contributors of GHG emissions.[2] The dominant GHG emitted is CO_2, which is mostly from fossil fuel combustion.

Two terms are typically used when discussing how we address the impacts of climate change: “greenhouse gas mitigation” and “adaptation.” Greenhouse gas mitigation covers the activities and policies aimed at reducing GHG emissions to limit or “mitigate” the impacts of climate change. Adaptation, on the other hand, is concerned with planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).

4.3.1 Regulatory Setting

This section outlines federal and state efforts to comprehensively reduce GHG emissions from transportation sources.

4.3.1.1 Federal

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

The Federal Highway Administration (FHWA) recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices.[3] This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—“the triple bottom line of sustainability.”[4] Program and project elements that foster sustainability and resilience also support economic vitality and

1 https://www.epa.gov/ghgemissions/us-greenhouse-gas-inventory-report-1990-2014
2 https://www.arb.ca.gov/cc/inventory/data/data.htm
3 http://www.fhwa.dot.gov/environment/sustainability/resilience.
4 https://www.sustainablehighways.dot.gov/overview.aspx.

global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life. Addressing these factors up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

Energy Policy Act of 1992 (EPACT92, 102nd Congress H.R.776.ENR): With this act, Congress set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 consists of 27 titles detailing various measures designed to lessen the nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings. Title III of EPACT92 addresses alternative fuels. It gave the U.S. Department of Energy administrative power to regulate the minimum number of light-duty alternative fuel vehicles required in certain federal fleets beginning in fiscal year 1993. The primary goal of the Program is to cut petroleum use in the United States by 2.5 billion gallons per year by 2020.

Energy Policy Act of 2005 (109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Indian energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Standards: This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the Corporate Average Fuel Economy (CAFE) program on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States.

Executive Order Executive Order (EO) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance, 74 Federal Register* 52117 (October 8, 2009): This federal EO set sustainability goals for federal agencies and focuses on making improvements in their environmental, energy, and economic performance. It instituted as policy of the United States that federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities.

Executive Order 13693, Planning for Federal Sustainability in the Next Decade, 80 Federal Register 15869 (March 2015): This EO reaffirms the policy of the United States that federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities. It sets sustainability goals for all agencies to promote energy conservation, efficiency, and management by reducing energy consumption and GHG emissions. It builds on the adaptation and resiliency goals in previous executive orders to ensure agency operations and facilities prepare for impacts of climate change. This order revokes Executive Order 13514.

The U.S. EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in Massachusetts v. EPA (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions.

The U.S. EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010[5] and significantly increased the fuel economy of all new passenger cars and light trucks sold in the United States. The standards required these vehicles to meet an average fuel economy of 34.1 miles per gallon by 2016. In August 2012, the federal government adopted the second rule that increases fuel economy for the fleet of passenger cars, light-duty trucks, and medium-duty passenger vehicles for model years 2017 and beyond to average fuel economy of 54.5 miles per gallon by 2025. Because NHTSA cannot set standards beyond model year 2021 due to statutory obligations and the rules' long timeframe, a mid-term evaluation is included in the rule. The Mid-Term Evaluation is the overarching process by which NHTSA, EPA, and ARB will decide on CAFE and GHG emissions standard stringency for model years 2022–2025. NHTSA has not formally adopted standards for model years 2022 through 2025. However, the EPA finalized its mid-term review in January 2017, affirming that the target fleet average of at least 54.5 miles per gallon by 2025 was appropriate. In March 2017, President Trump ordered EPA to reopen the review and reconsider the mileage target.[6]

NHTSA and EPA issued a Final Rule for "Phase 2" for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO_2 emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

Presidential Executive Order 13783, *Promoting Energy Independence and Economic Growth,* of March 28, 2017, orders all federal agencies to apply cost-benefit analyses to regulations of GHG emissions and evaluations of the social cost of carbon, nitrous oxide, and methane.

4.3.1.2 State

With the passage of legislation, including State Senate and Assembly bills and executive orders, California has been innovative and proactive in addressing GHG emissions and climate change:

Assembly Bill (AB) 1493, Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009 model year.

Executive Order S-3-05 (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below the year 1990 levels by 2050. This goal was further reinforced with the passage of AB 32 in 2006 and Senate Bill (SB) 32 in 2016.

Assembly Bill 32 (AB 32), Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals as outlined in EO S-3-05, while further mandating

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5 https://one.nhtsa.gov/Laws-&-Regulations/CAFE-%E2%80%93-Fuel-Economy

6 http://www.nbcnews.com/business/autos/trump-rolls-back-obama-era-fuel-economy-standards-n734256; and https://www.federalregister.gov/documents/2017/03/22/2017-05316/notice-of-intention-to-reconsider-the-final-determination-of-the-mid-term-evaluation-of-greenhouse

that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and State agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

Senate Bill (SB 97), Chapter 185, 2007, Greenhouse Gas Emissions: This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the ARB to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land use, and housing policies to plan for the achievement of the emissions target for their region.

Senate Bill 391 (SB 391), Chapter 585, 2009, California Transportation Plan: This bill requires the State's Long-Range Transportation Plan (LRTP) to meet California's climate change goals under AB 32.

Executive Order B-16-12 (March 2012): This order orders State entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

Executive Order B-30-15 (April 2015): This order establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent ($MMTCO_2e$). Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, *Safeguarding California*, every 3 years, and to ensure that its provisions are fully implemented.

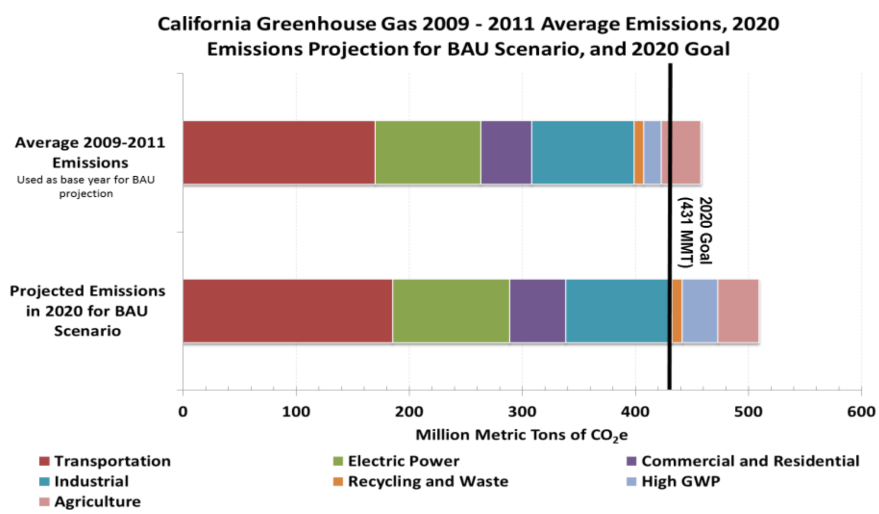
Senate Bill 32 (SB 32), Chapter 249, 2016: This bill codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

4.3.1.3 Environmental Setting

In 2006, the Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), which created a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020. The Scoping Plan was first approved by ARB in 2008 and must be updated every 5 years. The second updated plan, California's 2017 Climate Change Scoping Plan, [https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf] adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32..

The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Updated Scoping Plan, ARB released the 2018 edition of the GHG inventory for California.[7] ARB is responsible for maintaining and updating California's GHG Inventory per H&SC Section 39607.4. The associated forecast/projection is an estimate of the emissions anticipated to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented.

An emissions projection estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. The projected 2020 emissions provided in Figure 4-2 represent a business-as-usual (BAU) scenario assuming none of the Scoping Plan measures are implemented. The 2020 BAU emissions estimate assists ARB in demonstrating progress toward meeting the 2020 goal of 431 $MMTCO_2e$.[8] The 2018 edition of the GHG emissions inventory (https://www.arb.ca.gov/cc/inventory/data/data.htm) found total California emissions of 429 MMTCO2e for 2016.



Source: https://www.arb.ca.gov/cc/inventory/data/bau.htm

Figure 4-2: 2020 Business as Usual (BAU) Emissions Projection 2014 Edition

The 2020 BAU emissions projection was revisited in support of the First Update to the Scoping Plan (2014). This projection accounts for updates to the economic forecasts of fuel and energy demand as well as other factors. It also accounts for the effects of the 2008 economic recession and the projected recovery. The total emissions expected in the 2020 BAU scenario include reductions

7 2018 Edition of the GHG Emission Inventory Released (July 2018): https://www.arb.ca.gov/cc/inventory/data/data.htm.

8 The revised target using Global Warming Potentials (GWP) from the IPCC Fourth Assessment Report (AR4)

anticipated from Pavley I and the Renewable Electricity Standard (30 $MMTCO_2e$ total). With these reductions in the baseline, estimated 2020 statewide BAU emissions are 509 $MMTCO_2e$.

4.3.2 Project Analysis

An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its incremental change in emissions when combined with the contributions of all other sources of GHGs.[9] In assessing cumulative impacts, it must be determined whether a project's incremental effect is "cumulatively considerable" (CEQA Guidelines, Sections 15064(h)(1) and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. Gathering sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

GHG emissions for transportation projects can be divided into those produced during operations and those produced during construction. The following represents a best faith effort to describe the potential GHG emissions related to the proposed project.

4.3.3 Project Operational Emissions

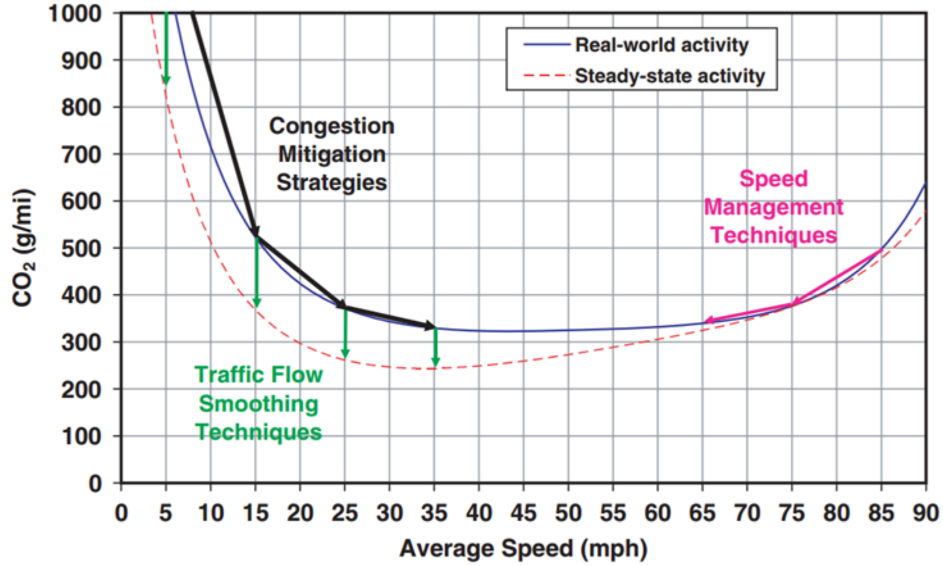
Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity), (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective all four strategies should be pursued concurrently.

FHWA supports these strategies to lessen climate change impacts, which correlate with efforts that the state of California is undertaking to reduce GHG emissions from the transportation sector.

The highest levels of CO_2 from mobile sources such as automobiles occur at stop-and-go speeds (0–25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0–25 miles per hour (see Figure 4-3). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO_2, may be reduced.

The purpose of the proposed action is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles. The Build Alternatives would not generate new vehicular traffic trips since new homes or businesses would not be constructed. However, there is a possibility that some traffic currently utilizing other routes would be attracted to use the new highway facilities or would shift to the new transit options, thereby resulting in slight changes in VMT. The impact of GHG emissions is a global

[9] This approach is supported by the Association of Environmental Professionals: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (SCAQMD) (*Chapter 6: The CEQA Guide,* April 2011) and the United States Forest Service (*Climate Change Considerations in Project Level NEPA Analysis,* July 13, 2009).



Source: Matthew Barth and Kanok Boriboonsomsin, University of California, Riverside, May 2010 (https://www.researchgate.net/publication/46438207).

Figure 4-3: Possible Use of Traffic Operation Strategies in Reducing On-Road CO_2 Emissions

rather than local issue. However, due to lack of global models for project-level analysis, the impact of the Build Alternatives on GHG emissions was calculated using traffic data for the Traffic Operations Analysis Area, as shown in Figure 3.5-1.

The *Transportation Technical Report* (April 2014) calculated the VMT and vehicle hours traveled (VHT) for all of the vehicle trips in the Traffic Operations Analysis Area. These traffic data, in conjunction with the CT-EMFAC2014 emission model (Version 6.0), were used to calculate and compare the CO_2 emissions for the 2012, 2020, 2025, and 2035 regional conditions.

While EMFAC2014 has a rigorous scientific foundation and has been vetted through multiple stakeholder reviews, its emission rates are based on tailpipe emission test data. The numbers are estimates of CO_2 emissions and not necessarily the actual CO_2 emissions. The model does not account for factors such as the rate of acceleration and the vehicles' aerodynamics, which would influence CO_2 emissions. To account for CO_2 emissions, ARB's GHG Inventory follows the IPCC guideline by assuming complete fuel combustion, while still using EMFAC data to calculate CH_4 and N_2O emissions. Though EMFAC2014 is currently the best available tool for use in calculating GHG emissions, it is important to note that the CO_2 numbers provided are only useful for a comparison of alternatives.

The CO_2 and CH_4 results of the modeling were used to calculate the CO_2 equivalent (CO_2e) emissions listed in Tables 4.9 through 4.11. The CO_2e emissions numbers listed in Tables 4.9 through 4.11 are only useful for a comparison among project alternatives. As shown in Tables 4.9 through 4.11, with the exception of the 2035 TSM/TDM, BRT, LRT, and Freeway Tunnel (dual bore freeway tunnel without truck option) Alternatives, the other Build Alternatives would result in small decreases in CO_2 emissions within the region when compared to No Build conditions. When compared to Existing (2012) conditions, all the future alternatives (No Build and Build) would have lower CO_2e emissions.

TABLE 4.9:
2020 Opening Year Greenhouse Gas Emissions – Traffic Operations Analysis Area (MT/yr)

Alternative	VMT (mi/yr)	CO_2e (MT/yr)	Change from Existing (MT/yr)	Change from No Build (MT/yr)
2012 Existing	7,739,970,007	3,583,875	-	-
2020 No Build	8,326,730,105	3,347,160	-236,715	-
TSM/TDM	8,330,295,767	3,337,716	-246,159	-9.44
BRT	8,323,417,067	3,334,039	-249,836	-13.121

Source: *Supplemental Air Quality Assessment Report* (2018)
CO_2e = carbon dioxide equivalent, includes CO_2 and CH_4
mi/yr = miles per year
MT/yr = metric tons per year
Annual VMT was converted from daily VMT using a factor of 343

TABLE 4.10:
2025 Opening Year Greenhouse Gas Emissions – Traffic Operations Analysis Area (MT/yr)

Alternative	VMT (mi/yr)	CO_2e (MT/yr)	Change from Existing (MT/yr)	Change from No Build (MT/yr)
2012 Existing	7,739,970,007	3,583,875	-	-
2025 No Build	8,424,296,745	2,960,060	-623,815	-
LRT	8,424,036,374	2,953,706	-630,169	-6,354
Single-Bore Freeway Tunnel with Tolls	8,466,698,704	2,939,380	-644,495	-20,680
Single-Bore Freeway Tunnel with Tolls and No Trucks	8,473,608,007	2,939,967	-643,908	-20,093
Single-Bore Freeway Tunnel with Tolls and Express Buses	8,467,481,974	2,941,255	-642,621	-18,805
Dual-Bore Freeway Tunnel No Tolls	8,542,232,899	2,945,838	-638,037	-14,222
Dual-Bore Freeway Tunnel No Trucks	8,555,946,005	2,950,504	-633,372	-9,556
Dual-Bore Freeway Tunnel with Tolls	8,547,727,321	2,951,661	-632,214	-8,399

Source: *Supplemental Air Quality Assessment Report* (2018)
CO_2e = carbon dioxide equivalent, includes CO_2 and CH_4
mi/yr = miles per year
MT/yr = metric tons per year
Annual VMT was converted from daily VMT using a factor of 343.

TABLE 4.11:
2035 Greenhouse Gas Emissions – Traffic Operations Analysis Area (MT/yr)

Alternative	VMT (mi/yr)	CO_2e (MT/yr)	Change from Existing (MT/yr)	Change from No Build (MT/yr)
2012 Existing	7,739,970,007	3,583,875	-	-
2035 No Build	8,615,787,159	2,664,824	-919,051	-
TSM/TDM	8,640,234,701	2,666,243	-919,632	1,419
BRT	8,634,359,867	2,666,010	-917,865	1,186
LRT	8,630,822,965	2,665,171	-918,066	347
Single-Bore Freeway Tunnel with Tolls	8,678,204,063	2,653,895	-929,981	-10,930
Single-Bore Freeway Tunnel with Tolls and No Trucks	8,684,590,736	2,654,505	-929,370	-10,319
Single-Bore Freeway Tunnel with Tolls and Express Buses	8,678,174,718	2,652,837	-931,038	-11,987
Dual-Bore Freeway Tunnel No Tolls	8,754,722,088	2,662,318	-921,557	-2,506
Dual-Bore Freeway Tunnel No Trucks	8,772,545,344	2,665,810	-918,065	986
Dual-Bore Freeway Tunnel with Tolls	8,756,962,264	2,662,736	-921,139	-2,088

Source: *Supplemental Air Quality Assessment Report* (2018)
CO_2e = carbon dioxide equivalent, includes CO_2 and CH_4
mi/yr = miles per year
MT/yr = metric tons per year
Annual VMT was converted from daily VMT using a factor of 343

The Southern California Association of Governments (SCAG) included an SCS and adopted a Programmatic Environmental Impact Report (PEIR) as part of its 2016 financially constrained RTP/SCS. Under SB 375, the primary goal of the SCS is to provide a vision for future growth that will decrease per capita GHG emissions from automobiles and light trucks. The PEIR determined that the

2016 RTP/SCS would result in a less than significant impact in relation to GHG. On June 28, 2016, ARB determined that the SCAG's 2016 RTP/SCS would achieve the GHG emissions reduction targets that the ARB established for the region for 2020 and 2035, which is 8% reduction by 2020 and 13% reduction by 2035. By providing new or improved transit, improved intersections, and/or new freeway connections, the proposed project alternatives will help achieve the improved access and mobility goals of SCAG's 2016 RTP/SCS.

As with other projects included within the Project List, when the SR-710 North Study EIR/EIS process is complete, the 2016 RTP/SCS will be updated to reflect the Preferred Alternative as identified in this Final EIR/EIS and would be consistent with the proposed RTP amendment and associated GHG analysis in the PEIR. In addition, when compared to the Existing (2012) conditions, all the future alternatives (no build and build) would result in a net decrease in CO_2 emissions.

4.3.4 Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

Construction emissions were estimated for the project alternatives using detailed equipment inventories and project construction scheduling information combined with emissions factors from the EMFAC2014 and CalEEMod models. Short-term off-road construction equipment was calculated using emission rates from CalEEMod. Construction-related emissions for the TSM/TDM, BRT, and LRT Alternatives, and the single-bore and dual-bore design variations of the Freeway Tunnel Alternative are presented in Table 4.12. The emissions presented in Table 4.12 are based on the best information available at the time of calculations. The emissions listed in Table 4.12 represent the peak daily construction emissions that would be generated by each alternative.

TABLE 4.12:
Total Construction Greenhouse Gas Emissions

Project Alternative	Total CO_2e (Metric Tons)
TSM/TDM	21,137
BRT	2,553
LRT	54,607
Freeway Tunnel (Single-Bore Design Variation)	51,916
Freeway Tunnel (Dual-Bore Design Variation)	71,380

Source: *Supplemental Air Quality Assessment Report* (2018)
BRT = Bus Rapid Transit
CO_2e = carbon dioxide equivalent
LRT = Light Rail Transit
TDM = Transportation Demand Management
TSM = Transportation System Management

Idling times would be restricted to 10 minutes in each direction for passenger cars during lane closures and 5 minutes for construction vehicles. Restricting idling times reduces harmful emissions from passenger cars and diesel-powered construction vehicles. Elements of Measures AQ-2 and AQ-3 would also help reduce GHGs, and the project will comply with Caltrans Standard

Specifications 14-9.02, Air Pollution Control, which requires the contractor to comply with all federal, state, and local rules, regulations, ordinances, and statutes concerning air quality, some of which would also help reduce GHGs. This project also includes AQ-5, compliance with Metro's “Green Construction Policy" which includes requirements for certain off-road diesel-powered construction equipment.

4.3.5 CEQA Conclusion

As discussed above, with the exception of the TSM/TDM, BRT, LRT, and the Freeway Tunnel (dual bore without truck design variation) Alternatives in 2035, CO_2 emissions are projected to decrease when compared to the No Build Alternative. When compared to existing conditions, all of the future alternatives (No Build and Build) would have lower CO_2e emissions. As also discussed above, there are also limitations with EMFAC and with assessing what a given CO_2 emissions increase means for climate change. Therefore, it is Caltrans’s determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a determination regarding the direct impact of the proposed project and its contribution on a cumulative scale to climate change. However, Caltrans and Metro are firmly committed to implementing measures to help reduce energy consumption and GHG emissions throughout the State. These measures are outlined in the following section.

4.3.6 Greenhouse Gas Reduction Strategies

4.3.6.1 Statewide Efforts

In an effort to further the vision of California’s GHG reduction targets outlined an AB 32 and SB 32, Governor Brown identified key climate change strategy pillars (concepts). These pillars highlight the idea that several major areas of the California economy will need to reduce emissions to meet the 2030 GHG emissions target. These pillars are (1) reducing today’s petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farm and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, Safeguarding California (see Figure 4-4).

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled. One of Governor Brown's key pillars sets the ambitious goal of reducing today's petroleum use in cars and trucks by up to 50 percent by 2030.

Governor Brown called for support to manage natural and working lands, including forests, rangelands, farms, wetlands, and soils, so they can store carbon. These lands have the ability to remove carbon dioxide from the atmosphere through biological processes, and to then sequester carbon in above- and below-ground matter.

Figure 4-4: the Governor's Climate Change Pillars: 2030 Greenhouse Gas Reduction Goals

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set a new interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future statewide, integrated, multimodal transportation system. It serves as an umbrella document for all of the other statewide transportation planning documents.

SB 391 (Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans Strategic Management Plan

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing VMT per capita
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several funding and technical assistance programs that have GHG reduction benefits. These include the Bicycle Transportation Program, Safe Routes to School, Transportation Enhancement Funds, and Transit Planning Grants. A more extensive description of these programs can be found in Caltrans Activities to Address Climate Change (2013).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a department policy that will ensure coordinated efforts to incorporate climate change into departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013) provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce GHG emissions resulting from agency operations.

4.3.6.2 Project-Level GHG Reduction Strategies

The following project features will be included as part of the preferred alternative, TSM/TDM Alternative, to reduce GHG emissions and potential climate change impacts from the project:

1. Several bicycle route segments will be added and expanded bicycle parking facilities will be added at existing Metro Gold Line stations to encourage use of non-motorized modes of transportation.

2. Expanded bus service to provide increased transit service for existing and future users to reduce the use of single-occupancy vehicles.

3. Ramp metering will help maintain more consistent freeway throughput and use highway capacity more efficiently.

The following measures will also be included in the project to reduce GHG emissions and potential climate change impacts from the project:

1. Landscaping reduces surface warming and, through photosynthesis, decreases CO_2. Landscaping would be provided where necessary within the corridor to provide aesthetic treatment, replacement planting, or mitigation planting for the project. The landscape planting would help offset any potential CO_2 emissions increase.

2. The project would recommend the use of energy-efficient lighting, such as light-emitting diode (LED) traffic signals. LED bulbs—or balls, in the stoplight vernacular—cost $60 to $70 apiece but last 5 to 6 years compared to the 1-year average lifespan of the incandescent bulbs previously used. The LED balls themselves consume 10 percent of the electricity of traditional lights, which will also help reduce the project's CO_2 emissions.

3. According to Caltrans Standard Specification Provisions, idling time for lane closure during construction is restricted to 10 minutes in each direction. In addition, the Contractor must comply with Title 13, California Code of Regulations (CCR), Section 2449(d)(3), that was adopted

by the ARB on June 15, 2008. This regulation restricts idling of construction vehicles to no longer than 5 consecutive minutes. Compliance with this regulation reduces harmful emissions from diesel-powered construction vehicles.

In addition, implementation of the emission control measures for equipment and vehicles as described in Section 3.13.4, Measure AQ-2, Measure AQ-3 and Measure AQ-5 would further reduce GHG emissions from the project.

4.3.7 Adaptation Strategies

"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the State's transportation infrastructure and strengthen or protect the facilities from damage – or, put another way, planning and design for resilience. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. These types of impacts to the transportation infrastructure may also have economic and strategic ramifications.

4.3.7.1 Federal Efforts

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011,[10] that outlines the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks.

The federal Department of Transportation issued U.S. DOT Policy Statement on Climate Adaptation in June 2011, committing to "integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely and that transportation infrastructure, services and operations remain effective in current and future climate conditions."[11]

To further the DOT Policy Statement, on December 15, 2014, FHWA issued order 5520 (Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events).[12] This directive established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. The FHWA will work to integrate consideration of these risks into its planning, operations, policies, and programs in order to promote preparedness and resilience; safeguard federal investments; and ensure the safety, reliability, and sustainability of the nation's transportation systems.

10 https://obamawhitehouse.archives.gov/administration/eop/ceq/initiatives/resilience.
11 https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/usdot.cfm
12 https://www.fhwa.dot.gov/legsregs/directives/orders/5520.cfm

FHWA has developed guidance and tools for transportation planning that fosters resilience to climate effects and sustainability at the federal, state, and local levels.[13]

4.3.7.2 State Efforts

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea-level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea-level rise and directed all state agencies planning to construct projects in areas vulnerable to future sea-level rise to consider a range of sea-level rise scenarios for the years 2050 and 2100, assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea-level rise. Sea-level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, and storm surge and storm wave data.

Governor Schwarzenegger also requested the National Academy of Sciences to prepare an assessment report to recommend how California should plan for future sea-level rise. The final report, Sea-Level Rise for the Coasts of California, Oregon, and Washington (Sea-Level Rise Assessment Report)[14] was released in June 2012 and included relative sea-level rise projections for the three states, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates; and the range of uncertainty in selected sea-level rise projections. It provided a synthesis of existing information on projected sea-level rise impacts to state infrastructure (such as roads, public facilities, and beaches), natural areas, and coastal and marine ecosystems; and a discussion of future research needs regarding sea-level rise.

In response to EO S-13-08, the California Natural Resources Agency (Resources Agency), in coordination with local, regional, state, federal, and public and private entities, developed The California Climate Adaptation Strategy (Dec 2009), which summarized the best available science on climate change impacts to California, assessed California's vulnerability to the identified impacts, and outlined solutions that can be implemented within and across state agencies to promote resiliency. The adaptation strategy was updated and rebranded in 2014 as Safeguarding California: Reducing Climate Risk (Safeguarding California Plan).

Governor Jerry Brown enhanced the overall adaptation planning effort by signing EO B-30-15 in April 2015, requiring state agencies to factor climate change into all planning and investment decisions. In March 2016, sector-specific Implementation Action Plans that demonstrate how state agencies are implementing EO B-30-15 were added to the Safeguarding California Plan. This effort represents a multi-agency, cross-sector approach to addressing adaptation to climate change-related events statewide.

EO S-13-08 also gave rise to the State of California Sea-Level Rise Interim Guidance Document (SLR Guidance), produced by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), of which Caltrans is a member. First published in 2010, the document provided "guidance for incorporating sea-level rise (SLR) projections into planning and decision making for

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13 https://www.fhwa.dot.gov/environment/sustainability/resilience/

14 *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389.

projects in California," specifically, "information and recommendations to enhance consistency across agencies in their development of approaches to SLR."[15]

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address transportation system vulnerabilities to increased precipitation and flooding, the increased frequency and intensity of storms and wildfires, rising temperatures, and rising sea levels. Caltrans is actively engaged in working towards identifying these risks throughout the state and will work to incorporate this information into all planning and investment decisions as directed in EO B-30-15.

The proposed project is located approximately 800 ft above sea level and 18 mi from the coast and is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected .

4.4 Mitigation Measures for Significant Impacts under CEQA

Table 4.13 lists the avoidance, minimization, mitigation, and compensation measures included in the Build Alternatives to address the impacts of those alternatives on the resources as described earlier in this section. The complete text of each measure is provided in the appropriate sections of Chapter 3.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures, and in Appendix E, Environmental Commitments Record.

TABLE 4.13:
Measures for Significant Impacts

Measure No.	Measure Description	Alternative			
		TSM/TDM	BRT	LRT	Freeway Tunnel
Biological Resources					
WET-1	Dredge and Fill Permit, including compensatory mitigation for nonwetland and other waters.				●
WET-2	Streambed Alteration Agreement, including restoration, enhancement, establishment, and/or mitigation for drainages and habitats				●
WET-3	Water Quality Certification, including restoration, enhancement, establishment, and/or mitigation for waters				●
PS-3	Compliance with local tree ordinances, including compensatory mitigation.		●	●	●
Traffic and Transportation					
Improvements to Intersections and Freeway Segments (Section 3.5.4.2)		●	●	●	●
Visual/Aesthetics					
V-5	Design considerations for built structures			●	
Cultural Resources					
Design considerations, avoidance measures, and other measures detailed in Section 3.7.4.		●	●	●	●
Paleontological Resources					
PAL-1	Paleontological Mitigation Plan and Paleontological Resources Impact Mitigation Program	●	●	●	●
Hazards and Hazardous Materials					
HW-8	Phase II site investigations	●	●	●	●
Land Use and Planning					
LU-1	Amendment of local jurisdiction's General Plans and other local plans	●	●	●	●
PARKS-1	Compliance with the Public Park Preservation Act and compensatory mitigation for impacts to Cascades Park		●		

● = Measure applies to this alternative.

15 http://www.opc.ca.gov/2013/04/update-to-the-sea-level-rise-guidance-document/

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5. Comments and Coordination

5.1 Introduction

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation and the level of analysis required, and to identify potential impacts and avoidance, minimization, and/or mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including interagency coordination meetings, Technical Advisory Committee (TAC), and Stakeholder Outreach Advisory Committee (SOAC) meetings. This chapter summarizes the results of the efforts of the Los Angeles County Metropolitan Transportation Authority (Metro) and Caltrans to fully identify, address, and resolve project-related issues through early and continuing coordination.

5.2 Scoping Process

5.2.1 Notice of Preparation/Notice of Intent

The scoping process for the State Route 710 (SR 710) North Project was initiated with the preparation and distribution of a Notice of Preparation (NOP) and the publication of a Notice of Intent (NOI) in the Federal Register. The formal scoping process period was initiated on March 3, 2011, and ended on April 14, 2011.

The NOP was posted at the State Clearinghouse (SCH No. 1982092310) and was circulated to public agencies and other interested parties in compliance with Section 15082 of the California Environmental Quality Act (CEQA) Guidelines on March 3, 2011. The NOP notified the public of the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) being prepared, the scoping meeting dates, times, and locations, and how to provide comments on the project.

The NOI was published on March 3, 2011, in the Federal Register in compliance with Federal Regulation 40 Code of Federal Regulations (CFR) 1508.28. The NOI included the background of the project, the project purpose and need, a brief description of the proposed alternatives, information regarding the scoping meeting locations, and how to provide comments on the project.

Copies of the NOP and NOI are provided in Appendix I, Notice of Preparation and Notice of Intent.

5.2.2 Scoping Meetings

In addition to the NOP/NOI, eight scoping meetings were held as part of the scoping process. The meetings were held as follows:

- March 15, 2011, at Jefferson Middle School in San Gabriel
- March 16, 2011, at the Civic Center Library in Alhambra
- March 22, 2011, at Glendale Community College in Glendale
- March 23, 2011, at South Pasadena High School in South Pasadena
- March 29, 2011, at Los Angeles Christian Presbyterian Church in El Sereno
- March 30, 2011, at Lake Avenue Church in Pasadena

- April 5, 2011, at La Cañada High School in La Cañada Flintridge
- April 6, 2011, at Ramona Hall Community Center in Highland

5.2.3 Comments Received During Scoping

A total of 100 written comment letters and 29 comment cards were received from federal, State, and regional/county agencies, elected officials, community groups, members of the general public, and other interested parties via letters, emails, comment cards, and recorded scoping meeting comments. Key issues noted in the comments included, but were not limited to:

- Alternatives;
- Air quality and public health impacts;
- Biological resources;
- Noise;
- Traffic impacts;
- Environmental justice;
- Aesthetic, social, and economic impacts;
- Traffic management and pedestrian safety;
- Land use, population, and housing effects;
- Water quality;
- Hazards;
- Recreation; and
- Construction mitigation.

The *Scoping Summary Report* (2011) documented the scoping process and contains the following documents and more detailed information regarding the scoping process:

- Copies of the NOP and NOI
- Summary of the comments received in response to the NOP and NOI
- Formal scoping letters
- Public outreach, including the summary of the public scoping notices
- Summary of public meetings
- Summary of scoping comments

5.3 Circulation of the Draft Environmental Document

On March 6, 2015, Caltrans circulated the Draft EIR/EIS and supporting technical studies to the public for review and comment. The comment period was extended to August 5, 2015. Five public hearings were held during the comment period as follows:

- April 11, 2013 - East Los Angeles College
- April 14, 2015 - Pasadena Convention Center
- May 6, 2015 - La Canada High School Auditorium
- May 7, 2015 - Los Angeles Christian Presbyterian Church
- June 20, 2015 - David Wark Griffith Middle School

5.3.1 Comments Received During Circulation of the Draft Environmental Document

The comment period began on March 6, 2015 and was extended to August 5, 2015. During the public comment period approximately 8,000 comments were submitted from elected officials, federal, state and local agencies, stakeholders and interested individuals. Key issues noted in the comments included, but were not limited to:

- Aesthetics/visual impacts
- Alternatives
- Air quality and public health impacts
- Community impacts
- Construction mitigation
- Cultural resources
- Economic impacts
- Environmental justice
- Hazards
- Lead Agency
- Noise
- Other proposed alternatives
- Parking impacts
- Project study area
- Public participation/comment period
- Recirculation of Draft EIR/EIS
- Sale of excess Caltrans properties
- Thresholds of significance
- Traffic impacts
- Tunneling considerations
- Water quality

Responses to comments received on the Draft EIR/EIS are included in Volume IIIA of the Final EIR/EIS.

A Record of Public Hearing was prepared which documented the public hearing process for the Draft EIR/EIS and contained the following information:

- Summaries of the public hearings
- Public hearing comments
- Handouts provided at the public hearings
- Display materials
- Other comments received at the public hearing
- List of public hearing attendees

5.4 Circulation of the Focused Recirculated Draft EIR/Supplemental Draft EIS

On May 18, 2018, Caltrans circulated a Focused RDEIR/SDEIS which addressed significant new information regarding cultural resources following circulation of the Draft EIR/EIS for public review and comment. A public hearing was held on June 13, 2018 and comments were accepted until July 5, 2018.

5.4.1 Comments Received During Circulation of the Focused Recirculated Draft EIR/Supplemental Draft EIS

During the public comment period approximately 75 comments were submitted from elected officials, federal, state and local agencies, stakeholders and interested individuals. Key issues noted in the comments included potential impacts to cultural resources.

Responses to comments received on the Focused Recirculated Draft EIR/Supplemental Draft EIS are included in Volume IIIB of the Final EIR/EIS.

A Record of Public Hearing documents the public hearing process for the Focused Recirculated Draft EIR/Supplemental Draft EIS and contained the following information:

- Notification of public hearing
- Summary of public hearing
- Public hearing comments
- Handouts provided at the public hearings

- Display materials
- Other comments received at the public hearing
- List of public hearing attendees
- Public hearing transcripts

5.5 Consultation and Coordination with Agencies

5.5.1 Consultation and Coordination with Cooperating and Participating Agencies

The *Efficient Environmental Review Coordination Plan for State Route 710 North Study* for the project documents the coordination of public and agency participation and comments received during the environmental review process. It is the responsibility of the lead agencies to develop the coordination plan to facilitate and document the interaction among the lead agencies, the participating and cooperating agencies, and the public.

As of October 1, 2012, MAP-21 made further amendments to the efficient environmental review process added by SAFETEA-LU and is codified at 23 United States Code (USC) Section 139. For this process, Caltrans sent letters inviting agencies to be Cooperating and/or Participating Agencies in the environmental process for the SR 710 North Project on February 15, 2012. (A sample of the Caltrans invitation letter is provided following the last page of tables in this chapter.) Participating Agencies are federal, State, regional, or local agencies that may have an interest in the project. The Federal Transit Administration (FTA) declined to be a Participating Agency for the project. (Copies of the acceptance letters and the declining email for participating agencies are provided as attachments to this chapter.) The following agencies agreed to become Participating Agencies for the project:

- Los Angeles County Metropolitan Transportation Authority
- United States Fish and Wildlife Service (USFWS)
- Office of Environmental Policy and Compliance, United States Department of the Interior
- National Park Service, United States Department of the Interior
- United States Environmental Protection Agency (EPA)
- United States Army Corps of Engineers (USACE)
- San Gabriel Valley Council of Governments
- County of Los Angeles
- County of Los Angeles Department of Public Works
- City of Los Angeles Department of Transportation
- City of Alhambra
- City of Glendale
- City of La Cañada Flintridge
- City of Monterey Park
- City of Pasadena
- City of San Marino
- City of South Pasadena

Cooperating Agencies are federal agencies that have jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative. Cooperating Agencies are also Participating Agencies. USACE and EPA agreed to be both Cooperating and Participating Agencies for the project.

A Coordination Plan under USC Section 139 was prepared and provided to the cooperating and participating agencies in a meeting on December 7, 2012. Handouts for that meeting included the Coordination Plan, a draft purpose and need statement for the project, and a draft summary of the project alternatives. Coordination with the cooperating and participating agencies for the SR 710 North Project is ongoing.

Caltrans, as the Lead Agency, specifically requested the Participating and Cooperating Agencies to provide comments and input on the following topics:

- Project purpose and need
- Proposed range of alternatives

Caltrans also requested that these agencies participate in coordination meetings and joint field reviews, as appropriate, and review and comment on early project information to reflect the views and concerns of each agency regarding the proposed environmental documentation, alternatives considered, methodology and the anticipated project impacts and mitigation.

5.5.2 Consultation and Coordination with Public Agencies

This section describes consultation and coordination with public agencies, including some of the Cooperating and Participating Agencies described above.

5.5.2.1 Biological Resources Consultation

The USFWS was consulted regarding plant and animal species, and threatened and endangered species potentially present in the project study area. A list of species was supplied by the USFWS and is provided in Appendix K, USFWS Species List.

A letter requesting a list of special-status species potentially occurring within the BSA was sent to the USFWS on September 16, 2013. A response to the request was received on October 28, 2013. A request for an updated species list from USFWS was sent on October 24, 2014. An updated species list was received from USFWS on October 27, 2014. Additional requests for an updated species list was made and an updated list was received from USFWS on August 13, 2018. As a result of this updated list, Section 3.20 was updated to add one federally-listed endangered species (California Condor) and to remove the Thread-Leaved Brodiaea, California least tern, Light-footed Clapper Rail, Pacific pocket-mouse, and Palos Verdes Blue butterfly. Additionally, a National Marine Fisheries Service (NMFS) species list was generated using their online resources on September 20, 2018 and is also provided in Appendix K.

Agency coordination regarding jurisdictional water features took place with USACE and California Department of Fish and Wildlife (CDFW). Coordination with USACE was initiated on August 12, 2013. Coordination with CDFW was initiated on January 27, 2014.

5.5.2.2 Section 4(f) Consultation and Coordination

Impacts to protected resources pursuant to Section 4(f) of the U.S. Department of Transportation Act (Section 4(f)) include publicly owned recreational facilities, wildlife refuges and historic properties that are on or eligible for listing in the National Register. Publicly owned parks and parkland are discussed in detail in Section 3.1.4, Parks and Recreational Facilities and historic properties are discussed in detail in Section 3.7, Cultural Resources; and Section 4(f) Resources are discussed in detail in Appendix B of this Final EIR/EIS.

Publicly Owned Parks and Parkland

Caltrans initiated consultation with the City of Monterey Park regarding the temporary and permanent effects of the Bus Rapid Transit (BRT) Alternative on Cascades Park, a Section 4(f) resource. An initial meeting with the City of Monterey Park was held on November 12, 2014 at the City of Monterey Park. The meeting attendees included:

- Amy Ho, Program Management Analyst, City of Monterey Park
- Samantha Tewasart, Senior Planner, City of Monterey Park
- Ray Alfonso, Assistant City Engineer, City of Monterey Park
- Cesar Vega, Associate Engineer, City of Monterey Park
- Jason Roach, Environmental, Caltrans
- Michelle Smith, Project Manager, Metro
- Aziz Elattar, Executive Officer-Highway Programs, Metro
- Yoga Chandran, CH2M Hill, consultant to Caltrans and Metro
- Lilly Acuna, Project Assistant, CH2M Hill, consultant to Caltrans and Metro
- Deborah Pracilio, Environmental Studies, LSA Associates, Inc., consultant to Caltrans and Metro

The purpose of the meeting was to confirm the boundaries of Cascades Park and Heritage Falls Park with the City and to discuss the potential effects of the proposed BRT Alternative on those resources. The resource boundaries confirmed by the City are shown on the figures provided in Chapter 2 in Appendix B, Section 4(f) Evaluation.

Historic Properties

On February 14, 2018, Caltrans held a meeting with the SHPO, ACHP, and Consulting Parties. The purpose of the meeting was to provide a project update and answer questions related to new significant effects identified subsequent to the circulation of the Draft EIR/EIS in the FOAE and how they would be addressed in the Focused Recirculated Draft Environmental Impact Report/ Supplemental Draft Environmental Impact Statement (Focused RDEIR/SDEIS), Draft Individual Section 4(f) Evaluation and the Final EIR/EIS. The Consulting Parties requested to review the Draft Individual Section 4(f) Evaluation.

Under 23 CFR 774.5, prior to making Section 4(f) approvals under 23 CFR 774.3(a), the Section 4(f) Evaluation was provided for coordination and comment to SHPO, the official with jurisdiction over the Section 4(f) resource, and to the Department of the Interior.

On February 23, 2018, the Draft Individual Section 4(f) Evaluation was circulated to the SHPO, Department of Interior (DOI) and to the Consulting Parties. A minimum of 45 days was provided for receipt of comments. SHPO and DOI did not provide comments within 15 days after the comment deadline; therefore, a lack of objection is assumed. Comments were received from the following Consulting Parties on April 23, 2018: National Trust for Historic Preservation, Pasadena Heritage and the City of South Pasadena. Section 4(f) correspondence is contained in the Appendix of the Individual Section 4(f) Evaluation (Appendix B).

5.5.2.3 SHPO Consultation

Consultation with the State Historic Preservation Office was conducted regarding the HPSR. Concurrence on the eligibility of cultural properties evaluated in the HPSR by the SHPO was provided in a letter dated February 26, 2015. A copy of that letter is provided in the correspondence section following the last page in this Chapter. In that letter, SHPO indicated they had no objection to the following determinations and assumptions of eligibility:

- Pursuant to Stipulation VIII.C.6 of the Programmatic Agreement (PA), concurrence that the 440 properties listed in Attachment 1, Table 2 of the Caltrans letter dated February 20, 2015 are not eligible for the National Register of Historic Places (National Register)
- Pursuant to Stipulation VIII.C.6 of the PA, concurrence that the 22 properties listed in Attachment 1, Table 3 in the Caltrans letter dated February 20, 2015 are eligible for the National Register
- Pursuant to Stipulation VIII.C.4, Caltrans is assuming National Register eligibility for the purposes of the undertaking for the following properties: 318 Fairview Avenue, South Pasadena; 2020 Fremont Street, South Pasadena; US Highway 66; Horatio Rush Prehistoric Village Site; and Otsungna Prehistoric Village Site.
- In addition, based on additional correspondence (email and phone) on February 26, 2015, Caltrans will also, pursuant to Stipulation VIII.C.4 of the PA, assume the following properties are National Register eligible for the purposes of the project (these properties were listed as not eligible in Attachment 1, Table 2 in the Caltrans letter dated February 20, 2015): Library Neighborhood Historic District; 904 Monterey Road, South Pasadena; and 270 S Orange Grove Boulevard, Pasadena.

In a letter to SHPO dated February 26, 2015, Caltrans initiated a phased approach of the Application of Criteria of Adverse Effects and consultation regarding the Preliminary Finding of No Adverse Effect (FONAE) for the project. That February 26, 2015 letter is also provided in the correspondence section at the end of this Chapter.

On March 6, 2015, Caltrans circulated the Draft EIR/EIS, with its supporting technical studies to the public for review and comment. Five public hearings were held during the public comment period, from March to June 2015. The comment period was extended to August 5, 2015. During the public comment period, elected officials from federal, state, and local agencies, and many other stakeholders submitted approximately 8,000 comments that covered common themes and questions.

- During the public review period for the Draft EIR/EIS, comments were received regarding the adequacy of the identification and evaluation of historic properties and questions regarding Caltrans' finding that the project would not have an adverse effect on historic properties.
- On April 11, 2016, Caltrans and Metro held a meeting with SHPO and Office of Historic Preservation (OHP) staff, the Advisory Council on Historic Preservation (ACHP), and the Consulting Parties to provide more information about the tunneling process and the types of construction associated with each Build Alternative. As a result of this meeting a communication plan was developed to inform Consulting Parties of the progress of ongoing Section 106 studies through email, telephone calls, or in person meetings.
- Caltrans and their consultant investigated and responded to each comment. As a result, the APE was refined in consultation with SHPO. The responses to cultural resources comments can be found in the Volume III of the Final EIR/EIS.
- In October 2017, the Supplemental Historic Property Survey Report (SHPSR) was submitted to SHPO for review.
- On November 3, 2017, SHPO concurred with the determinations in the SHPSR.
- On January 3, 2018, a Finding of Adverse Effect (FOAE) was sent to SHPO for review.

- On February 14, 2018, Caltrans met with the SHPO, ACHP, and Consulting Parties to provide an update and answer questions related to new significant effects identified subsequent to the circulation of the Draft EIR/EIS in the FOAE and explain how they would be addressed in a Focused Recirculated Draft EIR/Supplemental Draft EIS (Focused RDEIR/SDEIS), the Draft Individual Section 4(f) Evaluation and in the Final EIR/EIS. Specific questions were answered regarding the content, circulation requirements, and how response to comments on the Focused RDEIR/SDEIS would be incorporated into the Final EIR/EIS. A summary was also provided regarding next steps to address comments from the Consulting Parties and SHPO and to obtain concurrence on the FOAE from SHPO.
- On May 3, 2018 SHPO concurred with the findings and analysis in the FOAE for the TSM/TDM (preferred) Alternative.
- The MOA was executed by Caltrans and SHPO on October 18, 2018. The MOA is included in the Correspondence section at the end of this chapter.

Section 106 Outreach

Starting in early 2013, Caltrans and Metro reached out to a large number of individuals, organizations, and to other parties potentially interested in participating in the Section 106 process for the project, including Native American Tribes (discussed further in Section 5.5). That coordination and consultation effort is described in detail in the *Historic Property Survey Report* (2015), the *Supplemental Historic Property Survey Report* (2017), and the *Finding of Adverse Effect* (2018). This included representatives from public agencies, historic associations, museums, and local community groups as well as representatives from several Native American Tribes. Input was solicited from these parties, specifically related to known cultural and historic properties in the project study area and their concerns regarding possible project effects on those properties. The Section 106 outreach process overlapped with and was part of the outreach efforts under CEQA and NEPA. This included outreach conducted during the public circulation period for the Draft EIR/EIS and Focused RDEIR/SDEIS. As part of the 106 process, the following parties requested to be consulting parties for the project, pursuant to 36 CFR 800.2(c)(5): City of South Pasadena, Los Angeles Conservancy, West Pasadena Residents' Association, Sequoyah School, National Trust for Historic Preservation, Pasadena Heritage, and No on 710 Action Committee.

5.5.2.4 Consultation with the Los Angeles County Flood Control District

Meetings were held on January 22, 2013 and April 3, 2014 with the Los Angeles County Flood Control District to discuss the SR 710 Project alternatives including the alternatives for Dorchester Channel and Laguna Regulating Basin and solicit feedback from Los Angeles County Flood Control District.

5.5.3 Community Outreach and Information Meetings

The engineering and environmental studies for the SR 710 North Project include an extensive ongoing community outreach program. Table 5.1 lists the community outreach meetings held for the SR 710 North Project starting in 2011. (Please note that the tables cited in this chapter are provided following the last page of text in this chapter.) Unless otherwise noted, some or all of the following parties from the SR 710 North Project planning and engineering teams conducted and/or attended each of these meetings:

- Metro planning, engineering, and community relations/media staff
- Caltrans engineering and environmental planning staff

- Engineering, environmental, and public outreach consultants

Those meetings and the primary participants in those meetings are described below:

- **SR 710 Conversation Series Meetings:** This series of meetings held in early 2011 were intended to provide broad overviews of key steps in the project process. Each meeting was offered in a number of cities and communities in the overall study area. Attendance at these meetings was open to members of the general public and other interested parties. The first series of meetings provided the public with a broad overview of the history of the SR 710 North Project. The second series of meetings provided the public with information on the National Environmental Policy Act (NEPA) and CEQA, and how NEPA and CEQA apply to the project. The third and final series of meetings served as the formal scoping meetings for the project.
- **Stakeholder Outreach Advisory Committee (SOAC) Meetings:** The SOAC is composed of elected or appointed officials from the jurisdictions in the study area. The SOAC meetings were held approximately quarterly and are intended to provide updated information on the project engineering, the progress of the technical studies, and the public outreach activities. Typically, the SOAC meetings were held one day after TAC meetings with the same agendas and information updates. The SOAC members provide updates to their respective jurisdictions on the progress of the project.
- **Technical Advisory Committee (TAC) Meetings:** The TAC is composed of representatives from public works, engineering, and planning departments in the cities and public resource/ regulatory agencies in the study area. These meetings were typically held quarterly and are intended to provide updated information on the project engineering and environmental planning tasks, the project schedule, and to discuss issues and concerns.
- **All Communities Convening (ACC) Information Sessions and Open House Meetings:** The ACC is composed of interested members of the general public. The ACC Information Sessions and Open House meetings were held periodically and intended to provide updated information on the project engineering and environmental planning tasks, and the project schedule.
- **Community Liaison Council (CLC) Meetings:** The CLCs consisted of representation from each community in the Study area to reflect the ethnic and cultural diversity amongst communities as well as the diversity of interests of residents, local business, major employers, community leadership, etc. The role of this council was to keep the project team informed on the effectiveness of outreach, and provide recommendations for outreach. The following cities, communities and neighborhoods were represented by community stakeholders: Alhambra, Altadena, Arcadia, Atwater Village, Azusa, Baldwin Park, Bradbury, Burbank, Cypress Park, Duarte, East Los Angeles, El Monte, El Sereno, Glassell Park, Glendale, Highland Park, Irwindale, La Cañada Flintridge, La Crescenta-Montrose, Monrovia, Monterey Park, Mt. Washington, Pasadena, Rosemead, San Gabriel, San Marino, Sierra Madre, South El Monte, South Pasadena, and Temple City. Meetings were held with the CLC from April 2012 to August 2013.
- **Information Sessions:** Information meeting and open houses were held in communities throughout the study area. The purpose of the meetings were to provide general information related to the Build Alternatives under consideration, alternatives withdrawn from consideration, topics to be evaluated in the EIR/EIS. Attendees were provided the opportunity to provide verbal and written comments at the meetings.
- **Scoping under CEQA and NEPA:** The scoping process for the EIR/EIS was initiated on March 4, 2011, and the scoping period ended on April 14, 2011. During that period, a number of public

meetings and public information/comment opportunities were offered to members of the general public, other interested parties, and public agencies to describe the project and the environmental process, and to solicit comments on issues related to the project and the environmental process.

- **Other Sources of Information Regarding the Project:** In addition to the meetings and public information/comment opportunities described above, Metro used Facebook, Twitter, and a project-specific page on their website for the SR 710 North Project to provide updated project information to all interested parties. Frequently Asked Questions (FAQs) have been provided on the website for subjects such as: the environmental review process, alternative concepts and truck/goods movement. These electronic information sources are updated as appropriate to ensure that current project-related information is available.
- **Circulation of the Draft EIR/EIS:** On March 6, 2015, Caltrans circulated the Draft EIR/EIS and supporting technical studies to the public for review and comment. Five public hearings were held during the comment period from March to June 2015. The comment period was extended to August 5, 2015. During the public comment period approximately 8,000 comments were submitted from elected officials, federal, state and local agencies, stakeholders and interested individuals. Responses to comments received on the Draft EIR/EIS are included in Volume III of the Final EIR/EIS.
- **Circulation of the Focused RDEIR/SDEIS:** On May 18, 2018, Caltrans circulated a Focused RDEIR/SDEIS which addressed significant new information regarding cultural resources following circulation of the Draft EIR/EIS for public review and comment. A public hearing was held on June 13, 2018 and comments were accepted until July 5, 2018. Responses to comments received on the Focused RDEIR/SDEIS are included in Volume III of the Final EIR/EIS.

5.6 Interagency Coordination Regarding Air Quality (Transportation Conformity Working Group)

As discussed in Section 3.13, Air Quality a $PM_{2.5}$ and PM_{10} hot-spot form (May 2014) was submitted to and reviewed by the Transportation Conformity Working Group (TCWG) on May 27, 2014 and additional requested information was provided to the TCWG in June 2014. The primary TCWG members are EPA, FHWA, and Caltrans Headquarters. On October 28, 2014, the TCWG determined that the TSM/TDM, BRT, and LRT Alternatives are not Projects of Air Quality Concern (POAQC) and that the Freeway Tunnel Alternative single- and dual-bore design variations are a POAQC. The minutes from the TCWG meeting are provided at the end of this chapter.

5.7 Native American Consultation and Coordination

The Native American Heritage Commission (NAHC) was contacted on June 14, 2013 and was specifically requested to conduct a Sacred Lands File (SLF) search for the project area. The NAHC responded on June 18, 2013, to state that the SLF did not indicate the presence of Native American cultural resources in the project Area of Potential Effects (APE) based on the coordinates defined in the request. However, the NAHC response did note that adjacent areas in the Cities of Azusa and Pasadena include Native American cultural resources and that this historic area of the Tongva is known to be culturally sensitive. The NAHC recommended that 10 Native American individuals representing the Gabrielino and Gabrielino Tongva groups be contacted for information regarding cultural resources that could be impacted by the project. Table 5.2 lists the Native American individuals consulted for the project and the results of that consultation. The first contact was a certified letter dated June 26, 2013, which was sent to all 10 individuals to notify them of the proposed SR 710 North Project. As shown in Table 5.2, two responses to that letter were received. Two rounds of follow-up communication (telephone calls and emails) were conducted between July 19, 2013, and July 26, 2013, and three additional responses were received as shown in Table 5.2. As shown in Table 5.2, no response was received from Ron Andrade, Los Angeles City/County Native American Indian Commission; Cindi M. Alvitre, Ti'At Society/Inter-Tribal Council of Pimu; Bernie Acuna, Gabrielino-Tongva Tribe; Linda Candelaria, Gabrielino-Tongva Tribe; or Conrad Acuna, Gabrielino-Tongva Tribe.

Subsequent to the consultation conducted in June 2013, additional historical research for the project identified two cultural resource sites that were recorded in the APE. The two archaeological sites are the Horatio Rust and the Otsungna prehistoric village sites. An additional consultation letter was sent to Tribal representatives and interested parties on December 8, 2014, informing the representatives of the sites and requesting comments or discussions about the sites. Table 5.3 summarizes the consultation for the two archaeological sites and the input provided by the Tribal representatives. Table 5.4 summarizes consultation subsequent to circulation of the Draft EIR/EIS and as part of the Finding of Adverse Effect.

5.8 Documentation of Consultation

The consultation letters and correspondence described in this section are provided following the last page of text in this chapter.

5.8.1 Participating Agencies

Concurrence letters from the following agencies who agreed to become Participating Agencies for the project are provided:

- Los Angeles County Metropolitan Transportation Authority
- USFWS
- Office of Environmental Policy and Compliance, United States Department of the Interior
- National Park Service, United States Department of the Interior
- EPA
- USACE
- San Gabriel Valley Council of Governments
- County of Los Angeles
- County of Los Angeles Department of Public Works
- City of Los Angeles Department of Transportation
- City of Alhambra
- City of Glendale
- City of La Cañada Flintridge
- City of Monterey Park
- City of Pasadena
- City of San Marino
- City of South Pasadena

5.8.2 Cooperating Agencies

Concurrence letters from USACE and EPA, who agreed to become Cooperating Agencies for the project, are provided at the end of this Chapter. In compliance with 23 USC 139, the Administrative Draft EIR/EIS for the SR 710 North Study (dated January 2015) was submitted to the Cooperating Agencies, as requested, on January 22, 2015 for review.

5.8.3 City of Monterey Park

Prior to the Final EIR/EIS, if the BRT Alternative had been identified as the Preferred Alternative, the City of Monterey Park will be formally requested to provide its concurrence with the temporary and permanent impacts of the Bus Rapid Transit (BRT) Alternative on El Encanto/Cascades Park and the preliminary De Minimis Finding for those effects as described in detail in Appendix B

5.8.4 Native American Consultation

Written documentation regarding the consultation with Native American representatives is provided in the *Historic Property Survey Report* (HPSR) (2014).

5.8.5 Correspondence

The following correspondence regarding the project is provided following the last page of the tables in this section:

- Determination of Eligibility for the SR 710 North Project from SHPO (February 26, 2015, 2 pages)
- Phased Approach of the Application of Criteria of the Adverse Effects and Preliminary Finding of No Adverse Effect for the Proposed 710 North Project from Caltrans to SHPO (February 26, 2015, 1 page)
- *Supplemental Historic Property Survey Report* concurrence from SHPO (November 9, 2017, 3 pages)
- *Finding of Adverse Effect for the Proposed Interstate 710 North Project* concurrence from SHPO (May 3, 2018, 2 pages)
- October 16, 2018 letter from the Advisory Council on Historic Preservation (1 page)
- MOA executed on October 18, 2018 by Caltrans and SHPO (27 pages)
- Sample Caltrans “Invitation to Become Participating Agency and Cooperating Agency on the State Route 710 Study” (2 pages)
- Cooperating Agency response letters from:
  - United States Army Corps of Engineers (February 28, 2012, 2 pages)
  - United States Environmental Protection Agency (March 21, 2012, 2 pages)
- Participating Agency acceptance and declining responses from:
  - United States Fish and Wildlife Service (March 19, 2012, 1 page)
  - County of Los Angeles Department of Public Works (March 19, 2012, 2 pages)
  - City of Los Angeles Department of Transportation (February 23, 2012, 1 page)
  - City of Alhambra (March 16, 2012, 1 page)
  - City of Glendale (February 23, 2012, 2 pages)
  - City of La Canada Flintridge (March 15, 2012, 1 page)
  - City of Monterey Park (February 21, 2012, 1 page)
  - City of Pasadena (February 28, 2012, 1 page)
  - City of San Marino (February 22, 2012, 1 page)
  - City of South Pasadena (April 5, 2012, 2 pages)
  - San Gabriel Valley Council of Governments (February 23, 2012, 1 page)
  - Caltrans email (November 3, 2014) and FTA email (November 18, 2014, 1 page)
- Transportation Conformity Working Group minutes from October 28, 2014 meeting (4 pages)
- United States Environmental Protection Agency Comments re: Revised PM Hot Spot Interagency Review Form for 18790 (SR 710) (August 12, 2014, 2 pages)

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
		SR 710 Conversation Series Meetings	
02/15/11 02/16/11 02/19/11 02/23/11 02/24/11 02/26/11	SR 710 Conversations, Series 1	Presentation and discussion regarding "Transportation – Where have we been? Where are we going?"	Members of the general public and other interested parties at six locations in six communities: Alhambra, El Sereno, Glendale, Pasadena, San Gabriel, and South Pasadena.
03/01/11 03/02/11 03/03/11 03/08/11 03/09/11 03/17/11	SR 710 Conversations, Series 2	Presentation and discussion regarding "Understanding the Environmental Process – CEQA/NEPA"	Members of the general public and other interested parties at six locations in six communities: Alhambra, El Sereno, Glendale, Pasadena, San Gabriel, and South Pasadena.
03/15/11 03/16/11 03/22/11 03/23/11 03/29/11 03/30/11 04/05/11 04/06/11 04/06/11	SR 710 Conversations, Series 3	Presentation and discussion regarding "Scoping – Going on the Record" One virtual Scoping Meeting hosted through the SR 710 North Project Website	Members of the general public and other interested parties at eight locations in eight communities: Alhambra, El Sereno, Glendale, Highland Park, La Cañada Flintridge, Pasadena, San Gabriel, and South Pasadena.
		Stakeholder Outreach Advisory Committee (SOAC) Meetings **(refer also to the list of TAC meetings for discussion of SOAC Meeting Nos. 5–11, which were based on the same presentations as the TAC meetings)**	
05/11/12	SOAC Meeting No. 1 Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: project scoping process and topics of the comments provided at the Scoping Meetings, the community outreach structure, dates of the Open House meetings in May 2012, the alternatives analyses process, the four elements of need, the preliminary project purpose, the initial evaluation of alternative concepts, and the recommended alternative concepts for conceptual engineering.	SOAC members, Metro and Caltrans representatives, and consultants
07/20/12	SOAC Meeting No. 2 Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: preliminary alternatives analysis, transportation analysis for the Build and No Build Alternatives, initial environmental assessment, and status of conceptual engineering.	SOAC members, Metro and Caltrans representatives, and consultants
8/30/12	SOAC Meeting No. 3	Presentation and discussion: public outreach and community involvement update, update on technical work in support of the alternatives analyses.	SOAC members, Metro and Caltrans representatives, and consultants
11/15/12	SOAC Meeting No. 4	Presentation and discussion: public outreach and community involvement update, initial discussion on goods movement, fact checks, and refinement of alternatives.	SOAC members, Metro and Caltrans representatives, and consultants
For SOAC Meeting Nos. 5–18, refer to the information provided for TAC Meetings 9–22 below			

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
	Technical Advisory Committee (TAC) Meetings and SOAC Meetings		
01/18/12	TAC Meeting No. 1 Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: scoping process and comments, and preliminary project need.	TAC members, Metro and Caltrans representatives, and consultants
02/08/12	TAC Meeting No. 2 Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: roles and responsibilities of the members of the TAC, Metro, Caltrans, the engineering team and consultants, SR 710 decision-making flow chart, discussion topics from TAC Meeting No. 1, Transportation System Analysis, review of the Project Need statement, the alternatives evaluation framework, and discussion of goals and objectives.	TAC members, Metro and Caltrans representatives, and consultants
03/07/12	TAC Meeting No. 3 Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: overview of alternatives analysis; project purpose; objectives, criteria, and performance measures; alternatives development methodology; and initial set of alternatives.	TAC members, Metro and Caltrans representatives, and consultants
04/05/12	TAC Meeting No. 4 Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: initial alternatives, results of initial evaluation, and identification of alternatives for conceptual engineering.	TAC members, Metro and Caltrans representatives, and consultants
05/09/12	TAC Meeting No. 5 Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: alternative concepts for preliminary engineering, conceptual design approach, performance measures for screening, and forecasting methodology and assumptions.	TAC members, Metro and Caltrans representatives, and consultants
07/11/12	TAC Meeting No. 6 Metro Headquarters One Gateway Plaza, Los Angeles	Presentation and discussion: Public outreach and community involvement update, update on Part 1 – Alternatives Analyses Technical Work, open discussion/new business and meeting adjournment.	TAC members, Metro and Caltrans representatives, and consultants
08/29/12 08/30/12	TAC Meeting No. 7 (first date) SOAC Meeting (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach, community involvement, and alternatives analysis; and open discussion.	TAC members, Metro and Caltrans representatives, and consultants
11/14/12	TAC Meeting No. 8 Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach activities and alternatives analysis; goods movement; fact checks; refinement of alternatives; and next steps.	TAC members, Metro and Caltrans representatives, and consultants
02/13/13 02/14/13	TAC Meeting No. 9 (first date) SOAC Meeting No. 5 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach activities, Project Report and environmental studies; recap of the alternatives analysis; and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
04/24/13 04/25/13	TAC Meeting No. 10 (first date) SOAC Meeting No. 6 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach activities, Project Report, environmental studies, and the Build Alternatives; and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
07/10/13 07/11/13	TAC Meeting No. 11 (first date) SOAC Meeting No. 7 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach activities, preliminary engineering, and environmental technical studies; and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
09/11/13 09/12/13	TAC Meeting No. 12 (first date) SOAC Meeting No. 8 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach activities, preliminary engineering, environmental technical studies, and the Value Analysis Study; and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
11/13/13 11/14/13	TAC Meeting No. 13 (first date) SOAC Meeting No. 9 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: review of public outreach activities; and updates on the status of the Project Report, preliminary engineering, environmental technical studies, and the Value Analysis Study.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
2/19/14 2/20/14	TAC Meeting No. 14 (first date) SOAC Meeting No. 10 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: review of public outreach activities; and status of the Project Report, preliminary engineering, environmental technical studies documentation, and a recap of the TAC Meeting No. 13 and SOAC Meeting No. 9.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
5/14/14 5/15/14	TAC Meeting No. 15 (first date) SOAC Meeting No. 11 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: review of public outreach activities; status of the Project Report and the environmental studies documentation; recap of the TAC No. 14 and SOAC No.10 Meetings; and update of the preliminary engineering and the technical studies.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
8/13/14 8/14/14	TAC Meeting No. 16 (first date) SOAC Meeting No. 12 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: review of public outreach activities; status of the Project Report and the environmental studies documentation; and update of the preliminary engineering and the technical studies.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
11/19/14 11/20/14	TAC Meeting No. 17 (first date) SOAC Meeting No. 13 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: status of the Project Report and the environmental studies documentation, and overview of the Draft Environmental Impact Report and Environment Impact Statement (EIR/EIS).	TAC and SOAC members, Metro and Caltrans representatives, and consultants

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
3/11/15 3/12/15	TAC Meeting No. 18 (first date) SOAC Meeting No. 14 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach community involvement, an overview of the alternatives, environmental studies and traffic studies key findings, and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
7/8/15 7/9/15	TAC Meeting No. 19 (first date) SOAC Meeting No. 15 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach community involvement; Draft EIR/EIS updates, Cost Benefit Analysis key findings, and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
9/9/15 9/10/15	TAC Meeting No. 20 (first date) SOAC Meeting No. 16 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach community involvement, overview of comments received on Draft EIR/EIS updates, Traffic key findings, Performance evaluation approach, and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
3/9/16 3/10/16	TAC Meeting No. 21 (first date) SOAC Meeting No. 17 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach community involvement; Draft EIR/EIS updates and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
7/27/17 7/27/17	TAC Meeting No. 22 (first date) SOAC Meeting No. 18 (second date) Metro Headquarters One Gateway Plaza Los Angeles	Presentation and discussion: updates on public outreach community involvement; Draft EIR/EIS updates and next steps.	TAC and SOAC members, Metro and Caltrans representatives, and consultants
All Communities Convening (ACC) Information Sessions and Open House Meetings			
03/01/12 03/03/12	ACC Convening Meetings in Highland Park ACC Convening Meeting in East LA	Presentation and open house with the following information/discussion stations: • Station 1: Sign-in • Station 2: Project Overview • Station 3: Environmental Process • Station 4: Community Outreach • Station 5: Community Liaison Councils • Station 6: Comments	Members of the general public and other interested parties in area communities
05/14/12	Open House meeting in El Sereno	The purpose of the meeting was to: provide a study overview, share the study history, provide information on the environmental and alternative development processes, and describe the multi-modal alternatives. The meeting was an open house format with the following information/discussion stations: • Station 1: Welcome • Station 2: What is the State Route 710 Study?	Members of the general public and other interested parties
05/17/12	Open House meeting in Eagle Rock		
05/19/12	Open House meeting in La Cañada Flintridge		
05/22/12	Open House meeting in El Monte		
05/23/12	Open House meeting in South Pasadena		
05/24/12	Open House meeting in Alhambra		

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
05/30/12	Open House meeting in Pasadena	• Station 3: The Environmental Study Process and Timeline • Station 4: Alternatives Evaluated in the Alternatives Analysis Report • Station 5: Five Alternatives to be Further Analyzed • Station 6: SR 710 Study E-Tool	
01/23/13	Open House Meeting at Maranatha High School in Pasadena	Open house with the following information/discussion boards: • Board 1: Welcome • Board 2: Study Overview • Board 3: Environmental Study • Board 4: Scoping Process • Board 5: Alternative Concepts • Board 6: Tell Us What You Think • Board 7: Next Steps • Board 8: Provide Your Feedback	Members of the general public and other interested parties
01/24/13	Open House Meeting at San Marino Community Church in San Marino		
01/26/13	Open House Meeting at California State University, Los Angeles in Los Angeles		
07/18/13	ACC Information Session Los Angeles Presbyterian Church 2241 N. Eastern Avenue El Sereno	Presented updated information about the five alternatives that will be carried forward for detailed analysis in the Draft EIR/EIS.	Community groups
07/20/13	ACC Information Session Blair High School 1201 S. Marengo Avenue Pasadena	Presented updated information about the five alternatives that will be carried forward for detailed analysis in the Draft EIR/EIS.	Community groups
07/23/13	ACC Information Session Langley Senior Center 400 W. Emerson Avenue Monterey Park	Presented updated information about the five alternatives that will be carried forward for detailed analysis in the Draft EIR/EIS.	Community groups
08/26/13	East LA Community Specific Information Session Centro Maravilla 4716 East Cesar E. Chavez Avenue Los Angeles	Presented updated information about the five alternatives that will be carried forward for detailed analysis in the Draft EIR/EIS. For some residents this update was an introduction to the SR 710 North Project.	Community Groups
10/10/13	Alhambra Community Specific Information Session Emery Park Community Center 2709 Mimosa St. Alhambra	Presented updated information about the five alternatives that will be carried forward for detailed analysis in the Draft EIR/EIS. For some residents this update was an introduction to the SR 710 North Project. The meeting was organized by Alhambra Councilman Luis Avala. Metro made a small presentation and answered questions.	Emery Park Residents
10/16/13	East LA Community Specific Information Session Hilda Solis Learning Academy 319 N. Humphreys Avenue East Los Angeles	Presented updated information about the five alternatives that will be carried forward for detailed analysis in the Draft EIR/EIS. For some residents this update was an introduction to the SR 710 North Project.	Community groups

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
Community Liaison Council (CLC) Meetings			
04/12/12	Meeting for San Marino and Arcadia San Marino Center 1800 Huntington Drive San Marino	Presented an overview of the participation process, the opportunities for participation, the environmental review process and the process of developing the initial set of project alternatives.	Members of the general public and other interested parties in the CLC communities
04/16/12	Meeting for Crescenta Valley, Burbank, Glendale, and Montrose La Crescenta Library Community Room 2809 Foothill Boulevard La Crescenta		
04/17/12	Meeting for El Monte, South El Monte, Irwindale, Baldwin Park, and Temple City El Monte Community Center 3130 N. Taylor Avenue El Monte		
04/18/12	Meeting for Alhambra and Monterey Park Alhambra Civic Center Library 101 South 1st Street Alhambra	Presented an overview of the participation process, the opportunities for participation, the environmental review process and the process of developing the initial set of project alternatives.	Members of the general public and other interested parties in the CLC communities
04/18/12	Meeting for Lincoln Heights and El Sereno El Sereno Senior Center 4818 Klamath Place Los Angeles		
04/19/12	Meeting for Arroyo Seco, Eagle Rock, Highland Park, and Mt. Washington 4580 North Figueroa Street Los Angeles		
04/19/12	Meeting for Sierra Madre, Monrovia, Duarte, Azusa, and Bradbury Monrovia Library Community Room 321 S. Myrtle Avenue Monrovia		
4/23/12	Meeting for Altadena and Pasadena Chefs Center of California 45 N. San Gabriel Boulevard Pasadena		

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
04/24/12	Meeting for Rosemead and San Gabriel Garvey Community Center 9108 Garvey Avenue Rosemead		
04/24/12	Meeting for Boyle Heights, East Los Angeles, and City Terrace Mothers of East LA 3354 E. Olympic Boulevard Los Angeles		
04/25/12	Meeting for South Pasadena Garfield Youth House 625 Stratford Avenue South Pasadena		
04/26/12	Meeting for Atwater Village, Cypress Park, and Highland Park 3750 Verdugo Road Glassell Park	Presented an overview of the participation process, the opportunities for participation, the environmental review process and the process of developing the initial set of project alternatives.	Members of the general public and other interested parties in the CLC communities
04/30/12	Meeting for La Cañada-Flintridge La Cañada High School Resource Information Center 4463 Oak Grove Drive La Cañada		
08/06/12	Meeting for the Northeast Los Angeles CLC in Highland Park	Presentation and discussion to review the 12 alternative concepts	Members of the general public and other interested parties in the CLC communities
08/08/12	Meeting for the Pasadena CLC		
08/08/12	Meeting for the San Gabriel CLC in Alhambra		
08/09/12	Meeting for the South Pasadena CLC		
08/09/12	Meeting for the East Los Angeles CLC in El Sereno		
08/09/12	Meeting for the San Gabriel CLC in Monrovia		
08/13/12	Meeting for the La Cañada Flintridge CLC		
Open House and Community Meetings			
08/26/13	East Los Angeles Community Meeting Centro Maravilla Service Center 4716 East Cesar E. Chavez Avenue East Los Angeles	Presented updated information about the five alternatives that will be carried forward for detailed analysis in the Draft EIR/EIS.	Community groups and members of the general public

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
10/16/13	East Los Angeles Community Meeting Hilda Solis Learning Academy Gymnasium 319 North Humphreys Avenue East Los Angeles	Discussion of previous meeting and presented information based on comments from previous meeting.	Community groups and members of the general public
Scoping Under CEQA and NEPA (March 4, 2011 to April 14, 2011)			
03/15/11	Formal scoping meetings held at: Jefferson Middle School, 1372 East Las Tunas Drive, San Gabriel	The formal scoping meetings included a project overview presentation followed by public comments, which were transcribed by a court reporter. Spanish, Chinese, and Armenian translators were available.	Members of the general public and other interested parties
03/16/11	Alhambra Civic Center Library, 101 South 1st Street, Alhambra		
03/22/11	Glendale Community College, 1500 N. Verdugo Road, Glendale		
03/23/11	South Pasadena High School, 1401 Fremont Avenue, South Pasadena		
03/29/11	Los Angeles Christian Presbyterian Church, 2241 N. Eastern Avenue, El Sereno		
03/30/11	Lake Avenue Church, 393 N. Lake Avenue, Pasadena		
04/05/11	La Cañada High School, 4463 Oak Grove Drive, La Cañada Flintridge		
04/06/11	Ramona Hall Community Center, 4580 N. Figueroa Street, Los Angeles		
03/21/11–04/14/11	Virtual Scoping Meeting at metro.net/sr710conversations	Presentation and discussion of the effects of the SR 710 freeway gap, the scoping process and meeting date, the role of the public in the scoping process, map of the project study area, preliminary project purpose and need statement, project alternatives, project milestones, the type of environmental document to be prepared, and contact information for providing comments about the presentation and the project.	Members of the general public and other interested parties
03/14/11	Agency scoping meeting	An overview of the project and the possible alternatives were provided, concerns regarding the project were addressed, and other questions were answered.	Representatives from public agencies
Other Sources of Information Regarding the Project			
Ongoing	facebook.com/sr710study	Regular updates and status reports	Members of the general public and other interested parties
Ongoing	twitter.com/sr710study	Regular updates and status reports	Members of the general public and other interested parties
Ongoing	metro.net/sr710study	Regular updates and status reports	Members of the general public and other interested parties
Ongoing	sr710study@metro.net	Regular updates and status reports	Members of the general public and other interested parties

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
Ongoing	instagram.com/710destinations	Behind the scenes photos and study related information	Members of the general public and other interested parties
Ongoing	Youtube.com/sr710study	Study overview and tutorials	Members of the general public and other interested parties
Public Hearings for the Draft EIR/EIS			
4/11/2015	Public Hearing #1 East Los Angeles College Monterey Park	An overview of the EIR/EIS was presented, comments regarding the project were heard and recorded by a court reporter, and other questions were answered.	Members of the general public and other interested parties
4/14/2015	Public Hearing #2 Pasadena Convention Center Pasadena		Members of the general public and other interested parties
5/6/2015	Public Hearing #3 La Cañada High School La Cañada-Flintridge		Members of the general public and other interested parties
5/7/2015	Public Hearing #4 Los Angeles Christian Presbyterian Church El Sereno		Members of the general public and other interested parties
6/20/2015	Public Hearing #5 Griffith Middle School East Los Angeles		Members of the general public and other interested parties
Meetings Held During the /Preparation of the Draft EIR/EIS			
3/26/14	Pasadena Councilman Kennedy Community Meeting Robinson Park Multi-Purpose Room Pasadena	Meetings were held with various interested parties and stakeholders during the preparation of the Draft EIR/EIS. At these meetings questions and concerns about the environmental document and technical studies were addressed.	Members of the general public and other interested parties
3/26/14	SGV COG Transportation Forum City of Industry		Members of the general public and other interested parties
3/31/14	Grifols Grifols Headquarters El Sereno		Members of the general public and other interested parties
5/7/14	Zocalo Public Square Panel Discussion Museum of Contemporary Art (MOCA) Los Angeles		Members of the general public and other interested parties
5/13/14	Metro Public Private Partnership Roundtable Metro Headquarters Los Angeles		Members of the general public and other interested parties
9/8/14	San Gabriel Valley Metro Service Council Metro Division 9 El Monte (Metro Division 9)		Members of the general public and other interested parties

TABLE 5.1:
Summary of SR 710 North Project Community Outreach Meetings

Meeting Date	Meeting and Location	Description	Participants
9/20/14	Alma Family Services Gala for Supervisor Molina Centro Estrella & Alma Family Res. Ctr. East Los Angeles		Members of the general public and other interested parties
9/25/14	City of South Gate City Manager Briefing South Gate City Hall South Gate		Members of the general public and other interested parties
10/9/14	Gateway COG City Manager Steering Committee South Gate Park Auditorium South Gate		Members of the general public and other interested parties
10/14/14	South Gate City Council Briefing South Gate City Hall South Gate		Members of the general public and other interested parties
10/20/14	San Gabriel Valley COG Public Works TAC Embassy Suites Arcadia		Members of the general public and other interested parties
10/28/14	Briefing with Lee Dolley, Alhambra Metro Headquarters Los Angeles		Members of the general public and other interested parties
4/3/15	Supervisor Hilda Solis Griffith Middle School East Los Angeles		Members of the general public and other interested parties
7/15/15	City of Alhambra, Mayor Steven Placido Metro Headquarters Los Angeles		Members of the general public and other interested parties
12/14/15	City of Alhambra, Council Member Barbara Messina Los Angeles		Members of the general public and other interested parties
2/12/15	No 710 Action Committee Members Metro Headquarters		
3/3/15	710 Coalition Meeting Metro Headquarters Los Angeles		Members of the general public and other interested parties
6/13/18	Maranatha High School	An overview of the Focused RDEIR/SDEIS was presented, comments regarding the project were heard and recorded by a court reporter, and other questions were answered.	Members of the general public and other interested parties

Source: Los Angeles County Metropolitan Transportation Authority, SR 710 North Project, http://www.metro.net/projects/sr-710-conversations/, accessed December 31, 2013.
ACC = All Communities Convening EIR = Environmental Impact Report
CLC = Community Liaison Council EIS = Environmental Impact Statement

TABLE 5.2:
Summary of Consultation with Native American Tribes and their Representatives in June 2013

Native American Contact	Responses to the June 26, 2013 Letters[1]	Responses to Follow-up Emails and Phone Calls
Ron Andrade, Director, Los Angeles City/County Native American Indian Commission	None received	No response to follow-up phone call on July 19, 2013 and email on July 26, 2013.
Sam Dunlap, Cultural Resources Director, Gabrielino Tongva Nation	None received	Mr. Dunlap responded by email on July 29, 2013 to say the project is within the traditional tribal territory of the Gabrielino Tongva Nation and that there is a possibility for the project to impact the cultural resources of their tribal group. It was requested that an archaeologist and a Native American monitor be present during all subsurface construction activities.
Cindi M. Alvitre, Chairwoman-Manisar, Ti'At Society/Inter-Tribal Council of Pimu	None received	No response to follow-up phone call on July 19, 2013 and email on July 26, 2013.
Robert F. Dorame, Tribal Chair/Cultural Resources, Gabrielino Tongva Indians of California Tribal Council	Mr. Dorame responded in a telephone call on July 8, 2013, in which he stated this project will impact areas known to be culturally sensitive to his group and that Native American monitors need to be present. He would like to be involved in consultation for the duration of the project.	--
John Tommy Rosas, Tribal Administrator, Tongva Ancestral Territorial Tribal Nation	In an email on June 26, 2013, Mr. Rosas stated his concerns by referencing the Advisory Council on Historic Preservation in their endorsement of the United Nations Declaration on the Rights of Indigenous People (UNDRIP) and encouraged all agencies and non-agencies to become familiar with the UNDRIP.	--
Bernie Acuna, Co-Chairperson, Gabrielino-Tongva Tribe	--	No response to follow-up phone call on July 19, 2013 and email on July 26, 2013.
Anthony Morales, Chairperson, Gabrielino/Tongva San Gabriel Band of Mission Indians	--	Mr. Morales called to discuss the project on August 22, 2013. He indicated he believes the area to be sensitive for cultural resources. He requested diligence by the agencies when dealing with cultural resources and that Native American monitoring of ground disturbance be done by a member from his group.
Linda Candelaria, Co-Chairperson, Gabrielino-Tongva Tribe	--	No response to follow-up phone call on July 19, 2013 and email on July 26, 2013.
Andrew Salas, Chairperson, Gabrieleño Band of Mission Indians – Kizh Nation	--	Mr. Salas responded by email on July 21, 2013, and stated that the project is within highly culturally sensitive areas, and as a measure to protect their resources, they are requesting one of their Native American monitors be on site during all ground disturbances.
Conrad Acuna, Gabrielino-Tongva Tribe	--	No response to follow-up phone call on July 19, 2013 and email on July 26, 2013.

Source: *Historic Property Survey Report* (2014).
[1] Letter was sent on June 26, 2013 requesting information on cultural resources concerns for the SR 710 North Project.

TABLE 5.3:
Summary of Consultation with Native American Tribes and their Representatives and Other Interested Parties in December 2014

Native American Contact	Date of Letter to Tribes/Interested Parties[1]	Responses
Sam Dunlap, Cultural Resources Director Gabrielino/Tongva, Gabrielino Tongva Nation	12-08-2014	• On 12-08-14: Mr. Dunlap was informed that the letter had been sent to him that described the known archaeological resources within the APE. He was also informed that Caltrans had authorized Native American monitoring in sensitive areas of the APE. No additional response was received from Mr. Dunlap.
Robert F. Dorame, Tribal Chair/Cultural Resources Gabrielino Tongva, Gabrielino Tongva Indians of California Tribal Council	12-08-2014	• On 12-08-14: A voicemail was left for Mr. Dorame. • On 12-09-14: Mr. Dorame left a voicemail. • On 12-10-14: Mr. Dorame was informed that the letter had been sent to him that described the known archaeological resources within the APE. He was also informed that Caltrans had authorized Native American monitoring in sensitive areas of the APE. Mr. Dorame stated that he would like his group to monitor and has monitors available. He will respond again if he has any comments once he receives the letter. No additional response was received from Mr. Dorame.
Anthony Morales, Chairperson Gabrielino/Tongva, Gabrieleño/Tongva San Gabriel Band of Mission Indians	12-08-2014	• On 12-08-14: Mr. Morales was informed that the letter had been sent to him that described the known archaeological resources within the APE. He was also informed that Caltrans had authorized Native American monitoring in sensitive areas of the APE. • On 01-21-15: Mr. Morales called to say that he recommends archaeological and Native American monitoring for any sensitive areas where native soil is present. He is aware that there are cultural resources in the area, particularly on the east and west sides of the southbound lanes.
Andrew Salas, Chairperson Gabrielino/Tongva San Gabriel Band of Mission Indians	12-08-2014	• On 12-08-14: Mr. Salas was informed that the letter had been sent to him that described the known archaeological resources within the APE. He was also informed that Caltrans had authorized Native American monitoring in sensitive areas of the APE. No additional response was received from Mr. Salas.
John Tommy Rosas, Tribal Administration, Tongva Ancestral Territorial Tribal Nation	12-08-14 (via email)	• On 12-08-14: Mr. Rosas responded by email to confirm he received the letter.
Cindi M. Alvitre, Chairwoman-Manisar, Ti'At Society/Inter-Tribal Council of Pimu	12-08-2014	• On 01-09-15: The letter was returned as "return to sender unable to forward."
Bernie Acuna, Co-Chairperson, Gabrielino-Tongva Tribe	12-08-2014	• On 01-01-15: The letter was returned as "unclaimed."
Linda Candelaria, Co-Chairperson, Gabrielino-Tongva Tribe	12-08-2014	• On 01-01-15: The letter was returned as "unclaimed."
Conrad Acuna, Gabrielino-Tongva Tribe	12-08-2014	• On 01-01-15: The letter was returned as "unclaimed."
Ron Andrade, Director, LA City/County Native American Indian Commission	12-08-2014	• No response received.

Source: *Historic Property Survey Report* (2015).
[1] Letter was sent on December 8, 2014 informing representatives of the Horatio Rust Site and Otsungna Village Site.

TABLE 5.4:
Summary of Consultation with Native American Tribes and Their Representatives Since December 2014

Date	From Whom/Whom Involved	To Whom/Whom Involved	Description
	Territorial Tribal Nation		
1/21/2015	Anthony Morales, Chairperson, Gabrielino/Tongva San Gabriel Band of Mission Indians	LSA Associates	Phone call stated that the Tribe recommends archaeological and Native American monitoring for any sensitive areas where native soil is present. He is aware that there are cultural resources in the area, particularly on the east and west sides of the southbound lanes.
11/24/2016	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Mariam Dahdul, Caltrans	Mr. Salas responded to that consultation request on December 9, 2014 stating that the project is in an area highly sensitive to the Kizh people and providing general information on traditional settlement and subsistence practices. Mr. Salas also requested monitoring by a Native American monitor. Again, this email communication pertains to the segment of I-710 in Long Beach, not SR 710 in Los Angeles and San Gabriel Valley.
11/29/2016	Mariam Dahdul, Caltrans	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Email (9:36 a.m.) thanking Mr. Salas for the 11/24/2016 email and that she would follow up with LSA on the status of the SR 710 North Project.
2/1/2017	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Mariam Dahdul, Caltrans	Email (6:53 a.m.) to check in on project update.
2/6/2017	Mariam Dahdul, Caltrans	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Email stating that there was a Phase I archaeological investigation of the Area of Potential Effects and an ASR prepared. A copy of the ASR would be provided if requested.
5/5/2017	Mariam Dahdul, Caltrans	• Gloria J. Cuevas, Native American Indian Commission • Cindi M. Alvitre, Ti'At Society/Inter-Tribal Council of Pimu • John Tommy Rosas, Tongva Ancestral Territorial Tribal Nation • Anthony Morales, Gabrieleño/Tongva San Gabriel Band of Mission Indians • Sam Dunlap, Gabrielino/Tongva Nation • Robert F. Dorame, Gabrielino Tongva Indians of California Tribal Council • Bernie Acuna, Gabrielino-Tongva Tribe • Linda Candelaria, Gabrielino-Tongva Tribe • Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation • Conrad Acuna, Gabrielino-Tongva Tribe	Letter providing an update on the cultural resources investigations for the SR 710 North Project. Specifically, the letter stated that ethnographic and archival research indicated that nine ethnographic/prehistoric villages were once located in the immediate vicinity of the Area of Potential Effects. As a result, a PRDMP was prepared that delineated archaeological monitoring areas for locations with highest geoarchaeological sensitivity, and that tribal monitoring is anticipated. The letter also asked that if the represented Tribes wished to review the PRDMP, they please request a copy by May 22, 2017. The Post Office made three attempts to deliver the letter to Ms. Alvitre, with no success.
5/9/2017	Gloria J. Cuevas, Native American Indian Commission	Mariam Dahdul, Caltrans	Email requesting a hard copy of the PRDMP for review.
5/18/2017	Mariam Dahdul, Caltrans	Andrew Salas and Matthew R. Teutimez, Gabrieleño Band of Mission Indians – Kizh Nation	Teleconference call discussing the important to the Gabrieleño of the corridor on which SR 710 traverses. Ms. Dahdul asked that the Tribe provide some form of documentation (e.g., ethnographic accounts, tribal oral histories, historical documents) that sheds more light n this new information. Mr. Salas stated that he would provide more information via email. Mr. Salas also requested a copy of the PRDMP for review and comment.

TABLE 5.4:
Summary of Consultation with Native American Tribes and Their Representatives Since December 2014

Date	From Whom/Whom Involved	To Whom/Whom Involved	Description
5/18/2017	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Mariam Dahdul, Caltrans	Email providing link to a KCET story on the history of the 710 Long Beach Freeway.
5/19/2017	Mariam Dahdul, Caltrans	Gloria J. Cuevas, Native American Indian Commission	Submittal of a hard copy of the PRDMP. Comments on the plan were requested by June 9, 2017.
5/19/2017	Mariam Dahdul, Caltrans	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Submittal of a hard copy of the PRDMP. Comments on the plan were requested by June 9, 2017.
5/26/2017	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Mariam Dahdul, Caltrans	Email stating that in his review of the PRDMP, he noted that there were some errors in Table 1 of the PRDMP. Mr. Salas provided attachments for reference. In a later email on the say day, Mr. Salas provided more information on Kizh Nation.
5/26/2017	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Mariam Dahdul, Caltrans	Email requesting a meeting to discuss the SR 710 North Project.
5/31/2017	Mariam Dahdul, Caltrans	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Email acknowledging receipt of Mr. Salas emails and the request for a meeting. The status of the project was discussed and that he would be contacted to set up a meeting in the future.
6/9/2017	Andrea Diaz, Los Angeles Native American Indian Commission	Mariam Dahdul, Caltrans	Phone message stating that a copy of the PRDMP was provided to her by Ms. Gloria Cuevas of the Native American Indian Commission, and requesting additional time to review the SR 710 North Project's PRDMP.
6/16/2017	Mariam Dahdul, Caltrans	Andrea Diaz, Los Angeles Native American Indian Commission	Phone call to update Ms. Diaz on the status of the project. It was agreed that Diaz would provide comments on the PRDMP by mid-July 2017.
8/31/2017	Mariam Dahdul, Kelly Ewing-Toledo, Kristin Fusselo, Caltrans	Andrew Salas and Matthew Teutimez, Gabrieleño Band of Mission Indians – Kizh Nation	Meeting at the Tribal office to discuss the SR 710 North Project and other Caltrans projects. During the meeting, the Tribe described the sensitivity of the project area and that the Tribe believes that archaeological and Native American monitoring is necessary for the entirety of the project's APE. Caltrans explained the process for determining monitoring for the project, which is based on the results of the cultural studies, and that the study findings did not warrant monitoring of the entirety of the project's APE.
11/16/2017	Debbie McLean, LSA	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Phone call to follow up on the concerns raised during the August 31, 2017 meeting, but specifically to address the topic of monitoring as it pertains to the protocols and procedures outlined in the Draft PRDMP that the Tribe reviewed. During the conversation, LSA asked if the Tribe had any written documentation that supports the sensitivity raised by Mr. Salas. Mr. Salas stated that he would provide such documentation the following week, as well as comments to the Draft PRDMP. Mr. Salas also requested that project information be resent to him, including a map of the APE, areas Caltrans determined warranted monitoring, and the PRDMP.
11/16/2017	Debbie McLean, LSA	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Email submitting (1) map showing ethnographic villages, (2) APE map, and (3) Draft PRDMP.

TABLE 5.4:
Summary of Consultation with Native American Tribes and Their Representatives Since December 2014

Date	From Whom/Whom Involved	To Whom/Whom Involved	Description
11/16/2017	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Debbie McLean, LSA	Phone call acknowledging receipt of the documents, that there were errors on the map, and that he will provide the correct plotting of these locations.
11/20/2017	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Debbie McLean, LSA	Letter again acknowledging receipt of the documents and providing the Tribe's understanding of the locations of specific locations on the maps. Mr. Salas reiterated that the entirety of the project's APE is culturally sensitive and, thus, requires the development of "a suitable cultural resources program."
12/5/2017	Mariam Dahdul, Caltrans	Andrew Salas and Matthew Teutimez, Gabrieleño Band of Mission Indians – Kizh Nation; Gary Stickel, Tribal Archaeologist; Debbie McLean and Rod McLean, LSA – consulting archaeologists	Meeting to review additional research that was conducted to address the Tribe's most recent concerns. During the meeting, Mr. Salas provided oral history of the area within and around the project's APE and reiterated the Tribe's view that the APE is culturally sensitive and should be monitored in its entirety. Caltrans acknowledged the Tribe's concerns and explained Caltrans' guidelines for monitoring, specifically that monitoring is identified for those areas where multiple lines of evidence indicate there is potential for encountering buried archaeological deposits. Based on the information provided by the Tribe at this meeting, information provided by the Tribe during this meeting was synthesized and analyzed against ethnographic records, historic maps, geologic maps, etc. This synthesis and analysis were used to assess the Archaeological Monitoring Areas identified in the Post-Review Discovery and Monitoring Plan prepared for this project. The results of this synthesis and analysis will be detailed in the final Post-Review Discovery and Monitoring Plan.
12/6/2017	Mariam Dahdul, Caltrans	Andrew Salas, Gabrieleño Band of Mission Indians – Kizh Nation	Email (10:18 a.m.) thanking Mr. Salas for the meeting and the information shared. Dahdul informed Mr. Salas that the information is being incorporated into the PRDMP and that the data is being analyzed against other lines of evidence (e.g., ethnohistoric and ethnographic accounts, historical maps, and physical landforms). Based on this analysis, Caltrans reassessed the Archaeological Monitoring Areas that were previously defined in the PRDMP. She also asked that Mr. Salas provide any comments on the revised PRDMP by December 15, 2017, so that these could be incorporated as appropriate prior to finalizing the document.

APE = Area of Potential Effects
ASR = Archaeological Survey Report
PRDMP = Post-Review Discovery and Monitoring Plan
SR 710 = State Route 710

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Correspondence

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February 26, 2015 Reply To: FHWA_2014_1216_001

Kelly Ewing-Toledo
Heritage Resource Coordinator
Caltrans District 7 Division of Environmental Planning
100 South Main Street, Suite 100
Los Angeles, CA 90012-3606

Re: Determinations of Eligibility for the SR 710 North Study Project, Los Angeles County, CA

Dear Ms. Ewing-Toledo:

Thank you for consulting with me about the subject undertaking in accordance with the January 1, 2014 *First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

On December 15, 2014 Caltrans initiated consultation on the above project. On January 9 and 12 and February 15, 2015, Natalie Lindquist of my office requested additional information regarding the project. Supplemental information was provided via e-mail in January and a final transmittal with a revised Historic Property Survey Report, Historic Resources Evaluation Report, and DPR 523 forms were sent along with your letter of February 20, 2015.

In your letter of February 20, 2015 Caltrans is requesting the following:

- Pursuant to Stipulation VIII.C.6 of the PA, concurrence that the 440 properties listed in Attachment 1, Table 2 of your letter are not eligible for the National Register of Historic Places (NRHP)
- Pursuant to Stipulation VIII.C.6 of the PA, concurrence that the 22 properties listed in Attachment 1, Table 3 of your letter are eligible for the NRHP
- Pursuant to Stipulation VIII.C.4 Caltrans is assuming NRHP eligibility for the purposes of the undertaking for the following properties:
    - 318 Fairview Avenue, South Pasadena, CA
    - 2020 Fremont Street, South Pasadena, CA
    - US Highway 66
    - Horatio Rush Prehistoric Village Site
    - Otsunga Prehistoric Village Site
- Based on an e-mail from Kelly Hobbs on February 26, 2015 and conversations with Francesca Smith, also on February 26, 2015, Caltrans will also, pursuant to Stipulation VIII.C.4 of the PA, assume the following properties eligible for the NRHP for the purposes of the project (these properties are currently listed as not eligible in Attachment 1, Table 2):
    - Library Neighborhood Historic District
    - 904 Monterey Road, South Pasadena, CA
    - 270 S Orange Grove Boulevard, Pasadena, CA

Based on my review of submitted documentation, I have no objection to the foregoing determinations and assumptions of eligibility.

Thank you for considering historic properties during project planning. If you have any questions, please contact Natalie Lindquist of my staff at (916) 445-7014 or email at natalie.lindquist@parks.ca.gov .

Sincerely,

Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer

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Serious drought. Help save water!

February 26, 2015

Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, California 95816

SR 710 North Study
Los Angeles County
FHWA_2014_1216_001

Re: Phased Approach of the Application of Criteria of Adverse Effects and Preliminary Finding of No Adverse Effect for the Proposed 710 North Project.

Dear Dr. Roland-Nawi:

The California Department of Transportation (Caltrans) is continuing consultation with the State Historic Preservation Officer (SHPO) regarding the proposed 710 North Study Project. This consultation is undertaken in accordance with the January 1, 2014 *First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it pertains to the administration of the Federal-Aid Highway Program in California (PA).*

This letter is to notify the SHPO that in accordance with 36 CFR.800.5(a)(3) and Stipulation XII.A of the PA, Caltrans intends to continue consultation regarding application of the Criteria of Adverse Effects for the project. Based on current environmental studies a preliminary Finding of No Adverse Effect has been proposed by the Caltrans District 7 Environmental Studies Branch. Caltrans will provide additional documentation to support this finding with the understanding that based on the ongoing consultation any findings that have been made to date and included in the Draft Environmental Documentation are preliminary and subject to change as consultation continues. Caltrans District 7 staff has been advised to provide this notice and any documentation to interested parties as necessary.

If you require any additional information, please do not hesitate to contact me at 916.654.3567 or kelly.hobbs@dot.ca.gov. Thank you for your assistance with this undertaking.

Sincerely,

Kelly Hobbs

Kelly Hobbs
Section 106 Coordinator
Cultural Studies Office
Division of Environmental Analysis

cc. Kelly Ewing-Toledo, Caltrans D7

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Edmund G. Brown Jr., *Governor*

DEPARTMENT OF PARKS AND RECREATION
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November 9, 2017

VIA EMAIL

In reply refer to: FHWA_2014_1216_001

Ms. Kelly Ewing-Toledo
Senior Environmental Planner
Environmental Branch Chief, Cultural Resources Unit
Caltrans, District 7
100 S Main Street, MS 16A
Los Angeles, CA 90012

Subject: Supplemental Historic Property Survey Report for the SR-710 North Study Project, Los Angeles County, CA

Dear Ms. Ewing-Toledo:

Caltrans is continuing consultation for the above project in accordance with the January 1, 2014 *First Amended Programmatic Agreement Among the Federal Highway Administration (FHWA), the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

Caltrans, in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), proposes transportation improvements to improve mobility and relieve congestion in the area bounded by SR-2 and I-5, I-10, I-210, and I-605. To accomplish this four build alternatives are proposed (in addition to the no-build alternative): Freeway Tunnel Alternative, Light Rail Transit Alternative (LRT), Bus Rapid Transit Alternative (BRT), and Transportation System Management/Transportation Demand Management Alternative (TSM/TDM). A full project description and description of the area of potential effect (APE) are on pages 1-2 of the Supplemental Historic Property Survey Report.

Consultation and identification efforts for the project resulted in the revision of the APE map. As a result, three built environment resources within the APE required evaluation.

Caltrans determined that 275 W Colorado Blvd in Pasadena was not eligible for the National Register of Historic Places (NRHP).

Caltrans also determined that the following properties are eligible for the NRHP for the following reasons:

- Edward R. Roybal Comprehensive Health Center, 245 S Fetterly Avenue, East Los Angeles, CA – This property is eligible for the NRHP under Criterion A as a tangible expression of the Chicano Rights movement. Its construction brought affordable healthcare to a large, previously underserved segment of the population that had existed without that basic service for more than a century. Its completion was the incarnation of the civic pride of East Los Angeles, setting the tone for a newly focused civic center that was built for the community. It meets the “exceptional importance” requirements under Criteria Consideration G as a documented physical result of the Chicano Movement.

  Under Criterion C the building does not meet the requirements for exceptional importance for design qualities. It is Caltrans’ opinion however that in 2028, the property should be re-evaluated for listing under Criterion C for its design and architecture that skillfully interprets the design palate of the Mexican-American community.

- Maravilla Handball Court and El Centro Grocery, 4787 Hammel Street, Los Angeles, CA – This property is eligible under Criterion A for its long held prominent place in the local social landscape. The property serves not only as a place of recreation, but also as a central gathering point in the East Los Angeles neighborhood of Maravilla. The property evolved into a community focal point and gathering place; a place to post announcements, connect with neighbors, and for music and dancing. As such, it played a role in cultivating a sense of community and cultural identity for the Hispanic and Mexican-American residents. The handball court itself also stands as a significant reminder of the Basque culture in the region and beyond.

  Under Criterion C the property is eligible as an increasingly rare property type – a vernacular recreation building used for the Basque sport of Pelota. Many of the courts that were once found throughout the Los Angeles area have since been demolished. The Maravilla court appears to be the oldest extant handball court in Los Angeles. The property maintains a high level of integrity. The handball court being the most architecturally distinct part of the site and comprises the largest portion of the footprint. Character-defining features include the brick walls, a concrete floor, an open floor plan, the absence of a roof, built-in benches, high fencing to prevent the ball from going out of the court, and an original locker cabinet.

Based on my review of the submitted documentation, I concur with the foregoing determinations.

Thank you for considering historic properties during project planning. If you have any questions, please contact Natalie Lindquist of my staff at (916) 445-7014 with e-mail at natalie.lindquist@parks.ca.gov or Alicia Perez at (916) 445-7020 with e-mail at alicia.perez@parks.ca.gov .

Sincerely,

Julianne Polanco
State Historic Preservation Officer

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May 3, 2018

VIA EMAIL

In reply refer to: FHWA_2014_1216_001

Ms. Emily Castano, Acting Section 106 Coordinator
Cultural Studies Office
Caltrans Division of Environmental Analysis
1120 N Street, PO Box 942873, MS-27
Sacramento, CA 94273-0001

Subject: Finding of Adverse Effect for the Proposed Interstate 710 North Project in Los Angeles County, CA

Dear Ms. Castano:

Caltrans is continuing consultation about the subject undertaking in accordance with the January 1, 2014 *First Amended Programmatic Agreement Among the Federal Highway Administration (FHWA), the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA). As part of your documentation Caltrans submitted a Finding of Adverse Effect (FOAE) for the project.

Los Angeles Metropolitan Transportation Authority (Metro) and Caltrans District 7 propose traffic improvements to improve mobility and relieve congestion in the area bounded by State Route 2 and Interstates 5, 10, 210, and 605 in the east/northeast of Los Angeles and the western San Gabriel Valley.

The preferred alternative for this project is the Transportation System Management/Transportation Demand (TSM/TDM) Alternative. This alternative consists of strategies and improvements to increase efficiency and capacity for all modes of transportation within the system with lower capital cost investments and/or lower potential impacts. It will maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. TSM strategies increase efficiency of existing facilities (i.e. increase the number of vehicle trips or lane capacity of a facility without increasing number of through lanes). TDM strategies will expand bus services and bicycle facilities.

Caltrans identified 84 cultural resources within the area of potential effect (APE). This includes 74 properties listed or eligible for the National Register of Historic Places (NRHP).

Caltrans conducted an extensive public outreach effort as part of their identification and evaluation efforts. This effort is summarized in Chapter 3 and Appendix B of the FOAE.

Pursuant to Stipulation X.A. of the PA, Caltrans applied the criteria of adverse effect set forth at 36 CFR 800.5(a)(1) and finds that the undertaking will a direct adverse effect on the Arroyo Seco Parkway Historic District (Parkway). A full description of the impacts the project will have on the Parkway is located on pages 5.3-31 through 5.3-34 of the Finding of Adverse Effect.

Based on my review of the submitted documentation, I have no objection to this finding.

If you have any questions, please contact Natalie Lindquist of my staff at (916) 445-7014 with e-mail at natalie.lindquist@parks.ca.gov or Alicia Perez at (916) 445-7020 with e-mail at alicia.perez@parks.ca.gov .

Sincerely,

Julianne Polanco
State Historic Preservation Officer

Preserving America's Heritage

October 16, 2018

Mr. Ron Kosinski
Deputy District Director of Environmental Planning
Caltrans District 7
100 S. Main St.
Los Angeles, CA 90012

Ref: *Memorandum of Agreement regarding State Route 710 Project*
Los Angeles County, California
ACHPConnectLog Number: 006437

Dear Mr. Kosinski:

Enclosed is your copy of the fully executed Memorandum of Agreement (MOA) for the referenced project. By carrying out the terms of the Agreement, the California Department of Transportation's (Caltrans) will fulfill its responsibilities under Section 106 of the National Historic Preservation Act (NHPA) and the regulations of the Advisory Council on Historic Preservation, "Protection of Historic Properties" (36 CFR Part 800). Please ensure that all consulting parties are provided a copy of the executed Agreement in accordance with 36 CFR 800.6(c)(9). The original Agreement will remain on file at our office.

We commend Caltrans for working closely with the California State Historic Preservation Officer and the other consulting parties in developing this MOA. If we may be of further assistance as the MOA is implemented, please contact Sarah Stokely at (202) 517-0224, or via e-mail at sstokely@achp.gov.

Sincerely,

Jaime Loichinger
Acting Assistant Director
Office of Federal Agency Programs
Federal Permitting, Licensing, and Assistance Section

Enclosure

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MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA DEPARTMENT OF TRANSPORTATION,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE STATE ROUTE 710 (SR-710) NORTH PROJECT,
CITIES OF ALHAMBRA, LOS ANGELES, MONTEREY PARK, PASADENA, ROSEMEAD, SAN GABRIEL, SAN MARINO, and SOUTH PASADENA, and the UNICORPORATED COMMUNITY of EAST LOS ANGELES, LOS ANGELES COUNTY, CALIFORNIA

WHEREAS, the Federal Highway Administration (FHWA) has assigned, and the California Department of Transportation (Caltrans, including all subordinate divisions defined below) has assumed FHWA responsibility for environmental review, consultation, and pursuant to 23 USC 327, which became effective on October 1, 2012 and applies to this Undertaking; and

WHEREAS, pursuant to the January 2014 *First Amended Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (Section 106 PA), Caltrans is deemed to be a federal agency for all highway-aid projects it has assumed, and in that capacity Caltrans has assigned the role of "agency official" to the Caltrans Division of Environmental Analysis (DEA) Chief for the purpose of compliance with 36 CFR 800 and is responsible for oversight of District environmental responsibilities. To provide for effective compliance, day-to-day responsibilities and coordination of the Section 106 process are further delegated to the DEA Cultural Studies Office (CSO) Chief; and

WHEREAS, Caltrans and the Los Angeles County Metropolitan Transportation Authority (METRO) propose to improve mobility and relieve congestion in the area bounded by State Route 2 and Interstates 5, 10, 210 and 605 in east/northeast Los Angeles and the western San Gabriel Valley, and have selected the Transportation System Mangement (TSM)/Transportation Demand Management (TDM) Alternative as described in Attachment A; and

WHEREAS, Caltrans has consulted with the California State Historic Preservation Officer (SHPO) pursuant to Stipulations X.C, and XI of the Section 106 PA, and, where the Section 106 PA so directs, in accordance with 36 CFR Part 800, the regulation that implements Section 106 of the National Historic Preservation Act of 1966 (54 USC 306108), as amended (NHPA), regarding the Undertaking's effects on historic properties; and

WHEREAS, in accordance with 36 CFR 800.6(a)(1), Caltrans has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination with specified documentation, and the ACHP has chosen to participate in the consultation pursuant to 36 CFR 800.6(a)(1)(iii); X.C. 3.b of the Section 106 PA; and

WHEREAS, the Undertaking's Area of Potential of Effects (APE) includes maximum existing or proposed right-of-way for the TSM/TDM alternative and all areas that could potentially be directly or indirectly affected by the proposed Undertaking; and

WHEREAS, Caltrans has determined that the State Route 710 (SR-710) North Project, TSM/TDM Alternative (Undertaking) will have adverse effects on the Arroyo Seco Parkway Historic District, a property listed in the National Register of Historic Places (National Register) under Criteria A and C; and

WHEREAS, Caltrans in consultation with SHPO and the Consulting Parties, has determined that the Undertaking's adverse effects cannot be avoided and that implementation of the treatments set forth in Stipulations II and III of this MOA will satisfactorily take into account the Undertaking's adverse effects on the historic property; and

WHEREAS, Caltrans District 7 and METRO have a responsibility to fulfill terms of this MOA and are participating as invited signatories; and

WHEREAS, Caltrans has consulted with the Los Angeles Conservancy, National Trust for Historic Preservation, No on 710 Action Committee, Pasadena Heritage, City of Pasadena, City of South Pasadena, Sequoyah School, and West Pasadena Residents' Association regarding the Undertaking and its adverse effects on the subject historic properties and have invited them to sign this MOA as concurring parties; and

WHEREAS, Caltrans has initiated consultation with the Los Angeles City/County Native American Indian Commission; the Gabrielino Tongva Nation; Ti'At Society/Inter-Tribal Council of Pimu; the Gabrielino-Tongva Tribe, Linda Candelaria, Bernie Acuna and Conrad Acuna; the Gabrielino/Tongva San Gabriel Band of Mission Indians; the Gabrielino Band of Mission Indians; Tongva Ancestral Territorial Tribal Nation; Gabrielino Tongva Indians of California Tribal Council, regarding the Undertaking and none of the groups requested to be a consulting party; will continue to consult with them and will afford them, should they so desire, the further opportunity to more directly and actively participate in the implementation of the Undertaking itself and this MOA; and

WHEREAS, Caltrans and Metro began extensive public outreach for the undertaking in early 2011 with eight public scoping meetings. Opportunities to involve the public in the engineering and environmental studies continued through Spring 2018 with Conversation Series Meetings, Stakeholder Meetings, Open Houses, Common Liaison Council Meetings, social media outlets, five public hearings as result of the circulation of the Draft EIR/EIS and FOE, and an additional public hearing following circulation of the Focused Recirculated DEIR/Supplemental EIS. The Section 106 outreach process overlapped with and was part of the outreach efforts under CEQA and NEPA beginning in 2013;

NOW, THEREFORE, Caltrans, SHPO, and ACHP agree that, upon Caltrans' decision to proceed with the Undertaking, Caltrans shall ensure that the Undertaking is implemented in accordance with the following stipulations in order to take into account the effects of the Undertaking on historic properties, and further agrees that these stipulations shall govern the Undertaking and all of its parts until this MOA expires or is terminated.

STIPULATIONS

Caltrans shall ensure that the following stipulations are carried out:

I. AREA OF POTENTIAL EFFECTS

A. The Undertaking's Area of Potential Effects (APE) is depicted in Attachment B of this MOA. The APE includes the maximum existing or proposed right-of-way for the preferred alternative, easements (temporary and permanent), all improved properties subject to temporary or permanent changes in access (ingress and egress), and areas where visual or audible changes could occur outside the required right-of-way.

B. If modifications to the Undertaking subsequent to the execution of this MOA necessitate the revision of the APE (i.e. Temporary Construction Easements, reduction of project scope or activities), District 7 will consult with Caltrans Headquarters Cultural Studies Office and the SHPO to facilitate mutual agreement on the subject revisions. If Caltrans, District 7, and the SHPO cannot reach such agreement, then the parties to this MOA shall resolve the dispute in accordance with Stipulation IV.B below. If Caltrans, District 7, and the SHPO reach mutual agreement on the proposed revisions, then District 7 will submit a final map of the revisions, consistent with the requirements of Stipulation VIII.A and Attachment 3 of the Section 106 PA no later than 30 days following such agreement. Any additional required identification and evaluation efforts necessitated due to changes to the APE will be undertaken consistent with the requirements of Stipulation VIII.B and VIII.C of the Section 106 PA. Amendment of the APE through consultation among the MOA parties will not require an amendment to this MOA. The revised APE and supporting documentation shall be incorporated into Attachment B to this MOA.

II. TREATMENT OF HISTORIC PROPERTIES

Caltrans shall:

A. Minimize the effects on the character-defining features of the Arroyo Seco Parkway Historic District (ASPHD) by preparing a plan that conforms to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (SOIS) in consultation with Caltrans CSO and SHPO, as required.. The project Architectural Historian shall review the final design plans, review mockups as needed, and conduct a field visit to ensure that the following work is performed in accordance with the SOIS. At a minimum, the SOIS Plan will ensure:

   • New elements, like retaining walls, off-ramps, on-ramps, curbing, and lighting, will be designed to be compatible with the Historic District, in terms of color, materials, profiles, dimensions, etc.;

   • Any work taking place on character-defining features will minimize potential damage to the Historic District; and

   • All revegetation of buffers and planting strips will be designed to be compatible with the Historic District.

B. Install a highway sign near the northern entrance to the Parkway at Glenarm Street that welcomes drivers to the Arroyo Seco Parkway Historic District. The sign will be compatible with similar signage found at the southern entrance to the Parkway.

C. Create and post electronic content for a smartphone traveler application (The Clio or equal) that describes and interprets the Historic District. The content will include historical narrative information, as well as historical photographs, and other documentation. This application will be available free to the public through smartphone application stores prior to the termination of this agreement. The availability of the application will be advertised on or in Metro facilities such as bus benches, local bus lines, Gold Line Stations and rail cars within the project area.

D. Caltrans shall submit design development plans for the Fair Oaks and State Street Interchanges for review and comment at 60% and 90% completion.

   1. All parties to the MOA will be invited to review the design development plans to determine whether the plans conform to concepts described in Item A of this stipulation. All parties to the MOA will provide comments on the submittals to Caltrans within 30 calendar days of receipt. If MOA parties do not comment within the time provided, Caltrans may assume that MOA parties concur and that the package meets the cited objectives.

   2. Caltrans will incorporate MOA parties' comments into the project plans to the fullest extent. If Caltrans revises project plans in response to MOA parties' comments, then no further review is required for that consultation package.

3. Should Caltrans object to incorporation of MOA parties' comments into consulation packages at any stage of the project, Caltrans will provide MOA parties with written explanation of that objection. Objections to the plans shall be resolved in accordance with Stipulation IV.B of this MOA.

III. DISCOVERIES, UNANTICIPATED EFFECTS AND TREATMENT OF HUMAN REMAINS

A. Post-Review Discovery and Monitoring Plan (PRDMP). The PRDMP for the proposed project (Confidential Volume III of the Finding Of Adverse Effect) specifies procedures to be followed prior to and during construction activities to ensure compliance with the Caltrans Section 106 PA. The policies and procedures in the PRDMP will apply during ground-disturbing activities in areas deemed sensitive for subsurface archaeological deposits, particularly in the vicinity of the Horatio Rust Site and Otsungna Village Site. Archaeological Monitoring Areas are further specified in the PRDMP.
   - The Resident Engineer will require the Construction Contractor to implement the policies and procedures of the PRDMP detailed in Volume III of the Finding of Adverse Effect. The implementation of those requirements will be overseen by a Qualified Archaeological Monitor or a consultant who meets the Professionally Qualified Staff (PQS) requirements for a Qualified Archaeological Monitor.

B. As legally mandated, human remains and related items discovered during the implementation of the terms of this Agreement and the Undertaking will be treated in accordance with the requirements of Health and Safety Code Section 7050.5(b). If pursuant to Health and Safety Code Section 7050.5(c) the coroner determines that the human remains are or may be those of a Native American, then the discovery shall be treated in accordance with the provisions of Public Resources Code Section 5097.98 (a)(d). Caltrans, as the landowner, shall ensure, to the extent possible, that the views of the Most Likely Descendent(s), as determined by the California Native American Heritage Commission, are taken into consideration when decisions are made about the disposition of Native American human remains and associated objects.

C. If Caltrans determines, during implementation of the terms of this MOA or after construction of the Undertaking has commenced, that the Undertaking will affect a previously unidentified property that may be eligible for listing in the National Register, or affect a known historic property in an unanticipated manner, Caltrans will address the discovery or unanticipated effect in accordance with 36 CFR Section 800.13(b)(3) and the PRDMP. Caltrans at its discretion may hereunder assume any discovered property to be eligible for the National Register in accordance with 36 CFR Section 800.13(c) and the PRDMP.

IV. ADMINISTRATIVE PROVISIONS

A. STANDARDS

1. **Definitions**. The definitions provided at 36 CFR Section 800.16 are applicable throughout this MOA.

2. **Parties** to this agreement are defined as follows:

   a. **Signatory parties** have the sole authority to execute, amend, or terminate the MOA.

b. **Invited signatories** have the authority to amend or terminate the MOA.

c. **Concurring parties** signing the MOA do so to acknowledge their agreement or concurrence with the MOA, but have no legal authority under the MOA to terminate or amend the MOA. Concurring with the terms of the MOA does not constitute their agreement with the Undertaking.

d. The above use of the term "All Parties" refers to those defined in Stipulations IV.A.2.a-c regardless as to whether or not they sign the MOA.

3. **Professional Qualifications.** Caltrans shall ensure that the actions and products required by Stipulation II of this MOA shall be carried out by or under the direct supervision of persons meeting the *Secretary of the Interior's Professional Qualification Standards for Archeology and Historic Preservation* (36 CFR Part 61) in the relevant field of study.

B. RESOLVING OBJECTIONS

1. Should any party to this MOA object at any time in writing to the manner in which the terms of this MOA are implemented, to any action carried out or proposed with respect to implementation of the MOA (other than the Undertaking itself), or to any documentation prepared in accordance with and subject to the terms of this MOA, Caltrans shall immediately notify the other MOA parties of the objection, request their comments on the objection within 15 days following receipt of Caltrans' notification, and proceed to consult with the objecting party for no more than 30 days to resolve the objection. Caltrans will honor the request of the other parties to participate in the consultation and will take any comments provided by those parties into account.

2. If the objection is resolved during the 30-day consultation period, Caltrans may proceed with the disputed action in accordance with the terms of such resolution.

3. If at the end of the 30-day consultation period, Caltrans determines that the objection cannot be resolved through such consultation, then Caltrans shall forward all documentation relevant to the objection to the ACHP, including Caltrans' proposed response to the objection, with the expectation that the ACHP will, within thirty (30) days after receipt of such documentation:

   a. Advise Caltrans that the ACHP concurs in Caltrans' proposed response to objection, whereupon Caltrans will respond to the objection accordingly. The objection shall thereby be resolved; or
   b. Provide Caltrans with recommendations, which Caltrans will take into account in reaching a final decision regarding its response to the objection. The objection shall thereby be resolved; or
   c. Notify Caltrans that the objection will be referred for comment pursuant to 36 CFR §800.7(c) and proceed to refer the objection and comment. Caltrans shall take the resulting comments into account in accordance with 36 CFR § 800.7(c) (4) and Section 110(1) of the NHPA. The objection shall thereby be resolved.

4. Should the ACHP not exercise one of the above options within 30 days after receipt of all pertinent documentation, Caltrans may proceed to implement its proposed response. The objection shall thereby be resolved.

5. Caltrans shall take into account any of the ACHP's recommendations or comments provided in accordance with this stipulation with reference only to the subject of the objection.

Caltrans's responsibility to carry out all actions under this MOA that are not the subjects of the objection shall remain unchanged.

6. At any time during implementation of the measures stipulated in this MOA, should a member of the public raise an objection in writing pertaining to such implementation to any signatory party to this MOA, that signatory party shall immediately notify Caltrans. Caltrans shall immediately notify the other signatory parties in writing of the objection. Any signatory party may choose to comment in writing on the objection to Caltrans. Caltrans shall establish a reasonable time frame for this comment period. Caltrans shall consider the objection, and in reaching its decision, Caltrans will take all comments from the other signatory parties into account. Within 15 days following closure of the comment period, Caltrans will render a decision regarding the objection and respond to the objecting party. Caltrans will promptly notify the other signatory parties of its decision in writing, including a copy of the response to the objecting party. Caltrans' decision regarding resolution of the objection will be final. Following issuance of its final decision, Caltrans may authorize the action subject to dispute hereunder to proceed in accordance with the terms of that decision.

7. Caltrans shall provide all parties to this MOA, and any parties that have objected pursuant to section B.3 and B.4 of this stipulation, with a copy of its final written decision regarding any objection addressed pursuant to this stipulation.

8. Caltrans may authorize any action subject to objection under this stipulation to proceed after the objection has been resolved in accordance with the terms of this stipulation.

C. AMENDMENTS

Any signatory party to this MOA may propose that this MOA be amended, whereupon all parties shall consult for no more than 30 days to consider such amendment. The amendment will be effective on the date a copy is signed by all of the original signatories. If the signatories cannot agree to appropriate terms to amend the MOA, any signatory may terminate the agreement in accordance with Stipulation III.D, below.

D. TERMINATION

1. If this MOA is not amended as provided for in Section C of this stipulation, or if any signatory proposes termination of this MOA for other reasons, the signatory party proposing termination shall, in writing, notify the other MOA parties, explain the reasons for proposing termination, and consult with the other parties for at least 30 days to seek alternatives to termination. Such consultation shall not be required if Caltrans proposes termination because the Undertaking no longer meets the definition set forth in 36 CFR Section 800.16 (y).

2. Should such consultation result in an agreement on an alternative to termination, the signatory parties shall proceed in accordance with the terms of that agreement.

3. Should such consultation fail, the signatory party proposing termination may terminate this MOA by promptly notifying the other MOA parties in writing. Termination hereunder shall render this MOA without further force or effect.

4. If this Agreement is terminated hereunder, and if Caltrans determines that the Undertaking will nonetheless proceed, then Caltrans shall comply with the requirements of the Section 106 PA, or request the comments of the ACHP pursuant to 36 CFR Part 800.

5. Once the MOA is terminated, and prior to work continuing on the undertaking, Caltrans must either:
    a. Execute an MOA pursuant to 36 CFR § 800.6 or
    b. Request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. Caltrans shall notify the signatories as to the course of action it will pursue.

E. DURATION OF THE MOA

The duration of this MOA shall be no more than five (5) years following the date of execution by the SHPO and Caltrans, or upon completion of the Undertaking (whichever comes first). If the terms are not satisfactorily fulfilled at that time, Caltrans shall consult with the signatories and concurring parties to extend it or reconsider its terms. Reconsideration may include continuation of the MOA as origianllly executed, amendment of the MOA, or termination. In the event of termination, Caltrans will comply with Stipulations III through XI of the Section 106 PA it it determines that the Undertaking will proceed notwithstanding termination of this MOA.

F. REPORTING REQUIREMENTS AND RELATED REVIEWS

Caltrans shall provide the parties to this agreement an annual update. Such updates shall include any scheduling changes proposed, any problems encountered, failures to adopt proposed mitigation measures, and any disputes and objections received in Caltrans' efforts to carry out the terms of this MOA. The update will be due no later than December 31 of each year, beginning December 31, 2019 and continuing annually thereafter throughout the duration of this MOA. At the request of any party to this MOA, or if deemed necessary at least on an annual basis, Caltrans shall ensure that one or more meetings are held to facilitate review and comments, and to resolve questions and comments.

G. EFFECTIVE DATE

This MOA will take effect on the date that it has been executed by Caltrans, SHPO, and ACHP.

EXECUTION of this MOA by Caltrans, the SHPO, and the ACHP, and implementation of its terms, is evidence that Caltrans has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment.

MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA DEPARTMENT OF TRANSPORTATION,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE STATE ROUTE 710 (SR-710) NORTH PROJECT,
CITIES OF ALHAMBRA, LOS ANGELES, MONTEREY PARK, PASADENA, ROSEMEAD, SAN GABRIEL, SAN MARINO, and SOUTH PASADENA, and the UNICORPORATED COMMUNITY of EAST LOS ANGELES, LOS ANGELES COUNTY, CALIFORNIA

SIGNATORY PARTIES:

Advisory Council on Historic Preservation

By John M. Fowler

John M. Fowler
Executive Director

Date 10/18/18

MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA DEPARTMENT OF TRANSPORTATION,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE STATE ROUTE 710 (SR-710) NORTH PROJECT,
CITIES OF ALHAMBRA, LOS ANGELES, MONTEREY PARK, PASADENA, ROSEMEAD, SAN GABRIEL, SAN MARINO, and SOUTH PASADENA, and the UNICORPORATED COMMUNITY of EAST LOS ANGELES, LOS ANGELES COUNTY, CALIFORNIA

SIGNATORY PARTIES:

California Department of Transportation

By ______________________ 10/9/18
Jeremy Ketchum, Acting Chief
Caltrans Division of Environmental Analysis
Date

California State Historic Preservation Officer

By ______________________ 10/9/18
for Julianne Polanco
State Historic Preservation Officer
Date

MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA DEPARTMENT OF TRANSPORTATION,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE STATE ROUTE 710 (SR-710) NORTH PROJECT,
CITIES OF ALHAMBRA, LOS ANGELES, MONTEREY PARK, PASADENA, ROSEMEAD, SAN GABRIEL, SAN MARINO, and SOUTH PASADENA, and the UNICORPORATED COMMUNITY of EAST LOS ANGELES, LOS ANGELES COUNTY, CALIFORNIA

INVITED SIGNATORY:

California Department of Transportation

By ______________________________
John Bulinski, District Director
District 7, Los Angeles

10/10/18
Date

Los Angeles County Metropolitan Transportation Authority

By ______________________________
Abdollah Ansari, Senior Executive Officer
Highway Program

10/10/18
Date

**MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA DEPARTMENT OF TRANSPORTATION,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY
COUNCIL ON HISTORIC PRESERVATION
REGARDING THE STATE ROUTE 710 (SR-710) NORTH PROJECT,
CITIES OF ALHAMBRA, LOS ANGELES, MONTEREY PARK, PASADENA, ROSEMEAD,
SAN GABRIEL, SAN MARINO, and SOUTH PASADENA, and the UNICORPORATED
COMMUNITY of EAST LOS ANGELES, LOS ANGELES COUNTY, CALIFORNIA**

CONCURRING PARTIES:

Los Angeles Conservancy

By Did not respond
Adrian Scott Fine, Director of Advocacy

Date

National Trust for Historic Preservation

By Did not respond
Paul W. Edmondson, Chief Legal Officer

Date

No on 710 Action Committee

By Claire W. Bogaard
Claire W. Bogaard, Chair

18 October 2018
Date

Pasadena Heritage

By Susan Mossman
Susan Mossman, Executive Director

10-19-2018
Date

City of Pasadena

By Did not respond
Steve Mermell, City Manager

Date

MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA DEPARTMENT OF TRANSPORTATION,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE STATE ROUTE 710 (SR-710) NORTH PROJECT,
CITIES OF ALHAMBRA, LOS ANGELES, MONTEREY PARK, PASADENA, ROSEMEAD, SAN GABRIEL, SAN MARINO, and SOUTH PASADENA, and the UNICORPORATED COMMUNITY of EAST LOS ANGELES, LOS ANGELES COUNTY, CALIFORNIA

CONCURRING PARTIES Continued:

City of South Pasadena

By Did not respond
Stephanie DeWolfe, City Manager

Date

Sequoyah School

By [signature]
Josh Brody, Head of School

10/22/18
Date

West Pasadena Residents' Association

By Did not respond
Sarah Gavit, WPRA Board Member
SR-710 North Study Lead

Date

Attachment A: Project Description

2.2.2 Transportation System Management (TSM)/Transportation Demand Management (TDM) Alternative

The TSM/TDM Alternative consists of strategies and improvements to increase efficiency and capacity for all modes of transportation within the system with lower capital cost investments and/or lower potential impacts. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. TSM strategies increase the efficiency of existing facilities (i.e., TSM strategies are actions that increase the number of vehicle trips or lane capacity of a facility without increasing the number of through lanes).

Transportation System Management (TSM)

TSM strategies include Intelligent Transportation Systems (ITS), local street and intersection improvements, and Active Traffic Management (ATM). These concepts are explained below.

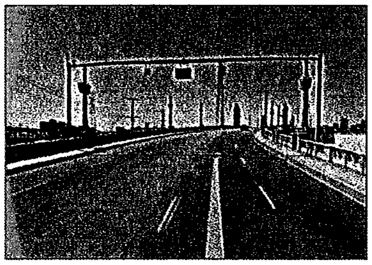
- **Intelligent Transportation Systems (ITS) Improvements:** ITS improvements include traffic signal upgrades, synchronization and transit prioritization, installation of arterial changeable message signs (CMS), and arterial video and speed data collection systems. The TSM/TDM Alternative includes signal optimization on corridors with signal coordination hardware already installed by Metro's Traffic Signal Synchronization Program (TSSP). These corridors include Del Mar Avenue, Rosemead Boulevard, Temple City Boulevard, Santa Anita Avenue, Fair Oaks Avenue, Fremont Avenue, and Peck Road. The only remaining major north-south corridor in the San Gabriel Valley in which TSSP has not been implemented is Garfield Avenue; therefore, TSSP on this corridor is included in the TSM/TDM Alternative. The following provides further explanation of the proposed ITS elements.
    - Traffic signal upgrades include turn arrows, vehicle and/or bicycle detection, pedestrian countdown timers, incorporation into the regional management traffic center for real-time monitoring of traffic, and updating of signal timing.
    - Synchronization is accomplished through signal coordination to optimize progression as well as reduce delay.
    - Transit signal prioritization includes adjusting signal priority for transit vehicles to optimize travel times for public transit riders and vehicular traffic.
    - Arterial CMS are used to alert travelers about unusual road conditions, special event traffic, accident detours, and other incidents.
    - Arterial video and speed data collection includes cameras and other vehicle detection systems that are connected to a central monitoring location control, thereby allowing for faster detection and response adjustment to traffic incidents and other unusual traffic conditions.

Physical improvements associated with the ITS improvements would be located on existing street poles and/or traffic signals or located underneath the roadway asphalt within the public right-of-way. Figure 2.2.2-1 on the following page shows typical visual representation of these components. The locations of the proposed ITS improvements are shown in Figure 2.2.2-2 and Table 2.2.2-1 on page 2-6.

- **Local Street and Intersection Improvements:** The local street and intersection improvements are proposed within the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, Arcadia, Temple City, and San Marino, and in areas of unincorporated Los Angeles County. The locations of the proposed improvements to local streets, intersections, and freeway ramps as well as two new local roadways are shown in Figure 2.2.2-3 and listed in Table 2.2.2-2 on page 2-7. As identified in Table 2.2.2-2 on page 2-8, Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road) would only be constructed with the BRT and TSM/TDM Alternatives.
- **Active Traffic Management (ATM):** ATM technology and strategies are also included in the TSM/TDM Alternative. The major elements of ATM are arterial speed data collection and CMS. Data on arterial speeds would be collected and distributed through Los Angeles County's Information Exchange Network (IEN). Many technologies are available for speed data collection or the data could be purchased from a third-party provider.

  Travel time data collected through this effort could be provided to navigation system providers for distribution to the traveling public. In addition, arterial CMS or "trailblazer" message signs would be installed at key locations to make travel time and other traffic data available to the public. The locations of the proposed ATM improvements are shown in Figure 2.2.2-4 and Table 2.2.2-3 on page 2-9 and Figure 2.2.2-5 on page 2-10.

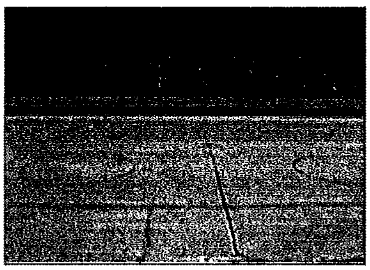
FIGURE 2.2.2-1:
TSM/TDM Alternative ITS Improvements



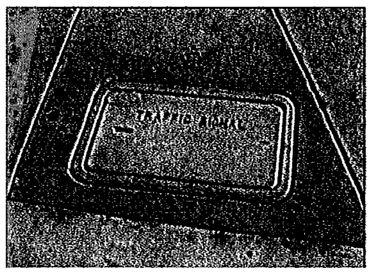
Bridge structure for Changeable Message Sign (CMS).

Mast-arm structure for CMS.

Vehicle/bicycle detection loops and turn arrows at intersection.

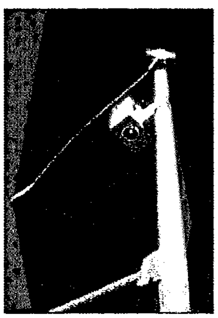


Vehicle/bicycle detection loops in lane.

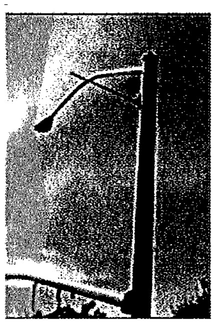


Traffic signal pull box.

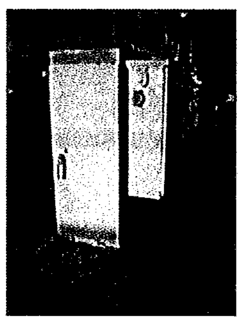
Traffic signal poles at intersection.



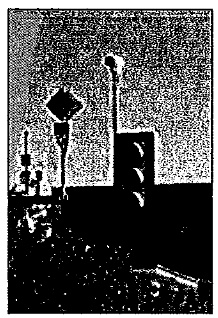
Wireless camera on light pole.



Wireless antenna on light pole.



Traffic signal controller cabinet.

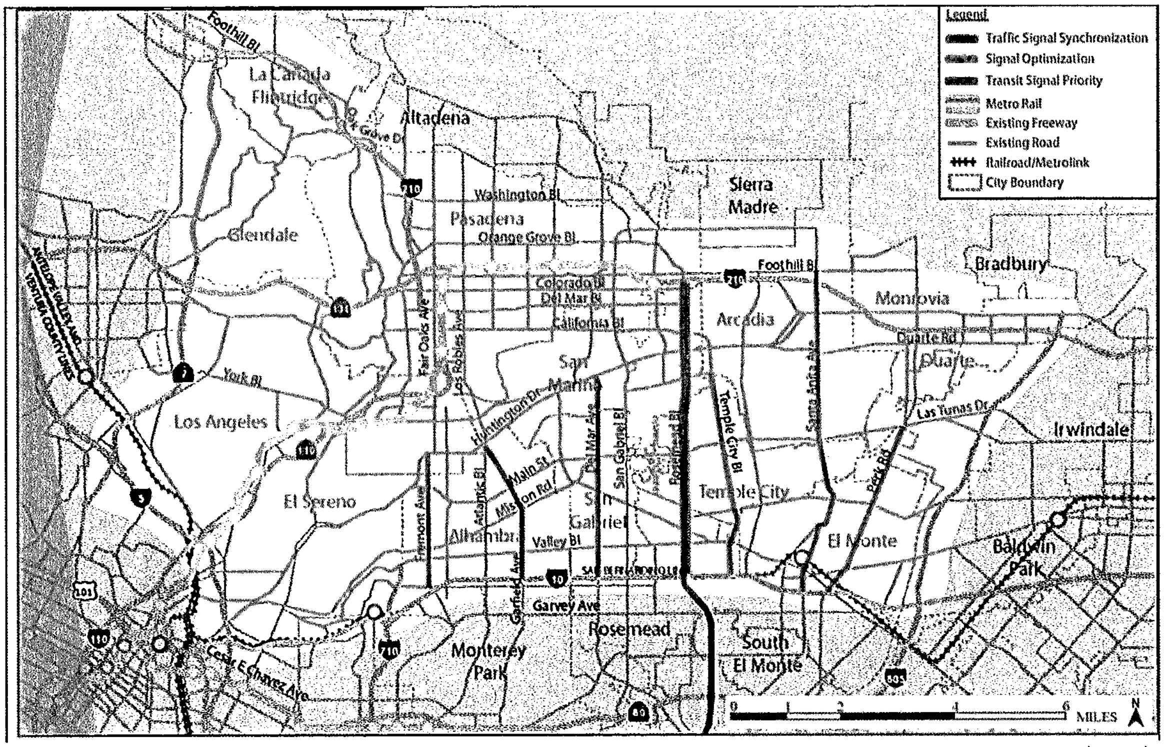


Wireless antenna on traffic light.

Traffic signal poles at crosswalk.

Source: LSA Associates Inc. (2014)

FIGURE 2.2.2-2:
Map of TSM/TDM Alternative ITS Improvements



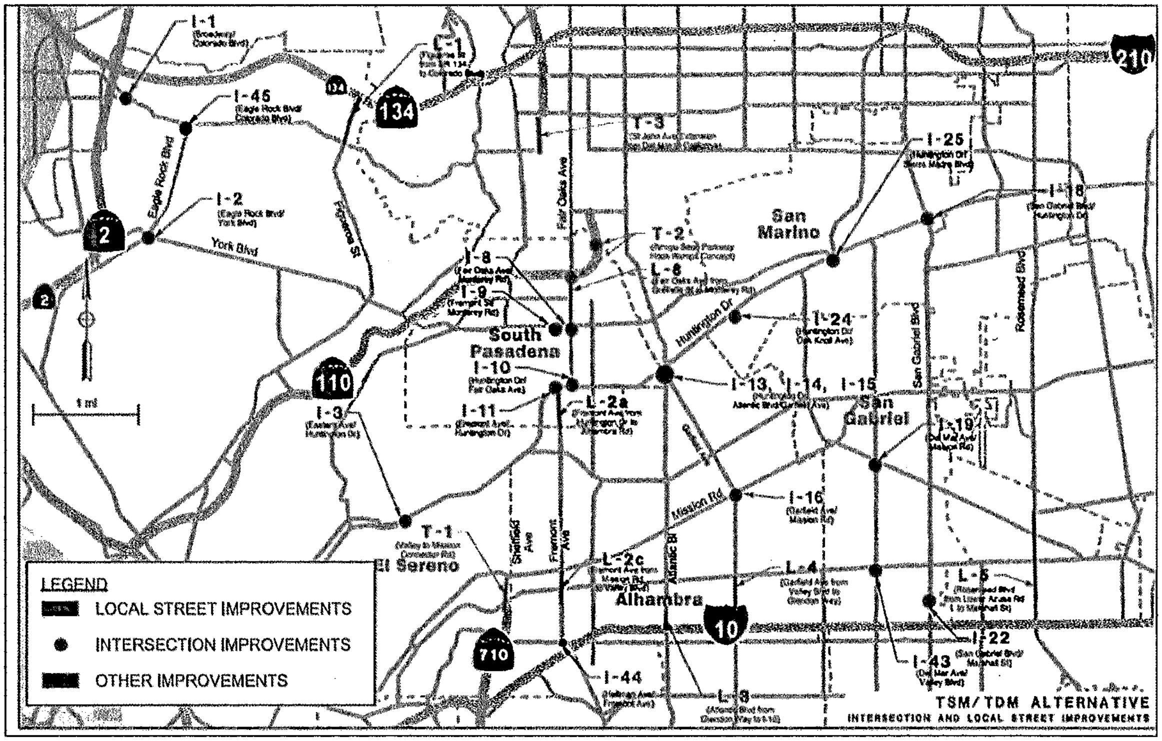
SOURCE: CH2M HILL (2015)

TABLE 2.2.2-1:
TSM/TDM Alternative ITS Improvements

ID No.	Description	Location
ITS-1	Transit Signal Priority	Rosemead Boulevard (from Foothill Boulevard to Del Amo Boulevard)
ITS-2	Install Video Detection System on SR 110	SR 110 north of US-101
ITS-3	Install Video Detection System at Intersections	At key locations in the study area
ITS-4	Arterial Speed Data Collection	On key north/south arterials
ITS-5	Install Arterial CMS	At key locations in the study area
ITS-6	Traffic Signal Synchronization on Garfield Avenue	Huntington Drive to I-10
ITS-7	Signal optimization on Del Mar Avenue	Huntington Drive to I-10
ITS-8	Signal optimization on Rosemead Boulevard	Foothill Boulevard to I-10
ITS-9	Signal optimization on Temple City Boulevard	Duarte Road to I-10
ITS-10	Signal optimization on Santa Anita Avenue	Foothill Boulevard to I-10
ITS-11	Signal optimization on Peck Road	Live Oak Avenue to I-10
ITS-12	Signal optimization on Fremont Avenue	Huntington Drive to I-10

CMS = changeable message signs
I-10 = Interstate 10
ITS = Intelligent Transportation Systems
SR 110 = State Route 110
TDM = Transportation Demand Management
TSM = Transportation System Management
US-101 = United States Route 101

FIGURE 2.2.2-3:
Local Street and Intersection Improvements of the TSM/TDM Alternative



SOURCE: CH2M HILL (2015)

TABLE 2.2.2-2:
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location
	Local Street Improvements	
L-1	Figueroa Street from SR 134 to Colorado Boulevard	City of Los Angeles (Eagle Rock)
L-2a	Fremont Avenue from Huntington Drive to Alhambra Road	City of South Pasadena
L-2c	Fremont Avenue from Mission Road to Valley Boulevard	City of Alhambra
L-3[1]	Atlantic Boulevard from Glendon Way to I-10	City of Alhambra
L-4	Garfield Avenue from Valley Boulevard to Glendon Way	City of Alhambra
L-5	Rosemead Boulevard from Lower Azusa Road to Marshall Street	City of Rosemead
L-8[1]	Fair Oaks Avenue from Grevelia Street to Monterey Road	City of South Pasadena
	Intersection Improvements	
I-1	West Broadway/Colorado Boulevard	City of Los Angeles (Eagle Rock)
I-2	Eagle Rock Boulevard/York Boulevard	City of Los Angeles (Eagle Rock)
I-3	Eastern Avenue/Huntington Drive	City of Los Angeles (El Sereno)
I-4	I-710 SB On-Ramp/Valley Boulevard	City of Alhambra
I-5	I-710 NB Off-Ramp/Valley Boulevard	City of Alhambra
I-8	Fair Oaks Avenue/Monterey Road	City of South Pasadena
I-9	Fremont Street/Monterey Road	City of South Pasadena
I-10	Huntington Drive/Fair Oaks Avenue	City of South Pasadena
I-11	Fremont Avenue/Huntington Drive	City of South Pasadena
I-13	Huntington Drive/Garfield Avenue	Cities of Alhambra/South Pasadena/San Marino
I-14	Huntington Drive/Atlantic Boulevard	Cities of Alhambra/South Pasadena/San Marino

TABLE 2.2.2-2 (Cont.):
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location
Intersection Improvements (cont.)		
I-15	Atlantic Boulevard/Garfield Avenue	Cities of Alhambra/South Pasadena/San Marino
I-16	Garfield Avenue/Mission Road	City of Alhambra
I-18	San Gabriel Boulevard/Huntington Drive	City of San Marino/Unincorporated Los Angeles County (East Pasadena/East San Gabriel)
I-19	Del Mar Avenue/Mission Road	City of San Gabriel
I-22	San Gabriel Boulevard/Marshall Street	City of San Gabriel
I-24	Huntington Drive/Oak Knoll Avenue	City of San Marino
I-25	Huntington Drive/Sierra Madre Boulevard	City of San Marino
I-43	Del Mar Avenue/Valley Boulevard	City of San Gabriel
I-44	Hellman Avenue/Fremont Avenue	City of Alhambra
I-45	Eagle Rock Boulevard/Colorado Boulevard	City of Los Angeles (Eagle Rock)
Other Road Improvements		
T-1[2]	Valley Boulevard to Mission Road Connector Road	Cities of Alhambra/Los Angeles (El Sereno)
T-2	SR 110/Fair Oaks Avenue Hook Ramps (within the Arroyo Seco Parkway Historic District)	Cities of South Pasadena/Pasadena
T-3[3]	St. John Avenue Extension between Del Mar Boulevard and West California Boulevard	City of Pasadena

[1] Local Street Improvements L-3 and L-8 would not be constructed with the BRT Alternative.
[2] Other Road Improvement T-1 would only be constructed with the BRT and TSM/TDM Alternatives.
[3] Other Road Improvement T-3 would not be constructed with either the single-bore or dual-bore design variation of the Freeway Tunnel Alternative.

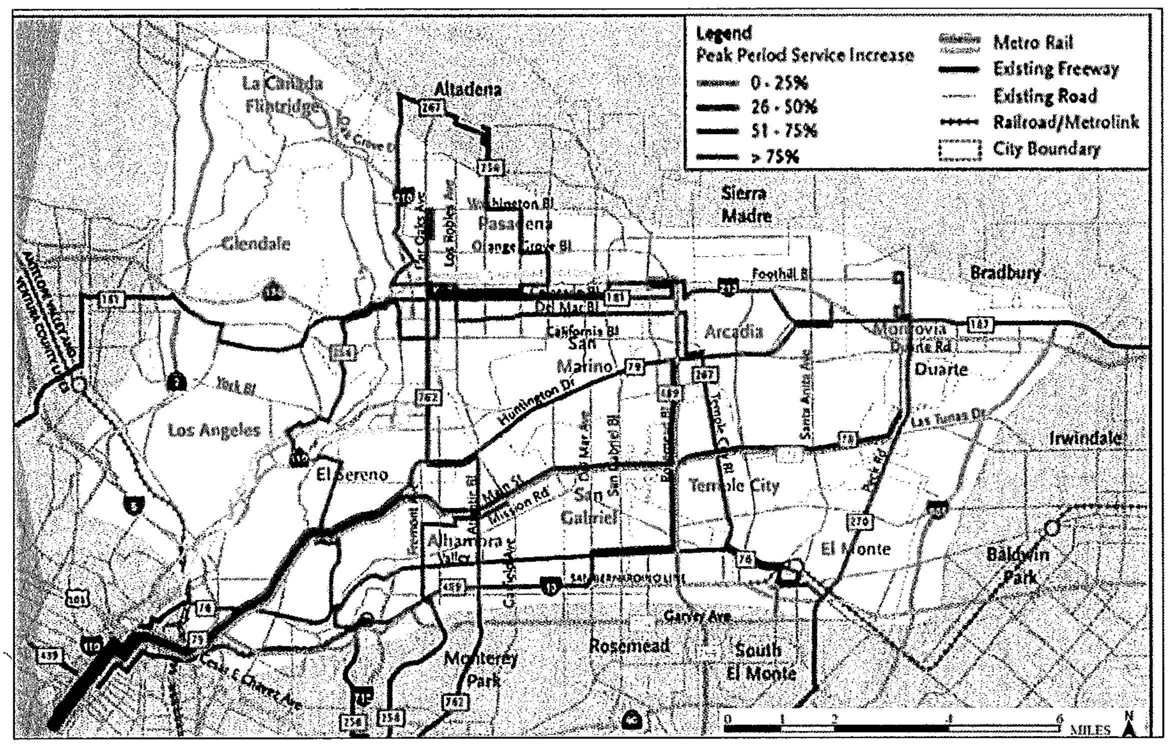
I-10 = Interstate 10
I-710 = Interstate 710
NB = North Bound
SB = South Bound
SR 110 = State Route 110
SR 134 = State Route 134
TDM = Transportation Demand Management
TSM = Transportation System Management

Transportation Demand Management (TDM)

TDM strategies focus on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. TDM strategies facilitate higher vehicle occupancy or reduce traffic congestion by expanding the traveler's transportation options in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience. The TDM strategies include reducing the demand for travel during peak periods, reducing the use of motor vehicles, shifting the use of motor vehicles to uncongested times of day, encouraging rideshare and transit use, eliminating trips (i.e., telecommuting), and improved transportation options. The TDM strategies include expanded bus service, bus service improvements, and bicycle improvements:

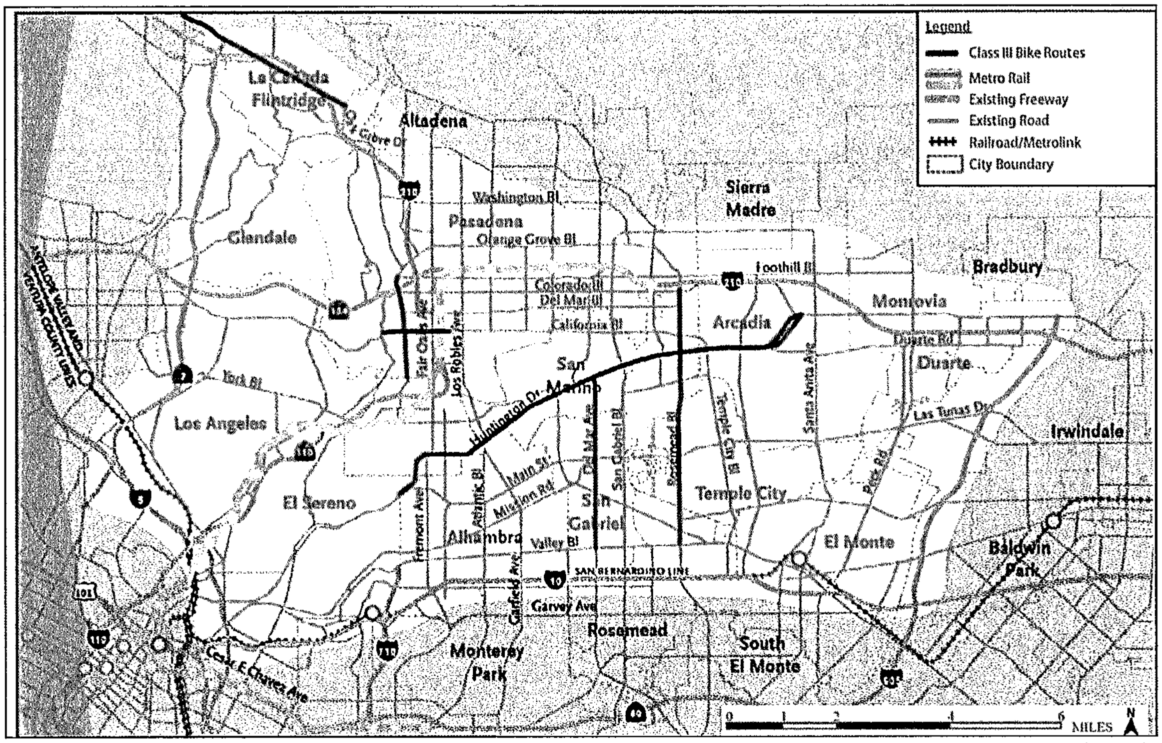
- **Expanded Bus Service and Bus Service Improvements:** The transit service improvements enhance bus headways between 10 and 30 minutes during the peak hour and 15 to 60 minutes during the off-peak period. Bus headways are the amount of time between consecutive bus trips (traveling in the same direction) on the bus route. Some of the bus service enhancements would almost double the existing bus service. The locations of the expanded bus service are illustrated in Figure 2.2.2-4 below.
- **Bicycle Facility Improvements:** The bicycle facility improvements include on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Proposed bicycle facility improvements are outlined in Figure 2.2.2-5 and Table 2.2.2-3 on page 2-10.

FIGURE 2.2.2-4:
Proposed Bus Transit Refinement for the TSM/TDM Alternative



SOURCE: CH2M Hill (2015)

FIGURE 2.2.2-5:
Active Transportation and Bicycle Enhancements in the TSM/TDM Alternative



SOURCE: CH2M HILL (2015)

TABLE 2.2-3:
Active Transportation and Bus Enhancements in the TSM/TDM Alternative

ID No.	Description	Location
	Bus Service Improvements	
Bus-1	Additional bus service	Various
Bus-2	Bus stop enhancements	Along TSM routes
	Bicycle Facility Improvements	
Bike-1	Rosemead Boulevard bike route (Class III)	Colorado Boulevard to Valley Boulevard (through Los Angeles County, Temple City, and Rosemead)
Bike-2	Del Mar Avenue bike route (Class III)	Huntington Drive to Valley Boulevard (through San Marino and San Gabriel)
Bike-3	Huntington Drive bike route (Class III)	Mission Road to Santa Anita Avenue (through the City of Los Angeles, South Pasadena, San Marino, Alhambra, Los Angeles County, and Arcadia)
Bike-4	Foothill Boulevard bike route (Class III)	In La Cañada Flintridge
Bike-5	Orange Grove bike route (Class III)	Walnut Street to Columbia Street (in Pasadena)
Bike-6	California Boulevard bike route (Class III)	Grand Avenue to Marengo Avenue (in Pasadena)
Bike-7	Add bike parking at transit stations	Metro Gold Line stations
Bike-8	Improve bicycle detection at existing intersections	Along bike routes in study area

2.2.2.1 Construction Activities Associated with the TSM/TDM Alternative

To better understand how the TSM/TDM Alternative could potentially affect historic properties, this section provides a description of the construction activities associated with the TSM/TDM Alternative, including a description of the methods and equipment that would be employed during construction of the TSM/TDM Alternative. Not all the construction or operational activities described below are necessarily proposed immediately adjacent to or near historic properties. **Chapter 5** describes the thresholds for various construction-related effects and analyzes the potential effects on each historic property identified within the APE.

Construction activities associated with the TSM/TDM Alternative are minimal. The proposed improvements associated with the TSM/TDM Alternative would include installing new mechanical equipment onto existing infrastructure within existing right-of-way or using technology to improve the operation and traffic flow of existing transportation facilities. The proposed ITS improvements such as installing video detection systems, optimizing traffic signals, and collecting arterial speed data would include mounting new mechanical equipment onto existing street poles and/or traffic signals which would not require any physical construction. Therefore, the physical construction activities associated with the TSM strategies would be limited to installation of new Arterial Changeable Message Signs (CMS) and cutting the existing asphalt to install vehicle or bicycle detection devices beneath the roadway within the public right-of-way. Limited small-scale construction equipment such as jackhammers or cement cutters may be used to install the CMS support structures and vehicle and/or bicycle detection systems. Infrastructure improvements for improved bicycle circulation would include striping the existing roadway with new bike lanes and adding bike parking to existing Gold Line transit stations. Some improvements, such as installation of new sidewalks, curbs, and gutters, the installation of traffic monitoring and control equipment, and new traffic lanes, installation/replacement of street lighting, signage, lane and pedestrian crosswalk striping, street furniture (e.g., bus stop amenities, benches, trash cans), and landscaping, could utilize excavators, bulldozers, compactors, graders, concrete trucks, concrete pumping equipment, asphalt pavers, and rollers.

Construction activities associated with improving various local street intersections and interchanges may include slight re-alignment of existing freeway ramps or street configurations; grading or paving; installing medians; replacing curbs, gutters, and sidewalks; restriping the roadway; and the introduction of two new local roadways. Small-scale construction equipment (vehicle size or smaller) such as jackhammers, backhoes, trenchers, trucks hauling materials, cement trucks, generators and compressors, pavers, and compactors might be used for constructing the proposed street improvements. However, all the proposed TSM and TDM improvements would take place in areas where larger-scale infrastructure improvements have already occurred within existing right-of-way.

2.2.2.2 Operational Activities Associated with the TSM/TDM Alternative

The TDM strategies focus on expanding transportation options to reduce the number and length of vehicle trips and increase vehicle occupancy by reducing the demand for travel during peak periods, reducing the use of motor vehicles. It would include expanded bus service (double the existing bus service)and bus service improvements. Therefore, no ongoing physical effects would be anticipated, apart from the addition of more buses and bicycles onto the existing streets during peak periods. Operational effects of the TSM/TDM Alternative could include changes to noise and visual settings associated with proposed improvements.

Attachment B: Area of Potential Effects Map (APE) for TSM/TDM Alternative

Attachment C: Consulting Party Log

PROJECT NAME: **710 North Project**
PROJECT EA # 187900
Section 106 MOA (first draft)

REVIEWER: **Kelly Ewing-Toledo**
DISCIPLINE: **Senior Environmental Planner, Principal Architectural Historian**

CODES : A - Accept/will comply, B - Basic input req'd from others, C - Clarify/discuss, D - Different submittal applies, N - Comment not applicable

No.	Page No.	Reviewer	Reviewer Comment No.	Comments	Code	Response/Actions	Initial (a)	Initial (b)
1	1	WPRA	1	MOA should add wording that the TSM/TDM is 'the project' and the only Preferred Alternative.	A	Added clarificaton to *Whereas* clauses that identifies the TSM/TDM as the preferred alternative.	KET	
2	1	WPRA	2	MOA should add wording that the tunnel alternative analyses are inadequate and should not be certifed in the FEIR/FEIS, and that the tunnel alternatives are infeasible under Section 4(f) of the DOT Act of 1966.	D	The MOA is not the appropriate document to include this statement. See revised Section IV. D. 5. for clarification.	KET	
3	1	WPRA	3	MOA should add wording that if the tunnels are considered for implementation at a later time, a new environmental impact process will need to be performed.	C, D	The MOA is not the appropriate document to include this statement. See revised Section IV. D. 5. for clarification.	KET	
4								
5	1	PH	1	Recommend that recital clause be included in the MOA that clearly identifies the Undertaking as the TSM/TDM Alternative, as opposed to the SR-710 North Project.	A	Added clarificaton to *Whereas* clauses that identifies the TSM/TDM as the preferred alternative; Name of project or undertaking remains SR-710 North Project.	KET	
6	all	PH	2	MOA should refer specifically to "Consulting Parties," (CPs) as opposed to "all parties," which could be misconstrued to include only signatories.	A	This MOA is inclusive of all parties. Referring specifically to "Consulting Parties" would limit other parties' full participation, i.e. Native American Tribes. Will clarify throughout to include "all parties to this MOA."	KET	
7	2	PH	3	Before treatment plan is prepared, the NR nomination should be updated, especially district boundaries and CDFs; take into consideration the cumulative effects of multiple projects, both present and future.	D	These stipulations are included in the MOA executed 06/26/17 for the SR-110 (Arroyo Seco Parkway) Safety Enhancement Project in the Cities of Los Angeles and S. Pasadena, Los Angeles County	KET	
8	2	PH	4	CPs should be allowed to review and contribute to the treatment plan.	D	The Consulting Parties for the SR-110 Safety Enhancement Project are City of S. Pasadena and California Preservation Foundation(CPF). No other parties requested consultation. Section IV. B. 6 refers to public objection in writing. TBD which SR-710 CPs desire to "object" (review and comment on the Treatment Plan).	KET	
9	3, II.B	PH	5	Support installation of parkway sign. To be compatible with existing signage and surroundings.	A	Changed language to read "existing signage and its surroundings."	KET	
10	2, II	PH	6	Recommend recordation of the ASPHD prior to the commencement of construction activities.	D	The Historic American Engineering Record for the Arroyo Seco Parkway (HAER no. CA-265), August 1999 remains sufficient recordation of the Parkway.	KET	
11	3, II.C	PH	7	We support the creation of a smart phone traveler application.	A	Included in current draft MOA.	KET	
12	3, II. D & E	PH	8	Design development plans reviewed by SHPO at 60 and 90 percent should also be reviewed by CPs and all comments incorporated.	A	Revised Stipulation II. D to include all parties to the MOA.	KET	

WPRA- West Pasadena Residents' Association
PH- Pasadena Heritage

No 710 AC- No on 710 Action Committee
City of S. Pasadena- City of South Pasadena

National Trust- National Trust for Historic Preservation
ACHP- Advisory Council on Historic Preservation

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DISCIPLINE: **Senior Environmental Planner, Principal Architectural Historian**

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No.	Page No.	Reviewer	Reviewer Comment No.	Comments	Code	Response/Actions	Initial (a)	Initial (b)
13	4, III. C	PH	9	Request that Caltrans recognize locally eligible properties and ensure that they be protected.	D, N	Caltrans prepared a HPSR/HRER in December 2014 that identifed and evaluated all properties for NR eligiblity within the APE for this project. Identification of historical resources and locally significant properties is part of that process as well. A SHPSR was prepared October 2017 that evaluated additonal properties. The SHPO concurred on those identification efforts. In addition, all State-owned properties in the SR-710 Corridor Cities of Pasadena, S. Pasadena and Los Angeles were reviewed for NR eligibilty, and identifed for California Register eligiblity and local significance in the HRCRs dated March 2015. SHPO concurred on those identification and evaluations.	KET	
14	4, IV. B. 1	PH	10	Recommend Caltrans make this process (resolving objections) available to all CPs rather than some smaller group such as Signatories.	A	Document reads, "...any party to this MOA..." It does not limit objections and resolution to Signatories only.	KET	
15								
16	1	No 710 AC	1	Title page should not include cities not directly involved with the TSM/TDM alternative.	N	This comment refers to the official title of the project. No change will be made to the official title of the project in the MOA. There are TSM/TDM improvements proposed for all areas listed in title.	KET	
17	1	No 710 AC	2	Suggest the MOA be both MOA and PA since details about future projects on state-owned property impacted by TSM/TDM alternative are unknown.	N	Execution of this MOA is specifically to resolve adverse effects of the TSM/TDM alternative on historic properties, the ASPHD. This alternative is clearly defined, See Attachment A for TSM/TDM description. Any future projects will be subject to a separate environmental process. The MOA is the appropriate document.	KET	
18	2	No 710 AC	3	Supports update to National Register nomination of the ASPHD, review must include SHPO and local interested groups.	D	These stipulations are included in the MOA executed 06/26/17 for the SR-110 (Arroyo Seco Parkway) Safety Enhancement Project in the Cities of Los Angeles and S. Pasadena, Los Angeles County; City of S. Pasadena and CPF are consulting parties for that project; SHPO will review and comment on the update per Stipulation II.B. of that MOA.	KET	

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19	2	No 710 AC	4	Caltrans should consider a review of properties in Pasadena, S. Pasadena, Los Angeles listed or eligible for the NR. Many years have passed since initial review and properties may qualify now for the NR.	D	Caltrans prepared a HPSR/HRER in December 2014 that identifed and evaluated all properties for NR eligiblity within the APE for this project. A SHPSR was prepared October 2017 that evaluated additonal properties. The SHPO concurred on those identification efforts. In addition, all State-owned properties in the SR-710 Corridor Cities of Pasadena, S. Pasadena and Los Angeles were reviewed for NR eligibilty, and identifed for California Register eligiblity and local significance in the HRCRs dated March 2015. SHPO concurred on those identification and evaluations.	KET	
20	1	No 710 AC	5	Recommend that ACHP be invited to participate and to be Signatory on this MOA.	A	ACHP has been invited and has accepted participation in this MOA. They will be included as a Signatory.	KET	
21								
22	1	City S. Pasadena	1	MOA should state clearly that the preferred alternative is the TSM/TDM.	A	Added clarification to *Whereas* clauses that identifies TSM/TDM as the preferred alternative.	KET	
23	1	City S. Pasadena	2	MOA should state that tunnel alternatives have significant impacts that do not support the certification of the Final EIR/EIS.	N	The MOA is not the appropriate document to state this. MOA is written only to address adverse effects caused by the preferred alternative.	KET	
24	1	City S. Pasadena	3	MOA should acknowledge Metro's May 25, 2017 decision to select TSM/TDM alternative.	N	The MOA is not the appropriate document to state this.	KET	
25	1	City S. Pasadena	4	MOA should be changed to a PA as effects/impacts from a new list of local TSM/TDM projects is unknown	C, N	There are no additional "early action" or otherwise previously unidentifed projects associated with the TSM/TDM for the SR-710 North Project. All projects listed under the preferred alternative are defined. See Attachment A. Any future projects will be subject to a separate environmental review and document. The MOA is the appropriate document for this project.	KET/JR	
26	2	City S. Pasadena	5	A comprehensive analysis of impacts to the ASPHD should be considered to determine minimization/mitigation measures. MOA should identify, develop, incorporate mechanism for defining, assessing cumulative impacts from current, planned and future projects as well as effects of same on excess parcels conveyed by Caltrans to other owners.	D	This MOA is the appropriate document to address resolution of adverse effects to the ASPHD causes by the preferred alternative, including identifying minimization/mitigation measures. A cumulative impact analysis for the ASPHD was completed as part of the SR-110 Safety Enhancement Project, another planning document not related to this project. Discussion of effects resulting from the transfer or sale of state-owned properties is not related to the completion of Section 106 for this project.	KET	
27	2, 3	City S. Pasadena	6	Caltrans, Metro and CPs should develop and implement an Arroyo Seco Corridor Mangement Plan to help monitor, guide, manage, and mitigate the cumulative effects of multiple projects over time.	D	This stipulation is included in the MOA executed 06/26/17 for the SR-110 (Arroyo Seco Parkway) Safety Enhancement Project in the Cities of Los Angeles and S. Pasadena, Los Angeles County; City of S. Pasadena and CPF are consulting parties for that project.	KET	

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28	2,3	City S. Pasadena	7	Update the ASPHD National Register nomination-contributing features.	D	This stipulation is included in the MOA executed 06/26/17 for the SR-110 (Arroyo Seco Parkway) Safety Enhancement Project in the Cities of Los Angeles and S. Pasadena, Los Angeles County; City of S. Pasadena and CPF are consulting parties for that project; SHPO will review and comment on the update per Stipulation II.B. of that MOA.	KET	
29	2, II D &E	City S. Pasadena	8	Design development plans to be submitted to CPs and comments incorporated into project plans, including annual updates on project implementation.	A	Revised Stipulation II. D to include all parties to the MOA.	KET	
30	1	City S. Pasadena	9	Clarify roles and responsibilities. Clarify role of cities in the header. Specify role of Caltrans and Metro.	A	The header, including the cities within the project limits of the undertatking, is the official title of the project. The *Whereas* clauses have been revised to clarify roles and responsibilities.	KET	
31	All	City S. Pasadena	10	MOA should replace "all parties," which could be misconstrued to include only the signatories, with Consulting Parties.	A	This MOA is inclusive of all parties. Referring specifically to "Consulting Parties" only would limit other parties full participation, i.e. Native American Tribes. MOA has been clarified to include "all parties to this MOA."	KET	
32	4	City S. Pasadena	11	CPs should be included in the Resolution of Objections referenced in Section IV.B to provide CT an opportunity to resolve issues by consensus. Consultation process should address whether there are ways the TSM/TDM alternative's adverse effects on the ASPHD can be minimized and/or mitigated.	C, N	Section IV. B includes "any party to this MOA..." This MOA, and current consultation, is the appropriate document/process for resolving (minimizing or mitigating) adverse effects to the ASPHD caused by the preferred alternative.	KET	
33	1, All	City S. Pasadena	12	ACHP and Metro should also execute the MOA.	A	ACHP has been invited and has accepted participation in this MOA as a Signatory. Metro will be an Invited Signatory.	KET	
34	NA	City S. Pasadena	13	Pursuant to PRC 21167(f), the City requests to be notified of the approval of the SR-710 North Project.	N,D	Comment not applicable to the execution of this MOA.	KET	
35								
36	1, Nature of doc	National Trust	1	Individual projects under TSM/TDM alternative are still being defined, therefore CT should structure this agreement as PA not MOA.	N	There are no additional "early action" or otherwise previously unidentifed projects associated with the TSM/TDM for the SR-710 North Project. All projects listed under the preferred alternative are defined. See Attachment A. Any future projects will subject to a separate environmental review and document. The MOA is the appropriate document for this project.	KET/JR	
37	1, Clarification	National Trust	2	Modify language to include TSM/TDM as the clearly defined project alternative.	A	Added clarificaton to *Whereas* clauses that identifies the TSM/TDM as the preferred alternative.	KET	

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38	2, Clarification	National Trust	3	Once nature and location of all projects are defined, consultation should address ways to minimize/mitigate adverse effects on the ASPHD.	C	All project activities associated with the TSM/TDM (preferred) alternative are identified in the environmental documents and supporting technical studies. This MOA and the current consultation efforts with the CPs is the opportunity to addess ways to minimize/mitigate adverse effects to the ASPHD.	KET	
39	2, Clarification	National Trust	4	The agreement should identify,develop and incorporate mechanism for defining and assessing cumulative effects to the ASPHD for current,planned and future projects as well as effects from current and future development on excess parcels to be conveyed by Caltrans to other owners.	D	This MOA is the appropriate document to address resolution of adverse effects to the ASPHD causes by the preferred alternative. A cumulative impact analysis for the ASPHD was completed as part of the SR-110 Safety Enhancement Project, another planning document not related to this project. Discussion of effects resulting from the transfer or sale of state-owned properties is not related to the completion of Section 106 for this project.	KET	
40	1, Roles	National Trust	5	Clarify why other cities are listed in the title. Will they be signatories to this agreement? Would each have the authority to terminate agreement?	C	The cities are listed as that is the official title of the SR-710 North Project. This MOA is being executed between Caltrans, SHPO and the ACHP in consultation with the Section 106 Consulting Parties for this project.	KET	
41	1, Roles	National Trust	6	Specify roles and responsibilities of Metro and Caltrans in this document.	A	Roles and responsibilites of Caltrans and Metro has been clarified in the *Whereas* clauses.	KET	
42	All	National Trust	7	Document should refer to "Consulting Parties," as opposed to "all parties." This could be misconstrued to include only the agreement signatories.	A	This MOA is inclusive of all parties. Referring specifically to "Consulting Parties" would limit other parties full participation, i.e. Native American Tribes. Clarification has been made to read "all parties to this MOA."	KET	
43	2, Roles	National Trust	8	Entities with a demonstrated interest in the ASPHD, such as Highland Park Heritage Trust, AS Foundation, AS Neighborhood Council, HP Neighborhood Council, should be invited to participate as Consulting Parties.	C	These groups were invited to participate in the Section 106 and overall environmental process since early 2014 through the recent RDEIR/SEIS. No comments have been received from these entities throughout the process.	KET	
44	4	National Trust	9	Resolution of objections in Section IV. B should be open to all CPs and not limited to smaller subsection of Signatories.	N	Section IV. B includes "any party to this MOA..."	KET	
45	1, Roles	National Trust	10	This MOA should be executed by the ACHP and Metro, in addition to Caltrans and the SHPO	A	ACHP has been invited and has accepted participation in this MOA. They will be included as a Signatory. Metro is an Invited Signatory.	KET	

WPRA- West Pasadena Residents' Association
PH- Pasadena Heritage

No 710 AC- No on 710 Action Committee
City of S. Pasadena- City of South Pasadena

National Trust- National Trust for Historic Preservation
ACHP- Advisory Council on Historic Preservation

PROJECT NAME: **710 North Project**
PROJECT EA # 187900
Section 106 MOA (first draft)

REVIEWER: **Kelly Ewing-Toledo**
DISCIPLINE: **Senior Environmental Planner, Principal Architectural Historian**

CODES : A - Accept/will comply, B - Basic input req'd from others, C - Clarify/discuss, D - Different submittal applies, N - Comment not applicable

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46	2	National Trust	11	As projects are yet clearly defined, we welcome opportunity for on-going discussion regarding appropriate mitigation measures to include: an update and revision of the ASPHD Corridor Management Plan. Distribute a copy of the 2003 draft plan to all CPs and Signatories.	C, D, N	All project activities associated with the TSM/TDM (preferred) alternative are clearly identified in the environmental documents and supporting technical studies. This MOA and the current consultation efforts with the CPs is the opportunity to address ways to minimize/mitigate adverse effects to the ASPHD caused by the preferred alternative. Update to the 2003 CMP is subject to the MOA for the SR-110 Safety Enhancement Project. CPF and City of S. Pasadena are Consulting Parties on that project. Do SR-710 North Project CPs wish to receive a draft copy of the CMP?	KET	
47	NA	National Trust	12	Caltrans should consider supporting the development of supplemental plans that address the conveyence of Caltrans-owned excess property at the ends of the SR-710 North to the City of Pasadena and the unincorporated community of Los Angeles.	D, N	This comment is not applicable to the SR-710 North Project, TSM/TDM alternative and resolution of adverse effects to the ASPHD.	KET	
48	2,3	National Trust	13	The ASPHD National Register nomination should be updated.	D	Stipulation included in the MOA executed 06/26/17 for the SR-110 (Arroyo Seco Parkway) Safety Enhancement Project in the Cities of Los Angeles and S. Pasadena, Los Angeles County; City of S. Pasadena and CPF are consulting parties for that project; SHPO will review and comment on the update per Stipulation II.B.	KET	
49	3, II. D & E	National Trust	14	All design development plans should be submitted to CPs for comment and incorporation into project plans, including annual updates on project implementation.	A	Revised Stipulation II. D to include all parties to the MOA.	KET	
50	1	National Trust	15	Section 106 PA should be appended to MOA or weblink to it in the second *Whereas* clause.	N	Not applicable to MOA. Caltrans Seciton 106 PA is publically available.	KET/ABN	
51	2	National Trust	16	Last sentence of second *Whereas*; What does that mean to more directly and actively participate in the implementation? Construction jobs?	C	This refers to Native American Monitoring during project implementation as outlined in the Post Review Discovery and Monitoring Plan (PRDMP).	KET	
52	2	National Trust	17	Clarify typo referring to Appendix.	A	Done.	KET	
53	2	National Trust	18	Include qualifications for the Architectural Historian.	C	Section IV. A. 2. d. defines Professional Qualifications that guide the development of products required by the Stipulations.	KET	
54	4	National Trust	19	Section IV.A.2. add definition of Consulting Parties.	N	No changes will be made to the boilerplate language that has been previously approved by the SHPO in coordination with the ACHP.	KET	
55	5	National Trust	20	Section D. Termination. What is last sentence referring to? "Such consultation shall not be required if Caltrans proposes termination because the Undertaking no longer meets the definition set forth in 36 CFR 800.16 (y).	C	That is if the project is cancelled, or no longer programmed for implementation.	KET	
56								

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City of S. Pasadena- City of South Pasadena

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PROJECT NAME: **710 North Project**
PROJECT EA # 187900
Section 106 MOA (first draft)

REVIEWER: **Kelly Ewing-Toledo**
DISCIPLINE: **Senior Environmental Planner, Principal Architectural Historian**

CODES : A - Accept/will comply, B - Basic input req'd from others, C - Clarify/discuss, D - Different submittal applies, N - Comment not applicable

No.	Page No.	Reviewer	Reviewer Comment No.	Comments	Code	Response/Actions	Initial (a)	Initial (b)
57	1	ACHP	1	Requests CT address CP's recent concerns regarding the adeqeuacy of the alternatives analyses considering preferred alternative was not identifed in the FRDEIR/SEIS.	A	The TSM/TDM will be identifed as the preferred alternative in the MOA. The preferred alternative will be identified in the FEIR/FEIS as well.	KET	
58	NA	ACHP	2	Under CEQA, CT may be required to identify a preferred alternative, explain how this could impact this Section 106 consultation.		As Lead Agency, it is Caltrans' decision to identify the prefered alternative after speciifc effects and reasonable avoidance, minimization, and mitigation measures have been identifed for each project alternative and consideration of public comments. The MOA has been revised to identify the TSM/TDM as the preferred alternative.	KET/JR	
59	1	ACHP	3	Will CT identify the preferred alternative in this MOA?	A	The TSM/TDM will be identifed as the preferred alternative in the MOA.	KET	
60	NA	ACHP	4	It does not appear CT has adequately considered the undertaking's cumulative effects on historic properties.	C, D	The Finding of Adverse Effect (FOAE) for the SR-710 North Project, December 2017, adequately analyzed and assessed effects for all alternatives described as the undertaking. On May 25, 2017 Metro Board voted to select the TSM/TDM alternative, therefore the SHPO concurred on the analysis of the effects on May 3, 2018 for the TSM/TDM alternative. Cummulative effects for the ASPHD was studied under in the Cummulative Impact Analysis as part of the SR-110 (Arroyo Seco Parkway) Safety Enhancement Project in the Cities of Los Angeles and S. Pasadena, Los Angeles County; City of S. Pasadena and CPF are consulting parties for that project.	KET	
61	NA	ACHP	5	Recommend CT explore potential for reasonably foreseeable effects that may result during the life of the project that could further diminish the characteristics that make the historic properties in the APE eligible for the NRHP.	C, D	It is unclear what this comment is referring to. Effects to the ASPHD are known for the preferred alternative for this undertaking.	KET	
62	NA	ACHP	6	The evaluation of cumulative effects should include the impacts from the development of the excess lands that CT has conveyed and is conveying to other parties.	D	Discussion of effects resulting from the transfer or sale of state-owned properties is not related to the completion of Section 106 (MOA) for this project.	KET	
63	NA	ACHP	7	Recommend CT respond to the SPPF's comment in the July letter (FRDEIR/SEIS) regarding whether the agency will reserve the subsurface mineral rights for potential tunneling below properties Caltrans is selling.	D	This comment is not related to the execution of this MOA. The response to SPPF will be addressed in the FEIR/FEIS.	KET	
64	NA	ACHP	8	Provide a justification explaining how the agency determined that a specific alternative will not have any cumulative effects	D	The effects of each alternative was analyzed in the FOAE. This MOA is being executed to address the adverse effects associated with the preferred alternative, TSM/TDM.	KET	
65	2	ACHP	9	Add detail about which proposed activities in Stipulation II will involve consultation with CPs, and include specific timeframes for consultation.	A	Clarified in Stipulation II. D.	KET	

PROJECT NAME: **710 North Project**
PROJECT EA # 187900
Section 106 MOA (first draft)

REVIEWER: **Kelly Ewing-Toledo**
DISCIPLINE: **Senior Environmental Planner, Principal Architectural Historian**

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66	2	ACHP	10	Additional consultation with all CPs will take place to draft and finalize agreed upon minimization and mitigation measures found in Stipulations II.	C	All project activities associated with the TSM/TDM (preferred) alternative are clearly identified in the environmental documents and supporting technical studies. This MOA and the current consultation efforts with the CPs is the opportunity to address ways to minimize/mitigate adverse effects to the ASPHD caused by the preferred alternative.	KET	
67	4	ACHP	11	Devleop a Stipulation to address objections from the public regarding MOA's implementation.	A	Done. See IV. B. 6.	KET	

Group	Contact/Department	Address	Telephone	Email	Date/Type of Contact	Response	Follow Up
National Trust for Historic Preservation	Chris Morris, Los Angeles Field Director; Betsy Merritt, Deputy General Counsel; Brian Turner, Sr. Field Officer and Attorney Jesse Lattig, Field Director (06/2018)	Fine Arts Building, 811 West 7th Street, Suite 1138, Los Angeles, CA 90017	424-251-5865 213-705-7122 (c)	CMorris@savingplaces.org emerritt@savingplaces.org	Requested CP status 06/04/15	Letter granting status 06/15/15	05/2015 Transmit FONAE 10/05/15 Notify that CT changing finding to Adverse 04/11/16 Mtg/tour @ Caltrans 10/10/16 email (letter) update on FOAE 03/03/17 mtg. @ Pasadena Heritage 10/25/17 SHPSR/update on FOAE transmit 12/22/17 FOAE sent 01/30/18 sent FOAE to E. Merritt, B. Turner 01/12/18 Extend review period to 60 days, comments due 03/01/18 email sent to all CPs, CSO, SHPO 02/14/18 Sec 106 CP meeting-project update, FOAE, MOA discussion 03/01/18 received comments on FOAE 05/04/18 sent CPs SHPO concur. On FOAE and update on RDEIR/SEIS and MOA prep 06/19/18 telec. With Betsy, Jesse, Chris re: RDEIR/SEIS. Answered questions, referred to Jason for 4(f). 06/28/18 sent draft MOA. Comment by 07/20/18. Rec'd comments 07/16/18. 08/03/18 sent revised MOA and RTC.
Sequoyah School	Elena Phleger, Director of Development and Communications Josh Brody, Head of Sch James Cooper, Bus. Mngr Brian Wilson, Trustee	535 S. Pasadena Ave. Pasadena, CA 91105	626-795-4351 ext.215	ephleger@sequoyahschool.org	Requested CP status 03/24/16	Letter granting status 03/28/16	04/11/16 Mtg/tour @ Caltrans 10/10/16 email (letter) update on FOAE 03/21/17 email summary of 03/03 mtg. 10/25/17 SHPSR/update on FOAE transmit 12/22/17 FOAE sent 01/12/18 Extend review period to 60 days, comments due 03/01/18 email sent to all CPs, CSO, SHPO 02/14/18 Sec 106 CP meeting-project update, FOAE, MOA discussion(Brian Wilson, James Cooper, Josh Brody attended) 03/01/18 received comments on FOAE 05/04/18 sent CPs SHPO concur. On FOAE and update on RDEIR/SEIS and MOA prep 06/28/18 sent draft MOA. Comment by 07/20/18. Rec'd email with signer information and no further comments at this time 07/13/18. 08/03/18 sent revised MOA and RTC.
West Pasadena Resident's Association	Sarah Gavit, Vice President, SR-710 Lead Mic Hansen	580 Arbor Street Pasadena, CA 91105	626-584-0946	Sarah.gavit@att.net	Requested CP status 04/09/16	Letter granting status 05/20/16	10/10/16 email (letter) update on FOAE 03/21/17 email summary of 03/03 mtg. 10/25/17 SHPSR/update on FOAE transmit 12/22/17 FOAE sent 01/12/18 Extend review period to 60 days, comments due 03/01/18 email sent to all CPs, CSO, SHPO 02/14/18 Sec 106 CP meeting-project update, FOAE, MOA discussion(Mic Hansen attended) 03/01/18 received comments on FOAE 05/04/18 sent CPs SHPO concur. On FOAE and update on RDEIR/SEIS and MOA prep 06/28/18 sent draft MOA. Comment by 07/20/18. Rec'd comments 07/15/18. 08/03/18 sent revised MOA and RTC.

Pasadena Heritage	Jesse Lattig, Director; Susan Mossman, Executive Director Adam Rajper, Director	651 S. St. John Ave. Pasadena, CA 91105	626-441-6333	jlattig@pasadenaheritage.org smossman@pasadenaheritage.org	Requested CP status 06/03/15	Letter granting status 06/15/15	05/2015 Transmit FONAE 10/05/15 Notify that CT changing finding to Adverse 04/11/16 Mtg/tour @ Caltrans 10/10/16 email (letter) update on FOAE 03/03/17 mtg. @ Pasadena Heritage 10/25/17 SHPSR/update on FOAE transmit 12/22/17 FOAE sent 01/12/18 Extend review period to 60 days, comments due 03/01/18 email sent to all CPs, CSO, SHPO 02/14/18 Sec 106 CP meeting-project update, FOAE, MOA discussion(Adam Rajper attended) 03/01/18 received comments on FOAE 05/04/18 sent CPs SHPO concur. On FOAE and update on RDEIR/SEIS and MOA prep 06/28/18 sent draft MOA. Comment by 07/20/18. Rec'd comments 07/17/18. 08/03/18 sent revised MOA and RTC.
Los Angeles Conservancy	Adrian Fine	523 W. 6th St, #826 Los Angeles, CA 90014	213-430-4207	afine@laconservancy.org	Requested CP status 06/25/15	Letter granting status 06/26/15	05/2015 Transmit FONAE 10/05/15 Notify that CT changing finding to Adverse 04/11/16 Mtg/tour @ Caltrans 10/10/16 email (letter) update on FOAE 03/03/17 mtg. @ Pasadena Heritage 10/25/17 SHPSR/update on FOAE transmit 12/22/17 FOAE sent 01/12/18 Extend review period to 60 days, comments due 03/01/18 email sent to all CPs, CSO, SHPO 02/14/18 Sec 106 CP meeting-project update, FOAE, MOA discussion 03/01/18 received comments on FOAE 05/04/18 sent CPs SHPO concur. On FOAE and update on RDEIR/SEIS and MOA prep 06/28/18 sent draft MOA. Comment by 07/20/18. No comments received. Called/emailed 07/24/18. No response. 08/03/18 sent revised MOA and RTC.
City of South Pasadena	John Mayer, Sr. Planner; Margaret Lin, Principal Management Analyst; David Watkins, Director Planning and Building	Planning and Building Department 1414 Mission Street South Pasadena, CA 91030	626-403-7228 626-403-7236 (M. Lin) as of 01/02/18	jmayer@southpasadenaca.gov MLin@southpasadenaCA.gov	M. Lin requested CP status (email) 06/04/15	Letter granting status 06/16/15	05/2015 Transmit FONAE 10/05/15 Notify that CT changing finding to Adverse 04/11/16 Mtg/tour @ Caltrans 10/10/16 email (letter) update on FOAE 03/21/17 email summary of 03/03 mtg. 10/25/17 SHPSR/update on FOAE transmit 11/03/17 J. Mayer no longer with City. emailed D. Watkins who transmitted SHPSR to M. Lin 12/22/17 FOAE sent 01/02/18 spoke w/ M. Lin. She asked when 30 rev. period is up. I told her all CPs would meet first week Feb. 01/12/18 Extend review period to 60 days, comments due 03/01/18 email sent to all CPs, CSO, SHPO 02/14/18 Sec 106 CP meeting-project update, FOAE, MOA discussion 03/01/18 received comments on FOAE 05/04/18 sent CPs SHPO concur. On FOAE and update on RDEIR/SEIS and MOA prep 06/28/18 sent draft MOA. Comment by 07/20/18. Rec'd comments 07/19/18. 08/03/18 sent revised MOA and RTC.

No on 710 Action Committee	Claire Bogaard	581 Garden Lane Pasadena, CA 91105	626-799-9819	cwbogaard@earthlink.net	Requested CP status 06/15/15	Letter granting status 06/19/15	05/2015 Transmit FONAE 10/05/15 Notify that CT changing finding to Adverse 04/11/16 Mtg/tour @ Caltrans 10/10/16 email (letter) update on FOAE 03/03/17 mtg. @ Pasadena Heritage 10/25/17 SHPSR/update on FOAE transmit 12/22/17 FOAE sent 01/02/18 SHPSR returned via post; Claire B. emailed me with new address; resent SHPSR and FOAE. 01/12/18 Extend review period to 60 days, comments due 03/01/18 email sent to all CPs, CSO, SHPO 02/14/18 Sec 106 CP meeting-project update, FOAE, MOA discussion 05/04/18 sent CPs SHPO concur. On FOAE and update on RDEIR/SEIS and MOA prep 06/28/18 sent draft MOA. Comment by 07/20/18. Rec'd comments 07/18/18. 08/03/18 sent revised MOA and RTC.
City of Pasadena After Feb 14, 2018 add Steve Mermell (City Manager) smermell@cityofpasadena.net David Reyes, Director Planning and Community Development					Nicole Davis attended via phone the Feb. 14, 2018 CP meeting regarding the FOAE.		Other than formal comments to the DEIR/DEIS, City of Pasadena has not participated in the Section 106 process to date. They were invited to be a CP, and Leon White was informed of meetings, but never responded or attended. On 02/28/18 GPA received email from Nicole Davis of Michael Baker Consulting asking who to submit FOAE comments to. Andrea responded to send them to my attention. 02/28/18 Claudia Harbert received voicemail from John Bellis 310)890-9537 asking who to submit comments to, she returned call and left message to send to Ct to my attention. As of 03/06/18 have not received any comments from City of Pasadena 05/04/18 sent CPs SHPO concur. On FOAE and update on RDEIR/SEIS and MOA prep 06/28/18 sent draft MOA. Comment by 07/20/18. No comments received. Emailed David Reyes on 07/24/18. No response. Steve Mermell email address non-deliverable. 08/03/18 sent revised MOA and RTC.

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STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN JR, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, Division of Environmental Planning
100 South Main Street, MS 16a
LOS ANGELES, CA 90012-3606
PHONE (213) 897-0703
FAX (213) 897-0685
TTY (213) 897-4937

Flex your power!
Be Energy efficient!

February 15, 2012

SAMPLE

Ms. Sally Brown
Assistant Field Supervisor
United States Fish and Wildlife Service
6010 Hidden Valley Road, Suite 101
Carlsbad, CA 92011

Dear Ms. Brown,

Re: Invitation to Become Participating Agency and Cooperating Agency on the State Route 710 Study.

Effective July 1, 2007, the Federal Highway Administration (FHWA) assigned, and the California Department of Transportation (Caltrans) assumed, all the United States Department of Transportation (USDOT) Secretary's responsibilities under National Environmental Policy Act (NEPA) pursuant to Section 6005 of SAFETEA-LU codified at 23 U.S.C. 327(a)(2)(A). Caltrans assumed all of FHWA's responsibilities under NEPA for projects on California's State Highway System (SHS) and for federal-aid local streets and roads projects under FHWA's Surface Transportation Project Delivery Pilot Program, pursuant to 23 CFR 773. Caltrans also assumed all of FHWA's responsibilities for environmental coordination and consultation under other federal environmental laws pertaining to the review or approval of projects under the Pilot Program. For purposes of carrying out the responsibilities assumed under the Pilot Program, Caltrans is deemed to be acting as the FHWA with respect to the environmental review, consultation, and other action required under those responsibilities.

Caltrans, in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro) is initiating an Environmental Impact Statement (EIS) for proposed State Route 710 Study in Los Angeles County in California. The project study area is generally located between Interstate 5, Interstate 10, Interstate 605, Interstate 210, and State Route 2.

The proposed project depending on the results of a thorough environmental analysis of all possible transportation improvements during the NEPA process, may include, but not be limited to: surface and subsurface highway/freeway construction, heavy rail and bus/light rail systems, local street upgrades, traffic management systems, and a no build alternative. The objective of this project is to relieve congestion and improve mobility within the study area. Potential environmental impacts include air quality, land use changes, displacements/relocations, cultural resources, utilities, visual/aesthetics, paleontological resources, water quality, hydrology/floodplains, hazardous waste/materials, noise, and biological resources.

In accordance with 40 CFR 1501.6 of the Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedural Provision of the National Environmental Policy Act, we are requesting your agency to be a cooperating agency because your agency has jurisdiction by law or special expertise.

You have the right to expect that the EIS will enable you to discharge your jurisdictional responsibilities. Likewise, you have the obligation to tell us if, at any point in the process, your needs are not being met. We expect that at the end of the process the EIS will satisfy your NEPA requirements including those related to project alternatives, environmental consequences and mitigation. Further we intend to utilize the EIS and our subsequent record of decision as our decision-making documents and as the basis for the permit application.

In accordance with Section 6002 of SAFETEA-LU, we are requesting your agency to be a participating agency because we believe that your agency will have an interest in this transportation project. Pursuant to Section 6002 of SAFETEA-LU, participating agencies are responsible to identify, as early as practicable, any issues of concern regarding the project's potential environmental or socioeconomic impacts that could substantially delay or prevent an agency from granting a permit or other approval that is needed for the project. We suggest that your agency's role in the development of the above project should include the following as they relate to your area of expertise:

1. Provide meaningful and early input on defining the purpose and need, determining the range of alternatives to be considered, and the methodologies and level of detail required in the alternatives analysis.

2. Participate in coordination meetings and joint field reviews as appropriate.

3. Timely review and comment on early project information to reflect the views and concerns of your agency on the adequacy of the document, alternatives considered, and the anticipated impacts and mitigation.

Under Section 6002 of SAFETEA-LU, if your agency is a federal agency and declines to be a participating agency, your agency must do so in writing by stating:

1. Your agency has no jurisdiction or authority;

2. Your agency has no expertise or information relevant to the project; and

3. Your agency does not intend to comment on the project.

We look forward to your response to our request for your agency to be a cooperating agency and a participating agency and to working with you on this transportation project. Neither of these designations implies that your agency supports the proposed project. The favor of a reply is requested by March 19, 2012. If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during the preparation of this EIS, please contact Garrett Damrath at (213) 897-9016 or garrett_damrath@dot.ca.gov.

Sincerely,

Ron Kosinski
Deputy District Director

DEPARTMENT OF THE ARMY

Los Angeles District, Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

February 28, 2012

REPLY TO
ATTENTION OF:
Office of the Chief
Regulatory Division

Ron Kosinski, Deputy District Director RK
Division of Environmental Planning
California Department of Transportation, District 7
Attention: Garrett Damrath
100 South Main Street, MS-16a
Los Angeles, California 90012-0703

Subject: Invitation to Become Cooperating and/or Participating Agency on the State Route 710 Study

Dear Mr. Kosinski:

I am responding to the California Department of Transportation (Caltrans), District 7, February 15, 2012 request for the U.S. Army Corps of Engineers ("Corps") to participate as a Cooperating and/or Participating agency in the State Route (SR) 710 Study, Los Angeles County, California.

The Corps understands that the Federal Highways Administration (FHWA) has delegated its responsibilities for environmental consultation and coordination under the National Environmental Policy Act (NEPA) and the Clean Water Act (CWA) to Caltrans for the proposed project, pursuant to Section 6005 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). As such, Caltrans, as a federal lead agency, will prepare an Environmental Impact Statement (EIS) for the proposed project, following the Council on Environmental Quality (CEQ) "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act" of November 29, 1978. In accordance with Section 6002 of SAFETEA-LU, Caltrans requests that our agency become a cooperating and/or participating agency in the development of this project.

The Corps agrees to accept Caltrans' offer to become a cooperating agency. The Corps also understands that our views, as well as those of other cooperating agencies, will be sought through all stages of the EIS development. It is understood that this coordination is intended to preclude any subsequent and duplicative reviews by cooperating agencies. This coordination is also designed to aid in identifying all reasonable project alternatives, environmental impacts, and measures to mitigate adverse impacts for the project. The Corps would like to ensure that this project progresses in a mutually acceptable way to streamline the eventual application process for required state and Federal permits. Further, because of our Section 404 of the CWA administrative responsibilities, we have a particular concern in seeing the project comply with the 404(b)(1) guidelines (40 CFR 230) which are fundamental to supporting our eventual determination of the least environmentally damaging practicable alternative (LEDPA).

The Corps has reviewed the FHWA "Guidance on Cooperating Agencies," which outlines the responsibilities of the federal lead agency and those of the cooperating agencies. However, staff resource constraints will limit Corps participation to the following:

- Assist in identifying interest groups.
- Attend coordination meetings and joint field reviews.
- Provide meaningful and early input on issues of concern.
- Review pre-draft and pre-final environmental documents.
- Adopt the final environmental document, if after an independent review, the Corps concludes that the document satisfies NEPA and other requirements for our approval and permit for the proposed action.
- Provide information on alternatives, including the "no practicable alternative" finding.
- Assist the lead agency in determining appropriate and practicable mitigation, including "all practicable measures to minimize harm." These measures should reflect avoidance, minimization, and compensation.
- Cooperate in the application of principles for integration of NEPA and the Section 404 Permits contained in Chapter 11 of Applying the Section 404 Permit Process to Federal-aid Highway Projects.

The Corps looks forward to continued dialogue and coordination with Caltrans on this project. If you have any questions, please contact Stephanie Hall of my staff at 213-452-3410 or via e-mail at Stephanie.J.Hall@usace.army.mil. Please refer to this letter and Corps File Number: SPL-2012-00094-SJH in your reply.

Sincerely,

Mark D. Cohen
Deputy Chief, Regulatory Division
Los Angeles District

cc:
Sally Brown, U.S. Fish & Wildlife Service, Carlsbad, CA
Susan Sturges, Environmental Protection Agency, Region IX, San Francisco, CA
Valerie Carrillo, California Regional Water Quality Control Board, Los Angeles
Ed Pert, California Department of Fish & Game, San Diego, CA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

March 21, 2012

Ron Kosinski
Deputy District Director
California Department of Transportation, District 7
100 South Main Street, MS 16a
Los Angeles, CA 90012-3606

Subject: Response to Invitation to Become Participating Agency and Cooperating Agency for the State Route 710 Study, Los Angeles County, California

Dear Mr. Kosinski:

The United States Environmental Protection Agency (EPA) has reviewed the February 15, 2012 request from the California Department of Transportation (Caltrans) for EPA to become a participating agency and a cooperating agency for the State Route 710 Study in Los Angeles County, California. EPA accepts Caltrans's invitation to become a "Participating Agency" (as defined in 23 USC 139 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)).

EPA also accepts Caltrans's invitation to become a cooperating agency (as defined in NEPA). As a cooperating agency, EPA will provide comments on the draft and final environmental impact statements (EISs) and at other milestones where we believe we can contribute to avoidance and minimization of potential impacts to resources during the development of the EIS.

On April 15, 2011, EPA provided scoping comments for the proposed project. We look forward to working with Caltrans to ensure that our continued coordination assists both of our agencies in meeting our statutory missions. EPA's participation as a participating and cooperating agency does not constitute formal or informal approval of any part of this project under any statute administered by EPA, nor does it limit in any way EPA's independent review of the draft and final EISs pursuant to Section 309 of the Clean Air Act.

We also thank Caltrans for the invitation to participate in the technical advisory committee (TAC) for the project. We have not actively participated in this group; however, we would like to be updated regarding the release of final reports or recommendations by the TAC.

Once the draft EIS is released for public review, please send one hard copy and one electronic copy to the address above (mail code: CED-2). Please feel free to direct any questions you may have to me at (415) 947-4161 or dunning.connell@epa.gov.

Sincerely,

Connell Dunning

Connell Dunning, Transportation Team Supervisor
Environmental Review Office

cc: Steven John, EPA Southern California Office

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

In Reply Refer To:
FWS-LA-12B0146-12TA0246

MAR 19 2012

Mr. Ron Kosinski
Deputy District Director, District 7
Environmental Planning
California Department of Transportation
100 South Main Street
Los Angeles, California 90012

Attention: Garrett Damrath

Subject: Invitation to Become a Cooperating and/or Participating Agency on the State Route 710 Study, Los Angeles County, California

Dear Mr. Kosinski:

We received your letter dated February 15, 2012, requesting our participation as a cooperating and/or participating agency for the proposed State Route 710 Study. At this time we are unable to act as a cooperating agency in the preparation of an Environmental Impact Statement for the project due to workload constraints.

However, we will continue to provide technical assistance as a participating agency under Section 6002 of SAFETEA-LU. We appreciate the opportunity to participate in the transportation planning process and look forward to our continued coordination in these matters.

If you have any questions regarding this letter, please contact Sally Brown of this office at 760-431-9440, extension 278.

Sincerely,

Jonathan Snyder

for Karen A. Goebel
Assistant Field Supervisor

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GAIL FARBER, Director

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: PD-0

March 19, 2012

Mr. Michael Miles
District Director
California Department of Transportation
District 7 – Division of Environmental Planning
100 South Main Street, Mail Stop 16A
Los Angeles, CA 90012

Attention Mr. Ron Kosinski

Dear Mr. Miles:

STATE ROUTE 710 STUDY – INVITATION TO BECOME PARTICIPATING AGENCY

Thank you for your letter (copy enclosed) inviting the County of Los Angeles Department of Public Works (Public Works) to be a participating agency in the State Route 710 Environmental Impact Statement Study (Study), which is being cooperatively administered by California Department of Transportation (Caltrans) and the Los Angeles County Metropolitan Transportation Authority (LACMTA).

Public Works is pleased to join Caltrans and LACMTA, along with other cities and agencies in the region, as a participating agency on this very important Study. Currently, Messrs. John Walker and John Huang of Programs Development Division are participating members of the State Route 710 Technical Advisory Committee. Messrs. Walker and Huang, and Public Works as a whole, are committed to providing timely and constructive input on the Study's purpose and need, alternative analysis, anticipated impacts and mitigation, and other matters as the Study moves forward.

Mr. Michael Miles
March 19, 2012
Page 2

Thank you for this invitation, and we look forward to working with Caltrans, LACMTA, and other project partners and stakeholders on this Study.

If you have any questions, please contact Mr. Walker at (626) 458-3900 or at jwalker@dpw.lacounty.gov.

Very truly yours,

GAIL FARBER
Director of Public Works

Patrick V. DeChellis

PATRICK V. DeCHELLIS
Deputy Director

JTW:ro
P:\pdpub\Admin\Walker\Metro\SR 710 TAC\CaltransInvitation1.doc

Enc.

Ken Husting <ken.husting@lacity.org>

02/23/2012 11:49 AM

To
<garrett_damrath@dot.ca.gov>
cc
Jasmin San Luis <Jasmin.SanLuis@lacity.org>, Zaki Mustafa <Zaki.Mustafa@lacity.org>, Michael Brown <Michael.Brown@lacity.org>, Jim Doty <jim.doty@lacity.org>
Subject
Invitation to BecomeParticipating Agency on the SR-710 Study

Good morning Garrett,

I received the letter dated February 15, 2012 from Caltrans Deputy District Director, Ron Kosinski, inviting LADOT to be a participating agency on the State Route (SR) 710 Study. LADOT thanks Caltrans for this invitation that we gladly accept. The SR-710 Study is of significant importance to LADOT to determine: viable options to improve the transportation network, any potential impacts, and corresponding mitigations. We welcome a comprehensive study to help our agency, other agencies, and the policy makers in the City of LA make an informed decision on the future of the SR-710.

Should you have any questions or need any assistance, please feel free to contact me at (213) 972-5008.

Best regards,
........Ken

Ken Husting, P.E.
Senior Transportation Engineer
LADOT
(213) 972-5008

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LELAND C. DOLLEY, LC
ATTORNEY-AT-LAW

March 16, 2012

Mr. Ron Kosinski
Deputy District Director
Department of Transportation
District 7, Division of Environmental Planning
100 South Main Street MS 16a
Los Angeles, CA 90012-3606

Dear Mr. Kosinski,

This is in response to your letter dated February 15, 2012.

This will first confirm that the undersigned is the authorized representative of the City of Alhambra on matters pertaining to the completion of the Gap on SR710 between the 10 and the 210 freeways, which is the subject of your letter.

This will further confirm that the City will be a participating agency in accordance with Section 6002 of SAFETEA-LU.

We also confirm that we are familiar with the facts on this issue, and with the mentioned sections of law.

We look forward to meeting with you, beginning the process and working through issue as they arise.

Very Truly Yours,

Leland C Dolley
Representing the City of Alhambra

601 13TH STREET, MANHATTAN BEACH, CALIFORNIA 90266
TEL: 310.545.3048 CELL: 310.977.7704 FAX: 310.939.7162
LEEDOLLEY@VERIZON.NET

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CITY OF GLENDALE, CALIFORNIA
Management Services Division

613 East Broadway, Room 200
Glendale, California 91206-4391
Tel. (818) 548-4844 Fax (818) 547-6740
www.ci.glendale.ca.us

February 23, 2012

Mr. Ron Kosinski RK
Deputy District Director
California Department of Transportation – District 7
Division of Environmental Planning
100 South Main Street, MS 16a
Los Angeles, CA 90012-3606

Dear Mr. Kosinski:

RE: Caltrans' Invitation to Become a Participating Agency on the SR-710 Study

Thank you for your letter of February 15, 2012, extending Caltrans' invitation to the City of Glendale ("City") to become a participating agency on the SR-710 Study. The potential extension of SR-710 between I-10 and SR-134/I-210 is of great interest to the City, and we currently are represented on the SR-710 EIR/EIS Technical Advisory Committee organized by Metro. Therefore, on behalf of the City, I accept Caltrans' invitation to perform the responsibilities enumerated on page 2 of your letter.

As stated in your letter, the designation of "participating agency" does not imply that the City supports the proposed project. In fact and to the contrary, I wish to reiterate that the position of the City remains consistent with Resolution No. 09-111 approved by the Glendale City Council on July 28, 2009, which addresses both the SR-710 tunnel "gap closure" as well as the general subject of "gap closure" alternatives for the SR-710 freeway between the I-10 and the SR-134/I-210 freeways:

- The City opposes any "gap closure" alternative that has or could be developed;
- The City opposes the continued effort and expenditure of tax-payer monies to explore, study, and develop any means to facilitate this "gap closure"; and
- The City believes and desires that efforts should instead be directed to the development of alternatives that more effectively and more thoroughly address the concerns of mobility, congestion, and the movement of goods in the SR-710 corridor, particularly from our ports. Such alternatives should expand mass transit systems, improve existing infrastructure, and limit the long-distance movement of cargo/freight from the ports to rail.

In closing, thank you again for inviting the City to be a participating agency on the SR-710 Study. We look forward to working with the various interested parties. (Note: Please direct all communications regarding this effort to Mr. Thomas Mitchell, Assistant Traffic & Transportation Administrator, City of Glendale, 633 East Broadway - Room 300, Glendale 91206-4384 (tmitchell@ci.glendale.ca.us; 818/548-3960 Option 4.)

Sincerely,

Scott Ochoa
City Manager

SO:SZ/tm

cc: Stephen M. Zurn, City of Glendale Director of Public Works
Thomas E. Mitchell, City of Glendale Assistant Traffic & Transportation Administrator

CITY OF LA CAÑADA FLINTRIDGE ®

CITY COUNCIL

David A. Spence, Mayor
Stephen A. Del Guercio, Mayor Pro Tem
Michael T. Davitt
Laura Olhasso
Donald R. Voss

March 15, 2012

Mr. Ron Kosinski
Deputy District Director
Caltrans - District 7
Division of Environmental Planning
100 South Main Street, MS 16a
Los Angeles, CA 90012-3606

Dear Mr. Kosinski:

Thank you for your letter to Ms. Ann Wilson dated February 15, 2012, requesting that the City of La Cañada Flintridge be a participating agency on the State Route 710 Study (in accordance with Section 6002 of SAFETEA-LU).

By this letter, we accept your invitation to be a participating agency in the State Route 710 Study.

Sincerely,

Mark R. Alexander

Mark R. Alexander
City Manager

1327 Foothill Boulevard • La Cañada Flintridge • California 91011-2137 • (818) 790-8880 • FAX: (818) 790-7536

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- Forwarded by Garrett Damrath/D07/Caltrans/CAGov on 02/21/2012 10:33 AM -----

"Ho, Amy" <AMHo@MontereyPark.ca.gov>

02/21/2012 09:51 AM

To
<garrett_damrath@dot.ca.gov>
cc

Subject
SR 710 Study

Garrett,

In response to Caltrans's Feb. 15, 2012 letter, the City of Monterey Park will participate in the SR 710 Study. I will be the point of contact.

Thanks.

Amy Ho
Principal Management Analyst
City of Monterey Park
320 W. Newmark Ave.
Monterey Park, CA 91754
(626) 307-1383

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DEPARTMENT OF TRANSPORTATION

February 28, 2012

Ron Kosinsky, Deputy District Director
Division of Environmental Planning
Caltrans, District 7
100 Main Street, MS 16A
Los Angeles, CA 90012

Dear Mr. Kosinski:

Subject: Participating Agency on the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the State Route 710 Study

This letter in is response to your letter dated February 15, 2012 requesting the City of Pasadena to be a participating agency for the State Route 710 Study. I confirm the City's intent to be a participating agency and am looking forward to working with Caltrans on this important transportation project.

Pasadena is already participating on the Technical Advisory Committee for this project. Mr. Bahman Janka, Transportation Administrator, is the City's primary representative and I serve as the Alternate as the need arises.

We appreciate the opportunity to participate in this process. If you have any questions or would like additional information, please contact me directly at 626-744-6450, or Mr. Bahman Janka at 626-744-4610.

Sincerely,

Frederick C. Dock
Director of Transportation

[copies to City Manager and Mayor]

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Matt Ballantyne <MBallantyne@SanMarinoCA.gov>

02/22/2012 10:03 AM

To
"garrett_damrath@dot.ca.gov"
<garrett_damrath@dot.ca.gov>
cc

Subject
Patricipating Agency on the State Route 710 Study

Mr. Damrath-

I am in receipt of the letter sent by Mr. Kosinski regarding our interest in participating in the 710 Study. The City of San Marino would be interested in being a participating agency. Best regards,

Matt Ballantyne
City Manager
City of San Marino
2200 Huntington Drive
San Marino, CA 91108
626.300.0700

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Nicole West

From: Jason Roach <jason_roach@dot.ca.gov>
Sent: Monday, April 09, 2012 2:48 PM
To: Deborah Pracilio; Nicole West
Subject: Fw: 6002 participating agency

Below is a late arrival to the 6002 invitations: City of South Pass.
We expect to receive a response from Pasadena as well.

Jason Roach
Caltrans Environmental Planning
100 S. Main Street, MS 16A
Los Angeles, CA 90012
(213) 897-0357

----- Forwarded by Jason Roach/D07/Caltrans/CAGov on 04/09/2012 02:46 PM

Garrett
Damrath/D07/Caltr
ans/CAGov To
Jason Roach/D07/Caltrans/CAGov@DOT
04/05/2012 03:58 cc
PM
Subject
Fw: 6002 participating agency

Sincerely,

Garrett Damrath
Senior Environmental Planner
Division of Environmental Planning
Caltrans, District 7
213-897-9016

----- Forwarded by Garrett Damrath/D07/Caltrans/CAGov on 04/05/2012 03:58 PM -----

Dennis Woods
<DWoods@ci.south-
pasadena.ca.us> To
Garrett Damrath
04/05/2012 03:08 <garrett_damrath@dot.ca.gov>
PM cc
Sally Kilby
<SKilby@ci.south-pasadena.ca.us>,

Sergio Gonzalez
<SGonzalez@ci.south-pasadena.ca.us>
Subject
6002 participating agency

Dear Mr. Damrath

This is to confirm South Pasadena's desire to be a participating agency in the evaluation of mobility solutions in a project area that includes South Pasadena.

Dennis Woods

Sent from Dennis' iPhone

San Gabriel Valley Council of Governments

1000 S. Fremont Ave., Unit 42, Alhambra, CA 91803 Phone: (626) 457-1800 FAX: (626) 457-1285 E-Mail SGV@sgvcog.org

February 23, 2012

Mr. Ron Kosinski RK
Deputy District Director
Department of Transportation
District 7, Div. of Environmental Planning
100 South Main Street, MS 16a
Los Angeles, CA 90012-3606

RE: Invitation to Become Participating Agency on the State Route 710 Study

Dear Mr. Kosinski:

In response to your February 15 correspondence, this letter will confirm the San Gabriel Valley Council of Governments' interest and commitment to be a participating Agency on Caltrans State Route 710 study. As a participating agency, we understand that we are responsible for identifying any issues of concern regarding the project's potential environmental or socio-economic impacts that could substantially delay or prevent any agency from granting a permit or other approvals that are needed for this project.

Should you have any questions, please contact Nicholas Conway at 626-457-1800.

Sincerely,

Angel Carrillo
President

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From: Roach, Jason P@DOT
Sent: Monday, November 03, 2014 11:02 AM
To: 'ray.tellis@dot.gov'; 'mary.nguyen@dot.gov'
Subject: SR-710 North Study - FTA Participating Agency

Good Morning Ray and Mary –

I'd like to follow up on our 10/23/14 meeting at Metro concerning the role of FTA in the SR-710 North Study. Per your request at the meeting, Caltrans has assigned FTA as a participating agency rather than Cooperating Agency under 23 CFR 139.

If you would not like to be assigned as participating agency, please respond by November 14, 2014 and indicate the following conditions apply:

a) No jurisdiction or authority with respect to the project
b) Have no expertise or information relevant to the project; and
c) Do not intend to submit comments on the project

Please contact me with any questions and/or concerns.

Thank you,

Jason Roach
Caltrans Environmental Planning
District 7, 100 S. Main St, MS-16A
Los Angeles, CA 90012
(213) 897-0357

From: Mary.Nguyen@dot.gov
Sent: Tuesday, November 18, 2014 3:43 PM
To: Roach, Jason P@DOT
Cc: Ray.Tellis@dot.gov; Raymond.Sukys@dot.gov
Subject: SR-710 North Study

Jason,

It is our understanding that the SR-710 North Study is considering multiple modal alternatives, but does not include funding or any approvals by FTA at this time. As such, FTA has no jurisdiction or authority with respect to the project, no expertise or information relevant to the project, and does not intend to submit comments on the project. Therefore, FTA declines to be a participating agency.

Should federal funding from FTA be applied to this project, then we would look forward to coordinating with the team.

Feel free to contact us if you have any questions.

Mary Nguyen | Environmental Protection Specialist
Federal Transit Administration, Region 9
Los Angeles Metropolitan Office
888 South Figueroa Street, Suite 2170
Los Angeles, CA 90017-5467
tel: 213.202.3960
fax: 213.202.3961
www.fta.dot.gov

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TRANSPORTATION CONFORMITY WORKING GROUP
of the
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

October 28, 2014
Minutes

THE FOLLOWING MINUTES ARE A SUMMARY OF THE MEETING OF THE TRANSPORTATION CONFORMITY WORKING GROUP. A DIGITAL RECORDING OF THE ACTUAL MEETING IS AVAILABLE FOR LISTENING IN SCAG'S OFFICE.

The Meeting of the Transportation Conformity Working Group was held at the SCAG office in Los Angeles.

In Attendance:

Baker, Jillian	SCAQMD
Galvan, Randy	Caltrans
Jaffery, Edison	Caltrans, District 8
Lor, David	Metro
Louka, Tony	Caltrans, District 8
Morris, Michael	FHWA
Sherwood, Arnie	

SCAG

Asuncion, John
Luo, Rongsheng

Via Teleconference:

Anderson, Cari	ARB
Aurasteh, Reza	Caltrans, District 12
Denno, Neal	Parsons
Behtash, Arman	Caltrans, District 12
Cacatian, Ben	VCAPCD
Chang, Paul	Caltrans, District 12
Cooper, Keith	ICF
De Salvio, Alan	AVAQMD and MDAQMD
DeHate, Eric	RCTC
Gallo, Ilene	Caltrans, District 11
Hosseini, Ehsan	TAHA
Lay, Keith	LSA Associates
Mills, Jeff	OCTA
Moe-Luna, Lorelle	RCTC
O'Connor, Karina	EPA, Region 9
Silverman, Sam	TAHA
Todaro, Ryan	Parsons
Tavitas, Rodney	Caltrans Headquarters
Yoon, Andrew	Caltrans, District 7

TRANSPORTATION CONFORMITY WORKING GROUP
of the
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

October 28, 2014
Minutes

1.0 CALL TO ORDER AND SELF-INTRODUCTION

Tony Louka, TCWG Chair, called the meeting to order at 10:05 am. Mr. Louka acknowledged Dan Garcia, outgoing TCWG Member representing SCAQMD, for his active participation and contribution to TCWG, and welcomed Dr. Jillian Baker as new SCAQMD representative.

2.0 PUBLIC COMMENT PERIOD

There were no public comments.

3.0 CONSENT CALENDAR

3.1 TCWG September 23, 2014 Meeting Minutes
The meeting minutes were deferred to the next meeting.

4.0 INFORMATION ITEMS

4.1 Review of PM Hot Spot Interagency Review Forms

1) Rail Road Canyon Interchange Project
PM hot spot interagency review form for the project was withdrawn at the meeting.

2) 18790
It was determined that the TSM/TDM, BRT, and LRT alternatives of the project are not POAQCs while all of the Tunnel alternatives are POAQCs.

4.2 Review of PM Hot Spot Quantitative/Qualitative Analyses

1) 0C2500 Updated Modeling Protocol
Project consultant discussed, responded to, and sought clarifications about SCAQMD comments on the updated modeling protocol. A follow-up teleconference will be scheduled after EPA comments are available.

2) ORA030605
It was determined that the qualitative analysis is acceptable for NEPA circulation.

4.3 FTIP Update
John Asuncion, SCAG, reported the following:

- 2013 FTIP Administrative Modification #13-21, final one for 2013 FTIP, had been approved.
- 2015 FTIP is still anticipated to be approved by FHWA/FTA in mid-December 2014.

- 2015 FTIP Amendment #15-01 had been submitted to Caltrans and FHWA/FTA and is expected to be approved by FHWA/FTA at the same time as 2015 FTIP.
- Project submittals from county transportation commissions would be due to SCAG by November 4, 2014 for 2015 FTIP Administrative Modification #15-02.

4.4 <u>RTP Update</u>

The following RTP update email from Daniel Tran, SCAG, was forwarded to TCWG after the meeting:

- SCAG is currently in the initial stages towards the overall development of the 2016-2040 RTP/SCS. To date, SCAG has submitted the list of RTP projects, current as of Amendment No. 2 to the 2012-2035 RTP/SCS, to the six County Transportation Committees (CTCs) that serve the SCAG region for input. We anticipate for the CTCs to provide us with finalized project lists to be included as part of the 2016-2040 RTP/SCS by the end of November 2014. On October 24, 2014 SCAG conducted a workshop providing an overview of the project list and Q/A session to the various staff members from the six CTCs. At the moment, SCAG staff has been working closely with the CTCs towards ensuring that the list of RTP projects is updated accordingly and to assist with any issues that the CTCs may come across when populating the various fields as outlined in the project list.

4.5 <u>EPA Update</u>

Karina O’Connor, EPA Region 9, reported that EPA had recently released an update to MOVE2014.

4.6 <u>ARB Update</u>

Cari Anderson, ARB, reported the following:

- Updates to Coachella Valley and Western Mojave Desert 1997 8-hour Ozone Standard SIPs were adopted by ARB Board on October 24, 2014; Both SIP Updates include new transportation conformity budgets and will be submitted to EPA.
- Draft Imperial County 2006 PM2.5 Standard SIP had been released by Imperial County Air District for public review and would be presented to its Board for adoption in early November; The Draft PM2.5 SIP also includes new transportation conformity budgets and is scheduled to be adopted by ARB Board on December 18, 2014.

- An EMFAC 2014 Public Workshop would be held in Sacramento on November 7, 2014 and also be webcasted; EMFAC2014 is still scheduled to be released by end of 2014.

4.7 Air Districts Update

Ben Cacatian, VCAPCD, reported that VCAPCD was refining emission forecast as part of its SIP development for 2008 8-hour Ozone Standard.

Alan De Salvio, AVAMQD and MDAQMD, reported that no TCMs are anticipated to be included in Western Mojave Desert 2008 8-hour Ozone Standard SIP.

The following air district update email from Dr. Jillian Baker, SCAQMD, was forwarded to TCWG after the meeting:

- On October 28, 2014, there was an AQMP Advisory Group Meeting (http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=2016-aqmp-advisory-group-meeting-october-28-2014). SCAQMD staff is continuing work on the white papers and finished review of the socioeconomic assessment. More importantly, the 2012 AQMP projected attainment of the 24-hour PM2.5 standard (35 µg/m3) at the end of 2014, however, preliminary monitoring data for this year indicates that attainment is not likely to occur, so are working on an extension request with EPA. More details can be found on the slides.

5.0 INFORMATION SHARING

None.

6.0 ADJOURNMENT

The meeting was adjourned at 11:17 am.

The next Transportation Conformity Working Group meeting will be held on Tuesday, December 2, 2014 at the SCAG office in downtown Los Angeles.

PM Hot Spot Analysis Project Lists

Review of PM Hot Spot Interagency Review Forms

October, 2014	Determination
RailroadCanyonInterchange October 2014	
18790 October 2014 18790 October 2014 EPAcomments	TSM/TDM, BRT, and LRT alternatives of the project are not POAQCs - Hot Spot Analysis Not Required; All Tunnel alternatives are POAQCs.

EPA Comments re. Revised PM Hot Spot Interagency Review Form for 18790 (SR-710)

From: OConnor, Karina [mailto:OConnor.Karina@epa.gov]
Sent: Tuesday, August 12, 2014 2:58 PM
To: Yoon, Andrew U@DOT; Rongsheng Luo
Subject: RE: SR-710, PM Hot-Spot Form review

Andrew and Rongsheng – as I mentioned in my voicemail, EPA has reviewed the information in the form you submitted for the SR-710 project as well as the additional information you provided in the figures and project description documents. We agree that the following alternatives are not projects of air quality concern.

- TSM/TDM
- BRT
- LRT

However, based on the increases in truck traffic (Truck ADT above 9,000 in Dual Bore and above 5,000 in Single Bore without trucks) shown in some intersections for the Tunnel alternatives and the nature of the alternatives increasing capacity on new facilities, we recommend that all of the Tunnel alternatives are projects of air quality concern, therefore would need a full quantitative PM hot spot analysis to show conformity.

Please give me a call if you'd like to discuss this further.

Thanks, Karina

Karina OConnor
EPA, Region 9
Air Planning Office (AIR-2)
(775) 434-8176
oconnor.karina@epa.gov

6. List of Preparers

This chapter lists the State, Federal, and Local Agency personnel, including consultants, who were primarily responsible for preparing this Environmental Impact Report/Environmental Impact Statement for the SR 710 North Project.

6.1 Lead Agency

6.1.1 California Department of Transportation, District 7

Ron Kosinski, Deputy District Director, Division of Environmental Planning

John Lee, Project Manager

Paul Caron, Senior District Biologist

Mariam Daduhl, Associate Environmental Planner (Archaeologist)/District Native American Coordinator

Garrett Damrath, Assistant Deputy District Director, Division of Environmental Planning

Kelly Ewing-Toledo, Senior Heritage Resources Coordinator

Francesca Smith, Associate Environmental Planner, Principal Architectural Historian

Claudia Harbert, Associate Environmental Planner, Principal Architectural Historian

Derek Higa, Assistant District Division Chief, Design

Kaz Kayoda, Senior Transportation Engineer

Alex Kirkish, District Archaeologist *(no longer with Caltrans)*

Jin S. Lee, P.E., PMP, Branch Chief, Noise & Vibration Branch

Arnold Parmar, Senior Engineer, Noise & Vibration Branch

Sally Moawad, Associate Environmental Planner

Allison Morrow, Senior Environmental Planner *(no longer with Caltrans)*

Jason Roach, Senior Environmental Planner

Lourdes Ortega, Senior Environmental Planner

Andrew Yoon, P.E., Senior Transportation Engineer, Air Quality Branch

Dawn Kukla, Supervising Environmental Planner (Paleontology)

Dahlia Persoff, Landscape Associate

Penny Nakashima, P.G., Senior Engineering Geologist (Hazardous Waste)

6.2 Project Participating Agency

6.2.1 Los Angeles County Metropolitan Transportation Authority

Michelle Smith, P.E., Project Manager, Highway Program

Cleavon Govan, Senior Environmental Specialist, Highway Program *(no longer with Metro)*

Abdollah Ansari, Senior Executive Officer, Construction & Engineering

Carlos Montez, Senior Planner, Highway Program

Lilian De Loza-Gutierrez, Community Relations Manager
Aziz Elattar, Executive Officer, Highway Program *(no longer with Metro)*
Vincent Gonzalez, Community Relations Manager *(no longer with Metro)*
Helen Ortiz-Gilstrap, Community Relations/Media Manager *(no longer with Metro)*
Luis Vizcaino, Director, Community Relations *(no longer with Metro)*
Ann Kerman, Deputy Executive Officer, Community Relations *(no longer with Metro)*
Emmanuel Liban, P. E., Deputy Executive Officer, Environmental Compliance Services
Martha Butler, Director, Countywide Planning and Development
Thomas Eng, Director, Safety Certification & Operations Management
Wyman Jones, Director Project Engineering
Stewart Chesler, Transportation Planning Manager, Service Planning & Schedule
Brandon Farley, Transportation Planning Manager, Rail Operations
Robert Farley, Transportation Planning Manager, Systems Analysis and Research

6.3 Consultants to the Lead Agency

6.3.1 CH2M HILL

Yoga Chandran, Ph.D., Project Manager *(no longer with CH2M*)
Lilly Acuna, Project Administrator/Environmental Planner *(no longer with CH2M*)
Heather Anderson, Project Engineer
Sarah Baker, Environmental Planner
Jim Bednar, NEPA Documentation Review *(no longer with CH2M)*
Tim Bevan, Multi-modal Analysis Lead
Loren Bloomberg, Transportation Lead/Project Manager
Susan Chau, Bus Rapid Transit Alternative Engineer *(no longer with CH2M)*
George Hsu, Location Hydraulic Study, Drainage Report Task Manager
Wilfred Hsu, Location Hydraulic Study
Tom Ionta, Preliminary Engineering Task Manager *(no longer with CH2M)*
Dan Jankly, Senior Engineering Geologist
Ryan Meza, Project Engineer
Ryan Mitry, Freeway Tunnel Alternative Task Manager
Carlos Montez, Environmental Director *(no longer with CH2M)*
Tami Podesta, Senior Environmental Planner
Ravee Raveendra, Preliminary Geotechnical Report Task Manager
Cindy Salazar, Environmental Planner *(no longer with CH2M)*
Elisabeth Suh, Senior Environmental Planner *(no longer with CH2M*)
Hong Zhuang, Health Risk Assessment Task Manager

Dave Golles, Hazardous Waste Initial Site Assessment Task Manager

Jose Herrera, Transportation Engineer

6.3.2 LSA Associates, Inc.

Rob McCann, Principal, Environmental Studies and Documentation Manager

Deborah Pracilio, Principal, Environmental Task Manager

Jane Dillon, Environmental Planner, Assistant Project Manager, CIA and Section 4(f) reports, EIR/EIS documentation *(no longer with LSA)*

Nicole West, CPSWQ, QSD/QSP, Associate, Assistant Project Manager, Water Quality Assessment and Summary Floodplain Encroachment, EIR/EIS documentation

Elisa Bechtel, Cultural and Historical Resources *(no longer with LSA)*

Jennette Bosseler, Technical Editor/Word Processor

Ronald Brugger, Senior Air Quality Specialist, Energy Analysis Task Manager, PM Analysis

Ryan Bensley, Senior Environmental Planner, Community Impact Assessment Task Manager, EIR/EIS documentation

Maryanne Cronin, Assistant Environmental Planner, Cultural Resources and EIR/EIS documentation *(no longer with LSA)*

Meredith Canterbury, GIS Specialist

Tony Chung, Principal, Air Quality, Noise and Energy Group *(no longer with LSA)*

Jade Dean, Assistant GIS Specialist *(no longer with LSA)*

Gary Dow, Associate, Graphics

Richard Erickson, Associate, Biologist

Tom Flahive, Senior GIS Specialist

Logan Freeman, Noise Study Report

Terri Fulton, Senior Cultural Resources Manager, Native American Consultation *(no longer with LSA)*

Art Homrighausen, Principal, Biological Resource Task Reviewer

Jayna Harris, Senior Environmental Planner, Cumulative Impact Assessment Task Manager, EIR/EIS documentation

Hillary Haskell, Assistant Environmental Planner, Community Impact Assessment, Cultural Resources and EIR/EIS documentation *(no longer with LSA)*

Eugene Heck, Cultural and Historical Resources

Christine Huard-Spencer, Senior Environmental Planner, Section 4(f) Task Manager, EIR/EIS documentation *(no longer with LSA)*

Beverly Inloes, Associate, Lead Technical Editor/Word Processor

Lauren Johnson, Technical Editor

Corey Knips, Noise Study Report *(no longer with LSA)*

Keith Lay, Air Quality Analysis and PM Analysis Task Manager *(no longer with LSA)*

Danette Lebron, Word Processor *(no longer with LSA)*

Bridget Lillis, Assistant Environmental Planner, Water Quality Assessment and EIR/EIS documentation

Jason Lui, Senior Noise Specialist, Noise Study Report

Debbie McLean, Cultural Resources Task Lead *(no longer with LSA)*

Allison Morrow, Senior Environmental Planner

Matt Philips, Graphics Technician

Pam Reading, Senior Environmental Planner, Water Quality Assessment and Summary Floodplain Encroachment, EIR/EIS documentation

Adam Remmel, Noise Study Report

Justin Roos, Associate, Senior GIS Specialist

Sarah Rieboldt, Paleontological Evaluation Report/Impact Report Task Lead

Mario Scalzo, Assistant Environmental Planner, EIR/EIS documentation *(no longer with LSA)*

J.T. Stephens, Senior Noise Specialist, Noise Study Report Task Manager

Casey Tibbet, Cultural and Historical Resources

Chantik Virgil, Word Processor

6.3.3 AECOM

Steve Greene, Alternatives Analysis Task Manager *(no longer with AECOM)*

Michael Arizabal, Parking Impact Analysis

William Anderson, Economic and Fiscal Impact Analysis Task Manager

Lance Harris, Economic and Fiscal Impact Analysis

Christine Safriet, Economic and Fiscal Impact Analysis

Ryan Winn, Project Assistant

Joel Ulloa, GIS/Graphics

Jamal Al-Mashat, LRT Preliminary Engineering Task Manager *(no longer with AECOM)*

6.3.4 Barrio Planners, Inc.

William Villalobos, Project Manager

Korajack Srivongse, Visual Resources

Luis Vázquez, Visual Resources

6.3.5 D'Leon Consulting Engineers Corporation

Domingo Leon, Project Manager

Paul Spiteri, Utility Research and Relocation

6.3.6 Dean Ryan Consultants and Designers

Bill Stracker, Engineer *(no longer with Dean Ryan Consultants and Designers)*

Jim Fowler, Engineer

Jimmy Todorov, Engineer

6.3.7 Earth Consultants International

Eldon Gath, Project Manager, Geology, Fault Rupture Evaluation

6.3.8 Epic Land Solutions, Inc.

Jim Overcamp, Project Manager

B.J. Swanner, Relocation Impact Report, Right of Way Data Sheets

Ron Wicks, Relocation Impact Statement, Right of Way Data Sheets Task Manager

6.3.9 GPA Consulting

Andrea Galvin, Principal Architectural Historian

Christine Miller Cruiess, Architectural Historian

6.3.10 ILF Consulting Engineers

Jim Morrison, Task Manager

6.3.11 JMDiaz Inc.

Juan Diaz, Engineer

6.3.12 McMillen Jacobs Associates

Steve Dubnewych, Tunnel Design Task Manager *(no longer with McMillen Jacobs Associates)*

Steve Klein, Tunnel Design *(no longer with McMillen Jacobs Associates)*

Michael Torsiello, Tunnel Design *(no longer with McMillen Jacobs Associates)*

John Waggoner, Tunnel Design

6.3.13 Sapphos Environmental, Inc.

Marie Campbell, Project Manager

Shudeish Mahadev

Karl Holland, Archaeological Study Report Task Lead *(no longer with Sapphos Environmental, Inc.)*

Rachel Nixon, Archaeological Study Report *(no longer with Sapphos Environmental, Inc.)*

Joseph Platt, Natural Environment Study and Jurisdictional Delineation Reports

Pauline Roberts, PhD., Natural Environment Study and Jurisdictional Delineation Reports Task Manager *(no longer with Sapphos Environmental, Inc.)*

Roberta Thomas, Archaeological Study Report *(no longer with Sapphos Environmental, Inc.)*

Ryan Villanueva, Natural Environment Study and Jurisdictional Delineation Reports

Lauren Zameito, Natural Environment Study

Dustin Keeler, Paleontological Identification and Evaluation Report

6.3.14 Tatsumi and Partners

David Tatsumi, Project Manager, Visual Resources Impact Report

Gregg Hudspeth, Visual Resources Impact Report

Abby Jones, Visual Resources Impact Report

Wey Kang, Visual Resources Impact Report

Karen Shiba, Visual Resources Impact Report *(no longer with Tatsumi and Partners)*

6.3.15 Wilson, Ihrig and Associates

Richard Carman, Project Manager, Groundborne Noise and Vibration Report Task Manager

Patrick Farner, Groundborne Noise and Vibration Report

Deborah Jue, Groundborne Noise and Vibration Report

7. Distribution List

7.1 Federal Agencies

Advisory Council on Historic Preservation
Reid Nelson
Director
401 F Street NW, Suite 308
Washington, DC 20001

Federal Emergency Management Agency
Alessandro Amaglio
Environmental Officer
1111 Broadway, Ste. 1200
Oakland, CA 94607

Federal Transit Administration
Leslie T. Rogers
Regional Administrator
Region IX
90 Seventh Street, Ste. 15-300
San Francisco, CA 94103

Federal Transit Administration
Ray Tellis
Director
LA Metropolitan Office
90 7th Street, Suite 15-300
San Francisco, CA 94103

National Park Service
Laura Joss
Regional Director
Pacific West Region
333 Bush Street, Ste. 500
San Francisco, CA 94104

U.S. Army Corps of Engineers
Environmental Resources Branch
Los Angeles District
915 Wilshire Boulevard
Los Angeles, CA 90017

U.S. Army Corps of Engineers
Mark Cohen
Deputy Chief, Regulatory Division
Los Angeles District
915 Wilshire Boulevard
Los Angeles, CA 90017

U.S. Army Corps of Engineers
Stephanie Hall
Environmental Protection Specialist/TAC Member
Los Angeles District
915 Wilshire Boulevard
Los Angeles, CA 90017

U.S. Department of Agriculture,
Natural Resources Conservation
Area Conservationist
Oxnard Service Center
P.O. Box 63
3550 S. Harbor Blvd., Ste. 2-202
Oxnard, CA 93035

U.S. Department of Energy
Director, Office of Environmental Management
1000 Independence Ave., SW
Washington, D.C. 20585

U.S. Department of Health and Human Services
Director, Office of Environmental Affairs
200 Independence Ave., SW, Rm. 537 F
Washington, D.C. 20201

U.S. Department of Housing and Urban Development
Ray Brewer
Los Angeles Field Office
300 N. Los Angeles St., Ste. 4054
Los Angeles, CA 90012

U.S. Department of the Interior
Patricia Port
Regional Environmental Officer
Office of Environmental Policy and Compliance, Oakland Region IX
333 Bush Street, Suite 515
San Francisco, CA 94104

U.S. Department of the Interior
Director
Office of Environmental Policy and Compliance
1849 C Street NW MS 5538
Washington, D.C. 20240

U.S. Environmental Protection Agency
Carolyn Mulvihill
USEPA Region 9
75 Hawthorne Street
San Francisco, CA 94105

U.S. Environmental Protection Agency
Connell Dunning
Transportation Team Supervisor
Environmental Review Section
USEPA Region 9
75 Hawthorne Street
San Francisco, CA 94105

U.S. Environmental Protection Agency
Southern California Field Office
600 Wilshire Boulevard, Ste. 1460
Los Angeles, CA 90017

U.S. Fish and Wildlife Service
Karen A. Goebel
Assistant Field Supervisor
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

U.S. Fish and Wildlife Service
Sally Brown
Assistant Field Supervisor
Carlsbad Fish and Wildlife Office
2177 Salk Avenue
Carlsbad, CA 92008

7.2 State Agencies

California Air Resources Board
Mary Nichols
Chief
Planning and Technical Support Division
1001 I Street
Sacramento, CA 95814

California Department of Conservation
David Burin
Director
801 K St., MS 24-01
Sacramento, CA 95814

California Department of Fish and Wildlife
Ed Pert
Regional Manager
South Coast Region
4949 View Ridge Ave.
San Diego, CA 92123

California Department of Parks and Recreation
Julianne Polanco
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd St., Ste 100
Sacramento, CA 95816

California Department of Resources Recycling and Recovery
1001 I Street
P.O. Box 4025
Sacramento, CA 95812

California Department of Toxic Substances Control
Chatsworth Regional Office
9211 Oakdale Ave.
Chatsworth, CA 91311

California Department of Water Resources
Karla Nemeth
Director
1416 9th Street
Sacramento, CA 95814

California Environmental Protection Agency
Matthew Rodriguez
Secretary
1001 I Street
Sacramento, CA 95812

California Highway Patrol
Southern Division
411 N. Central Ave., Ste. 410
Glendale, CA 91203

California Natural Resources Agency
John Laird
Secretary
1416 Ninth St., Ste. 1311
Sacramento, CA 95814

California Public Infrastructure Advisory Commission
Business, Transportation, and Housing Agency
980 9th St., Ste. 2450
Sacramento, CA 95814

California Public Utilities Commission
Michael Picker
President
505 Van Ness Ave.
San Francisco, CA 94102

California Transportation Commission
Fran Inman
Commission Chair
1120 N St., Rm. 2221, MS 52
Sacramento, CA 95814

California Water Resources Control Board
Felicia Marcus
Chair
1001 I Street
Sacramento, CA 95814

Headquarters Division of Environmental Analysis (for CTC Submission)
Jose Oseguera
1120 N Street, MS 52
Sacramento, CA 95814

Native American Heritage Commission
1550 Harbor Blvd., Ste. 100
West Sacramento, CA 95691

Native American Tribal Councils
Inter-Tribal Council of California
3425 Arden Way
Sacramento, CA 95825

Office of California Emergency Services
Mark Ghilarducci
Director
3650 Schriever Ave.
Mather, CA 95655

State Clearinghouse
P.O. Box 3044
Sacramento, CA 95812

7.3 Regional Agencies

Los Angeles County Metropolitan
Transportation Authority
Susan Chapman
CEQA Review Coordination
One Gateway Plaza, MS 99-23-2
Los Angeles, CA 90012

Regional Water Quality Control Board
Region 4
320 W. 4th St., Ste. 200
Los Angeles, CA 90013

San Gabriel and Lower Los Angeles
Rivers and Mountains Conservancy
Mark Stanley
Executive Director
100 N. Old San Gabriel Canyon Rd.
Azusa, CA 91702

San Gabriel Valley Council of
Governments
Cynthia Sternquist
President
1000 S. Fremont Ave., Unit 42
Alhambra, CA 91803

San Gabriel Valley Council of
Governments
Marisa Creter
Executive Director
1000 S. Fremont Ave., Unit 42
Alhambra, CA 91803

South Coast Air Quality Management
District
Wayne Nastri
Executive Officer
21865 Copley Dr.
Diamond Bar, CA 91765

Southern California Association of
Governments
Hasan Ikhrata
Executive Director
900 Wilshire Blvd., 17th Floor
Los Angeles, CA 90017

Southern California Association of
Governments
Philip Law
Transit/Rail Manager
900 Wilshire Blvd., 17th Floor
Los Angeles, CA 90017

Southern California Association of
Governments
Inter-Governmental Review Program
900 Wilshire Blvd., 17th Floor
Los Angeles, CA 90017

7.4 County Agencies

Los Angeles County Department of
Parks and Recreation
520 S. Vermont Ave.
Los Angeles, CA 90020

Los Angeles County Department of
Public Health
Cyrus Rangan
Director
313 N. Figueroa St., Rm. 806
Los Angeles, CA 90012

Los Angeles County Department of
Public Works
John Walker/TAC Member
Assistant Deputy Director
900 S. Fremont Ave.
Alhambra, CA 91803

Los Angeles County Department of
Regional Planning
320 W. Temple St.
Hall of Records Rm. 1360
Los Angeles, CA 90012

Los Angeles County Fire Department
Kevin T. Johnson
Acting Chief, Forestry Division
1320 N. Eastern Ave.
Los Angeles, CA 90063

Los Angeles County Office of
Emergency Management
1275 N. Eastern Ave.
Los Angeles, CA 90063

Los Angeles County Public Health
Office of Planning
5050 Commerce Drive
Baldwin Park, CA 91706

Los Angeles County Sanitation
Districts
Adriana Raza
P.O. Box 4998
Whittier, CA 90607

Los Angeles County Sheriff's
Department
Headquarters Bureau
4700 Ramona Blvd.
Monterey Park, CA 91754

7.5 Tribal Governments

Gabrieleno Band of Mission Indians
Andrew Salas
Chairperson
P.O. Box 393
Covina, CA 91723

Gabrieleno Tongva Indians of California Tribal Council
Robert Dorame
Tribal Chair/Cultural Resources
Gabrielino Tongva Nation
P.O. Box 490
Bellflower, CA 90707

Gabrieleno/Tongva Council
Sam Dunlap
Cultural Resources Director
Gabrielino Tongva Nation
P.O. Box 86908
Los Angeles, CA 90089

Gabrieleno/Tongva Tribal Council of San Gabriel
Anthony Morales
Tribal Chairperson
PO Box 693
San Gabriel, CA 91778

Gabrielino-Tongva Tribe
Linda Candelaria
Co-Chairperson
P.O. Box 180
Bonsall, CA 92003

Gabrielino-Tongva Tribe
Conrad Acuna
P.O. Box 180
Bonsall, CA 92003

Gabrielino-Tongva Tribe
Bernie Acuna
Co-Chairperson
P.O. Box 180
Bonsall, CA 92003

Los Angeles City/County Native American Indian Community
Ron Andrade
Director
3175 W. 6th St., Rm. 403
Los Angeles, CA 90020

Ti'At Society
Cindi Alvitre
6515 E. Seaside Walk, Unit C
Long Beach, CA 90803

Ti'At Society
Cindi Alvitre
Chairwoman-Manisar
3094 Mace Acenue, Apartment B
Costa Mesa, CA 92626

Tongva Ancestral Territorial Tribal Nation
John Tommy Rosas
Tribal Administrator
Address incomplete/not provided

7.6 Libraries

7.6.1 County

Los Angeles County Library
Anthony Quinn Library
3965 Cesar E. Chavez Ave.
Los Angeles, CA 90063

Los Angeles County Library
Baldwin Park Library
4181 Baldwin Park Blvd,
Baldwin Park, CA 91706

Los Angeles County Library
City Terrace Library
4025 E. City Terrace Dr.
Los Angeles, CA 90063

Los Angeles County Library
Duarte Library
1301 Buena Vista St.
Duarte, CA 91010

Los Angeles County Library
East LA Library
4837 E. 3rd St.
Los Angeles, CA 90022

Los Angeles County Library
El Monte Library
3224 N. Tyler Ave.
El Monte, CA 91731

Los Angeles County Library
La Cañada Flintridge Library
4545 N. Oakwood Ave.
La Canada Flintridge, CA 91011

Los Angeles County Library
Live Oak Library
4153 E. Live Oak Ave.
Arcadia, CA 91006

Los Angeles County Library
Norwood Library
4550 N. Peck Rd.
El Monte, CA 91732

Los Angeles County Library
Rosemead Library
8800 Valley Blvd.
Rosemead, CA 91770

Los Angeles County Library
South El Monte Public Library
1430 North Central Avenue
South El Monte, CA 91733

Los Angeles County Library
Temple City Library
5939 Golden West Ave.
Temple City, CA 91780

7.6.2 City of Los Angeles

Los Angeles City Library
Arroyo Seco Regional Branch
6145 N. Figueroa St.
Los Angeles, CA 90042

Los Angeles City Library
Chinatown Neighborhood Branch
639 N. Hill Street
Los Angeles, CA 90012

Los Angeles City Library
Cypress Park Neighborhood Branch
1150 Cypress Avenue
Los Angeles, CA 90065

Los Angeles City Library
Eagle Rock Neighborhood Branch
5027 Caspar Ave.
Los Angeles, CA 90041

Los Angeles City Library
El Sereno Neighborhood Branch
5226 Huntington Dr. South
Los Angeles, CA 90032

Los Angeles City Library
Lincoln Heights Neighborhood Branch
2530 Workman St.
Los Angeles, CA 90031

Los Angeles City Library
Malabar Neighborhood Branch
2801 Wabash Ave.
Los Angeles, CA 90033

Los Angeles City Library
Robert Louis Stevenson Branch
803 Spence Street
Los Angeles, CA 90023

7.6.3 Other Cities

Alhambra Civic Center Library
101 S. First St.
Alhambra, CA 91801

Altadena Main Library
600 East Mariposa St.
Altadena, CA 91001

Arcadia Public Library
20 W. Duarte Rd.
Arcadia, CA 91007

Azusa Public Library
729 N. Dalton Ave.
Azusa, CA 91702

Cal State University Los Angeles
JFK Memorial Library
5151 State University Dr.
Los Angeles, CA 90032

East Los Angeles College
Helen Miller Bailey Library
1301 Avenida Cesar Chavez
Monterey Park, CA 91754

Glendale Central Library
222 East Harvard St.
Glendale, CA 91205

Irwindale Public Library
5050 N. Irwindale Ave.
Irwindale, CA 91706

Monrovia Public Library
321 S. Myrtle Ave.
Monrovia, CA 91016

Monterey Park Public Library
Bruggemeyer Library
318 S. Ramona Ave.
Monterey Park, CA 91754

Pasadena City College
Shatford Library
1570 E. Colorado Boulevard
Pasadena, CA 91106

Pasadena Public Library
Central Library
285 E. Walnut St.
Pasadena, CA 91101

Pasadena Public Library
Hastings Branch
3325 East Orange Grove
Pasadena, CA 91107

Pasadena Public Library
Hill Avenue Branch
55 South Hill Ave.
Pasadena, CA 91106

Pasadena Public Library
Lamanda Park Branch
140 S. Altadena Ave.
Pasadena, CA 91107

Pasadena Public Library
La Pintoresca Branch
1355 N. Raymond Ave.
Pasadena, CA 91103

Pasadena Public Library
Linda Vista Branch
1281 Bryant St.
Pasadena, CA 91103

Pasadena Public Library
San Rafael Branch
1240 Nithsdale Rd.
Pasadena, CA 91105

Pasadena Public Library
Villa Parke Community Center Library
363 E. Villa St.
Pasadena, CA 91101

San Gabriel Public Library
San Gabriel Library
500 S. Del Mar Avenue
San Gabriel, CA 91776

San Marino Public Library
Crowell Library
1890 Huntington Dr.
San Marino, CA 91108

Sierra Madre Public Library
440 W. Sierra Madre Blvd.
Sierra Madre, CA 91024

South Pasadena Public Library
1100 Oxley St.
South Pasadena, CA 91030

7.7 School Districts/Educational Institutions

Alhambra Unified School District
Denise R. Jaramillo
Superintendent
1515 W. Mission Rd.
Alhambra, CA 91803

Baldwin Park Unified School District
Froilan N. Mendoza, Ed.D.
Superintendent
3699 N. Holly Ave.
Baldwin Park, CA 91706

East Los Angeles College
Professor Jeffrey Hernandez
1301 Avenida Cesar Chavez
Monterey Park, CA 91754

Fremont Elementary School
Ignacio Muñiz, Ed.D
Principal
2001 S Elm Street
Alhambra, CA 91803

La Cañada Unified School District
Wendy Sinnette
Superintendent
4490 Cornishon Ave.
La Canada, CA 91011

Pasadena City College
Area 5
Dr. Rajen Vurdien
Superintendent President
1570 E. Colorado Boulevard
Pasadena, CA 91106

San Gabriel Unified School District
Dr. David Yoshihara
Superintendent
408 Junipero Serra Dr.
San Gabriel, CA 91776

Arcadia Unified School District
David Vannasdall
Superintendent
150 S. Third Avenue
Arcadia, CA 91006

California State University, Los Angeles
Warren Jacobs
Associate Vice President for Facilities, Planning, Design and Construction
5151 State University Drive
Los Angeles, CA 90032

East Los Angeles College
Marvin Martinez
College President
1301 Avenida Cesar Chavez
Monterey Park, CA 91754

Keck School of Medicine of USC
Andrea Hricko
Professor of Clinical Preventative Medicine
2001 N Soto St, MC 9237
Los Angeles, CA 90089

Los Angeles Unified School District
Ramon Cortines
Interim Superintendent
Office of the Superintendent
333 S. Beaudry Ave.
Los Angeles, CA 90017

Pasadena Unified School District
Dr. Brian McDonald
Superintendent
351 S. Hudson Ave.
Pasadena, CA 91109

San Marino Unified School District
Dr. Alex Cherniss
Superintendent
1665 West Dr.
San Marino, CA 91108

Azusa Unified School District
Dr. Linda Kaminski
Superintendent
546 S. Citrus Ave.
Azusa, CA 91702

Duarte Unified School District
Dr. Terry Nichols
Superintendent
1620 Huntington Dr.
Duarte, CA 91010

El Monte City School District
Dr. Maribel Garcia
Superintendent
3540 N. Lexington Ave.
El Monte, CA 91731

La Cañada Unified School District
Kaitzer Puglia
Governing Board President
4490 Cornishon Ave.
La Canada, CA 91011

Monrovia Unified School District
Dr. Katherine Thorossian
Superintendent
325 E. Huntington Dr.
Monrovia, CA 91016

Rosemead School District
Dr. Amy Enomoto-Perez
Superintendent
3907 Rosemead Blvd.
Rosemead, CA 91770

San Marino Unified School District
David Vannasdall
Superintendent
1665 West Dr.
San Marino, CA 91108

Sequoyah School
Josh Brody
Director of School
535 S. Pasadena Avenue
Pasadena, CA 91105

Sequoyah School
Michael Barak
President, Board of Trustees
535 South Pasadena Avenue
Pasadena, CA 91105

South Pasadena Unified School District
Dr. Geoff Yantz
Superintendent
1020 El Centro St.
South Pasadena, CA 91030

St Frances High School
Fr. Tony Marti
President
2005 Foothill Blvd
La Canada Flintridge, CA 91011

Temple City Unified School District
Kathy Perini
Superintendent
9700 Las Tunas Dr.
Temple City, CA 91780

The Waverly School
Heidi Johnson
Head of School
67 W Bellevue Dr
Pasadena, CA 91105

University of Southern California
Rob McConnell
2001 N. Soto Street #230 D
Los Angeles, CA 90089

7.8 Local Agencies

Arroyo Verdugo Communities Joint Powers Authority
Margaret McAustin
Chair
1327 Foothill Blvd.
La Canada Flintridge, CA 91001

City of Alhambra
Jessica Binnquist
City Manager
111 S. First St.
Alhambra, CA 91801

City of Alhambra
Mark Paulson
Chairman, Alhambra Planning Commission
111 South First Street
Alhambra, CA 91801

City of Arcadia
Dominic Lazzaretto
City Manager
240 W. Huntington Dr.
Arcadia, CA 91007

City of Azusa
Sergio Gonzalez
City Manager
213 E. Foothill Blvd.
Azusa, CA 91702

City of Baldwin Park
Shannon Yauchzee
Chief Executive Officer
14403 E. Pacific Ave.
Baldwin Park, CA 91706

City of Bradbury
Kevin Kearny
City Manager
600 Winston Ave.
Bradbury, CA 91008

City of Duarte
Darrell George
City Manager/TAC member
1600 Huntington Dr.
Duarte, CA 91010

City of El Monte
Alex Hamilton
City Manager
City Hall East
11333 Valley Blvd.
El Monte, CA 91731

City of Glendale
Fred Zohrehvan
Assistant Traffic & Transportation Administrator
613 E. Broadway
Glendale, CA 91206

City of Glendale
Yasmin K. Beers
City Manager
613 E. Broadway
Glendale, CA 91206

City of Irwindale
John Davidson
City Manager
5050 N. Irwindale Ave.
Irwindale, CA 91706

City of La Canada Flintridge
Mark R. Alexander
City Manager
1327 Foothill Blvd.
La Canada Flintridge, CA 91011

City of Los Angeles Department of Transportation
Ken Husting
Senior Transportation Engineer
100 South Main Street, 9th Floor
Los Angeles, CA 90012

City of Los Angeles Planning Department
Michael J. Logrande
Director of Planning
200 N. Spring Street, Room 525
Los Angeles, CA 90012

City of Los Angeles Public Works
Anthony E. Nyivih
Assistant Deputy Director
200 N. Spring Street, Room 525
Los Angeles, CA 90012

City of Los Angeles Public Works
Jim Doty
Env. Supervisor II
1149 S. Broadway, 6th Fl.
Los Angeles, CA 90015

City of Monrovia
Oliver Chi
City Manager
415 S. Ivy Ave.
Monrovia, CA 91016

City of Monterey Park
Amy Ho
Principal Management Analyst
320 W. Newmark Ave.
Monterey Park, CA 91754

City of Monterey Park
Ron Bow
City Manager
320 W. Newmark Ave.
Monterey Park, CA 91754

City of Monterey Park
Steven Klein
Traffic Commissions Chairperson
320 W. Newmark Ave.
Monterey Park, CA 91754

City of Pasadena
Steven Mermell
City Manager
100 N. Garfield Ave.
Pasadena, CA 91101

City of Rosemead
Gloria Molleda
City Manager
8838 E. Valley Blvd.
Rosemead, CA 91770

City of San Gabriel
Mark Lazzaretto
City Manager
425 S. Mission Dr.
San Gabriel, CA 91776

City of San Marino
Marcella Marlowe, Ph.D.
City Manager
2200 Huntington Dr., 2nd Fl.
San Marino, CA 91108

City of Sierra Madre
Gabriel Engeland
City Manager
232 W. Sierra Madre Blvd.
Sierra Madre, CA 91024

City of South El Monte
Jennifer Vazquez
City Manager
1415 Santa Anita Avenue
South El Monte, CA 91733

City of Pasadena
David M. Reyes
Director of Planning and Community
100 North Garfield Ave.
Pasadena, CA 91109

City of South Pasadena
City Council
1414 Mission St.
South Pasadena, CA 91030

City of South Pasadena
Stephanie DeWolfe
City Manager
1414 Mission St.
South Pasadena, CA 91030

City of Temple City
Bryan Cook
City Manager
9701 Las Tunas Dr.
Temple City, CA 91780

7.9 Federal Elected Officials

U.S. Representative
District 28
The Honorable Adam Schiff
245 East Olive Ave, #200
Burbank, CA 91502

U.S. Representative
District 32
The Honorable Grace Napolitano
4401 Santa Anita Ave, Suite 201
El Monte, CA 91731

U.S. Representative
District 34
The Honorable Jimmy Gomez
350 South Bixel Street, Suite 120
Los Angeles, CA 90017

U.S. Representative
District 27
The Honorable Judy Chu
527 S. Lake Ave, Suite 106
Pasadena, CA 91101

U.S. Senator
The Honorable Dianne Feinstein
11111 Santa Monica Blvd., Ste. 915
Los Angeles, CA 90025

U.S. Senator
The Honorable Kamala Harris
11845 W. Olympic Blvd., Ste. 1250W
Los Angeles, CA 90064

7.10 State Elected Officials

California State Assemblymember
District 48
The Honorable Blanca E. Rubio
100 Noth Barranca, Ste 895
West Covina, CA 91791

California State Assemblymember
District 57
The Honorable Ian C. Calderon
13181 Crossroads Parkway North, Ste. 160
City of Industry, CA 91746

California State Senator
District 25
The Honorable Anthony Portantino
116 E. Broadway, Ste. 204
Glendale, CA 91205

California State Senator
District 24
The Honorable Kevin de Leon
1808 W. Sunset Boulevard
Los Angeles, CA 90026

California State Assemblymember
District 41
The Honorable Chris Holden
600 N. Rosemead Blvd, Suite 117
Pasadena, CA 91107

California State Assemblymember
District 43
The Honorable Laura Friedman
300 E. Magnolia Blvd., Ste. 504
Burbank, CA 91502

California State Senator
District 22
The Honorable Ed Hernandez
100 S. Vincent Avenue., Ste 401
West Covina, CA 91790

California State Senator
District 32
- Vacant
17315 Studebaker Rd., Ste. 332
Cerritos, CA 90703

California State Assemblymember
District 49
The Honorable Ed Chau
1255 Corporate Center Dr., Ste. 306
Monterey Park, CA 91754

California State Assemblymember
District 51
The Honorable Wendy Carrillo
1910 W. Sunset Boulevard, Suite 810
Los Angeles, CA 90026

California State Senator
District 29
The Honorable Josh Newman
1800 E. Lambert Road, Ste 150
Brea, CA 92821

California State Senator
District 25
Suzanne Reed on behalf of the Honorable Carol Liu (no longer in office)
State Capitol #5907
3515 10th Street
Sacramento, CA 95814

7.11 County Elected Officials

LA County Supervisor
1st District
The Honorable Hilda L. Solis
Kenneth Hahn Hall of Administration
500 W. Temple St., Room 856
Los Angeles, CA 90012

LA County Supervisor
3rd District
The Honorable Sheila Kuehl
Kenneth Hahn Hall of Administration
500 W. Temple St., Room 821
Los Angeles, CA 90012

LA County Supervisor
4th District
The Honorable Janice Hahn
Kenneth Hahn Hall of Administration
500 W. Temple St., Room 822
Los Angeles, CA 90012

LA County Supervisor/Mayor
5th District
The Honorable Kathryn Barger
Kenneth Hahn Hall of Administration
500 W. Temple St., Room 869
Los Angeles, CA 90012

LA County Supervisor
2nd District
The Honorable Mark Ridley-Thomas
Kenneth Hahn Hall of Administration
500 W. Temple St., Room 866
Los Angeles, CA 90012

7.12 Local Elected Officials

7.12.1 City

Alhambra City Council
District 1
The Honorable Stephen Sham
Mayor
111 S. First St.
Alhambra, CA 91801

Bradbury City Council
District 2
The Honorable Richard T. Hale
Councilmember
600 Winston Ave.
Bradbury, CA 91008

City of Alhambra
The Honorable Steven T. Placido, DDS
City Councilmember
111 South First Street
Alhambra, CA 91801

City of Arcadia
The Honorable Peter Amundson
Mayor
240 W. Huntington Dr.
Arcadia, CA 91007

City of Azusa
The Honorable Joseph R. Rocha
Mayor
213 E. Foothill Blvd.
Azusa, CA 91702

City of Baldwin Park
The Honorable Manuel Lozano
Mayor
14403 E. Pacific Ave.
Baldwin Park, CA 91706

City of Bradbury
The Honorable Bruce Lathrop
Mayor
600 Winston Avenue
Bradbury, CA 91008

City of Duarte
The Honorable John Fasana
Mayor/Metro Board Member
1600 Huntington Dr.
Duarte, CA 91010

City of Duarte
The Honorable Liz Reilly
Mayor Pro Tem
1600 Huntington Dr.
Duarte, CA 91010

City of El Monte
The Honorable Andre Quintero
Mayor
11333 Valley Blvd.
El Monte, CA 91731

City of Glendale
The Honorable Ara Najarian
Councilmember/Metro Board Member
613 E. Broadway. Ste. 200
Glendale, CA 91206

City of Glendale
The Honorable Zareh Sinanyan
Mayor
613 E. Broadway. Ste. 200
Glendale, CA 91206

City of Inglewood
The Honorable James Butts
Mayor/Metro Board Member
One Manchester Boulevard
Inglewood, CA 90301

City of Irwindale
The Honorable Mark A. Breceda
Mayor
5050 N. Irwindale Ave.
Irwindale, CA 91706

City of La Cañada Flintridge
The Honorable Teresa "Terry" Walker
Mayor
1327 Foothill Blvd.
La Cañada Flintridge, CA 91011

City of Lakewood
The Honorable Steve Croft
Mayor
5050 Clark Avenue
Lakewood, CA 90712

City of Los Angeles
The Honorable Eric Garcetti
Mayor
200 N. Spring St.
Los Angeles, CA 90012

City of Monrovia
The Honorable Tom Adams
Mayor
415 S. Ivy Ave.
Monrovia, CA 91016

City of Monterey Park
The Honorable Stephen Lam
Mayor
320 W. Newmark Ave.
Monterey Park, CA 91754

City of Monterey Park
The Honorable Teresa Real-Sebastian
City Councilmember
1975 Fulton Avenue
Monterey Park, CA 91755

City of Pasadena
The Honorable Terry Tornek
Mayor
100 N. Garfield Ave., Room S228
Pasadena, CA 91109

City of Rosemead
The Honorable Steven Ly
Mayor
8838 E. Valley Blvd.
Rosemead, CA 91770

City of San Gabriel
The Honorable John R. Harrington
Mayor
425 S. Mission Dr.
San Gabriel, CA 91776

City of San Marino
The Honorable Eugene Sun
Mayor
2200 Huntington Dr.
San Marino, CA 91108

City of Sierra Madre
The Honorable Rachelle Arizmendi
Mayor
232 W. Sierra Madre Blvd.
Sierra Madre, CA 91024

City of South El Monte
The Honorable Gloria Olmos
Mayor
1415 Santa Anita Avenue
South El Monte, CA 91731

City of South Pasadena
The Honorable Richard Schneider
Mayor
1414 Mission St.
South Pasadena, CA 91030

City of Temple City
The Honorable William Man
Mayor
9701 Las Tunas Dr.
Temple City, CA 91780

LA City Council
District 1
The Honorable David Ry
200 N. Spring St., Rm 425
Los Angeles, CA 90012

LA City Council
District 1
The Honorable Gil Cedillo
200 N. Spring St., Rm. 460
Los Angeles, CA 90012

LA City Council
District 14
The Honorable Jose Huizar
Councilmember
200 N. Spring St., Rm. 465
Los Angeles, CA 90012

LA City Council
District 11
The Honorable Michael Bonin
Councilmember/Metro Board Member
200 N. Spring St., Rm. 475
Los Angeles, CA 90012

LA City Council
District 13
The Honorable Mitch O'Farrell
200 N. Spring St., Rm. 450
Los Angeles, CA 90012

LA City Council
District 2
The Honorable Paul Krekorian
200 N. Spring St., Rm. 435
Los Angeles, CA 90012

South Pasadena City Council
District 5
The Honorable Diana Mahmud
Councilmember
1414 Mission Street
South Pasadena, CA 91030

The Honorable Jacquelyn Dupont-Walker
Metro Board Member/City of LA Appointee
One Gateway Plaza
Los Angeles, CA 90012

7.12.2 Council

Altadena Town Council
Okorie Ezieme
Chair
730 E. Altadena Drive
Altadena, CA 91001

Arroyo Seco Neighborhood Council
Lynda Valencia
President
P.O. Box 42254
Los Angeles, CA 90042

Crescenta Valley Town Council
Harry Leon
President
P.O. Box 8676
La Crescenta, CA 91224

Glassell Park Neighborhood Council
Karen Davalos
President
3750 N. Verdugo Road
Los Angeles, CA 90065

Historic Highland Park Neighborhood Council
Harvey Slater
President
P.O. Box 50791
Los Angeles, CA 90050

LA 32 Neigborhood Council
Anthony Manzano
President
4818 Klamath Place
Los Angees, CA 90032

7.13 Community-Based Organizations

710 Freeway Coalition
100 E. Corson St., Ste 200
Pasadena, CA 91103

Alhambra Police Officers Association
Robert Torrance
President
P.O. Box 7339
Alhambra, CA 91802

Beyond the 710
Ara Najarian
Chair
1414 Mission Street
South Pasadena, CA 91030

California Native Plant Society
2707 K Street, Suite 1
Sacramento, CA 95816

California Wildlife Federation
1012 J Street
Sacramento, CA 95814

Citizens coalition for a safe community
Tom Williams
Address incomplete/not provided

City Terrace Residents' Coalition
Paul Esparza Andalon
1360 North Volney Drive
Los Angeles, CA 90063

Coalition for a Safe Environment
Jesse N. Marquez
1601 N. Wilmington Street Stuite B
Wilmington, CA 90244

Concerned Neighbors of El Sereno
Val Marquez and Pamela Marquez
Address incomplete/not provided

Connected Cities and Communities
c/o Shute, Mihaly & Weinberger
Catherine C. Engberg
396 Hayes Street
San Francisco, CA 94102

Crescenta Valley Community Assocation
William D. Weisman
Crescenta Valley Community Assocation Steering Committee
Address incomplete/not provided

East Los Angeles Advisory Committee
Dunia Fernandez
Committee Member
4241 Folsom Street
Los Angeles, CA 90063

East Los Angeles Chamber of Commerce
Board of Directors
4716 Cesar E. Chavez Ave
Los Angeles, CA 90022

East Los Angeles Chamber of Commerce
Angelina Sosa
3705 Whiteside Street
Los Angeles, CA 90063

East Los Angeles Chamber of Commerce
Eddie Torres
4716 E. Cesar Chavez Ave.
Los Angeles, CA 90022

East Los Angeles Chamber of Commerce
Raul Ruiz
4716 E. Cesar Chavez Ave.
Los Angeles, CA 90022

East Yard Communities for E.J.
Mark Lopez
2317 S. Atlantic Blvd.
Commerce, CA 90040

El Sereno Organizing Committee
Hugo Garcia
President
5302 Borland Road
Los Angeles, CA 90032

Empower LA Department of Neighborhood Empowerment
200 N. Spring St., Ste. 2005
Los Angeles, CA 90012

Friends of the Bullet Train
Tom Savio
Box 411682
Los Angeles, CA 90041

Glendale Homeowners Coordination Council
c/o Richard Lee
925 Penshore Terrace
Glendale, CA 91207

Glendale Homeowners Coordination Council
Grant Michals
President
Address incomplete/not provided

Inner City Struggle
Maria Brenes
124 N. Townsend Avenue
Los Angeles, CA 90063

Inner City Struggle
Norma Garytan
4319 E. Cesar Chavez Avenue

Inner City Struggle
Timothy Williams
348 S. Humphreys

Ironworkers Local 433
Michael Silvey
Business Manager
17495 Hurley Street East
Industry, CA 91744

LA Voice Pico
Agripina Huerta
963 S. Kern Avenue
Los Angeles, CA 90022

LA Voice Pico
Catalina Tahuello
1126 S. Burger Avenue
Los Angeles, CA 90022

LA-32 Historic Neighborhoods
Marleen Fonseca/SOAC Member
President
Address incomplete/not provided

Liuna Local 300
Sergio Rascon
Business Manager
2005 W. Pico Blvd
Los Angeles, CA 90006

Los Angeles Conservancy
Adrian Scott Fine
Director of Advocacy
523 West Sixth Street, Suite 826
Los Angeles, CA 90014

Los Angeles/ Orange Counties
Building and Construction Trades
Council
Ron Miller
Executive Secretary
1626 Beverly Boulevard
Los Angeles, CA 90026

Maravilla Community Advisory
Committee
Yolanda Duarte
Chairperson
4716 E. Cesar Chavez Avenue
Los Angeles, CA 90022

Museum of Vertebrate Zoology
3101 Valley Life Sciences Building
Berkeley, CA 94720

No on 710 Action Coalition Committee
Claire Bogaard
581 Garden Lane
Pasadena, CA 91115

No on 710 Action Committee
Carlos Javelera
337 Markham Place
Pasadena, CA 91105

No on 710 Action Committee
Carol Teutsch
841 Moon Avenue
Los Angeles, CA 90065

No on 710 Action Committee
Courtney Henderson
1442 E. Woodbury Road
Pasadena, CA 91104

No on 710 Action Committee
Ellen Kawano Biasin
110 Malcolm Drive
Pasadena, CA 91105

No on 710 Action Committee
Joe Cano
2946 Warwick Avenue
Los Angeles, CA 90032

No on 710 Action Committee
Melissa Michelson
Committee Member
821 Winthrop Drive
Alhambra, CA 91803

No on 710 Action Committee
Raymond Quan
Committee Member
938 Kewen Drive
San Marino, CA 91108

No on 710 Action Committee
Susan Bolan
Committee Member
3528 Prospect
La Crescenta, CA 91214

No on 710 Action Committee
Trish Gossett
Committee Member
182 Phillips Way
Los Angeles, CA 90042

Pasadena Audubon Society
Laura Garrett
President
1750 N. Altadena Drive
Pasadena, CA 91070

Pasadena Foothills Association of
Realtors
Todd Hays
1070 East Green Street, Suite 100
Pasadena, CA 91108

Pasadena Heritage
Susan N. Mossman
Executive Director
651 S. St. John Avenue
Pasadena, CA 91105

San Rafael Neighborhoods
Association
Mary Dee Romney
President
P.O. Box 91627
Pasadena, CA 92617

Save our Community
Address incomplete/not provided

Sheet Metal, Air, Rail, Transportation
Workers Local Union 105
Luther Medina
President/Business Manager
2120 Auto Center Drive
Glendora, CA 91740

Sierra Club - Angeles Chapter
Darrell Clarke
Angeles Chapter Conservation co-
chair and Transportation co-chair
Address incomplete/not provided

South Pasadena Preservation
Foundation
Steven Lawrence
President
913 Meridian Avenue
South Pasadena, CA 91030

Southern California Pipe Trades,
District Council 16
Michael Layton
Business Manager
501 Shatta Place, Suite 400
Los Angeles, CA 90020

Teamsters Local Union No. 848
Erik Lagafuaina
Business Representative
3888 Cherry Avenue
Long Beach, CA 90807

United Association of Journeyman and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada
Gary L. Cook
Business Manager
Address incomplete/not provided

United Association of Journeyman and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada
Ray LeVenfie, Jr.
Business Manager
8590 Utica Avenue, Suite 200
Rancho Cucamonga, CA 91730

United Association of Journeyman and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada
Vincent G. Diaz
Business Manager/Financial Secretary-Treasurer
1430 Huntington Drive
Duarte, CA 91010

West Pasadena Residents' Association
Avram Gold
P.O. Box 50242
Pasadena, CA 91115

West Pasadena Residents' Association
Cheryl Kane
P.O. Box 50242
Pasadena, CA 91115

West Pasadena Residents' Association
Geoffrey Baum
President
Address incomplete/not provided

West Pasadena Residents' Association
W. Hansslar
P.O. Box 50242
Pasadena, CA 91115

Women Involved in South Pasadena Political Action
Elisabeth Emirhaniam, Lela Bissner, Janet Brown
Co-President, Co-President, President
Address incomplete/not provided

Adam F. Raiper
Preservation Director
Pasadena, CA

Sequoyah School
Elena Phleger
Director of Development and Communications
535 Pasadena Avenue
Pasadena, CA 91105

West Pasadena Residents' Association
Sarah Gavit
WPRA Board Member, SR 710 Lead, SR 710 Section 106 Consulting Party Member
P.O. Box 50252
Pasadena, CA 91105

7.14 Interested Parties

American Institute of Architects - Pasadena and Foothill Chapter
555 S Oak Knoll Avenue
Pasadena, CA 91101

Arlington Garden
295 Arlington Drive
Pasadena, CA 91105

California State University Los Angeles
David Diaz
1211 Scenic Drive
Glendale, CA 91205

Cali-Mex Business Tax & Immigration Services LLC
Silvia Lorenzana
4519 E Cesar Chavez Ave
Los Angeles, CA 90022

Chatten-Brown & Carstens
Richard L. Meehan and Douglas H. Hamilton
2200 Pacific Coast Highway
Suite, 318
Hermosa Beach, CA 90254

Crescenta Valley United Methodist Church
Jeanne Lavieri
2700 Montrose Avenue
Montrose, CA 91020

East Los Angeles 710 CAC
Clara Solis
521 North Avenue 67
Los Angeles, CA 90042

Eastside Coalition Against Toxic Technologies
Delores Mejia
Address incomplete/not provided

Grifols Biologicals Inc.
Willie Zuniga
President
2410 Lillyvale Avenue
Los Angeles, CA 90032

Grifols Inc.
Greg Rich
CEO
2410 Lillyvale Avenue
Los Angeles, CA 90032

Grifols Shared Services NA, INC
Gregory Rich
President and CEO
2410 Lillyvale Avenue
Los Angeles, CA 90032

Huntington Memorial Hospital
Stephen A. Ralph
President/CEO
100 W California Blvd
Pasadena, CA 91105

I-710 Expansion CAC
Martha Hernandez
449 S. Arizona Avenue
Los Angeles, CA 90022

Iron Workers 433
Myung-Soo Seok
550 S. Hope Street #1910
Los Angeles, CA 90071

Jet Propulsion Laboratory
Dimitri Papanastassiou
4800 Oak Grove Drive M/S 183-335
Pasadena, CA 91109

Liuna Local 300
Angel Olvera
4399 Santa Anita Ave., Ste. 205
El Monte, CA 91731

Liuna Local 300
Betzabe Alonso
Address incomplete/not provided
2601 Onyx Drive

Liuna Local 300
Brian Alexander-Brown
1020 Chevron Court
Pasadena, CA 91103

Liuna Local 300
Hector Verdugo
2331 Lillyvale Avenue
Los Angeles, CA 90032

Liuna Local 300
Jason Baez
4144 W. 134th Street
Hawthorne, CA 90250

Liuna Local 300
Jayson Baiz
4144 W. 134th Street
Hawthorne, CA 90260

Liuna Local 300
Jesus Salas
4207 Abner Street
Los Angeles, CA 90032

Liuna Local 300
Joseph Brown
Address incomplete/not provided

Liuna Local 300
Karla Medina
436 N. Oak Avenue #2
Pasadena, CA 91107

Liuna Local 300
Manuel Monsibais
2610 S. 2nd Street
Arcadia, CA 91006

Liuna Local 300
Marelly Mendoza
2601 Onyx Drive
Los Angeles, CA 90032

Liuna Local 300
Saul Renteria
4399 Santa Anita Ave., Ste. 205
El Monte, CA 91731

Los Angeles and Orange Counties
Building and Construction Trades
Council
Ron Miller
Address incomplete/not provided
1626 Beverly Boulevard

National Trust for Historic
Preservation
Brian Turner
Senior Field Officer and Attorney
Address incomplete/not provided
San Francisco, CA

National Trust for Historic
Preservation
Chris Morris
Address incomplete/not provided
1803 Lemegue Street

National Trust for Historic
Preservation
Christina Morris
Los Angeles Field Director
700 South Flower Street, Suite 1100
Los Angeles, CA 90017

National Trust for Historic
Preservation
Elizabeth S. Merritt
Deputy General Counsel
The Watergate Office Building
2600 Virginia Avenue NW, Suite 1100
Washington, DC 20037

No on 710 Action Committee
Jan SooHoo
1339 El Vago Street
La Cañada-Flintridge, CA 91011

Norton Simon Museum of Art
c/o Latham and Watkins, LLP
George Mihlsten
355 South Grand Avenue
Los Angeles, CA 90071

NRDC
Damon Nagami
Senior Attorney
1314 Second Street
Santa Monica, CA 90401

Occidental College
Mark Vallianatos
Occidental College - Urban and
Environmental Policy Insititute
1600 Campus Road MS M-1
Los Angeles, CA 90041

Pasadena Chamber of Commerce
Paul Little
President and Chief Executive Officer
44 North Mentor Ave
Pasadena, CA 91106

PRC
Tristan Fuermayor
10704 Richeon Avenue
Downey, CA 90241

Senate Select Community Committee on California's Correctional System
Luis Garcia Yayvens
11110 Saragosa Street
Whittier, CA 90606

Sierra Club Transportation Committee
Dr. Tom Williams
Committee Member
4117 Barrett Road
Los Angeles, CA 90032

Southern California District Council of Laborers
Saul Renteria
4399 Santa Anita Avenue
El Monte, CA 91750

Southern California Laborer's Apprenticeship Program
Michael Rubio
1385 W. Sierra Madre Avenue
Azusa, CA 91702

SRNA
Freddie
SRNA Board of Directors
Address incomplete/not provided

Storrier Stearns Japanese Garden
James and Constance Haddal
270 Arlington Drive
Pasadena, CA 91105

Tending Loving Carers
Elisa Almeida
3218 Sheffield Avenue
Los Angeles, CA 90032

The Church of the Epiphany
Thomas Carey
2808 Altura Street
Los Angeles, CA 90031

United States House of Representatives
Genesis Coronado representing Congresswoman Lucille Roybal-Allard
Address incomplete/not provided

Victory Outreach
Pastor Omar Perich
700 Rio del Sol
Montebello, CA 90640

Whittier Boulevard Merchant Association of East LA
Tony Demarco
President
4818 Whittier Boulevard
Los Angeles, CA 90022

(first name not legible) Fernandez
Address incomplete/not provided
985 Blossom Hill

Aaron Loomis
1200 W. Huntington Drive #4
Arcadia, CA 91007

Abel Avellaneda
1021 Rousselle Street
Santa Ana, CA 92707

Abel Beltran
10037 Garvey Ave, Spc 21
El Monte, CA 91733

Abel Lopes Cortes
2455 Shore Hawk Avenue
Salton City, CA 92275

Abel Ortega
4140 Workman Mill Road, #110
Whittier, CA 90601

Abner and Molly Ramos
2321 Westcott Ave.
Monterey Park, CA 90033

Abraham Rodriguez
1362 Redondo Ave, Apt. D
Long Beach, CA 90804

Adalbento Garcia
6802 California Ave
Long Beach, CA 90805

Adalberto Martinez
Address incomplete/not provided

Adam Ayala
Address incomplete/not provided
Baldwin, CA 91706

Adam S.
Address incomplete/not provided
Los Angeles, CA

Adam Sakellarides
167 S. Oakknoll Avenue #9
Pasadena, CA 91101

Adam Wadlow
535 Walnut Avenue
Arcadia, CA 91007

Adan Ardon
14432 Rex St
Sylmar, CA 91342

Adan Flores
9930 E Alesia St
South El Monte, CA 91733

Adan Toledo
627 West Villa St
Pasadena, CA 91101

Addi Ortiz
15450 Nisqualli Road #T208
Victorville, CA 92395

Admin OCP
Address incomplete/not provided

Adolfo A. Luna
1600 N. Bronson Ave, Apt. 2
Los Angeles, CA 90028

Adrian A. Esparza
Address incomplete/not provided

Adrian Partida
4620 Phoenix Dr
Oxnard, CA 93033

Adrian Perez
1334 South Rosewood Avenue
Santa Ana, CA 92707

Adriana Carderas
Address incomplete/not provided

Adriana Gomez
3005 W Wisteria Pl
Santa Ana, CA 92704

Adrienne Picchi
395 Elmwood Drive
Pasadena, CA 91105

Adrienne Thomas
Address incomplete/not provided

Agustin Barradas
7363 Lillian Ln
Highland, CA 92346

Agustin Perez
Address incomplete/not provided

Al Diaz
240 Hampden Terrace
Tustin, CA 92780

Alan Bair
90 Hurlbut Street #1
Pasadena, CA 91105

Alan Pearson
1980 Nice Drive, Apt 13-205
Corona, CA 92882

Alan Perez
Address incomplete/not provided
13039 Hubbard St, #3

Alan Quan
1359 E. Villa Street
Pasadena, CA 91106

Alan R. Hoffman
5054 Fallhaven Lane
La Cañada Flintridge, CA 91011

Alan Torres
Address incomplete/not provided
Alhambra, CA

Alan Villegas
Address incomplete/not provided

Albert F. Barrios
2128 E. Nugent Street
Lancaster, CA 93535

Albert Foster
11578 Bonham Ave
Lakeview Terrace, CA 91342

Albert Guevara
Address incomplete/not provided

Albert Hernandez
Address incomplete/not provided
1101 Camelot Way

Albert Santiago
867 No. 2nd Street, #21114
El Cajon, CA 92021

Alberto Aguilera
12142 Marbel Ave
Downey, CA 90242

Alberto Garcia
1515 W 218th St
Torrance, CA 90501

Alberto Gomez
2419 East 7th St
Los Angeles, CA 90023

Alberto Graciano
1338 South Parton Street
Santa Ana, CA 92707

Alberto Lodesma
1212 Calle Jules A
Vista, CA 92084

Alberto Perez
Address incomplete/not provided

Alejandro (last name not legible)
18930 Sherman Way, #28
Reseda, CA 91335

Alejandro Flasca
16411 California Avenue
Paramount, CA 90723

Alejandro Marquez
Address incomplete/not provided
5628 Lighthouse

Alejandro Mayer
Address incomplete/not provided

Alex Carswell
PO Box 50021
Pasadena, CA 91115

Alex Dillon
1970 Heidleman Avenue
Los Angeles, CA 90032

Alex Fenderoff
Address incomplete/not provided
15375 Los Altos Dr

Alex Lafargo
1372 Lakme Ave
Wilmington, CA 90744

Alex Mireles
2086 Mission Hills Drive
Oxnard, CA 93036

Alex Zamora
10147 Delima Dr
Westminster, CA 92683

Alexandro Powelos
1331 South Westmoreland Ave
Los Angeles, CA 90006

Alexis Lantz
2974 Bellevue Avenue
Los Angeles, CA 90026

Alfonso Nepomuceno
909 Hussett Avenue
Las Vegas, NV 89104

Alfonso Sanchez
9068 Sycamore Avenue, Unit 216
Montclair, CA 91763

Alfonso Villa
414 S Parton St
Santa Ana, CA 92701

Alfred G. Rodriguez
5838 South Raitt Street
Santa Ana, CA 92703

Alfredo Conteras
14748 Lakeside St
Sylmar, CA 91342

Alfredo Coronado
16040 Ash Street
Hesperia, CA 92345

Alfredo J. Pena
603 Rancho Vista Road
Vista, CA 92083

Alfredo Lojero
Address incomplete/not provided
Alhambra, CA

Alfredo Martinez
1945 Simsburry St
Palmdale, CA 93550

Alice [no last name given]
Address incomplete/not provided
1350 Campbell Avenue

Alice Watanabe
4401 Santa Anita Avenue, #150
El Monte, CA 91731

Alison McAlpine
Address incomplete/not provided

Allan Bair
Address incomplete/not provided
Hurlbut Street
Pasadena, CA

Allison Swan
333 W California Boulevard
Pasadena, CA 91105

Alonso Garcia
15115 Roxford St #106
Sylmar, CA 91342

Alonso Santana
1520 ½ Bridge St
Los Angeles, CA 90033

Alonzo Torres
1231 Money Place
Oxnard, CA 93033

Alvaro Covarrubias
1128 Hoffman Avenue
Long Beach, CA 90813

Alvaro Facloi
530 South Van Ness Avenue
Santa Ana, CA 92701

Alvaro Mora
10550 Dunlap Crossing Road Spc 109
Whittier, CA 90606

Alvaro Ochoa
11219 Leland Avenue
Whittier, CA 90605

Amado Guzman
39815 Via Careza
Murrieta, CA 92563

Amy Vong
3208 Manitou Ave
Los Angeles, CA 90031

Ana Barrera
Address incomplete/not provided
Alhambra, CA

Ana Castro
3607 W Washington Boulevard
Los Angeles, CA 90018

Ana Cesar
Address incomplete/not provided
Alhambra, CA

Ana Cordova Ramos
6523 Kraft Ave
North Hollywood, CA 91606

Ana M Codero
Address incomplete/not provided
Los Angeles, CA 90032

Ana Magdaleno
320 East Rosewood Street
Rialto, CA 92376

Andrea Nathanson
2849 Harmony Place
LA Crescenta, CA 91214

Andres Diaz
Address incomplete/not provided
409 E. Walnut Street

Andres Lopez
5255 Camino Real
Jurupa Valley, CA 92509

Andres Rodriguez
Address incomplete/not provided
656 Moss St, #141

Andres Rosales Millan
3520 Castaic Street
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