Chapter 4 ENVIRONMENTAL ANALYSIS, CONSEQUENCES, AND MITIGATION

This chapter has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR and the Supplemental Environmental Assessment/Recirculated Sections of the Draft EIR (Supplemental EA/Recirculated Draft EIR Sections), as indicated in the Responses to Comments, Volumes F-2 through F-4, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). The refinements to the LPA were analyzed where potential differences in impacts compared to the unrefined LPA were identified. The environmental analysis assumes a conservative, worst-case, condition when determining potential impacts. A vertical line in the margin is used to show where revisions (excluding minor edits for consistency and correction of formatting and minor typographical errors) have occurred to this chapter since publication of the Draft EIS/EIR. No changes to the National Environmental Policy Act (NEPA) impact findings or California Environmental Quality Act (CEQA) impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR. A summary of updates since publication of the Draft EIS/EIR is included at the beginning of each section.

Section 4.18, Construction Impacts, and Section 4.19, Cumulative Impacts, serve as summaries of the construction and cumulative impact discussions from Chapter 3 and the other sections of Chapter 4. Construction impacts are discussed in more detail in Appendix FF, Construction Impacts Technical Memorandum, and cumulative impacts are discussed in more detail in Appendix GG, Cumulative Impacts Technical Memorandum, of this EIS/EIR.

4.1 Land Use and Development

This section summarizes the existing land uses and developments in the project area, and the potential impacts of the proposed alternatives on these resources. The information in this section is based on the Land Use Impacts Technical Memorandum, which is incorporated into this EIS/EIR as Appendix M.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, Volumes F-2 and F-3, of this Final EIS/EIR, and based on refinements to the LPA. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Minor modifications have been made to this section since publication of the Draft EIS/EIR, which include analysis of the LPA's consistency with the United States Environmental Protection Agency (USEPA), United States Department of Housing and Urban Development (HUD), and the United States Department of Transportation (USDOT) Partnership for Sustainable Communities livability principles. The need for fewer acquisitions of commercial properties associated with the refinements to the LPA is noted. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR.

The analysis of land use consequences associated with the LPA is detailed below in Section 4.1.4.5.

4.1.1 Existing Land Uses

The current land uses adjacent to the proposed project alignments are presented in detail in Appendix M, Land Use Impacts Technical Memorandum. Overall, the project area is characterized by a dense downtown urban environment.

Tall skyscrapers with offices and hotels dominate the western end of the project area, including the City National Towers, Bonaventure Hotel, CitiGroup Tower, US Bank Tower, and the Standard Hotel.

Civic institutions dominate the central portion of the project area, including City Hall, City Hall East, the California Department of Transportation District 7 Headquarters, Parker Center, and the new Los Angeles Police Department headquarters building.

Little Tokyo, which is located in the eastern portion of the project area, contains a mix of commercial, residential, civic, and light industrial mid- to low-scale development. Little Tokyo includes the Japanese Village Plaza (JVP), the Go For Broke Monument, and the Japanese American National Museum (JANM), all of which have particular significance to the City of Los Angeles.

4.1.2 Regulatory Framework

NEPA, CEQA, and the L.A. CEQA Thresholds Guide provide criteria for evaluating potential effects on land use and development. These criteria define an adverse impact as one that would:

- Conflict with regional land use policies
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect
- Conflict with the compatibility of surrounding land uses or adversely affect the development of surrounding land uses within the project area

The Regional Connector Transit Corridor project would be located entirely within the City of Los Angeles; therefore, consistency with the following plans, policies, and regulations would be needed to avoid land use impacts:

- City of Los Angeles General Plan:
    - Central City Community Plan
    - Central City North Community Plan
    - Transportation Element

  - City of Los Angeles Planning and Zoning Code
  - Civic Center Shared Facilities and Enhancement Plan
- Downtown Adaptive Reuse Incentive Ordinance
- Greater Downtown Housing Incentive Ordinance
- Redevelopment plans established by the Community Redevelopment Agency of the City of Los Angeles (CRA/LA):
  - Bunker Hill Urban Renewal Project
  - Central Business District Redevelopment Project
  - City Center Redevelopment Project
  - Little Tokyo Redevelopment Project

Additionally, the other impact analyses, such as the Noise and Vibration Technical Memorandum (Appendix S), were reviewed to determine whether any of the alternatives would have impacts that would diminish the quality of an adjacent land use. In general, zoning and land use policies in the project area are supportive of increased density and transit use, as well as reuse of existing buildings. More details on these regulations and plans are available in Appendix M, Land Use Impacts Technical Memorandum.

4.1.3 Affected Environment

The project area is heavily urbanized and is one of Los Angeles County's major employment centers that includes retail, entertainment, and residential districts. Income levels of residents vary greatly, and residential units range in cost from new luxury condominium developments in the western half of the project area to single-room occupancy hotels and homeless shelters in the eastern portion. Land use patterns in the project area consist mostly of commercial office buildings in the southwestern portion, public office buildings in the central and northern portions, and commercial manufacturing buildings in the southeastern portion. Pockets of residential uses, which include adaptive reuse of older non-residential buildings, are scattered throughout the project area.

Figure 4.1-1 shows the zoning designations and neighborhoods in the project area.

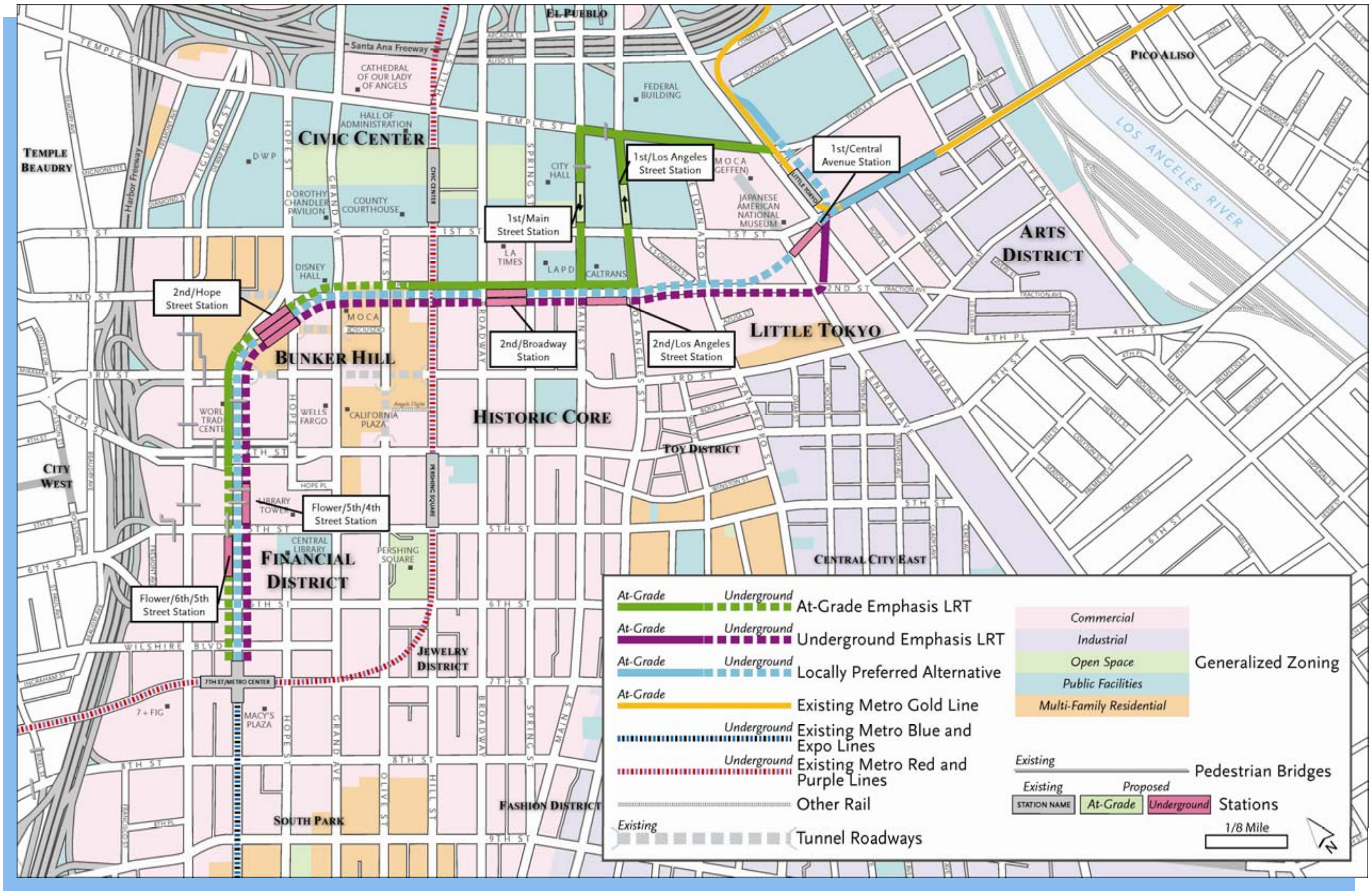


Figure 4.1-1. Neighborhoods and Zoning

The proposed build alternatives would introduce new light rail service into the following neighborhoods:

- Financial District: Existing land uses include office towers, public open space, hotels, and other commercial and retail establishments. The area is densely developed; many of the buildings in the area have 12 or more stories.
- Bunker Hill: Existing land uses include office towers, large auditoriums, residential developments, education buildings, and parking lots. The area contains the tallest buildings in the city. Most of the parcels currently used as parking lots are part of the proposed Grand Avenue redevelopment project.
- Historic Core: Existing land uses include public buildings, offices, retail establishments, and parking lots. This highly urbanized area contains many buildings from the 1920s and earlier (most with ground floor retail). Most originated as office buildings, though some have been converted to manufacturing space or residential units.
- Civic Center: Existing land uses include public offices and services, and public open space. Hotels, restaurants, and other commercial uses are also present. Many of the businesses in the area directly serve public agency needs. Most of the public buildings are large and occupy entire blocks.
- Little Tokyo: Existing land uses include office buildings, restaurants, hotels, cultural institutions, parking lots, and retail establishments. The neighborhood is a center for Japanese-American culture. In general, building heights are lower in Little Tokyo than in the rest of the project area. Also, many of the parking lots are planned for redevelopment.
- Arts District: Existing land uses include warehouse retail, public offices and maintenance facilities, new residential buildings, artist lofts, and pockets of restaurant and retail establishments. Like Little Tokyo, building heights are typically lower in this neighborhood than in the rest of the project area.

4.1.4 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential land use and development impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.1.2. Table 4.1-1 summarizes the results of the analysis.

4.1.4.1 No Build Alternative

The No Build Alternative does not include any new transportation infrastructure beyond what is identified in the 2009 Metro *Long Range Transportation Plan* (LRTP). The No Build Alternative would not provide the land use benefits typical of high-capacity transit projects, which the *City of Los Angeles General Plan* and the CRA/LA redevelopment plans seek to achieve (e.g., encouragement of livable spaces, sustainable travel patterns, and job growth).

Table 4.1-1. Summary of Potential Impacts to Land Use and Development

Alternative	Regional Land Use and Development (CEQA/NEPA)	Conflict with Applicable Land Use Plans (CEQA/NEPA)	Incompatibility with Surrounding or Adjacent Land Uses (CEQA/NEPA)	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
No Build	None	Potential significant impact/ adverse effect	None	No mitigation available; Adverse effect	No mitigation available; Significant unavoidable impact
TSM	None	Potential significant impact/ adverse effect	None	No mitigation available; Adverse effect	No mitigation available; Significant unavoidable impact
At-Grade Emphasis LRT	None	None	None	None	None
Underground Emphasis LRT	None	None	None	None	None
LPA	None	None	None	None	None

Since the LRTP predicts that traffic will worsen in the absence of additional transportation capacity, the No Build Alternative would contribute to deteriorating access and mobility within the Los Angeles region by failing to increase the efficiency and carrying capacity of the transit network.

This alternative would conflict with Federal Transportation Administration (FTA) guidance supporting transit investments that encourage and support land uses that are environmentally sustainable, foster livable communities, and increase economic vitality (FTA 2010).

The No Build Alternative would also be inconsistent with the *Central City Community Plan* goal for a light rail connector between 7th Street/Metro Center Station and Union Station.

4.1.4.1.1 NEPA Finding

The No Build Alternative would conflict with the *Central City Community Plan,* part of the *City of Los Angeles General Plan* Land Use Element, and would cause an adverse, unavoidable land use effect.

4.1.4.1.2 CEQA Determination

The No Build Alternative would conflict with the *Central City Community Plan,* part of the *City of Los Angeles General Plan* Land Use Element, and would cause a significant, unavoidable land use impact.

4.1.4.2 TSM Alternative

Like the No Build Alternative, the TSM Alternative does not include any new transportation infrastructure beyond what is identified in the LRTP. However, it does include two new shuttle bus lines connecting 7th Street/Metro Center Station and Union Station, but the quality of this service would be contingent on traffic congestion, which is anticipated to worsen in the coming years in the absence of additional capacity.

As such, the TSM Alternative would not provide the lasting benefits typical of high-capacity transit projects, which the *City of Los Angeles General Plan* and the CRA/LA redevelopment plans seek to achieve (e.g., encouragement of livable spaces, sustainable travel patterns, and job growth).

Since the LRTP states that traffic will worsen without additional transportation capacity, the TSM Alternative would contribute to deteriorating access and mobility within the Los Angeles region by failing to increase the efficiency and carrying capacity of the transit network.

This alternative would conflict with FTA guidance supporting transit investments that encourage and support land uses that are environmentally sustainable, foster livable communities, and increase economic vitality (FTA 2010). The TSM Alternative would also be inconsistent with the *Central City Community Plan* goal for a light rail connector between 7th Street/Metro Center Station and Union Station.

4.1.4.2.1 NEPA Finding

The TSM Alternative would conflict with the *Central City Community Plan*, part of the *City of Los Angeles General Plan* Land Use Element, and would cause an adverse, unavoidable land use effect.

4.1.4.2.2 CEQA Determination

The TSM Alternative would conflict with the *Central City Community Plan*, part of the *City of Los Angeles General Plan* Land Use Element, and would cause a significant, unavoidable land use impact.

4.1.4.3 At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative alignment is surrounded primarily by land zoned for public facilities, commercial, and multi-family residential uses.

During construction, the at-grade portions of the alignment would be constructed mostly in existing roadways, and the underground portions would be constructed using the cut and cover method. More information about these construction methods is available in the Description of Construction, Appendix K. These methods can involve temporary, intermittent street and sidewalk closures in the immediate vicinity of the alignment. This could temporarily inhibit, but not eliminate, access to the adjacent parcels. The alternative would also require permanent removal of traffic lanes on Flower, 2nd, Los Angeles, Main, and Temple Streets. Traffic flow would be affected; however, access would be retained to adjacent land uses.

The LRT facilities would encroach upon parcels in the Historic Core and Little Tokyo areas. A traction power substation would be placed in a portion of the parking lot immediately south of the

Los Angeles Times building, and the light rail tracks would encroach upon the parking lot surrounding the Go For Broke Monument in Little Tokyo.

However, this permanent conversion of land use to LRT facilities would be compatible with the other surrounding land uses. The acquisitions needed for this alternative are discussed in the Displacement and Relocation section (Section 4.2). Once the mitigation measures specified in the Noise and Vibration section (Section 4.7) have been implemented, significant incompatible noise impacts would not affect surrounding land uses.

By improving transit service to major activity centers, the At-Grade Emphasis LRT Alternative would be consistent with the stated General Plan goal of focusing growth toward existing high-density areas countywide. It would also be consistent with the Transportation Element's support of high-capacity transit service between Union Station and the Metro Blue Line. By adding new stations to the downtown area, the alternative would also make more parcels eligible for density and parking bonuses created by the City of Los Angeles to encourage growth in areas served by transit.

It is anticipated that the At-Grade Emphasis LRT Alternative and other transit projects currently underway or planned for the future would support increases in transit ridership, which would be a cumulatively beneficial effect. Many new commercial and residential developments are planned in the project area on sites that are currently occupied by surface parking lots, and the At-Grade Emphasis LRT Alternative would help offset the effects of these land use changes by providing a better alternative to driving.

4.1.4.3.1 NEPA Finding

The At-Grade Emphasis LRT Alternative would not have direct, indirect, or cumulative adverse effects on land use.

4.1.4.3.2 CEQA Determination

The At-Grade Emphasis LRT Alternative would not have significant direct, indirect, or cumulative impacts on land use.

4.1.4.4 Underground Emphasis LRT Alternative

During construction, the majority of the alignment and LRT facilities would be constructed using the cut and cover and Tunnel Boring Machine (TBM) methods. More information about these construction methods is available in Appendix K, Description of Construction. These methods can involve temporary, intermittent closures of streets and sidewalks in the immediate vicinity of the alignment and stations. This could temporarily inhibit, but not eliminate, access to the adjacent parcels. The alternative would also require permanent removal of a traffic lane on Flower Street. Traffic flow would be affected, but access would be retained to adjacent land uses. Overall, construction would be less noticeable in the Historic Core area than under the At-Grade Emphasis LRT Alternative, due to the use of TBMs instead of at-grade construction methods.

The LRT facilities would encroach upon parcels in the Historic Core and Little Tokyo areas. Some businesses on the commercial parcel bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue would be removed for portal construction. Businesses on the southeast corner of 2nd and

Spring Streets would also be acquired. Business owners would be compensated and relocation assistance would be provided as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act. This conversion of land use to LRT facilities would not be incompatible with the other surrounding land uses. After construction, it would be possible for new developments to be located on some of the land used for construction staging. So land use conversions, including conversions on the parcel bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue, may not all be permanent. The acquisitions needed for this alternative are described in the Displacement and Relocation section (Section 4.2). Significant noise impacts would not occur as a result of the Underground Emphasis LRT Alternative and land use incompatibility would not be expected.

By improving transit service to major activity centers, the Underground Emphasis LRT Alternative would be consistent with the stated General Plan goal of focusing growth toward existing high-density areas countywide. It would also be consistent with the Transportation Element's support of high-capacity transit service between Union Station and the Metro Blue Line. By adding new stations to the downtown area, the alternative would also make more parcels eligible for density and parking bonuses created by the City of Los Angeles to encourage growth in areas served by transit.

It is anticipated that the Underground Emphasis LRT Alternative and other transit projects currently underway or planned for the future would support increases in transit ridership, which would be a cumulatively beneficial effect. Many new commercial and residential developments are planned in the project area on sites that are currently occupied by surface parking lots, and the Underground Emphasis LRT Alternative would help offset the effects of these land use changes by providing a better alternative to driving.

4.1.4.4.1 NEPA Finding

The Underground Emphasis LRT Alternative would not have direct, indirect, or cumulative adverse effects on land use.

4.1.4.4.2 CEQA Determination

The Underground Emphasis LRT Alternative would not have significant direct, indirect, or cumulative impacts on land use.

4.1.4.5 Locally Preferred Alternative

The LPA alignment is similar to the Underground Emphasis LRT Alternative–Broadway Station Option, just west of Central Avenue. However, under the LPA the Flower/5th/4th/Street station is not proposed and businesses on the southeast corner of 2nd and Spring Streets would not be acquired. Just west of Central Avenue, at 2nd Street and the pedestrian signal to the JVP, the tracks would continue underground heading northeast under the JVP and 1st and Alameda Streets. An underground junction would be constructed beneath the intersection of 1st Street and Alameda Street. Two portals would be located to the north and east of the junction.

During construction, the majority of the alignment and LRT facilities would be constructed using the cut and cover and TBM methods, with some sequential excavation method (SEM). More information about these construction methods is available in Section 4.18. These methods can involve temporary, intermittent closures of street lanes and sidewalks in the immediate vicinity of the alignment and stations. This could temporarily inhibit, but not eliminate, access to the adjacent parcels. The LPA would also require permanent removal of a traffic lane on Flower Street. Traffic flow would be affected, but access would be retained to adjacent land uses.

The LRT facilities would encroach upon parcels in the Historic Core and Little Tokyo areas. A parking lot on the south side of 2nd Street, between Broadway and Spring Street, would be used for the 2nd/Broadway station. East of Central Avenue, only businesses on the northern portion of the block bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue would need to be removed for station construction. The Señor Fish, Weiland Brewery, the former Café Cuba (The Spice Table), and associated parking would need to be acquired for construction of this station. However, the remaining businesses on that block would remain, including the Office Depot and associated parking. Business owners would be compensated and relocation assistance would be provided as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

The introduction of LRT facilities in these areas would not be incompatible with the surrounding retail and dense residential land uses. After construction, it would be possible for new developments to be located on some of the land used for construction staging. Therefore, land use conversions may not all be permanent. The acquisitions needed for this alternative are discussed in the Displacement and Relocation section (Section 4.2). With implementation of mitigation specified in Section 4.7, significant noise impacts would not occur as a result of the LPA and land use incompatibility would not be expected.

By improving transit service to major activity centers, the LPA would be consistent with the stated General Plan goal of focusing growth toward existing high-density areas countywide. The LPA would also be consistent with the Transportation Element's support of high-capacity transit service between Union Station and the Metro Blue Line. By adding new stations to the downtown area, the LPA would also make more parcels eligible for density and parking bonuses created by the City of Los Angeles to encourage growth in areas served by transit. For example, the LPA would also make possible an integrated transit-oriented development at the Mangrove property on the northeast corner of 1st and Alameda Streets. This type of development would be supportive of the City's land use goals of encouraging density near transit stops. Metro has no reasonably foreseeable plans for a joint use development on this site. Furthermore, it is not known at this time what a private development on this site would consist or if there would be one. Future development on the site, if any, would be subject to planning an environmental review.

The USEPA joined with HUD and the USDOT to help improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide. Through a set of guiding livability principles and a partnership agreement that will guide the agencies' efforts, this partnership will coordinate federal housing, transportation, and other infrastructure investments to protect the environment, promote equitable development, and help to address the challenges of climate change.

The goals of the Regional Connector Transit Corridor project – improve travel times, reduce transfers, reduce traffic congestion, improve air quality, and develop an efficient and sustainable level of mobility within Los Angeles County to accommodate planned growth and a livable environment – would be consistent with the HUD-USDOT-USEPA Partnership for Sustainable Communities livability principles.

It is anticipated that the LPA and other transit projects currently underway or planned for the future would support increases in transit ridership, which would be a cumulatively beneficial effect. Many new commercial and residential developments are planned in the project area on sites that are currently occupied by surface parking lots, and the LPA would help offset the effects of these land use changes by providing a better alternative to driving.

4.1.4.5.1 NEPA Finding

The LPA would not have direct, indirect, or cumulative adverse effects on land use. The LPA would have a cumulatively beneficial effect on land use as it, in combination with other transit projects currently underway or planned for the future, would support increases in transit ridership.

4.1.4.5.2 CEQA Determination

The LPA would not have significant direct, indirect, or cumulative impacts on land use. The LPA would have a cumulatively beneficial impact on land use as it, in combination with other transit projects currently underway or planned for the future, would support increases in transit ridership.

4.1.5 Mitigation Measures

The No Build and TSM Alternatives would conflict with applicable land use plans and policies, but no mitigation is planned. Significant land use impacts and adverse effects would not occur as a result of any of the Regional Connector build alternatives, including the LPA. Hence mitigation measures would not be required for any alternative.

4.2 Displacement and Relocation

This section describes the potential displacements and relocations that could be needed to construct the proposed Regional Connector Transit Corridor alternatives. The information in this section is based on the Displacement and Relocation Technical Memorandum, which is incorporated into this EIS/EIR as Appendix N.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR and the Supplemental Environmental Assessment/Recirculated Sections of the Draft EIR (Supplemental EA/Recirculated Draft EIR Sections), as indicated in the Responses to Comments, Volumes F-2 through F-4, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. The primary changes include the reduction of full property acquisitions from 16 to 9, and an increase in permanent underground easements from 6 to 26 for the LPA. Some parcels would have more than one easement; therefore, the total number of parcels affected by easements would be less than 26. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.2.4.2 below, based on input received during the Draft EIS/EIR public review period. Since publication of the Supplemental EA/Recirculated Draft EIR Sections, the total square footage needed for temporary construction easements has been reduced as a result of further refinements. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of displacement and relocation consequences associated with the LPA is detailed below in Section 4.2.3.5.

4.2.1 Regulatory Framework

NEPA requires that the Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) of 1970 be implemented if displacements would be a direct cause of a project. An impact is considered adverse under NEPA if housing, people, and businesses are displaced due to the proposed project. The law ensures that relocation services and payments be made available to eligible residents, businesses, and non-profit organizations displaced as a direct result of federal projects. The act provides for uniform and equitable treatment of persons displaced from their homes and businesses by establishing uniform and equitable land acquisition policies.

CEQA provisions apply to projects in the absence of federal funding. CEQA requires conformance to the California Relocation Act (California Act), which is similar to the Uniform Act. It ensures consistent and fair treatment of owners, expedited acquisition of property by agreement to avoid litigation, and promotion of confidence in the public land acquisitions process. According to CEQA guidelines, a project would have a significant impact if it would result in any of the following:

- Displace a substantial number of existing housing units, particularly affordable housing units, necessitating the construction of replacement housing elsewhere.
- Displace a substantial number of people, necessitating the construction of replacement housing elsewhere.

CEQA does not include thresholds for employment displacement impacts. Thresholds similar to population and housing displacements are used in this analysis, since most of the potential displacements for the Regional Connector Transit Corridor project would be businesses.

4.2.2 Affected Environment

For purposes of this evaluation of potential land acquisition impacts, the affected environment is limited to the areas within and directly adjacent to the proposed alternative alignments. Depending on project funding and schedule, property acquisition may be phased over time.

4.2.2.1 Typical Causes of Displacement

Table 4.2-1 shows typical causes of land acquisition and displacement that could potentially occur with a project. When a land acquisition occurs, it typically results in either a full or partial take of a parcel.

Table 4.2-1. Causes of Displacement

Reason	Type of Acquisition	Cause/Process
Horizontal alignment	Full/Partial	Not enough right-of-way for construction and operation of alignment and stations
Vertical circulation above subway station	Partial	Additional area needed adjacent to subway station to bring passengers to surface
Street widening	Partial	At-grade trackway and stations
Illegal encroachment	Full	Unauthorized use of private property
Access to businesses (driveway or road)	Full	Damages resulting from inhibited access
Storage yards	Full	Additional area required to perform maintenance, for ancillary facilities, and TPSS sites
Widening of intersections	Partial	Additional area to maintain traffic volumes, turn lanes, or platforms
Tunneling easement	Easement	Subway travels off public right-of-way

A partial take would occur if only a portion of the entire parcel was required to accommodate the project (e.g., a portion of a commercial parking lot fronting the alignment is required, but not the adjacent commercial building located away from the alignment). Partial property takes may result from widening a street or intersection due to inadequate right-of-way widths, limited cross-sections, and vertical circulation needs adjacent to subway stations. Street widening may be necessary when the existing horizontal alignment contains insufficient right-of-way. Vertical circulation is necessary near subway stations to bring passengers to the surface and additional land may be needed for station entrances.

A full take could occur when the majority of the property is required for the horizontal alignment because of insufficient right-of-way or the need to construct storage or maintenance facilities.

An easement is the right to use another person's land for a stated purpose. An easement can involve a general or specific portion of the property and can be either at the surface level or beneath the property. Easements can be temporary (e.g., during construction) or permanent. Temporary construction easements are utilized when a portion of a property is acquired for construction staging or equipment use. Permanent underground easements are utilized when a subway is tunneled and during its operation, but none of the parcel's surface area is permanently acquired or disturbed.

Using these criteria for the types of acquisitions that could be required for the proposed project, a list of properties that could be affected was compiled for each alternative (listed in Section 4.2.3).

4.2.3 Environmental Impacts/Environmental Consequences

This section identifies all parcels where displacements could occur for the Regional Connector Transit Corridor project and provides additional details about the ones where the displacements could constitute a potentially significant impact. More information is available in Appendix N, Displacement and Relocation Technical Memorandum, of this EIS/EIR. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.2.1. Table 4.2-2 provides a summary of each alternative's potential displacement and relocation impacts. Off-street parking space displacement is also tallied in Table 4.2-2, since off-street parking lots are typically operated as businesses on privately-owned parcels. Removal of on-street parking spaces from public roadways is discussed in Chapter 3.

4.2.3.1 No Build Alternative

The No Build Alternative would not involve any new construction for the Regional Connector Transit Corridor project. As such, displacement of properties would not occur for transit infrastructure.

4.2.3.1.1 NEPA Finding

The No Build Alternative would have no effects with respect to displacement or relocation, and mitigation measures would not be required.

Table 4.2-2 Summary of Potential Displacement and Relocation Impacts

Alternative	Total Parcels Affected	Off-Street Parking Spaces Displaced	Types of Displacement for Affected Parcels[1]	Adverse Effects/Significant Impacts After Mitigation (NEPA/CEQA)
No Build	None	None	None	None
TSM	None	None	None	None
At-Grade Emphasis LRT	12	119	11 Partial Takes 6 Temporary Easements	None
Underground Emphasis LRT	32	122-255	18 Partial Takes 8 Full Takes 3 Temporary Easements 4 Permanent Easements	None
LPA	46	270	7 Partial Takes 9 Full Takes 12 Temporary Easements 26 Permanent Easements	None

Note:
[1] This column lists the total number of takings and easements for each alternative. The sum may be greater than the total parcels affected, because multiple easements would be needed on some parcels.

4.2.3.1.2 CEQA Determination

The No Build Alternative would have no significant impacts with respect to displacement or relocation, and mitigation measures would not be required.

4.2.3.2 TSM Alternative

The TSM Alternative includes all provisions of the No Build Alternative, plus two new shuttle bus lines linking 7th Street/Metro Center Station and Union Station. Up to 24 on-street parking and loading spaces would be removed along 2nd Street between Hill Street and Central Avenue to accommodate new bus stops, but this would not constitute a significant impact. The removal of surface parking lots for the addition of new developments to the downtown area, many of which qualify for reduced off-street parking quotas, could increase parking demand. The new shuttle bus service would partially offset the parking demand in the area; however, this offset would not be as great as would be provided by the build alternatives.

4.2.3.2.1 NEPA Finding

The TSM Alternative would not have adverse effects with respect to displacement or relocation, and mitigation measures would not be required.

4.2.3.2.2 CEQA Determination

The TSM Alternative would not have significant impacts with respect to displacement or relocation, and mitigation measures would not be required.

4.2.3.3 At-Grade Emphasis LRT Alternative

To construct the At-Grade Emphasis LRT Alternative, partial takings of 11 parcels and temporary easements across six parcels would be needed for the construction of LRT facilities. These parcels are shown in Table 4.2-3 and Figure 4.2-1 and discussed further in the following subsections.

Permanent displacement of approximately 170 parking spaces (about 51 of which are on-street parking spaces) would occur as a result of the acquisitions required for this alternative. Approximately 23 of these displaced spaces would occur in the Little Tokyo community, where businesses and residents have expressed concern over the potential loss of parking. Other displaced spaces would be located farther west along 2nd Street. Surface parking lots are an important resource in downtown Los Angeles due to the presence of many historic buildings that do not provide the amount of off-street parking required by current planning code. Surface parking is a transitional land use that can lead to future development, and improved transit service can allow a neighborhood to grow while reducing its overall need for parking. On-street parking spaces are discussed separately in Chapter 3, since they are located on public right-of-way as opposed to off-street parcels. Construction of this alternative would not directly disturb the Go For Broke Monument although it would affect the surrounding parking lot. No businesses, other than portions of privately-owned parking lots, would be displaced by this alternative.

The Regional Connector Transit Corridor project would provide new non-auto access to the area upon completion of construction, which would partially offset the parking demand in the area. However, some cumulative impacts would still remain, though they would not be significant.

4.2.3.3.1 Easements

Of the easements identified in Table 4.2-3 and Figure 4.2-1, none would have potentially significant impacts. Additional information regarding all proposed displacements is available in the Displacement and Relocation Technical Memorandum, Appendix N, of this EIS/EIR.

Table 4.2-3. Parcels Potentially Affected by Displacement - At-Grade Emphasis LRT Alternative

Figure 4.2-1 #	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
1	5151023400	525 S. Flower Street	Temporary Construction Easement/Partial Take	18,716/ 2,339	City National Plaza	Construction Staging
2	5151018017	444 S. Flower Street	Temporary Construction Easement	13,325	Courtyard	Construction Staging
3	5151014032	703 W. 3rd Street	Partial Take	16,927	Central Plant	Construction Staging
4	5151014033	Parcel Bounded by 3rd/Hope/Flower Streets and General Kosciuszko Way	Partial Take	39,363	Central Plant	Construction Staging
5	5151027256	Parcel Bounded by Figueroa/3rd/Flower/2nd Streets	Partial Take	5,348	Pool and Tennis Courts	Station Entrance
6	5149008032	201 S. Spring Street	Partial Take	22,783	Parking Lot	TPSS Location
7	5161014902	Parcel bounded by Main/1st/Los Angeles Streets and Parcel 5161014901	Temporary Construction Easement/Partial Take	888/ 3,609	Government Building	Station
8	5161014901	Parcel Bounded by Main/Temple/Los Angeles Streets and Parcel 5161014902	Temporary Construction Easement/Partial Take	18,065/ 3,230	Government Building	Alignment Tracks & Station
9	5161013905	Parcel bounded by Judge John Aiso/1st/Los Angeles Streets and Parcel 5161013904	Temporary Construction Easement/Partial Take	2,394/ 2,691	Government Building	Station
10	5161013904	Parcel Bounded by Judge John Aiso/Temple/Los Angeles Streets and Parcel 5161013905	Temporary Construction Easement/Partial Take	8,308/ 4,256	Government Building	Alignment Tracks & Station

Table 4.2-3. Parcels Potentially Affected by Displacement - At-Grade Emphasis LRT Alternative (continued)

Figure 4.2-1 #	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
11	5161012901	Parcel on SW corner of Temple/Alameda Streets	Partial Take	7,196	Parking Lot	Alignment Tracks
12	5161012905	152 N. Central Avenue	Partial Take	4,532	MOCA and Public Parking	Pedestrian Bridge Footing

4.2.3.3.2 Partial Takes

Of the partial takes identified in Table 4.2-3 and Figure 4.2-1, potentially significant impacts may occur at the following parcels, where mitigation measures are warranted (see Section 4.2.4 of the Draft EIS/EIR for candidate mitigation measures). Additional information regarding all proposed displacements is available in the Displacement and Relocation Technical Memorandum, Appendix N, of this EIS/EIR.

- APN 5151014032 (703 W. 3rd Street; Figure 4.2-1 #3) – This parcel contains the Central Plant, which is a heating and ventilation plant for some buildings in Bunker Hill. This parcel is located within the Bunker Hill Redevelopment Area as designated by the City of Los Angeles Community Redevelopment Agency (Parcel H, Central Plant). Construction of the At-Grade Emphasis LRT Alternative is expected to result in a partial take of this site for construction staging and the proposed 2nd/Hope Street station. The part of the parcel that would be utilized for construction staging is currently used for parking and is the primary access point to the Central Plant. During construction, this access point would remain available and replacement parking would be required. Potentially significant impacts could result if replacement parking was not provided or if access was inhibited or eliminated to the Central Plant. Proposed mitigation measures described in Section 4.2.4 of the Draft EIS/EIR have been developed to reduce this potential impact.

- APN 5161012901 (Parcel located on southwestern corner of the Temple Street/Alameda Street intersection; Figure 4.2-1 #11) – This parcel is currently used as a publicly-owned, off-street, surface parking lot. Part of this lot is anticipated to be developed by others (Bureau of Engineering 2009). Construction of the At-Grade Emphasis LRT Alternative is expected to result in a partial take of a parking lot and loss of several parking spaces (approximately 26 standard spaces and seven handicapped spaces) for part of its alignment to accommodate the turning radius required to join the existing Metro Gold Line Extension tracks. Since driveway access would be limited, coordination of design would need to occur between Metro and the development. In addition, Metro would need to meet the safety requirements of the California Public Utilities Commission (CPUC), the City, and other regulatory agencies. Loss of the current parking lot may cause an inconvenience for users but it would not represent a significant impact. Additional privately-operated parking lots and structures are located in the vicinity.

- APN 5161012905 (152 N. Central Avenue; Figure 4.2-1 #12) – This parcel, which is currently used as a publicly-owned, off-street, surface parking lot, also contains the Geffen Contemporary at the Museum of Contemporary Art (MOCA). Only part of the surface parking lot is anticipated to be developed by others (Bureau of Engineering 2009). Construction of the At-Grade Emphasis LRT Alternative is expected to result in a partial take of five parking spaces to locate the footing of a proposed pedestrian bridge across Alameda Street. Loss of the current parking lot may cause an inconvenience for users but it would not represent a significant impact.

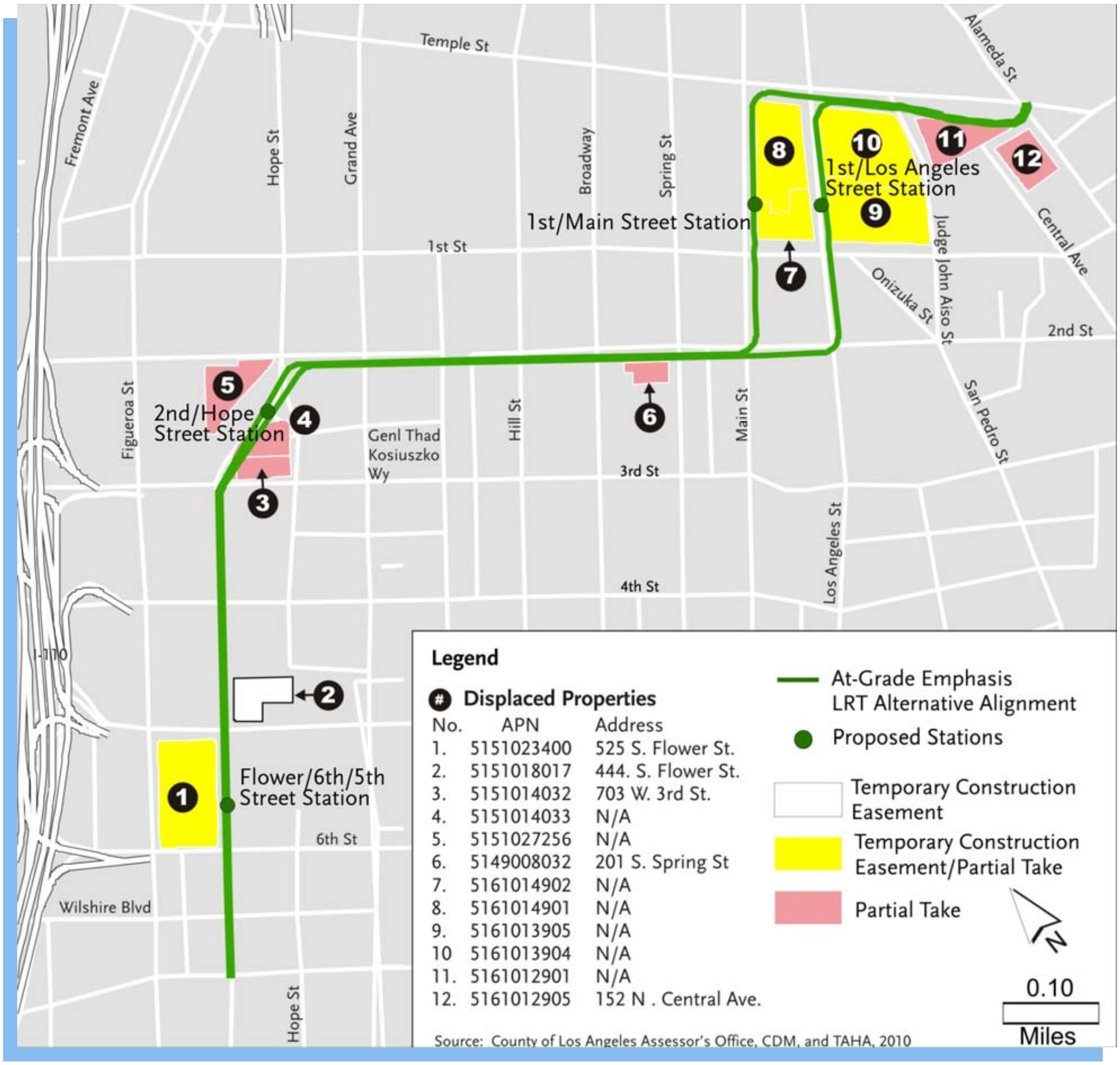
None of the other partial takes would result in potentially significant impacts because the takes consist of small portions of each parcel including landscaping and adjacent hardscape, privately-owned tennis courts, or private parking. Private parking is typically considered a transitional land use that could be developed by the owners for higher and better uses. The partial takes proposed by the At-Grade Emphasis LRT Alternative would not impede the function of these parcels or their potential for future development.

4.2.3.3.3 NEPA Finding

The At-Grade Emphasis LRT Alternative would have adverse direct and cumulative effects with respect to displacement and relocation. However, these impacts could be mitigated.

4.2.3.3.4 CEQA Determination

The At-Grade Emphasis LRT Alternative would have significant direct and cumulative impacts with respect to displacement and relocation. However, these impacts could be reduced or avoided through mitigation.



Note: Full parcels are shaded for partial takes to clearly illustrate parcel boundaries.

Figure 4.2-1. At-Grade Emphasis LRT Alternative Potential Displacements

4.2.3.4 Underground Emphasis LRT Alternative

To construct the Underground Emphasis LRT Alternative, partial takings of 18 parcels, full takings of eight parcels, and temporary easements across three parcels would be needed for the construction of LRT facilities, and permanent underground easements would be needed across four parcels. These counts have been updated since publication of the Draft EIS/EIR to differentiate between parcels that would have permanent partial takes on one part of the parcel, versus those that would have permanent partial takes and temporary construction easements on different parts of the parcel. These parcels are shown in Table 4.2-4 and Figures 4.2-2 through 4.2-4, and discussed further in the following subsections.

Permanent displacement of approximately 148 to 281 parking spaces (about 26 of which are on-street parking spaces) would occur as a result of the acquisitions required for this alternative. Approximately 139 of these displacements would occur in the Little Tokyo community, where businesses and residents have expressed concern over the potential loss of parking. The other displaced parking spaces would be located farther west along 2nd Street, near the 2nd Street station (Broadway option). Surface parking lots are an important resource in downtown Los Angeles due to the presence of many historic buildings that do not provide the amount of off-street parking required by current planning code. Surface parking is a transitional land use that can lead to future development, and improved transit service can allow a neighborhood to grow while reducing its overall need for parking. On-street parking spaces are discussed separately in Chapter 3, since they are located on public right-of-way as opposed to off-street parcels. The Regional Connector would provide new non-auto access to the area, and partially offset the parking demand in the area. However, some cumulative impacts would still remain, though they would not be significant. Acquisition of businesses would not result in significant displacement and relocation impacts given compliance with the Uniform Act as noted in Section 4.2.1.

4.2.3.4.1 Easements

Of the easements identified in Table 4.2-4 and Figures 4.2-2 through 4.2-4, none would have potentially significant impacts. Additional information regarding all proposed displacements is available in the Displacement and Relocation Technical Memorandum, Appendix N, of this EIS/EIR.

Table 4.2-4. Parcels Potentially Affected by Displacement – Underground Emphasis LRT Alternative

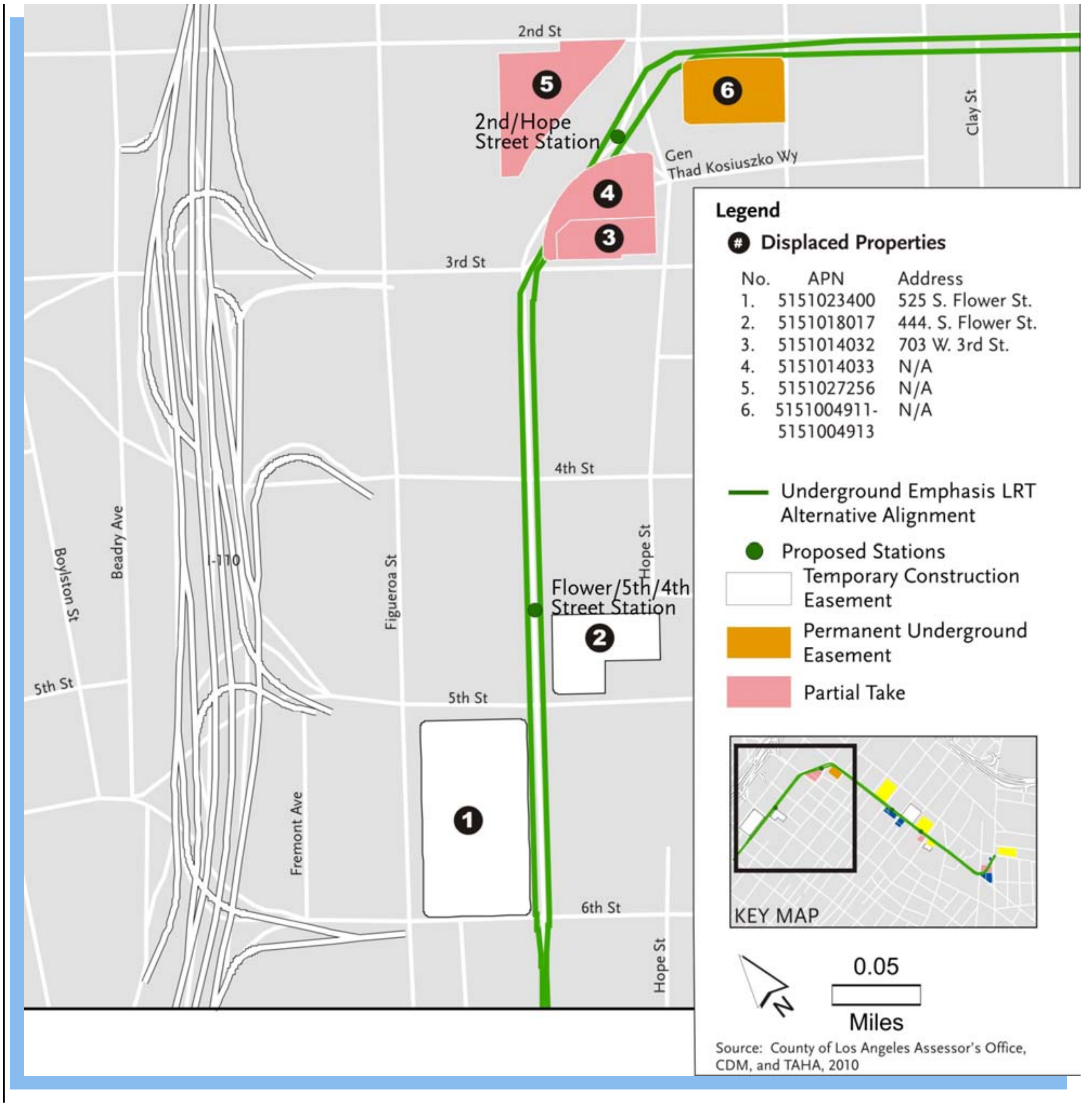
Figure	#	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
4.2-2	1	5151023400	525 S. Flower Street	Temporary Construction Easement	21,055	City National Plaza	Construction Staging
4.2-2	2	5151018017	444 S. Flower Street	Temporary Construction Easement	13,325	Citicorp Plaza	Construction Staging
4.2-2	3	5151014032	703 W. 3rd Street	Partial Take	16,927	Central Plant	Construction Staging
4.2-2	4	5151014033	Parcel Bounded by 3rd/Hope/Flower Streets and General Kosciuszko Way	Partial Take	39,549	Central Plant	Construction Staging
4.2-2	5	5151027256	Parcel Bounded by 3rd/Hope/Flower Streets	Partial Take	5,348	Tennis Courts and Pool for Residential Bldg	Station Entrance and Bridge
4.2-2	6	5151004911 thru 5151004913	Parcel Bounded by 2nd Street, Hope Street, Grand Avenue, and General Kosciuszko Way	Permanent Underground Easement	15,900	Parking Lot	Tunneling
4.2-3	7	5149001903	Parcel Bounded by 1st/2nd/Hill Streets, Broadway	Temporary Construction Easement/ Partial Take	28,795/ 8,015	Empty Lot	Construction Staging/ Station Facilities & Emergency Exit
4.2-3	8	5149008031	200 S. Broadway	Full Take	5,330	Parking Lot	Station Entrance
4.2-3	9	5149008030	208 S. Broadway	Full Take	8,340	Parking Lot	Station Entrance
4.2-3	10	5149008032	201 S. Spring Street	Full Take	25,824	Parking Lot	Station Entrance

Table 4.2-4. Parcels Potentially Affected by Displacement – Underground Emphasis LRT Alternative (continued)

Figure	#	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
4.2-3	11	5149001902	100 W. 1st Street	Partial Take	6,563	New LAPD HQ	Construction Staging
4.2-3	12	5149007006	206 S. Spring Street	Full Take	18,561	Commercial Buildings	Construction Staging
4.2-3	13	5149007005	212 S. Spring Street	Full Take	12,740	Commercial Buildings	Construction Staging
4.2-3	14	5149006010-028; 031-054; 056-059; 061-095; 097; 099-108; 110; 112-149, 151	108 W. 2nd Street, Units 102-108; 201-212; 215; 301-315; 401-408; 410-415; 501-515; 601-615; 701-704; 706; 708-715; 801-802; 804; 806-815; 901-915; 1001-10015	Permanent Underground Easement	550	Higgins Bldg; Mixed-Use Commercial and Condos	Tunneling
4.2-3	15	5161015901	100 S. Main Street	Partial Take	4,628	Caltrans HQ	Station Entrance
4.2-3	16	5161026023	200 S. Main Street	Permanent Underground Easement	20	Vibiana's	Tunneling
4.2-3	17	5161026024	114 E. 2nd Street	Permanent Underground Easement	325	Vibiana's	Tunneling
4.2-3	18	5161026033	Parcel at SW corner of Los Angeles/2nd Streets	Partial Take	4,128	Plaza	Station Plaza
4.2-3	19	5161026901	203 S. Los Angeles Street	Partial Take	951	Little Tokyo Branch Public Library	Station Entrance
4.2-3	20	5161024014	Parcel at SE corner of Los Angeles/2nd Streets	Partial Take	20829	Parking Lot	Construction Staging & Station Plaza

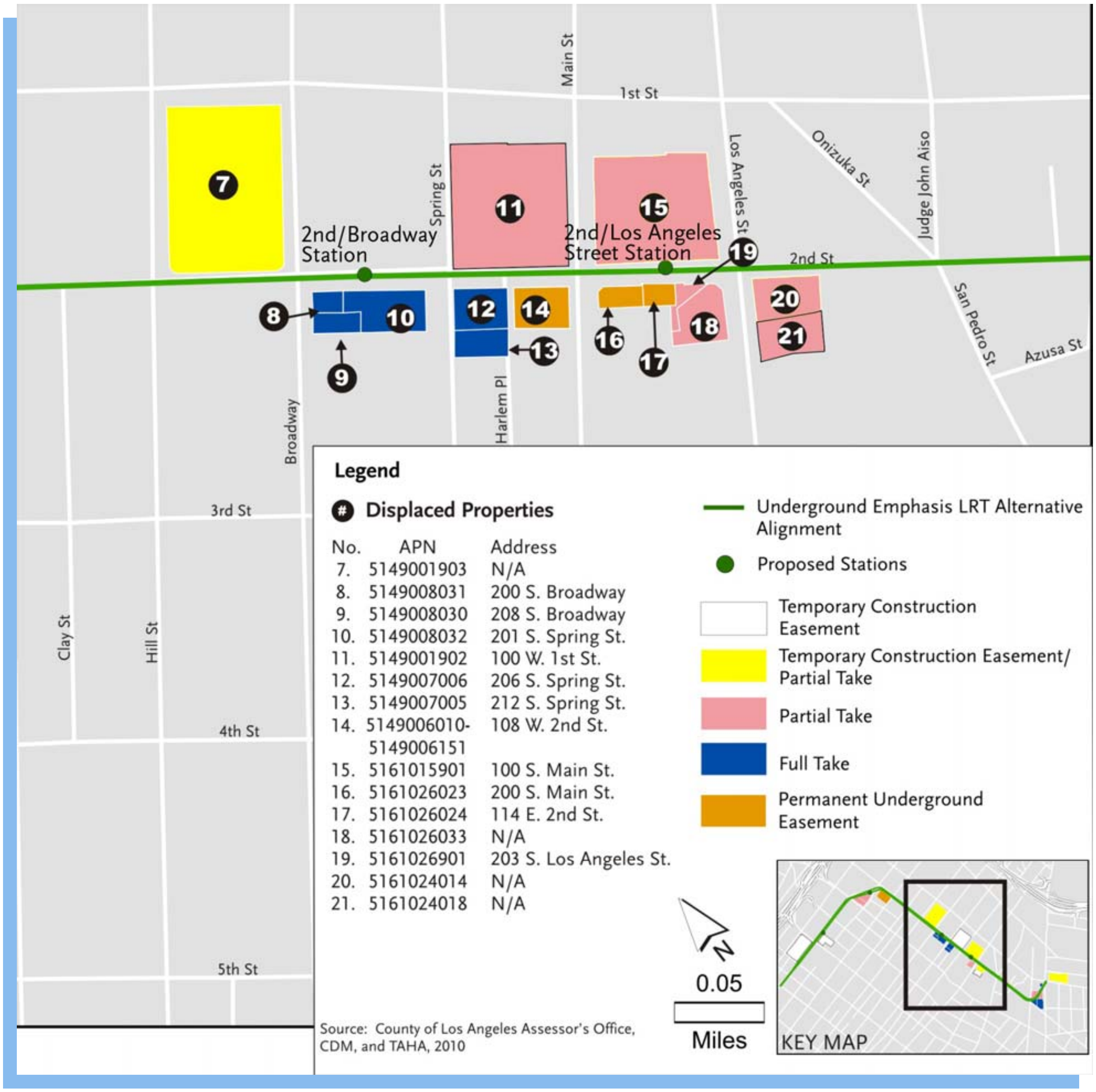
Table 4.2-4. Parcels Potentially Affected by Displacement – Underground Emphasis LRT Alternative (continued)

Fig.	#	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
4.2-3	21	5161024018	Parcel at SE corner of Los Angeles/2nd Streets	Partial Take	9,151	Parking Lot	Construction Staging
4.2-4	22	5161018007	401 E. 2nd Street	Full Take	17,890	Parking Lot	Portal
4.2-4	23	5161018011	437 E. 2nd Street	Full Take	26,239	Parking Lot	Portal
4.2-4	24	5161018020	Parcel Bounded by 1st/2nd/Alameda Streets and Central Avenue	Partial Take	24,967	Commercial	Portal
4.2-4	25	5161018010	Parcel Bounded by 1st/2nd/Alameda Streets and Central Avenue	Partial Take	2,204	Parking Lot	Portal
4.2-4	26	5161018009	Parcel Bounded by 1st/2nd/Alameda Streets and Central Avenue	Partial Take	1,834	Parking Lot	Portal
4.2-4	27	5161018008	105 S. Alameda Street	Partial Take	3,436	Commercial	Portal
4.2-4	28	5161018001	416 E. 1st Street	Full Take	5,111	Commercial	Portal
4.2-4	29	5173011902	Parcel at NE corner of 1st/Alameda Streets	Partial Take	7,724	Vacant Lot	Footing for Pedestrian Bridge
4.2-4	30	5161018901	Parcel Bounded by 1st/2nd/Alameda Streets and Central Avenue	Partial Take	5,804	Commercial	Portal
4.2-4	31	5161018021	Parcel Bounded by 1st/2nd/Alameda Streets and Central Avenue	Partial Take	1,618	Parking Lot	Portal
4.2-4	32	5161018002	Parcel Bounded by 1st/2nd/Alameda Streets and Central Avenue	Partial Take	459	Commercial	Portal



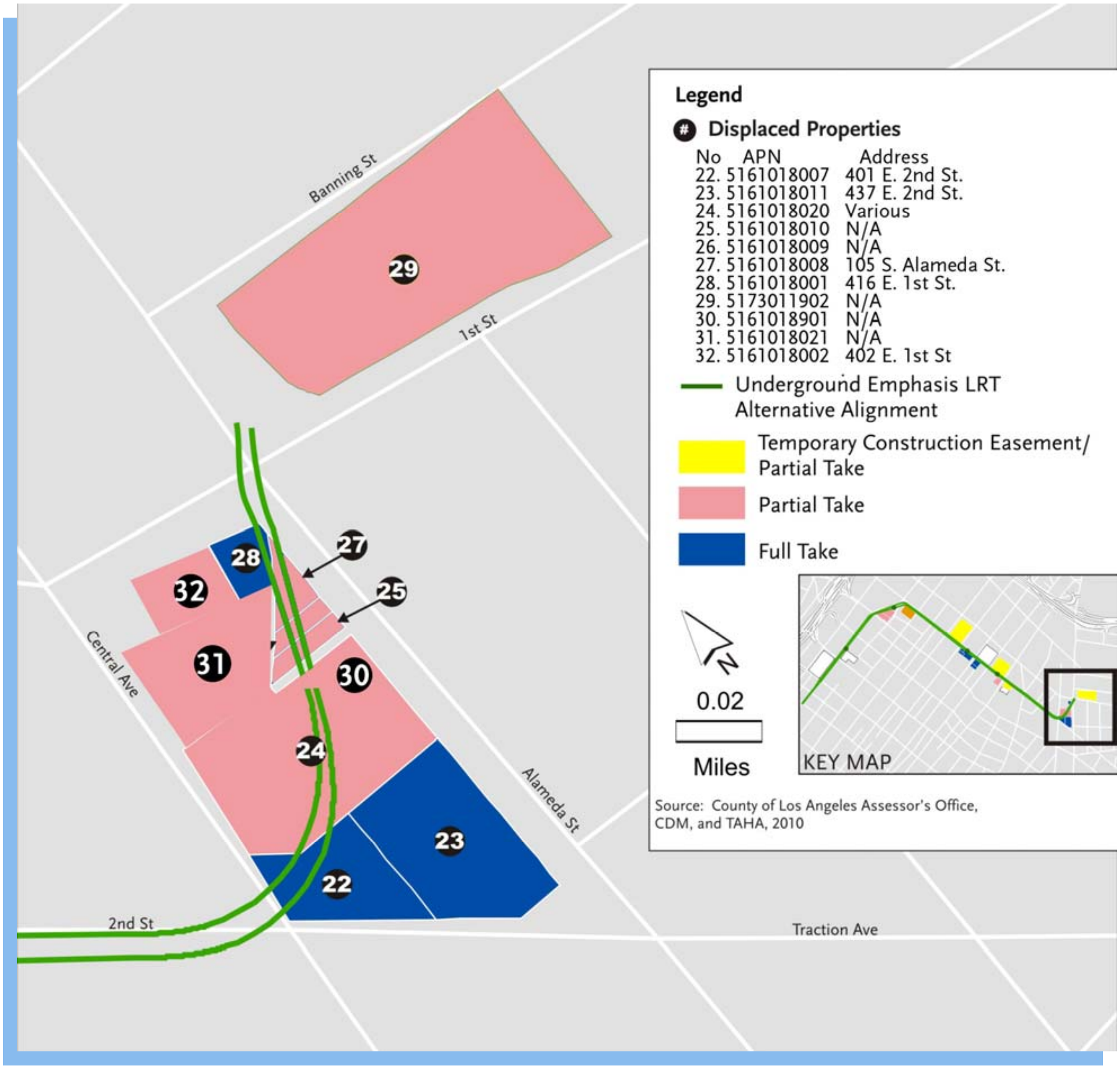
Note: Full parcels are shaded for partial takes to clearly illustrate parcel boundaries.

Figure 4.2-2. Underground Emphasis LRT Alternative Potential Displacements – Flower Street



Note: Full parcels are shaded for partial takes to clearly illustrate parcel boundaries.

Figure 4.2-3. Underground Emphasis LRT Alternative Potential Displacements – 2nd Street



Note: Full parcels are shaded for partial takes to clearly illustrate parcel boundaries.

Figure 4.2-4. Underground Emphasis LRT Alternative Potential Displacements – Little Tokyo

4.2.3.4.2 Partial Takes

Of the partial takes identified in Table 4.2-4 and Figures 4.2-2 through 4.2-4, potentially significant impacts may occur at the following parcels, where mitigation measures are warranted (see Section 4.2.4 of the Draft EIS/EIR for candidate mitigation measures). Additional information regarding all proposed displacements is available in the Displacement and Relocation Technical Memorandum, Appendix N, of this EIS/EIR.

- APN 5151014032 (703 W. 3rd Street; Figure 4.2-2 #3) – See discussion of impacts to this parcel in Section 4.2.3.3.2.

- APN 5161026901 (203 S. Los Angeles Street; Figure 4.2-3 #19) – This parcel is currently occupied by the City of Los Angeles Public Library Little Tokyo Branch. The Underground Emphasis LRT Alternative would use portions of this parcel as a plaza and entrance to the potential underground 2nd Street station (Los Angeles Street Option). This parcel contains a public resource. It is anticipated that during operations, the plaza would be a shared resource, serving as the main entrance to the library and the underground station. Potential significant impacts may occur if access to the Little Tokyo Library Branch were removed or inhibited during construction, but access would be maintained per the candidate mitigation measures in Section 4.2.4 of the Draft EIS/EIR.

- APNs 5161018010, 5161018009, and 5161018008 (portion) (Parcels Bounded by 1st/2nd/Alameda Streets and Central Avenue and 105 S. Alameda Street; Figure 4.2-4 #s 25, 26, and 27, respectively) – These parcels are currently used as a privately-operated parking lot. All of these parcels are expected to be acquired to stage materials during construction and serve as an LRT station entrance for the Underground Emphasis LRT Alternative. These parcels have approximately 30 parking spaces (this is an estimate because some of the spaces are unmarked). Typically, privately-operated parking lots are considered transitional land uses that could be developed by the owners for higher and better uses. Several other privately-operated parking lots and structures are located in the vicinity. Loss of the current parking lot may cause an inconvenience for users but it would not represent a significant impact. Parking demand in the area would be partially offset by the increased public transit access provided by the proposed project. However, Little Tokyo residents and business owners have indicated that parking spaces are important community resources and that the loss of this parking could negatively impact the adjacent small businesses and the Japanese-American National Museum (JANM) located across the street. The community is concerned that this could, in turn, affect the economic stability and ultimately the character of the community. Therefore, Metro would conduct a parking capacity study of the Little Tokyo area during construction to determine if there is sufficient parking availability without these parcels. This change would not be a significant impact with respect to displacements.

- APN5161018020 (436 E. 2nd Street; Figure 4.2-4 #24) – This parcel is currently occupied by several commercial buildings containing restaurants and retail uses. The largest portion of this parcel is occupied by an Office Depot. There are five smaller commercial businesses occupying the site, including three fast food chains and two local restaurants. Construction and operation of the Underground Emphasis LRT Alternative would displace two businesses (85 jobs) on this parcel for the train portal. Each business displaced as a result of the project would be given advance written notice and would be informed of its eligibility for relocation assistance and payments. It is anticipated that where relocation would be required, most of the jobs would be potentially displaced but would be retained with the relocation. Therefore, there would be no net loss of jobs overall and no significant impacts or adverse effects related to job loss.

None of the other partial takes would result in significant impacts because the takes consist of small portions of each parcel including landscaping and adjacent hardscape, privately-owned tennis courts, or private parking. Private parking is typically considered a transitional land use that could be developed by the owners for higher and better uses. The partial takes proposed by the Underground Emphasis LRT Alternative would not impede the function of these parcels or their potential for future development.

4.2.3.4.3 Full Takes

Of the full takes identified in Table 4.2-4 and Figures 4.2-2 through 4.2-4, potentially significant impacts may occur at the following parcels, where mitigation measures are warranted (see Section 4.2.4 of the Draft EIS/EIR for candidate mitigation measures). Business displacements without significant impacts are also discussed. Additional information regarding all proposed displacements is available in the Displacement and Relocation Technical Memorandum, Appendix N, of this EIS/EIR.

- APNs 5149008031, 5149008030, and 5149008032 (200, 208, and 201 South Spring Street, respectively; Figure 4.2-3 #s 8, 9, and 10 respectively) – These parcels are currently used as a privately-operated parking lot with approximately 142 parking spaces (this is an estimate because about half of the spaces are unmarked). Construction and operation of the Underground Emphasis LRT Alternative is expected to take all of the parcels and utilize them to stage materials and to serve as the entrance plaza for the proposed 2nd Street station (Broadway Option). Privately-operated parking lots are typically considered transitional land uses that could be developed by the owners for higher and better uses. There are several other privately-operated parking lots and structure in the vicinity. Although loss of the current parking lot may cause an inconvenience for users, it would not represent a significant impact or adverse effect. This potential impact to parking would be partially offset by the increased public transit access provided by the proposed project. No significant impacts or adverse effects associated with this displacement are expected.

- APN 5149007006 (206 S. Spring Street; Figure 4.2-3 #12) – This parcel is occupied by a commercial building that includes five businesses. The businesses located on this parcel include two restaurants, a cigar shop, a credit union, a newspaper printing office, and the City Employees Club. The entire parcel would be taken and utilized for staging materials and equipment for the Underground Emphasis LRT Alternative (for the entire alignment, not just the adjacent station options). Optional station entrance locations are also located on this site, though not all of the optional station entrance locations would be constructed. Displacement of these five businesses would displace approximately 40 employees. Each business displaced as a result of the project would be given advance written notice and would be informed of its eligibility for relocation assistance and payments. It is anticipated that where relocation would be required, most of the jobs that would be potentially displaced would be retained with the relocation. Therefore, there would be no net loss of jobs overall. This would result in no significant impacts or adverse effects related to job loss.

- APN 5149007005 (212 S. Spring Street; Figure 4.2-3 #13) – This parcel is currently occupied by a vacant commercial building. The Underground Emphasis LRT Alternative would take the entire parcel and use it for staging materials and equipment for construction of the entire alignment, not just the adjacent station options. Optional station entrance locations are also located on this site, though not all of the optional station entrances would be constructed. No significant impacts or adverse effects related to job loss would occur because the parcel is occupied only by a vacant building. However, should businesses exist when the project starts, each business displaced as a result of the project would be given advance written notice and would be informed of its eligibility for relocation assistance and payments. It is anticipated that where relocation would be required, most of the jobs potentially displaced would be retained with relocation. Therefore, there would be no net loss of jobs overall. This would result in no significant impacts or adverse effects related to job loss.

- APNs 5161018008 (portion) and 5161018001 (105 S. Alameda Street and 416 E. 1st Street; Figure 4.2-4 #s 27 and 28) – These parcels are currently occupied by a commercial building and associated patio (part of 5161018008). The current business is Señor Fish restaurant. The entire parcel is expected to be taken to serve as the train egress/ingress portal during operation of the Underground Emphasis LRT Alternative. Displacement of this property would result in the loss of approximately six jobs. Each business displaced as a result of the project would be given advance written notice and would be informed of its eligibility for relocation assistance and payments. It is anticipated that, where relocation would be required, most of the jobs would be retained with the relocation. Therefore, there would be no net loss of jobs overall. This would result in no significant impacts or adverse effects related to job loss.

- APNs 5161018007 and 5161018011 (401 E. 2nd Street and 437 E. 2nd Street; Figure 4.2-4 #s 22 and 23) – These parcels are currently used as parking lots. Construction and operation of the Underground Emphasis LRT Alternative would displace 109 parking spaces on these parcels for the LRT station entrance. The parking lot is associated with businesses in the adjacent parcels and normally would not be separately considered from its complementary use. However, this parking lot is also used in the evenings for public, paid parking after the Office Depot has closed for the day. Parking demand in the area would be partially offset by the increased public transit access provided by the proposed project. Little Tokyo residents and business owners have indicated that parking spaces are important community resources and that losing this parking could negatively impact the adjacent small businesses and the JANM, located across the street. The community is concerned that this could, in turn, affect the economic stability and ultimately the character of the community. Therefore, Metro would conduct a parking capacity study of the Little Tokyo area during construction to determine if there is sufficient parking availability without these parcels. This change would not be a significant impact with respect to displacements.

Given that the Uniform Act would be implemented for all proposed takings, and additional mitigation measures have been identified in Section 4.2.4 of the Draft EIS/EIR, none of the proposed takings would result in significant impacts.

4.2.3.4.4 NEPA Finding

The Underground Emphasis LRT Alternative would have adverse direct and cumulative effects with respect to displacement and relocation. However, these impacts could be mitigated.

4.2.3.4.5 CEQA Determination

The Underground Emphasis LRT Alternative would have significant direct and cumulative impacts with respect to displacement and relocation. However, these impacts could be reduced or avoided through mitigation.

4.2.3.5 Locally Preferred Alternative

To construct the LPA, partial takings of seven parcels, full takings of nine parcels, permanent underground easements across 26 parcels, and temporary construction easements across 12 parcels would be needed for the construction of LRT facilities. These parcels are shown in Table 4.2-5 and Figures 4.2-5 through 4.2-7, and discussed further in the following sections.

Permanent displacement of approximately 270 off-street parking spaces would occur as a result of the acquisitions required for the LPA. Approximately 130 of these off-street parking spaces are in the Little Tokyo community, where businesses and residents have expressed concern over the potential loss of parking. The other displaced parking spaces would be located farther west along 2nd Street, near the 2nd Street/Broadway station. Surface parking lots are an important resource in downtown Los Angeles due to the presence of many historic buildings that do not provide the amount of off-street parking required by current planning code. Surface parking is a transitional land use that can lead to future development, and improved transit service can allow a neighborhood to grow while reducing its overall need for parking. On-street parking spaces are discussed separately in Chapter 3, since they are located on public right-of-way as opposed to off-street parcels. The Regional Connector would provide new non-auto access to the area, and partially offset the parking demand in the area. With implementation of mitigation measures, the LPA would not result in a considerable contribution to a cumulative impact. The removal of on-street parking spaces is discussed in Chapter 3, Transportation Impacts and Mitigation.

Acquisition of businesses would not result in significant displacement and relocation impacts given compliance with the Uniform Act as noted in Section 4.2.1. With the refinements made since publication of the Draft EIS/EIR, the number of businesses displaced has been reduced from ten to four.

All property acquired as a partial take or full take would be for permanent transit use, such as station plazas, entrances, and portals. No surplus property would be left after construction.

Table 4.2-5. Parcels Potentially Affected by Displacement – Locally Preferred Alternative

Fig.	#	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
4.2-5	1	5151023400	525 S. Flower Street	Temporary Construction Easement	3,960	City National Plaza	Construction Staging
4.2-5	2	5151018017	444 S. Flower Street	Temporary Construction Easement	1,019	Citicorp Plaza	Construction Staging
4.2-5	3	5151014031	333 Hope Street	Permanent Underground Easement	7	YMCA/Parking Structure	Tunneling
4.2-5	4	5151014032	703 W. 3rd Street	Partial Take	16,884	Central Plant	Construction Staging
4.2-5	5	5151014033	Parcel Bounded by 3rd/Hope/Flower Streets and General Kosciuszko Way	Partial Take	39,720	Central Plant	Construction Staging
4.2-5	6	5151004911 thru 5151004913	Parcel Bounded by 2nd Street, Hope Street, Grand Avenue, and General Kosciuszko Way	Permanent Underground Easement	13,500	Parking Lot	Tunneling
4.2-5	7	5149010949	Parcel Bounded by Grand Avenue, 2nd Street, Olive Street, and 1st Street	Permanent Underground Easement	19,100	Parking Lot	Tunneling
4.2-5 4.2-6	8	5149001903	Parcel Bounded by 1st/2nd/Hill Streets, Broadway	Partial Take/Temporary Construction Easement/ Permanent Underground Easement	2,640/29,000/ 1,900/	Empty Lot	Construction Staging/Station Facilities & Emergency Exit
4.2-6	9	5149008031	200 S. Broadway	Full Take	5,330	Parking Lot	Station Entrance
4.2-6	10	5149008030	208 S. Broadway	Full Take	8,340	Parking Lot	Station Entrance
4.2-6	11	5149008032	201 S. Spring Street	Full Take	25,824	Parking Lot	Station Entrance
4.2-6	12	5149001902	100 W. 1st Street	Permanent Underground Easement	1,200	New LAPD HQ	Station Facilities

Table 4.2-5. Parcels Potentially Affected by Displacement – Locally Preferred Alternative (continued)

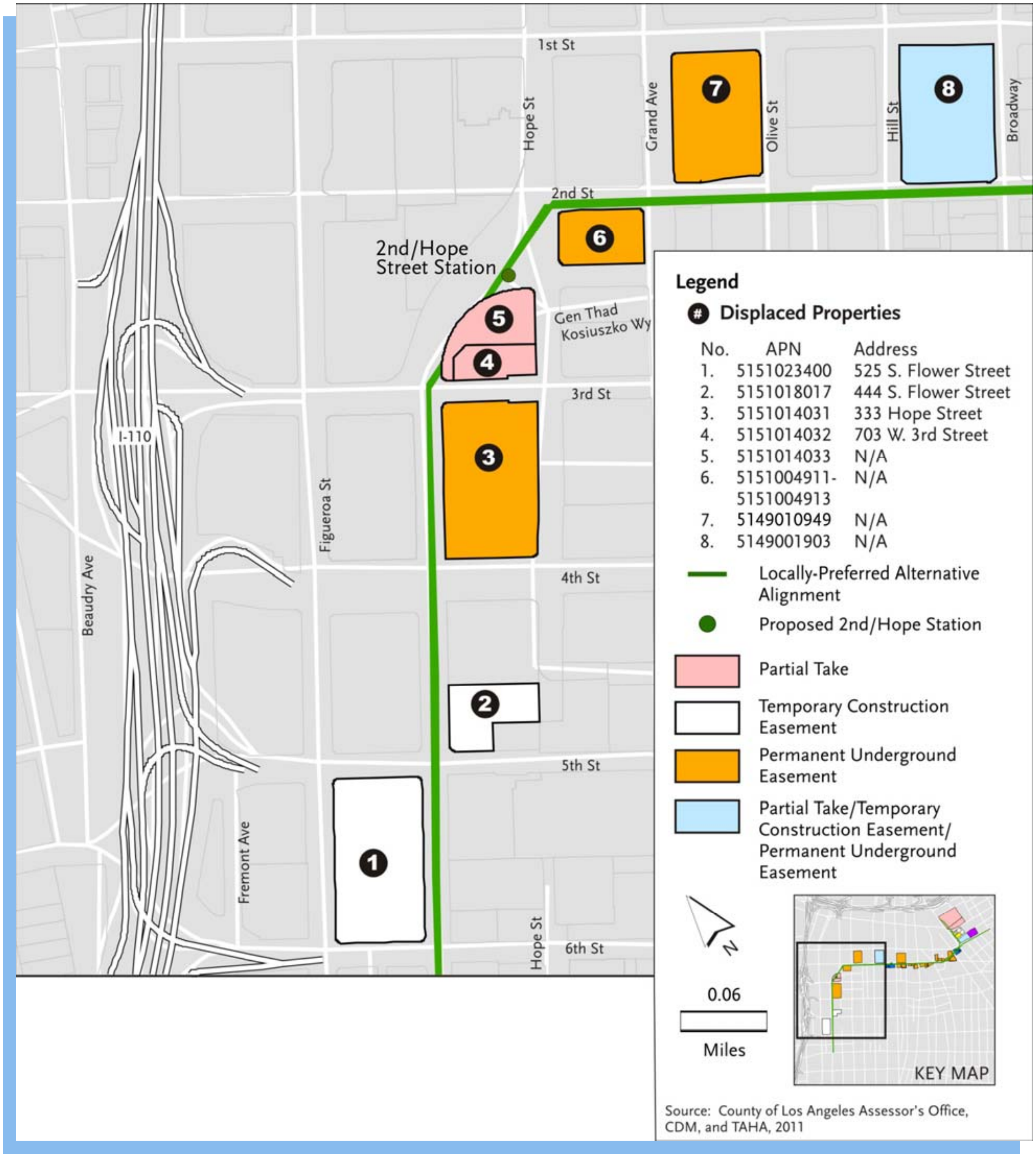
Fig.	#	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
4.2-6	13	5149007006	206 S. Spring Street	Permanent Underground Easement	900	Commercial Buildings	Station Facilities
4.2-6	14	5149006010-028; 031-054; 056-059; 061-095; 097; 099-108; 110; 112-149, 151	108 W. 2nd Street, Units 102-108; 201-212; 215; 301-315; 401-408; 410-415; 501-515; 601-615; 701-704; 706; 708-715; 801-802; 804; 806-815; 901-915; 1001-10015	Permanent Underground Easement	800	Higgins Bldg; Mixed-Use Commercial and Condos	Station Facilities
4.2-6	15	5161026023	200 S. Main Street	Permanent Underground Easement	571	Vibiana's	Tunneling
4.2-6	16	5161026024	114 E. 2nd Street	Permanent Underground Easement	898	Vibiana's	Tunneling
4.2-6	17	5161026033	Parcel at SW corner of Los Angeles/2nd Streets	Permanent Underground Easement	400	Plaza	Tunneling
4.2-6	18	5161026901	203 S. Los Angeles Street	Permanent Underground Easement	39	Little Tokyo Branch Public Library	Tunneling
4.2-6	19	5161024014	Parcel at SE corner of Los Angeles/2nd Streets	Permanent Underground Easement	876	Parking Lot	Tunneling
4.2-6	20	5161024015	Parcel on 2nd Street	Permanent Underground Easement	246	Parking Lot	Tunneling
4.2-6	21	5161024010	228 E. 2nd Street	Permanent Underground Easement	124	Parking Lot	Tunneling
4.2-6	22	5161024011	230 E. 2nd Street	Permanent Underground Easement	123	Parking Lot	Tunneling
4.2-6	23	5161024012	232 E. 2nd Street	Permanent Underground Easement	754	Parking Lot	Tunneling
4.2-6 4.2-7	24	5161017029	120 S. San Pedro Street	Permanent Underground Easement	173	Bank	Tunneling

Table 4.2-5. Parcels Potentially Affected by Displacement – Locally Preferred Alternative (continued)

Fig.	#	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
4.2-7	25	5161017009	321 E. 2nd Street	Permanent Underground Easement	50	Office Building	Tunneling
4.2-7	26	5161017023	333 E. 2nd Street	Permanent Underground Easement	1,040	Japanese Village Plaza	Tunneling
4.2-7	27	5161017033	335 E. 2nd Street	Permanent Underground Easement	22,000	Japanese Village Plaza and Parking Structure	Tunneling
4.2-7	28	5161017039-5161017050	375 E. 2nd Street	Permanent Underground Easement	119	Hikari Building	Tunneling
4.2-7	29	5161017920	364 E. 1st Street	Permanent Underground Easement	100	Parking Structure, Street & Sidewalk	Tunneling
4.2-7	30	5161018002	402 E. 1st Street	Full Take	13,544	Parking Lot	Potential Station
4.2-7	31	5161018021	114 S. Central Avenue	Full Take	22,370	Restaurants	Potential Station
4.2-7	32	5161018001	416 E. 1st Street	Full Take	5,111	Restaurant	Potential Station
4.2-7	33	5161018008	105 S. Alameda Street	Full Take	3,572	Commercial	Potential Station
4.2-7	34	5161018009	Parcel Bounded by 1st/2nd/Alameda Streets and Central Avenue	Full Take	2,119	Parking Lot	Potential Station
4.2-7	35	5161018010	Parcel Bounded by 1st/2nd/Alameda Streets and Central Avenue	Full Take	2,731	Parking Lot	Potential Station
4.2-7	36	5173011901	Parcel at NE corner of 1st/Alameda Streets	Partial Take/Temporary Construction Easement/ Permanent Underground Easement	20,000/91,336/ 12,200	Parking Lot	Construction Staging, Tunneling & Street Widening

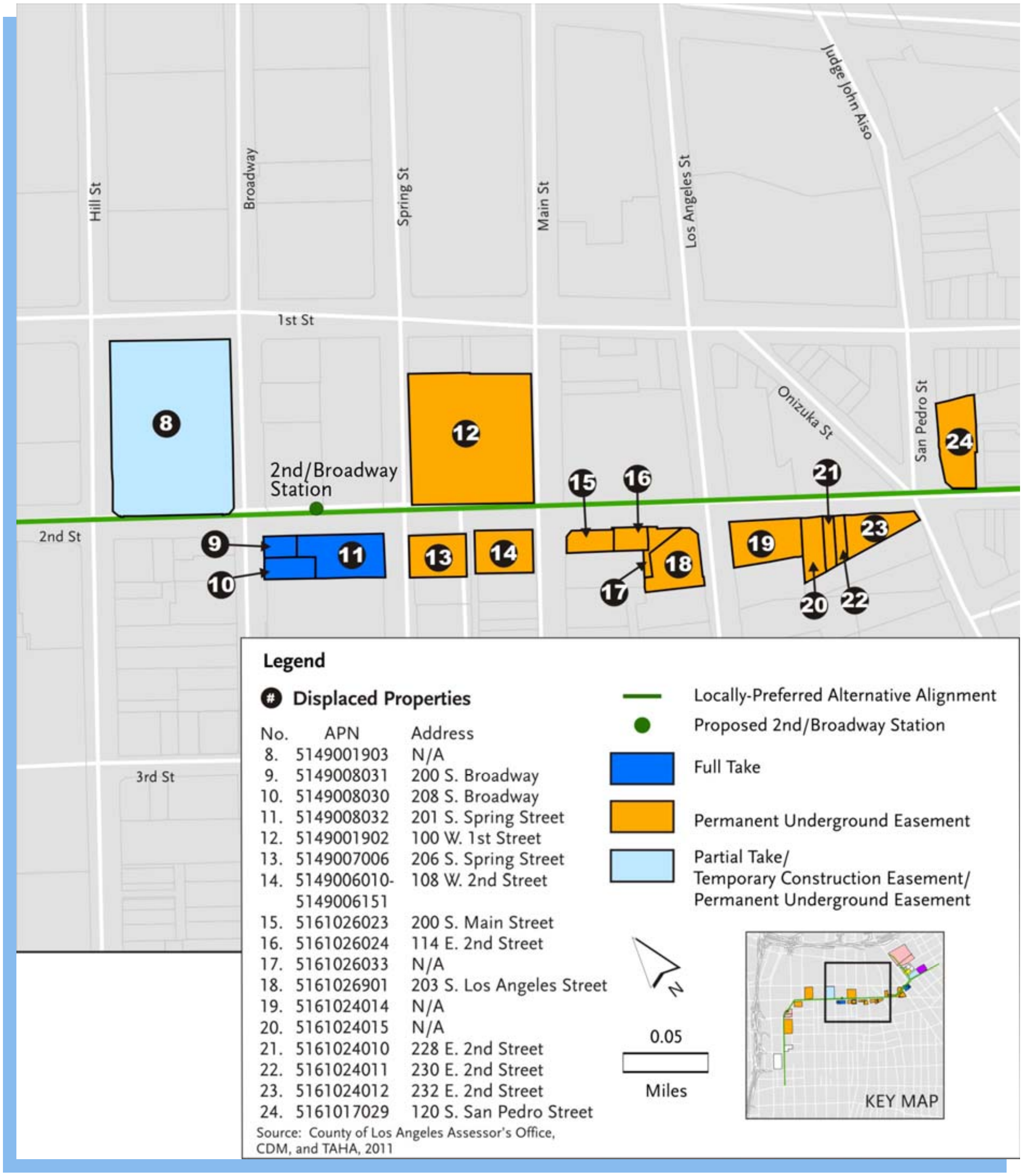
Table 4.2-5. Parcels Potentially Affected by Displacement – Locally Preferred Alternative (continued)

Fig.	#	APN	Address	Type of Displacement	Square Footage Needed	Current Use	Intended Use
4.2-7	37	5173012906	Parcel bounded by 1st Street, Temple Street, and Parcels 5173011902 and 5173012031	Partial Take/Temporary Construction Easement	28,088/9,600	Parking Lot	Construction Staging, Station & Road Widening
4.2-7	38	5173008908	432 E. Temple Street	Temporary Construction Easement/Permanent Underground Easement	34,103/7,450	Parking Lot	Construction Staging & Tunneling
4.2-7	39	5173008902	537 Banning Street	Temporary Construction Easement	46,184	Parking Lot	Construction Staging
4.2-7	40	5173008901	432 E. Temple Street	Temporary Construction Easement/Permanent Underground Easement	13,600/5,500	Parking Lot	Construction Staging & Tunneling
4.2-7	41	5173008904	416 E. Temple Street	Temporary Construction Easement	7,883	Parking Lot	Construction Staging
4.2-7	42	5173008905	422 E. Temple Street	Temporary Construction Easement	5,886	Parking Lot	Construction Staging
4.2-7	43	5173008906	432 E. Temple Street	Temporary Construction Easement	19,495	Warehouse	Construction Staging
4.2-7	44	5173007905	Parcel at Temple Street/ Alameda Street Intersection	Temporary Construction Easement/Permanent Underground Easement	2,089/1,272	Vacant	Construction Staging & Tunneling
4.2-7	45	5173007901	433 E. Temple Street	Partial Take	2,688	Los Angeles Dept. of Water & Power (LADWP) Station	Portal
4.2-7	46	5173006900	433 E. Temple Street	Partial Take	31,400	LADWP Station	Portal/Aerial Structure



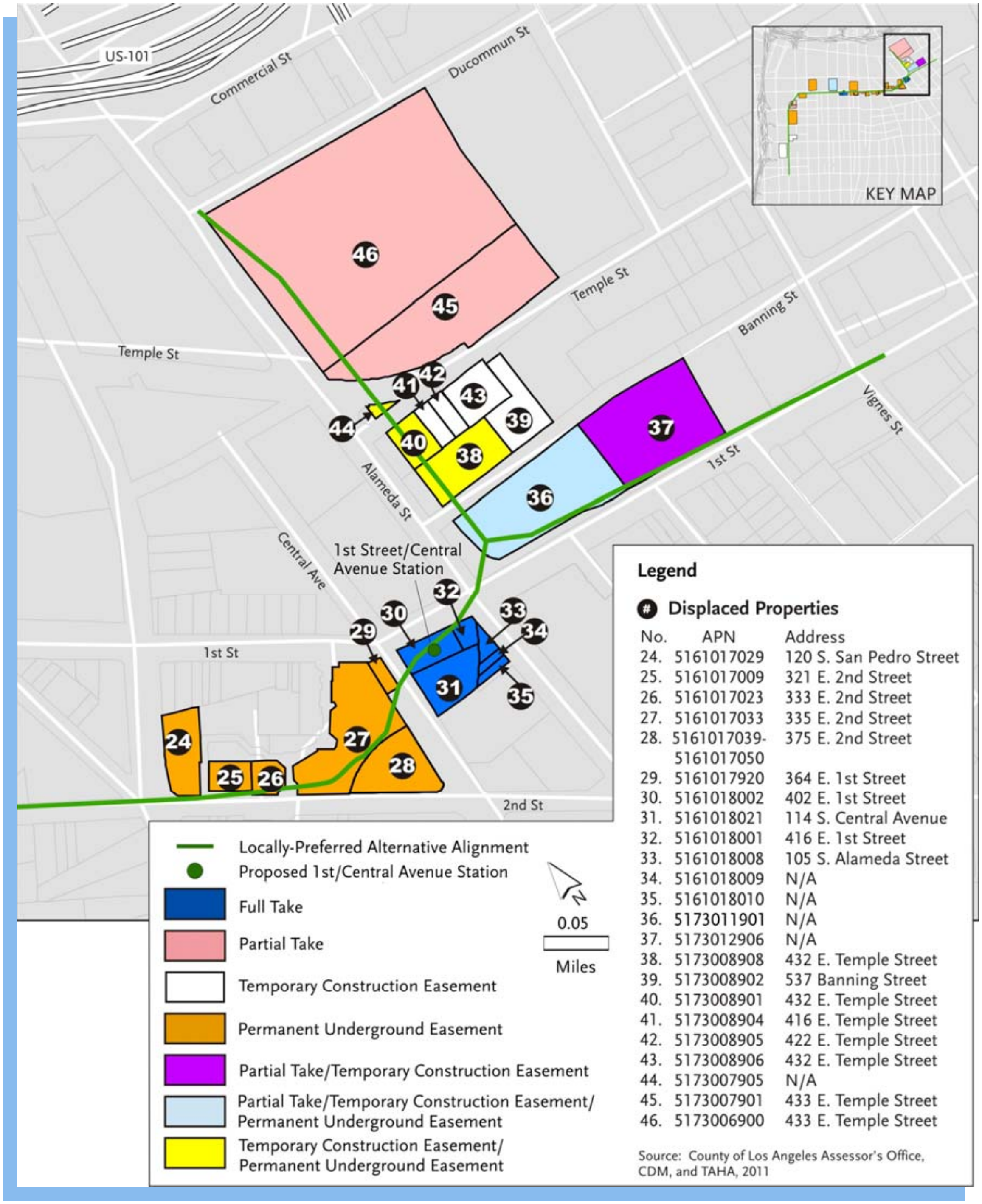
Note: Full parcels are shaded for partial takes to clearly illustrate parcel boundaries.

Figure 4.2-5. Locally Preferred Alternative Potential Displacements – Flower Street and Bunker Hill



Note: Full parcels are shaded for partial takes to clearly illustrate parcel boundaries.

Figure 4.2-6. Locally Preferred Alternative Potential Displacements – 2nd Street



Note: Full parcels are shaded for partial takes to clearly illustrate parcel boundaries.

Figure 4.2-7. Locally Preferred Alternative Potential Displacements – Little Tokyo

4.2.3.5.1 Easements

Of the easements identified for the LPA, potentially significant impacts may occur with the following permanent underground easement, where mitigation measures are warranted (see Section 4.2.4.2 below for final mitigation measures for the LPA). Additional information regarding all proposed displacements is available in the Displacement and Relocation Technical Memorandum, Appendix N, of this EIS/EIR.

- APNs 5161017023 and 5161017033 (333 E. 2nd Street and 335 E. 2nd Street; Figure 4.2-7 #s 26 and 27) – These parcels are occupied by the Japanese Village Plaza (JVP), which includes many restaurants and retail stores and a parking structure. The LPA tunnel would pass beneath these parcels. Impacts to the JVP structures, including the parking structure, are not anticipated. Only a subsurface easement is needed, and no surface area of the parcels would be acquired. The existing parking and retail structures on the parcels would remain in place. Appropriate protective measures would be used to avoid subsidence and damage to the structures, including the parking structure, during construction and operation as discussed in Section 4.9.4 of the Draft EIS/EIR. There are no reasonably foreseeable projects planned for this property, "any future project where the applicant has devoted significant time and financial resources to prepare for any regulatory review..." (Gray v. County of Madera (2008)). No surface area would be permanently acquired on this property for the LPA, only a subsurface easement for tunneling. Future subsurface development would be precluded within the easement area only. However, not all development would be precluded, including future subsurface development outside the easement area. Significant impacts are not expected with this permanent underground easement with these protective measures.

None of the proposed temporary surface easements would result in significant impacts because they consist of small portions of each parcel including landscaping and adjacent hardscape, privately-owned tennis courts, or off-street parking. Subsurface easements would not result in significant impacts because they do not involve displacement or acquisition of surface area.

4.2.3.5.2 Partial Takes

Of the partial takes identified for the LPA in Table 4.2-5 and Figures 4.2-5 through 4.2-7, potentially significant impacts may occur at the following parcels, where mitigation measures are warranted (see Section 4.2.4.2 below for final mitigation measures for the LPA). Additional information regarding all proposed displacements is available in the Displacement and Relocation Technical Memorandum, Appendix N, of this EIS/EIR.

- APN 5151014032 (703 W. 3rd Street; Figure 4.2-5 #4) – This parcel contains the Central Plant, which is a heating and ventilation plant for some buildings in Bunker Hill. This parcel is located within the Bunker Hill Redevelopment Area as designated by the City of Los Angeles Community Redevelopment Agency (Parcel H, Central Plant). Construction of the LPA is expected to result in a partial take of this site for construction staging and the proposed 2nd/Hope Street station. The part of the parcel that would be utilized for construction staging is currently used for parking and is the primary access point to the Central Plant. During construction, this access point would remain available and replacement parking would be required. Potential significant impacts could result if replacement parking was not provided or if access was inhibited or eliminated to the Central Plant. Final mitigation measures described in Section 4.2.4.2 and Chapter 8, MMRP for the LPA, have been developed to reduce this potential impact.

- APNs 5173007901 and 5173006900 (433 E. Temple Street; Figure 4.2-7 #45 and #46) – This parcel contains the LADWP yard and maintenance facility. LADWP is the water and power supplier for the City of Los Angeles. The LPA is expected to result in a permanent partial taking of this site for placement of the new ramp and portal leading to the existing light rail transit bridge across the US 101 Freeway. Potential significant impacts could result if access was inhibited or eliminated. Some parking spaces on the LADWP site would be temporarily displaced during construction, but not permanently. There is alternate parking on-site available for LADWP use, and construction activities would be coordinated with LADWP to ensure that there would be no adverse effects. Access to the facility would be maintained during construction and operation, thus avoiding significant impacts. Final mitigation measures described in Section 4.2.4.2 and Chapter 8, MMRP for the LPA, have been developed to reduce this potential impact.

None of the other partial takes would result in significant impacts because the takes consist of small portions of each parcel including landscaping and adjacent hardscape, privately-owned tennis courts, or private parking. Private parking is typically considered a transitional land use that could be developed by the owners for higher and better uses. The partial takes proposed by the LPA would not impede the function of these parcels or their potential for future development.

4.2.3.5.3 Full Takes

Of the full takes identified for the LPA in Table 4.2-5 and Figures 4.2-5 through 4.2-7, potentially significant impacts may occur at the following parcels, where mitigation measures are warranted (see Section 4.2.4.2 below for final mitigation measures for the LPA). Business displacements without significant impacts are also discussed. Additional information regarding all proposed displacements is available in the Displacement and Relocation Technical Memorandum, Appendix N, of this EIS/EIR.

- APNs 5149008031, 5149008030, and 5149008032 (200, 208, and 201 S. Spring Street, respectively; Figure 4.2-6 #s 9, 10, and 11 respectively) – These parcels are currently used as a privately-operated parking lot with approximately 142 parking spaces (this is an estimate because about half of the spaces are unmarked). Construction and operation of the LPA is expected to take all of the parcels and utilize them to stage materials and to serve as the entrance plaza for the proposed 2nd Street/Broadway station. Privately-operated parking lots are typically considered transitional land uses that could be developed by the owners for higher and better uses. There are several other privately-operated parking lots and structures in the vicinity. Although loss of the current parking lot may cause an inconvenience for users, it would not represent a significant impact or adverse effect. This potential impact to parking would be partially offset by the increased public transit access provided by the proposed project. No significant impacts or adverse effects associated with this displacement are expected.

- APNs 5161018002, 5161018010, 5161018009, and 5161018008 (402 E. 1st Street, Parcels bounded by 1st/2nd/Alameda Streets and Central Avenue, and 105 S. Alameda Street; Figure 4.2-7 #s 30 and 33 through 35) – These parcels are currently used as a privately-operated parking lot. All of these parcels are expected to be acquired to stage materials during construction and serve as a potential station entrance. These parcels have approximately 130 parking spaces (this is an estimate because some of the spaces are unmarked). Typically, privately-operated parking lots are considered transitional land uses that could be developed by the owners for higher and better uses. Several other privately-operated parking lots and structures are located in the vicinity. Loss of the current parking lot may cause an inconvenience for users but it would not represent a significant impact. Parking demand in the area would be partially offset by the increased public transit access provided by the proposed project. However, Little Tokyo residents and business owners have indicated that parking spaces are important community resources and that the loss of this parking could negatively impact the adjacent small businesses and the JANM located across the street. The community is concerned that this could, in turn, affect the economic stability and ultimately the character of the community. Therefore, prior to construction of the alternative, Metro would conduct an annual parking capacity study of the Little Tokyo area during construction to determine if there is sufficient parking availability without these parcels. Metro would also make a portion of the Mangrove property available for valet parking to offset the parking loss. This change would not be a significant impact with respect to displacements.

- APNs 5161018008 (portion) and 5161018001 (105 S. Alameda Street and 416 E. 1st Street; Figure 4.2-7 #s 33 and 32) – These parcels are currently occupied by a commercial building and associated patio (part of 5161018008). The current business is Señor Fish restaurant. The entire parcel is expected to be taken to serve as the station entrance plaza for the 1st/Central Avenue station. Displacement of this property would result in the loss of approximately six jobs. Each business displaced as a result of the project would be given advance written notice and would be informed of its eligibility for relocation assistance and payments. It is anticipated that, where relocation would be required, most of the jobs would be retained with the relocation. Therefore, there would be no net loss of jobs overall. This would result in no significant impacts or adverse effects related to job loss.

- APN 5161018002 (402 E. 1st Street; Figure 4.2-7 #30) – This parcel is currently occupied by a privately-owned, off-street parking lot used primarily by customers of the restaurants in the vicinity of the lot and patrons of JANM. Acquisition of this parcel would displace all parking spaces (approximately 70; however, this is an estimate because not all spaces are marked) for construction of an underground station and construction staging. Privately-operated parking lots are typically considered transitional land uses that could be developed by the owners for higher and better uses. There are several other privately-operated parking lots and structures in the vicinity. Although loss of the current parking lot may cause an inconvenience for users, it would not normally represent a significant impact or adverse effect. This potential impact to parking would be partially offset by the increased public transit access provided by the proposed project. Little Tokyo residents and business owners have indicated that parking spaces are important community resources and that the loss of this parking could negatively impact the adjacent small businesses and JANM located across the street. The community is concerned that this could, in turn, affect economic stability and ultimately the character of the community. Therefore, Metro would replace some of the parking temporarily during construction, and conduct a parking capacity study of the Little Tokyo area to determine if there is sufficient parking availability without those parcels or identify if additional replacement parking is warranted. Significant impacts or adverse effects to parking associated with this displacement would not occur.

- APN 5161018021 (114 S. Central Avenue; Figure 4.2-7 #31) – This parcel is currently occupied partly by a commercial building containing two restaurants and partly by a privately-operated parking lot that is also part of APN 5161018002. The LPA would displace two restaurants (25 jobs) on this parcel to construct the underground 1st/Central Avenue station. Each business displaced as a result of the project would be given advance written notice and informed of its eligibility for relocation assistance and payments. It is anticipated that where relocation would be required, most of the jobs potentially displaced would be retained with the relocation. Therefore, there would be no net loss of jobs overall and no significant impact or adverse effect related to job loss.

Given that the Uniform Act would be implemented for all displacements, along with the mitigation measures presented in Section 4.2.4.2 and the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, none of these takings would result in significant impacts.

4.2.3.5.4 NEPA Finding

The LPA would have adverse direct and cumulative effects with respect to displacement and relocation. However, these impacts will be mitigated.

4.2.3.5.5 CEQA Determination

The LPA would have significant direct and cumulative impacts with respect to displacement and relocation. However, these impacts could be reduced or avoided through mitigation. With implementation of mitigation measures, the LPA would not result in a considerable contribution to a cumulative impact. After mitigation, the LPA would not have any significant displacement or relocation impacts.

4.2.4 Mitigation Measures

4.2.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for displacements and relocations facilities impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.2.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Addition of coordination with the Los Angeles Department of Transportation (LADOT) to open city parking lots in the evenings for short-term parking during construction and to reduce the impacts of government vehicles parking on 2nd Street.

- Addition of detail to mitigation measures for consistency with other sections.

4.2.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

Due to the partial taking of parking and primary access to the Central Plant (APN 5151014032, Parcel 3 in Figures 4.2-1 and 4.2-2, and Parcel 4 in Figure 4.2-5; 703 W. 3rd Street):

- Metro shall provide replacement parking elsewhere on the parcel or on a nearby parcel during construction. (DR-1)

- Metro shall maintain access to the Central Plant at all times during construction. (DR-2)

Since some privately-owned parcels needed for construction staging currently contain buildings, but would be owned by Metro and may be vacant after construction:

- Upon completion of construction, property needed for construction but not required to maintain the physical infrastructure or necessary for access shall be included in the Metro Joint Development Program for possible development. Any development shall be environmentally and separately cleared from this project and shall undergo its own community input process. Until a development is approved, the remaining underutilized property may be used for public parking spaces or at the very least shall be graded and fenced to a higher standard that reflects the community's identity and character more than typical gravel and chain link. Per Metro's Joint Development Policy, the community shall be included in the development process. (DR-3)

To offset the public parking spaces that would be lost in Little Tokyo during construction:

- Metro shall work with the City to develop a parking mitigation program to mitigate the loss of public parking spaces during construction. This would include, but is not limited to, restriping the existing street to allow for diagonal parking, reducing the number of restricted parking areas, phasing construction activities in a way that minimizes parking disruption, and increasing the time limits for on-street parking. Restriping would occur on portions of Temple Street, Alameda Street, 1st Street, 2nd Street, Central Avenue, San Pedro Street, Judge John Aiso Street, 3rd Street, and Traction Avenue. Such parking mitigation shall be implemented on a temporary, tiered basis pending findings of the annual parking analysis described in EJ-11 in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. (DR-4)

- Metro shall not hinder access to other public parking lots during construction. (DR-5)

- Prior to construction, Metro shall conduct an annual parking needs assessment in Little Tokyo. Metro shall provide replacement parking for spaces lost as a result of the project as described in EJ-3 and to respond to the needs identified in the parking needs assessment. Metro shall work with Little Tokyo and surrounding communities to educate visitors and residents where parking is available during construction. Metro shall monitor parking, and the parking analysis shall be conducted on an annual basis throughout the duration of construction. This effort shall include new signage and other way finding features as appropriate. (EJ-11)

- Any unmet demand for parking spaces eliminated in Little Tokyo during construction shall be temporarily replaced within one block of the land uses that rely on those spaces, or through a combination of: (EJ-2)

    - Metro shall work with the City of Los Angeles to develop a parking mitigation program, as described above. (DR-4)

    - Metro shall provide two acres of land on the Mangrove property (northeast of 1st and Alameda Streets) for the purposes of providing alternative parking services during construction, which could include satellite parking served by shuttle buses, valet parking from vehicle pick-up/drop-off in the central business areas of Little Tokyo, and standard self-parking. The number of spaces provided would range from 200 standard spaces to approximately 300 spaces when supplemental parking services are operating. Any parking services shall be operated by a licensed/bonded parking company and shall be selected through a competitive request for proposal (RFP) process. Cost to park shall be comparable with current cost to park. This shall offset the temporary loss of parking available to patrons of Little Tokyo businesses, and other visitors, during construction. (EJ-3)

    - Metro shall provide notices of traffic control plans and parking relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. (EJ-4)

- Metro shall support efforts to curb non-legitimate use of disabled parking spaces. (EJ-5)
- Metro shall work with LADOT, owners of private parking lots, and businesses to develop an advanced parking reservation system at cooperative and suitable locations during construction. (EJ-6)
- Metro shall work with LADOT to open city parking lots for short-term use on evenings and weekends during construction in the vicinity of Little Tokyo. (EJ-7)
- Metro shall work with the City of Los Angeles to reduce impacts of government vehicles parking on 2nd Street during construction, such as identification of alternate parking areas. (EJ-8)
- Metro shall work with the City of Los Angeles and the Little Tokyo Business Improvement District to facilitate creation of financial incentives such as parking validation programs to prioritize parking for Little Tokyo customers, residents, and businesses during construction. (EJ-9)
- Metro shall develop measures to assist business owners significantly impacted by construction. These shall include temporary parking, marketing programs, and other measures developed jointly between Metro and affected businesses. (EF-1)

In order to offset the potential for reduction of access to the Little Tokyo Library and other community destinations due to construction:

- Metro shall maintain access to the Little Tokyo Library and other community facilities at all times during construction. (DR-6)
- Metro shall develop a Construction Mitigation Program that includes protocol for community notification of construction activities including traffic control measures, schedule of activities, and duration of operations, with written communications to the community translated into appropriate languages. (DR-7)

To offset the impacts of necessary displacement and relocation of businesses:

- Metro shall provide relocation assistance and compensation as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. (DR-8)

Due to the permanent acquisition of a portion of the LADWP site on APNs 5173007901 and 5173006900 for right-of-way:

- Metro shall consult LADWP during the design phase to accommodate its operational needs during construction and operation of the project. (DR-9)

4.3 Community and Neighborhood Impacts

This section summarizes the existing communities and neighborhoods in the project area, and the potential impacts that the proposed alternatives, including the Locally Preferred Alternative (LPA), could have on these areas. The information in this section is based on the Community and Neighborhood Impacts Technical Memorandum, which is incorporated into this EIS/EIR as Appendix O.

Community and neighborhood impacts encompass physical division of a community, adverse alterations of its social or physical character, or degradation of quality of life, which can include:

- Deterioration of public health and safety
- Increase in crime, and adverse effects on community resources and events
- Adverse effects on senior citizens and disabled persons
- Reduction of local business viability
- Deterioration of community public services
- Large changes in population or employment

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, as indicated in the Responses to Comments, Volumes F-2 and F-3, of this Final EIS/EIR, and based on refinements to the LPA. Updates include additional analysis demonstrating that the LPA refinements since publication of the Draft EIS/EIR reduce community impacts by lessening the amount of surface disruption; additional detail added to the final LPA mitigation measures; and more analysis regarding project benefits to the community. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.3.4 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP), Chapter 8, of this Final EIS/EIR.

Refinements to the LPA since publication of the Draft EIS/EIR have reduced the significance of potentially adverse community and neighborhood impacts in Little Tokyo. Less cut and cover construction and fewer business acquisitions would be needed, and tunnel boring machine (TBM) staging would be in a less impactful location. The refinements reduce the need for road and sidewalk closures, property acquisitions, and overall neighborhood disruption during construction.

The analysis of community and neighborhood impacts associated with the LPA is detailed below in Section 4.3.3.5.

Some impacts contained in other overlapping sections are also discussed in this section, including:

- The Displacement and Relocation Section (Section 4.2)
- The Parklands and Other Community Facilities Section (Section 4.13)
- The Transportation Impacts and Mitigation Chapter (Chapter 3)
- The Environmental Justice Section (Section 4.17)
- The Safety and Security Section (Section 4.15)

4.3.1 Regulatory Framework

The community and neighborhood impact analysis and proposed mitigation measures for the Regional Connector Transit Corridor project was performed in accordance with all applicable NEPA, CEQA, and local guidelines.

At the federal level, the United States Department of Transportation (USDOT) provides specific NEPA guidance to assist with determinations of community and neighborhood impact significance. Other federal regulatory requirements include:

- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
- Americans with Disabilities Act of 1990

At the state level, the CEQA guidelines require analysis of potential project impacts that could physically divide an established neighborhood or community. Additional local regulations and plans that pertain to communities and neighborhoods that would potentially be affected by the Regional Connector Transit Corridor project are:

- Central City Community Plan (City of Los Angeles General Plan Land Use Element)
- Central City North Community Plan (City of Los Angeles General Plan Land Use Element)
- City of Los Angeles Planning and Zoning Code

Potential effects on communities and neighborhoods were evaluated by the potential for each alternative to affect the following key criteria:

- Community mobility
- Emergency service response times

- Community resources and events
- Business viability

4.3.2 Affected Environment

The project area encompasses several downtown Los Angeles communities, including the Financial District, Bunker Hill, Civic Center, Historic Core, Little Tokyo, and the Arts District. Depending on which alternative is selected, these communities could have new light rail infrastructure added as part of the Regional Connector Transit Corridor project. Other areas that would be indirectly affected through improved transit service would include communities along the Metro Gold Line, Metro Blue Line, and the future Metro Expo Line.

4.3.2.1 Demographic Overview

In 2000, the central downtown area's[1] population was approximately 23,175, representing less than 0.6 percent of the entire City of Los Angeles' population (Census Bureau 2000). In 2005, SCAG estimated that the central downtown area's population was approximately 24,794, which was about 0.6 percent of the City's population (City of Los Angeles Planning Department/ Demographic Research Unit 2009). Table 4.3-1 shows the 2000 and 2005 population by census tract for central downtown. Figure 4.3-1 shows the locations of these tracts.

Figure 4.3-2 shows the ethnic makeup of the central downtown area.

The average age of the population in the central downtown area varies considerably throughout the different communities. In 2000, three main areas recorded relatively higher populations of seniors (over the age of 65):

- The Bunker Hill area
- The Little Tokyo area
- The northern portion of central downtown

Table 4.3-2 shows the median age of the central downtown population by census tract for the year 2000 (Census Bureau 2000).

The most common language spoken at home throughout the central downtown area in 2000 was English, followed by Asian/Pacific Isle languages, Spanish, Indo-European languages, and other languages (Census Bureau 2000). Each community within the downtown area varies considerably regarding the language spoken at home. Figure 4.3-3 shows the percentage breakdown of the languages spoken at home by census tract for the year 2000.

[1] *Note: The total population of the analysis area for the community and neighborhood impacts is shown. The area and population defined in the Central City Community Plan and the Central City North Community Plan will vary. Also, some of the census tracts included in the demographic data extend beyond the boundaries of the communities to be analyzed.*

4.3.2.1.1 Housing

There were an estimated 10,500 housing units in the central downtown area in 2008. Of the 10,500 housing units, only 200 were single-family units, and the remainder were multi-family units. The vacancy rate for all housing units was about 11 percent (City of Los Angeles Planning Department/Demographic Research Unit 2009).

Land designated for residential use is found in the east and south portions of central downtown and makes up only about five percent of the total land use (City of Los Angeles Planning Department 2003a). The residentially zoned properties in the central downtown area are found in Bunker Hill and Little Tokyo. To meet an increased demand for housing, some commercial buildings in the central downtown area have been redeveloped into residential units (City of Los Angeles Planning Department 2003a).

Table 4.3-1. Population for the Central Downtown Area

Census Tract	Approximate Neighborhoods	2000 Population	2005 Estimated Population
2060.30	Little Tokyo, Arts District, Boyle Heights*	955	1,029
2060.40	Little Tokyo, Arts District, Boyle Heights*	3,445	3,753
2062	Little Tokyo, Central City East*	3,477	3,638
2063	Central City East*, Central Industrial District*	4,995	5,320
2073	Historic Core	3,739	4,068
2074	Civic Center	1,237	1,344
2075	Bunker Hill	4,098	4,326
2077.10	Financial District, South Park	1,229	1,316
Total		**23,175**	**24,794**

Source: Census Bureau, Summary File 1, 2000; 2SCAG 2009
** Neighborhood included in census tract data but is too far from proposed alternatives, including the LPA, to be impacted. More specific data is not available.*

4.3.2.1.2 Employment

The central downtown area employs a substantial number of people: over 170,000 in 2005. As shown in Table 4.3-3, most of the people working in the central downtown area do not live there and must commute to work each day.

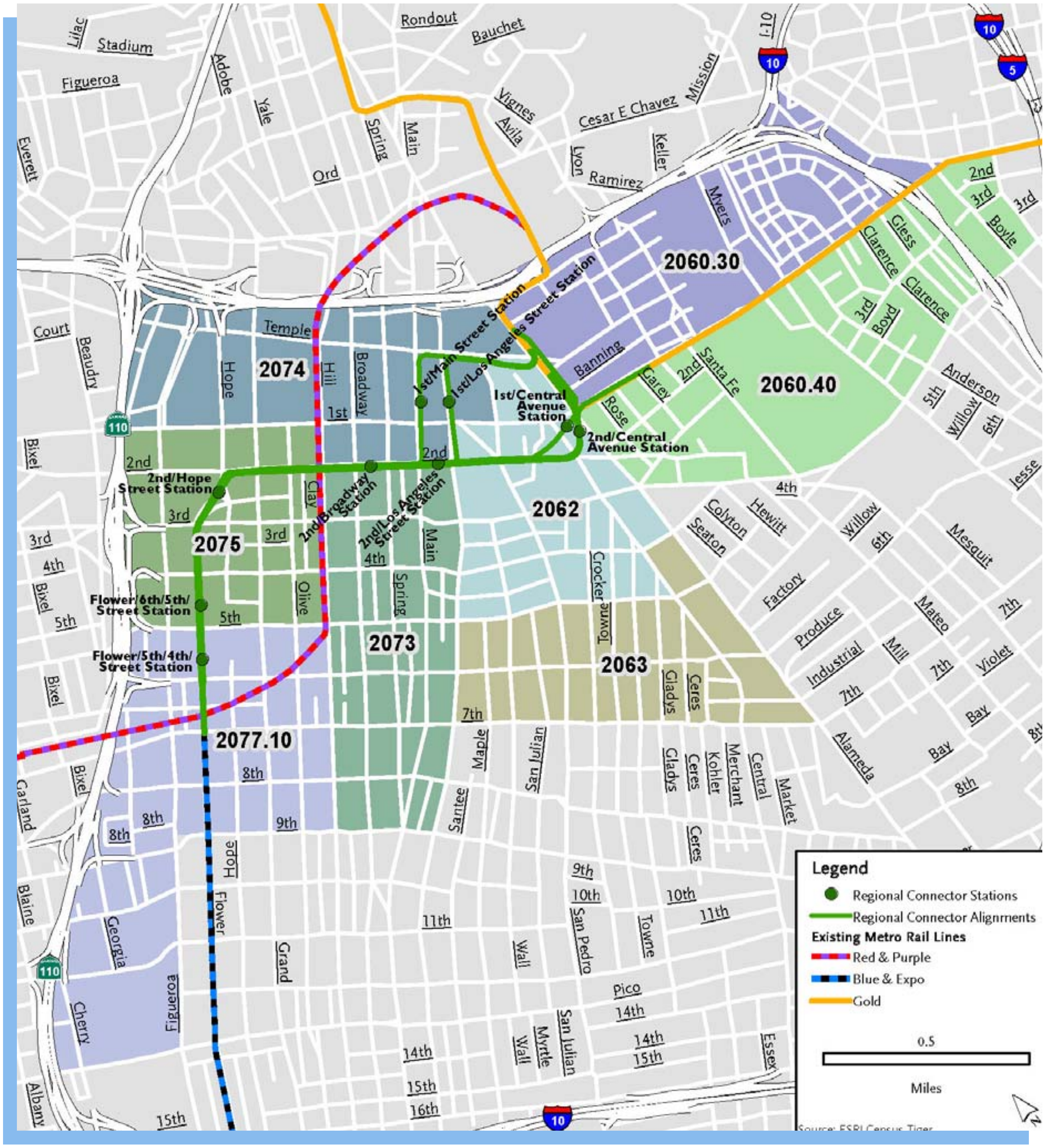
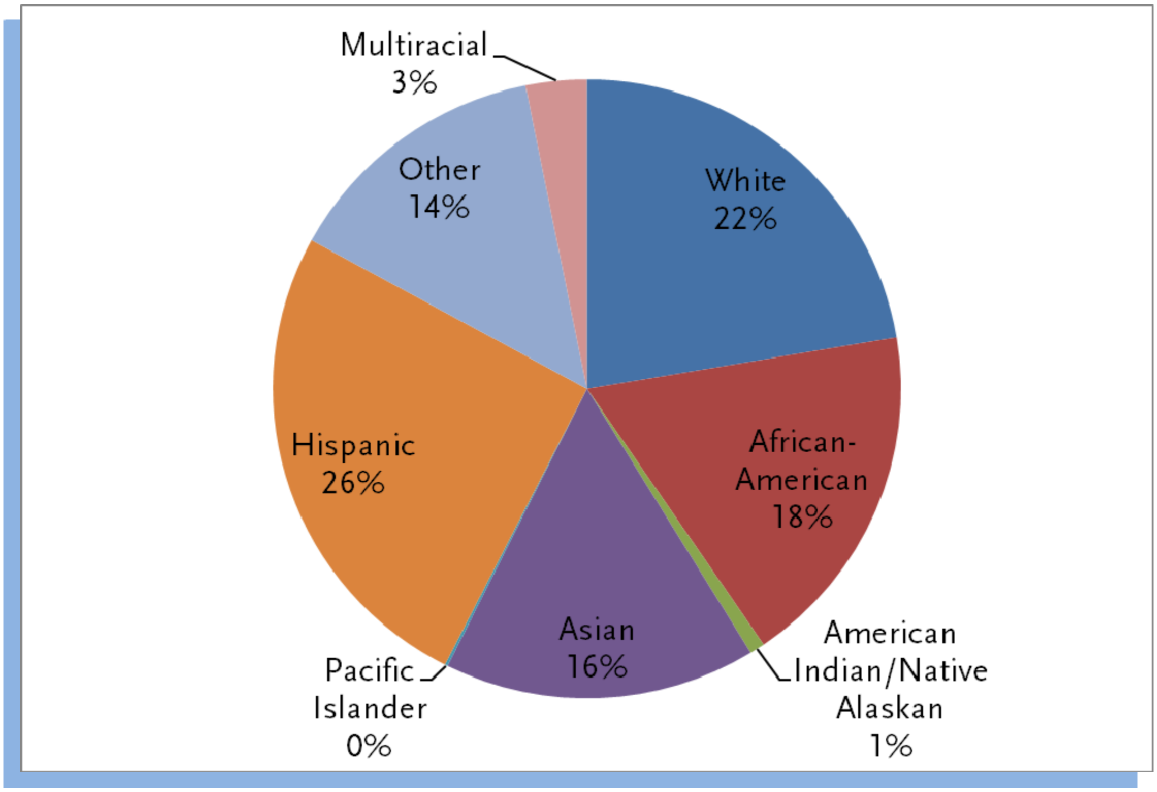


Figure 4.3-1. Census Tract Location



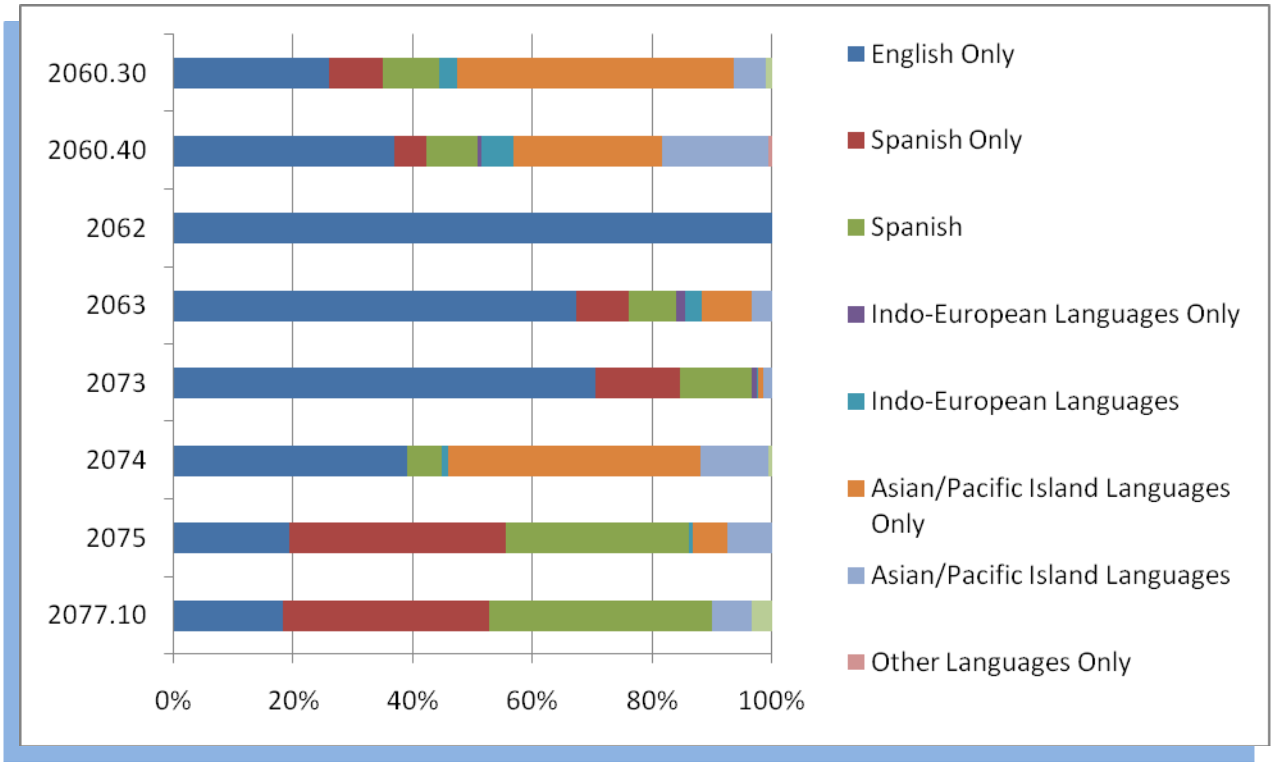
Source: Census Bureau, Summary File 1, 2000

Figure 4.3-2. Ethnicity for Central Downtown

Table 4.3-2. Median Age of Central Downtown Population

Census Tract	Approximate Neighborhoods	Both Sexes	Male	Female
2060.30	Little Tokyo, Arts District, Boyle Heights*	28.2	28.7	27.1
2060.40	Little Tokyo, Arts District, Boyle Heights*	32.3	31.5	33.1
2062	Little Tokyo, Central City East*	45.1	43.6	50.4
2063	Central City East*, Central Industrial District*	42.1	43.3	38.4
2073	Historic Core	49.2	49.2	49.4
2074	Civic Center	35	34.5	38
2075	Bunker Hill	48.5	43.1	53.4
2077.10	Financial District, South Park	45.4	43.6	48

Source: Census Bureau, Summary File 1, 2000
** Neighborhood included in census tract data but is too far from proposed alternatives, including the LPA, to be impacted. More specific data is not available.*



Source: Census Bureau, Summary File 3, 2000

Figure 4.3-3. Languages Spoken at Home by Census Tract in Central Downtown

Table 4.3-3. Population, Households, and Employment for the Central Downtown Area

Census Tract	2005 Population	2005 Households	2005 Employment
2060.30	1,029	267	2,444
2060.40	3,753	1,125	2,855
2062	3,638	1,179	6,631
2063	5,320	1,591	4,670
2073	4,068	3,101	35,488
2074	1,344	8	38,760
2075	4,326	3,024	27,319
2077.10	1,316	635	53,760
Total	**24,794**	**10,930**	**171,927**

Source: SCAG, 2009

The areas within central downtown that provide the largest number of jobs include:

- The Financial District
- The Civic Center
- The Historic Core/Jewelry District
- The Fashion District

4.3.2.1.3 Community Mobility

The central downtown area experiences heavy pedestrian traffic on weekdays, particularly during the commute and lunch hours (City of Los Angeles Planning Department 2003a). Much of the pedestrian traffic occurs in areas with daytime employment such as Bunker Hill, the Financial District, and the Historic Core. Some pedestrian movement occurs between the Civic Center and Little Tokyo along Temple, 1st, and 2nd Streets (City of Los Angeles Planning Department 2003a).

The Fashion District attracts many pedestrians during both weekdays and weekends, as does Broadway between 2nd and 7th Streets. Due to the location of Wilshire Grand and Sheraton Hotels, office buildings, residential buildings, restaurants, and retail businesses, 7th Street often carries large volumes of pedestrians. Pedestrian activity decreases at night in the central downtown area because much of the daytime population leaves after business hours. The exceptions are Little Tokyo and the Arts District that have experienced a resurgence of evening activity due to increases in new housing in the area and a solid commercial base of restaurants.

The main pedestrian infrastructure in central downtown consists of sidewalks and crosswalks. An elevated pedestrian walkway network is located adjacent to Bunker Hill that connects many of the large hotels and office buildings.

The central downtown area is served by over 100 bus lines, operated by ten different transit agencies, and a network of commuter rail, light rail, and heavy rail lines. Metrolink operates commuter rail trains from Union Station to multiple points in Los Angeles, Ventura, Orange, San Bernardino, San Diego, and Riverside Counties. Metro operates the Metro Red Line heavy rail subway to North Hollywood, the Metro Purple Line heavy rail subway to Wilshire/Western Station, the Metro Blue Line light rail service to Long Beach, and the Metro Gold Line light rail service to Pasadena and East Los Angeles. The Metro Expo Line light rail service to Culver City is currently under construction.

Transit mobility within downtown, to and from the communities of downtown, and within the region as a whole is impaired by the lack of a train connection between the Metro Gold Line and Metro Blue Line. Passengers traveling between these two LRT lines must currently transfer via the Metro Red and Metro Purple Lines. This lack of a direct connection adversely affects travel times and the ability of transit to attract automobile commuters. For information on travel times within the project area, see the Alternatives Considered Chapter (Chapter 2).

The Regional Connector Transit Corridor project would eliminate transfers by enabling through service between the Metro Gold Line, Metro Blue Line, and Metro Expo Line. The Regional Connector Transit Corridor would add additional reliable transit service that, unlike buses, would not be subject to future deteriorating traffic conditions if surface street congestion increases.

For information on existing traffic patterns within the project area, see Appendix L, Transportation Technical Memorandum.

4.3.2.2 Community Events

Many community and cultural events occur in the Regional Connector Transit Corridor project area each year, including music festivals, parades, arts and theater performances, and exhibitions. These events often attract hundreds of people to the area. Large events scheduled in the project area during 2009 included:

- World City
- First Thursday San Pedro Art Walk
- Downtown Art Walk (monthly)
- St. Patrick's Day Parade
- Cherry Blossom Festival of Southern California
- Azusa Street Festival
- AT&T Fiesta Broadway
- Annual Children's Day
- Mixed Roots Film and Literary Festival
- Shakespeare Festival
- Grand Performances (recurring)
- Nisei Week Japanese Festival
- Los Angeles County Holiday Celebration

4.3.2.3 Crime and Emergency Services

Crime in the central downtown area has fluctuated in recent years, with between 5,000 and 7,000 arrests made annually. Law enforcement is provided from the Central Area Community Police Station and the new Los Angeles Police Department headquarters.

The following three fire stations are located in the central downtown area as well:

- Near Temple and Alameda Streets
- 1st Street and Fremont Avenue
- 7th and San Julian Streets

4.3.2.4 Community Profiles

The following subsections present brief profiles for each of the communities and districts within the central downtown area that have the potential to be directly affected by construction or operation of the Regional Connector Transit Corridor project. Figure 4.3-4 provides a map of the approximate locations of these communities. While distinctions have been made between the different districts, many districts continue to develop and expand their area of influence, often resulting in an overlap with other districts or communities. The boundaries of the districts discussed below are for descriptive purposes only and are not meant to delineate distinct borders. Not all of the communities shown on the map would experience negative impacts from the project, however all of them would benefit from the improved transit service the Regional Connector would provide. The communities that could potentially experience impacts are profiled in the following subsections.

4.3.2.4.1 Financial District

The Financial District contains most of the City's banks, large hotels, and skyscraper office buildings. It is also home to the Central Library, Maguire Gardens, retail stores, and social clubs. This area experiences a high volume of traffic during daytime hours because of its location next to the SR 110 Freeway. While not as pedestrian-friendly as some of the other districts, the Financial District lies within walking distance to the 7th Street retail area, Grand Avenue corridor, and Pershing Square. This neighborhood is within walking distance to the Metro Red Line, Metro Purple Line, Metro Blue Line, and future Metro Expo Line.

The Central Library, located on Hope Street, is one of the key features of the Financial District. North of the library is downtown's tallest building, and at 73 stories high, the Library Tower is visible for miles (City of Los Angeles Planning Department 2003a). The Bunker Hill Steps surround the building and connect the Financial District to Bunker Hill (City of Los Angeles Planning Department 2003a).

4.3.2.4.2 Bunker Hill

Bunker Hill is within close walking distance to the Financial District, the Historic Core, and the Civic Center and is easily accessible by public transit. It includes a large portion of central downtown's residential population due to the presence of numerous apartments and condominiums (over 3,200 residential units, mainly in mid- and high-rise buildings).

Major downtown destinations located within Bunker Hill include the Walt Disney Concert Hall, Museum of Contemporary Art (MOCA), high-rise office towers, senior and market rate housing, hotels, and commercial/retail centers. Large development projects planned for this area include Civic Park, the Broad Art Foundation Museum (currently under construction), and the Grand

Avenue Development project that will develop this area into a regional arts, entertainment, and residential destination.

4.3.2.4.3 Toy District

The Toy District is a wholesale and retail area with over 500 businesses offering silk flowers, incense/oils, craft supplies, luggage, electronics, and traditional toys like dolls, die-cast cars, action figures, and video games (Central City East Association 2009). This area experiences high volumes of pedestrians. The Medallion project under construction in this district is expected to provide 192 residential lofts and over 200,000 square feet of retail space.

4.3.2.4.4 Civic Center

The Civic Center contains federal, state, and local government offices and has the second largest concentration of civic buildings in the country (City of Los Angeles Planning Department 2003a). Important community resources in this area include the Cathedral of Our Lady of the Angels on Temple Street, Los Angeles City Hall, the County Hall of Administration, the California State Department of Transportation (Caltrans) Headquarters, and a U.S. Federal District Courthouse planned for the block bounded by 2nd, Hill, and 1st Streets, and Broadway. The area includes the Civic Center Historic District centered around the City Hall building.

Most of the government facilities in this area are within a ten minute walk of each other designated as the “10 minute diamond.” Several cultural, arts, and music facilities are located in the Civic Center such as the Ahmanson Theater, Mark Taper Forum, and the Dorothy Chandler Pavilion (City of Los Angeles Planning Department 2003a).

4.3.2.4.5 Historic Core

The Historic Core approximates the area where Los Angeles originated in the early 1800s and contains a variety of historic and architecturally significant buildings. In addition, the Historic Core links many of the districts and communities of central downtown.

Two historic districts registered in the National Register of Historic Places (City of Los Angeles Planning Department 2003a) are located in this area, including:

- The Spring Street Financial District between 4th and 7th Streets, and
- The Broadway Theater District between 3rd and 9th Streets.

Broadway is the major corridor in the Historic Core, with clothes outlets, restaurants, Grand Central Market, and other shops frequented by the Hispanic population (City of Los Angeles Planning Department 2003a). To the east, a variety of offices, hotels, shops and government buildings are located along Los Angeles, Spring, and Main Streets. Many buildings here have been renovated and converted to residential uses with ground floor retail, restaurants, and art galleries. Most of the historic financial buildings of the 1920s are found on Spring Street. Several historic theatres are located in this area; however, some are currently vacant or are being used for retail purposes.

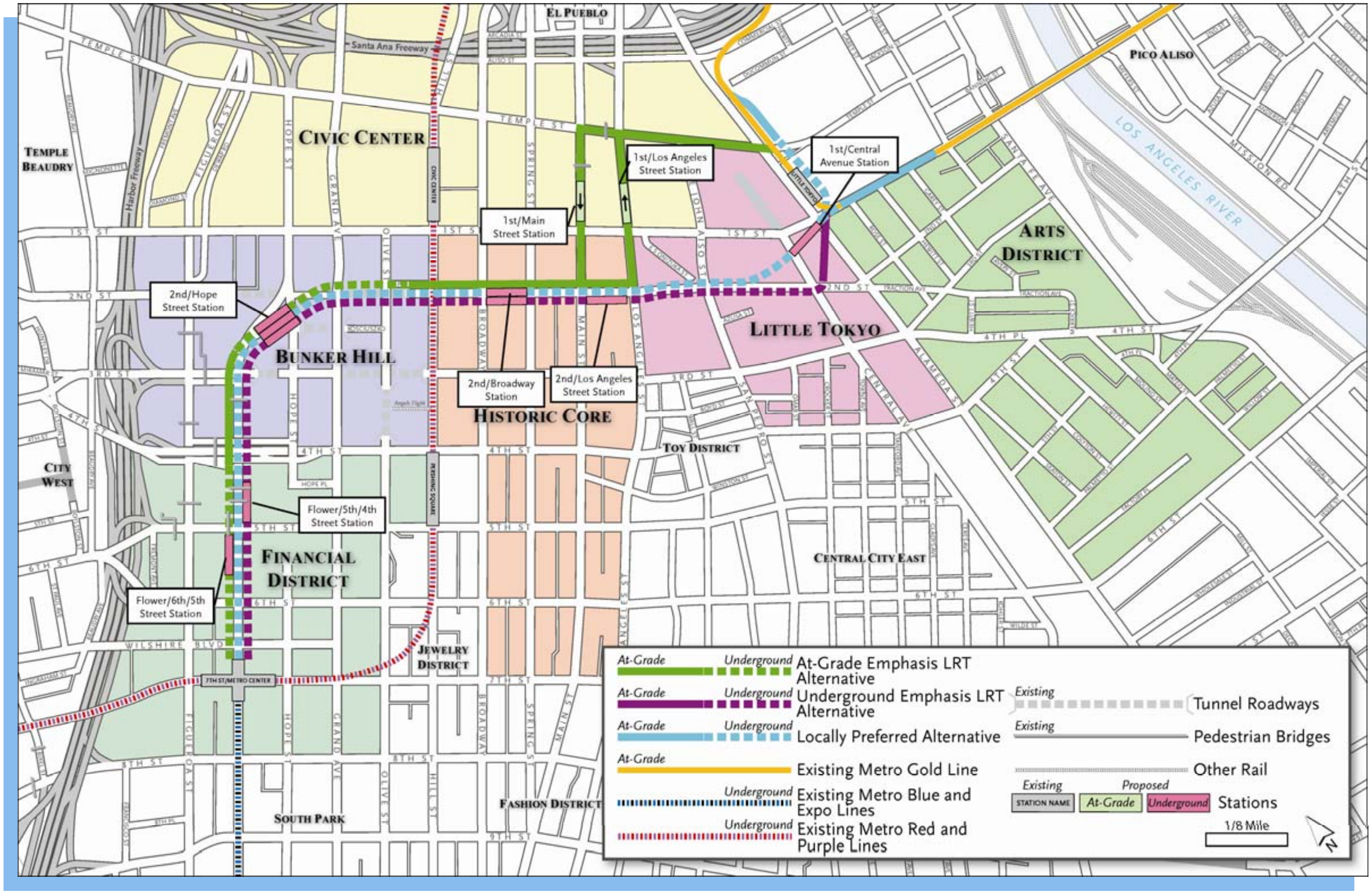


Figure 4.3-4. Downtown Communities

The southern end of the Historic Core is adjacent to the Fashion District and contains historic buildings now used to manufacture clothing. The Metro Red Line and Metro Purple Line travel beneath this district with a shared station on Hill Street between 4th and 5th Streets (City of Los Angeles Planning Department 2003a). The Skid Row community (considered part of the Central City East area) is located adjacent to the Historic Core/Center City area and contains a large homeless population and many single-occupant hotel residential properties.

4.3.2.4.6 Little Tokyo

Little Tokyo is a unique cultural community in downtown Los Angeles because it has the largest Japanese-American community in the continental United States (City of Los Angeles Planning Department 2003). Little Tokyo is one of only three remaining Japantowns in the United States (in addition to San Francisco and San Jose). Little Tokyo has a range of mixed-uses including retail, hotel, office, and commercial spaces.

The area also contains a substantial portion of central downtown's residential units and has several new residential developments. The rehabilitation of existing spaces into residential uses is also occurring in Little Tokyo. Important developments in the early planning stages include a 4.5-acre site adjacent to the Little Tokyo/Arts District Station on the Metro Gold Line. Due to the proximity to Metro's transit lines, this development could potentially contain a high-density combination of offices and housing.

Little Tokyo, which exists to the east and west of Alameda Street, contains a variety of important cultural venues and resources including the Japanese American National Museum (JANM), the Jodo Shu Betsuin Temple, the Los Angeles Hompa Hongwanji Temple, and the Japanese-American Cultural and Community Center. The Geffen Contemporary at MOCA is located behind JANM. The Go For Broke Monument, located north of The Geffen Contemporary at MOCA at Temple and Alameda Streets is a monument dedicated to the Japanese-American veterans of World War II. East West Players, the largest and oldest Asian American theater organization in the country, is located across from The Geffen Contemporary and the Go For Broke Monument, in the Union Church Building (now the Union Center for the Arts). Little Tokyo also houses the Little Tokyo Service Center that provides affordable housing and community services to residents of the area.

The Little Tokyo Historic District was listed on the National Register of Historic Places in 1986. The district spans from the north side of 1st Street from Judge John Aiso Street to Central Avenue and the east side of Judge John Aiso Street from 1st Street to midblock between 1st and Temple Streets. Buildings in the Historic District include commercial buildings on the north side of 1st Street, the Union Church on San Pedro Street, and the former Nishi Hongwanji Temple (the first Buddhist Temple built in Los Angeles) located at 1st and Central Streets.

4.3.2.4.7 Arts District

The Arts District is technically outside central downtown and considered a part of the Central City North Community Plan area; however, it is discussed in this section because it is adjacent to Little Tokyo and would be affected and served by the project. The Arts District consists mostly of old warehouses that have been converted to artists' lofts and studios (City of Los Angeles Planning Department 2003b). The largest concentration of artists is within the area between 1st, Palmetto, and Alameda Streets, and the Los Angeles River. This area is also sometimes referred to as the Artist-in-Residence District (City of Los Angeles Planning Department 2003b).

The Arts District has experienced a fast-paced revitalization over the past several years. New condominium and apartment buildings have opened, and additional industrial spaces have been converted to restaurants and retail establishments, some of which include sidewalk dining. Most of the streets through the district are not major thoroughfares, resulting in a quieter, more pedestrian-friendly environment than some other parts of the downtown area. Notable institutions in the area include Southern California Institute of Architecture (SCI-ARC), an independent architecture school.

4.3.3 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential community and neighborhood impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.3.1. Table 4.3-4 summarizes the results of the analysis.

Table 4.3-4. Summary of Potential Impacts to Communities and Neighborhoods

Alternative	Physically Divide Community (CEQA)	Community Mobility (NEPA)	Emergency Services Response (NEPA)	Community Resources and Events (NEPA)	Business Viability (NEPA)	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
No Build	None	Decline	None	None	None	None	None
TSM	None	None	None	None	None	None	None
At-Grade Emphasis LRT	None	Adverse construction effects	Adverse construction effects	Adverse construction effects	Adverse construction effects	None	None
Underground Emphasis LRT	None	Adverse construction effects	Adverse construction effects	Adverse construction effects	Adverse construction effects	None	None
LPA	None	Adverse construction effects	Adverse construction effects	Adverse construction effects	Adverse construction effects	None	None

4.3.3.1 No Build Alternative

The No Build Alternative would not involve any new transportation infrastructure, construction, or major service changes beyond what is identified in Metro's 2009 LRTP. As such, significant adverse impacts are not anticipated within the project area. However, community mobility would deteriorate with the worsening regional traffic congestion that is expected to occur between now and 2035. Also, the communities in the project area would not benefit from the additional access, business, and job growth stimulation that the proposed build alternatives, including the LPA, could provide.

4.3.3.1.1 NEPA Finding

The No Build Alternative would not have adverse construction, operation, or cumulative effects on communities or neighborhoods, except for deterioration of community mobility in the long-term.

4.3.3.1.2 CEQA Determination

The No Build Alternative would not have significant adverse construction, operation, or cumulative impacts on communities or neighborhoods.

4.3.3.2 TSM Alternative

The TSM Alternative includes the same provisions as the No Build Alternative, plus two new shuttle bus lines that would provide additional mobility benefits to Little Tokyo, the Civic Center, Bunker Hill, the Historic Core, and the Financial District. However, the proposed bus lines would not improve regional mobility as much as the proposed build alternatives, including the LPA. The increased availability of transit service could also stimulate local businesses. However, these benefits may not be permanent if worsening traffic congestion causes a reduction in operating speeds and service reliability.

4.3.3.2.1 NEPA Finding

The TSM Alternative would not have adverse construction, operation, or cumulative effects on communities or neighborhoods.

4.3.3.2.2 CEQA Determination

The TSM Alternative would not have significant adverse construction, operation, or cumulative impacts on communities or neighborhoods.

4.3.3.3 At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative would require the construction of a new light rail alignment and three new stations in the following areas:

- The Financial District along Flower Street
- Bunker Hill
- The Civic Center area composed of two one-way stations located on adjacent streets

Construction of these stations would require temporary sidewalk and street closures. During construction, installation of the at-grade tracks and other necessary light rail infrastructure would require street closures on Temple, Main, Los Angeles, and 2nd Streets in the Civic Center and Historic Core areas. The alignment would run underground from Flower Street and the Financial District through the Bunker Hill area onto 2nd Street. Cut and cover excavation activities for the underground portion of the alignment would result in road closures in the

Financial District, Bunker Hill, and the vicinity of the proposed underpass in Little Tokyo. These combined activities could reduce pedestrian and vehicle mobility between communities throughout the project area during construction, which would constitute a potentially adverse construction impact.

Road closures associated with construction activities could result in increased response times for emergency services (e.g., police and fire). Any increase in response times for emergency services would be an adverse construction impact.

Road and sidewalk closures and the addition of construction vehicles and equipment to central downtown streets could also adversely affect annual festivals and events in the central downtown area. Construction could also disrupt traffic patterns and make public access to certain community resources (e.g., The Geffen Contemporary at MOCA building and the Go For Broke Monument) more difficult. This potential construction impact could be adverse.

Construction activities would likely result in a decrease in accessibility to many businesses and could reduce on-street and off-street parking. This could negatively affect business activity levels because the number of customers may temporarily decline, which would be a potentially adverse construction impact to business viability.

All attempts would be made to provide adequate detours and to minimize road closures, however, some consumers might avoid the area altogether which could have an indirect effect on businesses within the project area. When short-term construction impacts and long-term operational benefits are considered together, there would be a net benefit due to new transit access to businesses and the enhancement of downtown as a business destination.

Once constructed, the alternative would permanently improve community mobility by providing a new attractive means of access that does not rely on solo driving. Connections to other neighborhoods within the downtown area and across the region would be strengthened by the rail link. Business viability would improve because the increased pedestrian traffic near the proposed stations would provide new potential customers.

4.3.3.3.1 NEPA Finding

The At-Grade Emphasis LRT Alternative would have adverse construction-related effects on community mobility, emergency service response times, community resources and events, and business viability. However, these impacts would be temporary and could be reduced to a not substantially adverse level by the mitigation measures proposed in Section 4.3.4 of the Draft EIS/EIR.

4.3.3.3.2 CEQA Determination

The At-Grade Emphasis LRT Alternative would not have significant adverse construction, operation, or cumulative impacts on communities or neighborhoods after mitigation measures are considered.

4.3.3.4 Underground Emphasis LRT Alternative

This alternative would require the construction of a new light rail alignment and three new underground stations in the following areas:

- Near the Financial District
- Bunker Hill
- The Historic Core/Little Tokyo

Construction of these stations would require temporary sidewalk and street closures. Installation of underground tracks would require tunnel construction along 2nd and Flower Streets. The segment on Flower Street would require temporary cut and cover excavations and concrete decking along the entire length of the roadway from 7th Street/Metro Center Station to the new portal just south of 3rd Street. Temporary street closures and construction activities similar to cut and cover would be needed in the vicinity of the proposed underpass at 1st and Alameda Streets. Streets and sidewalks in the vicinity of the temporary excavation areas would likely be periodically closed during construction. Along 2nd Street, TBMs would be used for the majority of the alignment. As such, construction impacts to surface traffic and mobility would be less pronounced in the Historic Core than in the Financial District and Little Tokyo. In summary, road and sidewalk closures and traffic detours could reduce mobility for pedestrian and vehicle traffic in all neighborhoods in the project area which could be a potentially adverse impact.

Road closures associated with construction activities could result in increased response times for emergency services (e.g., police and fire). Any increase in response times for emergency services would be an adverse construction impact.

Road and sidewalk closures and the introduction of construction vehicles and equipment would have the potential to create temporary adverse effects on festivals and events in the central downtown area. It could also result in an adverse impact to traffic patterns and make it more difficult for the public to access certain community resources like the JANM and The Geffen Contemporary at MOCA building. Little Tokyo stakeholders have expressed concern about retaining the character of the existing community and cultural events in the area. Measures to address these concerns would be considered for implementation once the ongoing coordination process is complete within the Little Tokyo community. However, this is not necessary because the Underground Emphasis LRT Alternative was not designated as the LPA by the Metro Board of Directors.

Businesses around each of the new stations and along the proposed alignment could be affected by construction activities, construction-related traffic, and road and sidewalk closures. Construction activities would likely result in a temporary decrease in accessibility to many businesses and could reduce on-street and off-street parking which could negatively affect business activity levels as the number of customers may temporarily decline. Metro would provide adequate detours and minimize road closures; however, some indirect effects to businesses may occur as people may avoid the project area altogether. This potential impact could be adverse during the construction phase. The introduction of construction employees into the area who could potentially be new customers of neighborhood restaurants and retail establishments could lessen this impact.

Some existing commercial properties would need to be acquired under this alternative in Little Tokyo and the Historic Core. Displaced businesses could include Office Depot, Señor Fish, and Starbucks Coffee in Little Tokyo, and the businesses on the southeast corner of 2nd and Spring Streets in the Historic Core. The businesses that would be removed in Little Tokyo do not contribute to the community identity as a Japanese-American cultural and community center. Properties would be acquired according to the Uniform Relocation Act, and owners would be compensated. However, loss of these businesses could indirectly affect the viability of surrounding businesses because less people could be drawn to the general area which could be a potentially adverse impact.

Once constructed, the alternative would permanently improve community mobility by providing a new attractive means of access that does not rely on solo driving. Connections to other neighborhoods within the downtown area and across the region would be strengthened by the rail link. Business viability would improve because the increased pedestrian traffic near the proposed stations would provide new potential customers. The rail infrastructure would be almost entirely underground and out of view, and station entrances would be designed to enhance the surrounding urban landscape. Vacant parcels remaining after construction could potentially be developed as transit oriented developments or other neighborhood-supportive resources.

4.3.3.4.1 NEPA Finding

The Underground Emphasis LRT Alternative would have temporary adverse construction-related effects on:

- Community mobility
- Emergency service response times
- Community resources and events
- Business viability

The alternative would also have a short-term adverse operation effect on business viability due to acquisitions, (though not permanent). These effects could be reduced to a not substantially adverse level by the mitigation measures proposed in Section 4.3.4 of the Draft EIS/EIR.

4.3.3.4.2 CEQA Determination

The Underground Emphasis LRT Alternative would not have significant adverse construction, operation, or cumulative impacts on communities or neighborhoods after consideration of proposed mitigation measures.

4.3.3.5 Locally Preferred Alternative

This alternative was developed in response to community concerns voiced during the Draft EIS/EIR analysis process. It was initially adapted from the Underground Emphasis LRT Alternative to allow the alignment and junction to run underground at 1st and Alameda Streets.

This alternative would require the construction of new light rail alignment and three new underground stations in the following areas:

- Bunker Hill area
- Historic Core
- Little Tokyo/Arts District

Construction of these stations would require temporary sidewalk and lane closures. Installation of underground tracks would require tunnel construction along 2nd and Flower Streets. The segment on Flower Street would require temporary cut and cover excavations and concrete decking along the entire length of the roadway from 7th Street/Metro Center Station to 4th Street. Cut and cover would also be needed on a portion of Central Avenue between 1st and 2nd Streets, in the 1st and Alameda Streets intersection, and on 1st Street between Alameda and Garey Streets. Street lanes and sidewalks in the vicinity of the temporary excavation areas would likely be periodically closed during construction. Along 2nd Street and the portion of Flower Street north of 4th Street, TBMs would be used for the majority of the alignment except at stations and crossovers as described in Chapter 2. As such, construction impacts to surface traffic and mobility would be less pronounced in the Historic Core than in the Financial District and Little Tokyo/Arts District.

Compared to the Underground Emphasis LRT Alternative, this alternative would involve a larger construction area, and potentially greater impacts to surface traffic during construction, since two portals would need to be constructed instead of one. Closures would also have the potential to create temporary adverse effects on festivals and events in the central downtown area. It could also result in a potentially adverse impact to traffic patterns and make it more difficult for the public to access certain community resources like the JANM and The Geffen Contemporary at MOCA building. This would not result in a considerable contribution to a cumulative impact. Access to these facilities would be maintained throughout construction. Street lane closures associated with construction activities could result in increased response times for emergency services (e.g., police and fire). Any increase in response times for emergency services would be a potentially adverse construction impact. Closures and traffic detours could also reduce mobility for pedestrian and vehicle traffic in all neighborhoods in the project area, which could be a potentially adverse impact. This would not result in a considerable contribution to a cumulative impact.

Little Tokyo stakeholders have expressed concern about retaining the character of the existing community and cultural events in the area. Measures to address these concerns have been developed during an ongoing coordination process with the Little Tokyo community, and have been included in the MMRP.

Businesses around each of the new stations and along the proposed alignment could be affected by construction activities, construction-related traffic, and street lane and sidewalk closures. Construction activities would likely result in a greater temporary decrease in accessibility to many businesses and a greater impact to on-street and off-street parking than the Underground Emphasis LRT Alternative due to the additional construction needed on 1st Street. As with the Underground Emphasis LRT Alternative, this potential impact could be adverse during the construction phase. The introduction of construction employees into the area who could potentially be new customers of neighborhood restaurants and retail establishments could lessen the impact. This would not result in a considerable contribution to a cumulative impact.

Some existing commercial properties would need to be acquired under this alternative in Little Tokyo. Displaced businesses would include Señor Fish, Weiland Brewery, and The Spice Table in Little Tokyo. This would be a greater number of businesses than would be displaced by the Underground Emphasis LRT Alternative. The businesses that would be removed in Little Tokyo do not contribute to the community identity as a Japanese-American cultural and community center. Properties would be acquired and owners would be compensated according to the Uniform Relocation Act. However, loss of these businesses could indirectly affect the viability of surrounding businesses because less people could be drawn to the general area which could be a potentially adverse impact. This would not result in a considerable contribution to a cumulative impact.

Once constructed, the alternative would permanently improve community mobility by providing a new attractive means of access that does not rely on solo driving. Connections to other neighborhoods within the downtown area and across the region would be strengthened by the rail link. Business viability would improve because the increased pedestrian traffic near the proposed stations would provide new potential customers. The rail infrastructure would be entirely underground and out of view, and station entrances would be designed to enhance the surrounding urban landscape. Vacant parcels remaining after construction could potentially be developed as transit oriented developments or other neighborhood-supportive resources.

Refinements to the LPA since publication the Draft EIS/EIR have reduced the significance of potentially adverse community and neighborhood impacts in Little Tokyo. Cut and cover construction would no longer be needed on 2nd Street; fewer businesses would need to be acquired on the parcel bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue; and TBM staging would occur on the Mangrove property instead of on 2nd Street. The refinements reduce the need for road and sidewalk closures, property acquisitions, and overall neighborhood disruption during construction.

4.3.3.5.1 NEPA Finding

The LPA would have temporary adverse construction effects on community mobility, emergency service response times, community resources and events, and business viability. The alternative would also have a short-term adverse operational effect on business viability due to acquisitions, though not permanent, because businesses could return in future developments on these sites. These effects will be reduced to a not substantially adverse level by the final mitigation measures in Section 4.3.4 and Chapter 8.

4.3.3.5.2 CEQA Determination

The LPA would not have significant construction or operation impacts on communities or neighborhoods after the final mitigation measures in Section 4.3.4 and Chapter 8 are implemented. The LPA would not result in a considerable contribution to a cumulative impact.

4.3.4 Mitigation Measures

4.3.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for community and neighborhood impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.3.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Addition of a 24-hour live hotline for community concerns regarding construction, as well as a project office within the Little Tokyo community, in order to maintain day-to-day contact with the community during construction.
- Addition of the Regional Connector Community Leadership Council (RCCLC) to provide input into the construction mitigation and outreach plans.
- Addition of an "Arts District Path" linking the Arts District to the 1st/Central Avenue station.
- Addition of measures to mitigate possible temporary intermittent utility disruption, including field verification of underground utility line locations, coordination with utility providers, protective construction measures, and immediate technician response in the event of unplanned outages.

4.3.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

To mitigate the temporary disruption of traffic patterns and access to residences and businesses during construction, which could affect the economic vitality of some businesses:

- Accessible detours shall be provided whenever possible. Detours shall be compliant with the Americans with Disabilities Act. Signage shall be provided in those languages most commonly spoken in the immediate community. Signs shall mark detours in accordance with the Manual on Uniform Traffic Control Devices, and other applicable local and state requirements. Detours shall be designed to minimize cut-through traffic in adjacent residential areas. (CN-1)

- Early notification of traffic disruption shall be given to emergency service providers. Work plans and traffic control measures shall be coordinated with emergency responders to prevent impacts to emergency response times. (CN-2)

- Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events. Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders. Crossing guards and other temporary traffic controls shall be provided in the vicinity of construction sites, haul routes, and other relevant sites as proposed in California DOT Traffic Manual, Section 10-07.3, Warrants for Adult Crossing Guards, and as appropriate to maintain traffic flow during construction. (CN-3)

- A 24-hour live hotline for community concerns regarding construction shall be provided, as well as a project office within the Little Tokyo community. Residents and businesses shall also be provided with comment/complaint forms during construction. A construction office shall also be placed within the community to provide in-person assistance and services. Metro shall negotiate with the Japanese American National Museum to locate the office within the museum's historic building on 1st Street. The hotline and office shall enable Metro to maintain day-to-day contact with the community during construction and provide community members with all project details that may be relevant to the public. (CN-4)

- A community outreach plan shall be developed and implemented to notify local communities and the general public of construction schedules and road and sidewalk detours. Metro shall coordinate with local communities during preparation of the traffic management plans to minimize potential construction impacts to community resources and special events. Construction activities shall be coordinated with special events. (CN-5)

- Metro shall develop a construction mitigation plan with community input to directly address specific construction impacts in the project area. Metro shall establish and receive input from the RCCLC in developing the construction mitigation plan. The RCCLC shall consist of representatives from all parts of the alignment area. Metro shall work with the RCCLC in developing the outreach plan. (CN-6)

- Metro shall work with the City to develop a parking mitigation program to mitigate the loss of public parking spaces during construction. This would include, but is not limited to, restriping the existing street to allow for diagonal parking, reducing the number of restricted parking areas, phasing construction activities in a way that minimizes parking disruption, and increasing the time limits for on-street parking. Restriping would occur on portions of Temple Street, Alameda Street, 1^{st} Street, 2^{nd} Street, Central Avenue, San Pedro Street, Judge John Aiso Street, 3^{rd} Street, and Traction Avenue. Such parking mitigation shall be implemented on a temporary, tiered basis pending findings of the annual parking analysis described in EJ-11 in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. (DR-4)

- Metro shall not hinder access to other public parking lots during construction. (DR-5)

To mitigate the negative impact construction sites could have on the community if left unsecured:

- Barriers shall be erected and security personnel provided during construction to minimize trespassing and vandalism. Barriers shall be enhanced with culturally-relevant artwork, attractive design features, and advertisements for parking locations and businesses. Signage shall also identify that businesses are open during construction. Community input shall be sought in determining artwork and design features. (CN-7)

To incorporate both the Arts District and Little Tokyo neighborhood identities into the 1^{st}/Central Avenue station:

- Metro shall implement urban design improvements in the form of an "Arts District Path" linking the Arts District to the 1^{st}/Central Avenue station. Metro shall invite SCI-ARC and other local students to participate in the path's design. The path shall include sidewalk enhancements, design elements, way finding signage, and crosswalk improvements. The design of the station shall enhance pedestrian circulation. (CN-8)

- Design of the 1^{st}/Central Avenue station shall encourage connections and pedestrian travel to the Japanese Village Plaza, Los Angeles Hompa Hongwanji Temple, the Japanese American National Museum, and businesses south of 2^{nd} Street. (CN-9)

To mitigate the temporary intermittent utility disruption that could occur as part of construction:

- Metro shall field verify (by potholing or other methods) the exact locations and depths of underground utilities and conduct condition checks prior to utility relocation. (CN-10)

- Metro shall coordinate closely with utility providers to develop a service plan as needed to address planned and unplanned utility service interruptions. Should an unplanned outage occur as a result of construction activities, Metro shall contact the appropriate utility provider immediately to restore service. Metro shall also maintain access to utilities for providers' technicians. Metro shall provide protective measures such as pipe and conduit support systems, vibration and settlement monitoring, trench sheeting, and shoring during construction to avoid potential damage to utilities. (CN-11)

4.4 Visual and Aesthetic Impacts

This section summarizes the existing visual and aesthetic environment within the project area and evaluates the potential for visual and aesthetic impacts resulting from construction and operation of the proposed Regional Connector Transit Corridor alternatives. Potential visual impacts to historic resources are summarized in Section 4.12.1 Historic Resources - Built Environment. Information in this section is based on the Visual and Aesthetic Impacts Technical Memorandum prepared for the project contained in Appendix P of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, as indicated in the Responses to Comments, Volumes F-2 and F-3, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Refinements to the LPA since publication of the Draft EIS/EIR include the designation of the Mangrove property (formerly the Nikkei development) for construction staging and Tunnel Boring Machine (TBM) insertion, and information about the possible use of antennas as part of the LRT communication system. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.4.4.2 below, based on input received during the Draft EIS/EIR public review period. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR.

The analysis of visual and aesthetic consequences associated with the LPA is detailed below in Section 4.4.3.5.

4.4.1 Regulatory Framework

Guidance for assessing potential visual impacts of the Regional Connector Transit Corridor project was found in the National Historic Preservation Act (NHPA) and CEQA, and was used to evaluate potential visual and aesthetic effects under NEPA.

Multiple federal agencies have developed analytical frameworks for visual resource management, including:

- United States Department of Agriculture (USDA), Forest Service (USFS 1974, 1995)
- United States Department of Interior (USDOI), Bureau of Land Management (BLM 1978)
- United States Department of Transportation (USDOT), Federal Highway Administration (FHWA 1981)

The methodology and assumptions used to assess visual and aesthetic impacts of the Regional Connector Transit Corridor project alternatives build on the guidance developed by these federal agencies and the extensive work of Lawrence Headley of LH&A for the Port of Los Angeles and other Los Angeles projects (Headley 2008, 2006, and 2005). Analyzing potential visual impacts includes evaluating the following effects:

- Conflicts with or compliments the existing visual character
- Changes in visual quality
- Intrudes on or blocks sensitive views (emphasizes views protected by local jurisdictions)
- Creates shadows
- Creates new light or glare sources

More information regarding the regulatory and analytical framework is available in Appendix P, Visual and Aesthetic Impacts Technical Memorandum.

4.4.2 Affected Environment

The area of potential effects (APE) for the visual impact analysis consists of the area one city block adjacent to each side of the proposed alignments.

4.4.2.1 Visual Resources

The build alternatives' existing visual and aesthetic environment is characterized by an established urban landscape. Research was completed to locate previously identified visual and aesthetic resources. These resources include, but are not limited to, structures of architectural or historic significance or visual prominence; public plazas, art, and gardens; heritage oaks or other trees or plants protected by the City of Los Angeles; consistent design elements (such as setbacks, massing, height, and signage) along a street or district; pedestrian amenities; and landscaped medians or park areas. Based on site reviews, the predominant visual resources within the APE are recognized historic buildings. Figures 4.4-6 through 4.4-8 show the visual resources identified within the APE.

4.4.2.2 Scenic Vistas

The City of Los Angeles General Plan and the Scenic Highways Plan within the *General Plan's Circulation Element* were reviewed to determine whether the project would affect scenic vistas.

Based on this review, it was determined that there are no scenic highways in downtown Los Angeles. Although Objective 11 of the *General Plan's Circulation Element* is to "preserve and enhance access to scenic resources and regional open space," there are no such features adjacent to the TSM or build alternatives.

4.4.2.3 Scenic Resources

The following buildings, which are recognized as historic resources in Section 4.12.1, Cultural Resources – Built Environment, and open spaces have been identified as scenic resources along the proposed alignment corridors for the TSM and build alternatives. Figures 4.4-1 through 4.4-5 illustrate some of the existing visual conditions in the project area.

Financial District:

- Fine Arts Building
- 818 Building
- Roosevelt Lofts
- Pegasus
- 811 Wilshire Boulevard
- Engine Company No. 28
- The Standard Hotel
- The California Club
- Los Angeles Central Library and Maguire Gardens
- City National Plaza
- Citigroup Center Plaza

Bunker Hill:

- Walt Disney Concert Hall
- 2nd Street Tunnel
- Grassy Open Space at General Thaddeus Kosciuszko Way

Historic Core:

- Los Angeles Law Center
- Times Annex
- Times Building
- Higgins Building

- St. Vibiana Cathedral
- Redwing Shoes

Figure 4.4-1. Financial District/Flower Street Corridor

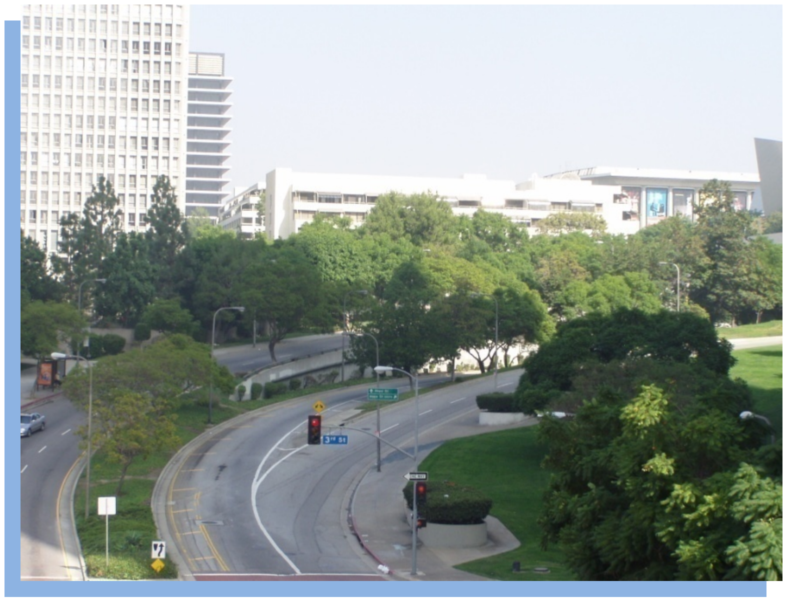


Figure 4.4-2. Open Space at West End of 2nd and 3rd Street Tunnels

Figure 4.4-3. 1st Street Corridor and the Los Angeles Times Building

Civic Center:

- Civic Center Historic District
- City Hall South
- Los Angeles City Hall
- U.S. Courthouse
- Fletcher Bowron Square
- Parker Center
- Tinker Toy Parking Structure

Figure 4.4-4. Los Angeles City Hall

Little Tokyo:

- Little Tokyo Historic District
- Los Angeles Hompa Hongwanji Temple
- Union Center Arts

More information regarding the existing visual and aesthetic environment within the project area is available in Appendix P, Visual and Aesthetic Impacts Technical Memorandum.

Figure 4.4-5. Japanese Village Plaza with "Friendship Knot" at San Pedro & 2nd Streets

4.4.3 Environmental Impacts/Environmental Consequences

Potential impacts to historic resources are evaluated in Section 4.12.1 Historic Resources - Built Environment. Scenic byways, scenic vistas, and protected public view corridors are not located within the project area. Therefore, the project would neither impede views from any nationally recognized scenic highways, designated scenic routes, corridors, or parkways nor would it affect any otherwise recognized or valued public viewing locations.

Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.4.1. Table 4.4-1 summarizes visual and aesthetic impacts associated with each of the five alternatives. Further information regarding visual and aesthetic impacts is provided in Appendix P, Visual and Aesthetic Impacts Technical Memorandum.

4.4.3.1 No Build Alternative

New transit projects would not be constructed or begin operation in the project area under this alternative. Therefore, direct or indirect visual impacts would not occur to scenic vistas, scenic resources, nighttime lighting, and shading and shadowing. The No Build Alternative would not result in visual impacts to these resources.

4.4.3.1.1 NEPA Finding

The No Build Alternative would have no effects with respect to visual and aesthetic conditions.

4.4.3.1.2 CEQA Determination

The No Build Alternative would have no impact with respect to visual and aesthetic conditions.

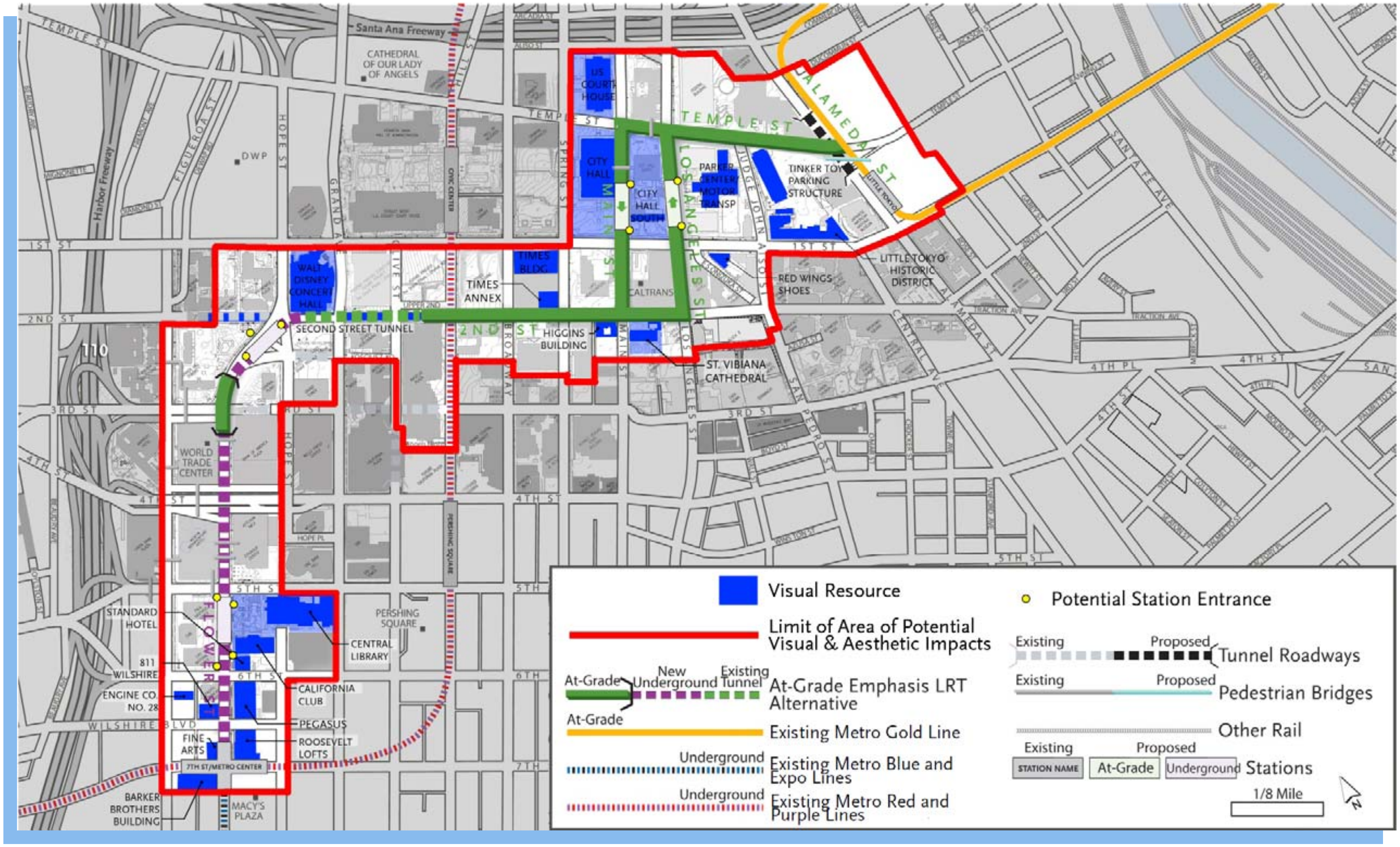


Figure 4.4-6. Visual Resources Associated with the At-Grade Emphasis LRT Alternative

** Light blue areas are plazas, open space, and courtyards identified as visual resources*

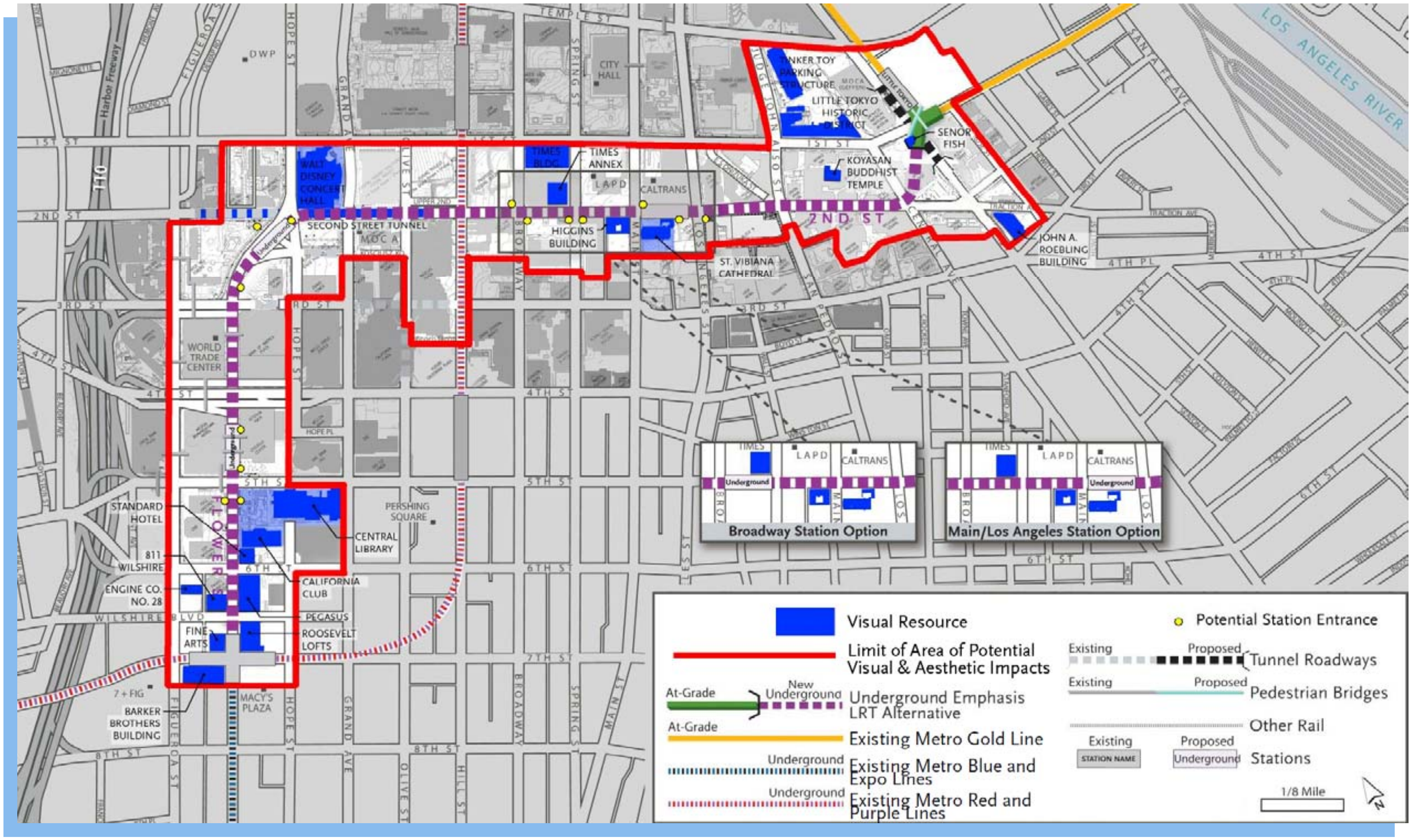


Figure 4.4-7. Visual Resources Associated with the Underground Emphasis LRT Alternative

** Light blue areas are plazas, open space, and courtyards identified as visual resources*

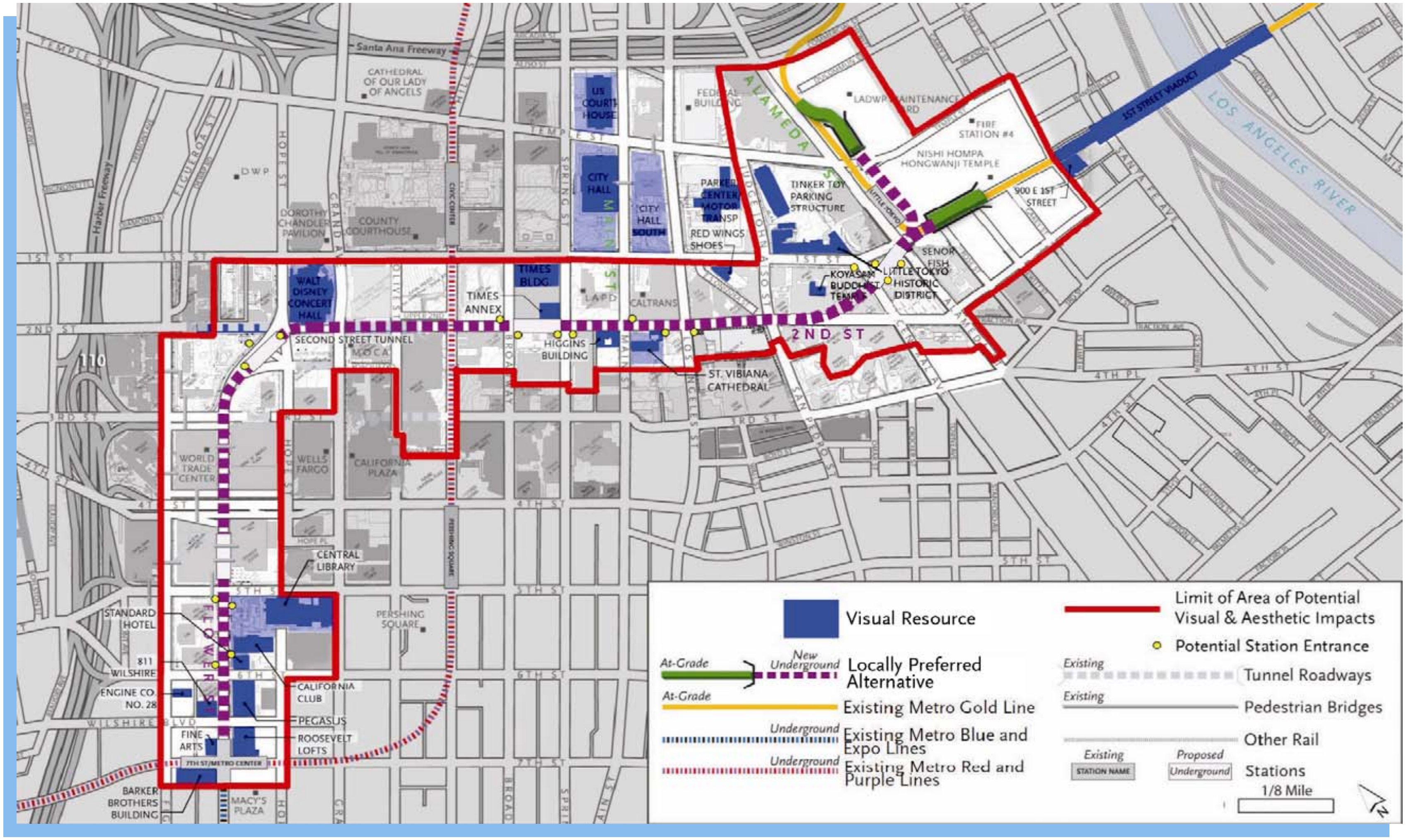


Figure 4.4-8. Visual Resources Associated with the Locally Preferred Alternative

** Light blue areas are plazas, open space, and courtyards identified as visual resources*

4.4.3.2 TSM Alternative

The TSM Alternative would result in minor visual modifications to the existing environment due to construction of enhanced bus stops. Examples of how these improvements might appear are shown in Figures 4.4-9a and 4.4-9b. Direct or indirect construction or operation impacts would not occur to scenic vistas, scenic resources, nighttime lighting, and shading and shadowing under the TSM Alternative because there would not be any new major construction or new light rail operation.

4.4.3.2.1 NEPA Finding

The TSM Alternative would not have adverse effects on the visual and aesthetic conditions in the project area.

4.4.3.2.2 CEQA Determination

The TSM Alternative would not have a significant impact on the visual and aesthetic conditions in the project area. The visual character of the corridor would not change with either construction or operation of the TSM Alternative.

Figure 4.4-9a and Figure 4.4-9b. Enhanced Bus Stop

4.4.3.3 At-Grade Emphasis LRT Alternative

4.4.3.3.1 Construction

Construction of the At-Grade Emphasis LRT Alternative would involve both at-grade and underground construction activities. At-grade construction would include installing tracks and guideway structures and constructing station platforms and ancillary facilities along roadways in the Historic Core, Civic Center, and Little Tokyo areas of downtown Los Angeles. At-grade construction activities would also include streetscape improvements along the entire alignment.

For aboveground construction, activities, equipment, and staging locations would be visible to nearby land uses and passersby. Proposed construction staging locations for the at-grade portion of this alternative include the Main/1st Street station, the Los Angeles/1st Street station, and the Temple and Alameda junction. At each of these three staging locations, construction equipment, worker vehicles, and construction trailers would be visible to nearby land uses and passersby for a period of two to three years.

For underground construction activities, cut and cover construction would be conducted primarily below ground along approximately 1,600 feet of Flower Street north of the existing 7th Street/Metro Center Station and extend to the proposed 2nd/Hope Street station. At any given time, two to three blocks would be closed during cut and cover construction activities. Aboveground activities associated with cut and cover construction would be visible to nearby land uses and passersby; however, the bulk of construction would occur below ground and, therefore, would not obstruct views or substantially alter the visual character of the Flower Street corridor in the Financial District.

Also associated with underground construction would be construction staging areas proposed at the Flower/6th/5th Street station site and the 2nd/Hope Street station site. Construction staging locations would be visible to nearby land uses and passersby; however, the construction sites themselves would be sheltered from direct public view by temporary construction walls.

Table 4.4-2 summarizes construction impacts on scenic resources associated with construction of the At-Grade Emphasis LRT Alternative.

Both above and below ground construction activities—including installation of tracks and poles, station construction, and pedestrian and train portal construction—would temporarily disrupt the visual character and views along the corridors. However as shown in Figures 4.4-1 to 4.4-5, the project would be constructed in a heavily urbanized environment consisting of high- and mid-rise buildings where construction activities are not uncommon. Construction of the project would not noticeably reduce visual quality or alter viewing context. Therefore, temporary construction impacts would be less than significant.

During construction, nighttime lighting would predominantly consist of security lighting, and light would be directed on-site. As such, nighttime lighting impacts would be less than significant during construction. Heights of construction-related facilities and equipment located aboveground would be limited; as such, the potential for construction activities to result in shading and shadows beyond those currently created by the high- and mid-rise buildings along the alignment's corridors would be minimal. Therefore, no shade or shadow impacts would result.

4.4.3.3.2 Operations

Scenic Resources:

Views of scenic resources could be minimally disrupted during project operations due to the presence of overhead contact wire and catenary poles, at-grade stations, pedestrian portals and train portals. However, buildings within these districts that are scenic resources are much greater in scale than the components of the LRT system that the LRT system would not degrade any views. Open space and plazas would experience low visual impacts. In addition, the LRT facilities would be consistent with the historical context of many of the structures and reminiscent of the historic system of trolleys and street cars. Therefore, visual resource impacts would not be adverse or significant. Other buildings within the APE for the visual impact analysis do not have a direct line of sight of the project or are located too far from the at-grade portions of the At-Grade Emphasis LRT Alternative alignment to be visually affected. These include the Times Building, St. Vibiana Cathedral, and Union Arts Center. Therefore, no visual impacts to these buildings would occur.

Visual Character:

The At-Grade Emphasis LRT Alternative would be located in a heavily urbanized environment (as shown in Figures 4.4-1 to 4.4-5) and adding a fixed guideway, whether at-grade or underground, would not noticeably reduce visual quality or alter the viewing context in the Financial District, Bunker Hill, Historic Core, Civic Center, or Little Tokyo areas of downtown Los Angeles. The introduction and operation of these improvements would contribute to the existing urban character and high-density, pedestrian-friendly environment that already exists in downtown Los Angeles. There would not be a significant effect on the visual character of the historic districts because potential impacts to historic buildings that contribute to the historic districts would be less than significant. Therefore, visual character impacts associated with the At-Grade Emphasis LRT Alternative would be less than significant.

Nighttime Lighting/Shade and Shadow:

Nighttime lighting associated with the alternative would primarily consist of security lighting, which would be similar to the existing lighting located throughout downtown Los Angeles. Aboveground structures, including station platforms and catenary structures (which include poles and wires), would be limited to approximately two stories in height; therefore, the potential for the project to result in increased shading and shadows beyond those currently created by the high- and mid-rise buildings along the alignment corridors would be minimal and no shade or shadow impacts would result.

4.4.3.3.3 NEPA Finding

The At-Grade Emphasis LRT Alternative would result in minor changes in visual character, however, they would not be considered adverse when potential mitigation measures are implemented.

4.4.3.3.4 CEQA Determination

The At-Grade Emphasis LRT Alternative would not have a significant impact with respect to visual and aesthetic conditions with implementation of proposed mitigation measures.

4.4.3.4 Underground Emphasis LRT Alternative

4.4.3.4.1 Construction

Scenic Resources:

The Underground Emphasis LRT Alternative would involve primarily underground construction due to the proposed configuration of the alignment, except for cut and cover construction at station locations, construction staging areas, and potential TBM insertion sites. However, most construction would occur below ground, and temporary construction walls would prevent direct public view of construction staging and TBM insertion sites. TBM operation would be entirely below ground and not visible to nearby land uses or passersby in the Historic Core and Little Tokyo areas of downtown Los Angeles. Therefore, potential impacts on scenic resources associated with construction of the Underground Emphasis LRT Alternative would not be adverse or significant.

Visual Character:

Construction activities, including cut and cover construction, installation of the tracks and poles in the at-grade segment of the Underground Emphasis LRT Alternative, and station and pedestrian portal construction, would temporarily alter the existing visual character and views along the corridors. However as shown in Figures 4.4-1 to 4.4-5, the project would be constructed in a heavily urbanized environment consisting of high- and mid-rise buildings where construction activities are not uncommon. Construction of the project would not noticeably reduce visual quality or alter viewing context. Therefore, temporary construction impacts would be less than significant.

Nighttime Lighting/Shade and Shadow:

During construction, nighttime lighting would predominantly consist of security lighting, and light would be directed on-site. As such, nighttime lighting impacts would not be adverse or significant during construction. As with the At-Grade Emphasis LRT Alternative, shade and shadow impacts associated with construction-related facilities and equipment located aboveground would be minimal compared to those currently created by the high- and mid-rise buildings along the alignment’s corridors. Therefore, no shade or shadow impacts would result.

4.4.3.4.2 Operations

Scenic Resources:

The Underground Emphasis LRT Alternative would operate primarily underground, with a short at-grade segment in Little Tokyo near the existing Little Tokyo/Arts District Station and, therefore, would result in only minimal potential visual impacts to scenic resources. At-grade overhead contact systems, catenary poles, and trackway (standard features required for a light rail system to operate) would be located only at the easternmost end of the Underground Emphasis LRT Alternative alignment. The block bordered by Alameda Street, 2nd Street, 1st Street, and Central Avenue is the only block that would have exposed overhead contact wires, catenary poles, and track.

Older buildings on this block include the Señor Fish and John A. Roebling structures. The Cultural Resources – Built Environment (Updated), Appendix X, describes these buildings and potential project impacts. The portal area structures and surrounding streetscape and landscaping would incorporate historical and visual references to the surrounding Little Tokyo and Arts District neighborhoods, complementing these important communities. Given that most features associated with the Underground Emphasis LRT Alternative would be located below ground, and that only one city block would experience potential visual changes associated with the aboveground operations of this alternative, no adverse visual impacts to scenic resources would occur. Therefore, any potential impacts to visual resources would be less than significant.

Visual Character:

The Underground Emphasis LRT Alternative is located in a heavily urbanized environment (as shown in Figures 4.4-1 to 4.4-5), and adding primarily underground structures and a limited fixed guideway would not noticeably reduce visual quality or alter the viewing context in the Financial District, Bunker Hill, Historic Core, and Little Tokyo areas of downtown Los Angeles. Construction and operation of these features would contribute to the existing urban character and high-density, pedestrian-friendly environment that already exists in downtown Los Angeles. Therefore, potential visual character impacts associated with the Underground Emphasis LRT Alternative would not be adverse or significant.

Nighttime Lighting/Shade and Shadow:

Nighttime lighting associated with the alternative would predominantly consist of security lighting at pedestrian portal locations, and would be directed on-site. Therefore, no nighttime lighting impacts would occur during operation. Aboveground structures, including pedestrian portals and one block with at-grade light rail system, would be limited to no more than two stories in height; therefore, the potential for the project to result in increased shading and shadows beyond those currently created by the high- and mid-rise buildings along the alignment corridors would be minimal and no shade or shadow impacts would result.

4.4.3.4.3 NEPA Finding

The Underground Emphasis LRT Alternative would not have adverse effects on the visual and aesthetic character of the project area.

4.4.3.4.4 CEQA Determination

The Underground Emphasis LRT Alternative would not have a significant impact on the visual and aesthetic character of the project area.

4.4.3.5 Locally Preferred Alternative

4.4.3.5.1 Construction

Construction of the LPA would require mostly underground construction due to the proposed configuration of the alignment. Cut and cover, open cut, or sequential excavation method (SEM) construction could occur at station sites and cut and cover construction would occur along the southern portion of Flower Street just north of the 7th Street/Metro Center Station. Construction staging locations would include the Mangrove property (formerly the Nikkei development), which would be used as the TBM insertion site, as well as the 1st/Central Avenue, 2nd/Broadway, and the 2nd/Hope Street station sites.

The LPA would include a center platform station constructed under the northern portion of the block bounded by 1st, 2nd, and Alameda Streets, and Central Avenue, with tracks to the north and east proceeding at the same grade. The tracks leaving this block would split into two different directions. One set of tracks would head east within 1st Street, where it would rise up through a portal to an at-grade elevation and join the Metro Gold Line to I-605 about one and a half blocks east of Alameda Street. The other set of tracks would head northerly east of and parallel to Alameda Street, rising through a second portal, and joining the Metro Gold Line to Montclair and heading north to Union Station.

Scenic Resources:

Most construction would occur below ground, and temporary construction walls would prevent direct public view of construction staging and TBM insertion sites. Construction staging areas and associated temporary construction walls would be located on the northern portion of the block bounded by 1st, 2nd, and Alameda Streets, and Central Avenue. Additionally, the Mangrove property would be used as a construction staging location as well as for TBM insertion. These areas would not be visible to anyone but those in the vicinity of this block. There would be no impact to scenic resources in this vicinity because there are no nearby resources.

In the vicinity of the portal where the train would transition to at-grade, the Los Angeles Hompa Hongwanji Temple, an important community resource, is located at 815 East 1st Street. Construction of the portal within 1st Street would involve cut and cover methods and occur in the vicinity of the temple, which could have moderate potential visual impacts. Nonetheless, potential impacts on scenic resources associated with construction of the LPA would not be adverse or significant.

Construction of the LPA would not result in significant impacts to scenic resources. Therefore, construction of this alternative would not contribute to a cumulative scenic resource impact.

Visual Character:

During construction, activities occurring aboveground in roadways and along sidewalks would temporarily alter the existing visual character and views along the corridors. Construction staging locations would be visible to nearby land uses and passersby; however, the construction sites themselves would be sheltered from direct public view by temporary construction walls. The project would be constructed in a heavily urbanized environment consisting of high- and mid-rise buildings where construction activities are not uncommon. Project construction would not noticeably reduce visual quality or alter viewing context. Furthermore, temporary construction impacts on visual character would be less than significant. Mitigation has been incorporated to further reduce less than significant impacts.

Construction of the LPA would not result in a significant impact to the existing visual character. Therefore, construction of this alternative would not contribute to a cumulative visual character impact.

Table 4.4-1. Summary of Potential Visual and Aesthetic Impacts

Impacts	No Build	TSM		At-Grade Emphasis LRT		Underground Emphasis LRT		Locally Preferred Alternative	
		Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Scenic Vistas	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scenic Resources	NO	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Visual Character	NO	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Nighttime Illumination	NO	NO	NO	LTS	NO	LTS	NO	LTS	NO
Shade and Shadows	NO	NO	NO	NO	NO	NO	NO	NO	NO
Indirect Impacts	NO	NO	NO	NO	NO	NO	NO	NO	NO
Direct Impacts	NO	NO	NO	NO	NO	NO	NO	NO	NO
Cumulative Impacts	NO	NO	NO	NO	NO	NO	NO	NO	NO

Notes:
[1] Scenic vistas were not located in the project area; therefore, an analysis of impacts was not included.
NO = No impact
LTS = Less than significant impact

Table 4.4-2. Scenic Resources Potentially Affected by Construction of the At-Grade Emphasis LRT Alternative

Resources	Cut and Cover for Guideway	Construction Staging	Stations and Portals	Tunnel Boring
Financial District				
Fine Arts Building	NO	NO	NO	NO
818 Building	NO	NO	NO	NO
Roosevelt Lofts	NO	NO	NO	NO
Pegasus	LTS	NO	NO	NO
811 Wilshire Blvd	LTS	NO	NO	NO
Engine Co. No. 28	LTS	NO	NO	NO
Standard Hotel	LTS	NO	NO	NO
The California Club	LTS	NO	NO	NO
LA Central Library & Maguire Gardens	LTS	LTS	LTS	NO
City National Plaza	LTS	LTS	LTS	NO
Citigroup Center Plaza	LTS	LTS	LTS	NO
Bunker Hill				
Walt Disney Concert Hall	NO	LTS	LTS	NO
2nd Street Tunnel	LTS	LTS	LTS	NO
Grassy Open Space at General Thaddeus Kosciuszko Way	LTS	LTS	LTS	NO
Historic Core				
LA Law Center	NO	NO	NO	NO
Times Annex	NO	NO	NO	NO
Times Building	NO	NO	NO	NO
Higgins Building	NO	NO	NO	NO

Table 4.4-2. Scenic Resources Potentially Affected by Construction of the At-Grade Emphasis LRT Alternative (continued)

Resources	Cut and Cover for Guideway	Construction Staging	Stations and Portals	Tunnel Boring
St. Vibiana Cathedral	NO	NO	NO	NO
Redwing Shoes	NO	NO	NO	NO
Civic Center				
Civic Center Historic District	NO	LTS	LTS	NO
City Hall South	NO	LTS	LTS	NO
Los Angeles City Hall	NO	LTS	LTS	NO
U.S. Courthouse	NO	LTS	LTS	NO
Fletcher Bowron Square	NO	LTS	LTS	NO
Parker Center	NO	LTS	LTS	NO
Tinker Toy Parking Structure	NO	LTS	LTS	NO
Little Tokyo				
Little Tokyo Historic District	NO	LTS	NO	NO
Union Center Arts	NO	LTS	NO	NO
Los Angeles Hompa Hongwanji Temple	NO	LTS	NO	NO

Notes:
NO = No impact
LTS = Less than significant impact

Nighttime Lighting/Shade and Shadow:

During construction, nighttime lighting would predominantly consist of security lighting, and light would be directed on-site. As such, nighttime lighting impacts would not be adverse or significant during construction. Shade and shadow impacts associated with construction-related facilities and equipment located aboveground would be minimal compared to those currently created by the high- and mid-rise buildings along the alignment's corridors. Therefore, no shade or shadow impacts would result.

Construction of the LPA would not result in nighttime lighting or shade and shadow impacts. Therefore, this alternative would not contribute to cumulative nighttime lighting or shade and shadow impacts.

4.4.3.5.2 Operations

Scenic Resources:

Operation of the LPA would result in only minimal potential visual impacts to scenic resources. Other than pedestrian access and egress through pedestrian portals, and some ancillary facilities (which could include ventilation shafts, fare collection machines, station markers, bike racks, etc.) at the proposed underground stations, most operational activities would occur underground, with no degradation of views of historic buildings and little or no contrasting visual conditions (refer to Chapter 2 of this Final EIS/EIR for a more detailed list of potential ancillary facilities). The Broad Art Foundation Museum, which is currently under construction, is projected to include a plaza above General Thaddeus Kosciuszko Way connecting to Upper Grand Avenue. In order to provide access from the 2nd/Hope Street station to Upper Grand Avenue, an elevator from the station entrance to the plaza would be built as part of the LPA if one is not already provided. If the plaza is not built, a pedestrian connection (such as a pedestrian bridge) would be constructed as part of the LPA from the elevator to Upper Grand Avenue; the pedestrian connection would be designed in a manner that would not degrade views of historic buildings and would be compatible with surrounding uses. Roadway and lane reconfigurations would be needed around the 2nd/Hope Street station. The roadway and lane reconfigurations would not degrade views of historic buildings or contrast with visual conditions.

There would be no visual impacts as a result of the new trackway and systems appurtenances, which would be located underground, except where the trackway returns to grade in 1st Street and at the Alameda Street train portal. As illustrated in Figures 4.4-10 and 4.4-11, portions of the proposed alignment in the vicinity of Little Tokyo, along Alameda Street and east of Alameda Street would have prominent, visible street-level features, including pedestrian entrances to an underground station, and tunnel portals on 1st Street and northeast of Temple and Alameda Streets. As shown in Figures 4.4-10 and 4.4-11, implementation and operation of the LPA would contribute to the existing urban character and high-density, pedestrian-friendly environment that already exists in downtown Los Angeles. Typical underground station entrance and underground alignment renderings are shown in Chapter 2 as Figures 2-5 through 2-7. The LPA would add primarily underground structures and a limited fixed guideway which would not impact scenic resources in the heavily urbanized areas of Little Tokyo or the Arts District.

Operation of LPA would not result in significant impacts to scenic resources. Therefore, operation of the LPA would not contribute to cumulative scenic resource impacts.

Visual Character:

The LPA would add primarily underground structures and a limited fixed guideway which would not impact scenic resources, noticeably reduce visual quality, or alter the viewing context in the heavily urbanized areas of Little Tokyo or the Arts District. Additionally, the LPA would include streetscape enhancements on the sidewalk of Flower Street between 7th and 4th Streets to facilitate improved pedestrian access to the existing 7th Street/Metro Center Station. As indicated above, the Broad Art Foundation Museum, which is currently under construction, is projected to include a plaza above General Thaddeus Kosciuszko Way connecting to Upper Grand Avenue. If the plaza is not built, a pedestrian connection (such as a pedestrian bridge) would be constructed as part of the LPA from the elevator to Upper Grand Avenue in a manner that would not degrade views of historic buildings and would be compatible with existing uses. Roadway and lane reconfigurations associated with the 2nd/Hope Street station would not alter the existing visual character, views along the corridors, or intrude on the visual quality of the surrounding neighborhood. Therefore, potential visual character impacts associated with the LPA would not be adverse or significant.

The visual character of the corridor would slightly change with the LPA. The principal features visible aboveground would be station entrances, some ancillary facilities at stations (which could include ventilation shafts, fare collection machines, station markers, bike racks, etc.), streetscape enhancements along Flower Street between 7th and 4th Streets, visual alterations in the vicinity of the proposed 1st/Central Avenue station, and the train portals in 1st Street and just east of Alameda Street between Temple and Commercial Streets (refer to Chapter 2 of this Final EIS/EIR for a more detailed list of potential ancillary facilities). Also within the LPA, antennas may be used as part of the LRT communication system. Metro will be completing studies to confirm the location of antennas during preliminary and final design. There would be a maximum of one antenna per station to be located on Metro or other publicly-owned property, buildings, or on existing street lights or antennas. In order to not intrude on the surrounding neighborhoods, which include dense high-rise urban environments, mid-rise residential, commercial, and industrial areas, antennas and ancillary facilities would be integrated into station design in the following ways: to be in context to visual qualities of the surrounding communities and neighborhood; and incorporated as part of the station architecture or urban design, which would include new street and pedestrian lights along adjacent streets and on the station plaza, station canopies, new street trees, and other design features. In addition, antennas would be integrated into station design to be similar in height of existing street lights (maximum of 35 feet).

Antennas would be metallic and could be painted or designed to hide their form, similar to cell phone towers designed to look like palm trees. Antennas may also be designed as an attachment to existing station area structures as part of the station architecture. The antennas would also be strategically located using existing or new infrastructure or foliage so they are not visible from any historic resource. Antennas would not be visible from any historic resource and would not intrude on the visual quality of the surrounding neighborhood.

Operation of LPA would not result in significant impacts to the visual character of the surrounding area. Therefore, operation of the LPA would not contribute to cumulative visual character impacts.

Nighttime Lighting/Shade and Shadow:

Nighttime lighting associated with the LPA would predominantly consist of security lighting at pedestrian portal locations, and would be directed on-site. Therefore, no nighttime lighting impacts would occur during operation. Aboveground structures, including pedestrian portals and one block with at-grade light rail system, would be limited to no more than two stories in height; therefore, the potential for the project to result in increased shading and shadows beyond those currently created by the high- and mid-rise buildings along the alignment corridors would be minimal and no shade or shadow impacts would result.

The LPA would not result in nighttime lighting or shade and shadow impacts from operation. Therefore, this alternative would not contribute to cumulative nighttime lighting or shade and shadow impacts.

4.4.3.5.3 NEPA Finding

The LPA would not have adverse effects on the visual and aesthetic character of the project area. Since the LPA would not have adverse effects on the visual and aesthetic character of the project area, construction and operation of the LPA would not result in a considerable contribution to a cumulative visual or aesthetic effect.

4.4.3.5.4 CEQA Determination

The LPA would not have significant impacts on the visual and aesthetic character of the project area. Since the LPA would not have significant impacts on the visual and aesthetic character of the project area, construction and operation of the LPA would not result in a considerable contribution to a cumulative visual or aesthetic impact.

4.4.4 Mitigation Measures

4.4.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has added specificity to the candidate mitigation measures for visual and aesthetic impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.4.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Revisions based on comments on the Draft EIS/EIR.
- Mitigation measures to further reduce less than significant impacts associated with construction of the LPA.

4.4.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

4.4.4.2.1 Final Construction-Related Mitigation Measures for the Locally Preferred Alternative

While no significant impacts to the Historic Core, Civic Center, or Little Tokyo communities would result from construction of the LPA, the following mitigation measures will further reduce less than significant impacts.

- Metro shall shield temporary lighting during construction to reduce spillover lighting. (VA-3)
- Metro shall locate stockpile areas (storage areas for construction equipment, supplies, and excavated soil) primarily in less visually sensitive locations, where they are not visible from the road or to businesses or residents. (VA-4)
- Temporary construction sheds and barricades shall be located so as to avoid obscuring significant views of historic properties. (VA-5)

4.4.4.2.2 Final Operation-Related Mitigation Measures for the Locally Preferred Alternative

While no significant impacts to the Historic Core, Civic Center, or Little Tokyo communities would result from operation of the LPA, the following mitigation measures will further reduce less than significant impacts.

- Metro shall coordinate with the station area communities to obtain input on the urban design of the project within the community. (VA-1)
- Urban design measures shall be developed to integrate the LRT facilities (stations, portals, entrances, etc.) into each community as appropriate. Designs might address elements such as materials and colors. This process has already begun with community urban design workshops, and Metro shall continue to involve communities in this process. Metro shall coordinate with the City of Los Angeles Department of Planning staff during the design process and regarding urban design elements. (VA-2)

Figure 4.4-10. Locally Preferred Alternative – Aerial View at 1st and Alameda Streets Facing North without Existing Tracks

**Conceptual Joint Development project is shown*

Figure 4.4-11. Locally Preferred Alternative – Aerial View at 1st and Alameda Streets Facing East without Existing Tracks

**Conceptual Joint Development project is shown; Existing Metro Gold Line tracks to Pasadena are not shown*

4.5 Air Quality

This section describes the air quality conditions for the project area and analyzes both short-term impacts of emissions during construction and long-term impacts associated with operations of each Regional Connector alternative. It also summarizes potential impacts to air quality and inhalation health risks. The analysis includes the preparation of emissions inventories for construction and operations, health risk assessments for construction activities, and a carbon monoxide (CO) hot spots analysis. Information in this section is based on the Air Quality Impacts and Health Risk Assessment Technical Memorandum prepared for the project contained in Appendix Q of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, as indicated in the Responses to Comments, Volumes F-2 and F-3, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Minor changes were made to the numerical values stated in this section. Average weekday values were calculated in the Draft EIS/EIR for vehicle miles traveled (VMT) and other measures based on VMT. In order to report annual values for VMT in the Draft EIS/EIR, a multiplier (annualization factor) was used to convert the daily values. This annualization factor has been updated for this Final EIS/EIR to maintain consistency with other Metro projects, and has caused annual VMT and other annualized measures based on VMT to change slightly. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.5.4.2 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of air quality impacts associated with the LPA is detailed below in Section 4.5.3.

4.5.1 Regulatory Framework and Standards of Significance

Federal, state, and local governments all share responsibility for air quality management. The Clean Air Act (CAA) and the California Clean Air Act (CCAA) are the primary statutes that establish ambient air quality standards. They establish regulatory authorities to design and enforce air quality regulations.

4.5.1.1 Regulatory Framework

Under authority of the CAA, the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants that are considered harmful to public health and welfare: CO, lead (Pb), nitrogen dioxide (NO_2), ozone (O_3) (commonly known as "smog"), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). Ozone is a secondary pollutant, meaning that it is formed in the atmosphere from reactions of precursor compounds under certain conditions. Primary precursor compounds that lead to formation of O_3 include volatile organic compounds (VOC) and oxides of nitrogen (NO_x). Since the formation of ozone is complex and difficult to assess on a project level, air quality impact analyses address ozone by analyzing emissions of NO_x and VOC precursors instead. Fine particulate matter ($PM_{2.5}$) can be emitted directly from sources (engines) or can form in the atmosphere from precursor compounds. $PM_{2.5}$ precursor compounds include SO_x, NO_x, VOC, and ammonia.

The CAA specifies dates for achieving compliance with NAAQS and identifies specific emission reduction goals for noncompliant areas. The South Coast Air Basin (SoCAB) is designated as a federal non-attainment area for O_3, PM_{10}, and $PM_{2.5}$, and is in attainment for all other pollutants, including CO, NO_2, SO_2, and Pb.

Approval, funding, and implementation of Federal Highway Administration (FHWA) and Federal Transit Authority (FTA) projects are subject to transportation conformity regulations under the CAA (40 CFR 93, Subpart A). If a potential project is included in a conforming Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP), the project is already included in emission budgets developed for the region. Thus, a unique, regional analysis of project emissions would not be required. However, analysis regarding possible localized impacts is still required.

The State of California also has air quality regulations outlined in the California Ambient Air Quality Standards (CAAQS), which are at least as stringent as, and often more stringent than NAAQS. Further information on NAAQS, CAAQS, and CAA standards are provided in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum. Other applicable local plans and regulations include:

- Southern California Association of Governments (SCAG) Regional Transportation Plan
- SCAG Regional Transportation Improvement Program
- South Coast Air Quality Management District (SCAQMD) Air Quality Management Plans

Under the CAA Amendments of 1990, which direct the EPA to implement environmental measures to ensure acceptable levels of air quality, a project cannot:

- Cause or contribute to any new violation of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS in any area; or
- Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area.

4.5.1.2 Standards of Significance

NAAQS are used to determine air quality impacts under NEPA. The most recent thresholds of significance published by the SCAQMD were released in 2009. These thresholds supersede the

City of Los Angeles thresholds; therefore, this analysis uses the most recent significance thresholds from the SCAQMD to determine air quality impacts under CEQA. Many of these thresholds are presented in Tables 4.5-2 through 4.5-4, below.

Significance thresholds developed by the SCAQMD for local air quality impacts from construction activities (SCAQMD 2003 and SCAQMD 2006) and for both carcinogenic and non-carcinogenic toxic air contaminants (TACs) were used in this analysis. These thresholds are presented in Tables 4.5-2 through 4.5-4, below.

In accordance with Transportation Conformity (40 CFR 93, Subpart A), localized concentrations of CO were analyzed for this project. The analysis looks at surface traffic intersections, with the highest potential CO concentrations, that would be altered by the project, either during construction or after project completion.

4.5.2 Affected Environment

The air quality area of analysis includes the four-county region covered by the SoCAB (all of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties). The SoCAB area has high levels of air pollution, particularly from June through September. Pollutant concentrations in the SoCAB vary by location, season, and time of day. Concentrations of O_3, for example, tend to be lower along the coast and in far inland areas of the basin and adjacent desert and higher in and near inland valleys.

Over the past 30 years, substantial progress has been made in reducing air pollution levels in Southern California. Previously, the EPA designated SoCAB as a non-attainment area for all NAAQS except SO_2. The EPA now designates SoCAB as in attainment for NO_2, Pb, SO_2, and CO. PM_{10}, $PM_{2.5}$, and O_3 levels, while reduced substantially from their peak, remain above relevant NAAQS and CAAQS.

In completing the health risk assessment required under CEQA, this study identified sensitive receptors within the project area. Sensitive receptors are typically locations where the elderly, children, or other groups with a greater susceptibility to adverse health effects could be located. These locations include schools, hospitals, convalescent homes, parks, and daycare facilities. More information on the sensitive receptors in the project area is available in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum.

4.5.3 Environmental Impacts/Environmental Consequences

Impact conclusions for all of the alternatives are based on the thresholds summarized in Section 4.5.1.2 and identified in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum. Section 4.5.3.1 through Section 4.5.3.4 summarizes the transportation conformity, mobile source air toxic analysis, and anticipated emissions generated during construction and operation of each alternative. Section 4.5.3.5 through Section 4.5.3.7 provides an evaluation of potential air quality impacts for each alternative. Table 4.5-1 summarizes the results of the analysis.

4.5.3.1 Transportation Conformity

A transportation conformity determination is required for approval, funding, or implementation of FWHA/FTA projects. The Regional Connector Transit Corridor project would decrease the overall number of vehicles in the region, and it would not cause an increase in diesel vehicles. As a result, the proposed project would neither cause new PM_{10} or $PM_{2.5}$ hot spots nor increase the frequency or severity of existing PM_{10} or $PM_{2.5}$ violations. No localized adverse impacts from CO are expected under this project. The proposed project would implement the various PM_{10} and $PM_{2.5}$ control measures contained in the RTP and RTIP and meet the requirements of §93.117. No further action is required for transportation conformity.

Table 4.5-1. Summary of Potential Impacts to Air Quality

Alternative	Construction Effects (NEPA/CEQA)[1]	Operational Effects (NEPA/CEQA)	Adverse NEPA Effects After Mitigation[1]	Significant CEQA Impacts After Mitigation
No Build	None	None	None	None
TSM	None	Adverse effect	None	None
At-Grade Emphasis LRT	Temporary regional adverse effects/significant impacts	Beneficial effects	Adverse construction-related regional effects remain after mitigation	Significant construction-related regional impacts remain after mitigation
Underground Emphasis LRT	Temporary regional adverse effects/significant impacts	Beneficial effects	Adverse construction-related regional effects remain after mitigation	Significant construction-related regional impacts remain after mitigation
LPA[2]	Temporary regional adverse effects/significant impacts	Beneficial effects	Adverse construction-related regional effects remain after mitigation	Significant construction-related regional impacts remain after mitigation

Notes:
[1] Thresholds of significance for CEQA were used to analyze construction impacts under NEPA because NEPA does not contain air quality thresholds specific to construction.
[2] Air quality impacts from the construction and operation of the LPA (which only includes three stations) would be less than or equal to the construction- and operation-related air quality impacts from the Fully Underground LRT Alternative (which included four stations).

4.5.3.2 Mobile Source Air Toxics (MSAT)

The FHWA published an Interim Guidance Update on Mobile Source Air Toxic Analyses in NEPA Documents on September 30, 2009. This guidance document establishes a tiered approach for analyzing mobile source air toxics (MSAT) in NEPA, with the first tier being no analysis for projects with no potential for meaningful MSAT effects. The Regional Connector Transit Corridor project would have no MSAT effects because VMT for each of the build alternatives would decrease compared to the No Build Alternative. The proposed project falls within the first tier of MSAT analysis, so no further action is required.

4.5.3.3 Construction Emissions Results

Potential construction emissions were estimated and compared to thresholds of significance published by the SCAQMD. The SCAQMD also recommends that localized impacts be evaluated for significance. Thus, this section summarizes construction air quality impacts locally and regionally.

The build alternatives, including the LPA, would result in temporary emissions associated with construction. Construction would occur between and including the years 2014 and 2017. Construction emissions were analyzed with the methodology developed by the SCAQMD in its CEQA Air Quality Handbook (1993). Fugitive dust and engine exhaust emissions were characterized into the following main categories:

- Grading and excavation
- Heavy-duty equipment on unpaved areas
- Paved road dust (haul/delivery trucks)
- Loading/unloading of trucks
- Vehicle trips (including construction worker commuting and haul/delivery trucks)

Although the analysis used the CEQA Air Quality Handbook to estimate emissions, several emission factors and calculation methods in the Handbook are outdated. Thus, the analysis used current versions of the EMFAC and OFFROAD models, to generate on- and off-road emission factors, respectively, instead of the mobile source emission factors established in the CEQA Air Quality Handbook. The analysis used the Midwest Research Institute (MRI) Improvement of Specific Emission Factors report as necessary to update the fugitive dust emission factors identified in the CEQA Air Quality Handbook (MRI 1996). The analysis used EPA's Compilation of Air Pollutant Emission Factors (AP-42) to estimate emissions from fugitive dust (EPA 1995).

Dust emissions and dirt track-out would be minimized through compliance with SCAQMD Rule 403. Although projects are required to follow all of the Best Available Control Measures described in the rule, several of the key measures applicable to this project are as follows:

- For cut and fill at large sites, pre-water with sprinklers or water trucks and allow time for penetration.
- Apply water or stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes.
- Track-out shall not extend 25 feet or more in cumulative length from the point of origin from an active operation. All track-out from an active operation shall be removed at the conclusion of each workday or evening shift.

- If the disturbed surface area is five acres or more, or if the daily import or export of bulk material is 100 cubic yards or more, then at least one of the following precautions must also be taken.

  - Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long.

  - Pave the surface extending at least 100 feet and at least 20 feet wide.

  - Use a wheel shaker/wheel spreading device consisting of raised dividers at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

  - Install and use a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

4.5.3.3.1 Regional Construction Emissions

Emissions from construction of the project are analyzed under CEQA. Thresholds of significance developed for CEQA, and summarized in Section 4.5.1.2, were also used for the NEPA analysis, since CEQA requirements are at least as stringent as NEPA requirements. Construction emissions would not occur if not for the project, so baseline emissions are assumed to be zero. Short-term, peak, daily emissions of VOC, NO_X, CO, and $PM_{2.5}$ would exceed thresholds of significance for CEQA under all build alternatives. In addition, emissions of PM_{10} would exceed thresholds of significance for CEQA for the At-Grade Emphasis LRT Alternative. Table 4.5-2 summarizes construction emissions by peak day of operation for all build alternatives, including the LPA. The Underground Emphasis LRT Alternative has four construction sub-alternatives, as it pertains to air quality. The proposed 2nd/Hope Street station could be constructed using either the Sequential Excavation Method (SEM) or cut and cover method. In addition, two station options were considered along 2nd Street for the Underground Emphasis LRT Alternative (2nd/Broadway or 2nd/Los Angeles Street station). This emissions analysis, summarized in Table 4.5-2, evaluated all four construction options. The LPA has two construction sub-alternatives that were analyzed for potential effects on air quality. The proposed 2nd/Hope Street station could be constructed using either the SEM or cut and cover method. This emissions analysis evaluated both construction options, as summarized in Table 4.5-2.

4.5.3.3.2 SCAQMD Localized Significance Thresholds (LST)

In June 2003 (revised July 2008), the SCAQMD developed a methodology to evaluate localized construction impacts on air quality that would account for air dispersion. Maximum daily emissions for each project construction activity, considering their locations, were compared to relevant LSTs. The comparison, included in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum, assumes a one-acre site for each construction activity and a distance of 25 meters to the nearest sensitive receptor. This approach provides conservative results for the LST analysis. After implementation of mitigation measures identified in the air quality section of Chapter 8, the MMRP for the LPA, emissions of all pollutants would be less than LST thresholds for all build alternatives, including the LPA. Thus, construction-related pollutant concentrations would not be significant.

Table 4.5-2. Summary of Unmitigated Peak Daily Construction Emissions

Alternative	Unmitigated Peak Daily Construction Emissions (lbs/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
At-Grade Emphasis LRT Alternative	**289**	**2,175**	**1,150**	4	**151**	**126**
Underground Emphasis LRT Alternative						
2nd/Hope Station SEM Construction Method with 2nd/Broadway Station Option	**308**	**2,336**	**1,249**	4	111	**89**
2nd/Hope Station Cut and Cover Construction Method with 2nd/Broadway Station Option	**313**	**2,375**	**1,272**	4	113	**90**
2nd/Hope Station SEM Construction Method with 2nd/Los Angeles Station Option	**308**	**2,332**	**1,247**	4	110	**89**
2nd/Hope Station Cut and Cover Construction Method with 2nd/Los Angeles Station Option	**313**	**2,371**	**1,270**	4	113	**90**
LPA[1]						
2nd/Hope Station SEM Construction Method	**376**	**2,699**	**1,542**	5	129	**102**
2nd/Hope Station Cut and Cover Construction Method	**386**	**2,777**	**1,593**	5	133	**105**
SCAQMD Significance Threshold	75	100	550	150	150	55

Notes:
*Emissions greater than threshold of significance are shown in **bold**.*
SEM = Sequential Excavation Method. Application of SEM would have less surface disruption than the cut and cover method since the excavation would be performed mostly underground and accessed via a vertical shaft.
[1] The construction emissions are based on the Fully Underground LRT Alternative, which included the construction of four stations. Emissions generated from construction of the LPA (which only includes three stations) would be equal to or less than the construction emissions estimated for the Fully Underground LRT Alternative.

4.5.3.4 Operational Emissions Results

4.5.3.4.1 NEPA Results

NEPA analysis requires comparing emissions for the future project year (2035) to those for the No Build Alternative (2035). Incremental annual operational emissions associated with each of the proposed alternatives, including the LPA, above the No Build Alternative are summarized in Table 4.5-3 for NEPA. Each of the alternatives reduced highway VMT when compared to the No Build Alternative, which would result in a reduction in emissions generated by motor vehicles. The LPA would result in the greatest reduction of annual operational emissions. The TSM Alternative, however, would result in additional compressed natural gas (CNG) bus emissions.

NO_x emissions would increase beyond the NEPA significance threshold under the TSM Alternative.

Table 4.5-3. Incremental Annual Operational Emissions Compared to the No Build Alternative

Alternative	Incremental Emissions (tons per year)[1,2]					
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
TSM	(2)	(72)	**17**	(<1)	(37)	(6)
At-Grade Emphasis	(2)	(92)	(6)	(1)	(45)	(10)
Underground Emphasis	(2)	(95)	(6)	(1)	(46)	(10)
LPA[3]	(2)	(98)	(6)	(1)	(48)	(11)
NEPA Threshold	10	100	10	100	70	100

Notes:
[1] Incremental emissions are determined by subtracting the given alternative emissions from the No Build Alternative emissions.
*[2] Emission reductions (beneficial impacts) are shown in parentheses and emissions greater than threshold of significance are shown in **bold**.*
[3] The operational emissions are based on the Fully Underground LRT Alternative, which included four stations. Operational emissions associated with the LPA (which only includes three stations) would be equal to or less than the operational emissions estimated for the Fully Underground LRT Alternative.

4.5.3.4.2 CEQA Results

The CEQA analysis completed for the Regional Connector Transit Corridor project includes incremental daily operational emissions associated with each of the proposed alternatives, including the LPA, above the No Build Alternative (2035), which are summarized in Table 4.5-4. The determination of significant impacts within the CEQA analysis of daily, traffic-related operational emissions is based on a comparison to the No Build Alternative, which accounts for regional growth and increases in background traffic that would occur independent of the project.

In addition per the CEQA Guidelines, a significant impact would occur if the project would create objectionable odors affecting a substantial number of people. The No Build, TSM, and LRT Alternatives would not generate objectionable odors affecting a substantial number of people. Typical sources of objectionable odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, refineries, and in some instances restaurants. None of the alternatives include these land uses and, therefore, no impacts associated with objectionable odors would occur.

4.5.3.4.3 CO Hot Spots Analysis

Five intersections with the most potential for adverse impacts were analyzed using the CAL3QHC model. This is the EPA preferred model for CO hot spots modeling. The results of the analysis are provided in Table 4.5-5. Concentrations of CO at the intersections would not exceed the CAAQS or NAAQS for any of the alternatives, including the LPA. Thus, the CO hot spots would not be significant.

Table 4.5-4. Incremental Daily Operational Emissions Compared to the No Build Alternative (2035)

Alternative	Incremental Emissions (lbs/day)[1,2]					
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
TSM	0	(400)	0	(100)	(200)	0
At-Grade Emphasis	0	(500)	(100)	(100)	(300)	0
Underground Emphasis	0	(600)	(100)	(100)	(300)	0
LPA[3]	0	(600)	(100)	(100)	(300)	0
CEQA Threshold	55	550	55	150	150	55

Notes:
[1] Incremental emissions are determined by subtracting the given alternative emissions from the No Build Alternative emissions.
[2] Emission reductions (beneficial impacts) are shown in parentheses.
[3] The operational emissions are based on the Fully Underground LRT Alternative, which included four stations. Operational emissions associated with the LPA (which only includes three stations) would be equal to or less than the operational emissions estimated for the Fully Underground LRT Alternative.

Table 4.5-5. Summary of CO Hot Spots Analysis (Localized Concentrations of CO)

ID	Intersection	Max. CO Conc. (ppm)[1]		Significance	
		1-Hour	8-Hour	1-Hour[2]	8-Hour[3]
Existing Conditions (2009)					
5	1st Street and Main Street	4.20	3.17	no	no
12	2nd Street and Hill Street	3.90	2.96	no	no
57	Temple Street and Main Street	4.20	3.17	no	no
58	Temple Street and Los Angeles Street	4.20	3.17	no	no
60	Temple Street and Alameda Street	4.20	3.17	no	no
No Build Alternative (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no
57	Temple Street and Main Street	1.40	1.04	no	no
58	Temple Street and Los Angeles Street	1.30	0.97	no	no

Table 4.5-5. Summary of CO Hot Spots Analysis (Localized Concentrations of CO) (continued)

ID	Intersection	Max. CO Conc. (ppm)[1]		Significance	
		1-Hour	8-Hour	1-Hour[2]	8-Hour[3]
60	Temple Street and Alameda Street	1.40	1.04	no	no
TSM Alternative (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no
57	Temple Street and Main Street	1.40	1.04	no	no
58	Temple Street and Los Angeles Street	1.30	0.97	no	no
60	Temple Street and Alameda Street	1.40	1.04	no	no
At-Grade Emphasis LRT Alternative (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no
57	Temple Street and Main Street	1.50	1.11	no	no
58	Temple Street and Los Angeles Street	1.30	0.97	no	no
60	Temple Street and Alameda Street	1.40	1.04	no	no
Underground Emphasis LRT Alternative (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no
57	Temple Street and Main Street	1.40	1.04	no	no
58	Temple Street and Los Angeles Street	1.40	1.04	no	no
60	Temple Street and Alameda Street	1.40	1.04	no	no
LPA[4] (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no

Table 4.5-5. Summary of CO Hot Spots Analysis (Localized Concentrations of CO) (continued)

ID	Intersection	Max. CO Conc. (ppm)[1]		Significance	
		1-Hour	8-Hour	1-Hour[2]	8-Hour[3]
57	Temple Street and Main Street	1.40	1.04	no	no
58	Temple Street and Los Angeles Street	1.40	1.04	no	no
60	Temple Street and Alameda Street	1.40	1.04	no	no

Notes:
[1] Maximum concentrations for a given year include the ambient background CO concentrations (1-hour and 8-hour) for that year.
[2] 1-Hour CAAQS = 9.0 ppm; 1-Hour NAAQS = 9 ppm
[3] 8-Hour CAAQS = 20 ppm; 8-Hour NAAQS = 35 ppm
[4] CO concentrations are for the Fully Underground LRT Alternative. CO concentrations under the LPA (which only includes three stations) would be less than or equal to the CO concentrations under the Fully Underground LRT Alternative (which included four stations).

4.5.3.5 No Build Alternative

The No Build Alternative would not result in any construction emissions. The No Build Alternative would not create new emissions or have negative operational air quality impacts. However, the No Build Alternative would not reduce regional VMT-related emissions like the other alternatives.

The No Build Alternative would involve neither construction nor new transit operations. Therefore, the No Build Alternative would not contribute to cumulative impacts.

4.5.3.5.1 NEPA Finding

The No Build Alternative would not result in adverse effect to air quality.

4.5.3.5.2 CEQA Determination

The No Build Alternative would not result in significant air quality impacts.

4.5.3.6 TSM Alternative

The TSM Alternative would not involve any construction beyond installation of bus stops, so no construction emissions would occur. Emissions from operation of buses associated with the TSM Alternative are considered together with highway emissions. The resulting emissions were compared to thresholds of significance for CEQA and NEPA. Emissions of criteria pollutants under this alternative would not exceed CEQA thresholds; thus, they would not be significant, as shown in Table 4.5-4. However, as shown in Table 4.5-3, the projected NO_x emissions increase of 17 tons per year, as a result of the increase in bus and highway emissions compared to the No Build Alternative, would exceed the NEPA significance threshold of 10 tons per year.

This alternative would result in substantial reductions in peak daily emissions of CO, SO_2, and PM_{10}. Impacts from emissions of these pollutants would not be cumulatively significant.

However, the federally-approved RTP and RTIP include an electric light rail project like the Regional Connector project. Not developing such a project would result in higher VMT and emissions than listed in the RTP Programmatic Environmental Impact Report. Thus, cumulative impacts could be adverse under NEPA.

4.5.3.6.1 NEPA Finding

The TSM Alternative would not have adverse construction effects on air quality. This alternative would have adverse operational effects on air quality associated with the NO_x emissions increase under NEPA criteria for both buses and regional traffic. It is possible that using alternative fuels to run the new shuttle buses would reduce this impact.

4.5.3.6.2 CEQA Determination

The TSM Alternative would not have significant construction or operational impacts on air quality under CEQA criteria.

4.5.3.7 Build Alternatives (including the Locally Preferred Alternative)

Table 4.5-2 shows construction emissions by peak day of operation for all build alternatives, including the LPA. The analysis estimates emissions from off-road construction equipment, fugitive dust, construction worker commuting, and haul trucks. Emissions of VOC, NO_x, CO, and $PM_{2.5}$ would be significant according to SCAQMD thresholds for all build alternatives, including the LPA, and mitigation measures would need to be implemented. The LPA would generate greater emissions of VOC, NO_x, and CO and the At-Grade Emphasis LRT Alternative would generate greater emissions of $PM_{2.5}$ when compared to the other build alternatives. In addition, emissions of PM_{10} would be significant according to SCAQMD thresholds for the At-Grade Emphasis LRT Alternative.

Construction emissions on a regional level were evaluated for all build alternatives, including the LPA, and compared to SCAQMD's LSTs. The comparison is included in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum. LST evaluation indicates that NO_x, PM_{10}, and $PM_{2.5}$ emissions would be greater than maximum allowable levels during several construction phases. The Underground Emphasis LRT Alternative and the LPA would generate greater emissions of NO_x, compared to the At-Grade Emphasis LRT Alternative and the At-Grade Emphasis LRT Alternative would generate greater emissions of PM_{10} and $PM_{2.5}$ when compared to the other build alternatives. Therefore, LST impacts of these pollutants would be significant. With implementation of mitigation identified under the air quality section in Chapter 8, the MMRP for the LPA, localized construction emissions would be reduced below the maximum allowable emissions under the LST methodology and therefore less than significant. LST data is provided in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum.

The CEQA analysis completed for the Regional Connector Transit Corridor project build alternatives included incremental daily operational emissions associated with each of the proposed alternatives, including the LPA, above the No Build Alternative (2035), which are summarized in Table 4.5-4 according to CEQA thresholds and Table 4.5-3 according to NEPA thresholds.

The determination of significant impacts within the CEQA analysis of daily, traffic-related operational emissions is based on a comparison to the No Build Alternative, which accounts for regional growth and increases in background traffic that would independently occur from the project. Compared to the No Build Alternative, the daily incremental emissions associated with each build alternative would either decrease or remain unchanged for all pollutants under all alternatives, including the LPA (Table 4.5-4); thus all operational emission impacts are less than significant under CEQA. Overall, vehicular travel would decrease as a result of the project, which would result in a reduction in emissions generated by motor vehicles. This result would be consistent with air quality goals in the region.

NEPA analysis requires comparing emissions for the future project year (2035) to those for the No Build Alternative (2035), which is presented in Table 4.5-3. Incremental annual operational emissions associated with each of the proposed build alternatives, including the LPA, would improve compared to the No Build Alternative, with the LPA resulting in greatest overall improvement in annual operational emissions.

4.5.3.7.1 NEPA Finding

Thresholds of significance for CEQA were used to analyze construction impacts under NEPA because NEPA does not contain air quality thresholds specific to construction. Even with implementation of mitigation during construction, regional construction emissions of VOC, NO_x, and CO will remain adverse for all build alternatives, including the LPA. With incorporation of mitigation measures, construction of the LPA will still result in a considerable contribution to cumulative air quality effects associated with regional construction emissions under NEPA.

With implementation of mitigation identified under the air quality section in Chapter 8, the MMRP for the LPA, localized construction emissions will be reduced below the maximum allowable emissions under the LST methodology and therefore not adverse.

All of the build alternatives, including the LPA, would have no adverse effects from operational emissions. Therefore, all of the build alternatives, including the LPA, would not result in a considerable contribution to cumulative air quality effects associated with regional operational emissions. Although regional construction emissions under the build alternatives, including the LPA, would be adverse after mitigation, the reduction in regional VMT as a result of project implementation would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality.

4.5.3.7.2 CEQA Determination

Even with implementation of mitigation during construction, regional construction emissions of VOC, NO_x, and CO would remain significant and unavoidable under CEQA for all build alternatives, including the LPA. With incorporation of mitigation measures, construction of the LPA would still result in a considerable contribution to cumulative air quality impacts associated with regional construction emissions under CEQA.

With implementation of mitigation identified under the air quality section in Chapter 8, the MMRP for the LPA, localized construction emissions would be reduced below the maximum allowable emissions under the LST methodology and therefore less than significant.

All of the build alternatives, including the LPA, would have no significant impact from operational emissions. Therefore, all of the build alternatives, including the LPA, would not result in a considerable contribution to cumulative air quality impacts associated with regional operational emissions. Although regional construction emissions under the build alternatives, including the LPA, would be significant and unavoidable, the reduction in regional VMT as a result of project implementation would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality.

4.5.4 Mitigation Measures

4.5.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has added specificity to the candidate mitigation measures for air quality impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.5.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Projects are required to follow the SCAQMD Rule 403 and all of the Best Available Control Measures described in the rule. Nonetheless, several Rule 403 standards applicable to this project have been included as mitigation measures.
- The addition of the California Vehicle Code for haul trucks.
- The addition of California Air Resources Board (CARB) requirements.
- The addition of EPA emission standards.

4.5.4.1.1 Regional Construction Emissions

Emissions of VOC, NO_x, CO, and $PM_{2.5}$ would be significant during construction for the build alternatives, including the LPA, and emissions of PM_{10} would be significant during construction for the At-Grade Emphasis LRT Alternative. Exhaust emissions from the operation of off-road vehicles are responsible for most of the emissions during construction. Separate emissions were calculated for each alternative to evaluate how implementation of mitigation, using up-to-date engines, during the year 2014 to 2017 project construction period could reduce emissions of criteria pollutants. The results of this analysis are provided in Table 4.5-6 and can be compared to the emissions in Table 4.5-2, Summary of Unmitigated Peak Daily Construction Emissions.

Table 4.5-6. Mitigated (2014-2017) Maximum Daily Construction Emissions for All Alternatives

Alternative	Mitigated Daily Emissions (lbs/day)					
	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
At-Grade Emphasis LRT Alternative	**119**	**432**	**908**	4	27	12
Underground Emphasis LRT Alternative						
2nd/Hope Station SEM Construction Method with 2nd/Broadway Station Option	**144**	**473**	**978**	4	27	12
2nd/Hope Station Cut and Cover Construction Method with 2nd/Broadway Station Option	**147**	**488**	**998**	4	28	12
2nd/Hope Station SEM Construction Method with 2nd/Los Angeles Station Option	**144**	**469**	**977**	4	27	12
2nd/Hope Station Cut and Cover Construction Method with 2nd/Los Angeles Station Option	**146**	**485**	**997**	4	28	12
LPA[1]						
2nd/Hope Station SEM Construction Method	**189**	**602**	**1,266**	5	35	16
2nd/Hope Station Cut and Cover Construction Method	**193**	**626**	**1,304**	5	36	16
SCAQMD Significance Threshold	75	100	550	150	150	55

Notes:
Emissions greater than threshold of significance are shown in ***bold****.*
[1] Mitigated construction emissions are for the Fully Underground LRT Alternative. Mitigated construction emissions for the LPA (which only includes three stations) would be less than or equal to mitigated construction emissions for the Fully Underground LRT Alternative (which included four stations).

With implementation of mitigation, emissions of VOC, NO_x, and CO will still exceed the CEQA thresholds of significance for construction and are therefore significant and unavoidable for the all three LRT alternatives. Although the regional construction impacts remain significant, the proposed Regional Connector Transit Corridor project would improve transportation in the region by helping to remove vehicles from the region's roadways, which would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality. Future operational emissions under the build alternatives are less than the baseline emissions for several pollutants as shown in Tables 4.5-3 and 4.5-4.

4.5.4.1.2 Localized Significance Thresholds

Mitigated emissions were also compared to the SCAQMD's LST to evaluate significance. Mitigated emissions levels for each construction site will be less than the maximum allowable emissions under the LST methodology. Therefore, with implementation of mitigation, localized emissions from construction activities will be less than significant for the build alternatives. Data is available in Appendix Q, Air Quality Impacts and Health Risk Technical Memorandum.

4.5.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

- Contractors shall be required to adhere to SCAQMD standards for off-road engine emissions (refer to Section 4.5.1.1). Examples of how the contractors could ensure adherence include retrofitting off-road engines with add-on control devices such as catalytic oxidizers and diesel particulate filters where feasible. (AQ-1)
- Metro shall require contractors to use equipment that meets up-to-date specifications (equivalent to models manufactured from 2013 to 2017) for pollutant emissions during project construction. (AQ-2)
- Contractors shall be required to adhere to SCAQMD standards for dust emissions such as SCAQMD Rule 403. Examples of how the contractors could ensure adherence include applying water or a stabilizing agent to exposed surfaces in sufficient quantity to prevent generation of dust plumes. (AQ-3)
- Dirt from construction equipment shall not extend 25 feet or more from an active operation, and shall be removed at the conclusion of each workday (refer to Section 4.5.3.3). Street sweeping services shall be coordinated with construction activity to minimize impacts to surrounding businesses and residences. (AQ-4)
- Contractors shall be required to utilize at least one of the measures set forth in the SCAQMD Rule 403 Section (d)(5) to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site. (AQ-5)
- All haul trucks hauling soil, sand, and other loose materials shall maintain at least six inches of freeboard (not filling trucks all the way to the top) in accordance with California Vehicle Code 23114. (AQ-6)
- All haul trucks hauling soil, sand, and other loose materials shall be covered (e.g., with tarps or other enclosures that would reduce dust emissions) (refer to Section 4.5.1.1). (AQ-7)
- Traffic speeds on unpaved roads shall be limited to 15 MPH. (AQ-8)

When wind gusts exceed 25 MPH, Metro shall require the contractor to implement the following provisions, consistent with the requirements of SACQMD Rule 403, as they apply to each of the construction activities identified below: (AQ-9)

- Earth-moving activities:
  - (1A) Cease all active operations; or
  - (2A) Apply water to soil not more than 15 minutes prior to moving such soil.
- Disturbed surface areas:
  - (OB) On the last day of active operations prior to a weekend or holiday: apply water with a mixture of chemical stabilizer diluted with not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; or
  - (1B) Apply chemical stabilizers prior to wind event; or
  - (2B) Apply water to all unstabilized disturbed areas three times per day. If there is evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; or
  - (3B) Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; or
  - (4B) Utilize any combination of control actions (1B), (2B) and (3B) such that, in total, these actions apply to all disturbed surface areas.
- Unpaved roads:
  - (1C) Apply chemical stabilizers prior to wind event; or
  - (2C) Apply water twice per hour during active operation; or
  - (3C) Stop all vehicular traffic.
- Open storage piles:
  - (1D) Apply water twice per hour; or
  - (2D) Install temporary coverings.

- Paved road track-out:
  - (1E) Cover all haul vehicles; or
  - (2E) Comply with vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
- All categories:
  - (1F) Any other control measures approved by the Executive Officer and the USEPA as equivalent to the methods specified may be used.
- Heavy equipment operations shall be suspended during second stage smog alerts as issued by the SCAQMD. (AQ-10)
- On-site stockpiles of debris, dirt, or rusty materials shall be covered or watered at least two times per day. (AQ-11)
- Contractors shall utilize electricity supplied by the Los Angeles Department of Water and Power (LADWP) rather than temporary diesel or gasoline generators, as feasible. (AQ-12)
- Heavy-duty trucks shall be prohibited from idling in excess of five minutes, both on- and off-site. Metro shall employ CARB anti-idling requirements during construction, which would reduce emissions generated from construction vehicles. Metro shall require the contractor to regularly perform unscheduled inspections of construction equipment and activities to ensure minimization of associated air quality impacts. (AQ-13)
- Construction worker parking shall be configured to minimize traffic interference. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-14)
- Construction activity that affects traffic flow on the arterial system, including the transportation of excavated materials, shall be primarily limited to off-peak hours. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-15)
- Metro shall require ongoing maintenance and adherence to manufacturer's specifications for all construction equipment engines and vehicles. (AQ-16)
- Dedicated turn lanes for the movement of trucks and equipment to and from construction sites shall be provided where appropriate. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-17)
- Metro shall require on-site construction equipment to meet EPA Tier 2 or higher emission standards according to the January 1, 2012 to December 31, 2014 and post-January 15, 2015 criteria. (AQ-18)

- Metro shall maintain and clean all trucks and construction equipment. (AQ-19)
- Metro shall use low-sulfur fuel where possible. (AQ-20)
- The project and stations shall be designed and constructed in a manner consistent with Metro's sustainability policies (such as Metro's Energy and Sustainability Policy). (AQ-21)
- Detour routes shall be designed to ensure that traffic does not idle for extended periods of time, thus reducing the potential for localized exceedence of federal CO/CO_2 standards. (AQ-22)

4.6 Climate Change

This section summarizes the existing climate and greenhouse gas (GHG) conditions in the project area, and the potential impacts of the proposed alternatives, including the Locally Preferred Alternative (LPA), on these conditions. The information in this section is based on the Climate Change Technical Memorandum, which is incorporated into this EIS/EIR as Appendix R.

This section has been updated since publication of the Draft EIS/EIR based on refinements to the LPA. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Minor changes were made to the numerical values stated in this section since publication of the Draft EIS/EIR. Average weekday values were calculated in the Draft EIS/EIR for vehicle miles traveled (VMT) and other measures based on VMT. In order to report annual values for VMT in the Draft EIS/EIR, a multiplier (annualization factor) was used to convert the daily values. This annualization factor has been updated for this Final EIS/EIR to maintain consistency with other Metro projects, and has caused annual VMT and other annualized measures based on VMT to change slightly. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of these minor revisions.

The analysis of climate change impacts associated with the LPA is discussed in Section 4.6.3.

4.6.1 Regulatory Framework

NEPA does not include specific requirements for analysis of potential impacts related to global climate change (GCC), and a specific quantitative threshold of significance was not established for this project. Incremental project emissions were determined for motor vehicles and project electricity use based on the change in VMT between each build alternative and the No Build Alternative. A year 2035 scenario is analyzed in this section, and a year 2010 scenario is analyzed in Chapter 10 of this Final EIS/EIR. Changes in motor vehicle VMT were determined by the project traffic analysis for each alternative and include the potential project impacts for automobile and bus transit VMT and operation of light rail trains and new stations.

CEQA guidance provided by the South Coast Air Quality Management District (SCAQMD) and the California Natural Resources Agency requires examination of direct, indirect, and life-cycle emissions that would occur during project construction and operation. Significant impacts would occur if a project would exceed emissions thresholds determined by the lead agency or other applicable adopted state, regional, or local plan for the reduction or mitigation of GHG emissions. CEQA guidelines require quantification of GHG emissions over time in a specified geographic area, establishment of a significance threshold for cumulative contributions to climate change, analysis of GHG emissions as they pertain to specific project actions, and specification and monitoring of any mitigation measures needed to achieve specified emissions levels.

In addition, the following regulations and standards apply to the climate change analysis for the Regional Connector project:

- Federal
  - Massachusetts et al. v. Environmental Protection Agency et al.
  - Mandatory GHG Reporting Rule (U.S. Environmental Protection Agency (USEPA))
  - Endangerment Finding (USEPA)
  - American Clean Energy and Security Act of 2009
  - Clean Energy Jobs and American Power Act
- State
  - California Assembly Bill 1493
  - California Executive Order S-3-05
  - Global Warming Solutions Act of 2006 (Assembly Bill 32)
  - Senate Bill 97
  - California Air Resources Board (CARB) Interim Significance Thresholds
  - Senate Bill 375
- Local
  - SCAQMD Guidelines and Regulations

4.6.2 Affected Environment

As required by CEQA, existing (2009) emissions from regional traffic were estimated in the analysis to compare against future build alternatives, including the LPA. Data on VMT in the region and emission factors from the EMFAC2007 model were used to estimate emissions of GHG. The emissions calculations were based on the total VMT in the region and the average speed on the highway network. Since the EMFAC model only generates emissions of carbon dioxide (CO_2) and methane (CH_4), the California Climate Action Registry (CCAR) General Reporting Protocol was used to estimate emissions of nitrous oxide (N_2O). Table 4.6-1 summarizes the results of the baseline GHG emissions.

Table 4.6-1. Existing Conditions: 2009 Annual Highway Traffic GHG Emissions

	CO_2	CH_4	N_2O	Total[2]
Annual Vehicle Miles Traveled (VMT)	N/A	N/A	N/A	96,739,543,200
Emission Factor (grams per mile)	365.210	0.028	0.173	N/A
Emissions (metric tons per year)	35,330,200	2,700	16,700	N/A
GWP	1	21	310	N/A
CO_2e Emissions[1] (metric tons per year)	35,330,200	56,700	5,177,000	40,563,900

Key:
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
CH_4 = methane
GWP = Global Warming Potential
N/A = not applicable
N_2O = nitrous oxide
Notes:
[1] CO_2e emissions are weighted by the global warming potential (GWP) for each non-CO_2 pollutant (i.e., CO_2e equals emissions of non-CO_2 pollutant x GWP)
[2] Totals may vary due to rounding

4.6.3 Environmental Impacts/Environmental Consequences

The impact conclusions for all of the alternatives are based on the methodologies above in Section 4.6.1, and in Appendix R, Climate Change Technical Memorandum. Although thresholds of significance for GHG emissions are not well-established, methodologies and protocols for analyzing GHG emissions have been extensively documented and were used in this analysis. The analysis used protocols established by the CCAR, namely the General Reporting Protocol (CCAR 2009) and the Local Government Operations Protocol (CCAR 2008). Generally, GHG impact analyses follow the same quantification methodologies as air quality studies for criteria pollutants.

GHG emissions were calculated for direct and indirect sources of GHG, including engine exhaust and purchased electricity. Emissions were estimated for three GHG pollutants regulated under the Kyoto Protocol: CO_2, CH_4, and N_2O. Although the Kyoto Protocol also regulated three other GHG pollutants (hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]), these pollutants are not emitted as products of engine exhaust or purchased electricity and are not analyzed further herein. Emissions were converted to carbon dioxide equivalent (CO_2e) using the Global Warming Potentials (GWPs) in the United Nations Intergovernmental Panel on Climate Change's (IPCC's) Second Assessment Report (SAR) and documented in the Inventory of U.S. Greenhouse Gas Emissions and Sinks (USEPA 2009b).

GWPs are defined by CARB as the radiative forcing impact (degree of warming to the atmosphere) of one mass-based unit of a given GHG relative to an equivalent unit of CO_2. For example, one ton of CH_4 is equivalent to approximately 21 tons of CO_2 in the atmosphere. Although the IPCC has released several updates to the SAR since its release in 1996, the international standard is to use the original SAR to maintain consistency with GHG emission inventories already compiled.

The construction analysis followed the SCAQMD's recommendation that construction emissions be amortized over 30 years (defined as life of a project) and added to the operational emissions.

Potential emissions of CO_2, CH_4, and N_2O from construction equipment (e.g., bulldozers, scrapers, graders, off-highway trucks, etc.) were calculated using the OFFROAD model, developed by CARB, for off-road engine exhaust emissions. Potential emissions of CO_2 and CH_4 were calculated using the EMission FACtors (EMFAC) model for on-road vehicles, and includes construction worker trips to the construction site, on-road haulage trucks, material delivery trucks, and equipment maintenance vehicles. The EMFAC model is used to calculate emission rates from on-road motor vehicles in California. It is similar to the USEPA's MOVES2010 model but uses a fleet mix and assumptions specific to California. Although N_2O emissions would also occur from the operation of on-road vehicles, the EMFAC model does not currently estimate these emissions. Additionally, appropriate sources of GHG emissions were reviewed as part of this analysis to supplement the EMFAC model, as necessary.

The operational emissions analysis took into account engine exhaust emissions, which were calculated to quantify predicted reductions in VMT in the region; emissions resulting from the remote generation of electricity to run the light rail vehicles and to power the facilities at the new stations; and emissions generated by bus operations.

4.6.3.1 No Build Alternative

The No Build Alternative would not involve any new transit infrastructure as part of the Regional Connector project. No construction emissions would occur, and operational emissions would not increase as part of the project. All of the increase in GHG emissions beyond the existing year 2009 conditions shown in Table 4.6-1 would be due to the projected growth in regional traffic between 2009 and 2035. Table 4.6-2 summarizes the year 2035 No Build Alternative highway traffic GHG emissions. More detailed data is available in Appendix R, Climate Change Technical Memorandum, and Section 4.5, Air Quality.

4.6.3.1.1 NEPA Finding

The No Build Alternative describes a future condition where none of the build alternatives are implemented. As such, there would be no adverse climate change effect associated with the No Build Alternative. However, the No Build Alternative lacks the beneficial greenhouse gas reductions that the build alternatives, including the LPA, would provide.

4.6.3.1.2 CEQA Determination

There would be no climate change impact associated with the No Build Alternative. However, the No Build Alternative lacks the beneficial greenhouse gas reductions that the build alternatives, including the LPA, would provide.

Table 4.6-2. No Build Alternative 2035 Annual Highway Traffic GHG Emissions

	CO_2	CH_4	N_2O	Total[2]
Annual Vehicle Miles Traveled (VMT)	N/A	N/A	N/A	160,473,166,800
Emission Factor (grams per mile)	578.319	0.015	0.173	N/A
Emissions (metric tons per year)	92,804,700	2,400	27,700	N/A
GWP	1	21	310	N/A
CO_2e Emissions[1] (metric tons per year)	92,804,700	50,400	8,587,000	101,442,100
Increment (compared to Existing Conditions [2009]) (metric tons per year)	57,474,500	(6,300)	3,410,000	60,878,200

Key:
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
CH_4 = methane
GWP = Global Warming Potential
N/A = not applicable
N_2O = nitrous oxide
Notes:
[1] CO_2e emissions are weighted by the global warming potential (GWP) for each non-CO_2 pollutant (i.e., CO_2e equals emissions of non-CO_2 pollutant x GWP)
[2] Totals may vary due to rounding

4.6.3.2 TSM Alternative

The TSM Alternative includes all of the provisions of the No Build Alternative, plus two new shuttle bus lines linking 7th Street/Metro Center Station and Union Station. Only minimal construction activities would be needed, such as the installation of bus stops, and no construction-related emissions are anticipated. The TSM Alternative would result in a slight increase in CH_4 due to the increase in compressed natural gas (CNG) bus operations. However, combined with the reduction in CO_2 emissions caused by the resulting decrease in regional traffic, there would be a net climate change benefit. The operational emissions benefits associated with the TSM Alternative are summarized in Table 4.6-3.

4.6.3.2.1 NEPA Finding

The TSM Alternative would result in a regional decrease in GHG emissions compared to the No Build Alternative, though not to the extent that the build alternatives would, including the LPA. This would be a beneficial effect. The TSM Alternative would not have an adverse effect on climate change.

4.6.3.2.2 CEQA Determination

The TSM Alternative would result in a regional decrease in GHG emissions compared to the No Build Alternative, though not to the extent that the build alternatives would, including the LPA. This would be a beneficial impact. The TSM Alternative would not have a significant adverse impact on climate change.

Table 4.6-3. Summary of Incremental GHG Emissions (Operational and Construction) Compared to the No Build Alternative (2035)

Alternative	Annual CO_2e Emissions (metric tons per year)		
	Construction[1]	Operations[2]	Amortized Total[3]
TSM Alternative	NA	(51,400)	(51,400)
At-Grade Emphasis LRT Alternative	2,500	(59,400)	(56,900)
Underground Emphasis LRT Alternative[4]	3,300-3,400	(61,600)	(58,200-58,300)
Locally Preferred Alternative[4]	3,800-3,900	(63,400)	(59,500-59,600)

Key:
NA = not applicable
Notes:
[1] Construction emissions include total emissions that would occur over the life of the construction phase (2014-2017) amortized over 30 years.
[2] Incremental project-related operational emissions (i.e., increment between future build alternative and No Build Alternative).
[3] Amortized construction emissions added to incremental operational emissions. Totals may vary slightly due to rounding.
[4] A range of amortized construction emissions for the Underground Emphasis LRT Alternative and LPA is shown to account for slight variations due to multiple station location and construction method options.

4.6.3.3 Build Alternatives (including the Locally Preferred Alternative)

The build alternatives, including the LPA, would involve construction and operation of a new light rail link between 7th Street/Metro Center Station and the Little Tokyo/Arts District area. This would entail new emissions associated with train operation, powering station facilities, and powering train and system control systems. For each alternative, the regional reduction in GHG emissions due to traffic congestion relief is greater than the new emissions associated with construction activities and operation of the LRT trains and new facilities. All of the build alternatives, including the LPA, result in an overall reduction in GHG emissions. Table 4.6-3 shows the construction, operations, and amortized total emissions for each alternative. More detailed data is available in Appendix R, Climate Change Technical Memorandum, and Section 4.5, Air Quality.

4.6.3.3.1 NEPA Finding

The At-Grade Emphasis LRT Alternative, Underground Emphasis LRT Alternative, and LPA would result in a regional decrease in GHG emissions compared to the No Build Alternative. This would be a beneficial effect. No adverse climate change effects would occur as a result of implementation of any of these alternatives.

4.6.3.3.2 CEQA Determination

The At-Grade Emphasis LRT Alternative, Underground Emphasis LRT Alternative, and LPA would result in a regional decrease in GHG emissions compared to the No Build Alternative. This would be a beneficial impact. No significant adverse climate change impacts would occur as a result of any of these alternatives.

4.6.4 Mitigation Measures

None of the proposed build alternatives, including the LPA, would have adverse climate change impacts. No mitigation measures are required.

4.7 Noise and Vibration

This section summarizes the methodology and assumptions used to analyze potential effects from noise and vibration generated during construction and operation of the proposed build alternatives. Potential noise and vibration impacts of the proposed alternatives are evaluated in this section. Information in this section is based primarily on the Noise and Vibration Technical Memorandum prepared for the project contained in Appendix S, and Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR based on refinements to the Locally Preferred Alternative (LPA) and to address comments received on the Supplemental Environmental Assessment/Recirculated Sections of the Draft EIR (Supplemental EA/Recirculated Draft EIR Sections), as indicated in the Responses to Comments, Volume F-4, of this Final EIS/EIR. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Based on comments received on the Draft EIS/EIR and input received from community meetings held during preparation of this Final EIS/EIR, refinements were made to the LPA as a result of value engineering, such as the change in tunnel depth in the vicinity of the 2nd/Hope Street station and the shift of the alignment beneath the Japanese Village Plaza (JVP). The refinements to the LPA are described in further detail in Chapter 2. Additional noise and vibration studies were performed (Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR) to analyze refinements of the alignment in areas near sensitive land uses, specifically the Walt Disney Concert Hall, the Roy and Edna Disney/CalArts Theater (REDCAT), office uses in the JVP, the Hikari Lofts, the Nakamura Tetsujiro Building, and the Broad Art Foundation Museum, currently under construction. As a school, the Colburn School is properly considered as a Category 3 land use in this analysis. However, at the request of the Colburn School, additional noise analysis was undertaken, treating the school as a Category 1 land use. With implementation of mitigation, noise and vibration impacts associated with construction and operation of the LPA would be less than significant. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.7.4.2 below, based on input received during the Draft EIS/EIR public review period. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of potential noise and vibration impacts during construction and operation of the LPA is detailed below in Section 4.7.3.5.

4.7.1 Regulatory Framework

4.7.1.1 Federal Transit Administration

Noise Standards

The noise impact analysis for operation of this project is based on criteria defined in the *FTA Transit Noise and Vibration Impact Assessment* (USDOT 2006). The standards are based on community reaction to noise and evaluate potential changes to existing noise using a sliding scale. If existing noise is already high, a potential project is more limited in the amount of noise it can create.

Table 4.7-1 and Figure 4.7-1 show the FTA noise criteria used to determine “moderate” and “severe” levels of impact. Under NEPA, a “severe” level of impact is considered an adverse impact. In Table 4.7-1, the first column shows existing noise exposure, and the remaining columns show additional noise exposure caused by a potential transit project which is used to determine the level of impact. The future noise exposure would be the combination of existing noise exposure and the additional noise exposure caused by the Regional Connector Transit Corridor project. As the existing noise exposure increases in a particular location, the amount of the allowable increase in the overall noise exposure caused by the project decreases.

In an urban setting, a change of 1 decibel (dBA) or less is generally not detectable by the human ear while a change of 3 dBA will be noticeable to most people. A change of 5 dBA is readily perceived. A change of 10 dBA, up or down, is typically perceived as a doubling or halving of an urban noise level, respectively.

Some land use types are more sensitive to noise than others. For example, parks, churches, and residences are typically more noise-sensitive than industrial and commercial areas. The FTA noise impact criteria classify sensitive land uses into three categories:

- Category 1: Buildings or parks where low noise is an essential element of their purpose (e.g., amphitheaters and concert pavilions).
- Category 2: Buildings where people normally sleep, including residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
- Category 3: Institutional land uses with primarily daytime uses that depend on low noise as an important part of operations (e.g., schools, libraries, churches, theaters, and places of study).

Vibration Standards

FTA has developed impact criteria for ground-borne vibration (GBV), which is expressed as a velocity level in units of VdB, and ground-borne noise (GBN) due to transit project construction and operation of transit vehicles (USDOT 2006). GBN is created when a vibration source such as a train pass-by causes vibration of floors and walls in nearby buildings resulting in a low frequency rumble sound within the building. Impacts of GBN are particularly important for underground transit operations because, depending on the soil type, tunnels more efficiently transmit vibration to the surrounding soil than surface track structures.

There appears to be a relationship between the number of perceived vibration events and the degree of annoyance caused by the vibration. It is intuitive to expect that more frequent vibration events, or events that last longer, will be more annoying to building occupants. FTA guidelines address vibration frequency by applying different levels of annoyance criteria based on the number of transit vibration events per day.

A different analysis is used for vibration from construction activities that could cause damage to sensitive buildings. When assessing the potential for building damage, GBV is usually expressed in terms of the peak particle velocity (PPV) in units of inches per second. As defined in Section 7.1.2 of the *FTA Transit Noise and Vibration Impact Assessment*, "The peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is often used in monitoring of blasting vibration since it is related to the stresses that are experienced by buildings."

PPV is used for evaluating the potential for building damage, because it shows the peak of the vibration signal, which is what could cause stress to the structure of a building. Vibration sensitivity of a land use is described by using the root mean square (RMS) or the "smoothed" vibration amplitude. This is typically "the square root of the squared amplitude of the average of the squared amplitude of the signal. The average is typically calculated over a one-second period" (FTA May 2006).

In short, RMS (shown with the abbreviation "VdB") is used to evaluate human response to the vibration signals, and PPV is used to evaluate the potential for building damage.

The threshold of vibration perception for most humans is around 65 to 70 VdB. Levels in the 70 to 75 VdB range are often noticeable but acceptable. Levels greater than 80 VdB are often considered unacceptable.

Table 4.7-1. Noise Impact Criteria

Existing Noise Exposure Leq or Ldn[1]	Project Noise Exposure Impact Thresholds: Ldn or Leq[1] (all noise levels in dBA)			
	Category 1 or 2 Sites		Category 3 Sites	
	Moderate Impact	Severe Impact	Moderate Impact	Severe Impact
<43	Ambient +10	Ambient +15	Ambient +15	Ambient +20
43-44	52	58	57	63
45	52	58	57	63
46-47	53	59	58	64
48	53	59	58	64
49-50	54	59	59	64
51	54	60	59	65
52-53	55	60	60	65
54	55	61	60	66
55	56	61	61	66
56	56	62	61	67

Table 4.7-1. Noise Impact Criteria (continued)

Existing Noise Exposure Leq or Ldn[1]	Project Noise Exposure Impact Thresholds: Ldn or Leq[1] (all noise levels in dBA)			
	Category 1 or 2 Sites		Category 3 Sites	
	Moderate Impact	Severe Impact	Moderate Impact	Severe Impact
57-58	57	62	62	67
59-60	58	63	63	68
61-62	59	64	64	69
63	60	65	65	70
64	61	65	66	70
65	61	66	66	71
66	62	67	67	72
67	63	67	68	72
68	63	68	68	73
69	64	69	69	74
70	65	69	70	74
71	66	70	71	75
72-73	66	71	71	76
74	66	72	71	77
75	66	73	71	78
76-77	66	74	71	79
>77	66	75	71	80

Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006
Note:
[1] Ldn (average day-night noise level) is used for land uses where nighttime sensitivity is a factor; daytime Leq (equivalent continuous noise level) is used for land uses involving only daytime activities.

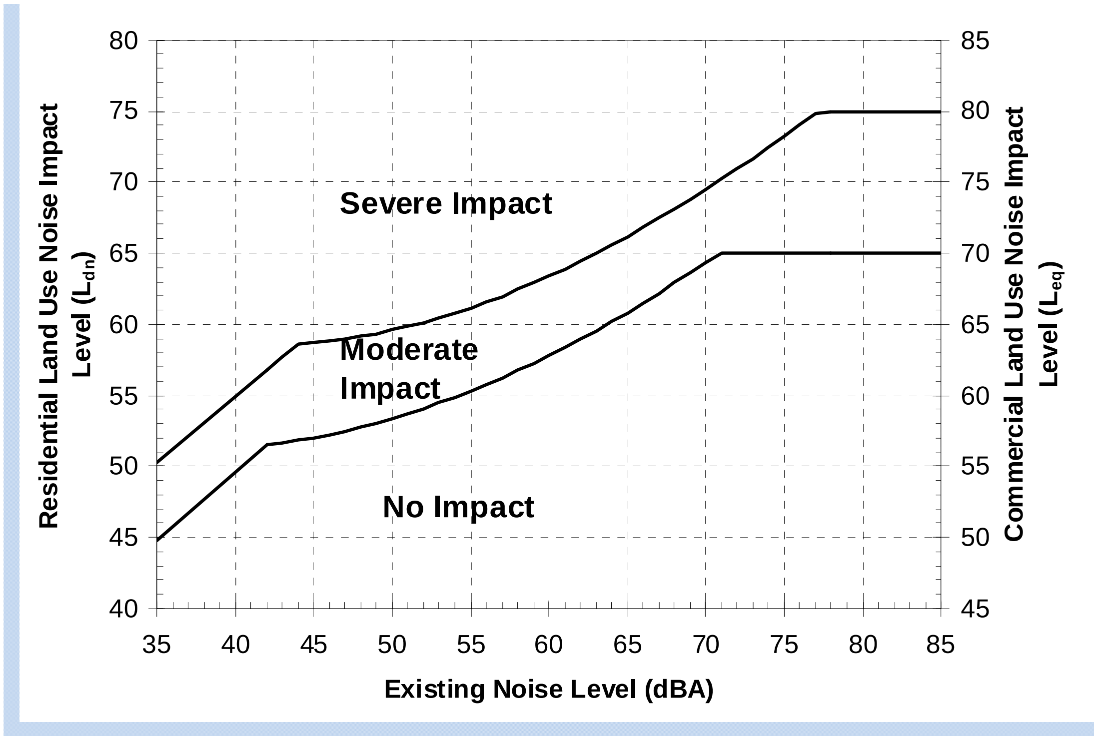


Figure 4.7-1. Noise Impact Criteria for Transit Projects

Table 4.7-2 summarizes the FTA impact criteria for GBV and GBN. Some buildings, such as concert halls, television and recording studios, and theaters, can be very sensitive to vibration but are not included in the three listed categories. These types of buildings, noted in Table 4.7-3, usually warrant special attention during the environmental review and engineering/pre-construction phases of a project. Table 4.7-2 and Table 4.7-3 list impact criteria for transit operations. Following FTA guidance, some criteria in Table 4.7-2 may also be used to assess human annoyance caused by vibration from construction activities.

In addition to human annoyance from transit operations, FTA guidelines also address the potential for construction-activity-induced vibration to damage buildings. The potential for GBV to cause damage to a building varies by the type of materials and structural techniques used to construct each building. FTA vibration damage criteria for various structural categories are listed in Table 4.7-4.

FTA guidelines suggest minimum safe distances between construction equipment and buildings based on the types of construction equipment and the category of a building (see Table 4.7-4). Minimum safe distances between construction and nearby buildings are presented in Table 4.7-5. For example, the minimum safe distance between the most invasive method of construction (impact pile driving) and a Category IV building (the most vibration-sensitive type of building) would be at least 136 feet. Conversely, a small bulldozer could safely operate less than five feet from a Category I building (the least vibration-sensitive type of building).

GBN from at-grade or open excavation construction activities is rarely a concern because the air-borne noise from the activity would likely dominate the noise environment. While not generally likely, some GBN from underground construction activity such as tunneling could occasionally be audible. However, this GBN would be temporary and of short duration as the construction activity moves along the project alignment.

This project would not involve impact or sonic pile driving or large vibratory rollers. As a result, the minimum safe distance between construction activities and buildings would never exceed 37 feet for this project. Distances in Table 4.7-5 are approximations based on typical equipment and construction activities and the general classification of structures.

Table 4.7-2. FTA Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria for General Assessment

Land Use Category	GBV Impact Levels (VdB re: 1 micro-inch/sec)			GBN Impact Levels (dB re: 20 micro-Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA[5]	43 dBA[5]	48 dBA[5]

Source: Transit Noise and Vibration Impact Assessment (USDOT 2006)
Notes:
[1] "Frequent Events" are defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
[2] "Occasional Events" are defined as between 30 and 70 vibration events of the same source per day. Most commuter rail lines produce at least this many events.
[3] "Infrequent Events" are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Buildings used for vibration-sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
[5] Vibration-sensitive equipment is generally not sensitive to GBN.

Table 4.7-3. FTA Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria for Special Buildings

Type of Building or Room	GBV Impact Levels (VdB re: 1 micro-inch/sec)		GBN Impact Levels (dB re: 20 micro-Pascals)	
	Frequent Events[1]	Occasional or Infrequent Events[2]	Frequent Events[1]	Occasional or Infrequent Events[2]
Concert Halls	65 VdB	65 VdB	25 dBA	25 dBA
Television Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

Source: Transit Noise and Vibration Impact Assessment (USDOT 2006)
Notes:
[1] "Frequent Events" are defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
[2] "Occasional Events" are defined as between 30 and 70 vibration events of the same source per day. Most commuter rail lines have this many events.

Table 4.7-4. FTA Construction Vibration Damage Criteria

Building Category and Description	PPV (in/sec)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual, May 2006. FTA-VA-90-1003-06. Table 12-3.

Table 4.7-5. Calculated "Minimum Safe Distances" from Construction Equipment to Reduce Potential for GBV Damage (ft)

Equipment		Building Categories and (FTA Guideline Damage Thresholds)			
		Cat I (0.5 PPV) Inch/sec	Cat II (0.3 PPV) Inch/sec	Cat III (0.2 PPV) Inch/sec	Cat IV (0.12 PPV) Inch/sec
Pile Driver (Impact)	Upper Range	53	74	97	136
	Typical	30	42	55	77
Pile Driver (Sonic)	Upper Range	33	46	60	84
	Typical	13	18	23	32
Large Vibratory Roller		15	20	26	37
Hoe Ram		8	12	15	21
Large Bulldozer		8	12	15	21
Caisson drilling		8	12	15	21

4.7.1.2 California Environmental Quality Act (CEQA)

Neither CEQA nor the City of Los Angeles Municipal Code provides quantitative thresholds for a substantial noise impact or a significant adverse vibration impact. This analysis applies FTA criteria to determine the thresholds for significance. More information regarding these regulations and criteria is available in Appendix S, Noise and Vibration Technical Memorandum, and Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR.

4.7.2 Affected Environment

An assessment of existing noise conditions along the Regional Connector Transit Corridor alternatives alignments was conducted to establish a baseline by which alternatives could be evaluated. Figure 4.7-2 shows noise monitoring locations and FTA land use categories within the project area. Table 4.7-6 lists noise-sensitive land uses within the screening distance for the build alternatives.

Noise levels were measured at 11 locations to establish the existing noise environment. The measurements included seven 24-hour and four short-term measurements. Existing noise levels are typical of an urban environment. The average day-night noise level (Ldn) ranges from 69 to 74 dBA. Most of the noise came directly from nearby or distant sources where there was no intervening terrain or buildings, some noise came from sources not in direct view that were partially shielded by a building, and some measured noise was reflected off one or more structures. Noise levels were also estimated at four locations using nearby noise measurements.

Noise levels were measured at four locations along Flower Street, Sites 1, 2, A, and B shown on Figure 4.7-2.

- Site 1: A short-term (10-minute) measurement was conducted at the park area outside of the Los Angeles Library on Flower Street. A one-hour Leq of 67 was measured at 2:00 p.m. and a peak-hour Leq of 68 dBA was estimated at this location based on the 24-hour measurement obtained at the Westin Bonaventure. Noise levels at this location are dominated by traffic noise from Flower and 5th Streets.

- Site 2: A short-term measurement was conducted in the Bank of America Building Plaza. The plaza is located five floors above Flower Street at the same level as the tennis courts of the World Trade Center, which is located on the north side of Flower Street. A one-hour Leq of 61 was measured at 1:15 p.m. and a peak-hour Leq at Site B is estimated at 63 dBA. Noise levels at this location are dominated by traffic noise from Flower Street.

- Site A: A 24-hour measurement was conducted on the pool deck of the fourth floor of the Westin Bonaventure. An Ldn of 71 dBA and a peak-hour Leq of 68 dBA was measured at 6:00 a.m.

- Site B: A 24-hour measurement was obtained outside the ground-floor condominiums of the Bunker Hill Towers at Flower and 3rd Streets. An Ldn of 74 dBA and a peak-hour Leq of 72 dBA were measured at 8:00 a.m. Noise levels at this location are dominated by traffic noise from Flower and 3rd Streets.

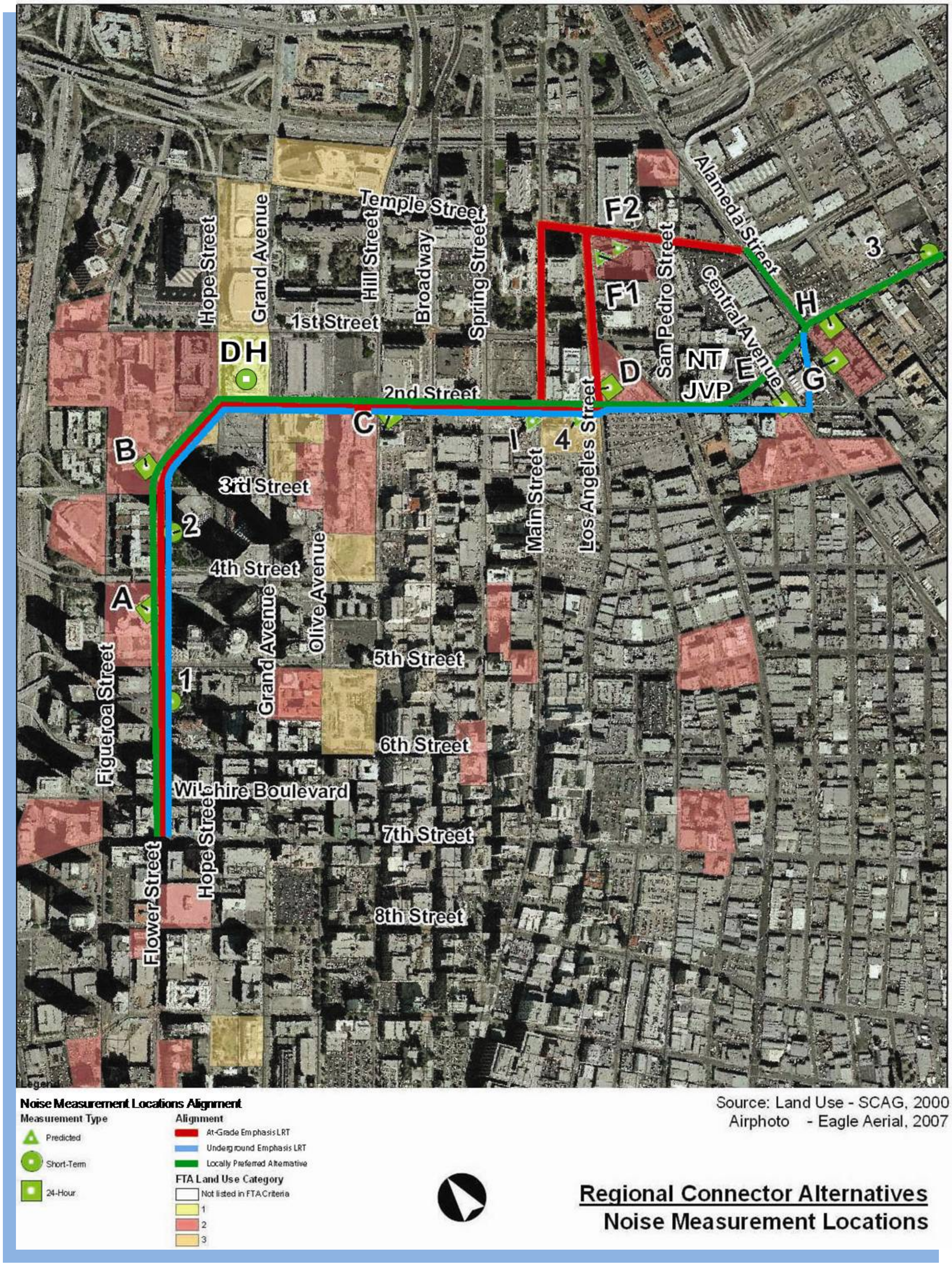


Figure 4.7-2. Noise Measurement Locations (Site #) and Noise-Sensitive Land Uses

Table 4.7-6. Noise-Sensitive Land Uses within Screening Distance

Name	Location	Build Alternative within Screening Distance	Land Use Category
Park at Central Library	200 North Main Street	ALRT, ULRT, LPA	3
Bonaventure Hotel	404 South Figueroa Street	ALRT, ULRT, LPA	2
World Trade Center Tennis Courts	333 South Figueroa Street	ALRT, ULRT, LPA	3
Open Space Bank of America Building Plaza	333 Hope Street	ALRT, ULRT, LPA	3
Bunker Hill Towers	234 South Figueroa Street 800 West 1st Street	ALRT, ULRT, LPA	2
Promenade Residences	121 South Hope Street	ALRT, ULRT, LPA	2
The Colburn School	200 South Grand Avenue	ALRT, ULRT, LPA	3
Kawada Hotel	200 South Hill Street	ALRT, ULRT, LPA	2
Higgins Building	108 South West 2nd Street	ALRT, ULRT, LPA	2
Saint Vibiana	206 South Main Street	ALRT, ULRT, LPA	3
Los Angeles Library Little Tokyo Branch	203 South Los Angeles Street	ALRT, ULRT, LPA	3
New Otani Hotel	120 South Los Angeles Street	ALRT, ULRT, LPA	2
Temple Street Jail	150 North Los Angeles Street	ALRT	2
Hikari Lofts	375 East 2nd Street	ALRT, LPA	2
JANM	369 East 1st Street	ULRT, LPA	3
Savoy – Alameda Street	100 South Alameda Street	ULRT, LPA	2
Los Angeles Hompa Hongwanji Temple	815 East 1st Street	LPA	3
Federal Metropolitan Detention Center	535 North Alameda Street	LPA	2

Notes:
ALRT = At-Grade Emphasis LRT Alternative; ULRT = Underground Emphasis LRT Alternative; LPA = Locally Preferred Alternative
The Walt Disney Concert Hall was analyzed for vibration effects, including GBV and GBN for the LPA, only because all of the alternatives are below-grade in the vicinity of the Concert Hall (Site DH), which would attenuate noise resulting in no potential for air-borne noise impact.
The Broad Art Foundation Museum is currently under construction and is considered a Category 3 land use.

Noise measurements were obtained at two locations along 2nd Street, Sites C and E, and existing conditions were estimated at Site I, as shown on Figure 4.7-2.

- Ambient noise exterior to the Walt Disney Concert Hall (Concert Hall, Site DH) was not measured because the alternatives are underground near the Walt Disney Concert Hall. Interior, short-term ambient noise was measured at the Walt Disney Concert Hall. A Leq of 24 to 28 dBA was measured inside the Walt Disney Concert Hall. In addition, interior noise monitoring was conducted at the REDCAT, which is located adjacent to the Walt Disney Concert Hall at the northeast corner of 2nd and Hope Streets. A Leq of 26 dBA was measured inside the REDCAT. The Walt Disney Concert Hall and REDCAT were included in the modeling of potential vibration impacts (including GBN).

- Site C: A 24-hour measurement was conducted on the roof of the Kawada Hotel at the intersection of 2nd and Hill Streets. An Ldn of 70 dBA and a peak hour Leq of 70 dBA were measured at 4:00 p.m. Noise levels at this location are dominated by traffic noise from 2nd and Hill Streets.

- Site E: A 24-hour measurement was conducted on the roof of the Hikari Loft Apartments at the intersection of 2nd Street and Central Avenue. A 24-hour Ldn of 69 dBA and a peak hour Leq of 71 dBA were measured at 7:00 p.m. Noise levels at this location are dominated by traffic noise from 2nd and Alameda Streets and Central Avenue.

- Site I: Noise levels for Site I, the Higgins Building at the northwest corner of 2nd and Main Streets, were estimated based on the measurements at Sites C and D. Existing noise levels could not be accurately measured due to construction at Saint Vibiana and on Main Street.

Noise measurements were obtained at four locations along 1st, Los Angeles, and Alameda Streets (Sites D, G, H, and 3), and existing conditions were estimated at Sites 4, F1, and F2, as shown on Figure 4.7-2.

- Site 4: This site, which lies on 2nd Street between Main and Los Angeles Streets, includes Saint Vibiana and the Los Angeles Library, Little Tokyo Branch. Existing noise levels could not be accurately measured due to construction at Saint Vibiana and on Main Street. Peak hour noise levels were estimated based on the measurements at Site D on the southeast corner of 2nd and Los Angeles Streets.

- No Category 1, 2 or 3 land uses are located on Main Street; thus, measurements were not recorded there.

- Site D: A 24-hour measurement was conducted at the ground level of the New Otani Hotel midway between 2nd and 1st Streets. This location most approximated noise levels in the tower that houses guest rooms. An Ldn of 73 dBA and a peak hour Leq of 73 dBA were measured at 7:00 a.m. and 6:00 p.m., respectively. Noise levels are dominated by traffic noise from Los Angeles Street.

- Sites F1 and F2: On Temple Street, noise-sensitive land uses exist where the Temple Street Jail is located. Due to construction on Temple Street, and activities at the jail, representative existing noise levels could not be measured. Noise levels for Sites F1 and F2 were estimated based on measurements at Site D, which is a nearby noise measurement, and Site H, which is an equivalent noise measurement.

- Site G: A 24-hour measurement was conducted at ground level to approximate noise in certain units of the Savoy Condominium where traffic noise levels are dominated by street traffic on Alameda Street. An Ldn of 73 dBA and a peak hour Leq of 75 dBA were measured at 7:00 p.m.

- Site H: A 24-hour measurement was conducted at ground level to approximate noise in certain condo units in the Savoy Condominium building where noise levels are dominated by the traffic on 1st Street and train noise from Metro Gold Line operations. An Ldn of 72 dBA and a peak hour Leq of 72 dBA were measured at 7:00 p.m.

- Site 3: A short-term measurement was conducted at ground level on East 1st Street, between Garey and Vignes Streets. This location approximates existing noise effects on the meeting room and meditation area of the Los Angeles Hompa Hongwanji Temple. Ambient noise levels at Site 3 are dominated by traffic on 1st Street and train noise from the Metro Gold Line operations. A one-hour (non-peak) Leq of 66 was measured at 2:00 p.m. At the time of this measurement, lane closures were in effect along 1st Street. This resulted in a lower ambient Leq than would have been expected if all lanes were open. Based on the long-term measurement at Site H, the peak hour Leq at Site 3 was calculated at 70 dBA.

For more information regarding existing noise levels within the project area, please refer to Appendix S, Noise and Vibration Technical Memorandum, and Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR.

4.7.3 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential noise and vibration impacts for each alternative. Table 4.7-7 summarizes the results of the analysis.

Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.7.1. Potential noise and vibration impacts from transit operations and construction are analyzed and compared to the existing conditions as described in Section 4.7.2.

The analysis of construction effects is based on Chapter 3 of the Construction Staging Plan from the Traffic Handling and Construction Staging Report (CDM 2009). Each of the build alternatives would utilize different construction methods, so each alternative would potentially generate different levels of construction noise and vibration. The Traffic Handling and Construction Staging Report estimates a four- to five-year construction period with surface street disruption of approximately 24 to 48 months for all build alternatives (CDM 2009). This analysis considered both daytime and nighttime construction activities using the procedures and criteria for a general noise assessment presented in Chapter 12 of the FTA guidance manual (USDOT 2006). Per Chapter 12 of the FTA guidance manual, a potential impact could occur from construction noise if the noise level exceeds the following (which are expressed in one-hour Leq):

- Residential: Day 90 dBA; Night 80 dBA
- Commercial: Day 100 dBA; Night 100 dBA
- Industrial: Day 100 dBA; Night 100 dBA

Table 4.7-7. Summary of Potential Noise and Vibration Impacts

Alternative	Construction Impacts (NEPA/CEQA)		Operational Impacts (NEPA/CEQA)		Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
	Noise	Vibration	Noise	Vibration		
No Build	None	None	None	None	None	None
TSM	None	None	None	None	None	None
At-Grade Emphasis LRT	None	Adverse effect/ Significant impact (mitigated)	Adverse effect/ Significant impact (mitigated)	None	None	None
Underground Emphasis LRT	None	Adverse effect/ Significant impact (mitigated)	None	None	None	None
LPA	Adverse effect/ Significant impact GBN (mitigated)	Adverse effect/ Significant impact (mitigated)	Adverse effect/ Significant impact GBN (mitigated)	None	None	None

Analysis of potential project-related noise levels for the build alternatives was based on FTA reference sound levels (USDOT 2006) and sound level data from current Metro Blue and Gold Line operations. This analysis used the project assumptions about how the project would be operated (speed, headways, and schedule) in estimating ridership, fare revenue, and other impacts. Operation noise and vibration sources could include the movement of vehicles along each alignment (pass-by), noise from warning signals, locations of special trackwork, ventilation related noise, and operation of traction power substations (TPSS).

Vibration impacts from light rail transit operations are generated by motions and actions at the wheel/rail interface. Vibration from passing trains has a small potential to traverse geologic strata and negatively impact near-by sensitive buildings. However, the principal concern with light rail transit vibration is potential annoyance to building occupants. It is extremely unlikely that GBV from transit operations would cause any damage to buildings.

The potential for vibration and GBN impacts resulting from the build alternatives was determined using the vibration assessment information and procedures contained in Chapters

7, 8, and 10 of the FTA's guidance manual for a general vibration assessment (USDOT 2006). Ground attenuation of vibration was based on FTA reference data (USDOT 2006). The conversion from vibration level to GBN level was based on the conversion factors in the FTA manual and measurements taken from the transit vehicles operating on the Metro Gold Line that the Regional Connector will join. To provide a very conservative analysis, the "typical" conversion factor of -35 dB was used to calculate the GBN level. A train traveling 50 miles per hour (MPH) was used to estimate vibration levels whereas the Regional Connector trains would be traveling at 35 MPH maximum and would generate lower vibration levels.

All estimates of GBV from the potential project alignments were projected to the foundations of the nearest building. The vibration estimates do not include adjustments for calculations of a building's specific reaction to GBV. Predicted GBV and GBN levels were compared to FTA criteria to determine potential impacts.

4.7.3.1 No Build Alternative

Automobile traffic would be the only likely source of increased noise levels under the No Build Alternative. However, traffic in the project area is already at or above road capacity, so increases in automobile traffic volumes are not expected to change existing 24-hour (Ldn) noise levels. New sources of vibration would not be proposed by this alternative and major construction activities would not occur under the No Build Alternative. Therefore, significant noise or vibration impacts are not anticipated under the No Build Alternative.

4.7.3.1.1 NEPA Finding

The No Build Alternative would have no effect on existing noise and vibration levels.

4.7.3.1.2 CEQA Determination

The No Build Alternative would have no impact on existing noise and vibration levels.

4.7.3.2 TSM Alternative

Major construction activities would not occur under the TSM Alternative; therefore, construction noise or vibration impacts would not occur under the TSM Alternative. This alternative would add bus routes along Alameda, Temple, 2nd, 3rd, 5th, 7th, Flower, Figueroa, and Olive Streets and Grand Avenue. Existing noise levels along proposed bus routes are substantially higher and would mask the noise of additional buses. Additionally, it takes a doubling of traffic to result in a 3 dBA (noticeable noise increase to the human ear) increase in noise (USDOT 2006). The number of buses that would be added under the TSM Alternative would not result in a doubling of traffic along the roadways listed above and, therefore, would not result in a noticeable increase in roadway noise. Operation of additional buses along the proposed route would not result in a noticeable increase in vibration levels. Under FTA criteria, the potential increase in noise and vibration from this alternative would not result in a significant noise impact.

4.7.3.2.1 NEPA Finding

The TSM Alternative would not have adverse noise and vibration impacts associated with either construction or operation.

4.7.3.2.2 CEQA Determination

The TSM Alternative would not have significant noise and vibration impacts associated with either construction or operation.

4.7.3.3 At-Grade Emphasis LRT Alternative

4.7.3.3.1 Construction Noise and Vibration

Under the At-Grade Emphasis LRT Alternative, the following construction activities would have the most potential for noise and vibration impacts: cut and cover construction of a tunnel on Flower Street; cut and cover construction of the proposed Flower/6th/5th Street station; cut and cover construction of the proposed 2nd/Hope Street station; and re-grading of Alameda Street near the junction at Alameda and Temple Streets. These four activities have the most potential for noise impacts because of their duration and their proximity to noise-sensitive land uses.

Construction activities, relevant construction equipment, and related noise levels for this alternative are shown in Table 4.7-8. As indicated in Table 4.7-8, estimated construction noise levels would not exceed FTA construction noise criteria identified in Section 4.7.3 above.

Construction would be consistent with the goals of Section 41.40(a) of the Los Angeles Municipal Code. The contractor would also be responsible for consistency with the goals of the applicable local ordinances as it applies to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the contractor.

Table 4.7-8. At-Grade Emphasis LRT Alternative Construction Activity and Equipment Typical Noise Levels at 50 feet

Activity	Duration (months)	Construction Equipment				
		Concrete Truck	Dozer	Excavator	Crane	Drill Rig
Pre-Construction	4-6	NA	NA	NA	NA	90
Site Preparation	6-12	77	85	82	NA	NA
Flower Street Cut and Cover Tunnel	24-48	77	85	82	81	90
Flower/6th/5th Cut and Cover Station	24-48	77	85	82	81	90
Portal on Flower south of 3rd	12-18	77	85	82	81	90
Portal northeast of Flower and 3rd	TBD	77	85	82	81	90
2nd/Hope Street Cut and Cover Station	24-28	77	85	82	81	90
New Portal into 2nd Street Tunnel	TBD	77	85	82	81	90

Table 4.7-8. At-Grade Emphasis LRT Alternative Construction Activity and Equipment Typical Noise Levels at 50 feet (continued)

Activity	Duration (months)	Construction Equipment				
		Concrete Truck	Dozer	Excavator	Crane	Drill Rig
Surface Trackwork	12-18	77	85	82	81	NA
Main and Los Angeles At-Grade Stations	12-18	77	85	82	81	90
Temple and Alameda Junction	24-36	77	85	82	81	90
Operating Systems Installation	TBD	TBD	TBD	TBD	TBD	TBD

In addition, the construction contractor would use Best Management Practices (BMPs) to ensure construction-related noise levels do not exceed FTA construction noise criteria and would also attenuate noise levels generated by construction equipment shown in Table 4.7-8 above. Typical types of BMPs the contractor would use, as needed, to be consistent with the goals of the applicable local ordinances include, but are not limited to, the following:

- Placement of temporary noise barriers around the construction site;
- Placement of localized barriers around specific items of equipment or smaller areas;
- Use of alternative back-up alarms/warning procedures;
- Higher performance mufflers on equipment used during nighttime hours; and
- Portable noise sheds for smaller, noisy, equipment, such as air compressors, dewatering pumps, and generators.

Consistency with the goals of the applicable local ordinances and implementation of BMPs would ensure that noise and vibration levels associated with construction of the At-Grade Emphasis LRT Alternative would not result in a significant adverse impact to sensitive land uses as classified by the FTA (e.g., residences, hospitals, and hotels are Category 2 land uses).

FTA guidelines also address the potential for construction-activity-induced vibration to damage buildings. With regard to the physical structure of the building, sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4), or historic buildings, such as the Barker Brothers and the Los Angeles Times Mirror Building, in the vicinity of construction activities may be susceptible to vibration damage. Construction of the project would not involve impact or sonic pile driving (pre-auguring would be used for installation of the soldier piles instead) or large vibratory rollers. Therefore, equipment such as large bulldozers and drill rigs would be the main source of construction vibration that could have the potential to cause vibration damage. Based on the FTA's minimum safe distances identified for Category IV buildings of 0.12 inch/sec PPV in Table 4.7-5, the minimum safe distance between construction activities (involving large bulldozers and drill rigs) and buildings would be 21 feet according to FTA guidelines for minimum safe distances. As a result, sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4) or historic buildings within 21 feet of construction may be susceptible to vibration damage. Therefore, construction-related vibration impacts to historic and sensitive buildings located within 21 feet of the anticipated vibration-producing construction activity would be significant. Refer to Section 4.12.1, Historic Resources - Built Environment, for a list of historic resources that are near construction activities associated with the At-Grade Emphasis LRT Alternative and may be susceptible to vibration damage.

As part of mitigation for the At-Grade Emphasis LRT Alternative, a pre-construction survey of all structures within 21 feet of the anticipated vibration-producing construction activity would be conducted to verify the building category, structural condition, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. During construction, use of building protection measures such as underpinning, soil grouting, or other forms of ground improvement, use of lower vibration equipment and/or construction techniques, combined with a geotechnical and vibration monitoring program would be used to protect identified historic and sensitive structures. With implementation of these mitigation measures, identified in Section 4.7.4 of the Draft EIS/EIR, construction-related vibration impacts to historic and sensitive buildings located within 21 feet of the anticipated vibration-producing construction activity would be reduced to less than significant.

Large bulldozers and drill rigs, the main sources of construction vibration, could exceed levels specified in FTA annoyance criteria for land uses (See Table 4.7-2). However, perceptible vibration from construction equipment would be short-term and intermittent and, therefore, considered an "infrequent event" (occurring less than 30 times a day) as defined by FTA. Sensitive land uses located along the alignment are considered Category 2 and Category 3 land uses under the FTA annoyance criteria. Taking into account a 10 dBA reduction in vibration for coupling to building foundation loss (Table 10-1, FTA 2006), occupants would not be subjected to vibration annoyance impacts. It should be noted that large bulldozers and drill rigs would operate intermittently and would not be used every day of construction. In addition, construction of the alignment would not dwell in one location for the entire duration of construction. Therefore, vibration impacts (including GBN) associated with large bulldozers and drill rigs would be less than significant.

4.7.3.3.2 Transit Operation Noise

Operation of the At-Grade Emphasis LRT Alternative could generate six sources of potential noise impacts: pass-bys from LRT vehicles, warning signals for at-grade crossings, areas of special trackwork, grade separation, ventilation shafts, and TPSS.

Pass-by Impacts:

Noise modeling for the At-Grade Emphasis LRT Alternative assumes a three-car train with 2.5-minute headways during peak hours (6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 7:00 p.m.) and 5-minute headways during off peak hours (5:00 a.m. to 6:00 a.m., 9:00 a.m. to 3:00 p.m., and 7:00

p.m. to 1:00 a.m.). There would be no regularly planned service between 1:00 a.m. and 5:00 a.m. However, Metro may run trains later during special events like New Years Eve. The model assumes trains will travel at 35 MPH along Flower and Temple Streets and 25 MPH along 2nd, Main, and Los Angeles Streets.

As shown in Table 4.7-9, the analysis predicts three potential "moderate" level noise impacts from LRT vehicle pass-bys under this alternative. Two impacts would occur on 2nd Street on the ground floor of the Kawada Hotel and the Higgins Building. One impact would occur on Los Angeles Street on the ground floor of the New Otani Hotel. These noise impacts are below "severe" level of change and, therefore, are not considered adverse impacts.

Warning Signals:

Warning signals near at-grade rail crossings that include bells and train horns could generate noise impacts and increase potential impacts caused by LRT pass-bys. The At-Grade Emphasis LRT Alternative would make LRT trains run with existing traffic signals. Warning signals would not be regularly used by LRT trains. No noise impacts from at-grade warning signals are expected to result under this alternative.

Special Trackwork:

The At-Grade Emphasis LRT Alternative would require special trackwork for turnouts, which allow trains to move from one track to another, and crossovers, which allow trains to move between parallel tracks. Noise from switches or crossovers comes from a small gap in the central part of the switch, which could increase noise levels up to 6 dBA locally.

The At-Grade Emphasis LRT Alternative would have two areas of special trackwork: an at-grade crossover on 2nd Street near Broadway and an at-grade junction near Temple Street and Alameda Street to connect to the Metro Gold Line tracks. Noise-sensitive land uses do not exist near areas of special trackwork. Noise impacts from special trackwork are not predicted.

Grade Separation:

Under this alternative, a vehicular underpass would be constructed at Alameda and 1st Streets to provide a grade separation between trains and vehicles. Traffic on Alameda, Temple and 1st Streets would not increase and, therefore, traffic noise levels along Alameda Street from 2nd to 1st Streets are not expected to increase as a result of this alternative.

Ventilation Shafts and TPSS:

Ventilation shafts and TPSS would be designed in accordance with Metro system-wide design criteria noise guideline of 50 dBA at 50 feet or the nearest residential building, whichever is closer. Under this alternative, noise levels associated with ventilation and TPSS would be far lower than current ambient noise levels and would not exceed FTA noise impact criteria. No significant, adverse noise impact would occur.

4.7.3.3.3 Transit Operation Vibration

The At-Grade Emphasis LRT Alternative would have two potential sources of vibration impacts during operations: transit vehicle pass-bys and special trackwork.

Vibration modeling for the At-Grade Emphasis LRT Alternative uses the same assumptions about train traffic as the noise impact analysis. Based on FTA's generalized ground surface vibration curves, adverse vibration impacts are not predicted from LRT vehicle pass-bys under this alternative (USDOT 2006). However, GBN impacts at Site C and Site D are predicted to occur from LRT vehicle pass-bys under this alternative, as presented in Table 4.7-10. These predicted levels do not reflect any adjustment of the vibration levels to account for expected attenuation from the building's foundation coupling loss. With implementation of mitigation, GBN impacts would be reduced to less than significant.

As indicated above, the areas of special trackwork are not located near any vibration-sensitive land uses. Thus, adverse vibration impacts from special trackwork are not predicted under this alternative and vibration impacts would be less than significant.

4.7.3.3.4 NEPA Finding

Construction of the At-Grade Emphasis LRT Alternative would not have adverse effects from vibration on sensitive land uses. With regard to the physical structure of the building, construction-related vibration impacts to sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4) and historic buildings located within 21 feet of the anticipated vibration-producing construction activity would be significant. Implementation of proposed mitigation measures would reduce adverse effects to sensitive or historic buildings within 21 feet of construction to not substantially adverse. All other potential noise and vibration effects associated with construction would not be substantially adverse. Mitigation measures, which would mitigate damage to sensitive or historic buildings within 21 feet of construction, would also further reduce potential noise and vibration effects from construction to not substantially adverse.

Noise effects in the entire project area associated with LRT vehicle pass-bys would be below "severe" impact level. Thus, the At-Grade Emphasis LRT Alternative would not have adverse noise effects to sensitive land uses related to LRT vehicle pass-bys. "Moderate" noise impacts from LRT vehicle pass-bys would not result in a substantial permanent increase in ambient noise levels and potential effects to sensitive land uses would not be adverse. GBN effects associated with LRT vehicle pass-bys during project operation would occur at Sites C and D but would not be adverse with implementation of mitigation. All other noise and vibration effects from operations would not be adverse.

4.7.3.3.5 CEQA Determination

Potential noise and vibration impacts associated with construction would be less than significant. Mitigation measures would further reduce potential noise and vibration impacts from construction below less than significant levels.

"Moderate" noise impacts would occur in the entire project area associated with LRT vehicle pass-bys, but noise impacts would be below "severe" impact level. "Moderate" noise impacts from LRT vehicle pass-bys associated with the At-Grade Emphasis Alternative would not result in a substantial permanent increase in ambient noise levels and potential impacts would not be significant. GBN impacts associated with LRT vehicle pass-bys during project operation would occur at Sites C and D but would be reduced below the significance threshold with implementation of mitigation. All other noise and vibration impacts from operations would be less than significant.

4.7.3.4 Underground Emphasis LRT Alternative

4.7.3.4.1 Construction Noise and Vibration

For the Underground Emphasis LRT Alternative, the following construction activities would have the most potential for noise and vibration impacts: cut and cover construction of a tunnel on Flower Street; cut and cover construction of the proposed Flower/5th/4th Street station; cut and cover construction of the approach to the proposed 2nd/Hope Street station and the station itself; construction of either of the proposed 2nd Street station alternatives (Los Angeles Street or Broadway Options); grade separation at the junction of 1st and Alameda Streets; and tunnel boring machine (TBM) tunneling beneath 2nd Street with an insertion site near either 2nd Street and Central Avenue or the proposed 2nd/Hope Street station. These seven activities have the most potential for noise and vibration impacts due to the duration and their proximity to sensitive land uses.

Construction activities, relevant construction equipment, and related noise levels for this alternative are shown in Table 4.7-11.

Potential noise from TBM operations at the insertion site, where bored material would be hauled out, treated and removed, is listed in Table 4.7-11. Noise levels for the TBM are not listed for the segments of the alignment between the TBM insertion and recovery sites. When it is operating underground, the TBM produces little to no noise that reaches surface land uses. As indicated in Table 4.7-11, estimated construction noise levels would not exceed FTA construction noise criteria identified in Section 4.7.3 above.

Construction would be consistent with the goals of Section 41.40(a) of the Los Angeles Municipal Code. The contractor would also be responsible for consistency with the goals of the applicable local ordinances as it applies to all equipment on the job or related to the job, including but not limited to trucks, transit mixers, or transient equipment that may or may not be owned by the contractor.

In addition, the construction contractor would use BMPs to ensure construction-related noise levels do not exceed FTA construction noise criteria and would also attenuate noise levels generated by construction equipment shown in Table 4.7-8 above. Consistency with the goals of the applicable local ordinances and implementation of BMPs, listed in Section 4.7.3.3.1 above, would ensure that noise and vibration levels associated with construction of the Underground Emphasis LRT Alternative would not result in a significant adverse impact to sensitive land uses as classified by the FTA (e.g., residences, hospitals, and hotels are Category 2 land uses).

FTA guidelines also address the potential for construction-activity-induced vibration to damage buildings. With regard to the physical structure of the building, sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4), or historic buildings, such as the Roosevelt Building and The California Club, in the vicinity of construction may be susceptible to vibration damage. The Underground Emphasis LRT Alternative would involve the same vibration producing construction equipment as the At-Grade Emphasis LRT Alternative. Therefore, the minimum safe distance of 21 feet between construction activities (involving large bulldozers and drill rigs) and buildings would also apply. Refer to FTA guidelines in Table 4.7-5 for minimum safe distances between large bulldozers and drill rigs and buildings under various scenarios. As a result, sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4) or historic buildings within 21 feet of construction may be susceptible to vibration damage. Therefore, construction-related vibration impacts to historic and sensitive buildings located within 21 feet of the anticipated vibration-producing construction activity would be significant. Refer to Section 4.12.1, Historic Resources - Built Environment, for a list of historic resources that are near construction activities associated with the Underground Emphasis LRT Alternative and may be susceptible to vibration damage.

Vibration produced by a TBM during tunneling activities is not anticipated to result in vibration damage. According to one study, peak particle vibration velocities from tunnel construction (in soft ground) lie in the range from 0.0024 to 0.0394 inches per second PPV at a distance of 33 feet from the vibration source (Verspohl 1995). Another study measured vibration velocities in the range of 0.0157 to 0.0551 inches per second also at a distance of 33 feet from the source (New 1990). These PPV vibrations may also be expressed as RMS vibration velocity levels ranging from 56 to 83 VdB. Given this range of potential vibration impacts, and the distance below-grade that tunnel boring would occur, vibration produced by a TBM would be well below the FTA threshold for Category IV buildings of 0.12 inches per second PPV and no vibration damage associated with operation of the TBM would occur.

As part of mitigation for the Underground Emphasis LRT Alternative, a pre-construction survey of all structures within 21 feet of the anticipated vibration-producing construction activity would be conducted to verify the building category, structural condition, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. During construction, use of building protection measures such as underpinning, soil grouting, or other forms of ground improvement, use of lower vibration equipment and/or construction techniques, combined with a geotechnical and vibration monitoring program would be used to protect identified historic and sensitive structures. With implementation of these mitigation measures, identified in Section 4.7.4 of the Draft EIS/EIR, construction-related vibration impacts to historic and sensitive buildings located within 21 feet of the anticipated vibration-producing construction activity would be reduced to a less than significant level.

The Underground Emphasis LRT Alternative would involve the same vibration producing construction equipment as the At-Grade Emphasis LRT Alternative, large bulldozers and drill rigs, and would, therefore, have similar vibration annoyance impacts on sensitive land uses (Table 4.7-2). Taking into account a 10 dBA reduction in vibration for coupling to building foundation loss (Table 10-1, FTA 2006), occupants would not be subjected to vibration annoyance impacts. It should be noted that large bulldozers and drill rigs would operate intermittently and would not be used every day of construction. In addition, construction of the alignment would not dwell in one location for the entire duration of construction. Therefore, vibration impacts (including GBN) associated with large bulldozers and drill rigs would be less than significant.

Table 4.7-9. At-Grade Emphasis LRT Alternative Predicted Noise Levels and Operational Impacts

Site #	Receptor Description	At-Grade LRT Segment	FTA Land Use[1]	Existing Ldn[2] (dBA)/ Peak Hour Leq (dBA)	Predicted Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Noise Impact Criteria for Predicted Project Noise Moderate/Severe[3]	Predicted Existing + Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Number of Noise Impacts	
								Moderate	Severe
								SF[4]/MF[4]/Non-Residential	SF/MF/Non-Residential
1	Park at Central Library	Flower Street – Wilshire to 5th	3	68	Proposed Underground	68/73	68	0/0/0	0/0/0
A	Bonaventure Hotel	Flower Street – 5th to 3rd	2	71	63	66/71	72	0/0/0	0/0/0
2	Park Area 4th floor deck of Bank of America Building	Flower Street – 5th to 3rd	3	63	54	65/70	64	0/0/0	0/0/0
B1	Bunker Hill Towers – Top Floor	Flower Street – 3rd to 2nd Street	2	71	54	66/70	71	0/0/0	0/0/0
B2	Bunker Hill Towers[5]	Flower Street – 3rd to 2nd Street	2	74	60	66/72	74	0/0/0	0/0/0
C1	Kawada Hotel – Top Floor	2nd Street – Hill to Los Angeles	2	70	61	65/69	70	0/0/0	0/0/0
C2	Kawada Hotel[5]	2nd Street – Hill to Los Angeles	2	75	69	66/73	76	0/1 MF/0	0/0/0
I	Higgins Building	2nd Street – Hill to Los Angeles	2	75	69	66/73	76	0/1 MF/0	0/0/0

Table 4.7-9. At-Grade Emphasis LRT Predicted Noise Levels and Operational Impacts (continued)

Site #	Receptor Description	At-Grade LRT Segment	FTA Land Use[1]	Existing Ldn[2] (dBA)/ Peak Hour Leq (dBA)	Predicted Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Noise Impact Criteria for Predicted Project Noise Moderate/Severe[3]	Predicted Existing + Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Number of Noise Impacts	
								Moderate	Severe
								SF[4]/MF[4]/Non-Residential	SF/MF/Non-Residential
4	Saint Vibiana Little Tokyo Library	2nd Street – Hill to Los Angeles	3	69	61	69/74	70	0/0/0	0/0/0
D1	New Otani Hotel	Los Angeles Street – 2nd to 1st	2	73	67	66/71	74	0/1 MF/0	0/0/0
D2	New Otani Hotel 3rd Floor Garden[5]	Los Angeles Street – 2nd to 1st	2	70	61	65/70	70	0/0/0	0/0/0
F1	Temple Street Jail	Los Angeles Street –1st to Temple	2	71	65	66/70	72	0/0/0	0/0/0
F2	Temple Street Jail	Temple Street – Los Angeles to Alameda	2	67	61	63/67	68	0/0/0	0/0/0

Source: Parsons Brinckerhoff, 2009
Notes:
[1] Land use category descriptors are as follows: FTA Category 1 = buildings or parks where low noise levels are an essential element of their purpose; FTA Category 2 = residences and other buildings where people sleep, such as hotels, apartments and hospitals; and FTA Category 3 = institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
[2] Ldn is used for land uses with nighttime sensitivity to noise and for residential areas where FTA rather than FHWA noise procedures are applicable. Peak-hour Leq is used for commercial, industrial, and other land uses that do not have nighttime noise sensitivity.
[3] Moderate and severe noise impact criteria are based on Table 4.7-1 and are the thresholds for noise generated by the project. The noise impact criteria correspond to the FTA land use category identified in Table 4.7-9.
[4] SF = Single family residential; MF = Multi-family residential
[5] Existing noise levels were estimated for Sites B2, C2, and D2. Estimates were based on noise measurements taken at Sites B1, C1, and D1.

Table 4.7-10. At-Grade Emphasis LRT Alternative Predicted Ground-Borne Noise and Vibration Levels and Impacts

Site #	FTA Land Use Category[1]	FTA Vibration Level Criteria (VdB)	FTA GBN Level Criteria (dBA)[2]	Predicted Project Vibration Levels (VdB)	Predicted Project GBN Levels (dBA)[3]	Vibration and GBN Impact
1	3	75	40	67	32	No Impact
A	2	72	35	64	29	No Impact
2	3	75	40	64	29	No Impact
B	2	72	35	58	23	No Impact
C	2	72	35	70	35	GBN Impact
I	2	72	35	62	27	No Impact
4	3	75	40	60	25	No Impact
D	2	72	35	70	35	GBN Impact
F1	2	72	35	59	24	No Impact
F2	2	72	35	53	18	No Impact
DH	Special Buildings	65	25	57	22	No Impact

Source: Parsons Brinckerhoff, Inc., 2009
Notes:
DH = Walt Disney Concert Hall
[1] Land use category descriptors: FTA Category 1 = buildings or parks where quiet is an essential element of their purpose; FTA Category 2 = residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
[2] Impact criteria are for frequent events.
[3] Based on more conservative "typical" vibration spectra.

Table 4.7-11. Underground Emphasis LRT Alternative
Construction Activity and Equipment Typical Noise Levels at 50 feet

Activity	Duration (months)	Construction Equipment				
		Concrete Truck	Dozer	Excavator	Crane	Drill Rig
Pre-Construction	4-6	NA	NA	NA	NA	90
Site Preparation	12-18	77	85	82	NA	NA
Flower Street Cut and Cover Tunnel	24-48	77	85	82	81	90
Flower/5th/4th Street Cut and Cover Station	24-48	77	85	82	81	90
Cut and Cover Approach to 2nd/Hope Street Station	24-48	77	85	82	81	90
2nd/Hope Street Station (SEM)[1]	24-48	77	85	82	81	NA
2nd/Hope Street Station (Cut and Cover)	24-48	77	85	82	81	90
2nd Street TBM Tunnel	24-48	77	85	82	81	NA
2nd Street Cut and Cover Station (Broadway Option)	24-48	77	85	82	81	NA
2nd Street Cut and Cover Station (Los Angeles Street Option)	24-48	77	85	82	81	90
Portal	12-24	77	85	82	81	90
TBM Insertion Site	2-4	77	85	82	81	90
1st and Alameda Junction	24-36	77	85	82	81	NA
Operating Systems Installation	TBD	TBD	TBD	TBD	TBD	TBD

Note:
[1] SEM = sequential excavation method

4.7.3.4.2 Transit Operation Noise

The Underground Emphasis LRT Alternative would involve six sources of potential noise impacts during operations. These include pass-by noise from LRT vehicles, warning signals near at-grade crossings, special trackwork, grade separations, ventilation shafts, and TPSS.

Pass-by Impacts:

Assumptions for the Underground Emphasis LRT Alternative noise modeling are the same as the At-Grade Emphasis LRT Alternative, except the analysis assumed a speed of 30 MPH for all segments instead of 35 MPH for the At-Grade Emphasis LRT Alternative. Given the underground design of this alternative, the only land uses with potential noise impacts from LRT vehicle pass-bys are the Hikari Lofts at the intersection of 2nd Street and Central Avenue and the Savoy Condominiums on Alameda Street, between 2nd and 1st streets. Given the existing ambient noise levels adjacent to the land uses (69 to 73 dBA Ldn), noise generated from LRT vehicle pass-bys would not result in an increase in ambient noise levels (Table 4.7-12). Based on FTA criteria, no noise impacts are predicted from LRT vehicle pass-bys.

Warning Signals:

Under this alternative, LRT vehicles would run underground except crossing Alameda and 1st Streets. The LRT vehicles would run with existing traffic signals on 1st Street and would be separated from traffic on Alameda Street. Therefore, pending California Public Utilities Commission (CPUC) approval, the project would not include the use of warning signals or gates and would not create noise impacts from at-grade warning signals.

Special Trackwork:

This alternative would have one area of special trackwork that is above-grade, the at-grade junction near Alameda and 1st Streets to connect to the Metro Gold Line tracks. Potential noise levels would increase up to 6 dBA in the vicinity of a switch. The junction near Alameda and 1st Streets are near the Savoy Condominiums and would be predicted to cause a "moderate" noise impact at the condominiums, as shown in Table 4.7-13.

Grade Separation:

Under this alternative, a vehicular underpass would be constructed at Alameda and 1st Streets to provide a grade separation between trains and vehicles. Traffic on Alameda, Temple and 1st Streets would not increase and, therefore, traffic noise levels along Alameda Street from 2nd to 1st Streets are not expected to increase as a result of this alternative.

Ventilation Shafts and TPSS:

Ventilation shafts and TPSS would be designed in accordance with Metro system-wide design criteria noise guideline of 50 dBA at 50 feet or the nearest residential building, whichever is closer. Under this alternative, noise levels associated with ventilation and TPSS would be far lower than current ambient noise levels and would not exceed FTA noise impact criteria. No significant, adverse noise impact would occur.

4.7.3.4.3 Transit Operation Vibration

The Underground Emphasis LRT Alternative has the same two potential sources of vibration impacts during operations as the At-Grade Emphasis LRT Alternative: pass-by vibration from LRT vehicles and areas of special trackwork.

Based on vibration modeling and FTA criteria, adverse vibration impacts are not predicted from LRT vehicle pass-bys, as presented in Table 4.7-14. The Underground Emphasis LRT Alternative would require one at-grade special trackwork on Alameda and 1st Streets, near the Savoy Condominiums and the Japanese American National Museum (JANM). Based on FTA's general vibration assessment guidelines, special trackwork for this alternative would add 10 db to the vibration level for LRT vehicle pass-bys. As a result, special trackwork for this alternative would generate vibration levels of 68 VdB, which remains under the FTA threshold of 72 VdB. Thus, adverse vibration impacts are not predicted for the Underground Emphasis LRT Alternative.

As shown in Table 4.7-14, this alternative would generate GBN levels up to 33 dBA, which is below the FTA criterion of 35 dBA. Thus, no adverse vibration or GBN impacts from special trackwork are predicted for the Underground Emphasis LRT Alternative.

4.7.3.4.4 NEPA Finding

Construction of the Underground Emphasis LRT Alternative would not have adverse effects from vibration on sensitive land uses. With regard to the physical structure of the building, construction-related vibration impacts to sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4) and historic buildings located within 21 feet of the anticipated vibration-producing construction activity would be significant. Implementation of proposed mitigation measures would reduce adverse effects to sensitive or historic buildings within 21 feet of construction to not substantially adverse. All other noise and vibration effects from construction would not be substantially adverse. Proposed mitigation measures, which would mitigate damage to sensitive or historic buildings within 21 feet of construction, would also further reduce potential noise and vibration effects from construction to not be substantially adverse.

Noise effects associated with operation of the Underground Emphasis LRT Alternative would be below "severe" impact levels and an adverse effect to sensitive land uses would not result under NEPA. Adverse noise or vibration effects from operation of the Underground Emphasis LRT Alternative are not anticipated. All other noise and vibration effects associated with operation would not be adverse.

4.7.3.4.5 CEQA Determination

Potential noise and vibration impacts associated with construction would be less than significant. Mitigation measures would further reduce potential noise and vibration impacts from construction below less than significant levels.

Noise impacts associated with operation of the Underground Emphasis LRT Alternative would be below "severe" impact levels and would not result in a substantial permanent increase in ambient noise levels. Therefore, noise impacts associated with operation of the Underground Emphasis LRT Alternative would be less than significant. All other noise and vibration impacts associated with operation would not be significant.

Table 4.7-12. Underground Emphasis LRT Alternative Predicted Noise Levels and Operational Impacts

Site #	Receptor Description	Underground LRT Segment	FTA Land Use[1]	Existing Ldn[2] (dBA)/Peak Hour Leq (dBA)	Predicted Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Predicted Existing + Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Number of Noise Impact					
							Moderate			Severe		
							SF[3]	MF[3]	Non-Residential	SF	MF	Non-Residential
E1	Top Floor of Hikari Lofts	Portal to Little Tokyo Station	2	69	51	69	0	0	0	0	0	0
E2	Hikari Lofts[4]	Portal to Little Tokyo Station	2	74	57	74	0	0	0	0	0	0
G	Savoy – Alameda Street	Portal to Little Tokyo Station	2	73	60	73	0	0	0	0	0	0
H	Savoy – 1st Street	Portal to Little Tokyo Station	2	72	60	72	0	0	0	0	0	0

Source: Parsons Brinckerhoff, 2009
Notes:
[1] Land use category descriptors: FTA Category 1 = buildings or parks where low noise levels are an essential element of their purpose; FTA Category 2 = residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
[2] Ldn is used for land uses with nighttime sensitivity to noise and for residential areas where FTA rather than FHWA noise procedures are applicable. Peak-hour Leq is used for commercial, industrial, and other land uses that do not have nighttime noise sensitivity.
[3] SF = Single family residential; MF = Multi-family residential
[4] Existing noise level was estimated for Site E2. Estimate was based on noise measurements taken at Site E1.

Table 4.7-13. Underground Emphasis LRT Alternative Predicted Noise Levels with Special Trackwork

Site #	Receptor Description	FTA Land Use Category[1]	Existing Ldn[2] (dBA)/Peak Hour Leq (dBA)	Predicted Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Noise Impact	Predicted Project + 6 dBA for Special Trackwork Ldn[2] (dBA)/Peak Hour Leq (dBA)	Predicted Existing + Project and Special Trackwork Ldn[2] (dBA)/Peak Hour Leq (dBA)	Noise Impact
E1	Top Floor of Hikari Lofts	2	68	51	No Impact	57	68	No Impact
E2	Hikari Lofts[3]	2	74	57	No Impact	63	74	No Impact
G	Savoy – Alameda Street	2	73	60	No Impact	66	74	Moderate Impact
H	Savoy – 1st Street	2	72	60	No Impact	66	73	Moderate Impact

Source: Parsons Brinckerhoff, Inc., 2009
Notes:
[1] Land use category descriptors: FTA Category 1 = buildings or parks where low noise levels are an essential element of their purpose; FTA Category 2 = residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
[2] Ldn is used for land uses with nighttime sensitivity to noise and for residential areas where FTA rather than FHWA noise procedures are applicable. Peak-hour Leq is used for commercial, industrial, and other land uses that do not have nighttime noise sensitivity.
[3] Existing noise level was estimated for Site E2. Estimate was based on noise measurements taken at Site E1.

Table 4.7-14. Underground Emphasis LRT Alternative Predicted Ground-Borne Noise and Vibration Levels and Impacts

Site #	FTA Land Use Category[1]	FTA Vibration Level Criteria (VdB)	FTA GBN Level Criteria (dBA)[2]	Predicted Project Vibration Levels (VdB)	Predicted Project GBN Levels (dBA)[3]	Vibration and GBN Impact
1	3	75	40	65	30	No Impact
A	2	72	35	64	29	No Impact
2	3	75	40	61	26	No Impact
B	2	72	35	58	23	No Impact
C	2	72	35	63	28	No Impact
I	2	72	35	67	32	No Impact
4	3	75	40	67	32	No Impact
D	2	72	35	67	32	No Impact
E	2	72	35	62	27	No Impact
G	2	72	35	58	23	No Impact
H	2	72	35	58/68	23/33	No Impact
DH	Special Buildings	65	25	53	18	No Impact

Source: Parsons Brinckerhoff, Inc., 2009
DH = Walt Disney Concert Hall
Notes:
[1] Land use category descriptors: FTA Category 1 = buildings or parks where quiet is an essential element of their purpose; FTA Category 2 = residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
[2] Impact criteria are for frequent events.
[3] Based on more conservative "typical" vibration spectra.

4.7.3.5 Locally Preferred Alternative

4.7.3.5.1 Construction Noise and Vibration

For the LPA, the following construction activities would have the most potential for construction-related noise and vibration impacts: cut and cover construction of a tunnel at Flower Street; cut and cover construction of the approach to the proposed 2nd/Hope Street station and cut and cover or sequential excavation method (SEM) construction of the station itself; construction of the proposed 2nd Street/Broadway station; construction of the proposed 1st/Central Avenue station; and TBM tunneling beneath 2nd Street and the insertion site northeast of the 1st and Alameda Streets intersection. These seven activities have the most potential for noise and vibration impacts due to their duration and their proximity to noise-sensitive land uses identified in Table 4.7-6.

Table 4.7-15 lists the construction activities, and the construction equipment expected to be used during each construction activity, and the related noise levels anticipated for the LPA.

Potential noise from TBM operations at the insertion site, where bored material would be hauled out, treated and removed, is listed in Table 4.7-15. Noise levels for the TBM are not listed for the segments of the alignment between the TBM insertion and recovery sites because it would be operating underground. As indicated in Table 4.7-15, estimated construction noise levels would not exceed FTA construction noise criteria identified in Section 4.7.3 above, and impacts would be less than significant.

Construction would be consistent with the goals of Section 41.40(a) of the Los Angeles Municipal Code. The code states that engaging in construction, repair, or excavation work, with any construction device, or job-site delivery of construction materials without a Police Commission-issued Variance or Permit would constitute a violation:

- Between the hours of 9:00 p.m. and 7:00 a.m.
- In any residential zone, or within 500 feet of land so occupied, before 8:00 a.m. or after 6:00 p.m. on any Saturday, or at any time on any Sunday.
- In a manner as to disturb the peace and quiet of neighboring residents or any reasonable person of normal sensitiveness residing in the area.

The contractor would also be responsible for consistency with the goals of the applicable local ordinances as it applies to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the contractor.

In addition, the construction contractor would use BMPs to ensure construction-related noise levels do not exceed FTA construction noise criteria and would also attenuate noise levels generated by construction equipment shown in Table 4.7-8 above. Typical types of BMPs the contractor will use, as needed, to be consistent with the goals of the applicable local ordinances include, but are not limited to, the following:

- Placement of temporary noise barriers around the construction site;
- Placement of localized barriers around specific items of equipment or smaller areas;
- Use of alternative back-up alarms/warning procedures;
- Higher performance mufflers on equipment used during nighttime hours; and
- Portable noise sheds for smaller, noisy, equipment, such as air compressors, dewatering pumps, and generators.

Consistency with the goals of the applicable local ordinances and implementation of BMPs, listed above, would ensure that noise levels associated with construction of the LPA would not result in a significant adverse impact to sensitive land uses as classified by the FTA (e.g., residences, hospitals, and hotels are Category 2 land uses). Mitigation has also been incorporated to ensure that the FTA construction noise criteria is not exceeded.

FTA guidelines also address the potential for construction-activity-induced vibration to damage buildings. With regard to the physical structure of the building, sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4), or historic buildings, such as the Roosevelt Building and the California Club, in the vicinity of construction may be susceptible to vibration damage. Construction of the project would not involve impact or sonic pile driving (pre-auguring would be used for installation of the soldier piles instead) or large vibratory rollers. In addition, vibration produced by a TBM during tunneling activities is not anticipated to result in vibration damage. According to one study, peak particle vibration velocities from tunnel construction (in soft ground) lie in the range from 0.0024 to 0.0394 inches per second PPV at a distance of 33 feet from the vibration source (Verspohl 1995). Another study measured vibration velocities in the range of 0.0157 to 0.0551 inches per second also at a distance of 33 feet from the source (New 1990). These PPV vibrations may also be expressed as RMS vibration velocity levels ranging from 56 to 83 VdB. Given this range of potential vibration impacts, and the distance below-grade that tunnel boring would occur, vibration produced by a TBM would be well below the FTA threshold for Category IV buildings of 0.12 inches per second PPV and no vibration damage associated with operation of the TBM would occur.

Therefore, equipment such as large bulldozers and drill rigs would be the main source of construction vibration that could have the potential to cause vibration damage. Based on the FTA's minimum safe distances identified for Category IV buildings of 0.12 inch/sec PPV in Table 4.7-5, the minimum safe distance between construction activities (involving large bulldozers and drill rigs) and buildings would be 21 feet. Refer to FTA guidelines in Table 4.7-5 for minimum safe distances between large bulldozers and drill rigs and buildings under various scenarios. As a result, sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4) or historic buildings within 21 feet of construction may be susceptible to vibration damage. Therefore, construction-related vibration impacts to sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4) and historic buildings located within 21 feet of the anticipated vibration-producing construction activity would be significant. Refer to Section 4.12.1, Historic Resources

- Built Environment, for a list of historic resources that are near construction activities associated with the LPA and which may be susceptible to vibration damage.

As part of mitigation for the LPA, a pre-construction survey of all structures within 21 feet of the anticipated vibration-producing construction activity would be conducted to verify the building category, structural condition, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. During construction, use of building protection measures such as underpinning, soil grouting, or other forms of ground improvement, use of lower vibration equipment and/or construction techniques, combined with a geotechnical and vibration monitoring program would be used to protect identified historic and sensitive structures. With implementation of mitigation measures identified in Section 4.7.4.2.1 below, construction-related vibration impacts to historic and sensitive buildings located within 21 feet of the anticipated vibration-producing construction activity would be reduced to a less than significant level.

The FTA provides short-term GBV and GBN impact criteria for project operation, which may also be used to assess human annoyance caused by vibration from construction activities. These criteria, identified in Section 4.7.1, were used for evaluating the LPA's potential GBV and GBN impacts to sensitive land uses during construction. Large bulldozers and drill rigs, the main at-grade sources of construction vibration, could exceed levels specified in FTA annoyance criteria for sensitive land uses (See Table 4.7-2). However, perceptible vibration from construction equipment would be short-term and intermittent and, therefore, considered an "infrequent event" (occurring less than 30 times a day) as defined by FTA. Sensitive land uses located along the alignment are considered Category 2 and Category 3 land uses under the FTA annoyance criteria. Taking into account a 10 dBA reduction in vibration for coupling to building foundation loss (Table 10-1, FTA 2006), occupants would not be subjected to vibration annoyance impacts. It should be noted that large bulldozers and drill rigs would operate intermittently and would not be used every day of construction. In addition, construction of the alignment would not dwell in one location for the entire duration of construction. Therefore, vibration impacts (including GBN) associated with large bulldozers and drill rigs would be less than significant.

Additional noise and vibration studies (contained in Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR) were performed for refinements to the alignment associated with the LPA. Due to refinements to the LPA, the TBM and delivery trains used in the tunnel during construction could exceed levels specified in FTA annoyance criteria (See Tables 4.7-2 and 4.7-3) for the following sensitive land uses: the Walt Disney Concert Hall; the REDCAT; office uses in the JVP; the Hikari Lofts; and the Nakamura Tetsujiro Building.

Table 4.7-15. Locally Preferred Alternative
Construction Activity and Equipment Typical Noise Levels at 50 feet

Activity	Duration (months)	Construction Equipment				
		Concrete Truck	Dozer	Excavator	Crane	Drill Rig
Pre-Construction	4-6	NA	NA	NA	NA	90
Site Preparation	12-18	77	85	82	NA	NA
Flower Street Cut and Cover Tunnel	24-48	77	85	82	81	90
Cut and Cover Approach to 2nd/Hope Street Station	24-48	77	85	82	81	90
2nd/Hope Street Station (SEM)[1]	24-48	77	85	82	81	NA
2nd/Hope Street Station (Cut and Cover)	24-48	77	85	82	81	90
2nd Street TBM Tunnel	24-48	77	85	82	81	NA
2nd Street Cut and Cover Station (Broadway Option)	24-48	77	85	82	81	NA
1st/Central Avenue Station	24-48	77	85	82	81	90
Portal	12-24	77	85	82	81	90
TBM Insertion Site	2-4	77	85	82	81	90
1st and Alameda Junction	24-36	77	85	82	81	NA
Operating Systems Installation	TBD	TBD	TBD	TBD	TBD	TBD

Notes:
All noise levels are expressed in dBA.
[1] SEM = sequential excavation method

The Walt Disney Concert Hall is located at the northwest corner of 2nd Street and Grand Avenue and the REDCAT is located adjacent to the Walt Disney Concert Hall at the northeast corner of 2nd and Hope Streets. The Walt Disney Concert Hall houses a variety of uses that range from Category 1 to Category 3 land uses. Taking into account building isolation and losses through the existing parking structure, the temporary and short-term GBV would range from approximately 53 VdB experienced at the most sensitive areas (Category 1) to 68 VdB experienced at the less sensitive areas (Category 2 and 3). These levels would not exceed the

FTA GBV criteria of 65 VdB for Category 1 uses and 78 to 80 VdB for Category 2 and 3 land uses. The temporary and short-term GBN potentially generated from the TBM at the Walt Disney Concert Hall would range from approximately 18 to 48 dBA, respectively, which would exceed the FTA GBN criteria of 25 to 35 dBA for the Walt Disney Concert Hall. The temporary and short-term GBV and GBN potentially generated from the TBM at the REDCAT would be approximately 53 VdB and up to 33 dBA, respectively. These levels would not exceed the FTA criteria of 80 VdB and 43 dBA for the REDCAT. It should be noted that operation of the TBM would be temporary and it would not operate for the entire duration of construction. The TBM would be underground in the vicinity of the Walt Disney Concert Hall and the REDCAT for approximately ten days assuming 35 feet per day.

GBN and GBV would also be generated by delivery trains in the tunnel during construction. Delivery trains could be used in the tunnel during construction as a method to move soil from the tunnel to the surface. It is estimated that the vibration generated by the delivery trains would be approximately 0 to 5dB greater than that generated by the LRT vehicles. Thus, at the Walt Disney Concert Hall, this would result in GBV of 50 VdB experienced at the most sensitive areas (Category 1) to 65 VdB experienced at the less sensitive areas (Category 2 and 3). These levels would not exceed the FTA GBV criteria of 65 VdB for Category 1 uses and 78 to 80 VdB for Category 2 and 3 land uses. GBN experienced at the Walt Disney Concert Hall would be 28 to 42 dBA at the most sensitive and less noise-sensitive land uses, respectively. Based on the FTA criteria for the Walt Disney Concert Hall indicated above, the delivery trains would potentially cause a short-term GBN impact at the Walt Disney Concert Hall. It is anticipated that the delivery trains would generate GBV of 44 VdB and GBN of approximately 26 dBA at the REDCAT, and impacts would be less than significant.

Overall during construction, operation of the TBM and delivery trains would result in a potentially significant GBN impact to the Walt Disney Concert Hall. Operation of the TBM and delivery train would not result in a significant GBV or GBN impact to the REDCAT. With implementation of mitigation identified in Section 4.7.4.2.1 below, GBN generated by the TBM and delivery train would not impact the sensitive activity occurring at the Walt Disney Concert Hall.

The Colburn School, located at the southeast corner of Grand Avenue and 2nd Street, is a school with recording spaces and performance halls. As a school, the Colburn School was considered a Category 3 land use, in other words a land use with primarily daytime use. The analysis using the Category 3 land use classification determined that no significant impacts would occur at the Colburn School during construction. At the request of the Colburn School, additional noise analysis was undertaken, treating the school as a Category 1 land use.

In this area, the LRT tunnels would be located approximately 50 feet below the 2nd Street Tunnel, within the public right-of-way. Per the as-built drawings of the Colburn School, the foundations of the school are located just south of the 2nd Street Tunnel and do not extend below the depth of the 2nd Street Tunnel. In this location, the distance between the LRT tunnel and the Colburn School would be greater than the distance between the LRT tunnel and the Walt Disney Concert Hall, which has foundations extending deeper than the 2nd Street Tunnel and is located along a portion of alignment with a higher elevation than the portion of the alignment at the Colburn School. Given that the distance between the LRT tunnel and the Colburn School would be greater than the distance between the LRT tunnel and the Walt Disney Concert Hall and that GBV impacts would not occur at the Walt Disney Concert Hall during construction, operation of the TBM and delivery trains would not result in significant GBV impacts to the Colburn School even if the school is treated as a Category 1 land use. Although the Colburn School is properly considered as a Category 3 land use in this analysis, if the Colburn School were a Category 1 land use, a potentially significant GBN impact could occur at the Colburn School due to operation of the TBM and delivery trains during construction. Thus, in an abundance of caution, the mitigation identified in Section 4.7.4.2.1 below has been modified to ensure that GBN generated by the TBM and delivery trains would not impact the sensitive activity occurring at the Colburn School.

From the 2nd/Hope Street station, the tracks would continue east underneath 2nd Street to just west of Central Avenue, at approximately the pedestrian signal to the JVP, where the alignment would then veer northeast under privately held property, the JVP office land uses and the Nakamura Tetsujiro Building, and Central Avenue to a proposed Little Tokyo/Arts District underground station (1st/Central Avenue station). The Hikari Lofts, which is considered a Category 2 land use, is located at the northwest corner of 2nd Street and Central Avenue, adjacent to the JVP. As the alignment veers northeast, it would travel underground adjacent to the Hikari Lofts. These land uses are considered Category 2 and Category 3 land uses under the FTA annoyance criteria. As indicated in Table 4.7-2, the FTA annoyance criteria for Category 2 land uses ranges from 80 VdB to 72 VdB for GBV and 43 dBA to 35 dBA for GBN depending on the frequency of the event. The FTA annoyance criteria for Category 3 land uses (the JVP and Nakamura Tetsujiro Building) ranges from 83 VdB to 75 VdB for GBV and 48 dBA to 40 dBA for GBN depending on the frequency of the event.

At a distance of 25 feet, the TBM would potentially generate a GBV level of 86 VdB. The corresponding GBN could be approximately 51 dBA. The JVP offices and the Hikari Lofts would potentially be exposed to these levels of GBV and GBN from TBM activities. The Nakamura Tetsujiro Building would potentially experience GBV and GBN levels of 84 VdB and 49 dBA. Even though this maximum vibration and noise from TBM operations would be occasional or infrequent, the TBM activities would potentially exceed the annoyance criteria listed above for occasional or frequent events at the Hikari Lofts, JVP offices, and the Nakamura Tetsujiro Building, which would result in a significant impact. With implementation of mitigation identified in Section 4.7.4.2.1 below, GBV and GBN potential impacts to these sensitive land uses would be reduced to less than significant.

Delivery trains would be used in the LRT tunnel during construction, which could generate infrequent events of GBV and GBN. The Hikari Lofts, JVP offices, and the Nakamura Tetsujiro Building would experience GBV of approximately 64 VdB and GBN up to 42 dBA. These levels would be less than the infrequent events criteria for Category 2 and 3 land uses and thus no impact would occur from delivery trains.

The Broad Art Foundation Museum is currently under construction on the southwest corner of Grand Avenue and 2nd Street. This project would be a Category 3 land use with FTA annoyance criteria ranging from 83 VdB to 75 VdB for GBV and 48 dBA to 40 dBA for GBN depending on the frequency of the event. Due to refinements to the LPA, GBN generated by operation of the TBM (42 to 57 dBA) and delivery trains (up to 46 dBA) could exceed the FTA GBN annoyance criteria for the Broad Art Foundation Museum and could result in a significant impact. With implementation of mitigation identified in Section 4.7.4.2.1 below, potential GBN impacts to this potential sensitive land use would be reduced to less than significant. GBV generated by the TBM (77 VdB) and delivery trains (up to 63 VdB) would not exceed the FTA GBV annoyance criteria for the Broad Art Foundation Museum and impacts would be less than significant. Refer to Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR for further information.

4.7.3.5.2 Transit Operation Noise

The LPA would have five sources of potential noise impacts during operations. These include pass-by noise from LRT vehicles, areas of special trackwork, ventilation shafts, TPSS, and roadway and lane-reconfigurations.

Pass-by Impacts:

Noise modeling for the LPA assumes a three-car train with 2.5-minute headways during peak hours (6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 7:00 p.m.) and 5-minute headways during off peak hours (5:00 a.m. to 6:00 a.m., 9:00 a.m. to 3:00 p.m., and 7:00 p.m. to 1:00 a.m.). There would be no regularly planned service between 1:00 a.m. and 5:00 a.m. However, Metro may run trains later during special events like New Years Eve. The model assumes trains will travel at 35 MPH along Flower and Temple Streets and 25 MPH along 2nd, Main, and Los Angeles Streets.

The only land use under the LPA with potential pass-by noise impacts would be the Los Angeles Hompa Hongwanji Temple at the intersection of 1st and Vignes Streets. As shown in Table 4.7-16, LRT vehicle pass-bys would not result in significant, adverse noise impacts under this alternative.

Warning Signals:

The LPA would not add any additional warning signals and, therefore, would not create noise impacts from at-grade warning signals.

Special Trackwork:

The LPA would require special trackwork for turnouts, which allow trains to move from one track to another, and crossovers, which allow trains to move between parallel tracks. Noise from switches or crossovers comes from a small gap in the central part of the switch, which could increase noise levels up to 6 dBA locally.

The LPA would include an above-grade switch along 1st Street near the Los Angeles Hompa Hongwanji Temple, which would be needed during construction for the temporary tracks. The switch would be located along 1st Street, between Hewitt and Garey Streets, at a distance of 70 feet from the Los Angeles Hompa Hongwanji Temple, which would ensure no noise impact would occur to the Temple due to operation of the switch. The noise analysis predicted that there would not be an adverse noise impact to the Temple (see Table 4.7-17). All other special track work would be below-grade or within portal structures and would not result in noise impacts to sensitive land uses.

Ventilation Shafts and TPSS:

Ventilation shafts and TPSS would be designed in accordance with Metro system-wide design criteria noise guideline of 50 dBA at 50 feet or the nearest residential building, whichever is closer. Under the LPA, noise levels associated with ventilation and TPSS would be far lower than current ambient noise levels and would not exceed FTA noise impact criteria. No significant, adverse noise impacts would occur.

Roadway and Lane Reconfigurations:

Roadway and lane reconfigurations would be needed around the 2nd/Hope Street station. The roadways surrounding the 2nd/Hope Street station would be reconfigured, but not in a way that would increase traffic (e.g., increase number of land or vehicle trips) and, therefore, would not result in noise or vibration impacts. In addition, the roadway and lane reconfigurations would not result in the relocation of a noise source closer to a sensitive land use.

4.7.3.5.3 Transit Operation Vibration

The LPA would have two potential sources of vibration impacts during operations: pass-by vibration from LRT vehicles and areas of special trackwork.

Vibration modeling for the LPA uses the same assumptions about train traffic as the noise impact analysis. Based on FTA's generalized ground surface vibration curves, vibration impacts are not predicted from LRT vehicle pass-bys under the LPA, as presented in Table 4.7-18 (USDOT 2006). The LPA would include an above-grade switch along 1st Street near the Los Angeles Hompa Hongwanji Temple. Based on FTA's general vibration assessment guidelines, special trackwork for this alternative would add 10 db to the vibration level for LRT vehicle pass-bys. At the switch along 1st Street, the predicted vehicle pass-by vibration level at Sites H and 3 would be 68 VdB, which is still below the FTA criterion of 72 VdB. Thus, no adverse GBV impacts would occur for the LPA.

Additional noise and vibration studies were performed for refinements to the LPA alignment (contained in Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR). Due to the refinements to the LPA, operation of the LPA could result in GBN impacts at the following sensitive land uses: the Walt Disney Concert Hall; office uses in the JVP; the Hikari Lofts; and the Nakamura Tetsujiro Building. As shown in Table 4.7-18, one LRT vehicle pass-by associated with the LPA, which is considered a frequent event under FTA criteria, would potentially generate GBN up to 37 dBA at the Walt Disney Concert Hall and 47 dBA at the Hikari Lofts, office uses in the JVP, and the Nakamura Tetsujiro Building. These GBN levels would potentially exceed the following FTA annoyance criterion for frequent events: 25 dBA for the Walt Disney Concert Hall, 35 dBA for the Hikari Lofts, and 40 dBA for the office uses in the JVP and the Nakamura Tetsujiro Building. Thus, potentially significant GBN impacts from LRT vehicle pass-bys are predicted at these sensitive land uses.

Under a two LRT vehicle pass-by scenario, which would be considered an occasional/infrequent event under FTA criteria, the LPA would potentially generate GBN between 26 and 40 dBA at the Walt Disney Concert Hall, and 50 dBA at the Hikari Lofts, office uses in the JVP, and the Nakamura Tetsujiro Building. These GBN levels would potentially exceed the following FTA annoyance criterion for occasional/infrequent events: 25 dBA for sensitive uses and 38 to 43 dBA for less sensitive uses for the Walt Disney Concert Hall, 38 dBA for the Hikari Lofts, and 43 dBA for the office uses in the JVP and the Nakamura Tetsujiro Building. Thus, potentially significant GBN impacts from two LRT vehicle pass-bys are predicted at these sensitive land uses. It should be noted that a two LRT vehicle pass-by would be infrequent.

However with implementation of mitigation identified in Section 4.7.4.2.2 below, GBN impacts from one and two LRT vehicle pass-bys to the Walt Disney Concert Hall, the Hikari Lofts, office uses in the JVP, and the Nakamura Tetsujiro Building would be reduced to less than significant. As a performance standard, mitigation identified in Section 4.7.4.2.2 is required to reduce GBN below the appropriate FTA annoyance criteria.

As indicated above, the distance from the LRT tunnel to the Colburn School would greater than the distance from the LRT tunnel to the Walt Disney Concert Hall. Therefore, the level of GBV and GBN, generated by one and two LRT vehicle pass-bys at the Colburn School would be lower but similar to the level of GBV and GBN generated at the Walt Disney Concert Hall. Although no impacts are anticipated for this site, when analyzed as a Category 1 land use, it appears that the Colburn School could experience potentially significant GBN impacts from one and two LRT vehicle pass-bys. Thus, in an abundance of caution, the mitigation identified in Section 4.7.4.2.2 below has been modified to ensure that GBN generated by one and two LRT vehicle pass-bys at the Colburn School would not impact the sensitive activity occurring at the Colburn School.

The Broad Art Foundation Museum is currently under construction on the southwest corner of Grand Avenue and 2nd Street. This project would be a Category 3 land use with a FTA annoyance criteria ranging from 83 VdB to 75 VdB for GBV and 48 dBA to 40 dBA for GBN depending on the frequency of the event. One LRT vehicle pass-by associated with the LPA, which is considered a frequent event under FTA criteria, could generate GBV less than 70 VdB at the Broad Art Foundation Museum, which would be below the FTA annoyance criteria and impacts would be less than significant. GBN levels generated by one LRT vehicle pass-by would range from 36 to 51 dBA at the Broad Art Foundation Museum and could potentially exceed the FTA annoyance criterion for frequent events. Thus, potentially significant GBN impacts from LRT vehicle pass-bys could occur at the Broad Art Foundation Museum.

Under a two LRT vehicle pass-by scenario, which would be considered an occasional event under FTA criteria, the LPA would potentially generate GBV up to 73 VdB at the Broad Art Foundation Museum, which would be below the FTA annoyance criteria and impacts would be less than significant. GBN levels generated by two LRT vehicle pass-bys would range from 39 dBA to 54 dBA at the Broad Art Foundation Museum and could potentially exceed the FTA annoyance criterion for an occasional event. Thus, potentially significant GBN impacts from two LRT vehicle pass-bys could occur at the Broad Art Foundation Museum. It should be noted that a two LRT vehicle pass-by would be infrequent.

However, with implementation of mitigation identified in Section 4.7.4.2.2 below, potential GBN impacts from one and two LRT vehicle pass-bys to the Broad Art Foundation Museum would be reduced to less than significant. As a performance standard, mitigation identified in Section 4.7.4.2.2 is required to reduce GBN below the appropriate FTA annoyance criteria. Refer to Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR for further information.

As shown in Table 4.7-18, the greatest GBN levels generated by LRT vehicle pass-bys and special trackwork would be 33 dBA at all other sensitive land uses, which is below the FTA criterion of 35 dBA. Thus, adverse vibration or GBN impacts from LRT vehicle pass-bys and special trackwork are not predicted at all other sensitive land uses.

4.7.3.5.4 NEPA Finding

During construction of the LPA, potential noise effects on sensitive land uses would not be adverse. With regard to the physical structure of the building, construction-related vibration impacts to sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4), and historic buildings located within 21 feet of the anticipated vibration-producing construction activity would be significant. Implementation of mitigation measures identified in Section 4.7.4.2.1 below will reduce potentially adverse vibration effects under NEPA to sensitive or historic buildings within 21 feet of construction to not substantially adverse.

With regard to sensitive land uses, during construction, GBV and GBN generated by the TBM would result in potentially adverse effect to office uses in the JVP; the Hikari Lofts, and the Nakamura Tetsujiro Building. GBN generated by the TBM and the delivery trains would result in a potentially adverse GBN noise effect to the Walt Disney Concert Hall and the Broad Art Foundation Museum, currently under construction. With implementation of mitigation identified in Section 4.7.4.2.1 below, potential GBV and GBN effects during construction will not be substantially adverse under NEPA at the locations identified above. All other noise and vibration effects associated with construction of the LPA would not be adverse. With implementation of mitigation measures identified in Section 4.7.4.2.1 below, construction of the LPA will not contribute to potentially adverse cumulative noise or vibration effects. As noted elsewhere, mitigation for the Walt Disney Concert Hall has been modified to cover the Colburn School as well, in an abundance of caution.

GBN generated by LRT vehicle pass-bys associated with operation of the LPA would result in potentially adverse effects at the Walt Disney Concert Hall, Hikari Lofts, office uses in the JVP, the Nakamura Tetsujiro Building, and the Broad Art Foundation Museum, currently under construction. With implementation of mitigation identified in Section 4.7.4.2.2 below, potential GBN effects to the Walt Disney Concert Hall, the Hikari Lofts, office uses in the JVP, the Nakamura Tetsujiro Building, and the Broad Art Foundation Museum, currently under construction will not be adverse. All other noise and vibration effects associated with operation of the LPA would not be adverse. As noted elsewhere, mitigation for the Walt Disney Concert Hall has been modified to also cover the Colburn School as well, in an abundance of caution. With implementation of mitigation measures identified in Section 4.7.4.2.2 below, operation of the LPA will not contribute to potentially adverse cumulative noise or vibration effects. Again, mitigation for the Walt Disney Concert Hall has been modified to also cover the Colburn School as well, in an abundance of caution.

4.7.3.5.5 CEQA Determination

During construction of the LPA, potential noise impacts to sensitive land uses would not be significant. During construction, GBV and GBN generated by the TBM would result in potentially significant impacts to office uses in the JVP; the Hikari Lofts, and the Nakamura Tetsujiro Building. GBN generated by the TBM and the delivery trains would result in a potentially significant GBN noise impact to the Walt Disney Concert Hall and the Broad Art Foundation Museum, currently under construction. With implementation of mitigation identified in Section 4.7.4.2.1 below, potential GBV and GBN impacts during construction would be less than significant under CEQA at the locations identified above. All other noise and vibration impacts associated with construction of the LPA would not be significant. With implementation of mitigation measures identified in Section 4.7.4.2.1 below, construction of the LPA would not contribute to potentially significant cumulative noise or vibration impacts. As noted elsewhere, mitigation for the Walt Disney Concert Hall has been modified to also cover the Colburn School as well, in an abundance of caution.

GBN generated by LRT vehicle pass-bys associated with operation of the LPA would result in potentially significant impacts at the Walt Disney Concert Hall, Hikari Lofts, office uses in the JVP, the Nakamura Tetsujiro Building, and the Broad Art Foundation Museum, currently under construction. With implementation of mitigation identified in Section 4.7.4.2.2 below, potential GBN impacts to the Walt Disney Concert Hall, the Hikari Lofts, office uses in the JVP, the Nakamura Tetsujiro Building, and the Broad Art Foundation Museum, currently under construction would be reduced to less than significant. All other noise and vibration impacts associated with operation of the LPA would be less than significant. With implementation of mitigation measures identified in Section 4.7.4.2.2 below, operation of the LPA would not contribute to potentially significant cumulative noise or vibration impacts. Again, mitigation for the Walt Disney Concert Hall has been modified to also cover the Colburn School as well, in an abundance of caution.

Table 4.7-16. Locally Preferred Alternative Predicted Noise Levels and Operational Impacts

Site #	Receptor Description	Underground LRT Segment	FTA Land Use[1]	Existing Ldn[2] (dBA)/Peak Hour Leq (dBA)	Predicted Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Predicted Existing + Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Number of Noise Impact					
							Moderate			Severe		
							SF	MF	Non-Residential	SF	MF	Non-Residential
3	Los Angeles Hompa Hongwanji Temple	Portal to Gold Line	3	70	60	70	0	0	0	0	0	0

Source: Parsons Brinckerhoff, 2009
Notes:
[1] Land use category descriptors: FTA Category 1 = buildings or parks where low noise levels are an essential element of their purpose; FTA Category 2 = residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
[2] Ldn is used for land uses with nighttime sensitivity to noise and for residential areas where FTA rather than FHWA noise procedures are applicable. Peak-hour Leq is used for commercial, industrial, and other land uses that do not have nighttime noise sensitivity.

Table 4.7-17. Locally Preferred Alternative Predicted Noise Levels with Special Trackwork

Site #	FTA Land Use Category[1]	Existing Ldn[2] (dBA)/Peak Hour Leq (dBA)	Predicted Project Ldn[2] (dBA)/Peak Hour Leq (dBA)	Noise Impact	Predicted Project + 6 dBA for Special Trackwork Ldn[2] (dBA)/Peak Hour Leq (dBA)	Predicted Existing + Project and Special Trackwork Ldn[2] (dBA)/Peak Hour Leq (dBA)	Noise Impact
3	3	70	60	No Impact	66	71	No Impact

Source: Parsons Brinckerhoff, Inc., 2009
Notes:
[1] Land use category descriptors: FTA Category 1 = buildings or parks where low noise levels are an essential element of their purpose; FTA Category 2 = residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
[2] Ldn is used for land uses with nighttime sensitivity to noise and for residential areas where FTA rather than FHWA noise procedures are applicable. Peak-hour Leq is used for commercial, industrial, and other land uses that do not have nighttime noise sensitivity.

Table 4.7-18. Locally Preferred Alternative Predicted Ground-Borne Noise and Vibration Levels and Impacts

Site #	FTA Land Use Category[1]	FTA Vibration Level Criteria (VdB)	FTA GBN Level Criteria (dBA)[2]	Predicted Project Vibration Levels (VdB)	Predicted Project GBN Levels (dBA)[3]	Vibration and GBN Impact
1	3	75	40	65	30	No Impact
A	2	72	35	64	29	No Impact
2	3	75	40	61	26	No Impact
B	2	72	35	58	23	No Impact
C	2	72	35	63	28	No Impact
I	2	72	35	67	32	No Impact
4	3	75	40	67	32	No Impact
D	2	72	35	67	32	No Impact
E	2	72	35	64-69	40-47	GBN Impact
G	2	72	35	58	23	No Impact
H	2	72	35	58/68	23/33	No Impact
3	3	75	40	58/68	23/33	No Impact
DH	Special Building	65	25	55-64	37	GBN Impact
JVP	3	75	40	53-69	24-47	GBN Impact
NT	3	75	40	64-69	40-47	GBN Impact

Source: Parsons Brinckerhoff, Inc., 2009; Wilson Ihrig & Associates 2011
Notes:
DH = Walt Disney Concert Hall, JVP = Japanese Village Plaza office land uses, NT = Nakamura Tetsujiro Building
#/# = LRT pass-by/LRT pass-by with special track work
[1] Land use category descriptors: FTA Category 1 = buildings or parks where quiet is an essential element of their purpose; FTA Category 2 = residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
[2] Impact criteria are for frequent events.
[3] Based on more conservative "typical" vibration spectra.

4.7.4 Mitigation Measures

4.7.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR and the Supplemental EA/Recirculated Draft EIR Sections, Metro has added specificity to the candidate mitigation measures for noise and vibration impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.7.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- The addition of mitigation during construction and operation of the LPA to reduce GBN levels that could occur at the Broad Art Foundation Museum, currently under construction.
- Mitigation for the Walt Disney Concert Hall has been modified to also cover the Colburn School, in an abundance of caution.

4.7.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

4.7.4.2.1 Final Construction Mitigation Measures for the Locally Preferred Alternative

During the construction phase of the LPA, sensitive or historic buildings within 21 feet of construction may be susceptible to vibration damage. The following mitigation measures shall be implemented:

- A survey of historic properties and/or historical resources within 21 feet of vibration producing construction activity shall be conducted to confirm the building category, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. The survey shall also be used to establish baseline, pre-construction conditions for historic properties and historical resources. During preliminary engineering and final design of the project, additional subsurface (geotechnical) investigations shall be undertaken to further evaluate soil, groundwater, seismic, and environmental conditions along the alignment. The analysis shall assist in the selection and development of appropriate support mechanisms for cut and cover construction areas and any sequential excavation method (mining) construction areas, in accordance with industry standards and the Building Code. The subsurface investigation shall also identify areas that could experience differential settlement as a result of using a TBM in close proximity to historic properties and/or historical resources. An architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards shall provide input and review of design contract documents prior to implementation of the mitigation measures. (CR/B-2)

- The mitigation measure above shall also apply to sensitive, non-historic structures (Category I, II, III, IV buildings as defined in Table 4.7-4) located within 21 feet of vibration producing construction activity. However, design contract documents shall not require input or review by an architectural historian or historical architect under this mitigation measure. (NV-1)

- A vibration monitoring plan shall be developed during final design to ensure appropriate measures are taken to avoid any damage to sensitive buildings (Category I, II, III, IV buildings as defined by FTA in Table 4.7-4) or historic buildings due to construction-induced vibration. This shall include pre-construction surveys of all buildings within 21 feet of vibration producing construction activity to confirm the building category (Category I, II, III, IV buildings as defined in Table 4.7-4), structural condition of the building, and to provide a baseline for monitoring of GBV and measuring the potential for GBV to cause damage where needed. Any damage caused by Metro's construction activities shall be repaired. (NV-2)

The following mitigation measures will further reduce annoyance to sensitive land uses caused by GBV. All or a combination of the following measures may be used to mitigate adverse noise and vibration impacts:

- Distances greater than those provided in EIS/EIR Table 4.7-5 shall be maintained near vibration-sensitive locations to avoid potential construction-related vibration impacts. (NV-3)

- Less vibration-intensive construction equipment or techniques shall be used near vibration-sensitive locations. (NV-4)

- Heavily laden vehicles shall be routed away from vibration-sensitive locations. (NV-5)

- Earthmoving equipment shall be operated as far as possible from vibration-sensitive locations. (NV-6)

- Construction activities that produce vibration, such as demolition, excavation, earthmoving, and ground impacting shall be sequenced so that the vibration sources do not operate simultaneously. (NV-7)

- Nighttime construction activities that produce noticeable vibration shall be avoided near vibration-sensitive locations. (NV-8)

- Devices with the least impact shall be used to accomplish necessary tasks. (NV-9)

- Non-impact demolition and construction methods, such as saw or torch cutting and removal for off-site demolition, chemical splitting, and hydraulic jack splitting, shall be used instead of high impact methods near vibration-sensitive locations. (NV-10)

- Building protection measures such as underpinning, soil grouting, or other forms of ground improvement shall be used where needed to prevent deterioration of building condition due to construction. (NV-11)

- Pavement breakers, vibratory rollers, and packers shall operate as far as possible from vibration-sensitive locations. (NV-12)

The construction mitigation plan shall prohibit noise levels generated during construction from exceeding the FTA construction noise criteria. This could include prohibiting simultaneous operation of major pieces of construction equipment if simultaneous operation exceeds FTA construction noise criteria.

If a noise complaint is filed during project construction, noise monitoring shall be conducted in the vicinity of the area in question. If monitored noise levels exceed FTA construction noise criteria, the contractor shall use all or a combination of the following measures to reduce construction noise levels below FTA construction noise criteria: (NV-13)

- Temporary noise barriers around the construction sites and localized barriers around specific items of equipment or smaller areas shall be provided as needed. (NV-14)

- Alternative back-up alarms/warning procedures shall be used where feasible as needed. (NV-15)

- Higher performance mufflers shall be used on equipment used during nighttime hours as needed near sensitive land uses. (NV-16)

- Portable noise sheds for smaller, noisy equipment, such as air compressors, dewatering pumps, and generators shall be provided as needed. (NV-17)

In addition to the construction mitigation measures listed above, the following mitigation measures will also reduce the potential annoyance to the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, caused by GBN associated with construction of the LPA. The following measures shall be used to mitigate adverse GBN impacts, and with respect to the Colburn School, are adopted in an abundance of caution:

- Construction of the LPA, in the vicinity of the Walt Disney Concert Hall, shall be done in accordance with the Memorandum of Agreement (MOA) between FTA and the State Historic Preservation Officer (SHPO), which includes stipulations that outline the specific requirements for consultation and decision-making between the lead federal agency and consulting parties, specify the level of Historic American Building Survey/Historic American Engineering Record (HABS/HAER) recordation, and outline specific requirements for pre- and post-construction surveys, geotechnical investigations, building protection measures, and TBM specifications (for the Walt Disney Concert Hall only). (NV-18)

Tunnel Boring Machine

- Maintenance and Operation: The construction contractor shall minimize vibration from jacking or pressing operations (if applicable, the action could be smoothed out to avoid a sharp push), and maintain machinery in good working order. (NV-19)

- Coordination and Notification: There would be times when the Main Auditorium of the Walt Disney Concert Hall is vacant or not used for a noise-sensitive activity, thereby eliminating any noise impact from TBM. Similarly, there would be times at the Los Angeles Philharmonic Association (LAPA) Conference Room (and offices) of the Walt Disney Concert Hall and at the recording/performance halls of the Colburn School when activities are not particularly noise-sensitive. Metro shall coordinate closely with the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, to ensure that the noise-generating parts of TBM operations shall be conducted to avoid noise-sensitive periods. (NV-20)

Delivery Train

- Speed: Delivery train speed shall be limited to 5 MPH in the vicinity of the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, currently under construction, which would reduce the GBN to the lower range, or 5 dBA from the maximum range. (NV-21)

- Resilient Mat: A resilient system to support and fasten the delivery train tracks shall be used during construction, which would reduce GBN levels by at least 4 dBA. (NV-22)

    - Such as system shall include a) resilient mat under the tracks and b) a resilient grommet or bushing under the heads of any track fasteners (assuming some kind of anchor or bolt system). The hardness of the resilient mat shall be in the 40 to 50 durometer range, and be about one to two inches thick, depending on how heavily loaded the cars would be. The contractor shall select the mat thickness so that the rail does not bottom out during a car pass-by.

- Conveyor: The delivery train shall be replaced with a conveyor system to transport materials in the tunnel if GBN exceeds the FTA annoyance criteria at the Walt Disney Concert Hall, the Colburn School, or the Broad Art Foundation Museum, which is currently under construction. (NV-23)

- Coordination and Notification: There would be times when the Main Auditorium and Choral Hall of the Walt Disney Concert Hall and the recording/performance halls of the Colburn School are vacant or not used for noise-sensitive activities, thereby eliminating any noise impact from the delivery train. Metro shall coordinate closely with the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, to ensure that the delivery train pass-bys would be conducted to avoid noise-sensitive periods. (NV-24)

In addition to the general construction mitigation measures listed above, the following mitigation measures will also reduce the potential annoyance to the Hikari Lofts, office uses in the JVP, and the Nakamura Tetsujiro Building caused by GBV and/or GBN associated with construction of the LPA. The following measures shall be used to mitigate adverse GBV and GBN impacts:

- Metro shall provide advance notice and coordinate with the affected property owners regarding schedules for tunneling and other activities prior to the commencement of those activities. (NV-25)

- Metro shall provide advanced notification and coordination by doing the following. (NV-26)

  - Metro shall establish a Construction Community Relation Program to inform and coordinate construction activities including notification to all occupants at the Hikari Lofts, the interior designer office at the JVP, and the Nakamura Tetsujiro Building about the schedule of tunneling activities at least one month prior to the start of the activities.

  - Metro shall monitor GBN and GBV levels in the in the building adjacent to TBM activity during its operation in that area.

  - During the few days the TBM will be operating in this area, should GBN or GBV measurements exceed FTA annoyance criteria for short-term impacts during construction, Metro shall offer to temporarily relocate affected residents.

4.7.4.2.2 Final Operational Mitigation Measures for the Locally Preferred Alternative

The following mitigation measures will reduce potential GBN impacts at the Walt Disney Concert Hall, Hikari Lofts, office uses in the JVP, the Nakamura Tetsujiro Building, and the Broad Art Foundation Museum, currently under construction due to LRT vehicle pass-bys associated with the LPA. The following mitigation measure is also applied with respect to the Colburn School, in an abundance of caution.

- In the vicinity of the Walt Disney Concert Hall and the Colburn School, Metro shall implement resiliently supported fasteners, isolated slab track, or other appropriate measures as needed to eliminate impacts and to reduce GBN below FTA annoyance criteria. (NV-27)

- In the vicinity of the Hikari Lofts and Nakamura Tetsujiro Building, Metro shall conduct engineering studies during final design to verify initial estimates of GBN and shall implement high compliance resilient fasteners, floating slab trackbed, or other appropriate measures as needed to eliminate impacts and to reduce GBN below FTA annoyance criteria. (NV-28)

- In the vicinity of the offices at JVP and the Broad Art Foundation Museum, currently under construction, Metro shall conduct engineering studies during final design to verify initial estimates of GBN and shall implement high compliance resilient fasteners or other appropriate measures as needed to eliminate impacts and reduce GBN below FTA annoyance criteria. (NV-29)

4.8 Ecosystems/Biological Resources

This section summarizes the existing biological resources located in the project area and the potential impacts of the proposed alternatives on these resources. Information in this section is based on the Ecosystems/Biological Resources Technical Memorandum prepared for the project contained in Appendix T of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. Minor modifications have been made to this section since publication of the Draft EIS/EIR, which include the addition of information from Appendix T, Ecosystems/Biological Resources Technical Memorandum. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.8.4.2 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA that have occurred since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of ecosystems and biological resource impacts associated with the LPA is detailed below in Section 4.8.3.5.

4.8.1 Regulatory Framework

Biological resources within the project area are protected by several federal, state, and local laws and policies, such as the Endangered Species Act, the Migratory Bird Treaty Act (MBTA), the California Endangered Species Act, the California Fish and Game Code, and the City of Los Angeles Native Tree Protection Ordinance.

Under the Endangered Species Act, consultation with the United States Fish and Wildlife Service (USFWS) is required if there is potential for a federally threatened or endangered species to be affected by the project. Because there would be no effects to federally threatened or endangered species (or critical habitat) from the project, no consultation with the USFWS was conducted.

The City of Los Angeles Native Tree Protection Ordinance (Ordinance No. 177,404) protects native oak tree species, California Sycamore, California Bay, and California Black Walnut. It was passed to slow the decline of native tree habitat. The ordinance applies to trees greater than four inches in diameter on both public and private lots and requires replacement of removed trees.

Thresholds for biological resources are identified in Section C of the L.A. CEQA Thresholds Guide. The measures below state that a project would normally have a significant impact on biological resources if it could:

- Result in the loss of individuals, or the reduction of existing habitat, of a state- or federally-listed endangered, threatened, rare, protected, or candidate species, or a Species of Special Concern, or federally-listed critical habitat.
- Result in the loss of individuals, the reduction of existing habitat of a locally designated species, or a reduction in a locally designated natural habitat or plant community.
- Interfere with habitat such that normal species behaviors are disturbed (e.g., from introducing noise, light) to a degree that may diminish the chances for long-term survival of a sensitive species.

More information regarding these laws and policies is available in Appendix T, Ecosystems/Biological Resources Technical Memorandum, of this EIS/EIR.

4.8.2 Affected Environment

Due to its densely developed and urbanized nature, the project area provides little opportunity for wildlife species or other biological resources to exist. There are no Habitat Conservation Plans for this area, and no Significant Ecological Areas located within 0.25 mile of either side of the proposed alignments (City of Los Angeles 2001). There are no wildlife corridors within this area to support movement of wildlife species. There are no wetlands, oak woodlands, or coastal sage scrub habitat within the project area. The Los Angeles River, which is contained within a concrete channel through the downtown area, is located more than 0.25 mile away from the project area.

A review of the California Natural Diversity Database (CNDDB) was conducted to identify sensitive plants and animals potentially occurring in the project area. CNDDB results are reported for the United States Geological Survey (USGS) Los Angeles 7.5-minute quadrangle which is an approximately 60-square mile area. One vegetation community, seven wildlife species, one of which is federally and California endangered, and eight plant species, two of which are seriously endangered in California, were listed on the CNDDB in the Los Angeles quadrangle. The results for this large area may not be accurate for the project area which is only about 1.6 square miles. Therefore, a field survey of the project area was also conducted on May 17, 2009. The field survey included parks and other public open spaces within 0.25 mile of either side of the proposed alignments, and included visual observation and photographic documentation of all parks, open space areas, and mature trees within the project area. Based on the field survey, there is no habitat within the project area that could support the sensitive species and vegetation community identified by the CNDDB as potentially occurring within the Los Angeles quadrangle. There is also no potential for the sensitive species and vegetation community identified by the CNDDB within the Los Angeles quadrangle to occur in the project area.

However, mature trees were observed along the proposed alignments and within roadway medians. Due to their mobility, some migratory bird species may utilize these mature trees during migration. While unlikely, there is potential for migratory birds, including raptors, to utilize these mature trees for breeding.

California Sycamore, a native tree species protected under the City of Los Angeles Native Tree Protection Ordinance, is found in several locations within the project area.

Table 4.8-1 shows trees that were identified in the project area.

Table 4.8-1. Trees Potentially Affected by the Build Alternatives

Location	At-Grade Emphasis LRT		Underground Alternatives[9]	
	Native (CA sycamores)	Palms and other mature non-native trees	Native (CA sycamores)	Palms and other mature non-native trees
Los Angeles Library (at Flower and 5th Streets)[1]	10	25	10	15
Flower Street to 2nd Street	0	15	0	0
Flower Street where alignment turns[2]	5	25	5	25
Along 2nd Street to Los Angeles Street[3]	20	35	0	0
Underground station at 2nd Street - Broadway[4]	0	0	10	15
Underground Emphasis LRT station at 2nd Street - Los Angeles Street Option[5]	0	0	10	25
Main Street (At-Grade Emphasis LRT only)[6]	20	40	0	0
Los Angeles Street (At-Grade Emphasis LRT only)[7]	5	35	0	0
Temple Street (At-Grade Emphasis LRT only)[8]	0	15	0	0
2nd Street east of Los Angeles Street (Underground Emphasis LRT only)	0	0	5	35
At-grade tracks along Alameda and underpass (Underground Emphasis LRT only)	0	0	0	15
LPA station at 1st Street and Central Avenue	0	0	0	7[10]

Table 4.8-1. Trees Potentially Affected by the Build Alternatives (continued)

Location	At-Grade Emphasis LRT		Underground Alternatives[9]	
	Native (CA sycamores)	Palms and other mature non-native trees	Native (CA sycamores)	Palms and other mature non-native trees
LPA portal east of Alameda Street	0	0	0	0[11]
Totals				
At-Grade Emphasis LRT Alternative	60	190	N/A	N/A
Underground Emphasis LRT Alternative	N/A	N/A	40	130
LPA[12]	N/A	N/A	25	62

Notes:
[1] The station at this location is underground for the build alternatives, but the potential impact is calculated based on the at-grade construction footprint.
[2] The station footprints are identical for the build alternatives since alignments are located underground.
[3] Alignments are along 2nd Street but impacts are different depending on whether proposed LRT is at-grade or underground.
[4] No station proposed at this location for the At-Grade Emphasis LRT Alternative.
[5] No station proposed at this location for the At-Grade Emphasis LRT Alternative or the LPA.
[6] Table lists existing sycamores and mature non-native trees along Main Street.
[7] Large pines located in the center median, other trees located along Los Angeles Street.
[8] Inventory includes large ficus, etc. along Temple Street.
[9] Underground alternatives include the Underground Emphasis LRT Alternative and the LPA.
[10] Includes trees on the west side of Alameda between 1st and 2nd Streets that may be affected and one mature cherry tree on Central Avenue that could be impacted if the building containing the Weiland Brewery is removed.
[11] There are several small trees along 1st Street that are much less than four inches dbh.
[12] Trees potentially impacted by the LPA (which only includes three stations) would be less than or equal to the number of trees potentially impacted by the Fully Underground LRT Alternative (which included four stations).

4.8.3 Environmental Impacts/Environmental Consequences

Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.8.1.

4.8.3.1 No Build Alternative

The No Build Alternative would have no direct or indirect effects on ecosystems or biological resources in the project area since there would be no construction activities. Since the No Build Alternative would not result in direct or indirect impacts to ecosystems or biological resources, there would be no cumulative impacts.

4.8.3.2 TSM Alternative

The two new express shuttle bus lines created under the TSM Alternative would not require construction that would directly or indirectly impact ecosystems or biological resources in the project area. The TSM Alternative would have no direct or indirect effects on ecosystems or biological resources in the project area. Since the TSM Alternative would not result in direct or indirect impacts to ecosystems or biological resources, there would be no cumulative impacts.

4.8.3.3 At-Grade Emphasis LRT Alternative

During construction of the At-Grade Emphasis LRT Alternative, some mature trees located along the proposed alignment could be removed or disturbed. However, it is unknown at this time exactly how many trees could be affected by construction of this alternative. Table 4.8-1 shows the maximum number of trees that could be affected. There are currently 250 mature trees in the area that could potentially be affected by construction, and a subset of these trees could be removed or disturbed during construction of the At-Grade Emphasis LRT Alternative. Of this total, 60 trees are protected native California sycamore trees. As project design progresses and construction plans are finalized, it may be possible to minimize the number of trees affected by avoidance or fencing. Potential mitigation measures are described in Section 4.8.4 of the Draft EIS/EIR and include compliance with the Native Tree Protection Ordinance. Compliance with the Native Tree Protection Ordinance would reduce this potential impact to a less than significant level. Additionally, station landscaping and urban design along the entire alignment would include planting new trees. Therefore, after mitigation, the At-Grade Emphasis LRT Alternative could result in a net increase in total tree inventory.

Removal or disturbance of mature trees could increase competition for food and nesting habitat for migratory bird species, which could result in a potential indirect impact. This adverse impact would not be significant, since the project area provides only low quality habitat for a small number of migratory birds, if any. Further, mitigation taken to comply with the MBTA and the California Fish and Game Code would reduce potential indirect impacts to a less than significant level.

Construction activities associated with future projects have the potential to affect migratory birds if nesting habitat is disturbed during the breeding season. Other ongoing and future construction projects would be required to implement mitigation measures for any potential impacts to biological resources, particularly migratory birds, as required under either the MBTA or the California Fish and Game Code. Therefore, there would be no cumulative impacts from the At-Grade Emphasis LRT Alternative with respect to biological resources.

Since the project area is already highly urbanized and the LRT project would be consistent with the urban character of the project area, there would be no operational impacts on ecosystems or biological resources.

4.8.3.3.1 NEPA Finding

The At-Grade Emphasis LRT Alternative would not have an adverse effect on ecosystems or biological resources in the project area.

4.8.3.3.2 CEQA Determination

With implementation of proposed mitigation measures, the At-Grade Emphasis LRT Alternative would not have a significant impact on ecosystems or biological resources.

4.8.3.4 Underground Emphasis LRT Alternative

Construction of the Underground Emphasis LRT Alternative could require less removal or disturbance of mature trees located along the proposed alignment than under the At-Grade Emphasis LRT Alternative. There are currently 170 mature trees in the area that could potentially be affected by construction, and a subset of these trees could be removed or disturbed during construction of the Underground Emphasis LRT Alternative. However, it is unknown at this time exactly how many trees could be affected by construction of this alternative. Table 4.8-1 shows the maximum number of trees that could be affected. An estimated 40 protected native California sycamore trees occur in the potential area of impact and could be affected by this alternative. As project design progresses and construction plans are finalized, it may be possible to minimize the number of trees affected by avoidance or fencing. Potential mitigation measures are described in Section 4.8.4 of the Draft EIS/EIR and include compliance with the Native Tree Protection Ordinance. Compliance with the Native Tree Protection Ordinance would reduce this potential impact to a less than significant level. Additionally, station landscaping and urban design along the entire alignment would include planting new trees. Therefore, after mitigation, the Underground Emphasis LRT Alternative could result in a net increase in total tree inventory.

Removal or disturbance of mature trees could increase competition for food and nesting habitat for migratory bird species, which could result in a potential indirect impact. This impact would not be significant because the project area provides only low quality habitat for a small number of migratory birds and only a small number of birds (if any) could be displaced. Mitigation taken to comply with the MBTA and the California Fish and Game Code would reduce these potential indirect impacts to a less than significant level.

Construction activities associated with future projects within the project area have the potential to affect migratory birds if nesting habitat is disturbed during the breeding season. Other ongoing and future construction projects would be required to implement mitigation measures to address any potential impacts to migratory birds under either the MBTA or the California Fish and Game Code. Therefore, there would be no cumulative impacts from the Underground Emphasis LRT Alternative with respect to biological resources.

Since the project area is already highly urbanized and the LRT project would be consistent with the urban character of the project area, there would be no operational impacts on ecosystems or biological resources.

4.8.3.4.1 NEPA Finding

The Underground Emphasis LRT Alternative would not have an adverse effect on ecosystems or biological resources in the project area.

4.8.3.4.2 CEQA Determination

With implementation of proposed mitigation measures, the Underground Emphasis LRT Alternative would not have a significant impact on ecosystems or biological resources.

4.8.3.5 Locally Preferred Alternative

The LPA has the potential to affect fewer trees compared to the Underground Emphasis LRT Alternative. The vehicle underpass along Alameda Street between Temple and 2nd Streets proposed for the Underground Emphasis LRT Alternative would affect more trees than the LPA alignment which is underground at this location. Currently 87 mature trees in the area could potentially be affected by construction, and a subset of these trees could be removed or disturbed during construction of the LPA. However, it is unknown at this time exactly how many trees could be affected by construction of the LPA. Table 4.8-1 shows the maximum number of trees that could be affected. An estimated 25 protected native California sycamore trees occur in the potential area of impact and could be affected by the LPA. As project design progresses and construction plans are finalized, it may be possible to minimize the number of trees affected by avoidance or fencing. Mitigation measures described below in Section 4.8.4.2, which include consistency with the Native Tree Protection Ordinance, would be required to reduce potential impacts associated with tree removal or disturbance during construction to a less than significant level. Additionally, station landscaping and urban design along the entire alignment would include planting new trees. Therefore, after mitigation, the LPA could result in a net increase in total tree inventory.

The northern portion of the block bounded by 1st, 2nd, and Alameda Streets and Central Avenue is required for construction and the Señor Fish, Weiland Brewery, the former Café Cuba (The Spice Table), and associated parking must be removed. This would result in the removal of one additional cherry tree that is slightly larger than four inches diameter breast height (dbh) in the sidewalk on Central Avenue. This effect would be less than significant.

Removal or disturbance of mature trees could increase competition for food and nesting habitat for migratory bird species, which could result in a potential indirect impact. Indirect impacts to migratory birds from the LPA would not be significant because the project area provides only low quality habitat for a small number of migratory birds and only a small number of birds (if any) could be displaced. Mitigation measures, which include compliance with the MBTA and the California Fish and Game Code, would further reduce these potential indirect impacts.

Construction activities associated with future projects within the project area have the potential to affect migratory birds if nesting habitat is disturbed during the breeding season. Other ongoing and future construction projects in the project area would be required to implement mitigation measures to address any potential impacts to migratory birds either under the MBTA or the California Fish and Game Code. Therefore, cumulative impacts would be less than significant with respect to biological resources.

Since the project area is already highly urbanized and the LRT project would be consistent with the urban character of the project area, there would be no operational impacts on ecosystems or biological resources.

4.8.3.5.1 NEPA Finding

The LPA would not have an adverse effect on ecosystems or biological resources in the project area.

4.8.3.5.2 CEQA Determination

With implementation of proposed mitigation measures, the LPA would not have a significant impact on ecosystems or biological resources.

4.8.4 Mitigation Measures

4.8.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for ecosystems and biological resource impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.8.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR.

4.8.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

In order to reduce the number of trees potentially removed or disturbed during construction of the LPA, the following mitigation measures shall be implemented:

- The construction contractor shall minimize disturbance to trees through avoidance or fencing. (EB-1)
- If disturbance is unavoidable, the construction contractor shall trim individual trees instead of removing them completely where feasible to reduce the scale of disturbance. (EB-2)
- The construction contractor shall replant or replace disturbed or removed trees as soon as practicable. (EB-3)
- The construction contractor shall schedule necessary tree removal and trimming activities that would affect bird nesting outside of the bird breeding season, which can extend from February 1 to August 31. (EB-4)

If it is not feasible to avoid tree removal and trimming related to construction during the breeding bird season from February 1 to August 31, breeding bird surveys shall be conducted as recommended by the California Department of Fish and Game and in accordance with the MBTA.

- A qualified biologist shall conduct two biological surveys, one 15 days prior and a second 72 hours prior to construction activities that would remove or disturb suitable nesting habitat. The biologist shall prepare survey reports documenting the presence or absence of active nests of any protected native bird (as identified in the Migratory Bird Treaty Act) in the habitat to be removed and any other such habitat within 300 feet of the construction work area (within 500 feet for raptors). (EB-5)

- If an active native bird species nest is located, construction within 300 feet of the nest (500 feet for raptor nests) shall be postponed or modified in consultation with the qualified biologist until the nest is vacated, juveniles have fledged, and there is no evidence of a second attempt at nesting. (EB-6)

A tree survey shall be conducted by a qualified arborist to identify native trees that could be affected by project construction. If construction of the project requires removal of any of the native trees located along the proposed alignment and stations for the LPA, the following mitigation measure shall be applied:

- A removal permit shall be obtained from the Los Angeles Board of Public Works in accordance with the City of Los Angeles Native Tree Protection Ordinance. Tree replacement shall comply with the ordinance and the terms of the removal permit. If construction would require pruning of any protected native tree, the pruning shall be performed in a manner that does not cause permanent damage or adversely affect the health of the trees. (EB-7)

New trees planted at station locations shall be regularly monitored by Metro to ensure healthy growth and development. Metro shall replace trees as close as possible to original locations. (EJ-30)

4.9 Geotechnical/Subsurface/Seismic/Hazardous Materials

This section summarizes the existing geologic conditions in the project area, including the general topography, geologic materials, faults, seismicity, and potential hazardous materials. The information in this section is based on Appendix U, Geotechnical/Subsurface/Seismic/Hazardous Materials Technical Memorandum, and Appendix W, Energy Resources Technical Memorandum, of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Supplemental Environmental Assessment/Recirculated Sections of the Draft EIR (Supplemental EA/Recirculated Draft EIR Sections), as indicated in the Responses to Comments, Volume F-4, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Minor modifications have been made to this section since publication of the Draft EIS/EIR, which include the addition of information from Appendix U, Geotechnical/Subsurface/Seismic/Hazardous Materials Technical Memorandum. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.9.4.2 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA that have occurred since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of geotechnical, subsurface, seismic, and hazardous material impacts associated with the LPA is detailed below in Section 4.9.3.5.

4.9.1 Regulatory Framework

NEPA requires an evaluation of potential impacts related to hazardous materials, including:

- The potential to encounter existing hazardous materials during project activities, and
- The potential for the proposed project to generate new hazardous materials that could affect the surrounding human and natural environments.

CEQA requires study of potential impacts related to geology, soils, and seismicity. The L.A. CEQA Thresholds Guide specifies additional thresholds of significance pertaining to creation or acceleration of geologic hazards, acceleration of erosion and sedimentation processes, alteration of distinct and prominent geologic and topographic land features, creation of hazards to the public by release or transport of hazardous materials, and interference with an adopted emergency response or evacuation plan. These thresholds are evaluated by determining whether the project would expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- 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,
- Strong seismic ground shaking,
- Seismic-related ground failure, including liquefaction,
- Landslides,
- Result in substantial soil erosion or the loss of topsoil,
- 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,
- Location on expansive soil, creating substantial risks to life or property,
- 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,
- Release or transport of hazardous materials, or
- Interference with an adopted emergency response or evacuation plan.

These thresholds have been incorporated into the analysis documented in this section.

Relevant regulations and programs also include:

- Federal:
  - Resource Conservation and Recovery Act
  - Superfund Amendments and Reauthorization Act
  - Comprehensive Environmental Response, Compensation, and Liability Act
  - Toxic Substances Control Act
  - Federal Occupational Safety and Health Act
- State:
  - Alquist-Priolo Act
  - Seismic Hazards Mapping Act of 1990
  - Surface Mining and Reclamation Act

- California Hazardous Waste Control Law
- Carpenter-Presley-Tanner Hazardous Substances Account Act
- State of California Occupational Safety and Health Act
- Unified Hazardous Waste and Hazardous Materials Management Regulatory Program
- Waters Bill of 1985
- La Follette Bill of 1986
- South Coast Air Quality Management District Rule 1403

- Local:
  - City of Los Angeles General Plan – Safety Element and Seismic Safety Element
  - The Mineral and Energy Resources Section of the County's General Plan
  - Uniform Fire Code
  - Los Angeles Municipal Code – Methane and Methane Buffer Zones

4.9.2 Affected Environment

4.9.2.1 Regional Geology

The proposed project alignments would traverse the southeastern end of the Elysian Park Hills and the ancient floodplain of the Los Angeles River. The geomorphology ranges from gently sloping alluvial floodplain surfaces to hillside slopes of moderate relief and grade. The steepest slopes along the alignment surface are between 3rd Street at Flower Street and Olive Street at 2nd Street. The Los Angeles River floodplain covers the broad, gently sloping, alluvial terrain east of the Bunker Hill area. Artificial fill of variable thickness underlies the proposed alignment near the surface. Fill materials consist of mixtures of sand, silt, clay, with variable amounts of construction debris. Deep areas of fill to depths of approximately 25 feet below ground surface are present at abandoned tunnels and storm drain excavations that have been backfilled. The regional geology and soils in the site vicinity are shown on Figure 4.9-1. The historical high groundwater in the vicinity of the alignment ranged between 30 to 70 feet below the existing grade. Additional groundwater information is found in the Water Resources Technical Memorandum (Appendix V).

4.9.2.2 Faulting and Seismicity

No known Holocene Active or Latest Pleistocene Active faults trend through the project area. The project area is not located within a currently established Alquist-Priolo earthquake fault zone for surface fault rupture. Holocene Active faults within ten miles of the planned alignment include the Hollywood fault (4.3 miles northwest of the proposed alignment), the Raymond fault (4.9 miles northeast of the proposed alignment), the Newport-Inglewood fault zone (7.0 miles west-northwest of the proposed alignment), Verdugo fault (7.1 miles north-northeast of the proposed alignment), and the Santa Monica fault (9.2 miles west of the proposed alignment). Although the Hollywood fault is considered active by the State Geologist, an Alquist-Priolo Earthquake Fault Zone has not yet been established for the Hollywood fault due to its poorly defined location along its length. Other potentially active faults not definitively proven to exist may be located as close as one-half mile from the project area. A detailed inventory of regional fault zones is available in Appendix U, Geotechnical/Subsurface/Seismic/Hazardous Materials Technical Memorandum. Seismic hazards that could affect the project alignment include ground shaking from an earthquake along one of the active faults in the region. Liquefaction-induced ground failure has historically been another major cause of earthquake damage in Southern California. Potential liquefaction zones in the project area are depicted in Figure 4.9-2.

Seismically induced settlement includes compression of dry soils above groundwater and liquefaction-induced settlement of liquefiable soils below groundwater. Seismically induced settlement occurs primarily within loose to moderately dense sandy soils due to volume reduction during or shortly after an earthquake event. The composition of most of the artificial fill along the proposed project alignment is expected to be undocumented and could include these loose soils. In addition, a portion of the alluvial soils along the alignment are anticipated to be loose to medium dense. Accordingly, both the portions of the proposed alignment mapped within the liquefiable zone and those underlain by undocumented fill have the potential to experience seismically induced settlement.

The proposed project alignment is not located within an earthquake-induced landslide zone according to the State of California Seismic Hazard Zones for the Hollywood and Los Angeles Quadrangles. However, the northwest portion of the project area in the vicinity of the proposed 2nd/Hope Street station (the area east of the US 101/SR 110 interchange) is within the Hillside Ordinance area according to the City of Los Angeles Seismic Safety Element (1996). Figure 4.9-2 shows potential landslide hazards in the project area.

Earthquake-induced flooding can be caused by failure of dams or other water-retaining structures due to an earthquake. Due to the absence of such structures in the vicinity of the alignment, the potential for such hazards to affect the project is considered low. The proposed alignments are located in an urbanized area composed mainly of impervious surfaces that include well-developed drainage infrastructure, so the project would not substantially increase the risk of flooding.

4.9.2.3 Seiches and Tsunamis

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Tsunamis are tidal waves generated in large bodies of water by fault displacement or major ground movement such as submarine landslides.

According to the City of Los Angeles Seismic Safety Element (1996) and the County of Los Angeles Seismic Safety Element (1990), the project area is more than ten miles from the ocean and is not located within areas potentially impacted by either tsunamis or seiches.

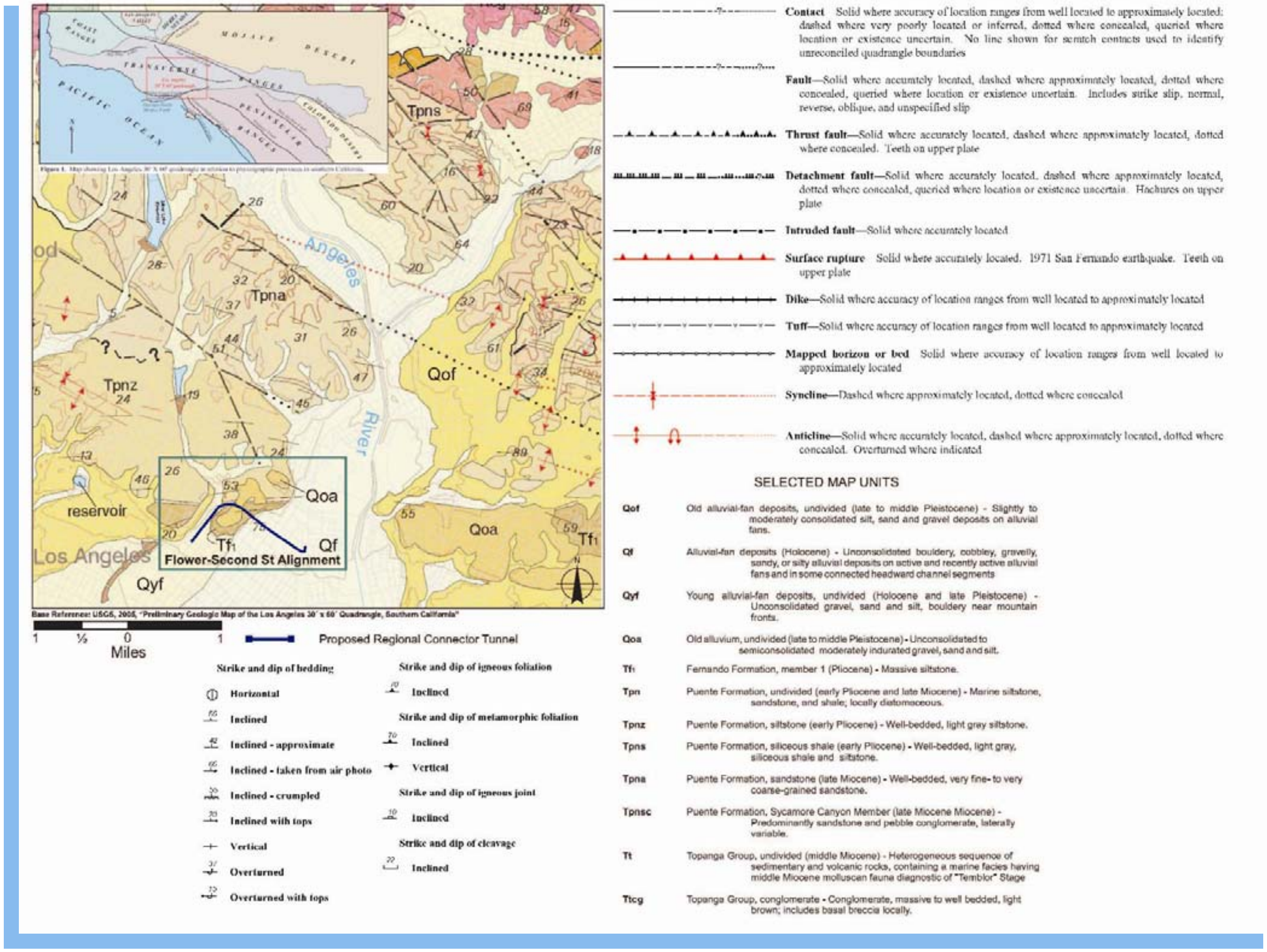


Figure 4.9-1. Regional Geologic Map

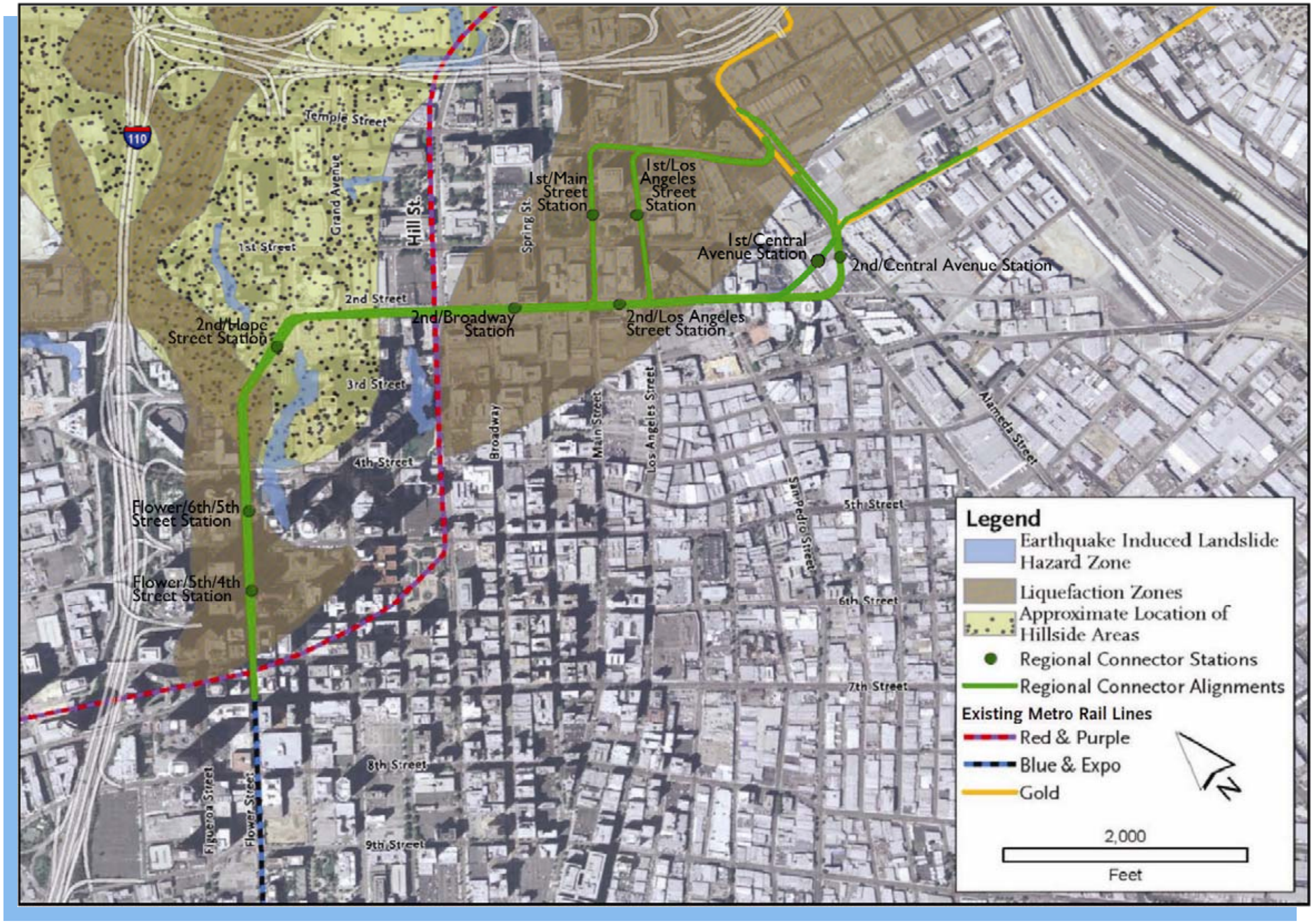


Figure 4.9-2. Liquefaction and Landslide Hazards

4.9.2.4 Mineral Resources

Regarding the loss of mineral resources, the project area traverses areas underlain by geologic materials such as sand and gravel that may be considered mineral resources and could be used as construction aggregates. However, these materials have not been previously mined along the project alignment. Furthermore, mining of these materials in an urbanized environment is not considered economical. However, there is a potential for re-use of excavated material as fill.

4.9.2.5 Hazardous Materials

A search of regulatory databases, including federal, state, and local environmental records, as well as historical mapping, was conducted for the project. The database search results include facilities that handle hazardous materials but have not necessarily had a release to the environment as well as sites that are documented as closed cases where past satisfactory remediation has occurred. These listings do not represent a potential concern for the proposed project and were eliminated from further evaluation.

In some instances, more information was requested from regulatory agencies to determine the current status of a site. In addition, Sanborn fire insurance maps, maps of the Union Station Methane Buffer Zone and Methane Zone and the Los Angeles City Methane Buffer Zone, and oil well construction and abandonment records provided additional information used to determine which sites pose a potential concern with respect to hazardous materials.

The *Hazardous Materials Investigation and Analysis* (CDM 2009) for the Regional Connector Transit Corridor project classifies properties of concern as High, Moderate, or Low based on the following criteria:

- High – sites with known/probable soil, groundwater, or soil gas contamination that have not been remediated, or where remediation is incomplete or undocumented. Other considerations include the type and mobility of any contamination, distance to a project, groundwater impacts, and the location with respect to the inferred or known direction of groundwater flow.

- Moderate – sites with known/potential soil, groundwater, or soil gas contamination and where remediation is in progress, contaminants do not appear to pose a concern for a project, or where construction would occur within mapped Methane Buffer Zones. Sites may also be considered a Moderate level of concern based on the type and intensity of former land use (e.g., chemical manufacturers, machine shops, gas stations, etc.), even though they did not otherwise have an environmental database listing.

- Low – sites that are not likely or are less likely to impact soil and/or groundwater that would be encountered during construction of a project. These may include sites having permitted air toxic emissions or some sites with spills or leaks to the environment that were subsequently remediated and have received case closure.

Figure 4.9-3 shows the properties of High or Moderate concern.

The City of Los Angeles, Department of Public Works, Bureau of Engineering, has mapped Potential Methane Zones and "buffer zones". The City's Municipal Code, Chapter IX, Building Regulations, Article 1, Division 71, Methane Seepage Regulations, requires construction projects located within the Methane Zone or Methane Buffer Zone to be consistent with the City's Methane Mitigation Standards to control methane intrusion emanating from geologic formations.

In addition to hazardous materials that are known or suspected to exist at the properties listed in Appendix U, Geotechnical/Subsurface/Seismic/Hazardous Materials Technical Memorandum other hazardous materials may be present (CDM 2009). Transformers located above- and below-grade along the alignments may contain polychlorinated biphenyls (PCBs). Lead may also be present in surface soil from historic emissions of leaded fuel from vehicles on adjacent roadways. Since most soil along the proposed alignment is covered by asphalt or concrete, exposure to these hazardous materials is unlikely. However, buildings along the proposed alignments that were constructed prior to 1979 may contain asbestos and buildings constructed prior to 1978 may contain lead-based paint that could be released during demolition. These hazardous materials would present a concern for the proposed project, as exposure to these materials at certain levels may cause adverse health effects to workers and the general public.

4.9.3 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential geotechnical, subsurface, seismic, and hazardous materials impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.9.1. Table 4.9-1 summarizes the results of the analysis.

4.9.3.1 No Build Alternative

As the No Build Alternative does not involve construction of any new transit infrastructure beyond projects already identified in Metro's 2009 Long Range Transportation Plan (LRTP), it would not result in any geotechnical, subsurface, seismic, or hazardous materials impacts.

4.9.3.1.1 NEPA Finding

The No Build Alternative would not have adverse geotechnical, subsurface, seismic, or hazardous materials effects.

4.9.3.1.2 CEQA Determination

The No Build Alternative would not have significant geotechnical, subsurface, seismic, or hazardous materials impacts.

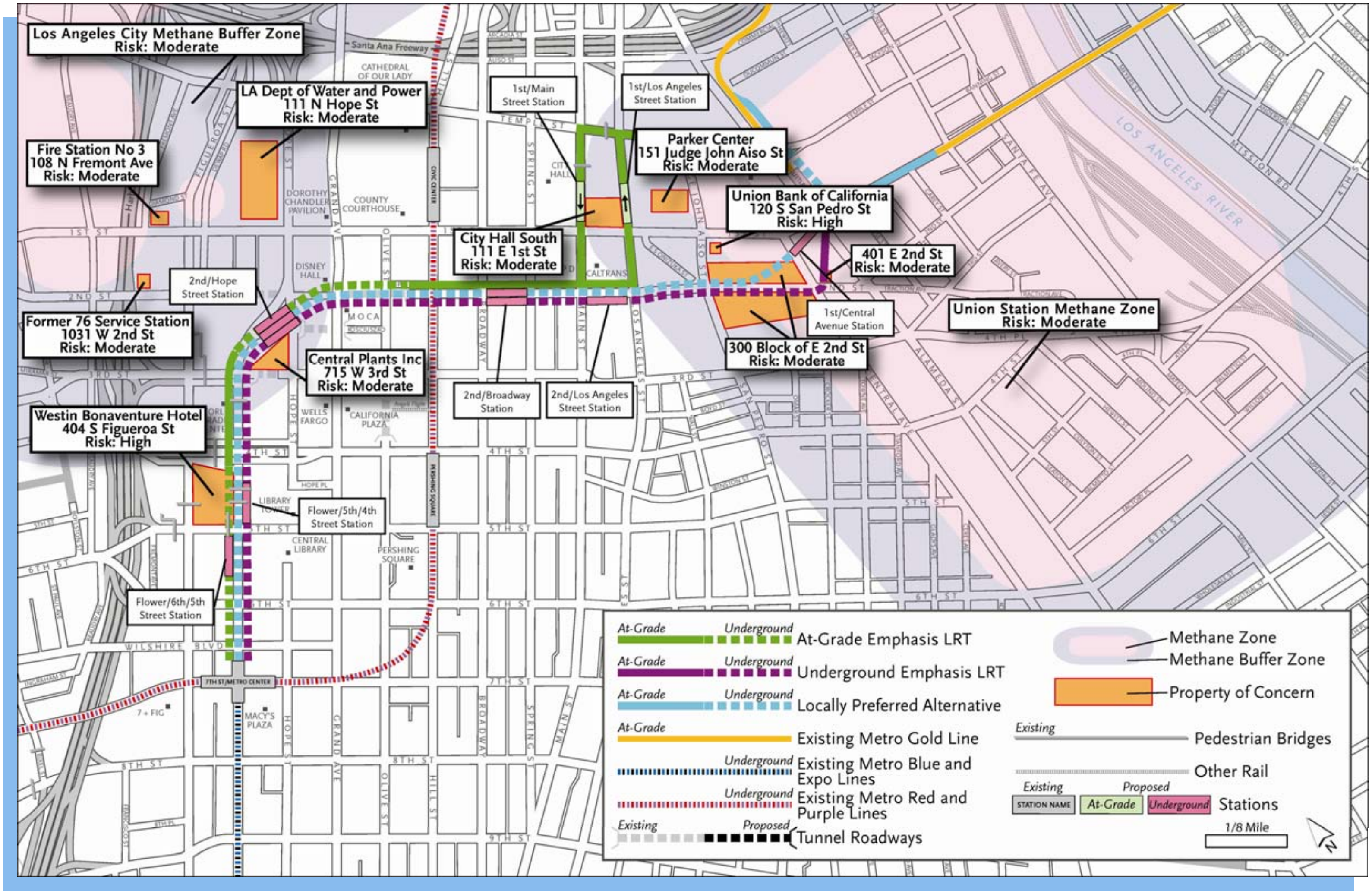


Figure 4.9-3. Known or Suspected Hazardous Materials in Soil and/or Groundwater within 0.25 Mile of Proposed Alignments

Table 4.9-1. Summary of Potential Impacts to Geotechnical/Subsurface/Seismic/Hazardous Materials

Alternative	Geotechnical Impacts[1]	Seismic Impacts[2]	Hazardous Materials[3]	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
No Build	None	None	None	None	None
TSM	None	None	None	None	None
At-Grade Emphasis LRT	None	Adverse effects/ significant impacts not significant/ adverse after mitigation	Adverse effects/ significant impacts not significant/ adverse after mitigation	None	None
Underground Emphasis LRT	Adverse effects/ significant impacts not significant/ adverse after mitigation	Adverse effects/ significant impacts not significant/ adverse after mitigation	Adverse effects/ significant impacts not significant/ adverse after mitigation	None	None
LPA	Adverse effects/ significant impacts not significant/ adverse after mitigation	Adverse effects/ significant impacts not significant/ adverse after mitigation	Adverse effects/ significant impacts not significant/ adverse after mitigation	None	None

Notes:
[1] Geotechnical impacts might include risk of landslides, soil erosion, or ground settlement due to unstable soils.
[2] Seismic impacts could include known faults, liquefaction risks, seismic-related flooding.
[3] Hazardous material risks include methane zone and methane zone buffer areas, contaminated soil and groundwater, and hazardous building materials.

4.9.3.2 TSM Alternative

The TSM Alternative includes all of the provisions of the No Build Alternative, plus two new shuttle bus routes through downtown Los Angeles. The implementation of these shuttle bus routes would not introduce any additional geotechnical, subsurface, seismic, or hazardous materials impacts compared to the No Build Alternative.

4.9.3.2.1 NEPA Finding

The TSM Alternative would not result in adverse geotechnical, subsurface, seismic, or hazardous materials effects.

4.9.3.2.2 CEQA Determination

The TSM Alternative would not result in significant geotechnical, subsurface, seismic, or hazardous materials impacts.

4.9.3.3 At-Grade Emphasis LRT Alternative

4.9.3.3.1 Geotechnical, Subsurface, and Seismic Hazards

The At-Grade Emphasis LRT Alternative does not cross any known fault. However, the At-Grade Emphasis LRT Alternative would be potentially susceptible to liquefaction in portions of the proposed alignment along Flower Street between Wilshire Boulevard and 2nd Street, and along 2nd Street between Hill and San Pedro Streets. The portions of the alignment within the mapped liquefiable zone or underlain by undocumented fill may be susceptible to seismically induced settlement.

Therefore, there is limited potential for adverse effects related to liquefaction and seismically induced settlement for portions of the At-Grade Emphasis LRT Alternative, but there would not be a potential for adverse impacts related to active or potentially active faults, landslides, flooding, seiches, or tsunamis.

The proposed construction would have the potential for adverse impacts related to ground settlement and differential settlement on adjacent structures including historical buildings. Further evaluation and survey would be performed during design to confirm building types and existing conditions, and to develop criteria to limit potential movement to acceptable threshold values.

Regarding the loss of mineral resources, the project area traverses areas underlain by geologic materials such as sand and gravel that may be considered mineral resources and could be used as construction aggregates. However, these materials have not been previously mined along the project alignment and, given the dense urban environment, are not accessible to be mined. Furthermore, mining of these materials in an urbanized environment is not considered economical. However, there is potential for the excavated material to be reused as fill. Therefore, the At-Grade Emphasis LRT Alternative would not result in a significant impact associated with the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

4.9.3.3.2 Hazardous Materials

During construction of the At-Grade Emphasis LRT Alternative, there is the potential to encounter hazardous materials along the proposed alignment (Figure 4.9-3). Construction of the at-grade portions of the alignment would entail clearing and grading of shallow soil, during which shallow groundwater could also be encountered. The underground portions of the At-Grade Emphasis LRT Alternative along Flower Street (approximately 45 percent) would require trenching or tunneling, and as a result would encounter deeper soils and groundwater. Known and/or suspected soil and/or groundwater contamination exists at properties directly within and near to the proposed alignment, as shown in Figure 4.9-3. Additional site-specific soil, groundwater, and/or soil gas investigation activities may be necessary at these properties to further delineate potential areas of contamination and guide construction activities.

Groundwater encountered during construction dewatering would require testing and either on-site treatment and discharge in accordance with applicable standards or transport to a treatment and/or disposal facility.

Lead may be present in surface soils along the proposed alignment from historical vehicle emissions, and PCBs may exist in surface or subsurface soils from leaking transformers located above- or below-grade. During construction, release of these hazardous materials in contaminated soil and/or groundwater could result in exposure to workers, the public, and sensitive receptors, such as schools within 0.25 mile. This could occur through the release of dust or vapors from exposed soil and/or groundwater. Until further study is conducted, the actual levels of hazardous materials that could be encountered in soil and/or groundwater during construction are unknown. Compliance with the federal, state, and local laws and regulations regarding hazardous materials listed in Section 4.9.1 would be required during construction of the At-Grade Emphasis LRT Alternative. In addition, mitigation would be required to reduce potential impacts to construction workers from encountering contamination during construction.

There is potential for hazardous materials, such as fuels and hydraulic oil used for construction equipment, paints, lubricating fluids, and solvents for maintenance to be accidentally released during construction. Direct impacts could result from an accidental release. The implementation of the best management practices (BMPs) in Section 4.9.4.1 of the Draft EIS/EIR would ensure that potential direct impacts from an accidental release would be less than significant. Compliance with existing laws and regulations would reduce the potential for significant impacts from an accidental release of hazardous materials during operation as well.

The proposed alignment would cross methane zones and methane buffer zones associated with oil deposits in the project area, as shown in Figure 4.9-3. The At-Grade Emphasis LRT Alternative alignment would cross into the Union Station Oil Field along Los Angeles and Temple Streets based on maps published by the California Division of Oil, Gas, and Geothermal Resources (CDOGG 2003). The Union Station Oil Field has been delineated as a Methane Zone by the City of Los Angeles Department of Public Works, Bureau of Engineering. The proposed alignment would also cross a City of Los Angeles Methane Buffer Zone north of 3rd Street and west of Grand Avenue. Petroliferous odors have been reported in several borings drilled north of 3rd Street between Flower Street and Grand Avenue.

Excavation within these zones may encounter naturally occurring hydrocarbon gases, including hydrogen sulfide and methane. Methane and hydrogen sulfide are considered hazardous because of their explosive properties. Additionally, hydrogen sulfide is highly toxic when inhaled. These gases can seep into tunnels and other excavations through soil and also through discontinuities (fractures, faults, etc.) in bedrock.

Mitigation requirements are determined according to the actual methane levels and pressures detected on a site. Mitigation measures could include both active and passive ventilation systems to ensure exchange of air, gas barriers (membranes around basements and foundations), and sensors in interior spaces to monitor the presence of gas and its pressure.

If construction of the At-Grade Emphasis LRT Alternative requires building demolition, release of hazardous materials including asbestos fibers and lead-based paint particles could occur, which could result in a potential impact. Mitigation, as described in Section 4.9.4 of the Draft EIS/EIR, would reduce this potential direct impact to a less than significant level.

During long-term operation of the At-Grade Emphasis LRT Alternative, there is the potential for the below-grade portions of the alignment to act as a preferential pathway for existing groundwater contamination to move to areas distant from the project.

Indirect impacts could occur from the accidental release of hazardous materials during the transport of soil or other media contaminated with hazardous materials to a disposal facility located away from the project area during construction.

There is the potential for cumulative impacts associated with hazards and hazardous materials from the At-Grade Emphasis LRT Alternative. A number of related construction projects have been identified and some of those projects could involve ground-disturbing construction where there is potential to encounter hazardous materials in soil and/or groundwater. In addition, other construction activities in the project area may entail building demolition, with the potential for release of asbestos fibers from asbestos containing materials and lead particles from lead-based paint. The additive effect of ongoing and future activities could result in cumulative impacts to human health or the environment through release of hazardous materials.

4.9.3.3.3 NEPA Finding

There is the potential for adverse effects with respect to liquefaction, seismically induced settlement, and hazardous materials for portions of the At-Grade Emphasis LRT Alternative. Mitigation would be required to reduce the severity of these potential effects to not adverse.

4.9.3.3.4 CEQA Determination

Potential impacts associated with liquefaction, seismically induced settlement, landslides, flooding, and hazardous materials could occur during construction and operation of the At-Grade Emphasis LRT Alternative. Compliance with federal, state, and local laws and regulations regarding hazardous materials would reduce many of these impacts to a less than significant level. In addition, implementation of mitigation measures would be required to address specific issues (e.g., liquefaction, settlement, potential presence of subsurface gases, asbestos containing materials and lead-based paint), which would reduce impacts to a less than significant level.

4.9.3.4 Underground Emphasis LRT Alternative

4.9.3.4.1 Geotechnical, Subsurface, and Seismic Hazards

The geotechnical, subsurface, and seismic hazards associated with the Underground Emphasis LRT Alternative would be similar to those of the At-Grade Emphasis LRT Alternative except that a greater proportion of the alignment is underground and would be potentially susceptible to adverse impacts related to ground settlement and differential settlement on adjacent structures. Ground improvement would be required in advance of tunneling to provide adequate support and to minimize settlement. In addition, a pre-construction survey of adjacent structures and all historical buildings in the vicinity would be conducted to establish a baseline against which to measure potential construction-induced damage. Construction monitoring would be required during construction to ascertain the criteria are met.

In addition, a limited portion of the eastern edge of the Underground Emphasis LRT Alternative alignment near the intersection of Alameda and 1st Streets would be within the mapped Inundation Hazard Area (Figure 4.10-1). The majority of the Underground Emphasis LRT Alternative is not located in an area mapped with the potential to be susceptible to flooding. The alignment is located in an urbanized area covered with impervious surfaces and includes a well-developed drainage infrastructure. The proposed project would not increase the risk of flooding.

Regarding the loss of mineral resources, the project area traverses areas underlain by geologic materials such as sand and gravel that may be considered mineral resources and could be used as construction aggregates. However, these materials have not been previously mined along the project alignment and, given the dense urban environment, are not accessible to be mined. Furthermore, mining of these materials in an urbanized environment is not considered economical. There is also potential for the excavated material to be reused as fill. Therefore, the Underground Emphasis LRT Alternative would not result in a significant impact associated with the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

With implementation of mitigation, potential effects related to geologic, subsurface, or seismic hazards would be reduced to a less than significant level. Figure 4.9-4 illustrates a typical alignment profile for the Underground Emphasis LRT Alternative, which shows the area of greatest ground cover over the tunnel (i.e., greatest depth from ground surface to tunnel grade) and the locations of borings associated with field explorations conducted for the project. Figure 4.9-5 provides the legend for Figure 4.9-4.

4.9.3.4.2 Hazardous Materials

The potential hazardous materials impacts associated with the Underground Emphasis LRT Alternative would be similar to those of the At-Grade Emphasis LRT Alternative. However, since a greater portion of the alignment would be underground, more of the project area would be susceptible to the potential spread of contaminated groundwater and release of subsurface oilfield gases. As with the At-Grade Emphasis LRT Alternative, the proposed alignment would cross methane zones and methane buffer zones associated with oil deposits in the vicinity, as shown in Figure 4.9-3. Excavation within these zones may encounter naturally occurring hydrocarbon gases, including hydrogen sulfide and methane. Therefore, construction of this alternative would require consistency with the City's Methane Mitigation Standards. Also, the Underground Emphasis LRT Alternative would require more property acquisition and demolition of existing structures, which could heighten the risk of potential release of asbestos fibers and lead-based paint particles.

4.9.3.4.3 NEPA Finding

The Underground Emphasis LRT Alternative would have the potential for adverse effects with respect to liquefaction, seismically induced settlement, ground loss due to tunneling, and hazardous materials. Ground loss refers to the ground movement that could occur immediately around the tunnel periphery. Mitigation would be required to reduce the severity of these effects to not adverse.

4.9.3.4.4 CEQA Determination

Potential significant impacts associated with liquefaction, seismically induced settlement, ground loss due to tunneling, and hazardous materials could occur during construction and operation of the Underground Emphasis LRT Alternative. Many of these impacts would be addressed with adherence to federal, state, and local laws and regulations regarding hazardous materials. However, mitigation would be required to address specific issues, including potential ground loss due to tunnel construction, liquefaction hazard, presence of subsurface gases, asbestos containing materials, and lead-based paint. With mitigation, potentially significant impacts would be reduced to less than significant.

4.9.3.5 Locally Preferred Alternative

4.9.3.5.1 Geotechnical, Subsurface, and Seismic Hazards

The geotechnical, subsurface, and seismic hazards for the LPA would be similar to those of the Underground Emphasis LRT Alternative. The LPA does not cross any known fault. However, there is the potential for liquefaction in portions of the proposed alignment along Flower Street between Wilshire Boulevard and 2nd Street, and along 2nd Street between Hill and San Pedro Streets. The portions of the alignment within the mapped liquefiable zone or underlain by undocumented fill may be susceptible to seismically induced settlement. In addition, the northwest portion of the project area (east of the US 101/SR 110 interchange) is within the Hillside Ordinance area, where there is a potential for landslides. The potential for landslide hazards to affect the site is considered low because the proposed 2nd/Hope Street station would be embedded below-grade and located predominately in bedrock. However, temporary slope stability during station construction would be evaluated and shoring would be designed to incorporate slope conditions as appropriate. The LPA would also not increase the risk for landslide hazards in this area because the alignment would be embedded below-grade, located predominately in bedrock, and shoring would be designed to incorporate slope conditions as appropriate.

A limited portion at the eastern edge of the alignment near the intersection of 1st and Alameda Streets is within the mapped Inundation Hazard Area. However, the majority of the LPA is not located in an area mapped with the potential to be susceptible to flooding. The alignment is located in an urbanized area covered with impervious surfaces and includes a well-developed drainage infrastructure. The proposed project would not increase the risk of flooding. There is also no potential for seiches and tsunamis, as the alignment is more than ten miles from the Pacific Ocean and there are no reservoirs nearby. The LPA alignment is overlain by alluvial soils and undocumented fill that are potentially susceptible to ground loss associated with tunnel construction.

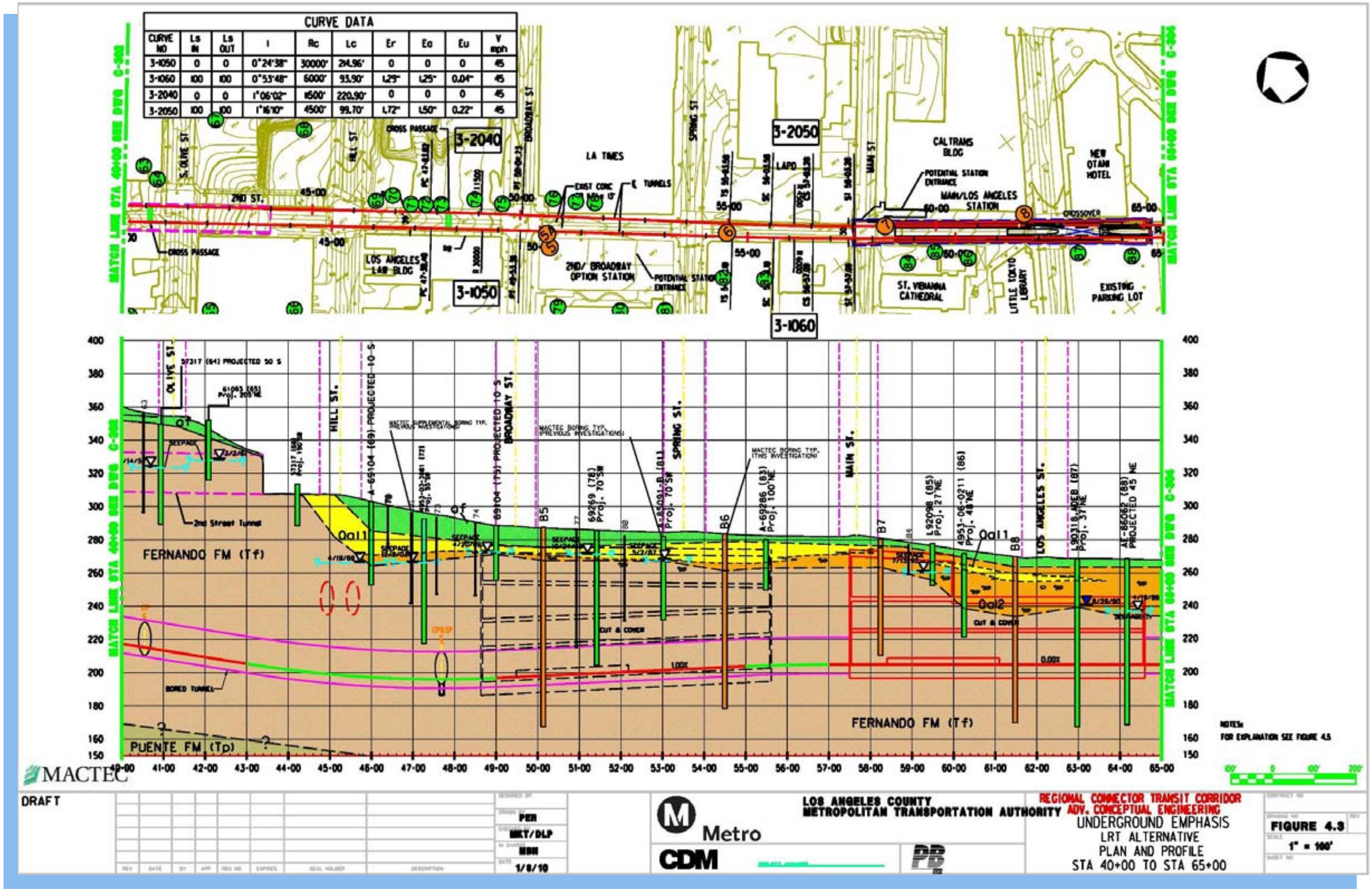


Figure 4.9-4. Underground Emphasis LRT Alternative Typical Underground Conditions

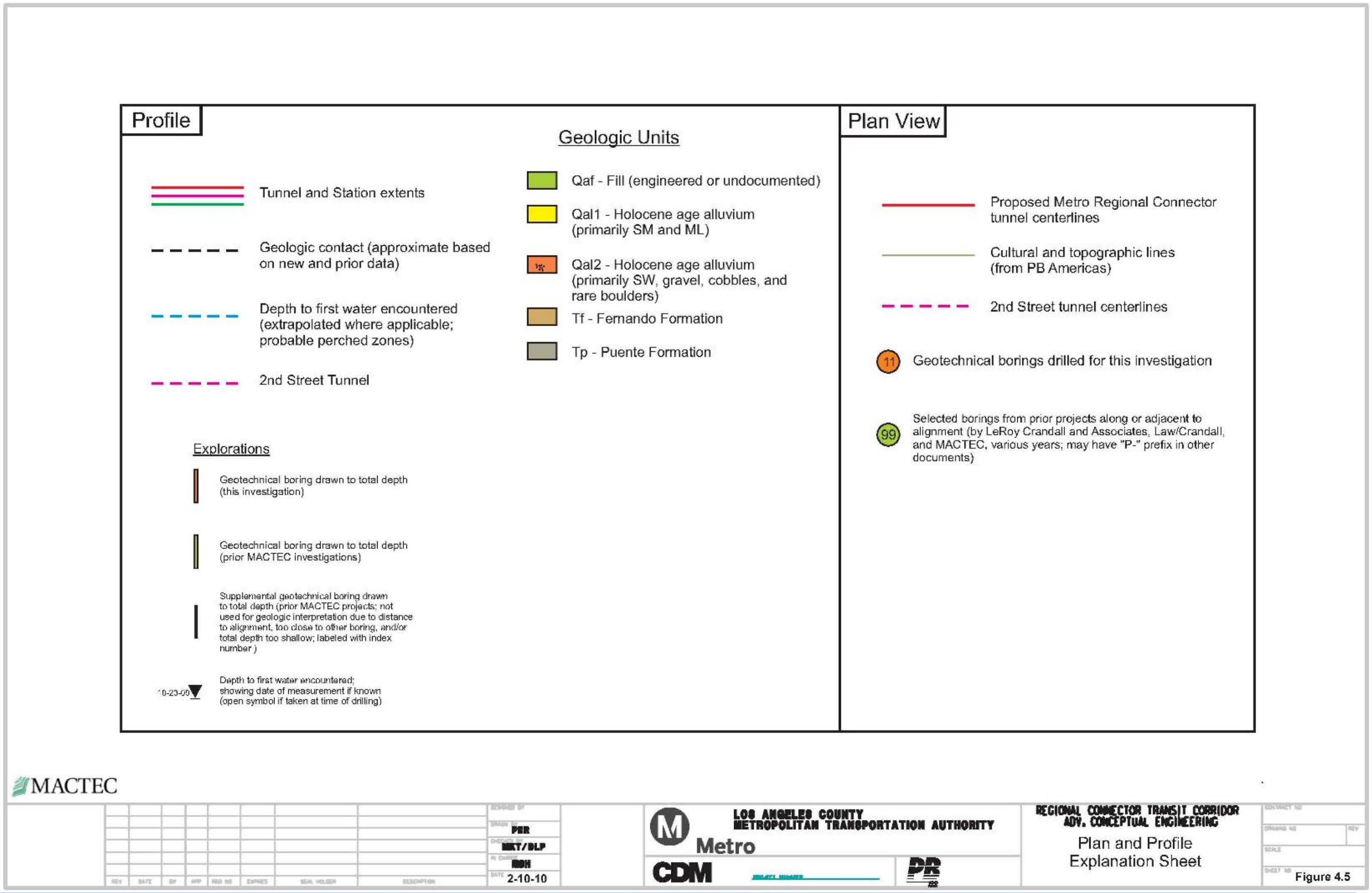


Figure 4.9-5. Geologic and Subsurface Formations Legend for Figure 4.9-4

There is the potential for adverse effects related to liquefaction, seismically-induced settlement, ground loss due to tunnel construction, and landslides for portions of the LPA alignment, but no potential for adverse impacts related to active or potentially active faults, flooding, seiches, or tsunamis.

The proposed tunneling would have the potential for adverse impacts related to ground settlement and differential settlement immediately above the alignment as well as adjacent to structures including the historical buildings. Ground improvement would be required in advance of tunneling to provide adequate support and to minimize settlement. In addition, a pre-construction survey of adjacent structures and all historical buildings in the vicinity would be conducted to establish a baseline against which to measure potential construction-induced damage. Construction monitoring would be required during construction to ascertain the criteria are met.

Regarding the loss of mineral resources, the project area traverses areas underlain by geologic materials such as sand and gravel that may be considered mineral resources and could be used as construction aggregates. However, these materials have not been previously mined along the project alignment and, given the dense urban environment, are not accessible to be mined. Furthermore, mining of these materials in an urbanized environment is not considered economical. There is also potential for the excavated material to be reused as fill. Therefore, the LPA would not result in a significant impact associated with the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

With mitigation, potential effects related to geologic, subsurface, or seismic hazards would be reduced to a less than significant level.

4.9.3.5.2 Hazardous Materials

During construction of the LPA, there is the potential to encounter hazardous materials along the proposed alignment (Figure 4.9-3). The underground portions of the LPA would require trenching or tunneling, and as a result would encounter deeper soils and groundwater. Construction of the at-grade portions of the alignment would entail clearing and grading of shallow soil, during which shallow groundwater could also be encountered. Known and/or suspected soil and/or groundwater contamination exists at properties directly within and near to the proposed alignment, as shown in Figure 4.9-3. Additional site-specific soil, groundwater, and/or soil gas investigation activities may be necessary at these properties to confirm areas of contamination and guide construction activities. Groundwater encountered during construction dewatering would require testing and either on-site treatment and discharge in accordance with applicable standards or transport to a treatment and/or disposal facility.

Lead may be present in surface soils along the proposed alignment from historical emissions of leaded fuel from vehicles, and PCBs may exist in surface or subsurface soils from leaking transformers located above- or below-grade along the alignment. Since most soil along the proposed alignment is covered by asphalt or concrete, exposure to these hazardous materials is unlikely.

During construction, release of these hazardous materials in contaminated soil and/or groundwater could result in exposure to workers, the public, and sensitive receptors, such as schools within 0.25 mile. This could occur through the release of dust or vapors from exposed soil and/or groundwater. Additional site-specific soil, groundwater, and/or soil gas investigation activities will be conducted during final design to confirm areas of contamination and guide construction activities. Standard practices and contingency preparations would be employed during construction to prevent accidental release of hazardous materials. Compliance with the federal, state, and local laws and regulations regarding hazardous materials listed in Section 4.9.1 would be required during construction of the LPA. In addition, mitigation would be required to reduce potential impacts to construction workers from encountering contamination during construction.

There is potential for hazardous materials, such as fuels and hydraulic oil used for construction equipment, paints, lubricating fluids, and solvents for maintenance to be accidentally released during construction. Direct impacts could result from an accidental release. The implementation of the BMPs in Section 4.9.4.2.1 below would ensure that potential direct impacts from an accidental release would be less than significant. Compliance with existing laws and regulations would reduce the potential for significant impacts from an accidental release of hazardous materials during operation as well.

The proposed alignment would cross methane zones and methane buffer zones associated with oil deposits in the project area, as shown in Figure 4.9-3. The LPA alignment would cross into the Union Station Oil Field along 2nd, 1st, and Alameda Streets based on maps published by the California Division of Oil, Gas, and Geothermal Resources (CDOGG 2003). The Union Station Oil Field has been delineated as a Methane Zone by the City of Los Angeles Department of Public Works, Bureau of Engineering. The proposed alignment would also cross a City of Los Angeles Methane Buffer Zone north of 3rd Street and west of Grand Avenue. Petroliferous odors have been reported in several borings drilled north of 3rd Street between Flower Street and Grand Avenue.

Excavation within these zones may encounter naturally occurring hydrocarbon gases, including hydrogen sulfide and methane. Methane and hydrogen sulfide are considered hazardous because of their explosive properties. Additionally, hydrogen sulfide is highly toxic when inhaled. These gases can seep into tunnels and other excavations through soil and also through discontinuities (fractures, faults, etc.) in bedrock. Therefore, construction of this alternative would require consistency with the City's Methane Mitigation Standards.

Mitigation requirements are determined according to the actual methane levels and pressures detected on a site. Mitigation measures could include both active and passive ventilation systems to ensure exchange of air, gas barriers (membranes around basements and foundations), and sensors in interior spaces to monitor the presence of gas and its pressure.

Construction of the LPA would require demolition of buildings located on the northern portion of the block bounded by 1st, 2nd, Alameda Streets, and Central Avenue. There is potential for release of hazardous materials including asbestos fibers and lead-based paint particles associated with demolition of these buildings, which could result in a potential impact.

Mitigation, as described in Section 4.9.4.2 below, would reduce this potential direct impact to a less than significant level.

During long-term operation of the LPA, there is the potential for the below-grade portions of the alignment to act as a preferential pathway for existing groundwater contamination to move to areas distant from the project.

Indirect impacts could occur from the accidental release of hazardous materials during the transport of soil or other media contaminated with hazardous materials to a disposal facility located away from the project area during construction.

The hazardous materials impacts associated with the LPA would be similar to those of the Underground Emphasis LRT Alternative. However, since a greater portion of the alignment would be underground, more of the project area would be susceptible to the potential spread of contaminated groundwater and release of subsurface oilfield gases.

Low level electro magnetic fields (EMFs) would be generated by overhead catenary lines and traction power substations (TPSS) associated with operation of the LPA. Compared to overhead power lines which use 400 kV, the LRT would use 0.6 kV and produce very weak EMF, which would be well below exposure guidelines established by the American Conference of Governmental Industrial Hygienists and the International Commission on Non-Ionizing Radiation Protection (Sound Transit 2008). In addition, the majority of the LPA alignment and TPSS sites would be located underground away from sensitive receptors. Therefore, there would be no impacts from exposure to EMF.

There is the potential for cumulative impacts associated with hazards and hazardous materials from the LPA. A number of related construction projects have been identified and some of those projects could involve ground-disturbing construction where there is potential to encounter hazardous materials in soil and/or groundwater. In addition, other construction activities in the project area may entail building demolition, with the potential for release of asbestos fibers from asbestos containing materials and lead particles from lead-based paint. The additive effect of ongoing and future activities could result in cumulative impacts to human health or the environment through release of hazardous materials. Implementation of mitigation measures identified in Section 4.9.4.2, along with compliance with applicable hazardous waste laws and regulations would ensure the LPA would not result in a considerable contribution to cumulative impacts.

4.9.3.5.3 NEPA Finding

The LPA would have the potential for adverse effects with respect to liquefaction, seismically induced settlement, ground loss due to tunneling, and hazardous materials. Mitigation will be required to reduce the severity of these effects to not adverse.

4.9.3.5.4 CEQA Determination

The LPA would have potentially significant impacts associated with liquefaction, seismically induced settlement, ground loss due to tunneling, and hazardous materials during construction and operation. With mitigation, potential impacts would be reduced to less than significant.

4.9.4 Mitigation Measures

4.9.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for geotechnical, subsurface, seismic hazards, and hazardous materials impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.9.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- The mitigation measure for EMFs is no longer needed for the LPA based on the updated hazardous materials analysis for the LPA. Refer to Section 4.9.3.5.2 above.

- Additional detail provided to mitigation measures for consistency with other sections.

- Additional detail provided for mitigation measures that assess the potential for hazardous materials and hazardous building materials to be encountered during construction.

4.9.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

4.9.4.2.1 Final Construction Mitigation Measures for the Locally Preferred Alternative

- Before any construction, a survey of structures within the anticipated zone of construction influence shall be conducted in order to establish baseline conditions. A geotechnical instrumentation and settlement monitoring plan and mitigation measures shall be developed and adhered to during construction to ensure appropriate measures are taken to address any construction-induced movement. If assessments indicate the necessity to proactively protect nearby structures, additional support for the structures by underpinning or other ground improvement techniques shall be required prior to the underground construction. Metro shall require the construction contractor to limit movement to less than acceptable threshold values for vertical, horizontal, and angular deformation as a performance standard. These acceptable threshold values shall be established such that the risk of damage to buildings and utilities will be negligible to very slight. For buildings, these threshold values will be based on the relationship of building damage to angular distortion and horizontal strain consistent with Boscardin and Cording (1989) and qualitative factors including but not limited to the type of structure and its existing condition. For utility mains, these threshold values shall be those established by the utility owners. Additional data and survey information shall be gathered during final design for each building and utility main to enable assessment of the tolerance of potentially affected structures and utilities. Additional engineering and design level geotechnical studies shall be performed to define the nature of the soils and to refine the means of achieving each performance specification. (GT-1)

- Ground improvement such as grouting or other methods shall be required to fill voids where appropriate and offset potential settlement when excess material has been removed during excavation. The criteria for implementing grouting or ground improvement measures shall be based on the analysis described in the above mitigation measure. (GT-2)

- The tunnel alignment shall be grouted in advance to provide adequate soil support and minimize settlement as geotechnical conditions require. (GT-3)

- Settlement along the project alignment shall be monitored using a series of measuring devices above the route of the alignment. Leveling surveys shall be conducted prior to tunneling to monitor for possible ground movements. (GT-4)

- Tunnel construction monitoring requirements shall be described and defined in design contract documents. Additional geotechnical provisions shall be included to the extent feasible, including use of an Earth Pressure Balance or Slurry Tunnel Boring Machine for tunnel construction to minimize ground loss. During tunnel construction, the soils encountered shall be monitored relative to anticipated soil conditions as described in a Geotechnical Baseline Report. (GT-5)

- A survey of historic properties and/or historical resources within 21 feet of vibration producing construction activity shall be conducted to confirm the building category, and to provide a baseline for monitoring of ground-borne vibration (GBV) and the potential for GBV to cause damage. The survey shall also be used to establish baseline, pre-construction conditions for historic properties and historical resources. During preliminary engineering and final design of the project, additional subsurface (geotechnical) investigations shall be undertaken to further evaluate soil, groundwater, seismic, and environmental conditions along the alignment. The analysis shall assist in the selection and development of appropriate support mechanisms for cut and cover construction areas and any sequential excavation method (mining) construction areas in accordance with industry standards and the Building Code. The subsurface investigation shall also identify areas that could experience differential settlement as a result of using a tunnel boring machine (TBM) in close proximity to historic properties and/or historical resources. An architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards shall provide input and review of design contract documents prior to implementation of the mitigation measures. (CR/B-2)

- A Contaminated Soil/Groundwater Management Plan shall be implemented during construction to establish procedures to follow if contamination is encountered in order to minimize associated risks. The plan shall be prepared during the final design phase of the project, and the construction contractor shall be held to the level of performance specified in the plan. The plan shall include procedures for the implementation of the following mitigation measures. (GT-6)

- Appropriate regulatory agencies shall be contacted if contaminated soil or groundwater is encountered. (GT-7)

- Sampling and analysis of soil and/or groundwater known or suspected to be impacted by hazardous materials shall be conducted. (GT-8)

- Procedures for the legal and proper handling, storage, treatment, transport, and disposal of contaminated soil and/or groundwater shall be delineated and conducted in consultation with regulatory agencies and in accordance with established statutory and regulatory requirements (refer to Section 4.9.1). (GT-9)

- Dust control measures such as soil wetting, wind screens, etc. shall be implemented for contaminated soil. (GT-10)

- Groundwater collection, treatment, and discharge shall be performed according to applicable standards and procedures (refer to Section 4.10.1). (GT-11)

- Worker Health and Safety Plan shall be implemented prior to the start of construction activities. All workers shall be required to review the plan, receive training if necessary, and sign the plan prior to starting work. The plan shall identify properties of concern, the nature and extent of contaminants that could be encountered during excavation activities, appropriate health and environmental protection procedures and equipment, emergency response procedures including the most direct route to a hospital, contact information for the Site Safety Officer. (GT-12)

- Impermeable grout and other appropriate measures shall be used where necessary to fill gaps between the tunnels and the surrounding earth to address the potential for creation of a preferential pathway and resulting spread of existing contaminated groundwater. (GT-13)

- Testing for subsurface gases shall be conducted along all portions of the underground alignment. (GT-14)

- Construction of the project shall be consistent with the City of Los Angeles Methane Mitigation Standards, established in accordance with City of Los Angeles Ordinance No. 175790 and No. 180619, which provide detailed installation procedures, design parameters, and test protocols for the methane gas mitigation system as well as methods to control methane intrusion emanating from geologic formations. (GT-15)

- Specialized excavation methods and equipment shall be implemented to protect workers and the public from exposure to toxic gases and prevent explosions. For instance, pressurized closed-face TBMs and other equipment outfitted with ventilation systems would be used, as needed, to excavate the tunnels associated with the LPA, including Slurry Face Machines (SFMs) and Earth Pressure Balance Machines (EPBMs). During tunneling, the volume of gas (or water containing dissolved gas) released from the soil is confined to the excavated material chamber of the TBM because of the closed-face and gas-tight lining that is installed immediately behind the TBM. The project shall also comply with the City's Methane Mitigation Standards, which include provisions to protect workers and the public. (GT-16)

- Prior to building demolition, surveys of asbestos containing materials and lead-based paint shall be conducted. If necessary, destructive sampling shall be used. All asbestos containing materials and lead-based paint shall be removed or otherwise abated prior to demolition in accordance with all applicable laws and regulations. (GT-17)

- The construction contractor shall be required to implement BMPs for handling hazardous materials in compliance with existing regulations. These shall include requirements for proper use, storage, and disposal of chemical products and hazardous materials used in construction; spill control and countermeasures, including employee spill prevention/response training; vehicle fueling procedures to avoid overtopping construction equipment fuel tanks; procedures for routine maintenance of construction equipment, including the proper containment and removal of grease and oils; procedures for the proper disposal of discarded containers of fuels and other chemicals. (GT-18)

- Metro shall develop and implement an Environmental Site Assessment program in accordance with appropriate laws and regulations (refer to Section 4.9.1) to assess the potential for hazardous materials that may be encountered during construction. (GT-20)

- Metro shall develop and implement plans for pre-demolition and demolition abatement of hazardous building materials (i.e., asbestos, lead-based paint, PCB-light ballasts) in accordance with appropriate laws and regulations such as the Toxic Substances Control Act (refer to Section 4.9.1). (GT-21)

4.9.4.2.2 Final Operational Mitigation Measures for the Locally Preferred Alternative

- Structures within methane zones and buffer zones shall be consistent with municipal code requirements for gas concentration/pressure testing on a specified frequency and, based on the results, appropriate mitigation measures or controls to be included in the design. These measures may include the use of gas-impermeable liners and venting to reduce or eliminate gas intrusion into stations and along the length of the underground segments. (GT-19)

4.10 Water Resources

This section summarizes the existing water resources in the project area and the potential impacts of the proposed alternatives on these resources. The information in this section is based on the Water Resources Technical Memorandum, which is incorporated into this EIS/EIR as Appendix V, Water Resources Technical Memorandum.

This section has been updated since publication of the Draft EIS/EIR based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Minor modifications have been made to this section since publication of the Draft EIS/EIR, which include the addition of information from Appendix V, Water Resources Technical Memorandum. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.10.4.2 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA that have occurred since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of water resource impacts associated with the LPA is detailed below in Section 4.10.3.5.

4.10.1 Regulatory Framework

The NEPA guidance issued by the Federal Transportation Administration (FTA) recognizes the potential for wastewater generation and increased runoff to diminish water quality as possible impacts of transit projects.

CEQA guidelines provide a framework for evaluating potential effects. A significant impact to hydrology and water quality would occur if an alternative would:

- Violate any applicable water quality standards or waste discharge requirements, including those defined in Section 13050 of the Clean Water Act
- Affect the rate or change the direction of movement of existing groundwater contaminants, or expand the area affected by contaminants
- 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
- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site

- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Otherwise substantially degrade water quality
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows
- Expose people to a significant risk of loss, injury, or death involving flooding

The City of Los Angeles also specifies that a significant impact would occur if a project would increase the risk of harmful flooding during a 50-year storm.

Other applicable laws and guidance include:

- Federal:
  - Clean Water Act
  - National Flood Insurance Program regulations
- State:
  - Porter-Cologne Water Quality Control Act
  - State Antidegradation Policy
  - National Pollutant Discharge Elimination System
- Regional/Local:
  - Los Angeles Regional Water Quality Control Board (LARWQCB) requirements
  - County of Los Angeles General Plan
  - Los Angeles County Code
  - City of Los Angeles General Plan
  - City of Los Angeles Specific Plan for the Management of Flood Hazards
  - Los Angeles Department of Water and Power – Urban Water Management Plan

More information about these regulations and plans are provided in Appendix V, Water Resources Technical Memorandum.

4.10.2 Affected Environment

The proposed alternatives are located in the Los Angeles River Watershed Management Area. The Los Angeles River Watershed covers an area of over 834 square miles from the eastern portions of the Santa Monica Mountains, Simi Hills, and the Santa Susana Mountains in the west to the San Gabriel Mountains in the east.

The Los Angeles Department of Water and Power (LADWP) is responsible for supplying, treating, and distributing water for domestic and industrial uses in the project area. The City of Los Angeles obtains its water supply from local wells in the Los Angeles groundwater basin, the Los Angeles aqueducts, and by purchasing water from the Metropolitan Water District (MWD) (City of Los Angeles Planning Department 1995).

Groundwater is a major component of the water supply in the Los Angeles metropolitan area. Local groundwater resources provide about 15 percent of the total water supply. In drought years, this number can be as large as 30 percent (City of Los Angeles 2005a).

The proposed project alignment encompasses an area of approximately 1,200 acres in the central downtown area of Los Angeles. Surface water bodies are not directly located in the project area. The closest surface water feature is the Los Angeles River which runs approximately 0.5 mile east of Alameda Street and is near the project area's eastern boundary. Land use along this part of the river includes industrial, residential, and commercial uses, including major refineries and petroleum products storage facilities, major freeways, and rail lines (LARWQCB 2007). Surface water runoff and peak runoff rates have increased due to the impervious surfaces related to development in the project area. Another reason for the increase in peak runoff rates in the coastal plain areas stems from the elimination of natural ponding areas and improved hydraulic efficiency of water carriers such as streets and storm drain systems. Drainage in the immediate project area generally flows southeast via storm drains towards the Los Angeles River.

The project area is outside of the 100-year and 500-year flood zones and thus would not be susceptible to these storm events as defined by FEMA (100-year and 500-year storms are defined as having a one percent and 0.2 percent chance, respectively, of occurring in any given year). The closest 100-year floodplain area is along the Los Angeles River between Broadway and Mission Road approximately 0.5 to 0.7 mile from the project area (City of Los Angeles 1996).

The Los Angeles Coastal Plain Groundwater Basins underlie the project area. These groundwater basins are incorporated into the Coastal Plain Hydrographic Subunit. The Coastal Plain Hydrographic Subunit contains the Central, West Coast, Santa Monica, and Hollywood Basins. The Central Sub-basin, one of the most important basins in the hydrographic subunit, directly underlies the project area (City of Los Angeles Planning Department 1995).

Exploratory borings in the vicinity of the proposed alternatives have discovered groundwater along Flower Street between 7th and 2nd Streets at depths ranging from approximately 15 to 35 feet below ground surface. Other borings made adjacent to Flower Street between 2nd and 5th Streets discovered groundwater at depths between approximately 18 to 27 feet below the ground surface. In the area of Hill and Alameda Streets, borings reported groundwater seepage at depths between approximately 14 to 36 feet (Metro 2008). From these preliminary borings, it appears that groundwater is perched on the underlying San Fernando formation bedrock. Perched groundwater is groundwater that is separated from the water table and is often formed in response to water that collects during rain events or is in the process of being recharged by percolation from nearby surface water or other perched water zones.

The Inundation Hazard Zone is defined as areas that could flood should earthquake-induced failure of up-gradient dams, flood control facilities, or other water retaining structures occur. Multiple flood control facilities are located in the San Fernando Valley portion of the Los Angeles River Watershed. Failure of these flood control mechanisms would potentially cause inundation in the vicinity of the proposed alternatives. A limited portion of the eastern section of the proposed build alternatives is at the edge of a potential inundation area (near the intersection of Alameda Street with both Temple and 1st Streets) (City of Los Angeles 1996). However, the majority of the length of the build alternatives is not located in an area mapped to have the potential to be susceptible to this type of flooding. Figure 4.10-1 shows the locations of the proposed build alternatives relative to the inundation zone.

4.10.3 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential water resource impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.10.1. Table 4.10-1 summarizes the results of the analysis.

Table 4.10-1. Summary of Potential Impacts to Water Resources

Alternative	Water Quality (NEPA/CEQA)	Groundwater Contamination (NEPA/CEQA)	Drainage Impacts (NEPA/CEQA)	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
No Build	None (No beneficial effects either)	None	None	None	None
TSM	None	None	None	None	None
At-Grade Emphasis LRT	Adverse effects/ significant impacts not adverse or significant after mitigation	Adverse effects/ significant impacts not adverse or significant after mitigation	None	None	None
Underground Emphasis LRT	Adverse effects/ significant impacts not adverse or significant after mitigation	Adverse effects/ significant impacts not adverse or significant after mitigation	Adverse effects/ significant impacts avoided through design	None	None

Table 4.10-1. Summary of Potential Impacts to Water Resources (continued)

Alternative	Water Quality (NEPA/CEQA)	Groundwater Contamination (NEPA/CEQA)	Drainage Impacts (NEPA/CEQA)	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
LPA	Adverse effects/ significant impacts not adverse or significant after mitigation	Adverse effects/ significant impacts not adverse or significant after mitigation	Adverse effects/ significant impacts avoided through design	None	None

4.10.3.1 No Build Alternative

The No Build Alternative would not involve any new construction or operation of transit service. Changes to groundwater resources or recharge would not occur within the project area. The No Build Alternative would not allow the transit network to replace as many automobile trips as the build alternatives would, so some increases in roadway pollutants would occur as traffic worsens. Roadway pollutants can wash off of surface streets into surface waters during rain events.

4.10.3.1.1 NEPA Finding

The No Build Alternative would not have adverse impacts to water resources, although with fewer transit options, potential reductions in roadway pollutants would not occur.

4.10.3.1.2 CEQA Determination

The No Build Alternative would not have significant adverse impacts to water resources.

4.10.3.2 TSM Alternative

The TSM Alternative includes the same provisions as the No Build Alternative, plus the addition of two new shuttle bus routes linking 7th Street/Metro Center Station and Union Station. These additional shuttle bus lines would require minor rebuilding of existing drainage structures to accommodate new curb bus stops and the effects of this activity would not cause changes to water quality, hydrology, or drainage. Like the No Build Alternative, the TSM Alternative would not allow the transit network to replace as many automobile trips as the build alternatives would, so some increases in roadway pollutants would occur as traffic worsens.

4.10.3.2.1 NEPA Finding

The TSM Alternative would not have adverse impacts to water resources, although the limited increase in transit ridership would limit potential reductions in roadway pollutants.

4.10.3.2.2 CEQA Determination

The TSM Alternative would not have significant adverse impacts to water resources.

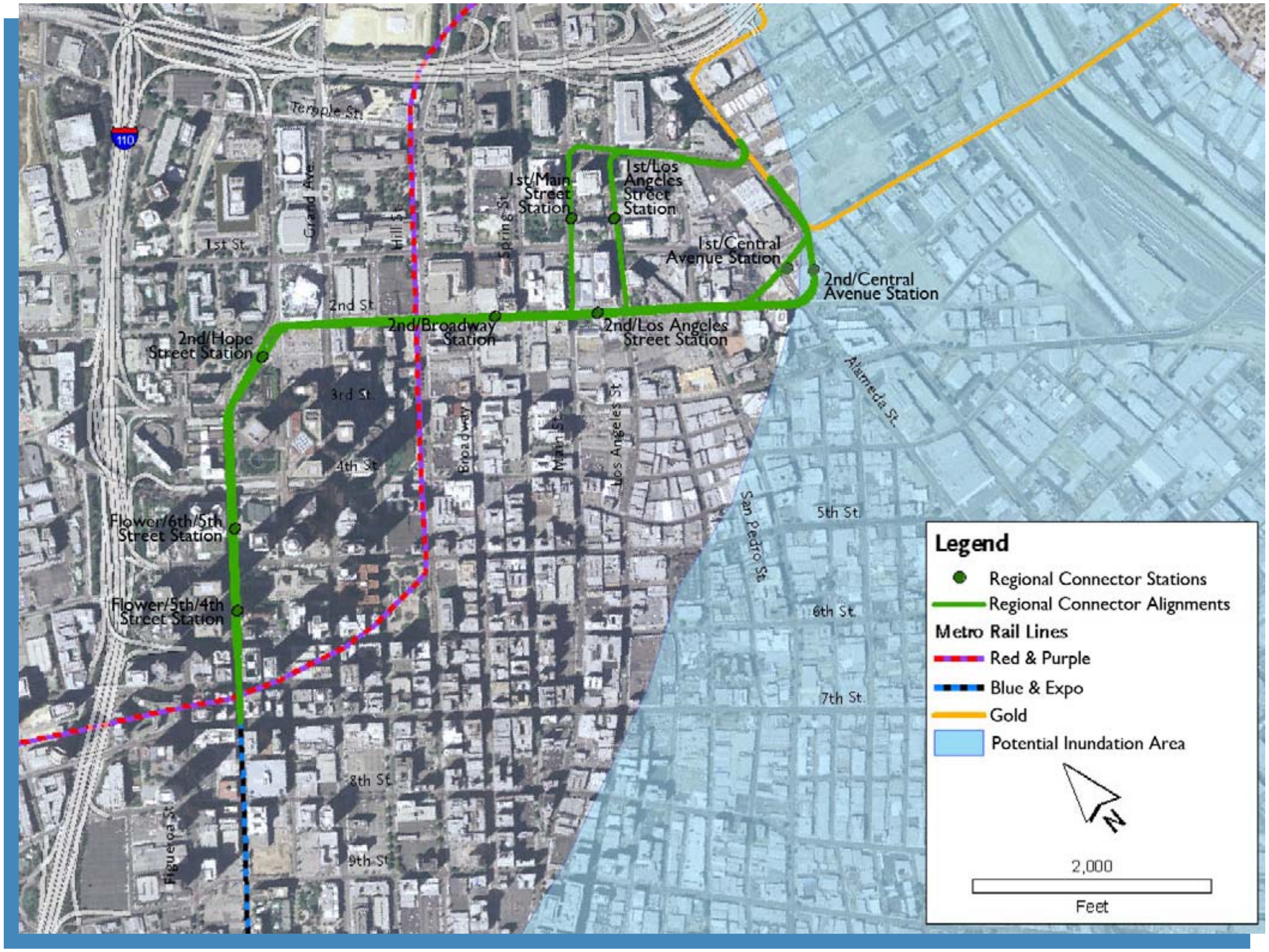


Figure 4.10-1. Potential Inundation Areas Relative to the Project

4.10.3.3 At-Grade Emphasis LRT Alternative

While approximately half of the At-Grade Emphasis LRT Alternative would be constructed at-grade and would not require as much excavation as the other build alternatives, there would still be a potential need for dewatering if groundwater is encountered during construction activities. Stations and tunneling would occur as deep as 80 feet below the surface. Exploratory borings showed groundwater depths of 15 to 35 feet below ground on Flower Street in the vicinity of the proposed alignment. As such, it is likely that groundwater would be encountered during excavation activities. This groundwater is known to be contaminated with pollutants common to urban and commercial activities.

Given the likelihood of encountering contaminated groundwater, compliance with federal, state, and local laws and regulations (as described in Section 4.9) would be required during construction activities. A dewatering permit from the LARWQCB would be necessary and any contaminated groundwater would be properly treated prior to being discharged. Uncontaminated groundwater may be treated and pumped back into the groundwater table, pumped to the sewer or storm drain system, or used on-site for dust control purposes. Additional site-specific groundwater investigation may be necessary to define the extent and location of groundwater contaminants for final design and to refine necessary mitigation measures.

Excavation activities also have the potential to create a preferential pathway for the spreading of contaminated groundwater in the groundwater basin. This impact could be mitigated by the use of impermeable concrete grouting materials which would reduce contaminant migration. Further mitigation measures to protect against potential environmental impacts from encountering contaminated groundwater are also described in Section 4.9.

Under the At-Grade Emphasis LRT Alternative, there is a potential for conflicts with the existing drainage system along 2nd Street between Grand Avenue and Olive Street where the alignment would be constructed through the 2nd Street Tunnel. Overall however, construction of the At-Grade Emphasis LRT Alternative would be expected to result in minimal impacts to and need for relocation of the current drainage system. In the case where construction activities would result in the need to relocate certain drainage infrastructure, temporary lines would be installed during the construction period. Construction of the At-Grade Emphasis LRT Alternative would have no significant impact on the overall drainage pattern in the project area.

The proposed alignment is outside of the 100-year flood hazard area; therefore, construction and operation of the At-Grade Emphasis LRT Alternative would not alter any existing flood zones.

In order to reduce any potential impacts related to stormwater runoff, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared and implemented during construction. Additionally, a Standard Urban Stormwater Management Plan (SUSMP) would be prepared and implemented in accordance with the Los Angeles Municipal Code, to ensure that stormwater runoff is managed for water quality concerns through implementation of appropriate best management practices (BMPs). Prior to issuance of any grading or building permits, the County and/or Stormwater Division of the Bureau of Sanitation must approve the SUSMP.

Due to the predominance of impervious surfaces throughout the project area, there is minimal percolation to the underlying groundwater basins. In addition, the alternative is not expected to substantially deplete groundwater supplies or interfere substantially with groundwater recharge and it would not affect percolation rates. Therefore, any potential increases in contaminated surface water runoff would have no significant impact on groundwater quality.

Tunneling during construction could potentially create a preferential pathway for contaminated groundwater that could be encountered. This could cause the contamination to spread at higher rates than would normally occur without disruption by construction activity. This potential impact would be reduced to a less than significant level with implementation of mitigation measures described in Section 4.10.4 of the Draft EIS/EIR.

Although unlikely during the operation phase of the At-Grade Emphasis LRT Alternative, groundwater dewatering and subsequent discharge may occur. The tunnel and underground stations would be constructed to preclude gas leakage or groundwater intrusion into the tunnel using a technique similar to that used for the Metro Gold Line tunnels in Boyle Heights. During operation, in the unlikely event that any water accumulates in the tunnel portions of the alignment, it would be pumped out by sump pumps and treated in accordance with applicable discharge permits before being discharged into the drainage system. Therefore, potential impacts to groundwater would be less than significant.

Operation of the At-Grade Emphasis LRT Alternative would likely decrease Vehicle Miles Traveled (VMT) of personal automobiles through the project area. An overall reduction in VMT could decrease the primary pollutants associated with all types of transportation operations such as heavy metals, solvents, and petroleum hydrocarbons. This would be a beneficial impact to surface water quality in the project area.

In regards to cumulative impacts, each of the reasonably foreseeable concurrent projects would be subject to applicable water quality regulations and each would be required to prepare a SWPPP for construction activities, incorporate BMPs to control pollutant discharges, and operate in compliance with Chapter 13.29, Stormwater and Urban Runoff Pollution Prevention Control and SUSMP. Also, it is not expected that any of the cumulative projects would result in a substantial change to the amount of impervious land cover in the project area, or a substantial alteration of the drainage systems. Overall, construction and operation of the At-Grade Emphasis LRT Alternative would not contribute to significant cumulative water quality, hydrology, and/or drainage impacts.

4.10.3.3.1 NEPA Finding

The At-Grade Emphasis LRT Alternative would have adverse effects with respect to water quality and groundwater contamination during construction. Operation of the alternative would have the potential beneficial effect of reducing automobile use and related roadway pollutants in stormwater runoff. Compliance with applicable regulations and implementation of the proposed mitigation measures in Section 4.10.4 of the Draft EIS/EIR would reduce potential adverse impacts to a less than significant level.

4.10.3.3.2 CEQA Determination

The At-Grade Emphasis LRT Alternative would not have significant impacts with respect to water quality and groundwater contamination after proposed mitigation measures are considered. Compliance with federal, state, and local laws in conjunction with implementation of mitigation measures proposed in Section 4.10.4 of the Draft EIS/EIR would reduce these potential impacts to a less than significant level.

4.10.3.4 Underground Emphasis LRT Alternative

The potential construction-related water quality and hydrology impacts of the Underground Emphasis LRT Alternative would be similar to those of the At-Grade Emphasis LRT Alternative. However, because the Underground Emphasis LRT Alternative involves more tunneling and generally greater intensity of construction activities, the potential for excavation to create a preferential pathway for the spreading of groundwater contamination in the groundwater basin would be greater. The use of impermeable concrete grouting materials would reduce potential contaminant migration, as described in Section 4.10.4 of the Draft EIS/EIR, to a less than significant level. The Underground Emphasis LRT Alternative would also impact a storm drain backbone line along Flower and 2nd Streets, but design measures would address the potential conflicts and avoid changes to system capacity or the overall direction of storm flows through the drainage infrastructure in the project area.

The Underground Emphasis LRT Alternative would have similar operation-related water quality, hydrology, and drainage impacts as the At-Grade Emphasis LRT Alternative. As with the At-Grade Emphasis LRT Alternative, this alternative would have slightly beneficial water quality impacts associated with a reduction in annual VMT of automobiles through the project area, which would reduce build-up of pollutant loads associated with automobile use such as oil, grease, and metals.

4.10.3.4.1 NEPA Finding

The Underground Emphasis LRT Alternative would have adverse effects with respect to water quality and groundwater contamination during construction. Operation of the alternative would have the potential beneficial effect of reducing automobile use and related roadway pollutants in stormwater runoff. Compliance with applicable regulations and implementation of the proposed mitigation measures in Section 4.10.4 of the Draft EIS/EIR would reduce potential adverse impacts to a less than significant level.

4.10.3.4.2 CEQA Determination

The Underground Emphasis LRT Alternative would not have significant impacts with respect to water quality and groundwater contamination after proposed mitigation measures are considered. Compliance with federal, state, and local laws in conjunction with implementation of mitigation measures proposed in Section 4.10.4 of the Draft EIS/EIR would reduce these potential impacts to a less than significant level.

4.10.3.5 Locally Preferred Alternative

Potential construction-related water quality impacts of the LPA would be similar to those of the Underground Emphasis LRT Alternative. The primary differences between the two alternatives is that the LPA includes a new station at 1st Street and Central Avenue, an underground rail junction beneath 1st and Alameda Streets, and the LPA would not impact the storm drain backbone line along Flower and 2nd Streets. This would result in more intense excavation activities in the potential inundation area than the Underground Emphasis LRT Alternative; however, the area is already fully urbanized and highly impervious so there would not be significant increases in the potential severity of inundation impacts.

Given the existing impervious nature of the project area, there is minimal infiltration to groundwater under existing conditions. The NEPA and/or CEQA thresholds identified in Section 4.10.1 were used for evaluating each alternative's (including the LPA) potential effect on water resources. Based on these thresholds, implementation of the LPA would not significantly impact groundwater recharge.

There would be a potential need for dewatering if groundwater is encountered during construction activities. It is likely that groundwater would be encountered during excavation activities. This groundwater is known to be contaminated with pollutants common to urban and commercial activities. Given the likelihood of encountering contaminated groundwater, compliance with federal, state, and local laws and regulations (as described in Section 4.9) would be required during construction activities. A dewatering permit from the LARWQCB would be necessary and any contaminated groundwater would be properly treated prior to being discharged. Uncontaminated groundwater may be treated and pumped back into the groundwater table, pumped to the sewer or storm drain system, or used on-site for dust control purposes. Additional site-specific groundwater investigation may be necessary to define the extent and location of groundwater contaminants for final design and to refine necessary mitigation measures.

Excavation activities also have the potential to create a preferential pathway for the spreading of contaminated groundwater in the groundwater basin. The use of impermeable concrete grouting materials would reduce potential contaminant migration, as described in Section 4.10.4.2 below, to a less than significant level. Further mitigation measures to protect against potential environmental impacts from encountering contaminated groundwater are also described in Section 4.9.

In the case where construction activities would result in the need to relocate certain drainage infrastructure, temporary lines would be installed during the construction period. Construction of the LPA would have no significant impact on the overall drainage pattern in the project area.

The proposed alignment is outside of the 100-year flood hazard area; therefore, construction and operation of the LPA would not alter any existing flood zones.

In order to reduce any potential impacts related to stormwater runoff, a SWPPP would be prepared and implemented during construction. Additionally, a SUSMP would be prepared and implemented consistent with the Los Angeles Municipal Code, to ensure that stormwater runoff is managed for water quality concerns through implementation of appropriate BMPs. Prior to issuance of any grading or building permits, the County and/or Stormwater Division of the Bureau of Sanitation must approve the SUSMP.

Due to the predominance of impervious surfaces throughout the project area, there is minimal percolation to the underlying groundwater basins. In addition, the alternative is not expected to substantially deplete groundwater supplies or interfere substantially with groundwater recharge and would not affect percolation rates. Therefore, any potential increases in contaminated surface water runoff would have no significant impact on groundwater quality.

Tunneling during construction could potentially create a preferential pathway for contaminated groundwater that could be encountered. This could cause the contamination to spread at higher rates than would normally occur without disruption by construction activity. This potential impact would be reduced to a less than significant level with implementation of mitigation measures described in Section 4.10.4.2 below.

Although unlikely during the operation phase of the LPA, groundwater dewatering and subsequent discharge may occur. The tunnel and underground stations would be constructed to preclude gas leakage or groundwater intrusion into the tunnel using a technique similar to that used for the Metro Gold Line tunnels in Boyle Heights. During operation, in the unlikely event that any water accumulates in the tunnel portions of the alignment, it would be pumped out by sump pumps and treated in accordance with applicable discharge permits before being discharged into the drainage system. Therefore, potential impacts to groundwater would be less than significant.

Operation of the LPA would likely decrease VMT of personal automobiles throughout the project area. An overall reduction in VMT could decrease the primary pollutants associated with all types of transportation operations such as heavy metals, solvents, and petroleum hydrocarbons. This would be a beneficial impact to surface water quality in the project area.

With regard to cumulative impacts, each of the reasonably foreseeable concurrent projects would be subject to applicable water quality regulations and each would be required to prepare a SWPPP for construction activities, incorporate BMPs to control pollutant discharges, and operate in compliance with Chapter 13.29, Stormwater and Urban Runoff Pollution Prevention Control and SUSMP. Also, it is not expected that any of the cumulative projects would result in a substantial change to the amount of impervious land cover in the project area, or a substantial alteration of the drainage systems. Overall, construction and operation of the LPA would not contribute to significant cumulative water quality, hydrology, and/or drainage impacts.

4.10.3.5.1 NEPA Finding

The LPA would have adverse effects with respect to water quality and groundwater contamination during construction. Operation of the alternative would have the potential beneficial effect of reducing automobile use and related roadway pollutants in stormwater runoff. Compliance with applicable regulations and implementation of the mitigation measures in Section 4.10.4.2 below will reduce potential adverse effects to not substantially adverse.

4.10.3.5.2 CEQA Determination

The LPA would not have significant impacts with respect to water quality and groundwater contamination after proposed mitigation measures are considered. Compliance with federal, state, and local laws in conjunction with implementation of mitigation measures in Section

4.10.4.2 below would reduce these potential impacts to a less than significant level. Overall, construction and operation of the LPA would not contribute to significant cumulative water quality, hydrology, and/or drainage impacts.

4.10.4 Mitigation Measures

4.10.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies and other stakeholders. Since publication of the Draft EIS/EIR, Metro has added specificity to the candidate mitigation measures for water resource impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.10.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR.

4.10.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

An erosion control plan shall be prepared prior to construction and shall specify procedures for implementing the following mitigation measures: (WR-1)

- Natural drainage, detention ponds, sediment ponds, or infiltration pits shall be used to allow runoff to collect and reduce or prevent erosion. (WR-2)
- Barriers shall be used to direct and slow the rate of runoff and to filter out large-sized sediments. (WR-3)
- Down-drains or chutes shall be used to carry runoff from the top of a slope to the bottom. (WR-4)
- Use of water for irrigation and dust control shall be controlled so as to avoid off-site runoff. (WR-5)

Potentially significant impacts to water quality stemming from both construction and operation of the LPA will be mitigated with the following measures as appropriate:

- Project design shall include properly designed and maintained biological oil and grease removal systems in new storm drain systems to treat water before it leaves project sites. (WR-6)
- Hazardous materials shall be stored properly to prevent contact with precipitation and runoff. (WR-7)
- An effective monitoring and cleanup program for spills and leaks of hazardous materials shall be developed and maintained. (WR-8)

- Equipment to be repaired or maintained shall be placed in covered areas on a pad of absorbent material to contain leaks, spills, or small discharges. (WR-9)
- Periodic and consistent removal of landscape and construction debris shall be performed. (WR-10)
- Any significant chemical residue on the project sites shall be removed through appropriate methods. (WR-11)
- Non-toxic alternatives for any necessary applications of herbicides or fertilizers shall be used. (WR-12)
- Detention basins shall be installed to remove suspended solids by settlement. (WR-13)
- Water quality or runoff shall be periodically monitored before discharge from project sites and into the storm drainage system. (WR-14)

4.11 Energy Resources

This section summarizes the energy resources in the project area, usage associated with construction and operation of the proposed Regional Connector Transit Corridor project alternatives, and the net energy demand associated with changes to the regional transportation network under each of the proposed alternatives. Information in this section is based on the Energy Resources Technical Memorandum prepared for the project contained in Appendix W of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR based on refinements to the Locally Preferred Alternative (LPA). Minor changes have also been made to this section in order to maintain consistency with other Metro projects. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Minor changes were made to the numerical values stated in this section. Average weekday values were calculated in the Draft EIS/EIR for vehicle miles traveled (VMT) and other measures based on VMT. In order to report annual values for VMT in the Draft EIS/EIR, a multiplier (annualization factor) was used to convert the daily values. This annualization factor has been updated for this Final EIS/EIR to maintain consistency with other Metro projects, and has caused annual VMT and other annualized measures based on VMT to change slightly for all of the alternatives. Construction-related energy impacts were estimated by applying a highway construction energy factor to the total estimated construction cost for the LPA. Other minor modifications that have been made to this section since publication of the Draft EIS/EIR include the summary in this section of some information from Appendix W, Energy Resources Technical Memorandum. Since publication of the Draft EIS/EIR, refinements to the LPA have lowered the associated construction costs, which have reduced the projected temporary energy demand during construction of the LPA. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA or other developments since publication of the Draft EIS/EIR.

The analysis of potential energy resource impacts associated with the LPA is detailed below in Section 4.11.3.5.

4.11.1 Regulatory Framework

Energy and energy use within the project area is governed by several federal, state, and local laws and policies, such as:

- The Energy Policy and Conservation Act of 1975
- The Alternative Fuels Act of 1988
- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)
- Senate Bill 1389

- Executive Order S-3-05
- Metro's Energy and Sustainability Policy

Electricity and transportation are the major energy use sectors analyzed by the California Energy Commission (CEC). Federal and state policies and regulations are gradually transforming electricity generation to cleaner sources and away from reliance on petroleum sources (CEC 2007a). More information regarding these laws and policies is available in Appendix W, Energy Resources Technical Memorandum.

The Council on Environmental Quality (CEQ) dictates requirements for reporting environmental consequences under NEPA. While there are no specific NEPA criteria for analyzing impacts to energy resources, 40 CFR § 1502.16(e) directs that environmental impact statements (EISs) include a discussion of the "energy requirements and conservation potential of various alternatives," "natural or depletable resource requirements and conservation potential of various alternatives," and potential mitigation measures.

The following significance criteria are based on Appendix G of the state CEQA Guidelines and the *L.A. CEQA Thresholds Guide* (2006). The proposed project alternatives would result in a significant impact to energy resources if they would:

- Require new (off-site) energy supply facilities and distribution infrastructure or capacity enhancing alterations to existing facilities
- Conflict with adopted energy conservation plans
- Use nonrenewable resources in a wasteful and inefficient manner
- Result in a need for new systems or substantial alterations to power or natural gas

4.11.2 Affected Environment

Transportation in Los Angeles County continues to be dominated by single-occupancy automobiles. In 2005, 74.7 percent of all people in the Southern California region drove alone to work (Los Angeles County 2008). High percentages of single-occupancy vehicles result in higher VMT throughout the state. In turn, high VMT translate into high energy use and increased air pollutants in the SCAG region. The CEC's Integrated Energy Policy Report concludes that the transportation sector is the largest contributor of greenhouse gases in the state (CEC 2007a).

Table 4.11-1 summarizes baseline (2009) annual transportation energy usage in the Los Angeles region. The most recent available data for Metro bus and light rail energy consumption in the project region are from 2007. In that year, light rail and buses consumed approximately 900 billion British Thermal Units (BTUs), the equivalent of approximately 160,000 barrels of oil. The most recent data for annual automobile energy consumption in the region comes from the transportation model. Automobiles in the region consumed approximately 600,000 billion BTUs in 2009, the equivalent of over 103 million barrels of oil.

Table 4.11-1. Regional Annual Transportation Energy Usage, Existing Conditions (2009)[a]

Vehicle Class	Consumption Factors[1,2] (BTU/mi)	Miles Traveled (Annual)	Total BTU Consumption (Billions)	Total Barrels of Oil
Light Rail[2]	77,327	3,925,583	304	52,337
Bus[2]	6,255	101,930,386	638	109,927
Automobiles[3]	6,213	96,739,543,200	601,043	103,628,066
Annual Total	N/A	96,845,399,169	601,985	103,790,330

Sources:
[1] DOE, 2008
[2] RY2007 (Database: http://www.ntdprogram.gov/ntdprogram/data.htm)
[3] CDM, 2009
Note:
[a] Existing conditions are reported from data sources dated 2007 and 2009. The 2007 data are the most recent available data from the National Transportation Data Program for Metro-reported light rail and bus miles traveled annually.

Metro's electricity use is split between powering the rail system and transit facilities (LACMTA 2009b). For both rail and facility electricity requirements, Metro buys power from Los Angeles Department of Water and Power (LADWP), Southern California Edison (SCE), and Pasadena Water and Power (LACMTA 2009b). In 2008, Metro rail consumed 175 million kilowatt hours (kWh) of electricity (approximately 597 billion BTUs) and Metro facilities consumed 69 million kWh (approximately 235 thousand BTUs) (LACMTA 2009b). Metro would purchase additional electricity from its current providers to facilitate the proposed project. Metro's 2009 Baseline Sustainability Report presents goals and recommendations for tracking and improving these performance measures. Please refer to Appendix W, Energy Resources Technical Memorandum, for more information regarding existing energy supplies and usage.

4.11.3 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential energy resource impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.11.1. Table 4.11-2 summarizes the results of the analysis.

Analysis of potential energy resource impacts included consideration of the following elements:

- Construction-related energy
- Energy operating costs
- Direct energy consumption (measured in BTUs per vehicle mile for cars, trucks, buses, and light rail operating in the project area)
- Net project operating energy savings or costs

Table 4.11-2. Summary of Potential Impacts to Energy Resources

Alternative	Energy Consumption – Construction (NEPA/CEQA)	Energy Consumption – Operation (NEPA/CEQA)	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
No Build	None	None (increase associated with projected growth)	None	None
TSM	Not Substantially Adverse/Less Than Significant Impact	None (some beneficial impacts)	None	None
At-Grade Emphasis LRT	Not Substantially Adverse/Less Than Significant Impact	Beneficial long-term impacts (overall net benefit to energy)	None	None
Underground Emphasis LRT	Not Substantially Adverse/Less Than Significant Impact	Beneficial long-term impacts (overall net benefit to energy)	None	None
LPA	Not Substantially Adverse/Less Than Significant Impact	Beneficial long-term impacts (overall net benefit to energy)	None	None

Construction-related impacts were estimated by applying a highway construction energy factor to the total estimated construction cost of the Regional Connector project. The California Department of Transportation (CALTRANS) derived energy consumption for different light rail transit (LRT) facilities in Energy and Transportation Systems, and these factors are still widely used in the industry today (CALTRANS 1983).

Consumption factors are reported in BTUs per dollar of construction spending. Given the date of this data source, the energy consumption factors were adjusted to account for the change in construction costs. The California Construction Cost Index was used to adjust the factors to 2009 dollars.

Analysis of the operational energy impact of proposed stations for the build alternatives, including the LPA, was determined following the same methodology used in the Climate Change analysis, following Chester and Horvath's electricity usage factors used for the San Francisco Municipal Railway (Muni) in San Francisco (Chester and Horvath 2008).

Table 4.11-3 summarizes annual changes in energy consumption associated with regional highway VMT for each of the action alternatives compared to the No Build Alternative. Calculations were based on data from the transportation model that projected changes in daily VMT throughout the region. As shown in Table 4.11-3, all of the alternatives would result in a net decrease in VMT throughout the region when compared to the No Build Alternative. This decrease in VMT would result in a net decrease in energy consumption, with the LPA having the greatest decrease. Table 4.11-4 summarizes total operational energy demands under all of the proposed alternatives. Table 4.11-4 compares BTUs and barrels of oil under each alternative as well as the percent change in BTUs between each build alternative and the No Build Alternative.

As discussed below, none of the alternatives would result in a significant impact to energy resources. Therefore, no new (off-site) energy supply facilities, distribution infrastructure, capacity enhancing alterations to existing facilities, or new systems or substantial alterations to power or natural gas would be required under any of the alternatives. The impact analysis for each alternative, based on the remaining thresholds identified in Section 4.11.1, is included below.

Table 4.11-3. Estimated Regional Highway VMT and Energy Consumption Comparisons

Comparison	Annual Change in Automobile VMT	Annual Change in Energy Consumption (BTU in billions)	Annual Change in Barrels of Oil
TSM Alternative vs. No Build Alternative	(87,195,600)	(542)	(93,404)
At-Grade Emphasis LRT Alternative vs. No Build Alternative	(95,972,400)	(596)	(102,806)
Underground Emphasis LRT Alternative vs. No Build Alternative	(99,311,400)	(617)	(106,383)
LPA vs. No Build Alternative	(102,268,800)	(635)	(109,551)

Note:
Parentheses indicate a reduction compared to the No Build Alternative.

4.11.3.1 No Build Alternative

Since construction would not be performed under the No Build Alternative, this alternative would not result in construction-related impacts to energy use or resources. Under the No Build Alternative, energy consumption would not be associated with the operation of new light rail lines or stations. Increased energy consumption that would occur under the No Build Alternative (an increase of almost 400,000 billion BTUs from the 2009 baseline) is a result of projected growth in traffic that is expected to occur in the region without the project (Table 4.11-4). Direct impacts to energy resources would not occur as a result of this alternative.

Since construction would not occur with this alternative, and project-level impacts would not occur in energy consumption, this alternative would not contribute to cumulative impacts with respect to energy consumption.

4.11.3.1.1 NEPA Finding

The No Build Alternative would not have adverse effects with respect to energy resources in the region.

4.11.3.1.2 CEQA Determination

The No Build Alternative would not have significant impacts with respect to energy resources in the region.

Table 4.11-4. Estimated Annual Operational Energy Consumption for Each Alternative

VMT[1] (billions)	BTU[2] (billions)	Barrels of Oil	Total BTU (billions)	Percent Change in BTU from No Build[3]	Total Barrels of Oil
Baseline (2009)					
Highway – 96.74	601,043	103,628,066	601,043	--	103,628,066
No Build (2035)					
Highway – 160.47	997,019	171,899,963	997,019	--	171,899,963
TSM					
Highway – 160.39	996,478	171,806,558	996,484	(0.054)	171,807,658
Bus – .000994	6.2	1,100			
At-Grade Emphasis LRT					
Highway – 160.38	996,423	171,797,157	996,456	(0.056)	171,802,757
Light Rail – .000383	29.7	5,100			
Stations – --	3.1	500			
Underground Emphasis LRT					
Highway – 160.37	996,403	171,793,580	996,436	(0.058)	171,799,180
Light Rail – .000380	29.4	5,000			
Stations – --	3.4	600			

Table 4.11-4. Estimated Annual Operational Energy Consumption for Each Alternative (continued)

VMT[1] (billions)	BTU[2] (billions)	Barrels of Oil	Total BTU (billions)	Percent Change in BTU from No Build[3]	Total Barrels of Oil
LPA					
Highway – 160.37	996,384	171,790,412	996,416	(0.060)	171,796,012
Light Rail – .000362	28.0	4,800			
Stations[4] – --	4.5	800			

Notes:
[1] Calculation of VMT describes changes in highway VMT within the project area projected by the transportation model for the 2035 horizon year under each alternative. Added bus VMT are included in the TSM Alternative and added light rail VMT are included in the three LRT build alternatives. Operations of buses and light rail outside of the proposed alternatives are assumed to remain unchanged.
[2] Operational BTUs include the energy required to operate additional stations under the LRT build alternatives.
[3] This percentage represents percent change in operational BTUs and does not include construction.
[4] The energy consumption is based on the Fully Underground LRT Alternative (which included four stations). The estimated energy consumption associated with the LPA (which only includes three stations) would be similar to the estimated energy consumption associated with the Fully Underground LRT Alternative.

4.11.3.2 TSM Alternative

The TSM Alternative would involve minimal construction, which would include the installation of bus stops. Construction associated with the TSM Alternative would not consume energy resources in a wasteful or inefficient manner. Therefore, construction impacts on energy resources would be less than significant.

Operation of the TSM Alternative would reduce highway VMT in the project area by approximately 87 million vehicle miles per year (Table 4.11-3). Correspondingly, automobile energy consumption would decrease and total net savings from operations of the TSM Alternative would be annually greater than 500 billion BTUs. Therefore, operation of the TSM Alternative would result in potential beneficial impacts. Cumulative impacts would not occur to energy resources since the TSM Alternative would not result in construction or operational-related impacts.

4.11.3.2.1 NEPA Finding

The TSM Alternative would not have adverse effects with respect to energy resources. The overall net energy effects would be beneficial.

4.11.3.2.2 CEQA Determination

The TSM Alternative would not have significant impacts with respect to energy resources. The overall net energy impacts would be beneficial.

4.11.3.3 At-Grade Emphasis LRT Alternative

To determine construction-related energy consumption, capital cost data were used per the methodology described in Section 4.11.3. Construction energy impacts are summarized in Table 4.11-5.

Construction of the At-Grade Emphasis LRT Alternative would result in a temporary energy demand of 3,457 billion BTUs (Table 4.11-5). This would be a temporary impact to energy resources. The air quality construction mitigation measures identified in Chapter 8, Mitigation Monitoring and Reporting Program (MMRP) for the LPA, under air quality, would ensure that this alternative would not consume energy resources in a wasteful or inefficient manner. In addition, the project would result in long-term, beneficial decreases in energy use in the region. The potential construction-related impacts would be less than significant, given the long-term, beneficial decreases in energy use from implementation of this alternative.

Total annual BTU consumption associated with the At-Grade Emphasis LRT alternative would be approximately 996,456 billion BTUs (Table 4.11-4). Total energy use is compared to the No Build Alternative (2035) to identify adverse effects under NEPA. Total energy use of the alternative is compared to current total energy usage (2009) to determine significance under CEQA.

Table 4.11-5. Estimated Energy Consumption from Construction – At-Grade Emphasis LRT Alternative

Project Component	Base Year Dollars (thousands)	Energy Consumption Factor (BTU/2009 $)	Total BTU Consumption (billions)
Track Elements	105,506	6,012	634
Stations, Stops, Terminals	230,850	6,012	1,388
Maintenance Facilities	8,625	7,394	63
Site work	165,378	6,012	994
Systems	40,950	9,240	378
Total	**551,309**	**N/A**	**3,457**

Total operational energy consumption at build out of the At-Grade Emphasis LRT Alternative would be greater than that of existing conditions. However, this increase results from increased regional traffic unrelated to this alternative. Compared to the No Build Alternative, this alternative would reduce VMT and result in an annual decrease in energy consumption (Table 4.11-3). Total annual net savings from operations under this alternative would be approximately 596 billion BTUs (equivalent to an annual savings of approximately 102,000 barrels of oil) (Table 4.11-3). This potential impact to energy resources in the region would be beneficial.

Construction of the At-Grade Emphasis LRT Alternative would result in less than significant impacts to energy resources. The proposed project, in conjunction with other reasonably foreseeable renovation, new construction, and transportation projects in the vicinity of the proposed project, would comply with federal, state, and local regulations to conserve and reduce energy usage. Construction would require energy from both transportation fuels and LADWP's electricity supply.

The LADWP is working to develop new renewable energy and energy efficient resources. This project alternative, and other potential projects in the area, would be consistent with applicable energy efficiency guidance set by the LADWP. Therefore, this project and other potential projects in the area would not conflict with adopted energy conservation plans or use nonrenewable resources in a wasteful or inefficient manner. Potential cumulative impacts related to construction would be less than significant.

LADWP predicts increases in electricity demand over the next decade. LADWP has increased its ability to serve the area by adding new facilities and increasing and diversifying its energy supplies. LADWP is committed to increasing electricity generation from renewable energy sources and ensuring a reliable flow of electricity to users in its service area. Potential cumulative impacts related to operation would be less than significant, given that operation of the At-Grade Emphasis LRT Alternative would result in a beneficial energy impact.

4.11.3.3.1 NEPA Finding

The At-Grade Emphasis LRT Alternative would not have adverse effects with respect to energy resources. The overall net energy effects would be beneficial.

4.11.3.3.2 CEQA Determination

The At-Grade Emphasis LRT Alternative would not have significant impacts with respect to energy resources. The overall net energy impact would be beneficial.

4.11.3.4 Underground Emphasis LRT Alternative

Construction energy impacts are summarized in Table 4.11-6.

Construction of the Underground Emphasis LRT Alternative would consume a one-time energy amount of approximately 4,955 billion BTUs (Table 4.11-6). This would be a temporary impact to energy resources. The air quality construction mitigation measures identified in Chapter 8, MMRP for the LPA, under air quality, would ensure that this alternative would not consume energy resources in a wasteful or inefficient manner. Overall, a net beneficial impact to energy resources would occur given the long-term reduction in energy use from implementation of this alternative. Therefore, potential construction-related impacts would be less than significant, given the long-term, beneficial decreases in energy use from implementation of this alternative.

Table 4.11-6. Estimated Energy Consumption from Construction – Underground Emphasis LRT Alternative

Project Component	Base Year Dollars (thousands)	Energy Consumption Factor (BTU/2009$)	Total BTU Consumption (billions)
Track Elements	161,921	6,012	973
Stations, Stops, Terminals	388,140	6,012	2,333
Maintenance Facilities	8,625	7,394	63
Site work	201,937	6,012	1,214
Systems	40,285	9,240	372
Total	**800,908**	**N/A**	**4,955**

Annual operation of this alternative would require approximately 996,436 billion BTUs (Table 4.11-4). Total energy use is compared to the No Build Alternative (2035) to identify adverse effects under NEPA. Total energy use of the alternative is compared to current total energy usage (2009) to determine significance under CEQA.

Total operational energy consumption at build out of the Underground Emphasis LRT Alternative would be greater than that of existing (2009) conditions. However, this increase results from increased regional traffic unrelated to this alternative. Compared to the No Build Alternative, this alternative would reduce VMT and result in an annual decrease in energy consumption (Table 4.11-3). Total annual net savings from operations under this alternative would be approximately 617 billion BTUs (equivalent to an annual energy savings of approximately 106,000 barrels of oil) (Table 4.11-3). This potential impact to energy resources in the region would be beneficial.

Construction of the Underground Emphasis LRT Alternative would result in less than significant impacts to energy resources. The proposed project, in conjunction with reasonably foreseeable renovation, new construction, and transportation projects in the vicinity of the proposed project would comply with federal, state, and local regulations to conserve and reduce energy usage. Construction would require energy from both transportation fuels and LADWP's electricity supply.

The LADWP is working to develop new renewable energy and energy efficient resources. This project alternative, and other potential projects in the area, would be consistent with applicable energy efficiency guidance set by the LADWP. Therefore, this project and other potential projects in the area would not conflict with adopted energy conservation plans or use nonrenewable resources in a wasteful and inefficient manner. Potential cumulative impacts related to construction would be less than significant.

LADWP predicts increases in electricity demand over the next decade. LADWP has increased its ability to serve the area by adding new facilities and increasing and diversifying its energy supplies. As indicated above, LADWP is working to develop new renewable energy and energy efficient resources. Potential cumulative impacts related to operation would be less than significant, given that operation of the Underground Emphasis LRT Alternative would result in a beneficial energy impact.

4.11.3.4.1 NEPA Finding

The Underground Emphasis LRT Alternative would not have adverse effects with respect to energy resources. The overall net energy effects would be beneficial and greater than the At-Grade Emphasis LRT Alternative, but less than the LPA.

4.11.3.4.2 CEQA Determination

The Underground Emphasis LRT Alternative would not have significant impacts with respect to energy resources. The overall net energy impacts would be beneficial and greater than the At-Grade Emphasis LRT Alternative, but less than the LPA.

4.11.3.5 Locally Preferred Alternative

Construction of the LPA would result in a temporary energy demand of approximately 4,292 billion BTUs, as presented in Table 4.11-7. This would be a temporary impact to energy resources. The air quality construction mitigation measures identified in Chapter 8, MMRP for the LPA, under air quality, would ensure that this alternative would not consume energy resources in a wasteful or inefficient manner. In addition, the project would result in long-term, beneficial decreases in energy use in the region. Given the long-term, beneficial decreases in energy use from implementation of the LPA, potential construction-related impacts would be less than significant.

Total annual BTU consumption associated with the LPA would be approximately 996,416 billion BTUs (Table 4.11-4). Total energy use is compared to the No Build Alternative (2035) to identify adverse effects under NEPA. Total energy use of the alternative is compared to current total energy usage (2009) to determine significance under CEQA.

Total operational energy consumption at build out of the LPA would be greater than that of existing (2009) conditions. However, this increase results from increased regional traffic unrelated to this alternative. Compared to the No Build Alternative, the LPA would reduce VMT and result in an annual decrease in energy consumption (Table 4.11-3). Total annual net savings from operations under the LPA would be approximately 635 billion BTUs (equivalent to an annual energy savings of approximately 109,500 barrels of oil) (Table 4.11-3). This potential impact to energy resources in the region would be beneficial.

Given that the alternative would result in a beneficial energy impact, the LPA would not require new (off-site) energy supply facilities, distribution infrastructure, capacity enhancing alterations to existing facilities, or result in a need for new systems or substantial alterations to power or natural gas. Therefore, impacts to these facilities would be less than significant.

Table 4.11-7. Estimated Energy Consumption from Construction – Locally Preferred Alternative

Project Component	Base Year Dollars (thousands)	Energy Consumption Factor (BTU/2009$)	Total BTU Consumption (billions)
Track Elements	233,008	6,012	1,401
Stations, Stops, Terminals	271,325	6,012	1,631
Maintenance Facilities	2,138	7,394	16
Site work	138,699	6,012	834
Systems	44,406	9,240	410
Total	**689,576**	**N/A**	**4,292**

Cumulative impacts would be similar to those described for the Underground Emphasis LRT Alternative. Construction of the LPA would result in less than significant impacts to energy resources. The proposed project, in conjunction with other reasonably foreseeable renovation, new construction, and transportation projects in the vicinity of the proposed project, would comply with federal, state, and local regulations to conserve and reduce energy usage. Construction would require energy from both transportation fuels and LADWP's electricity supply.

The LADWP is working to develop new renewable energy and energy efficient resources. This project alternative, and other potential projects in the area, would be consistent with applicable energy efficiency guidance set by the LADWP. Therefore, this project and other potential projects in the area would not conflict with adopted energy conservation plans or use nonrenewable resources in a wasteful and inefficient manner. Potential cumulative impacts related to construction would be less than significant.

LADWP predicts increases in electricity demand over the next decade. LADWP has increased its ability to serve the area by adding new facilities and increasing and diversifying its energy supplies. LADWP is committed to increasing electricity generation from renewable energy sources and ensuring a reliable flow of electricity to users in its service area. The LPA would not contribute to a potential cumulative impact during operation, given that operation of the LPA would result in a beneficial energy impact.

4.11.3.5.1 NEPA Finding

The LPA would not have adverse effects with respect to energy resources. The overall net energy effects would be beneficial and greater than any of the other build alternatives.

4.11.3.5.2 CEQA Determination

The LPA would not have significant impacts with respect to energy resources. The overall net energy impacts would be beneficial and greater than any of the other build alternatives. Potential cumulative impacts related to construction would be less than significant. Given that operation of the LPA would result in a beneficial energy impact, the LPA would not contribute to potential cumulative impacts during operation.

4.11.4 Mitigation Measures

Mitigation measures would not be required because potential impacts to energy resources under the TSM and build alternatives, including the LPA, would be beneficial. The air quality construction mitigation measures identified in Section 4.5, Air Quality, and Chapter 8, MMRP for the LPA, under air quality, will ensure that the LPA would not consume energy resources in a wasteful or inefficient manner.

4.12 Historic Resources

The following sections summarize the evaluation of potential impacts to historic resources for each alternative. Table 4.12-1 summarizes the results of the analysis.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, as indicated in the Responses to Comments, Volumes F-2 and F-3, of this Final EIS/EIR, discussion with the California State Historic Preservation Officer (SHPO), additional correspondence with the Advisory Council on Historic Preservation (ACHP), and based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA - which are listed in Section 4.12.1.4.2 below for the built environment, 4.12.2.4.2 below for archaeological resources, and 4.12.3.4.2 below for paleontological resources - based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations after mitigation were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR. Additional noise and vibration analysis of the LPA alignment refinements was performed to support this conclusion, and the results are included in Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR and summarized in this section where relevant to the impact analysis. Additional mitigation measures were also added to address impacts to the S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building. Environmental effects of the LPA are discussed in Section 4.12.1.3.5 for the built environment, 4.12.2.3.5 for archaeological resources, and 4.12.3.3.5 for paleontological resources.

Confirmed mitigation measures for the LPA are listed in Section 4.12.1.4.2 below for the built environment, 4.12.2.4.2 below for archaeological resources, and 4.12.3.4.2 below for paleontological resources. These mitigation measures have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR and, where appropriate, are included in a Memorandum of Agreement (MOA) with the California SHPO. The MOA has been developed to resolve potential adverse effects to archaeological resources and to protect historic properties. Some of the measures initially proposed in the Draft EIS/EIR and Supplemental Environmental Assessment/Recirculated Sections of the Draft EIR (Supplemental EA/Recirculated Draft EIR Sections) have been refined and adapted for the MMRP and MOA. The MOA is included in Appendix 3 of this Final EIS/EIR.

Table 4.12-1. Summary of Potential Impacts to Historic Resources

Alternative	Built Environment		Archaeology		Paleontology		Adverse NEPA/NHPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
	NEPA/NHPA	CEQA	NEPA/NHPA	CEQA	NEPA/NHPA	CEQA		
No Build	None[1]	None	None[1]	None	None[1]	None	None[1]	None
TSM	None[1]	None	Effect not adverse after mitigation[1]	Significant Impact	Effect not adverse after mitigation[1]	Significant Impact	None[1]	None
At-Grade Emphasis LRT	Adverse Effect[1]	Significant Impact	Effect not adverse after mitigation[1]	Significant Impact	Effect not adverse after mitigation[1]	Significant Impact	Built Environment [1]	None
Underground Emphasis LRT	Effect not adverse after mitigation[1]	Significant Impact	Effect not adverse after mitigation[1]	Significant Impact	Effect not adverse after mitigation (NHPA)[1], Potentially Significant Impact (NEPA)	Significant Impact	None (NHPA)[1], Paleontology (NEPA)	Paleontology
Locally Preferred Alternative	Effect not adverse after mitigation[1]	Significant Impact	Effect not adverse after mitigation[1]	Significant Impact	Effect not adverse after mitigation (NHPA)[1], Potentially Significant Impact (NEPA)	Significant Impact	None (NHPA)[1], Paleontology (NEPA)	Paleontology

Note:
[1] The California State Historic Preservation Officer concurred with FTA's determination of NHPA adverse effect on June 1, 2010. Additional SHPO consultation regarding the LPA refinements was conducted in April and May 2011. Confirmed mitigation measures are in Section 4.12.1.4.2 below for built environment and Section 4.12.2.4.2 below for archaeology.

4.12.1 Built Environment

This section describes the Regional Connector Transit Corridor's potential impacts on historic built environment resources. The information in this section is based on the updated Cultural Resources – Built Environment Technical Memorandum, which is incorporated into this Final EIS/EIR as Appendix X. Information has been added to Appendix X, Cultural Resources - Built Environment (Updated), since publication of the Draft EIS/EIR to describe refinements to the LPA. Environmental effects of the LPA are discussed in Section 4.12.1.3.5 below and confirmed mitigation measures are discussed in Section 4.12.1.4.2 below.

4.12.1.1 Regulatory Framework

NEPA requires that effects on historic properties be evaluated during the EIS process, in coordination with procedures established by Section 106 of the National Historic Preservation Act (NHPA). Federal agencies must evaluate potential direct and indirect effects on properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP). An adverse effect would occur if the project would directly or indirectly diminish any of the characteristics that qualify a historic property for NRHP eligibility or listing.

The NRHP, created under the NHPA, is the federal list of historic, archaeological, and cultural resources worthy of preservation. Resources listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, prehistory, architecture, archaeology, engineering, and culture. The NRHP is maintained and expanded by the National Park Service (NPS) on behalf of the Secretary of the Interior. The California Office of Historic Preservation (in Sacramento) administers the state-wide NRHP program under the direction of SHPO. To guide the selection of properties included in the NRHP, the NPS has developed the NRHP Criteria for Evaluation. The criteria are standards by which every property that is nominated to the NRHP is judged. Significance in American history, architecture, archaeology, and culture is possible in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling and association, and meet one of the following Criteria (36 CFR 60.4):

- Criterion A: A property is associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: A property is associated with the lives of a person or persons significant in our past; or
- Criterion C: A property embodies the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: A property has yielded, or may be likely to yield, information important in prehistory or history.

Buildings less than 50 years old do not meet the NRHP criteria unless they are of exceptional importance under Criteria Consideration G, as described in the NPS's Bulletin No. 22, "How to Evaluate and Nominate Potential National Register Properties That Have Achieved Significance Within the Last 50 Years." Other NRHP criteria considerations are used for religious properties, moved properties, birthplaces or graves, cemeteries, reconstructed properties, and commemorative properties.

CEQA requires that resources listed in or eligible for listing in the California Register of Historic Resources (CRHR) be studied. In addition to historic properties listed in or eligible for listing in the NRHP, the CRHR includes resources recently designated as California Historic Landmarks (CHL) and California Points of Historical Interest. SHPO review of the study is required before project-related changes to historic properties can proceed. CEQA also requires that mitigation measures to reduce or avoid impacts to historical resources be evaluated, and a range of alternatives be considered that could substantially lessen significant impacts to historical resources.

At the local level, the City of Los Angeles designates local landmarks (Historic-Cultural Monuments) and historic districts. NEPA and CEQA guide lead agencies to incorporate local designations in the review and evaluation of project effects. City of Los Angeles Historic-Cultural Monuments and Historic Preservation Overlay Zones were considered in this built environment analysis. These resources have "presumptive significance" under CEQA, and mitigation measures are recommended to address any significant impacts to these resources.

4.12.1.2 Affected Environment

The project-specific APE was established through consultation between FTA, Metro, SHPO, and other consulting parties. This consultation process is described in more detail in Appendix X, Cultural Resources - Built Environment (Updated). The APE was drawn to ensure inclusion of historic properties and historical resources that may be directly or indirectly affected by the project. All properties in the APE that were constructed 50 or more years prior to the anticipated 2019 project construction date, along with other significant properties that were built more recently, were evaluated for historical significance and potential impacts. A map of the APE is shown in Figures 4.12-1 through 4.12-9. Figure 4.12-1 shows the entire APE, and Figures 4.12-2 through 4.12-9 show enlarged segments of the APE. These maps divide the project APE into a "direct APE" and an "indirect APE" to show the type of effect to different areas in the project vicinity. The direct APE is the area where resources would be physically impacted by construction activities, while the indirect APE includes the larger area where project effects might include changes to the setting or limitations on access during to congestion. Resources in both the direct and indirect APE may be adversely affected by the project. This differentiation is only for informational purposes. The LPA alignment, as refined during preliminary engineering, falls outside of the original direct APE but still lies entirely within the original indirect APE, as shown in Figure 4.12-7. The parcels in the vicinity of this alignment refinement were re-examined as part of the preparation of this Final EIS/EIR. All relevant historic properties were analyzed through additional research and field work, and it was determined that they are contained within the existing depicted APE.

A record search, a built environment survey, consultation with SHPO, Native American tribes with interests in the project area, local government, local historic groups, and other interested parties regarding cultural resources was conducted for this project. A summary of these contacts is contained in Appendix X, Cultural Resources - Built Environment (Updated).

The records search and survey of the APE revealed that it contains 289 properties, 118 of which were constructed more than 50 years prior to the proposed project opening date of 2019. Twenty-nine of these properties were previously listed in the NRHP and/or the CRHR. More detailed studies of the other properties were undertaken to determine historical significance. Of the 55 eligible resources identified, 49 are historic properties that are either listed in or determined eligible for listing the NRHP and the CRHR. This includes the Walt Disney Concert Hall which was deemed eligible for the NRHP and the CRHR under the criterion for properties that have achieved significance in less than 50 years. SHPO has concurred with FTA's determination of eligibility for those properties eligible for listing in the NRHP (a copy of the SHPO concurrence letter is located in Appendix X, Cultural Resources - Built Environment (Updated)).

Following the procedures required under Section 106, FTA conducted an analysis of the potential adverse effects of the proposed Regional Connector Transit Corridor alternatives, including the LPA, to historic properties under NEPA and NHPA and potential significant impacts to historic resources under CEQA. This analysis incorporates the findings of other applicable technical studies as needed.

On June 1, 2010, SHPO concurred with FTA's determination of eligibility and effects from the project. An MOA was developed in consultation with SHPO to resolve potential adverse effects to archaeological resources and to protect historic properties. In addition to SHPO, consulting parties for this project include the Los Angeles Conservancy and the City of Los Angeles Office of Historic Resources. The ACHP was provided with copies of the Draft EIS/EIR and the updated Technical Memorandum on the Built Environment in April 2011. In a letter dated May 10, 2011, the ACHP informed FTA that the criteria for ACHP involvement in the project do not apply to this project. The ACHP noted that the final MOA and supporting documentation for the project, developed in consultation with the California SHPO and other consulting parties, should be filed with the ACHP. Additional coordination with SHPO occurred in April and May 2011 regarding refinements to the LPA made since publication of the Draft EIS/EIR. The MOA for the LPA was signed in September 2011. FTA/Metro also contacted a number of tribes with interests in the project. Although no federally recognized tribes requested consultation, FTA is continuing to consult with the Gabrielino/Tongva San Gabriel Band of Mission Indians and the Tongva Ancestral Territorial Tribal Nation.

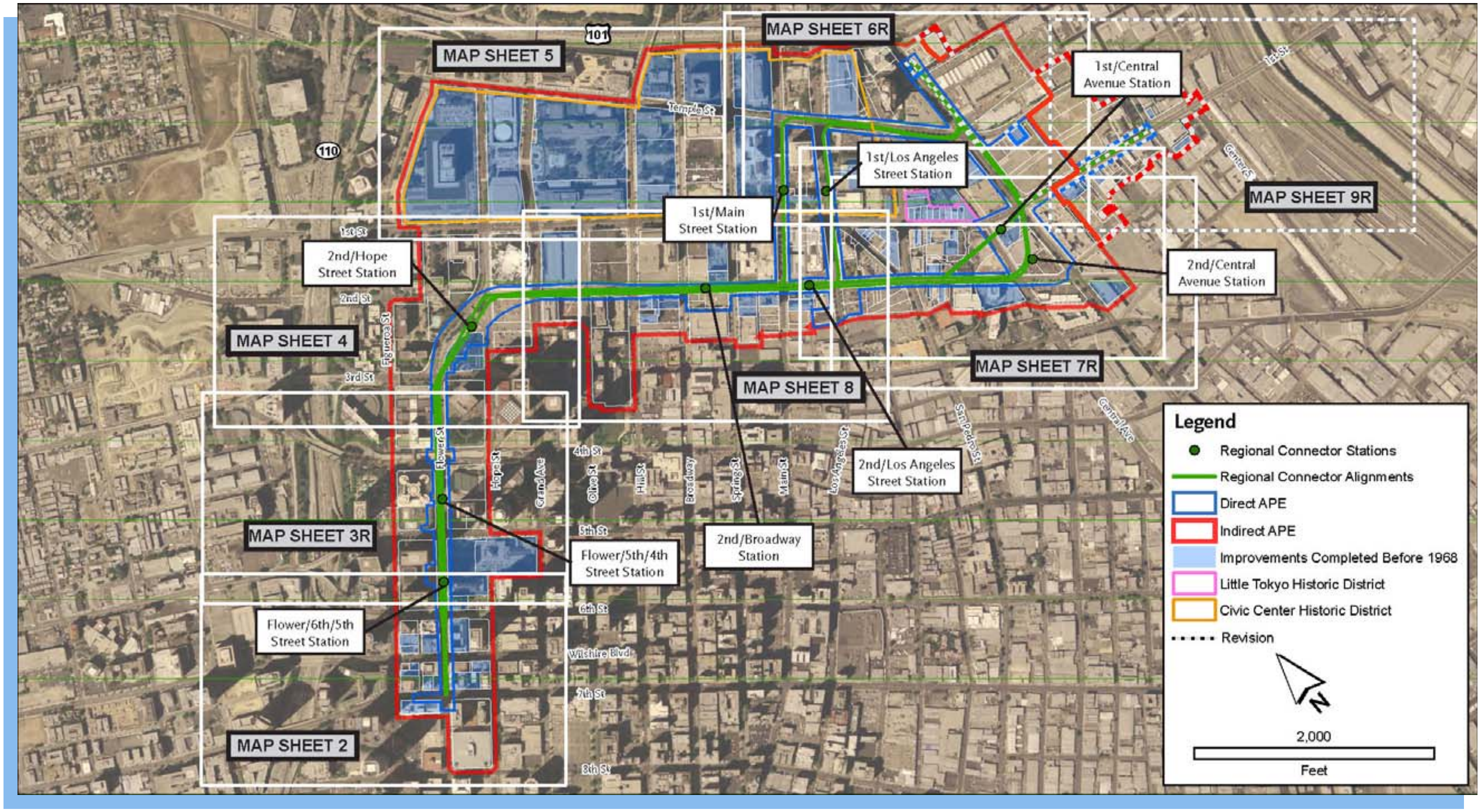


Figure 4.12-1. Area of Potential Effects (APE) for Historic Resources – Sheet 1

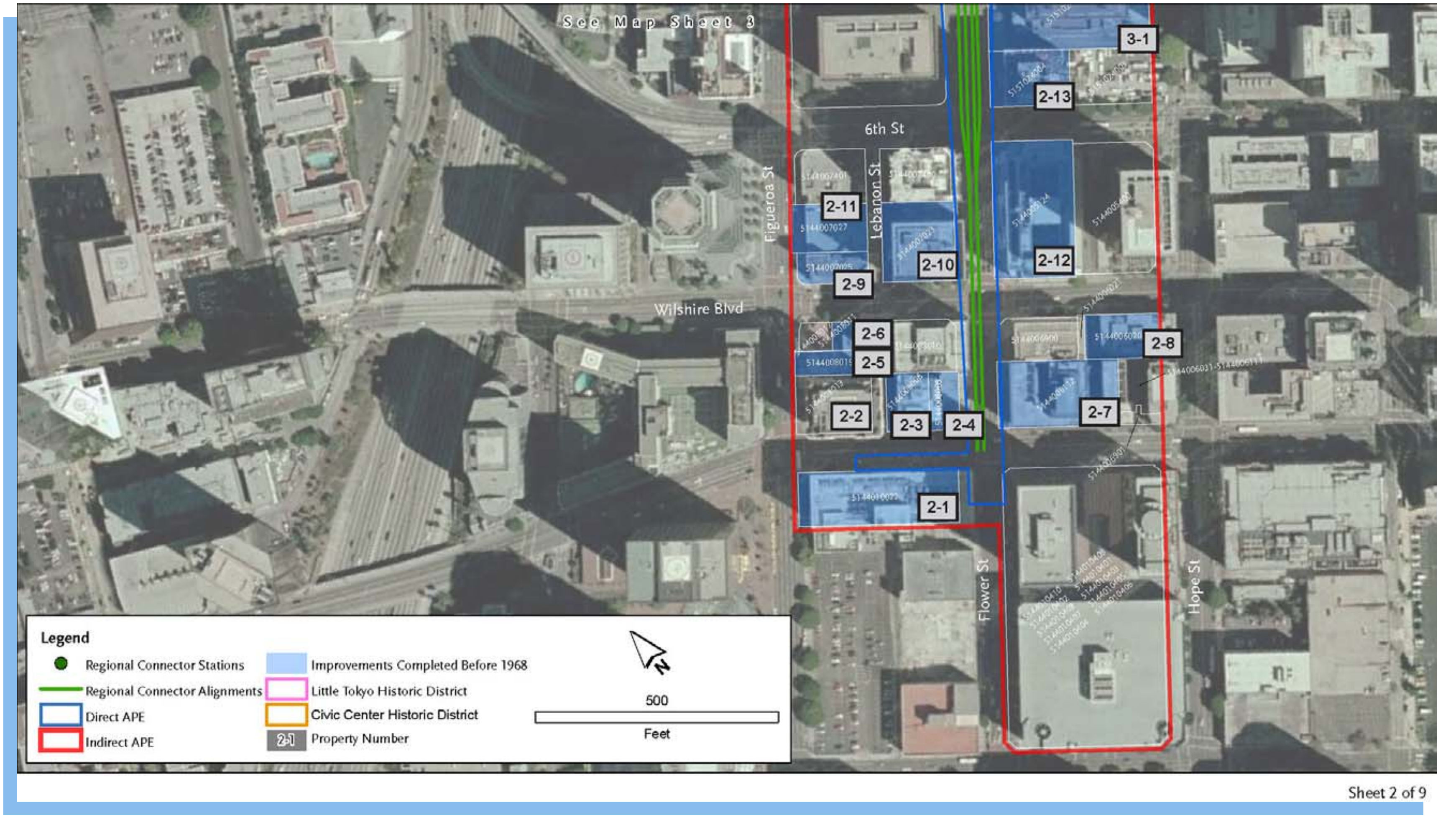


Figure 4.12-2. Historic Resources APE - Sheet 2

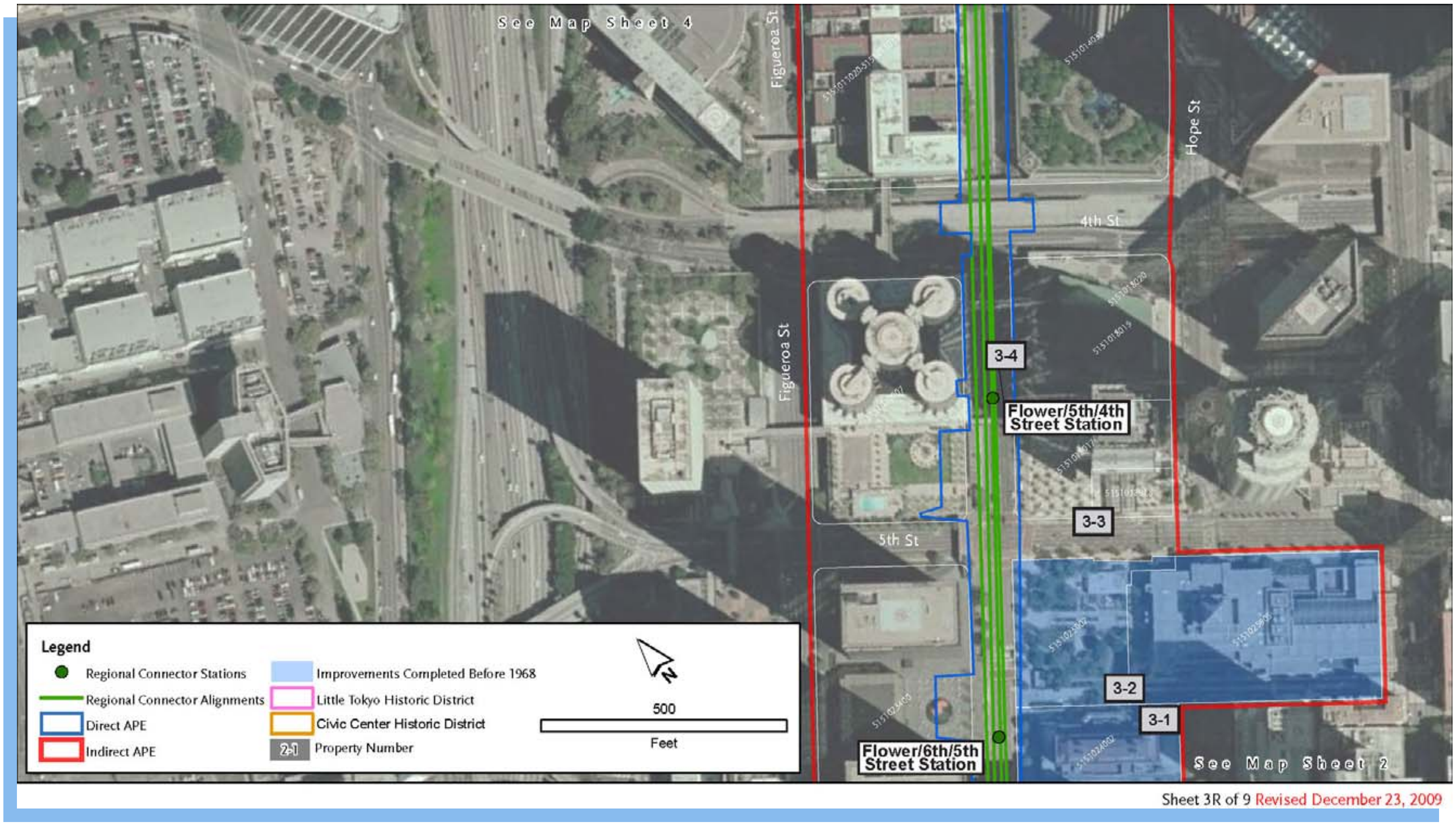


Figure 4.12-3. Historic Resources APE – Sheet 3

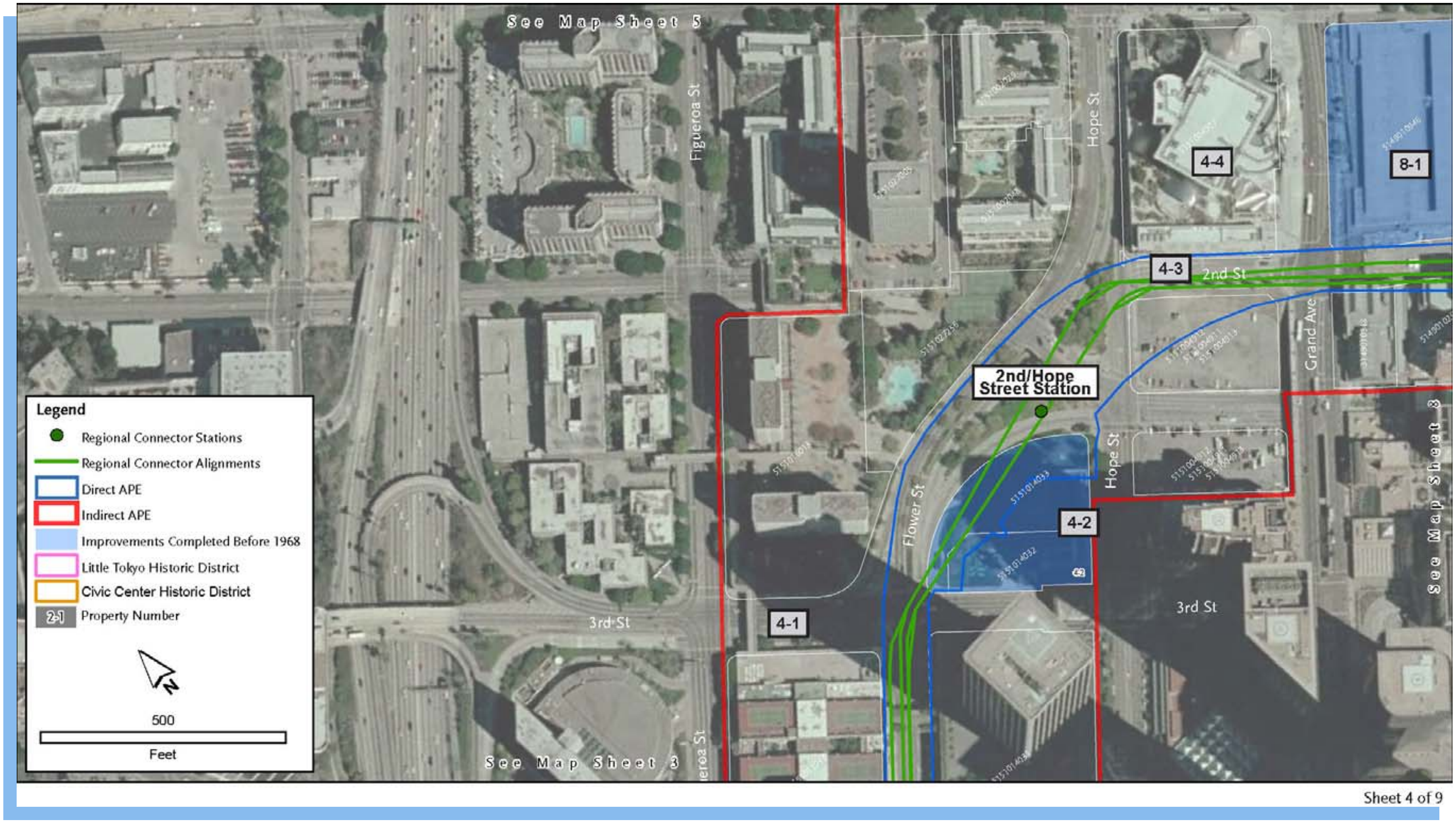


Figure 4.12-4. Historic Resources APE – Sheet 4

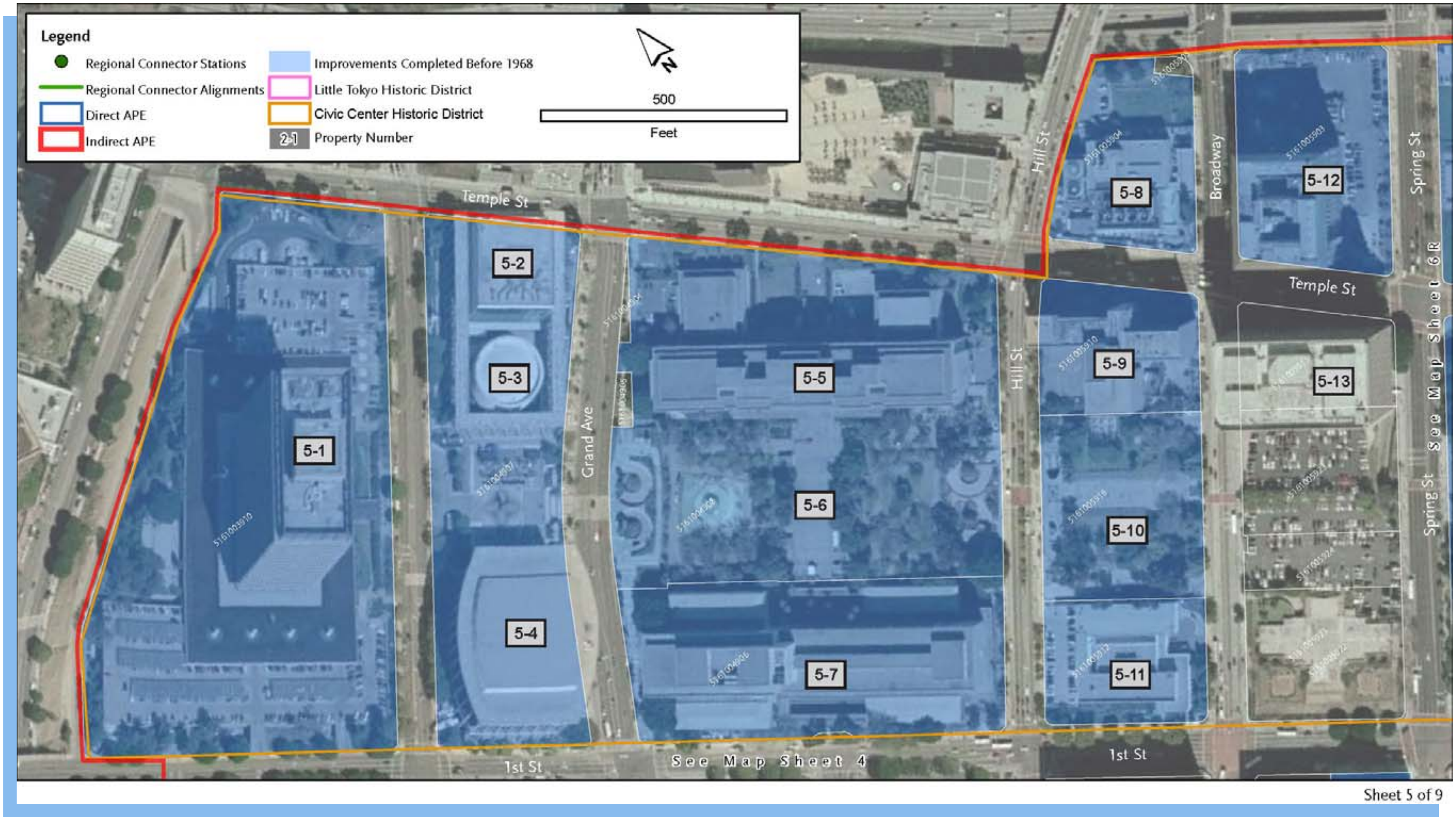


Figure 4.12-5. Historic Resources APE – Sheet 5

Figure 4.12-6. Historic Resources APE – Sheet 6

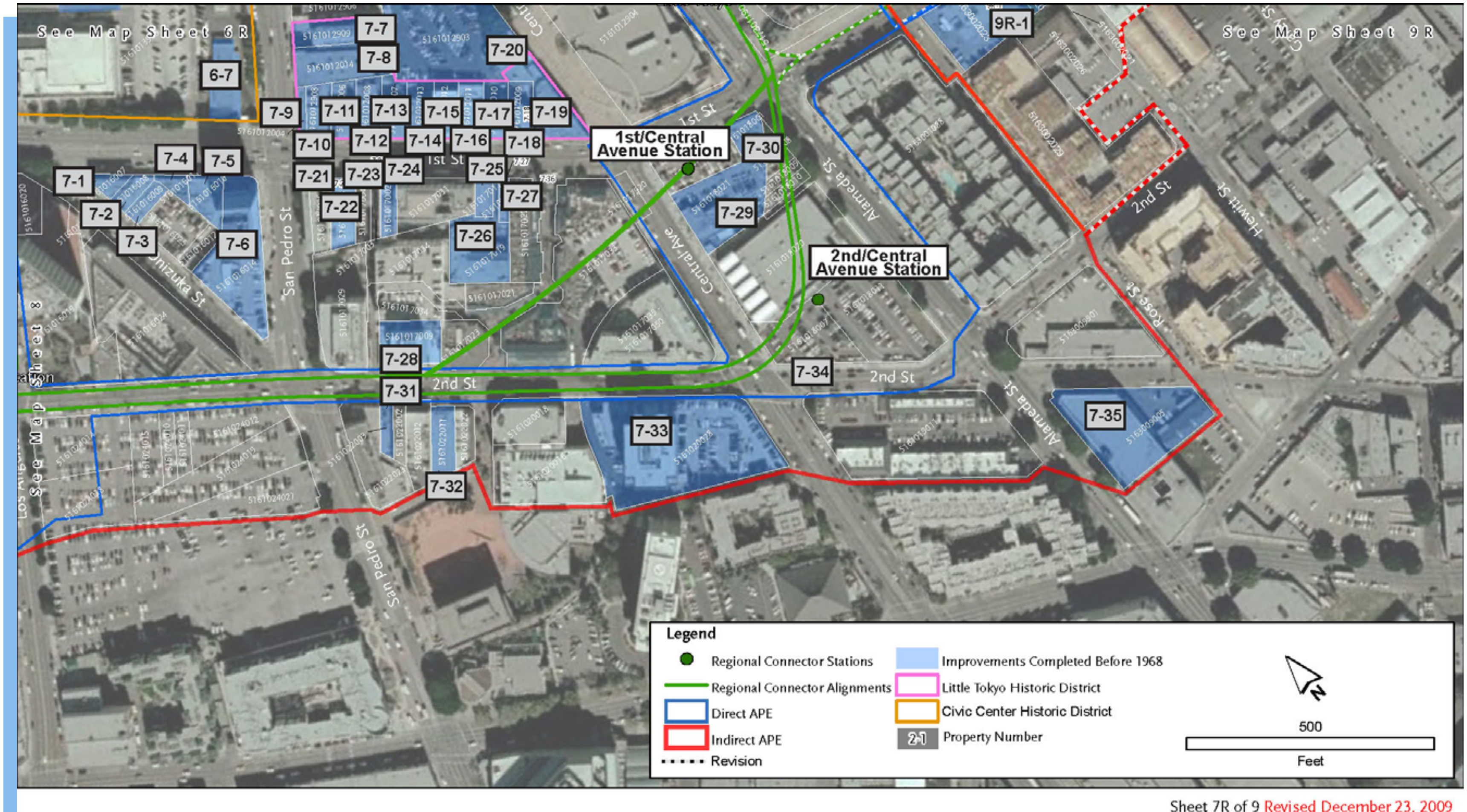


Figure 4.12-7. Historic Resources APE – Sheet 7

Figure 4.12-8. Historic Resources APE – Sheet 8

Figure 4.12-9. Historic Resources APE – Sheet 9

Of the 55 resources mentioned above, six are historical resources listed in, determined eligible for listing in, or recommended as eligible for listing in only the CRHR and not the NRHP. A complete list of evaluated properties and the details of their analysis are provided in Appendix X, Cultural Resources - Built Environment (Updated).

The APE contains portions of one NRHP/National Historic Landmark (NHL)-listed historic district (Little Tokyo Historic District) and one district that is eligible for inclusion in the CRHR (Los Angeles Civic Center Historic District). These districts each contain multiple historic resources that are individually eligible or as contributing resources for both the NRHP and CRHR. The effects from the project for all eligible resources within the APE were considered regardless of whether they were individually eligible or contributing resources to a NRHP/CRHR historic district.

4.12.1.3 Environmental Impacts/Environmental Consequences

The impact analysis examines likely adverse effects of the proposed Regional Connector Transit Corridor alternatives, including the LPA, to historic properties under NEPA and the NHPA and potential significant impacts to historic resources under CEQA. This analysis incorporates the findings of other applicable technical studies as needed. APE Map Resource numbers provided in this section correspond to the APE Map Resources shown in Figures 4.12-1 through 4.12-9. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.12.1.1.

Section 110(f) of the NHPA of 1966, as codified in 36 CFR 800.10, requires federal agencies to undertake planning and actions to minimize harm to designated NHL properties. If a proposed project is found to have the potential for an adverse effect on a NHL, the Secretary of the Interior (typically represented by a representative of the NPS) is invited to participate under Section 110(f) of the NHPA. For this project, the Little Tokyo Historic District NHL and its associated contributing resources are situated within the APE and would not be adversely affected by any of the alternatives, including the LPA. If project planning necessitates changes, and potential adverse effects to the NHL arise, consultation with the National Park Service will be conducted. Information regarding the At-Grade Emphasis LRT Alternative's effects on the 2nd Street Tunnel is provided in Section 4.12.1.3.3.2. Only the At-Grade Emphasis LRT Alternative would have an adverse effect on the 2nd Street Tunnel. Other alternatives, including the LPA, would avoid adverse effects to this resource.

CEQA also requires that proposed public projects be evaluated for their probability to cause significant impacts on "historical resources." CEQA equates a "substantial adverse change" in the significance of a historic property with a significant impact on the environment (Public Resources Code (PRC) Section 21084.1). Thresholds of substantial adverse change are established in PRC Section 5020.1, and include demolition, destruction, relocation, or "alteration activities that would impair the significance of the historic resource."

4.12.1.3.1 No Build Alternative

The No Build Alternative would not result in any new construction or transit operations as part of the Regional Connector project. Impacts on historic resources would not occur under this alternative; however, existing impacts resulting from growing levels of vehicular traffic and lack of improved public transit options would persist.

4.12.1.3.1.1 NEPA/NHPA Finding (Section 106 Determination)

The No Build Alternative would not include capital improvements. Thus, the No Build Alternative would not have adverse construction or implementation-related effects on historic properties in the project APE.

4.12.1.3.1.2 CEQA Determination

The No Build Alternative would have no effect on historical resources in the project APE. The No Build Alternative would not be expected to result in cumulative impacts to historical resources, other than potential impacts on resources through continued high and escalated levels of vehicular traffic, unabated by additional mass transit options. The No Build Alternative would not contribute to a cumulative impact on these resources.

4.12.1.3.2 TSM Alternative

The TSM Alternative would include two new shuttle buses linking 7th Street/Metro Center Station and Union Station. The new transit infrastructure (two new bus routes and associated stops and structures) would use the existing street and sidewalk networks and would not require the displacement or relocation of properties, residents, or employees. Improvements under this alternative would entail minor physical modifications, such as the installation of bus stops along existing city streets and rebuilding some curbs, sidewalks, and street surfaces to accommodate increased bus weights and traffic frequency. These activities would not have any adverse effects on historical resources, alter significant characteristics of historic properties, or cause adverse noise or vibration impacts.

4.12.1.3.2.1 NEPA/NHPA Finding (Section 106 Determination)

The TSM Alternative would not have direct or indirect adverse effects to historic properties from either construction or operation.

4.12.1.3.2.2 CEQA Determination

The TSM Alternative would not have direct or indirect significant impacts on historical resources from either construction or operation.

4.12.1.3.3 At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative would add transit options that would be consistent with the historic use of streetcars within the APE. Additionally, the LRT improvement could benefit historic properties and historical resources in the APE by increasing pedestrian access and use of the area. Metro would install double-track light-rail guideways in the existing street system, rebuild street surfaces and underground utilities, rebuild curbs and sidewalks, construct underground right-of-way, and install at-grade and underground stations, all within the APE.

Underground segments of the alternative would use parts of the existing 2nd Street Tunnel (APE Map Resource #4-3) and would require new cut and cover excavation on Flower Street between 7th and 4th Streets, north of the existing 7th Street/Metro Center Station.

Construction activities may cause noise, dirt, congestion, and limitations on access to the project area. These activities would be short-term and would not have adverse effects on historic properties or significant impacts to historical resources. In addition, Metro would employ best management practices (BMPs) to ensure that these effects are minimized.

4.12.1.3.3.1 Demolition, Partial Takes, or Alteration of a Property

To construct the At-Grade Emphasis LRT Alternative, there would also be partial takes of several historic properties and historical resources. Portions of properties occupied by the Los Angeles Police Facilities Building (APE Map Resource #6-6), Motor Transport Division Building (APE Map Resource #6-7), and City Health Building (City Hall South) (APE Map Resource #6-4), three contributing resources to the Los Angeles Civic Center Historic District, would be acquired to accommodate new stations. Only a portion of these properties would be acquired and converted to new uses, and the change would not affect the physical buildings, the historic district that they are a part of, or the characteristics that make them eligible for the NRHP. The new uses would include converting landscaped areas adjacent to the buildings to sidewalks and placing at-grade light rail transit stations along the curb. Landscape and urban design features that complement the historic resources would be included in the station facilities. These changes would be consistent with the existing urban setting of the resources.

NEPA/Section 106 Effects Analysis for Historic Properties

In applying the criteria of adverse effect for historic properties (36 CFR 800.5(a)(1)), there are no adverse effects to historic properties from the partial takes of three NRHP/CRHR eligible properties. The project would not diminish the integrity of their location, design, setting, materials, workmanship, feeling, or association and therefore, there would not be adverse effects.

CEQA Impact Analysis for Historical Resources

The partial property acquisitions would not constitute a substantial adverse change that would impair the significance of the historical resource. The characteristics that make the historical resources eligible for the CRHR and NRHP would remain to convey their significance. This alternative, therefore, would not have a significant impact upon historical resources.

4.12.1.3.3.2 Tunnels

The NRHP-eligible 2nd Street Tunnel (APE Map Resource #4-3) would be altered under this alternative. The walls of the tunnel would be partially demolished along its southwest interior to construct a new entrance and exit for the new tunnel in which the light rail transit would run. New elements that would be added to the tunnel include double tracks, catenary wires, and a walkway. The cut and cover trench along Flower Street would also require demolition of a portion of the CRHR-eligible Belmont Tunnel (APE Map Resource #3-4). The Belmont Tunnel is not eligible for the NRHP.

NEPA/Section 106 Effects Analysis for Historic Properties

In applying the criteria of adverse effect for historic properties (36 CFR 800.5(a)(1)) potentially affected by the construction near 2nd Street, an adverse effect would occur due to the demolition of a portion of the NRHP-eligible 2nd Street Tunnel and the subsequent change in use. The changes would directly alter a characteristic of the historic property in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. SHPO concurred with FTA's determination of an adverse effect on June 1, 2010 (a copy of the SHPO concurrence letter is located in Appendix X, Cultural Resources - Built Environment (Updated)). Documentation of the property in accordance with the mitigation measure described in Section 4.12.1.4.1 of the Draft EIS/EIR is proposed to resolve the potential adverse effect.

CEQA Impact Analysis for Historical Resources

Potential changes to the 2nd Street Tunnel would constitute a substantial adverse change that would impair the significance of the historical resource. However, the majority of the resource's features would remain to convey its significance. Additionally, implementation of the mitigation measure described in Section 4.12.1.4.1 of the Draft EIS/EIR would reduce the impact to a less than significant level. Implementation of the documentation mitigation measure (Section 4.12.1.4.1 of the Draft EIS/EIR) would reduce any impact to the CRHR-eligible Belmont Tunnel to a less than significant level.

4.12.1.3.3.3 Differential Settlement

Based on the activities described in the Description of Construction (Appendix K), some of the buildings situated near cut and cover excavation would be susceptible to differential settlement. Differential settlement is defined as "unequal settling of material; gradual downward movement of foundations due to compression of soil which can lead to damage if settlement is uneven" (Allaby 1999).

Differential settlement occurs when a building or feature's shape is twisted or is raised and lowered, sometimes imperceptibly, in different places. Differential settlement can cause foundations to settle and crack, floors to buckle and go out of level, walls to shift out of plumb and plane, and roofs to twist and deform. The resulting changes in structural systems and cladding or finish materials, including wood and masonry, floor tiles, wood flooring, concrete floors, plaster, marble, and other decorative wall and ceiling treatments, and adobe, stucco, and wood-framed walls can be cracks, fractures, and other noticeable (as well as long-term, not immediately visible) deformations and damage. Since historically significant buildings often have archaic construction and finish attachment systems, including unreinforced masonry, those building types are usually more susceptible to the effects of differential settlement than more recently constructed buildings.

Based on the activities described in the Description of Construction (Appendix K), four NRHP and/or CRHR eligible properties could be potentially affected by differential settlement due to cut and cover construction associated with the At-Grade Emphasis LRT Alternative:

- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)

NEPA/Section 106 Effects Analysis for Historic Properties

Implementation of mitigation measures would protect and stabilize the ground near historic properties (as noted in Sections 4.12.1.4.2, 4.12.1.4.3 and 4.12.1.4.5 of the Draft EIS/EIR) and would avoid adverse effects to all properties. If these measures are properly implemented, short-term construction activities would not directly alter any characteristics of the historic property in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

CEQA Impact Analysis for Historical Resources

The potential for differential settlement could constitute a substantial adverse change that would impair the significance of four properties listed below:

- The Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)

Implementation of mitigation measures described in Sections 4.12.1.4.2 and 4.12.1.4.3 of the Draft EIS/EIR would reduce the potential impacts to these historical resources to a less than significant level.

4.12.1.3.3.4 Vibration

According to the Noise and Vibration Technical Memorandum (Appendix S), construction activities with the most potential for impacts under the At-Grade Emphasis LRT Alternative include the cut and cover tunnel along Flower Street, the proposed cut and cover stations at Flower/6th/5th Streets and 2nd/Hope Street, and the Temple and Alameda junction, which includes lowering Alameda Street into an underpass configuration.

Ground-borne vibration (GBV) from these construction activities could affect historic structures. For the At-Grade Emphasis LRT Alternative, pre-augering would eliminate the need for impact pile driving of soldier piles at the cut and cover sections. This would leave large bulldozers and drill rigs as the main sources of construction vibration that could have the potential to cause vibration damage (Section 4.7). If these large pieces of equipment are not used within 21 feet of a historic property or historical resource, it is reasonably foreseeable that adverse effects or significant impacts could not occur to historic properties and historical resources from GBV.

Buildings near potential construction activities include:

- Barker Brothers (APE Map Resource #2-1)
- Roosevelt Building (APE Map Resource #2-7)
- General Petroleum-Mobil Oil Building (APE Map Resource #2-12)
- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- Los Angeles Central Library (APE Map Resource #3-2)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Los Angeles Times Mirror Building (APE Map Resource #8-3)
- Higgins Building (APE Map Resource #8-11, CRHR-eligible only)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)
- Cathedral of Saint Vibiana Rectory (APE Map Resource #8-13)

NEPA/Section 106 Effects Analysis for Historic Properties

Adverse effects would not occur if mitigation measures described in Sections 4.12.1.4.2, 4.12.1.4.3, and 4.12.1.4.5 of the Draft EIS/EIR are implemented within the project area. If these measures are properly implemented, potential effects of the At-Grade Emphasis LRT Alternative would not directly alter any characteristics of the historic property in a manner that would diminish the integrity of the historic properties' location, design, setting, materials, workmanship, feeling, or association.

CEQA Impact Analysis for Historical Resources

Under the At-Grade Emphasis LRT Alternative, construction-induced vibration could potentially cause a substantial adverse change that would impair the significance of any or all of the historical resources noted in this section. Implementation of mitigation measures described in Sections 4.12.1.4.2, and 4.12.1.4.3 of the Draft EIS/EIR would reduce potential impacts to a less than significant level.

4.12.1.3.3.5 NEPA/NHPA Finding (Section 106 Determination)

Construction of the At-Grade Emphasis LRT Alternative would be expected to result in one direct adverse effect. On June 1, 2010, SHPO concurred with FTA's finding of an adverse effect from the At-Grade Emphasis LRT Alternative on the 2nd Street Tunnel (a copy of the SHPO concurrence letter is located in Appendix X, Cultural Resources - Built Environment (Updated)). Alteration of the 2nd Street Tunnel (APE Map Resource #4-3) during construction to accommodate the LRT facility would require implementation of mitigation measures described in Sections 4.12.1.4.1 and 4.12.1.4.5 of the Draft EIS/EIR. Consistent with 36 CFR 800, additional consultation with SHPO and other consulting parties would need to be completed before beginning project construction. A summary of this information is presented in Table 4.12.1-1.

4.12.1.3.3.6 CEQA Determination

Construction of the At-Grade Emphasis LRT Alternative would potentially result in two direct significant impacts (Belmont Tunnel (APE Map Resource #3-4)) and 2nd Street Tunnel (APE Map Resource #4-3) and 11 indirect significant impacts. All of these potential impacts could result in a substantial adverse change to a historical resource. Implementation of mitigation measures described in Sections 4.12.1.4.1 through 4.12.1.4.5 of the Draft EIS/EIR would reduce these potential impacts to a less than significant level. Project operation is not expected to cause direct or indirect impacts. Refer to Table 4.12.1-1 for additional information.

4.12.1.3.4 Underground Emphasis LRT Alternative

The Underground Emphasis LRT Alternative would add an underground double-track right-of-way and three new underground stations to the project area, all within the APE. The alignment would surface on the block bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue to connect at-grade to the existing Metro Gold Line tracks. The proposed new transit infrastructure would be consistent with the historic use of streetcars within the APE. Additionally, the LRT could benefit historic properties and historical resources in the APE by increasing pedestrian use of the area. Construction activities may cause noise, dirt, congestion, and limitations on access to the project area. These activities would be short-term and would not cause adverse effects to historic properties or significant impacts to historical resources.

4.12.1.3.4.1 Demolition, Partial Takes, or Alteration of a Property

To construct the Underground Emphasis LRT Alternative, one parcel would be acquired that contains a historical resource. The S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports (APE Map Resource #7-30) is a CRHR-eligible (not NRHP-eligible) commercial building built in 1913 that is anticipated to be acquired and would serve as the underground egress/ingress portal. SHPO did not comment on properties identified solely for CRHR determination in the June 1, 2010 letter (a copy of the SHPO concurrence letter is located in Appendix X, Cultural Resources - Built Environment (Updated)).

NEPA/Section 106 Effects Analysis for Historic Properties

The S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building is not NRHP-eligible, and no adverse effects would occur under NEPA/Section 106 as a result of its acquisition and demolition.

Table 4.12.1-1. At-Grade Emphasis LRT Alternative Historic Resources Impacts NEPA/NHPA Findings (Section 106 Determinations) and CEQA Determinations

APE Map Resource No.	Name	NRHP Eligibility	CRHR Eligibility	Potential Impact	Section 106 Determination	CEQA Determination	Can be Mitigated Below Level of Significance (CEQA)?
2-1	Barker Brothers	Eligible	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
2-7	Roosevelt Building	Listed	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
2-12	General Petroleum-Mobil Oil Building	Listed Listed		Vibration	Effect Not Adverse	Significant Impact	Yes
2-13	Superior Oil Company Building	Listed Listed		Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
3-1	The California Club	Eligible	Listed	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
3-2	Los Angeles Central Library	Listed	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
3-4	Belmont Tunnel, Hollywood-Glendale-Burbank-San Fernando Valley Tunnel	Not Eligible	Eligible	Partial Removal	No Historic Property Affected	Significant Impact	Yes
4-3	2nd Street Tunnel, Bridge (tunnel) #53C 1318	Eligible El	igible	Demolition	Adverse Effect	Significant Impact	Yes
4-4	Walt Disney Concert Hall	Eligible	Eligible	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes

Table 4.12.1-1. At-Grade Emphasis LRT Alternative Historic Resources Impacts NEPA/NHPA Findings (Section 106 Determinations) and CEQA Determinations (continued)

APE Map Resource No.	Name	NRHP Eligibility	CRHR Eligibility	Potential Impact	Section 106 Determination	CEQA Determination	Can be Mitigated Below Level of Significance (CEQA)?
5-1 Thru 5-13, 6-1 thru 6-7, 6-12	Los Angeles Civic Center Historic District	Eligible Eligi	ble	Partial Take	Effect Not Adverse	Less than Significant Impact	N/A
6-4	City Health Building, City Hall South	Eligible (as a contributor to Los Angeles Civic Center Historic District)	Eligible Partial	Take	Effect Not Adverse	Less than Significant Impact	N/A
6-6, 6-7	Police Facilities Building, Parker Center, Motor Transport Building	Eligible (as a contributor to Los Angeles Civic Center Historic District)	Eligible Partial	Take	Effect Not Adverse	Less than Significant Impact	N/A
8-3	Los Angeles Times Mirror Building	Eligible El	igible	Vibration	Effect Not Adverse	Significant Impact	Yes
8-11	Higgins Building, General Petroleum Building, (Los Angeles) County Engineers Building	Not Eligible	Eligible	Vibration	No Historic Property Affected	Significant Impact	Yes
8-12	Cathedral of Saint Vibiana	Eligible	Eligible	Vibration	Effect Not Adverse	Significant Impact	Yes
8-13	Cathedral of Saint Vibiana, Rectory	Eligible El	igible	Vibration	Effect Not Adverse	Significant Impact	Yes

Note:
**No Historic Property Affected indicates that no properties eligible for the NRHP would be affected. Effect Not Adverse indicates that proposed candidate mitigation measures would reduce impacts to the point where no adverse effects would occur under Section 106 of NHPA.*

CEQA Impact Analysis for Historical Resources

The property acquisition and subsequent demolition of the S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building would constitute a substantial adverse change that would impair the significance of the historical resource. However, implementation of the mitigation measure described in Section 4.12.1.4.1 of the Draft EIS/EIR, along with the additional mitigation measures developed specifically for this building under the LPA in Section 4.12.1.4.2 below, would reduce potential impacts to a less than significant level.

4.12.1.3.4.2 Station Construction

For the Underground Emphasis LRT Alternative, a new station would be constructed beneath Flower Street between 5th and 4th Streets. This would require demolition of a portion of the CRHR-eligible Belmont Tunnel (APE Map Resource #3-4). The Belmont Tunnel is not eligible for the NRHP.

This alternative also evaluates two possible locations for the proposed 2nd Street station:

- Between Broadway and Spring Street. The Broadway Option would have entrances facing the NRHP-eligible Los Angeles Times Mirror Building (APE Map Resource #8-3).
- Between Main and Los Angeles Streets. The Los Angeles Street Option has proposed entrances opposite and next to the NRHP-eligible St. Vibiana Rectory (APE Map Resource #8-13).

NEPA/Section 106 Effects Analysis for Historic Properties

Both of the 2nd Street station options would have an effect on historic properties, but that effect would not be adverse. The change in setting would not directly alter any characteristic of the historic property in a manner that would diminish the integrity of the historic properties' location, design, setting, materials, workmanship, feeling, or association.

CEQA Impact Analysis for Historical Resources

Construction of proposed stations would not constitute a substantial adverse change that would impair the significance of the historical resources.

The change in setting created by the station would not diminish the integrity of the properties' significant historic features. The Underground Emphasis LRT Alternative station construction would therefore have a less than significant impact on historical resources.

Implementation of the mitigation measure described in Section 4.12.1.4.1 of the Draft EIS/EIR would reduce any impact to the CRHR-eligible Belmont Tunnel to a less than significant level.

4.12.1.3.4.3 Vibration

According to the Noise and Vibration Technical Memorandum (Appendix S), construction activities with the most potential for impacts include the cut and cover tunnel under Flower Street, proposed underground cut and cover station at Flower/5th/4th Streets, cut and cover construction of the approach to the proposed 2nd/Hope Street station and the station itself, construction of either of the proposed 2nd Street station locations (Los Angeles Street or Broadway Options), and the junction at 1st and Alameda Streets, which includes lowering Alameda Street into an underpass configuration.

GBV from these construction activities could affect historic structures. For the Underground Emphasis LRT Alternative, pre-augering of soldier piles at cut and cover sections would eliminate the need for impact pile driving. This would leave large bulldozers and drill rigs as the main sources of construction vibration that could have the potential to cause vibration damage. If these large pieces of equipment are not used within 21 feet of a historic property or historical resource, there would not be adverse effects to historic properties and significant impacts would not occur to historical resources from GBV. Properties that are close to the cut and cover construction activities and which may be affected by construction-related vibration include:

- Barker Brothers (APE Map Resource #2-1)
- Roosevelt Building (APE Map Resource #2-7)
- General Petroleum-Mobil Oil Building (APE Map Resource #2-12)
- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- Los Angeles Central Library (APE Map Resource #3-2)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Los Angeles Times Mirror Building (APE Map Resource #8-3)
- Higgins Building (APE Map Resource #8-11)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)
- Cathedral of Saint Vibiana Rectory (APE Map Resource #8-13)

The TBM(s) would not cause vibratory effects or impacts to historic properties or historical resources because TBM(s) performs a slow moving drilling process that generates very little vibration to the surrounding areas. Studies have measured TBM vibration to be in the range of 0.0024 to 0.0394 inches per second peak particle velocity (PPV) at a distance of 33 feet. The proposed TBM tunnels on 2nd Street would vary in depth due to the existing topography and vertical curves in the alignment. The tunnel would range from about 140 feet below the surface (distance from street level to the top of the tunnel) to about 40 feet below the surface. The vibratory potential of TBM(s) is minimal and would be well below the FTA threshold for Category IV buildings (buildings extremely susceptible to vibration damage) of 0.12 inches per second PPV.

NEPA/Section 106 Effects Analysis for Historic Properties

Effects would occur during construction at the following locations from vibration-induced damage, but would not be adverse after mitigation measures described in Sections 4.12.1.4.2, 4.12.1.4.3, and 4.12.1.4.5 of the Draft EIS/EIR are implemented. The potentially affected buildings would be:

- Barker Brothers (APE Map Resource #2-1)
- Roosevelt Building (APE Map Resource #2-7)
- General Petroleum-Mobil Oil Building (APE Map Resource #2-12)
- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- Los Angeles Central Library (APE Map Resource #3-2)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Los Angeles Times Mirror Building (APE Map Resource #8-3)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)
- Cathedral of Saint Vibiana Rectory (APE Map Resource #8-13)

If these mitigation measures are properly implemented, construction of this alternative would not directly alter any characteristics of these historic properties in a manner that would diminish the integrity of the historic properties' location, design, setting, materials, workmanship, feeling, or association.

CEQA Impact Analysis for Historical Resources

The potential for construction-related vibration could cause a substantial significant impact that would impair the following locations:

- Barker Brothers (APE Map Resource #2-1)
- Roosevelt Building (APE Map Resource #2-7)
- General Petroleum-Mobil Oil Building (APE Map Resource #2-12)
- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- Los Angeles Central Library (APE Map Resource #3-2)

- 2nd Street Tunnel (APE Map Resource #4-3)
- Los Angeles Times Mirror Building (APE Map Resource #8-3)
- Higgins Building (APE Map Resource #8-11)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)
- Cathedral of Saint Vibiana Rectory (APE Map Resource #8-13)

Implementation of mitigation measures described in Sections 4.12.1.4.2 and 4.12.1.4.3 of the Draft EIS/EIR would reduce the potential impacts to a less than significant level.

4.12.1.3.4.4 Differential Settlement

Based on the activities described in the Description of Construction (Appendix K), eight NRHP- and/or CRHR-eligible properties could be potentially affected by tunneling (TBM operation) and cut and cover construction:

- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)
- Former Nishi Hongwanji Buddhist Temple (APE Map Resource #7-19)
- Los Angeles Times Building (APE Map Resource #8-2)
- Higgins Building (APE Map Resource #8-11)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)

Implementation of mitigation measures described in Sections 4.12.1.4.2, 4.12.1.4.3, and 4.12.1.4.4 (when applicable) of the Draft EIS/EIR would avoid potential adverse effects to historic properties and reduce potential impacts to historical resources to a less than significant level.

NEPA/Section 106 Effects Analysis for Historic Properties

Implementation of mitigation measures (as described in Sections 4.12.1.4.2, 4.12.1.4.3, and 4.12.1.4.5 of the Draft EIS/EIR) to protect and stabilize the ground near the following locations would avoid adverse effects to all properties under this alternative:

- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)
- Former Nishi Hongwanji Buddhist Temple (APE Map Resource #7-19)
- Los Angeles Times Building (APE Map Resource #8-2)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)

If these mitigation measures are properly implemented, differential settlement would not directly alter characteristics of historic properties in a manner that would diminish the integrity of each property's location, design, setting, materials, workmanship, feeling, or association.

CEQA Impact Analysis for Historical Resources

The potential for differential settlement could constitute a substantial adverse change that would impair the significance of any or all of the historical resources noted in this section.

Implementation of mitigation measures described in Sections 4.12.1.4.2 and 4.12.1.4.3 of the Draft EIS/EIR would reduce potential impacts to a less than significant level.

4.12.1.3.4.5 NEPA/NHPA Finding (Section 106 Determination)

Construction and operation of the Underground Emphasis LRT Alternative would not be expected to result in any direct or indirect adverse effects to historic properties. On June 1, 2010, SHPO concurred with FTA's finding of no adverse effect from the Underground Emphasis LRT Alternative (a copy of the SHPO concurrence letter is located in Appendix X, Cultural Resources - Built Environment (Updated)).

4.12.1.3.4.6 CEQA Determination

Construction of the Underground Emphasis LRT Alternative would result in two direct significant impacts (Belmont Tunnel (APE Map Resource #3-4) and S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building (APE Map Resource #7-30)) and 14 indirect significant impacts to historical resources. Implementation of mitigation measures described in Sections 4.12.1.4.1 through 4.12.1.4.4 of the Draft EIS/EIR would reduce these potential impacts to a less than significant level. Project operation would not be expected to cause direct or indirect impacts. Refer to Table 4.12.1-2 for additional information.

Table 4.12.1-2. Underground Emphasis LRT Alternative Historic Resources Impacts NEPA/NHPA Findings (Section 106 Determinations) and CEQA Determinations

APE Map Resource No.	Name	NRHP Eligibility	CRHR Eligibility	Potential Impact	Section 106 Determination	CEQA Determination	Can be Mitigated Below Level of Significance (CEQA)?
2-1	Barker Brothers	Eligible	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
2-7	Roosevelt Building	Listed	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
2-12	General Petroleum-Mobil Oil Building	Listed	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
2-13	Superior Oil Company Building	Listed	Listed	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
3-1	The California Club	Eligible	Listed	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
3-2	Los Angeles Central Library	Listed	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
3-4	Belmont Tunnel, Hollywood-Glendale-Burbank-San Fernando Valley Tunnel	Not Eligible	Eligible	Partial Removal due to Station Construction	No Historic Property Affected	Significant Impact	Yes
4-3	2nd Street Tunnel, Bridge (tunnel) #53C 1318	Eligible	Eligible	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
4-4	Walt Disney Concert Hall	Eligible	Eligible	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes

Table 4.12.1-2. Underground Emphasis LRT Alternative Historic Resources Impacts NEPA/NHPA Findings (Section 106 Determinations) and CEQA Determinations (continued)

APE Map Resource No.	Name	NRHP Eligibility	CRHR Eligibility	Potential Impact	Section 106 Determination	CEQA Determination	Can be Mitigated Below Level of Significance (CEQA)?
7-19	Former Nishi Hongwanji Buddhist Temple	Listed (as a contributor to Little Tokyo Historic District)	Listed	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
7-30	S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports	Not Eligible	Eligible	Demolition	No Historic Property Affected	Significant Impact	Yes
8-2	Los Angeles Times Building	Eligible	Listed	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
8-3	Los Angeles Times Mirror Building	Eligible El	igible	Station Construction/ Vibration	Effect Not Adverse	Significant Impact	Yes
8-11	Higgins Building, General Petroleum Building, (Los Angeles) County Engineers Building	Not Eligible	Eligible	Vibration Settlement	No Historic Property Affected	Significant Impact	Yes
8-12	Cathedral of Saint Vibiana	Eligible	Eligible	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
8-13	Cathedral of Saint Vibiana, Rectory	Eligible El	igible	Station Construction/ Vibration	Effect Not Adverse	Significant Impact	Yes

Note:
**No Historic Property Affected indicates that no properties eligible for the NRHP would be affected. Effect Not Adverse indicates that proposed candidate mitigation measures would reduce impacts to the point where no adverse effects would occur under Section 106 of NHPA.*

4.12.1.3.5 Locally Preferred Alternative

The alignment for the LPA would extend underground from the 7th Street/Metro Center Station under Flower Street to 2nd Street. Tracks would then proceed east underneath the 2nd Street Tunnel and 2nd Street to midblock between San Pedro Street and Central Avenue. At that point, the tracks would continue underground curving northeast under the Japanese Village Plaza (JVP) toward 1st and Alameda Streets. Two new portals would be constructed to connect to the existing at-grade Metro Gold Line tracks:

- In the median of 1st Street between Alameda and Garey Streets
- Just northeast of Temple and Alameda Streets

Construction activities for the LPA may cause noise, dirt, congestion, and limitations on access to the project area. These activities would be short-term and not cause adverse effects to historic properties or significant impacts to historical resources. Other effects to historic properties and impacts to historical resources are described in more detail in the following sections.

4.12.1.3.5.1 Demolition, Partial Takes, or Alteration of a Property

To construct the LPA, one parcel would be acquired that contains a historical resource. The S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports (APE Map Resource #7-30) is a CRHR-eligible (not NRHP-eligible) commercial building built in 1913 that is anticipated to be acquired for station construction. SHPO did not comment on properties identified solely for CRHR determination in the June 1, 2010 letter (a copy of the SHPO concurrence letter is located in Appendix X, Cultural Resources - Built Environment (Updated)).

NEPA/Section 106 Effects Analysis for Historic Properties

The S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building is not NRHP-eligible, and no adverse effects would occur under NEPA/Section 106 as a result of its acquisition and demolition. SHPO has concurred with these findings for the LPA, as discussed in Section 4.12.1.3.5.6.

CEQA Impact Analysis for Historical Resources

The property acquisition and subsequent demolition of the S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building would constitute a substantial adverse change that would impair the significance of the historical resource. Implementation of the following mitigation measures described in Section 4.12.1.4.2 below and committed to in the MMRP for the LPA (Chapter 8) would reduce potential impacts to a less than significant level. Implementation of these mitigation measures would ensure that the LPA would not result in a considerable contribution to cumulative impacts.

- Historic properties/historical resources documentation
- Relocation of S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building
- Interpretive programs for S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building

4.12.1.3.5.2 Station Construction

For the LPA, a station is proposed to be constructed underground southwest of the intersection of 2nd and Hope Streets at a shallower depth than the similar station proposed for the Underground Emphasis LRT Alternative. The NRHP-eligible Walt Disney Concert Hall (APE Map Resource #4-4) is located on the hill adjacent to the proposed station and tunnels. The preliminary conceptual designs would be compatible with the contemporary forms, materials, and massing of this historical resource. However, noise and vibration from the construction of the tunnels would cause a moderate GBN impact under FTA's noise guidance, affecting the use of the historic property as a concert hall and recording facility. This impact shall be mitigated to reduce the noise impact below significance so that concert hall and recording facility use would not be adversely affected. The station is also near the NRHP-eligible 2nd Street Tunnel (APE Map Resource #4-3), and the LRT tunnels would be constructed directly below the 2nd Street Tunnel using TBM(s).

There would also be a station on 2nd Street between Broadway and Spring Street. Entrances would be located in the property currently used as a surface parking lot on the south side of 1st Street between Broadway and Spring Streets. A portion of the property located on the northwest corner of 2nd and Broadway would be used for access and other ancillary facilities. The construction of the station and other facilities would be in the vicinity of the Los Angeles Times Mirror Building (APE #8-3). The addition of these facilities would represent a slight alteration to the setting of the building, in that the parking lot across the street would be converted to a station plaza. This would remain consistent with the urban setting of the building, and urban design features would complement the building's historic qualities.

Another station would be constructed southeast of the intersection of 1st Street and Central Avenue. The station would be located under Central Avenue, Alameda Street and privately held properties on the south side of 1st Street between Central Avenue and Alameda Street. This station may include a small building at ground level on the southwest corner of 1st and Alameda Streets to house ventilation fans. This shallow station may potentially be built without a roof, leaving parts of the below-grade platform level exposed. The property currently contains the CRHR-eligible S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building (APE Map Resource #7-30). This building would be removed as part of construction for the LPA.

NEPA/Section 106 Effects Analysis for Historic Properties

Construction of proposed tunnels would create effects on the Walt Disney Concert Hall (APE Map Resource #4-4), and the proposed station at 2nd Street between Broadway and Spring Street would create effects, including slight alterations to the setting, of the Los Angeles Times Mirror Building (APE Map Resource #8-3). However, the effects on these historic properties would not be considered adverse because the potential changes would not diminish the integrity of the properties' location, design, setting, materials, workmanship, feeling, or association. SHPO has concurred with these findings for the LPA, as discussed in Section 4.12.1.3.5.6.

CEQA Impact Analysis for Historical Resources

Construction of proposed stations and tunnels would not constitute a substantial adverse change that would impair the significance of the Walt Disney Concert Hall (APE Map Resource #4-4) or Los Angeles Times Mirror Building (APE Map Resource #8-3). Implementation of the historic properties/historical resources documentation mitigation measure in Section 4.12.1.4.2 below would reduce any potential impact to the CRHR-eligible Belmont Tunnel to a less than significant level. Potential changes in setting created by stations would not diminish the integrity of the resources' significant historic features. The LPA therefore, would have a less than significant impact upon these historical resources.

The property acquisition and subsequent demolition of the S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building would constitute a substantial adverse change that would impair the significance of the historical resource. However, implementation of the following mitigation measures in Section 4.12.1.4.2 below and the MMRP for the LPA (Chapter 8) would reduce impacts to a less than significant level. With implementation of the following mitigation measures, construction and operation of the LPA would not contribute to potentially significant cumulative noise or vibration impacts.

- Historic properties/historical resources documentation
- Relocation of S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building
- Interpretive programs for S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building

It should be noted that the historical uses of the building, such as the Atomic Café, have long been gone. The building now houses a Mexican restaurant that is unrelated to the historical uses. The architectural features of the building have been substantially altered, and offer little semblance of the historical uses. The fact that those former uses have an association with events linked to community history, which is the primary basis for why the building is considered historically significant, is best preserved through the recommended mitigation measures. The proposed mitigation measures would address the criteria that render the building historically significant because they would incorporate and enhance the story of the building's historic use into a museum exhibit and place interpretive materials on-site.

4.12.1.3.5.3 Portal Construction

Two portals would be constructed for this alternative. One would be located just north of Temple and Alameda Streets and the existing at-grade Little Tokyo/Arts District Station. There are no historic properties or historical resources within the vicinity of the portal.

The second portal would be located within 1st Street between Alameda and Garey Streets. Tracks would rise to the east within this second portal and connect at-grade to the existing Metro Gold

Line tracks toward the Eastside. 1st Street would be widened to the north to accommodate this second portal and maintain the existing number of through lanes. This portal would be within the viewshed of two historic properties: the Little Tokyo Historic District and the NRHP-eligible John A. Roebling Sons Co. Building (APE Map Resource #7-35). However, the portal is not encompassed within the boundary of a historic property, historical resource, or a contributing element to the significance of either property.

NEPA/Section 106 Effects Analysis for Historic Properties

No adverse effect would occur to the Little Tokyo Historic District or the John A. Roebling Sons Co. Building from the construction of the portal. Potential effects would not alter the setting of historic properties in a manner that would diminish the integrity of the historic district. SHPO has concurred with these findings for the LPA, as discussed in Section 4.12.1.3.5.6.

CEQA Impact Analysis for Historical Resources

Construction of the portal would not constitute a substantial adverse change that would impair the significance of historical resources. The change in setting created by the portal would not diminish the integrity of the resources' significant historic features. Construction of the portal, therefore, would have a less than significant impact upon historical resources. This would not result in a considerable contribution to a cumulative impact.

4.12.1.3.5.4 Vibration

According to the Updated Locally Preferred Alternative Noise and Vibration Analysis, Appendix 2 of this Final EIS/EIR, construction activities with the most potential for noise and vibration impacts include the cut and cover tunnel under Flower Street, TBM excavation beneath 2nd Street, the TBM insertion site northeast of 1st and Alameda Streets, proposed underground cut and cover station at 2nd/Hope Street, proposed underground cut and cover station at 2nd/Broadway, proposed underground cut and cover station at 1st/Central Avenue, and the underground junction at 1st and Alameda Streets.

GBV from these construction activities could affect historic structures. Pre-augering of soldier piles at cut and cover sections would eliminate the need for impact pile driving. This would leave large bulldozers and drill rigs as the main sources of construction vibration that could have the potential to cause vibration damage. If these large pieces of equipment are not used within 21 feet of a historic property or historical resource, there would not be adverse effects to historic properties and significant impacts would not occur to historical resources from GBV. Properties that are close to the cut and cover construction activities and which may be affected by construction-related vibration include:

- Barker Brothers (APE Map Resource #2-1)
- Roosevelt Building (APE Map Resource #2-7)
- General Petroleum-Mobil Oil Building (APE Map Resource #2-12)
- Superior Oil Building (APE Map Resource #2-13)

- The California Club (APE Map Resource #3-1)
- Los Angeles Central Library (APE Map Resource #3-2)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)
- Mirror Building (APE Map Resource #8-3)
- Higgins Building(APE Map Resource #8-11)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)
- Cathedral of Saint Vibiana Rectory (APE Map Resource #8-13)

The TBM(s) associated with tunneling activities would not cause vibratory effects or impacts to historic properties or historical resources because TBM(s) perform a slow moving drilling process that generates very little vibration to the surrounding areas. Studies have measured TBM vibration to be in the range of 0.0024 to 0.0394 inches per second PPV at a distance at 33 feet. The proposed TBM tunnels on 2nd Street would vary in depth due to the existing topography and vertical curves in the alignment. The tunnel would range from about 140 feet below the surface (distance from street level to the top of the tunnel) to about 40 feet below the surface. The vibratory potential of TBM(s) is minimal and would be well below the FTA threshold for Category IV buildings (buildings extremely susceptible to vibration damage) of 0.12 inches per second PPV.

According to the Updated Locally Preferred Alternative Noise and Vibration Analysis, Appendix 2 of this Final EIS/EIR, that outlines how project refinements affect historic properties and historical resources and verified (Wilson Ihrig & Associates 2011; See also Section 4.7), the Walt Disney Concert Hall (APE Map Resource #4-4) has the potential to be affected by GBV and GBN during project construction that exceeds FTA annoyance criteria. This effect has the potential to alter the building's use and diminish its historical integrity if not mitigated.

The Walt Disney Concert Hall houses a variety of uses that range from Category 1 to Category 3 land uses. Taking into account building isolation and losses through the parking structure, the temporary and short-term GBV generated from TBM(s) would range from approximately 53 VdB experienced at the most sensitive areas (Category 1) to 68 VdB experienced at the less sensitive areas (Category 2 and 3). These levels would not exceed the FTA GBV criteria of 65 VdB for Category 1 uses and 78 to 80 VdB for Category 2 and 3 land uses. The temporary and short-term GBN potentially generated from TBM(s) at the Walt Disney Concert Hall would range from approximately 18 to 48 dBA, respectively, which would exceed the FTA GBN criteria of 25 to 35 dBA for the Walt Disney Concert Hall. The temporary and short-term GBV and GBN potentially generated from TBM(s) at the REDCAT (a theater at Walt Disney Concert Hall) would be approximately 53 VdB and up to 33 dBA, respectively. These levels would not exceed the FTA criteria of 80 VdB and 43 dBA for the REDCAT. It should be noted that operation of the TBM would be temporary and it would not operate for the entire duration of construction. The TBM would be underground in the vicinity of the Walt Disney Concert Hall and the REDCAT for approximately ten days assuming 35 feet per day.

GBN and GBV would also be generated by delivery trains in the tunnel during construction. It is estimated that the vibration generated by the delivery trains would be approximately 0 to 5dB greater than that generated by the LRT vehicles. Thus, at the Walt Disney Concert Hall, this would result in GBV of 50 VdB experienced at the most sensitive areas (Category 1) to 65 VdB experienced at the less sensitive areas (Category 2 and 3). These levels would not exceed the FTA GBV criteria of 65 VdB for Category 1 uses and 78 to 80 VdB for Category 2 and 3 land uses. GBN experienced at the Walt Disney Concert Hall would be 28 to 42 dBA at the most sensitive and less noise-sensitive land uses, respectively. Based on the FTA criteria for the Walt Disney Concert Hall indicated above, the delivery trains would potentially cause a short-term GBN impact at the Walt Disney Concert Hall. It is anticipated that the delivery trains would generate GBV of 44 VdB and GBN of approximately 26 dBA at the REDCAT, and impacts would be less than significant.

Overall during construction, operation of TBM(s) and delivery trains would result in a potentially significant GBN impact to the Walt Disney Concert Hall. Operation of TBM(s) and delivery trains would not result in a significant GBV or GBN impact to the REDCAT. With implementation of mitigation identified in Section 4.12.1.4.2 below, GBN generated by TBM(s) and delivery trains would not impact the sensitive activity occurring at the Walt Disney Concert Hall.

Due to the refinements to the LPA, operation of the LPA could result in GBN impacts at the following sensitive receptors: the Walt Disney Concert Hall. Both a one and two LRT vehicle pass-by scenario would occur under operation the LPA. One LRT vehicle pass-by would be the normal occurrence, which is why it was considered a frequent event under FTA criteria. The two LRT vehicle pass-by would be less frequent, which is why it was considered an occasional/infrequent event under FTA criteria.

One LRT vehicle pass-by associated with the LPA, which is considered a frequent event under FTA criteria, would potentially generate GBN up to 37 dBA at the Walt Disney Concert Hall. This GBN level would potentially exceed the FTA annoyance criterion for frequent events of 25 dBA for the Walt Disney Concert Hall. Thus, potentially significant GBN impacts from LRT vehicle pass-bys are predicted. Project operation would result in GBV levels of 41 to 60 VdB, which would not exceed the FTA criteria for the most sensitive use at the Walt Disney Concert Hall.

Under a two LRT vehicle pass-by scenario, which would be considered an occasional/infrequent event under FTA criteria, the LPA would potentially generate GBN between 26 and 40 dBA at the Walt Disney Concert Hall, which would potentially exceed the FTA annoyance criterion for occasional/infrequent events of 25 dBA for sensitive uses and 38 to 43 dBA for less sensitive uses for the Walt Disney Concert Hall. Thus, potentially significant GBN impacts from two LRT vehicle pass-bys are predicted at the Walt Disney Concert Hall. It should be noted that a two LRT vehicle pass-by would be infrequent. Under a two LRT vehicle pass-by scenario, GBV levels would range from 42 to 63 VdB, which would not exceed the FTA criteria for the most sensitive use at the Walt Disney Concert Hall.

NEPA/Section 106 Effects Analysis for Historic Properties

An effect, but not adverse in nature, would occur during construction at the following locations from vibration-induced damage.

- Barker Brothers (APE Map Resource #2-1)
- Roosevelt Building (APE Map Resource #2-7)
- General Petroleum Mobil Oil Building (APE Map Resource #2-12)
- Superior Oil Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- Los Angeles Central Library (APE Map Resource #3-2)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)
- Mirror Building (APE Map Resource #8-3)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)
- Cathedral of Saint Vibiana Rectory (APE Map Resource #8-13)

The effect would not be adverse after implementation of the following mitigation measures described in Section 4.12.1.4.2 below and committed to in the MMRP for the LPA (Chapter 8) and MOA (Appendix 3):

- Pre-construction baseline survey and geotechnical investigations
- Building protection measures, geotechnical and vibration monitoring, and post-construction survey

For the Walt Disney Concert Hall (APE Map Resource #4-4), an effect from GBN could occur during construction and operation. No adverse effect from GBV or GBN generated during construction or operation would occur at the REDCAT (APE Map Resource #4-4). The effect would not be adverse in nature after mitigation measures are implemented. These measures include performing pre-construction surveys and geotechnical investigation as well as geotechnical and vibration monitoring, and post-construction surveys. These investigations would protect and stabilize the ground near these resources and identify impacts before they become adverse. The use of an earth pressure balance or slurry shield TBM(s) would further reduce the potential vibration impacts. Implementation of the MOA would specify the specific requirements for pre- and post-construction surveys, geotechnical investigations, building protection measures, and TBM specifications. Mitigation measures for noise and vibration during operation and construction would further reduce potential effects to historic properties so they fall below FTA impact threshold criteria for noise and vibration. These mitigation measures are described further in Section 4.12.1.4.2 below.

If these mitigation measures are properly implemented, construction of this alternative would not directly alter a characteristic of these historic properties in a manner that would diminish the integrity of the historic properties' location, design, setting, materials, workmanship, feeling, or association. SHPO has concurred with these findings for the LPA, as discussed in Section 4.12.1.3.5.6.

CEQA Impact Analysis for Historical Resources

The potential for construction-related vibration could cause a substantial significant impact that would impair the following locations:

- Barker Brothers (APE Map Resource #2-1)
- Roosevelt Building (APE Map Resource #2-7)
- General Petroleum Mobil Oil Building (APE Map Resource #2-12)
- Superior Oil Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- Los Angeles Central Library (APE Map Resource #3-2)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)
- Mirror Building (APE Map Resource #8-3)
- Higgins Building (APE Map Resource #8-11)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)
- Cathedral of Saint Vibiana Rectory (APE Map Resource #8-13)

Implementation of the following mitigation measures described in Section 4.12.1.4.2 below and committed to in the MMRP for the LPA (Chapter 8) would reduce the potential impacts to a less than significant level.

- Pre-construction baseline survey and geotechnical investigations
- Building protection measures, geotechnical and vibration monitoring, and post-construction survey
- Memorandum of Agreement

For the Walt Disney Concert Hall (APE Map Resource #4-4), a substantial adverse impact from GBN could occur during construction and operation. The effect would not be adverse in nature after mitigation measures are employed. These measures include performing pre-construction surveys and geotechnical investigation as well as geotechnical and vibration monitoring, and post-construction surveys. These investigations would protect and stabilize the ground near these resources and identify impacts before they become adverse. The use of an earth pressure balance or slurry shield TBM(s) would further reduce the potential vibration impacts. Mitigation measures for noise and vibration during operation and construction, would further reduce potential effects to the Walt Disney Concert Hall (APE Map Resource # 4-4) so they fall below FTA impact threshold criteria for noise and vibration. These mitigation measures are described further in Section 4.12.1.4.2 below. With implementation of mitigation measures, construction and operation of the LPA would not contribute to potentially significant cumulative noise or vibration impacts.

4.12.1.3.5.5 Differential Settlement

Differential settlement occurs when a building or feature's shape is twisted or is raised and lowered, sometimes imperceptibly, in different places. Differential settlement can cause foundations to settle and crack, floors to buckle and go out of level, walls to shift out of plumb and plane, and roofs to twist and deform. The resulting changes in structural systems and cladding or finish materials, including wood and masonry, floor tiles, wood flooring, concrete floors, plaster, marble, and other decorative wall and ceiling treatments, and adobe, stucco, and wood-framed walls can be cracks, fractures, and other noticeable (as well as long-term, not immediately visible) deformations and damage. Since historically significant buildings often have archaic construction and finish attachment systems, including unreinforced masonry, those building types are usually more susceptible to the effects of differential settlement than more recently constructed buildings.

Based on the activities described in the Description of Construction (Appendix K) and Construction Impacts section (Section 4.18), eight NRHP and/or CRHR eligible properties could be potentially affected by tunneling (TBM operation) and cut and cover construction:

- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)

- Former Nishi Hongwanji Buddhist Temple (APE Map Resource #7-19)
- Los Angeles Times Building (APE Map Resource #8-2)
- Higgins Building (APE Map Resource #8-11)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)

Implementation of the mitigation measures described in Section 4.12.1.4.2 below (when applicable) and committed to in the MMRP for the LPA (Chapter 8) would avoid potential adverse effects to historic properties and reduce potential impacts to historical resources to a less than significant level.

- Pre-construction baseline survey and geotechnical investigations
- Building protection measures, geotechnical and vibration monitoring, and post-construction survey
- TBM specifications/requirements near historic properties and historical resources

NEPA/Section 106 Effects Analysis for Historic Properties

Implementation of mitigation measures described in Section 4.12.1.4.2 below and committed to in the MMRP for the LPA (Chapter 8) and MOA (Appendix 3) to protect and stabilize the ground near the following locations would avoid adverse effects to all properties under this alternative:

- Superior Oil Company Building (APE Map Resource #2-13)
- The California Club (APE Map Resource #3-1)
- 2nd Street Tunnel (APE Map Resource #4-3)
- Walt Disney Concert Hall (APE Map Resource #4-4)
- Former Nishi Hongwanji Buddhist Temple (APE Map Resource #7-19)
- Los Angeles Times Building (APE Map Resource #8-2)
- Cathedral of Saint Vibiana (APE Map Resource #8-12)

If the following mitigation measures from Section 4.12.1.4.2 below are properly implemented, as committed in the MMRP for the LPA (Chapter 8) and MOA (Appendix 3), differential settlement would not directly alter characteristics of historic properties in a manner that would diminish the integrity of each property’s location, design, setting, materials, workmanship, feeling, or association.

- Pre-construction baseline survey and geotechnical investigations
- Building protection measures, geotechnical and vibration monitoring, and post-construction survey
- Memorandum of Agreement

SHPO has concurred with these findings for the LPA, as discussed in Section 4.12.1.3.5.6.

CEQA Impact Analysis for Historical Resources

The potential for differential settlement could constitute a substantial adverse change that would impair the significance of any or all of the historical resources noted in this section. Implementation of the following mitigation measures described in Section 4.12.1.4.2 below and committed to in the MMRP for the LPA (Chapter 8) would reduce potential impacts to a less than significant level. Implementation of these mitigation measures would ensure that the LPA would not result in a considerable contribution to cumulative impacts.

- Pre-construction baseline survey and geotechnical investigations
- Building protection measures, geotechnical and vibration monitoring, and post-construction survey

4.12.1.3.5.6 NEPA/NHPA Finding (Section 106 Determination)

Construction and operation of the LPA would not be expected to result in any direct or indirect adverse effects to historic properties. On June 1, 2010, SHPO concurred with FTA's finding of no adverse effect from the Fully Underground LRT Alternative (LPA) (a copy of the SHPO concurrence letter is located in Appendix X, Cultural Resources - Built Environment (Updated)). An MOA for the LPA was signed in September 2011 and is included in this Final EIS/EIR as Appendix 3.

4.12.1.3.5.7 CEQA Determination

Construction of the LPA would potentially result in two direct significant impacts (Belmont Tunnel (APE Map Resource #3-4) and S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building (APE Map Resource #7-30)) and 15 indirect significant impacts to historical resources. Implementation of the following mitigation measures described in Section 4.12.1.4.2 below and committed to in the MMRP for the LPA (Chapter 8) would reduce these potential impacts to a less than significant level. Implementation of these mitigation measures would ensure that the LPA would not result in a considerable contribution to cumulative impacts.

- Historic properties/historical resources documentation
- Pre-construction baseline survey and geotechnical investigations

- Building protection measures, geotechnical and vibration monitoring, and post-construction survey
- TBM specifications/requirements near historic properties and historical resources
- Memorandum of Agreement

Project operation would result in one direct significant impact to a historical resource (Walt Disney Concert Hall (APE Map Resource #4-4). Implementation of the following mitigation measures described in Section 4.12.1.4.2 below and committed to in the MMRP (Chapter 8) would reduce this potential impact to a less than significant level.

- Pre-construction baseline survey and geotechnical investigations
- Building protection measures, geotechnical and vibration monitoring, and post-construction survey
- Memorandum of Agreement
- Mitigation for effects from noise and vibration during operation to the Walt Disney Concert Hall
- Mitigation for effects from Noise and Vibration during construction to the Walt Disney Concert Hall

Refer to Table 4.12.1-3 for additional information.

Table 4.12.1-3. Locally Preferred Alternative Historic Resources Impacts
NEPA/NHPA Findings (Section 106 Determinations) and CEQA Determinations

APE Map Resource No.	Name	NRHP Eligibility	CRHR Eligibility	Potential Impact	Section 106 Determination	CEQA Determination	Can be Mitigated Below Level of Significance (CEQA)?
2-1	Barker Brothers	Eligible	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
2-7	Roosevelt Building	Listed	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
2-12	General Petroleum-Mobil Oil Building	Listed	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
2-13	Superior Oil Company Building	Listed Listed		Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
3-1	The California Club	Eligible	Listed	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
3-2	Los Angeles Central Library	Listed	Listed	Vibration	Effect Not Adverse	Significant Impact	Yes
3-4	Belmont Tunnel, Hollywood-Glendale-Burbank-San Fernando Valley Tunnel	Not Eligible	Eligible	Partial Removal	No Historic Property Affected	Significant Impact	Yes
4-3	2nd Street Tunnel, Bridge (tunnel) #53C 1318	Eligible El	igible	Station Construction/ Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
4-4	Walt Disney Concert Hall	Eligible El	igible	Station Construction/ Vibration Settlement	Effect Not Adverse	Significant Impact	Yes

Table 4.12.1-3. Locally Preferred Alternative Historic Resources Impacts
NEPA/NHPA Findings (Section 106 Determinations) and CEQA Determinations (continued)

APE Map Resource No.	Name	NRHP Eligibility	CRHR Eligibility	Potential Impact	Section 106 Determination	CEQA Determination	Can be Mitigated Below Level of Significance (CEQA)?
7-19	Former Nishi Hongwanji Buddhist Temple	Listed (as a contributor to Little Tokyo Historic District)	Listed	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
7-30	S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports	Not Eligible	Eligible	Demolition	No Historic Property Affected	Significant Impact	Yes
8-2	Los Angeles Times Building	Eligible	Listed	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
8-3	Los Angeles Times Mirror Building	Eligible El	igible	Station Construction/ Vibration	Effect Not Adverse	Significant Impact	Yes
8-11	Higgins Building, General Petroleum Building, (Los Angeles) County Engineers Building	Not Eligible	Eligible	Vibration Settlement	No Historic Property Affected	Significant Impact	Yes
8-12	Cathedral of Saint Vibiana	Eligible	Eligible	Vibration Settlement	Effect Not Adverse	Significant Impact	Yes
8-13	Cathedral of Saint Vibiana, Rectory	Eligible	Eligible	Vibration	Effect Not Adverse	Significant Impact	Yes

Note:
** No Historic Property Affected indicates that no properties eligible for the NRHP would be affected. Effect Not Adverse indicates that the MOA would reduce impacts to the point where no adverse effects would occur under Section 106 of NHPA.*

4.12.1.4 Mitigation Measures

4.12.1.4.1 Updates to Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for built environment impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.12.1.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and the MOA (Appendix 3) and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Addition of offering the S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building to any party willing to move it off of the 1st/Central Avenue station site at their own expense, or exploration of incorporating portions of the building into the station should no party come forward.

- Addition of protection for facades of historic buildings adjacent to construction areas.

- Addition of mitigation measures to offset potential GBN impacts at the Walt Disney Concert Hall.

- Addition of detail to mitigation measures for consistency with other sections.

4.12.1.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. Some of the following built environment mitigation measures are also included in the MOA between SHPO, Metro, and FTA. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure. The MOA is included in this Final EIS/EIR as Appendix 3.

To offset construction-related direct and indirect adverse impacts, the following mitigation measures shall be applied as indicated in 4.12.1.3.5:

- Documentation of historic properties and historical resources adversely affected by the project shall consist of the development of individual HABS/HAER submissions. The appropriate level of recordation shall be established in consultation with the California SHPO and formalized as a part of a MOA as described in Section 4.12.1.4.5 of the Draft EIS/EIR and included in Appendix 3 of this Final EIS/EIR. The HABS/HAER documents shall be offered to the Library of Congress and the documents shall be prepared so that the original archival-quality documentation would be suitable for inclusion in the Library of Congress if the National Park Service accepts these materials. Archival copies of the documentation shall also be offered for donation to local repositories, including the Los Angeles Central Library and the Los Angeles Conservancy. (CR/B-1)

- A survey of historic properties and/or historical resources within 21 feet of vibration producing construction activity shall be conducted to confirm the building category, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. The survey shall also be used to establish baseline, pre-construction conditions for historic properties and historical resources. During preliminary engineering and final design of the project, additional subsurface (geotechnical) investigations shall be undertaken to further evaluate soil, groundwater, seismic, and environmental conditions along the alignment. The analysis shall assist in the selection and development of appropriate support mechanisms for cut and cover construction areas and any sequential excavation method (mining) construction areas, in accordance with industry standards and the Building Code. The subsurface investigation shall also identify areas that could experience differential settlement as a result of using a TBM in close proximity to historic properties and/or historical resources. An architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards shall provide input and review of design contract documents prior to implementation of the mitigation measures. (CR/B-2)

- The historic property and historical resource protection measures as well as the geotechnical and vibration monitoring program shall be reviewed by an architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards to ensure that the measures would adequately protect the properties/resources. A post-construction survey shall also be undertaken to ensure that adverse effects or significant impacts have not occurred to historic properties or historical resources. (CR/B-3)

- For those historic properties and historical resources where adverse impacts are anticipated, a MOA has been developed to resolve those adverse effects consistent with 36 CFR 800. This agreement, developed by FTA and Metro in consultation with the California SHPO and other consulting parties shall resolve and/or avoid, minimize, or mitigate potential effects to historic properties and/or historical resources. The agreement includes stipulations that outline the specific requirements for consultation and decision-making between the lead federal agency and consulting parties, specify the level of HABS/HAER recordation, and outline specific requirements for pre- and post-construction surveys, geotechnical investigations, building protection measures, and TBM specifications. See Appendix 3 (MOA) of this Final EIS/EIR for specific requirements. (CR/B-4)

- The S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building (to be removed) shall be offered for a period of one year following certification of the Final EIS/EIR for the price of $1 to any party willing to move it off of the 1st/Central Avenue station site at their own expense. Should no parties come forward, Metro shall incorporate materials from the building into the project facilities. Metro shall explore keeping portions of the building intact for use in the 1st/Central Avenue station. Metro shall also offer to provide an exhibit commemorating the building at the Japanese American National Museum, the 1st/Central Avenue station site, or other suitable location. An individual HABS/HAER submission shall be developed. (CR/B-5)

- Facades of historic buildings adjacent to the construction areas shall be protected from accumulation of excessive dirt or shall be cleaned in an appropriate manner periodically while construction activities are occurring nearby. (CR/B-6)

In order to mitigate potential ground movement associated with cut and cover construction and potential ground loss due to tunneling that could affect historic resources:

- Before any construction, a survey of structures within the anticipated zone of construction influence shall be conducted in order to establish baseline conditions. A geotechnical instrumentation and settlement monitoring plan and mitigation measures shall be developed and adhered to during construction to ensure appropriate measures are taken to address any construction-induced movement. If assessments indicate the necessity to proactively protect nearby structures, additional support for the structures by underpinning or other ground improvement techniques shall be required prior to the underground construction. Metro shall require the construction contractor to limit movement to less than acceptable threshold values for vertical, horizontal, and angular deformation as a performance standard. These acceptable threshold values shall be established such that the risk of damage to buildings and utilities will be negligible to very slight. For buildings, these threshold values will be based on the relationship of building damage to angular distortion and horizontal strain consistent with Boscardin and Cording (1989) and qualitative factors including but not limited to the type of structure and its existing condition. For utility mains, these threshold values shall be those established by the utility owners. Additional data and survey information shall be gathered during final design for each building and utility main to enable assessment of the tolerance of potentially affected structures and utilities. Additional engineering and design level geotechnical studies shall be performed to define the nature of the soils and to refine the means of achieving each performance specification. (GT-1)

- Ground improvement such as grouting or other methods shall be required to fill voids where appropriate and offset potential settlement when excess material has been removed during excavation. The criteria for implementing grouting or ground improvement measures shall be based on the analysis described in the preceding mitigation measure. (GT-2)

- The tunnel alignment shall be grouted in advance to provide adequate soil support and minimize settlement as geotechnical conditions require. (GT-3)

- Settlement along the project alignment shall be monitored using a series of measuring devices above the route of the alignment. Leveling surveys shall be conducted prior to tunneling to monitor for possible ground movements. (GT-4)

- Tunnel construction monitoring requirements shall be described and defined in design contract documents. Additional geotechnical provisions shall be included to the extent feasible, including use of an Earth Pressure Balance or Slurry Tunnel Boring Machine for tunnel construction to minimize ground loss. During tunnel construction, the soils encountered shall be monitored relative to anticipated soil conditions as described in a Geotechnical Baseline Report. (GT-5)

To offset the potentially significant GBN impacts that could occur during construction at Walt Disney Concert Hall:

- Construction of the LPA, in the vicinity of the Walt Disney Concert Hall, shall be done in accordance with the MOA between FTA and the SHPO, which includes stipulations that outline the specific requirements for consultation and decision-making between the lead federal agency and consulting parties, specify the level of HABS/HAER recordation, and outline specific requirements for pre- and post-construction surveys, geotechnical investigations, building protection measures, and TBM specifications. (NV-18)

Tunnel Boring Machine

- Maintenance and Operation: The construction contractor shall minimize vibration from jacking or pressing operations (if applicable, the action could be smoothed out to avoid a sharp push), and maintain machinery in good working order. (NV-19)

- Coordination and Notification: There would be times when the Main Auditorium of the Walt Disney Concert Hall is vacant or not used for a noise-sensitive activity, thereby eliminating any noise impact from TBM. Similarly, there would be times at the Los Angeles Philharmonic Association (LAPA) Conference Room (and offices) of the Walt Disney Concert Hall and at the recording/performance halls of the Colburn School when activities are not particularly noise-sensitive. Metro shall coordinate closely with the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, to ensure that the noise-generating parts of TBM operations shall be conducted to avoid noise-sensitive periods. (NV-20)

Delivery Train

- Speed: Delivery train speed shall be limited to 5 MPH in the vicinity of the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, currently under construction, which would reduce the GBN to the lower range, or 5 dBA from the maximum range. (NV-21)

- Resilient Mat: A resilient system to support and fasten the delivery train tracks shall be used during construction, which would reduce GBN levels by at least 4 dBA.

  - Such as system shall include a) resilient mat under the tracks and b) a resilient grommet or bushing under the heads of any track fasteners (assuming some kind of anchor or bolt system). The hardness of the resilient mat shall be in the 40 to 50 durometer range, and be about one to two inches thick, depending on how heavily loaded the cars would be. The contractor shall select the mat thickness so that the rail doesn't bottom out during a car pass-by. (NV-22)

- Conveyor: The delivery train shall be replaced with a conveyor system to transport materials in the tunnel if GBN exceeds the FTA annoyance criteria at the Walt Disney Concert Hall, the Colburn School, or the Broad Art Foundation Museum, which is currently under construction. (NV-23)

- Coordination and Notification: There would be times when the Main Auditorium and Choral Hall of the Walt Disney Concert Hall and the recording/performance halls of the Colburn School are vacant or not used for noise-sensitive activities, thereby eliminating any noise impact from the delivery train. Metro shall coordinate closely with the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, to ensure that the delivery train pass-bys would be conducted to avoid noise-sensitive periods. (NV-24)

To offset the potentially significant GBN impacts that could occur during operations at Walt Disney Concert Hall:

- In the vicinity of the Walt Disney Concert Hall and the Colburn School, Metro shall implement resiliently supported fasteners, isolated slab track, or other appropriate measures as needed to eliminate impacts and to reduce GBN below FTA annoyance criteria. (NV-27)

4.12.2 Archaeological Resources

This section summarizes the existing archaeological resources located in the project area and the potential impacts of the proposed alternatives, including the LPA, on these resources. Information in this section is based on the Cultural Resources – Archaeology Technical Memorandum prepared for the project contained in Appendix Y, Cultural Resources - Archaeology (Updated), of this EIS/EIR. No substantial changes to this section have been made since publication of the Draft EIS/EIR. Environmental effects of the LPA are discussed in Section 4.12.2.3.5 and mitigation measures are discussed in Section 4.12.2.4.2.

4.12.2.1 Regulatory Framework

NEPA guidelines include compliance with related federal laws that require identification of historic properties and consideration of project-related effects on those properties. This analysis was prepared to comply with Section 106 of the NHPA of 1966, as amended, and with regulations contained in 36 CFR Part 800. These regulations require federal agencies to consider the effects of proposed projects on historic properties. Historic properties may include archaeological resources.

Other federal laws include the Archaeological Data Preservation Act of 1974, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1989, among others. Section 106 and NEPA procedures—particularly through involvement of Native American and other public constituents in the identification, evaluation, and mitigation processes—might address impact resolution through these other federal laws.

This analysis was also prepared to comply with requirements of CEQA and the CEQA Guidelines (CERES 2009) as they apply to cultural resources. Under CEQA, it is necessary for a lead agency to evaluate proposed projects for the potential to cause significant impacts on "historical resources." For CEQA conformance, historical resources include the built environment as well as "unique paleontological resources" or "unique geologic features." A proposed project that may affect historical resources is submitted to SHPO for review and comment prior to project approval by the lead agency and before any project-related clearance, demolition, or construction activities are commenced.

Properties that could potentially be historic resources within the identified project APE were evaluated for NRHP eligibility according to criteria set forth in 36 CFR Part 60.4. The age criterion for inclusion in the NRHP is 50 years and older, except in cases of overriding significance (Criteria Consideration G).

Properties were also considered for eligibility for inclusion in the CRHR; although there is no established age threshold for the CRHR, the same 50-year cutoff was used for this project. Under PRC Section 5024.1, the CRHR was established to serve as an authoritative guide to the state's significant historical and archaeological resources.

NEPA does not provide specific definitions or criteria for determining the significance of historic properties, however effects on historic properties under Section 106 of the NHPA of 1966, as amended, are evaluated in accordance with the criteria of adverse effect in the regulations contained in 36 CFR Part 800.5 (a)(1) On June 1, 2010, the California SHPO concurred with the determinations of eligibility and finding of effects by the FTA for the Project and Alternatives and an MOA has been prepared to conclude Section 106 consultation (see Appendix 3). The MOA was signed in September 2011.

In accordance with CEQA a project would result in a significant impact on an archaeological resource if it results in the physical destruction of an archaeological resource eligible for listing in the NRHP and the CRHR.

4.12.2.2 Affected Environment

The project-specific APE was established through consultation between the lead federal agency (FTA), the lead CEQA agency (Metro), SHPO, and other consulting parties in accordance with 36 CFR 800.16(d).

For archaeological resources, the APE includes the proposed at-grade and underground right-of-way and areas of direct ground disturbance. This includes areas with permanent site improvements and areas for staging and temporary construction activities. The APE includes the full width of the street, the adjacent sidewalks, any additional street segments or portions of adjacent city blocks in areas of proposed stations, connections with existing rail lines, and alignments that deviate from existing streets. The vertical APE extends to approximately 100 feet below the existing ground surface.

A records and literature search indicated that five previously recorded archaeological resources (CA-LAN-887H, CA-LAN-3588, P-19-003097, P-19-003338, and P-19-003339) are located within the APE (see Table 4.12.2-1), and that all are historic archaeological sites. With regards to eligibility for listing in the NRHP or CRHR, some resources are identified in Table 4.12.2-1 as "No determination of eligibility," which means that research has not been conducted to determine the eligibility of the site. Resources are "presumed eligible" when, in the professional opinion of a qualified archaeologist, there are reasons to believe that it may be eligible for listing in the NRHP or CRHR, but there are factors that inhibit excavation or direct examination of the resource. Therefore, resources presumed eligible may or may not ultimately be determined eligible, which is why "no determination of eligibility" is used in the table.

The records and literature search also identified 143 previously conducted cultural resource studies within a 0.25 mile radius of the APE. Of these, 23 study areas are located within the direct APE.

Historic maps indicate that the direct APE was completely developed prior to 1888 and that several streets within the project area have been realigned over the past 120 years. The Los Angeles Zanja System, the City's original water system which operated from 1781 through the early 1900s, also crosses the direct APE in numerous locations.

The Native American Heritage Commission (NAHC) Sacred Lands File search indicated the presence of cultural resources important to Native Americans in the project area. The NAHC response included a list of five Native American contacts that may have knowledge of cultural resources in the project area. Location maps, a description of the proposed project, and its APE were sent to these five groups via U.S. mail; each letter was followed up with a telephone call. These five groups included the Ti'At Society, Gabrielino Tongva Indians of California Tribal Council, Gabrielino Tongva Nation, Gabrielino/Tongva San Gabriel Band of Mission Indians, and Tongva Ancestral Territorial Tribal Nation. Responses were received from two of the five Native American contacts (Gabrielino/Tongva San Gabriel Band of Mission Indians and Tongva Ancestral Territorial Tribal Nation). These responses are documented in Appendix Y, Cultural Resources – Archaeology (Updated), of this EIS/EIR.

In the course of the pedestrian survey, a single archaeological site (RC-1) was encountered within the direct APE. This resource consists of a historic brick alignment, likely representing part of a late 19^{th}/early 20^{th} century structure foundation. Available evidence suggests that RC-1 lacks sufficient integrity and is not eligible for listing in the NRHP or CRHR.

None of the five previously recorded archaeological sites within the direct APE were observed during the pedestrian survey. Site P-19-003097, a historic site consisting of 19^{th} and 20^{th} century features and artifacts, was considered to be significant by its excavators. Data recovery in 2002 was conducted to mitigate impacts to this resource and the site was subsequently destroyed. Site CA-LAN-3588, a historic site consisting of features and artifacts dating to circa 1880 to 1935, is presumed eligible for listing on both the NRHP and CRHR due to its association with earliest Japanese settlement of Little Tokyo.

Sites P-19-003338 and P-19-003339 are American period artifact deposits that have not been formally evaluated. For purposes of this analysis they are presumed eligible for both registers.

The Los Angeles Zanja System (recorded as CA-LAN-887H, P-19-003103, and P-19-003352) crosses the direct APE in numerous places. Zanja segments P-19-003103 and P-19-003352 were recorded outside of the APE. A segment of the Zanja System (P-19-003103) north and outside of the APE was nominated for listing in the NRHP under Criterion A at the local level of significance for its direct role in the development of Los Angeles between 1781 and circa 1900. The system as a whole is presumed eligible for listing in the NRHP and CRHR for the same reason.

4.12.2.3 Environmental Impacts/Environmental Consequences

This section describes the environmental impacts and consequences of the proposed alternatives, including the LPA. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.12.2.1.

4.12.2.3.1 No Build Alternative

No operational or construction impacts to archaeological resources would occur under the No Build Alternative since construction would not be performed as part of this alternative.

Cumulative impacts would not occur since the No Build Alternative would not result in construction or operational impacts to archaeological resources.

4.12.2.3.1.1 NEPA/NHPA Finding (Section 106 Determination)

The No Build Alternative would not result in adverse effects to archaeological resources.

4.12.2.3.1.1 CEQA Determination

The No Build Alternative would not result in significant impacts to archaeological resources.

4.12.2.3.2 TSM Alternative

Construction of the TSM Alternative has the potential to directly affect archaeological resources within the APE, including previously unidentified archaeological resources and the Los Angeles Zanja System. Zanja remnants (Zanja 6-1; P-19-003352), for instance, have been identified at depths as shallow as 1.5 feet below grade. Such damage to archaeological resources would represent a significant impact. Implementation of mitigation measures described in Sections 4.12.2.4.1 and 4.12.2.4.2 of the Draft EIS/EIR would reduce this potential impact to a less than significant level. The TSM Alternative would not result in operational impacts to archaeological resources.

Implementation of the mitigation measure described in Section 4.12.2.4.1 of the Draft EIS/EIR would reduce construction-related impacts to previously unidentified archaeological resources to a less than significant level. Therefore, the TSM Alternative would not contribute to a cumulative impact on these resources. By providing documentation and interpretation of the Zanja System on a system-wide scale, implementation of the mitigation measure described in Section 4.12.2.4.2 of the Draft EIS/EIR would reduce both direct and cumulative impacts to this resource to a less than significant level.

Table 4.12.2-1. Previously Recorded Archaeological Resources within the APE

Trinomial	Primary No.	Resource Description	Quadrangle	National and CA Register Eligibility	Recorded by and Year
CA-LAN-887H	P-19-000887	Historic: Segment of the Zanja Madre (water ditch) and associated artifacts	Los Angeles	Segment north of project recommended eligible; whole Zanja System presumed eligible	Padon, B. 1999; Costello, J. 1978
CA-LAN-3097	P-19-003097	Historic: structural remains and 3 privies with associated artifacts	Los Angeles	Presumed destroyed, no longer eligible	Applied Earthworks, Inc. 2002
CA-LAN-3338	P-19-003338	Historic: refuse deposit	Los Angeles	No determination of eligibility	Humphries, F. 2000
CA-LAN-3339	P-19-003339	Historic: refuse deposit	Los Angeles	No determination of eligibility	Humphries, F. 2000
CA-LAN-3588	P-19-003588	Historic: brick foundations and refuse deposits	Los Angeles	Presumed NRHP and CA Register eligible	Foster, J. 2006

4.12.2.3.2.1 NEPA/NHPA Finding (Section 106 Determination)

As the segments of the Zanja system (CA-LAN-887H) within the APE have not been determined eligible for the NRHP, the TSM Alternative may have adverse effects upon these resources if, during implementation of the MOA and Cultural Resources Monitoring and Mitigation Plan (CRMMP), they are determined to be eligible for the NRHP. These adverse effects under Section 106 would be resolved through the implementation of the MOA and CRMMP.

Operation of the TSM Alternative would not result in adverse effects to archaeological resources.

4.12.2.3.2.2 CEQA Determination

With implementation of the MOA and CRMMP, potential construction and cumulative impacts would not be significant under CEQA. Operation of the TSM Alternative would not result in significant impacts to archaeological resources.

4.12.2.3.3 At-Grade Emphasis LRT Alternative

Construction of the At-Grade Emphasis LRT Alternative has the potential to directly affect archaeological resources within the APE, including previously unidentified archaeological resources and previously undiscovered portions of site RC-1.

Site RC-1, a historic brick alignment (see Section 4.12.2.2), may be affected during ground disturbance from construction of a proposed pedestrian bridge at the intersection of Temple and Alameda Streets. Site RC-1 appears to not be eligible for either the National Register or the California Register. However, previously unrecorded parts of the site that retain substantial integrity may be present.

This alternative also has the potential to affect previously unrecorded archaeological resources during ground disturbance from constructing new underground tunnel segments, stations, and the automobile underpass and pedestrian overpass on Alameda Street at Temple Street. Such damage to archaeological resources would represent an adverse effect.

Implementation of the mitigation measure described in Section 4.12.2.4.1 of the Draft EIS/EIR would reduce construction impacts to previously unidentified archaeological resources and previously undiscovered portions of site RC-1 to a less than significant level.

The At-Grade Emphasis LRT Alternative would not result in operational impacts to archaeological resources.

4.12.2.3.3.1 NEPA/NHPA Finding (Section 106 Determination)

The At-Grade Emphasis LRT Alternative may have adverse effects upon previously unidentified archaeological resources or previously undiscovered portions of Site RC-1 if these resources are determined to be eligible for the NRHP. These adverse effects under Section 106 would be resolved through coordination with SHPO and the implementation of the MOA and CRMMP. SHPO has concurred with the project's NHPA determinations.

The At-Grade Emphasis LRT Alternative would not result in adverse operational effects to archaeological resources.

4.12.2.3.3.2 CEQA Determination

With implementation of the MOA and CRMMP, potential construction and cumulative impacts would not be significant under CEQA. The At-Grade Emphasis LRT Alternative would not result in significant operational impacts to archaeological resources.

4.12.2.3.4 Underground Emphasis LRT Alternative

Construction of the Underground Emphasis LRT Alternative has the potential to directly affect archaeological resources within the APE, including previously unidentified archaeological resources, the Los Angeles Zanja System, and site CA-LAN-3588. Although the precise location and local integrity of the zanjas have not been established, the project's 2nd Street alignment likely crosses the system multiple times.

Archaeological remains associated with these sites may extend into the project area and be subject to direct alteration. This would result in an adverse effect. Construction of new stations could affect any extant archaeological resources within their footprints. Construction of new tunnel segments through deep tunneling, as opposed to cut and cover techniques, could avoid effects to shallow archaeological resources, although the maximum depth of these resources and minimum depth of construction would both need to be established to ascertain actual effects. Implementation of mitigation measures described in Sections 4.12.2.4.1 and 4.12.2.4.2 of the Draft EIS/EIR would reduce potential construction impacts to both identified and previously unidentified archaeological resources to a less than significant level. The Underground Emphasis LRT Alternative would not result in operational impacts to archaeological resources.

Given that implementation of the mitigation measure described in Section 4.12.2.4.1of the Draft EIS/EIR would reduce potential construction impacts to previously unidentified archaeological resources to a less than significant level, the Underground Emphasis LRT Alternative would not contribute to a cumulative impact on unidentified archaeological resources.

Potential destruction of portions of the Los Angeles Zanja System could contribute to a cumulative impact to this resource. Implementation of the mitigation measure described in Section 4.12.2.4.2 of the Draft EIS/EIR would reduce both direct and cumulative impacts to known archaeological resources, including the Zanja System, to a less than significant level.

4.12.2.3.4.1 NEPA/NHPA Finding (Section 106 Determination)

As the segments of the Zanja system (CA-LAN-887H), site CA-LAN-3588, and previously unidentified archaeological resources within the APE have not been determined eligible for the NRHP, the Underground Emphasis LRT Alternative may have adverse effects upon these resources if, during implementation of the MOA and CRMMP, they are determined to be eligible for the NRHP. These adverse effects under Section 106 would be resolved through coordination with SHPO and the implementation of the MOA and CRMMP. SHPO has concurred with the project's NHPA determinations.

The Underground Emphasis LRT Alternative would not result in adverse operational effects to archaeological resources.

4.12.2.3.4.2 CEQA Determination

With implementation of the MOA and CRMMP, potential construction and cumulative impacts would not be significant under CEQA. The Underground Emphasis LRT Alternative would not result in significant operational impacts to archaeological resources.

4.12.2.3.5 Locally Preferred Alternative

Construction of the LPA has the potential to directly affect archaeological resources within the APE, including previously unidentified archaeological resources, the Los Angeles Zanja System, and sites CA-LAN-3588, P-19-003338, and P-19-003339. Although the precise location and local integrity of the zanjas have not been established, the project's 2nd Street alignment likely crosses the system multiple times.

As with the Underground Emphasis LRT Alternative, archaeological features associated with these sites may extend into the project area and be subject to direct alteration. This would result in an adverse effect. Construction of new tunnel segments through deep tunneling, as opposed to cut and cover techniques, could avoid effects to shallow archaeological resources, although the maximum depth of these resources and minimum depth of construction would both need to be established to ascertain actual effects. Implementation of the following mitigation measures described in Section 4.12.2.5 below would reduce potential direct impacts to identified and previously unidentified archaeological resources to a less than significant level.

- Treatment of undiscovered archaeological resources
- Treatment of known archaeological resources

The LPA would not result in operational impacts to either identified or previously unidentified archaeological resources. Given that implementation of the treatment of undiscovered archaeological resources mitigation measure described in Section 4.12.2.4.2 below would reduce potential construction impacts to previously unidentified archaeological resources to a less than significant level, the LPA would not contribute to a cumulative impact on unidentified archaeological resources.

Potential destruction of portions of the Los Angeles Zanja System could contribute to a cumulative impact to this resource. Implementation of the treatment of known archaeological resources mitigation measure described in Section 4.12.2.4.2 below would reduce both direct and cumulative impacts to known archaeological resources, including the Zanja System, to a less than significant level.

4.12.2.3.5.1 NEPA/NHPA Finding (Section 106 Determination)

As the four previously identified resources and unidentified archaeological resources situated within the APE have not been formally evaluated for the NRHP, the LPA may have adverse effects upon these resources if, during implementation of the MOA and CRMMP, they are determined to be eligible for the NRHP. These adverse effects under Section 106 will be resolved through coordination with SHPO and the implementation of the MOA and CRMMP. SHPO has concurred with the project's NHPA determinations, and an MOA was signed for the LPA in September 2011.

The LPA would not result in adverse operational effects to archaeological resources.

4.12.2.3.5.2 CEQA Determination

With implementation of the MOA and CRMMP, potential construction and cumulative impacts would not be significant under CEQA. The LPA would not result in significant operational impacts to archaeological resources.

4.12.2.4 Mitigation Measures

4.12.2.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for archaeological resources presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.12.2.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and the MOA (Appendix 3) and supersede candidate mitigation measures identified in the Draft

EIS/EIR. No substantial new mitigation measures have been added since publication of the Draft EIS/EIR.

4.12.2.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure. Some of the following archaeological resources mitigation measures are also included in the MOA between SHPO, Metro, and FTA. The MOA is included in this Final EIS/EIR as Appendix 3.

To offset the impacts of unknown archaeological impacts potentially being disturbed during construction:

- Construction personnel shall be trained on proper procedures by a qualified lead archaeologist. (CR/A-1)
- An archaeological monitor shall be present during ground-disturbing activities. The archaeological monitor shall have authority to halt operations to examine potential resources and recover artifacts using professional archaeological methods. (CR/A-2)
- A Native American cultural resources consultant from the Gabrielino/Tongva San Gabriel Band of Mission Indians and/or the Tongva Ancestral Territorial Tribal Nation shall be contacted to monitor ground-disturbing work if Native American cultural resources are discovered. (CR/A-3)
- Work shall stop if human remains are found, and the Los Angeles County Coroner shall be notified immediately. If the remains are determined to be prehistoric, the Coroner shall notify the NAHC, which will arrange for a MLD to inspect the site within 48 hours and issue recommendations for scientific removal and nondestructive analysis. (CR/A-4)
- If no cultural resources are discovered during construction monitoring, the archaeological monitor shall submit a brief letter to that effect. If previously unidentified cultural resources are discovered in the course of construction monitoring, a report shall be prepared following Archaeological Resource Management Report (OHP 1990) guidelines that documents field and analysis results and interprets the data within an appropriate research context. (CR/A-5)

To offset impacts caused by disturbance of the Los Angeles Zanja System (CA-LAN-887H and other unnumbered zanjas), and sites CA-LAN-3588, P-19-003338, and P-19-003339, which could occur during construction:

- A proactive identification and documentation program that would facilitate preservation or mitigation in a cost-effective manner shall be undertaken. This shall include using documentary research to identify, as accurately as possible, the precise alignments of the zanjas within the APE. Where these alignments are expected to be affected by the proposed project, particularly where cut and cover or other near-surface construction techniques are planned in the vicinity of mapped zanja segments, full-time archaeological monitoring shall be instituted to ensure documentation consistent with Section 4.12.2.4.2 of the Draft EIS/EIR. (CR/A-6)

4.12.3 Paleontological Resources

This section summarizes the existing paleontological resources located in the project area and the potential impacts of the proposed alternatives, including the LPA, on these resources. Information in this section is based on the Cultural Resources – Paleontology Technical Memorandum prepared for the project contained in Appendix Z, Cultural Resources - Paleontology (Updated), of this EIS/EIR. No substantial changes have been made to this section since publication of the Draft EIS/EIR. Environmental effects of the LPA are discussed in Section 4.12.3.3.5 and mitigation measures are discussed in Section 4.12.3.4.2 below.

4.12.3.1 Regulatory Framework

Fossils are classified as nonrenewable scientific resources and are protected by various laws, ordinances, regulations, and standards across the country. The Society of Vertebrate Paleontology (SVP) (1995) has established professional standards for assessment and mitigation of adverse impacts to paleontological resources. Regulations and standards that are applicable to paleontological resources within the project area include:

- American Antiquities Act of 1906
- The National Environmental Policy Act of 1969
- National Historic Preservation Act of 1966
- Federal Land Management and Policy Act of 1976
- Federal Land Management and Policy Act of 1962, Section 2
- Paleontological Resources Preservation Act (PRPA)
- California Environmental Quality Act
- Public Resources Code (Section 1.7), Sections 5097.5 and 30244
- City of Los Angeles General Plan, Conservation Element
- Society of Vertebrate Paleontology (SVP)

In its “Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources,” the SVP (1995:23) defines three categories of paleontological sensitivity (potential) for sedimentary rock units:

- High Potential. Rock units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered and are considered to have a high potential for containing significant nonrenewable fossiliferous resources. For geologic units with high potential, full-time monitoring typically is recommended during any project-related ground disturbance.

- Low Potential. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections. For geologic units with low potential, protection or salvage efforts typically are not required.

- Undetermined Potential. Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials. For geologic units with undetermined potential, field surveys by a qualified paleontologist are usually recommended to specifically determine the paleontologic potential of the rock units present within the study area.

In general terms, for geologic units with high potential, full-time monitoring typically is recommended during any project-related ground disturbance. For geologic units with low potential, protection or salvage efforts typically are not required. For geologic units with undetermined potential, field surveys by a qualified paleontologist are usually recommended to specifically determine the paleontologic potential of the rock units present within a study area.

For this project, a paleontological collections records search was conducted, a detailed review of museum collections records was performed to identify any known vertebrate fossil localities within at least one mile of the proposed project area and to identify the geologic units within the project area and vicinity, and published geologic maps were consulted.

4.12.3.2 Affected Environment

For paleontological resources, the APE includes the proposed at-grade and underground right-of-way and areas of direct ground disturbance. This includes areas with permanent site improvements and areas for staging and temporary construction activities. The APE includes the full width of the street, the adjacent sidewalks, any additional street segments or portions of adjacent city blocks in areas of proposed stations, connections with existing rail lines, and alignments that deviate from existing streets (Figure 4.12.3-1). The vertical APE extends to approximately 100 feet below the existing ground surface.

According to geologic mapping published by Yerkes and Graham (1997a; 1997b) and records maintained by the Natural History Museum of Los Angeles County, the project area is underlain by the following geologic units, from oldest to youngest:

- Miocene Puente Formation

- Pliocene Fernando Formation

- Quaternary terrace deposits
- Quaternary alluvium

These geologic units and respective paleontological resource sensitivity are depicted on Figure 4.12.3-2 and Figure 4.12.3-3, respectively. Museum records revealed that at least 12 previously recorded vertebrate fossil localities have been documented either along the proposed project alignment or within a two mile radius from the same sedimentary deposits underlying the project (Table 4.12.3-1). Information from previous finds in similar rock formations outside of the APE help to determine the sensitivity of the geologic units within the APE.

The combined results of the museum records search and literature review indicate that the geologic units underlying the project area have a paleontological sensitivity ranging from low to high.

4.12.3.3 Environmental Impacts/Environmental Consequences

This section describes the potential environmental impacts and consequences of the proposed alternatives, including the LPA. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.12.3.1.

Direct adverse impacts on surface or subsurface paleontological resources are the result of destruction by breakage and crushing, typically in construction-related excavations. In areas containing paleontologically sensitive geologic units, surface disturbance has the potential to adversely impact an unknown quantity of surface and subsurface fossils. Without mitigation, these fossils, as well as the paleontological data they could provide if properly salvaged and documented, could be adversely impacted (destroyed), rendering them permanently unavailable.

Direct adverse impacts can typically be mitigated to below a level of significance by implementing paleontological mitigation. Mitigation also creates a beneficial effect because it results in the salvage of fossils that may never have been unearthed via natural processes. With mitigation, these newly salvaged fossils would become available for scientific research, education, display, and preservation into perpetuity at a public museum.

Indirect adverse impacts typically include those effects that result from normal ongoing operations of facilities constructed within a given project area. They also occur as the result of constructing new access roads in areas that were previously less accessible. This increases public access and therefore increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting. No indirect impacts are expected as the result of this project because the APE is highly urbanized.

The incremental loss of paleontological resources over a period of time as a result of project-related ground disturbance has the potential to result in significant cumulative effects because it could result in destruction of nonrenewable paleontological resources and irretrievable loss of scientific information. However, when paleontological monitoring and mitigation is implemented prior to and during project construction, fossils would be protected and information would be obtained. By implementing monitoring and mitigation where feasible, the cumulative effects to paleontological resources resulting from the project would be negligible. Further, any scientifically significant fossils discovered prior to or during ground disturbances related to the proposed project would benefit the scientific community by increasing knowledge associated with the fossils.

4.12.3.3.1 No Build Alternative

Since construction would not occur under the No Build Alternative, construction or operational impacts also would not occur to paleontological resources. Since the No Build Alternative would not result in construction or operational impacts to paleontological resources, cumulative impacts are not anticipated.

4.12.3.3.1.1 NEPA Finding

The No Build Alternative would not result in adverse effects to paleontological resources.

4.12.3.3.1.2 CEQA Determination

The No Build Alternative would not result in significant impacts to paleontological resources.

4.12.3.3.2 TSM Alternative

Construction of the TSM Alternative has the potential to directly affect paleontological resources within the project area should excavations related to the construction of new bus stops occur in paleontologically sensitive geologic units.

Implementation of mitigation measures would reduce potential adverse impacts to a less than significant level. The TSM Alternative would not result in operational impacts to paleontological resources.

Given that construction-related impacts would be reduced to a less than significant level with implementation of mitigation and operational impacts would be less than significant, the TSM Alternative would not contribute to a cumulative impact on paleontological resources.

4.12.3.3.2.1 NEPA Finding

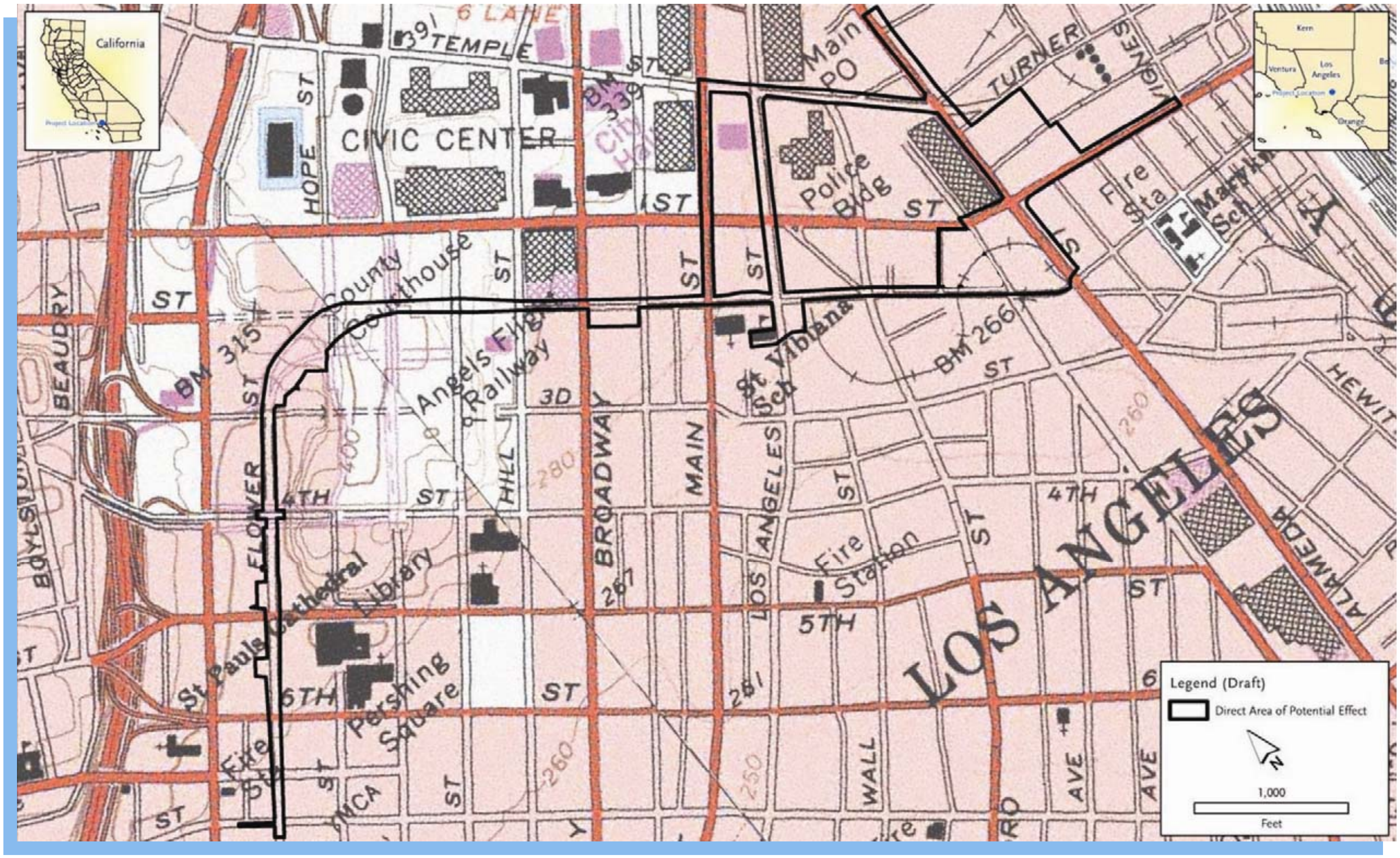
The TSM Alternative could have adverse effects on paleontological resources. With implementation of proposed mitigation, potential construction and cumulative effects would not be adverse under NEPA. Operation of the TSM Alternative would not result in adverse effects to paleontological resources.

4.12.3.3.2.2 CEQA Determination

The TSM Alternative could have significant impacts on paleontological resources. With implementation of proposed mitigation, potential construction and cumulative impacts would not be significant under CEQA. Operation of the TSM Alternative would not result in significant impacts to paleontological resources.

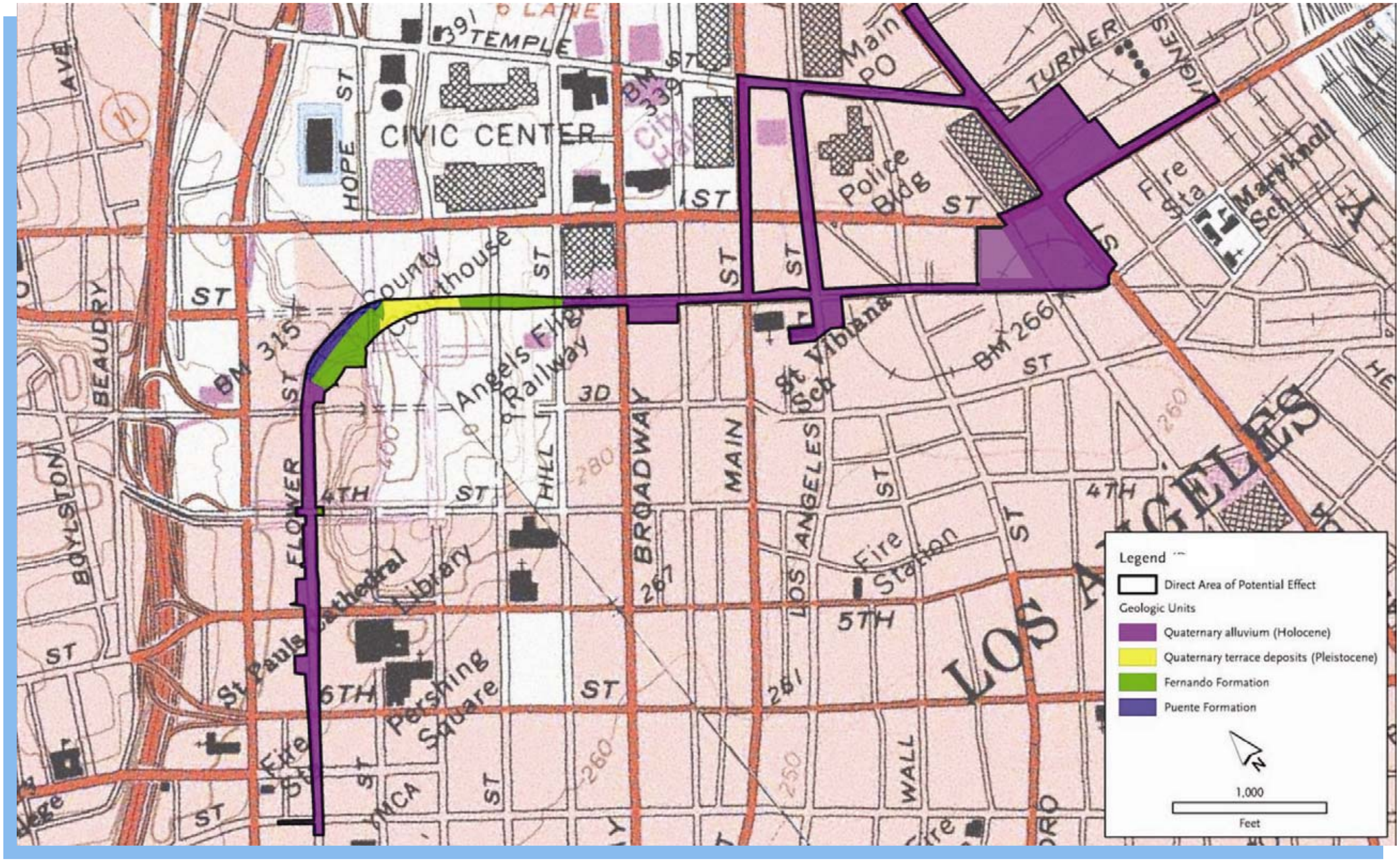
Table 4.12.3-1. Previously Discovered Paleontological Resources In and Around the Direct APE

LACM Locality Number(s) and Approximate Location	Geologic Formation	Age	Taxa
LACM 5845; Western Avenue and Beverly Boulevard	Quaternary alluvium	Pleistocene	*Mammutidae* (fossil mastodon)
LACM 3250; east of Vermont Avenue near Madison Avenue and Middlebury Street	Quaternary alluvium	Pleistocene	*Mammuthus* (fossil mammoth)
LACM 6971; 6th and Flower Streets; LACM 4726; 4th and Hill Streets	Fernando Formation	Pliocene	*Myliobatis* (eagle ray), *Carcharodon carcharias* (white shark), *Isurus oxyrinchus* (bonito shark), *Carcharhinus* (requiem shark), *Semicossyphus* (sheepshead)
LACM 3868; Wilshire Boulevard and Lucas Avenue	Fernando Formation	Pliocene	*Carcharodon sulcidens* (white shark)
LACM 5961; 1st and Hill Streets	Puente Formation	Late Miocene	*Cyclothone* (bristlemouth fish)
LACM 6198 - 6203; Wilshire Boulevard from intersection of Alvarado Street west to past Vermont Avenue	Puente Formation	Late Miocene	*Osteichthyes* (bony fish), *Cetacea* (whale)



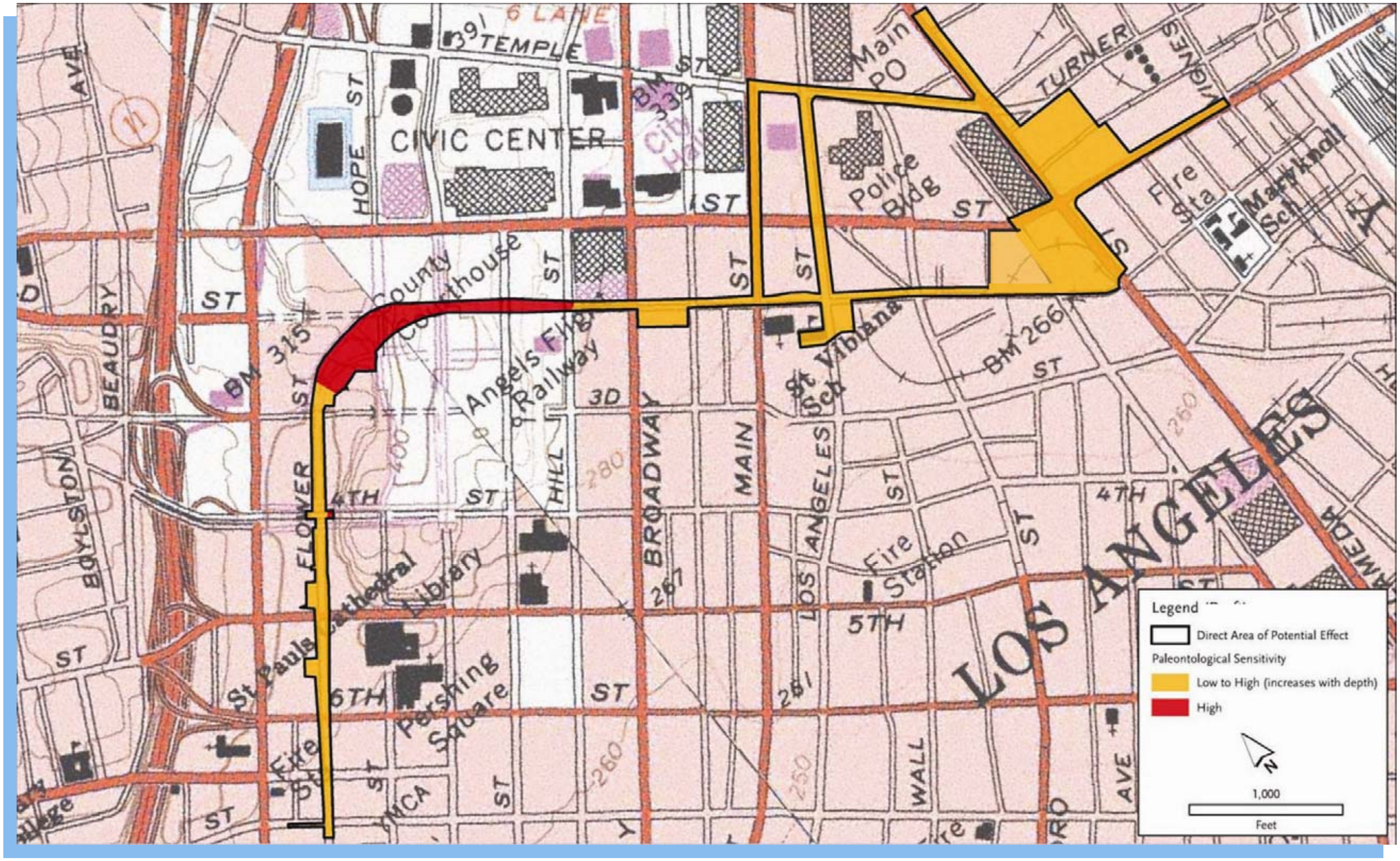
Source: USGS

Figure 4.12.3-1. Area of Potential Effects (APE) for Paleontological Resources



Source: USGS

Figure 4.12.3-2. Geologic Map



Source: USGS

Figure 4.12.3-3. Paleontological Sensitivity Map

4.12.3.3.3 At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative would have the potential to adversely impact paleontological resources at the surface and at depth within the project area as a result of ground disturbance related to construction of new underground tunnel segments between 7th and Hope Streets and at new proposed stations at Flower/6th/5th Street, 2nd/Hope Street, Main/1st Street, and Los Angeles/1st Street. Any ground disturbances in areas of high sensitivity (See Figure 4.12.3-3) would have the potential to impact paleontological resources at the surface and at depth; areas of ground disturbance in areas of sensitivity ranging from low to high have the potential to impact paleontological resources at a depth of five feet or greater below the ground surface. In areas where mitigation measures can be implemented, potential impacts could be reduced to a less than significant level.

The At-Grade Emphasis LRT Alternative would not result in operational impacts to paleontological resources. In areas where mitigation measures can be implemented, potential impacts could be reduced to a less than significant level, thus reducing any cumulative impact on paleontological resources to a less than significant level.

4.12.3.3.3.1 NEPA Finding

Construction of the At-Grade Emphasis LRT Alternative could potentially have adverse effects on paleontological resources. With implementation of mitigation, potential construction and cumulative effects would not be adverse under NEPA. The At-Grade Emphasis LRT Alternative would not have adverse effects on paleontological resources with implementation of proposed mitigation measures. The At-Grade Emphasis LRT Alternative would not result in adverse operational effects to paleontological resources.

4.12.3.3.3.2 CEQA Determination

Construction of the At-Grade Emphasis LRT Alternative could potentially have significant impacts on paleontological resources. With implementation of mitigation, potential construction and cumulative impacts would not be significant under CEQA. The At-Grade Emphasis LRT Alternative would not have significant impacts on paleontological resources with implementation of proposed mitigation measures. The At-Grade Emphasis LRT Alternative would not result in significant operational impacts to paleontological resources.

4.12.3.3.4 Underground Emphasis LRT Alternative

Construction of the Underground Emphasis LRT Alternative would involve ground disturbance associated with excavations of a new underground tunnel along most of the alignment; new underground stations at Flower/5th/4th Street, 2nd/Hope Street, 2nd Street station (either at Broadway or at Los Angeles Street); an automobile underpass on Alameda Street between 2nd Street and Temple Street; and a proposed pedestrian bridge at the intersection of Alameda and 1st Streets. Any ground disturbances in areas of high sensitivity (See Figure 4.12.3-3) would have the potential to impact paleontological resources at the surface and at depth; areas of ground disturbance in areas of sensitivity ranging from low to high have the potential to impact paleontological resources at a depth of five feet or more below the ground surface. In areas where mitigation measures can be implemented, potential impacts could be reduced to a less than significant level. In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and are thus unavoidable.

The Underground Emphasis LRT Alternative would not result in operational impacts to paleontological resources.

In areas where mitigation measures can be implemented, potential impacts could be reduced to a less than significant level, thus reducing any cumulative impact on paleontological resources to a less than significant level. In areas where mitigation measures cannot be implemented, such as areas where new underground TBM segments would be constructed, cumulative impacts may be unavoidable.

4.12.3.3.4.1 NEPA Finding

Construction of the Underground Emphasis LRT Alternative could potentially have adverse effects on paleontological resources. With implementation of mitigation, potential construction and cumulative effects would not be adverse under NEPA. The Underground Emphasis LRT Alternative would not have adverse effects on paleontological resources with implementation of proposed mitigation measures with the exception of areas where tunneling operations cannot be mitigated. In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and thus construction and cumulative effects would be unavoidable.

The Underground Emphasis LRT Alternative would not result in adverse operational effects to paleontological resources.

4.12.3.3.4.2 CEQA Determination

Construction of the Underground Emphasis LRT Alternative could potentially have significant impacts on paleontological resources. With implementation of mitigation, potential construction and cumulative impacts would not be significant under CEQA. The Underground Emphasis LRT Alternative would not have significant impacts on paleontological resources with implementation of proposed mitigation measures with the exception of areas where tunneling operations cannot be mitigated. In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and thus construction and cumulative impacts would be significant and unavoidable.

The Underground Emphasis LRT Alternative would not result in significant operational impacts to paleontological resources.

4.12.3.3.5 Locally Preferred Alternative

The LPA involves ground disturbance associated with excavations to construct three new stations and an entirely underground tunnel located from the 7th Street/Metro Center Station to the east and north of the intersection of 1st and Alameda Streets. Any ground disturbances in areas of high sensitivity (See Figure 4.12.3-3) would have the potential to impact paleontological resources at the surface and at depth; areas of ground disturbance in areas of sensitivity ranging from low to high have the potential to impact paleontological resources at a depth of five feet or more below the ground surface. Similar impacts to paleontological resources would likely occur during station construction, cut and cover locations and during the use of TBM. In areas where mitigation measures can be implemented, such as at new station locations and cut and cover locations where resources can be actively observed, potential impacts could be reduced to a less than significant level. In areas where new underground TBM segments would be constructed (the non-station portions of the alignment beneath 2nd Street, and beneath Flower Street north of 4th Street), mitigation for paleontological resources would not be feasible resulting in significant and unavoidable impacts.

The LPA would not result in operational impacts to paleontological resources.

In areas where mitigation measures can be implemented, potential impacts could be reduced to a less than significant level, thus reducing any cumulative impact on paleontological resources to a less than significant level. Mitigation measures cannot be implemented in areas where TBM excavation would be used. These areas include the non-station portions of the alignment beneath 2nd Street, and beneath Flower Street north of 4th Street. In these areas, cumulative impacts may be unavoidable.

4.12.3.3.5.1 NEPA Finding

The LPA could have adverse effects on paleontological resources. With implementation of mitigation, potential construction and cumulative effects will not be adverse under NEPA. The LPA will not have adverse effects on paleontological resources with implementation of proposed mitigation measures with the exception of areas where tunneling operations cannot be mitigated. In areas where new underground TBM segments would be constructed, mitigation for paleontological resources will not be feasible and thus construction and cumulative effects would be unavoidable.

The LPA would not result in adverse operational effects to paleontological resources.

4.12.3.3.5.2 CEQA Determination

The LPA could have significant impacts on paleontological resources. With implementation of mitigation, potential construction and cumulative impacts would not be significant under CEQA. The LPA would not have significant impacts on paleontological resources with implementation of proposed mitigation measures with the exception of areas where tunneling operations cannot be mitigated. In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and thus construction and cumulative impacts would be significant and unavoidable. Even with the incorporation of mitigation, the LPA would still result in a considerable contribution to cumulative impacts during construction.

The LPA would not result in significant operational impacts to paleontological resources.

4.12.3.4 Mitigation Measures

4.12.3.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. The final LPA mitigation measures, shown in Section

4.12.3.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR and supersede candidate mitigation measures identified in the Draft EIS/EIR. No substantial changes have been made to the candidate mitigation measures from the Draft EIS/EIR.

4.12.3.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

To offset the impacts of previously undiscovered paleontological resources potentially being disturbed during construction:

- A qualified paleontologist shall prepare a Paleontological Monitoring and Mitigation Plan for the proposed project and supervise monitoring of construction excavations within sensitive geologic sediments. The monitor shall have authority to temporarily divert grading away from exposed fossils to professionally and efficiently recover the fossil specimens and collect associated data. (CR/P-1)

- All project-related ground disturbances that could potentially affect the Puente Formation, Fernando Formation, and Quaternary older alluvium and terrace deposits would be monitored by a qualified paleontological monitor on a full-time basis (where feasible) because these geologic sediments are determined to have a high paleontological sensitivity. Very shallow surficial excavations (less than five feet) within Quaternary younger alluvium would be monitored on a part-time basis to ensure that underlying sensitive units are not adversely affected. Construction monitoring during any tunneling activity is not warranted as any potential fossil specimens present within sensitive geologic units would be crushed and destroyed by the nature of tunneling methodology. (CR/P-2)

- At each fossil locality, field data forms shall be used to record pertinent geologic data, stratigraphic sections shall be measured, and appropriate sediment samples shall be collected and submitted for analysis. (CR/P-3)

- Due to the likelihood of the presence of microfossils, matrix samples shall be collected and tested within the Puente Formation and Fernando Formation. Testing for microfossils shall consist of screen-washing samples (approximately 30 pounds) to determine if significant fossils are present. Productive tests shall result in screen-washing of additional bulk matrix up to a maximum of 2,000 pounds per locality to ensure recovery of a scientifically significant sample. (CR/P-4)

- Recovered fossils shall be prepared to the point of curation, identified by qualified experts listed in a database to facilitate analysis, and reposited in a designated paleontological curation facility such as the Natural History Museum of Los Angeles County. (CR/P-5)

The paleontologist shall prepare a final monitoring and mitigation report to be filed, at a minimum, with Metro and the identified repository. (CR/P-6)

4.13 Parklands and Other Community Facilities

This section identifies existing parklands and community facilities along and/or within 0.25 mile of either side of proposed project alignments, stations, and sites associated with construction activities and the project's potential to affect these facilities. Information in this section is based on the Parklands and Other Community Facilities Technical Memorandum prepared for the project contained in Appendix AA, Parklands and Other Community Facilities Technical Memorandum and Section 4(f) Evaluation, of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.13.4.2 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA that have occurred since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of potential parklands and other community facility impacts associated with the LPA is detailed below in Section 4.13.3.5.

4.13.1 Regulatory Framework

The following regulatory framework was used to guide the parkland and community facility impact evaluation: Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966, Uniform Fire Code (UFC), Title 24 of the California Building Code (CBC), California Education Code (CEC), Los Angeles County General Plan, City of Los Angeles General Plan, Central City Community Plan, and Central City North Community Plan. More information regarding the regulatory and analytical framework is available in Appendix AA, Parklands and Other Community Facilities Technical Memorandum and Section 4(f) Evaluation.

NEPA does not have specific thresholds related to potential impacts on parklands and community facilities. In accordance with CEQA, a project would normally have a significant impact on parklands if it could:

- Result in substantial adverse physical impacts from new or physically altered government facilities, need for new or physically altered government facilities, and construction that could cause significant environmental impacts to maintaining acceptable service ratios, response times, or other performance objectives for parks.
- Increase the use of existing neighborhood and regional parks or other regional facilities to the extent that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require construction or expansion of recreational facilities that might have a physical effect on the environment.

As indicated in the *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006), significant impacts to community/public facilities would occur if the project could:

- Result in substantial adverse physical impacts associated with providing new or physically altered governmental facilities, need for new or physically altered governmental facilities, and construction that could cause significant environmental impacts to maintaining acceptable service ratios, response times, or other performance objectives for police protection, fire protection, schools, or other public facilities.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

4.13.2 Affected Environment

An inventory was conducted of parklands and community facilities located within 0.25 mile of the proposed Regional Connector Transit Corridor project alignments. Results of the inventory are summarized below. Table 4.13-1 summarizes the number of parklands and community facilities located within 0.25 mile of the proposed project alignments. The parklands and community facilities that service the area or are within 0.25 mile of the proposed project alternatives alignments and stations (including the LPA) are detailed in Figures 4.13-1 through 4.13-12 and Tables 4.13-2 through 4.13-4. Detailed information regarding the existing parklands and community facilities within the project area is available in Appendix AA, Parklands and Other Community Facilities Technical Memorandum and Section 4(f) Evaluation.

Table 4.13-1. Summary of the Parklands and Community Facilities Located Within 0.25 Mile of the Alternative Alignments (including the Locally Preferred Alternative)

Facility Type	Project Alternatives			
	TSM	At-Grade Emphasis LRT	Underground Emphasis LRT	LPA
Parks	5	5	5	5
Recreational Facilities	7	6	6	6
Police Services	4	3	3	3
Fire Services	2	2	2	2
Libraries	5	5	4	4
Day-Care and Pre-School	8	5	6	7
Public Elementary and Middle Schools	0	0	0	0
Public High Schools	9	2	2	2
Colleges, Universities, & Trade Schools	12	8	9	10
Private Schools	0	0	0	0
Government Offices	14	13	12	12
Medical Facilities	1	1	1	1
Religious Facilities	12	10	11	10
Museums	7	6	4	5

Source: CDM, 2009

Figure 4.13-1. Parklands and Recreational Resources – TSM Alternative

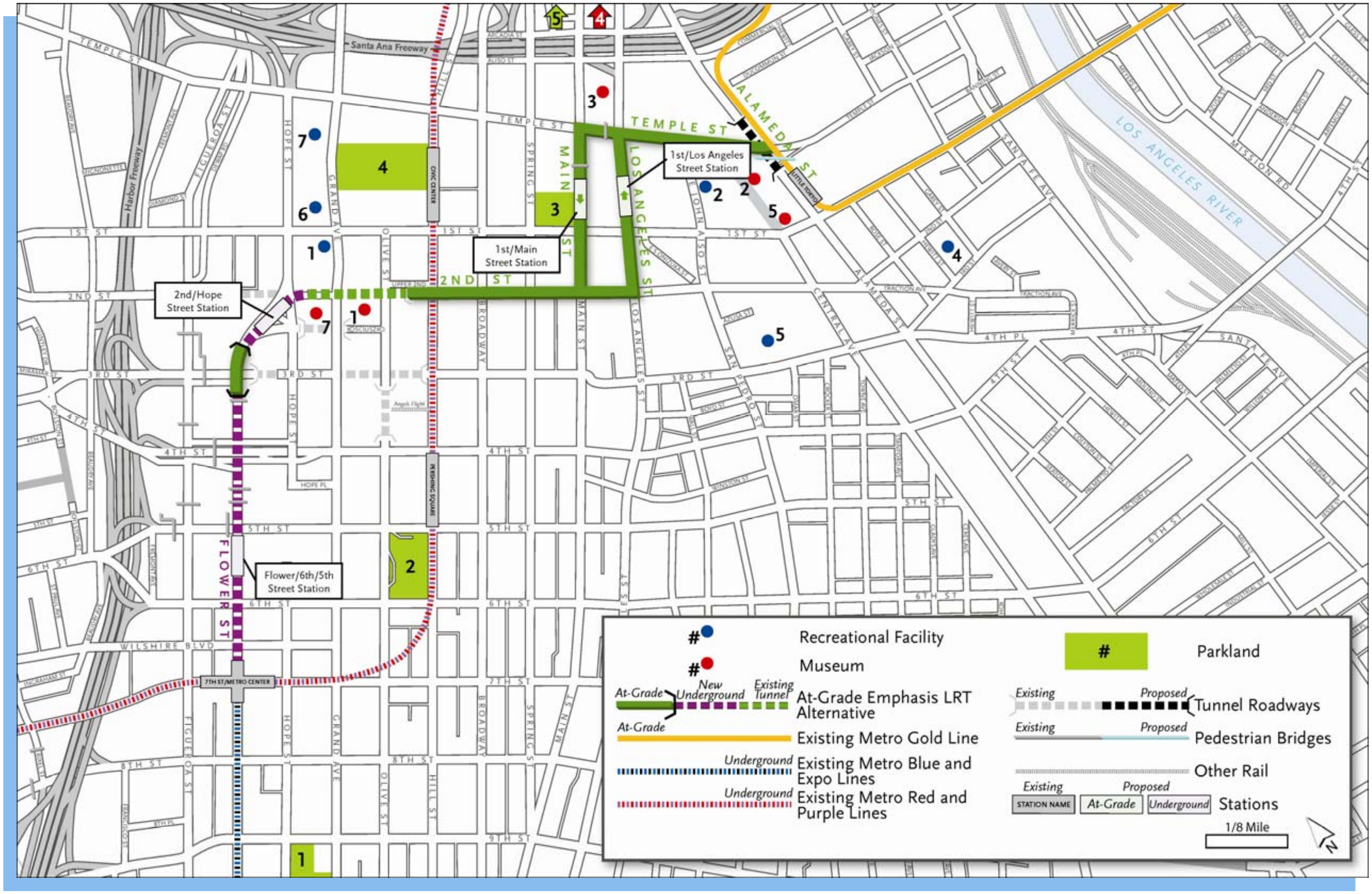


Figure 4.13-2. Parklands and Recreational Resources – At-Grade Emphasis LRT Alternative

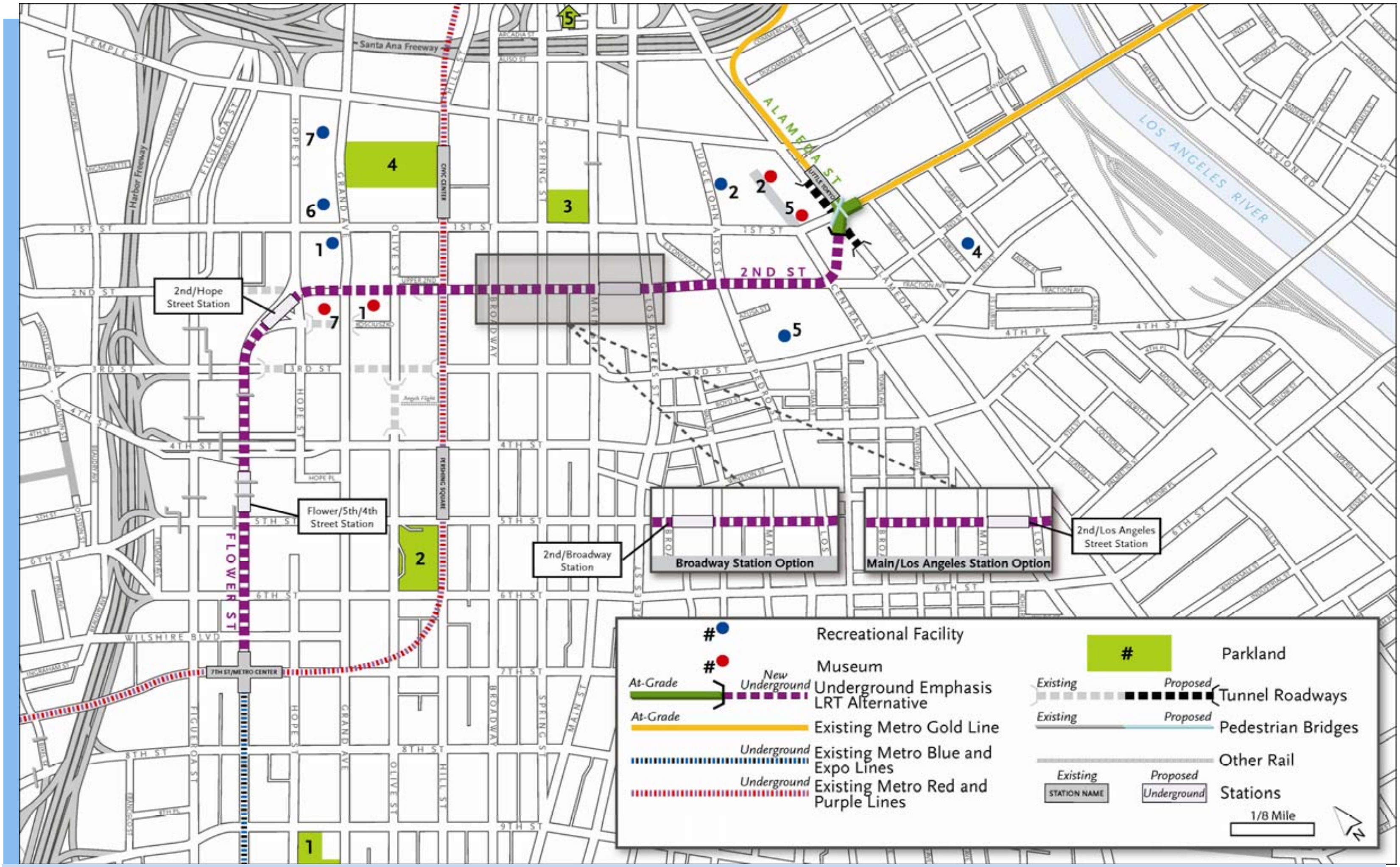


Figure 4.13-3. Parklands and Recreational Resources – Underground Emphasis LRT Alternative

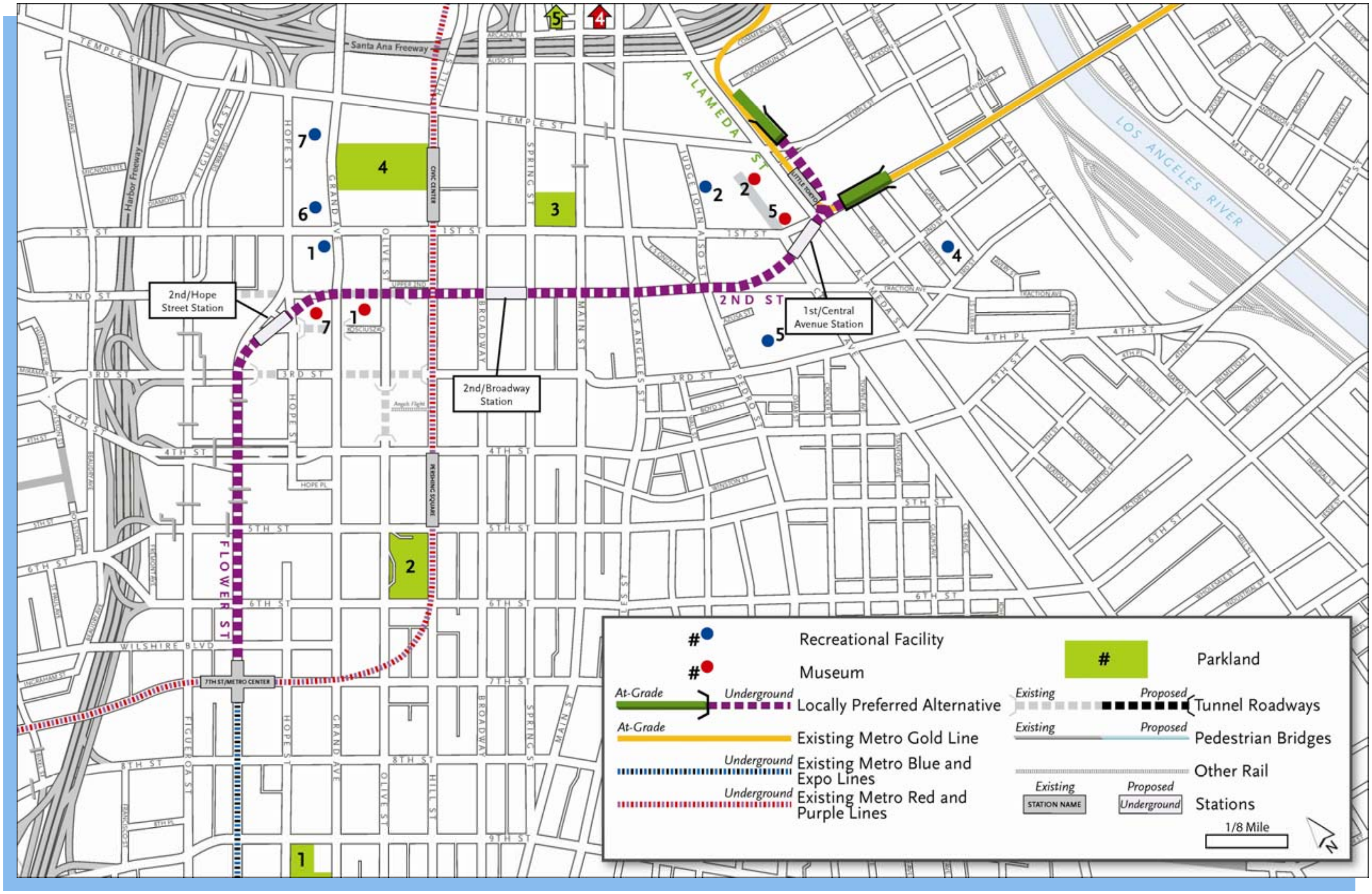


Figure 4.13-4. Parklands and Recreational Resources – Locally Preferred Alternative

Table 4.13-2. Parklands and Recreational Resources Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative)

Map No[1]	Name	Type of Facility	Approx Size (acres)	Location	Regulatory Agency	Proximity to Alignment (miles[2])
Parklands						
1	Grand Hope Park	Special Features: • Decorative sidewalks • 2 fountains • Clock tower • Pergolas • Children's play area • Displays of various artists' work	2.5	919 S. Grand Avenue	City of Los Angeles	0.16 ALRT 0.16 ULRT 0.16 LPA 0.16 LTSM 0.25 UTSM
2	Pershing Square	Special Features: • Ice Skating Rink (seasonal) • Stage • Sunken Amphitheatre Other Programs: • Earth Day • Shakespeare in the Park • Special Events Concert • St. Patrick's Day Parade	5.0	532 S. Olive Street	City of Los Angeles	0.24 ALRT 0.24 ULRT 0.24 LPA 0.24 LTSM 0.01 UTSM
3	City Hall South Lawn Park	Landscaped grounds of City Hall	4.0	200 N. Main Street	City of Los Angeles	0.04 ALRT 0.14 ULRT 0.14 LPA 0.14 LTSM 0.13 UTSM
4	Civic Center Mall/Future Civic Park	Special Features: • Large fountain • Multi-story parking garage for county employees underneath • Coffee shop	5.0	Block bounded by S. Hill Street, S. Grand Avenue, W. 1st Street, and W. Temple Street	County of Los Angeles	0.14 ALRT 0.14 ULRT 0.14 LPA 0.14 LTSM 0.01 UTSM
5	Los Angeles Plaza Park	Special Features: • Part of El Pueblo de Los Angeles (see Museums) • Restaurants and Shops • Olvera Street	7.0	125 Paseo de la Plaza	City of Los Angeles	0.25 ALRT 0.25 ULRT 0.25 LPA 0.10 LTSM 0.01 UTSM

Table 4.13-2. Parklands and Recreational Resources Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Name	Type of Facility	Approx Size (acres)	Location	Regulatory Agency	Proximity to Alignment (miles[2])
Museums						
1	Museum of Contemporary Art (MOCA)	Museum devoted to contemporary art	N/A	250 S. Grand Avenue	City of Los Angeles	0.09 ALRT 0.09 ULRT 0.09 LPA 0.03 LTSM 0.04 UTSM
2	The Geffen Contemporary at MOCA	Museum devoted to contemporary art, it is part of MOCA	N/A	152 N. Central Avenue	City of Los Angeles	0.09 ALRT 0.09 ULRT 0.09 LPA 0.03 LTSM 0.04 UTSM
3	Los Angeles Children's Museum	Not open to the public yet. Beginning fabrication of exhibits.	1.3	310 N. Main Street	Private	0.06 ALRT 0.32 ULRT 0.28 LPA 0.18 LTSM 0.03 UTSM
4	El Pueblo de Los Angeles State Historical Monument	A living museum whose role is as a historic and symbolic heart of the City Attractions include: • Avila Adobe • Chinese American Museum • Plaza Firehouse Museum • Sepulveda House • Italian Hall Museum • Pico House • Olvera Street	44.0	500 Block of N. Main Street	City of Los Angeles	0.24 ALRT 0.50 ULRT 0.20 LPA 0.08 LTSM 0.03 UTSM
5	Japanese American National Museum	Museum to promote understanding and appreciation of America's ethnic and cultural diversity by sharing the Japanese American experience.	N/A	369 E. 1st Street	Private	0.13 ALRT 0.02 ULRT 0.02 LPA 0.01 LTSM 0.13 UTSM

Table 4.13-2. Parklands and Recreational Resources Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Name	Type of Facility	Approx Size (acres)	Location	Regulatory Agency	Proximity to Alignment (miles[2])
6	Museum of Neon Art (MONA)	Museum to encourage learning and curiosity through the preservation, collection, and interpretation of neon art.	N/A	136 W. 4th Street	Private	0.26 ALRT 0.26 ULRT 0.26 LPA 0.13 LTSM 0.35 UTSM
7	Future Broad Art Foundation Museum (currently under construction)	Art museum currently under construction on Bunker Hill	N/A	Block bounded by 2nd Street, Grand Avenue, Hope Street, and General Thaddeus Kosciuszko Way	Private	<0.01 ALRT <0.01 ULRT <0.01 LPA 0.01 LTSM 0.01 UTSM
Recreational Facilities						
1	The Walt Disney Concert Hall	Concert House, Los Angeles Music Center	3.6	111 S. Grand Avenue	County of Los Angeles	0.06 ALRT 0.06 ULRT 0.06 LPA 0.04 LTSM 0.08 UTSM
2	Union Center for the Arts	Exhibition space for LA Artcore where new and original art works are displayed each month.	N/A	120 Judge John Aiso Street	Private	0.10 ALRT 0.14 ULRT 0.14 LPA 0.14 LTSM 0.10 UTSM
3	Ahmanson Theatre	Performance Center	N/A	135 N. Grand Avenue	County of Los Angeles	0.29 ALRT 0.29 ULRT 0.29 LPA 0.29 LTSM 0.03 UTSM
4	Maryknoll Shotokan Karate Club	Non-profit organization dedicated to teaching traditional karate.	N/A	222 S. Hewitt Street	Private	0.20 ALRT 0.20 ULRT 0.10 LPA 0.16 LTSM 0.34 UTSM

Table 4.13-2. Parklands and Recreational Resources Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Name	Type of Facility	Approx Size (acres)	Location	Regulatory Agency	Proximity to Alignment (miles[2])
5	Japanese American Cultural and Community Center	Mission is to present, perpetuate, transmit and promote Japanese and Japanese American arts and culture to diverse audiences, and to provide a center to enhance community programs.	N/A	244 S. San Pedro Street, Suite 505	Private	0.13 ALRT 0.07 ULRT 0.07 LPA 0.07 LTSM 0.13 UTSM
6	Dorothy Chandler Pavilion	Concert House, Los Angeles Music Center	N/A	135 N. Grand Avenue	County of Los Angeles	0.14 ALRT 0.14 ULRT 0.14 LPA 0.14 LTSM 0.03 UTSM
7	Mark Taper Forum	Performance Center	N/A	135 N. Grand Avenue	County of Los Angeles	0.25 ALRT 0.25 ULRT 0.25 LPA 0.25 LTSM 0.04 UTSM
	Maguire Gardens (See Central Library in Table 4.13-3)[3]					
	Fletcher Bowron Square (See City Hall East in Table 4.13-3)[3]					

Source: CDM, 2009
Notes:
[1] Map numbers correspond to Figures 4.13-1 through 4.13-4.
[2] Distance to At-Grade Emphasis LRT (ALRT), Underground Emphasis LRT (ULRT), Locally Preferred Alternative (LPA), Transportation System Management (TSM) Lower Grand Shuttle Bus (LTSM) and TSM Upper Grand Shuttle Bus (UTSM) unless otherwise noted. Some distances may be greater than 0.25 mile since a facility would be included if it is within 0.25 of at least one of the proposed alignment and it may be farther away from other alignments.
[3] Some resources are analyzed as part of public facilities where applicable (i.e., Maguire Gardens is analyzed as part of the Central Library, and Fletcher Bowron Square is analyzed as part of City Hall East). The Los Angeles River is with 0.25 mile of the LPA, but does not function as a recreational resource. Further details about this finding are available in Chapter 5. Chapter 5 evaluates the eligibility of the river as a 4(f) resource because waterways can be eligible under some circumstances such as recreational use.
Distances are approximate following a straight line from location to the alternative line.

Table 4.13-3. Public Services and Religious Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative)

Map No[1]	Facility	Address	Proximity to Alignment (miles)[2]
Police Services[3]			
1	LAPD Parker Center	150 N. Los Angeles Street	<0.01 ALRT 0.14 ULRT 0.14 LPA 0.14 LTSM 0.12 UTSM
2	New LAPD Headquarters	100 W. 1st Street	0.01 ALRT <0.01 ULRT <0.01 LPA 0.01 LTSM 0.17 UTSM
3	LAPD Central Division	251 E. 6th Street	0.40 ALRT 0.40 ULRT 0.40 LPA 0.24 LTSM 0.70 UTSM
4	Los Angeles Federal Metropolitan Detention Center	535 N. Alameda Street	0.10 ALRT 0.20 ULRT 0.20 LPA 0.01 LTSM 0.01 UTSM
Fire Services			
1	Fire Station #3	108 N. Fremont Avenue	0.25 ALRT 0.25 ULRT 0.25 LPA 0.15 LTSM 0.25 UTSM
2	Fire Station #4	450 E. Temple Street	0.20 ALRT 0.20 ULRT 0.20 LPA 0.20 LTSM 0.20 UTSM

Table 4.13-3. Public Services and Religious Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Facility	Address	Proximity to Alignment (miles)[2]
Libraries			
1	Little Tokyo Branch Public Library	203 S. Los Angeles Street	0.02 ALRT 0.01 ULRT 0.01 LPA 0.32 LTSM 0.02 UTSM
2	Los Angeles County Law Library	301 W. 1st Street	0.13 ALRT 0.13 ULRT 0.13 LPA 0.13 LTSM 0.16 UTSM
3	Los Angeles Central Library (includes Maguire Gardens)	630 W. 5th Street	0.09 ALRT 0.09 ULRT 0.13 LPA 0.09 LTSM 0.03 UTSM
4	Non-profit Resource Library	1000 N. Alameda Street, Ste 250	0.25 ALRT 0.25 ULRT 0.25 LPA 0.25 LTSM 0.02 UTSM
5	United States Court Library	312 N. Spring Street, #G8	0.08 ALRT 0.29 ULRT 0.29 LPA 0.29 LTSM 0.02 UTSM
Government Offices			
1a	Los Angeles City Hall	200 N. Spring Street	0.03 ALRT 0.20 ULRT 0.20 LPA 0.20 LTSM 0.07 UTSM
1b	City Hall East/Annex (includes Fletcher Bowron Square)	200 N. Main Street	<0.01 ALRT 0.11 ULRT 0.11 LPA 0.12 LTSM 0.01 UTSM

Table 4.13-3. Public Services and Religious Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Facility	Address	Proximity to Alignment (miles)[2]
2	Los Angeles County Archives & Records Center	222 N. Hill Street	0.11 ALRT 0.25 ULRT 0.25 LPA 0.25 LTSM 0.03 UTSM
3	Los Angeles Superior Stanley Mosk Courthouse	110 N. Grand Avenue	0.15 ALRT 0.15 ULRT 0.15 LPA 0.15 LTSM 0.08 UTSM
4	Los Angeles Superior Stanley Mosk Courthouse	111 N. Hill Street	0.15 ALRT 0.15 ULRT 0.15 LPA 0.15 LTSM 0.14 UTSM
5	State of California Administrative Offices	300 S. Spring Street	0.13 ALRT 0.13 ULRT 0.13 LPA 0.01 LTSM 0.32 UTSM
6	State of California Department Offices	320 W. 4th Street	0.26 ALRT 0.26 ULRT 0.26 LPA 0.13 LTSM 0.22 UTSM
7	Former Site of State of California Department Offices (Planned Federal Courthouse Site)	107 S. Broadway	0.09 ALRT 0.09 ULRT 0.09 LPA 0.09 LTSM 0.21 UTSM
8	United States Federal Government Offices	251 S. Olive Street	0.09 ALRT 0.09 ULRT 0.09 LPA 0.04 LTSM 0.07 UTSM

Table 4.13-3. Public Services and Religious Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Facility	Address	Proximity to Alignment (miles)[2]
9	United States Federal Building (Roybal Center)	255 E. Temple Street	0.01 ALRT 0.23 ULRT 0.18 LPA 0.23 LTSM 0.03 UTSM
10	United States Federal Courthouse	312 N. Spring Street	0.06 ALRT 0.30 ULRT 0.30 LPA 0.30 LTSM 0.03 UTSM
11	Caltrans – District 7	100 S. Main Street	0.01 ALRT <0.01 ULRT <0.01 LPA 0.02 LTSM 0.25 UTSM
12	Los Angeles Superior Courthouse – Clara Shortridge Foltz Criminal Justice Center	210 W. Temple Street	0.10 ALRT 0.23 ULRT 0.23 LPA 0.23 LTSM 0.01 UTSM
13	Kenneth Hahn Hall of Administration	500 W. Temple Street	0.25 ALRT 0.23 ULRT 0.23 LPA 0.23 LTSM 0.01 UTSM
Medical Facilities			
1	Veterans Administration Los Angeles Ambulatory Care Center	351 E. Temple Street	0.02 ALRT 0.17 ULRT 0.15 LPA 0.05 LTSM 0.01 UTSM
Religious Facilities			
1	Third Church of Christ Scientist	730 S. Hope Street	0.10 ALRT 0.10 ULRT 0.10 LPA 0.10 LTSM 0.07 UTSM

Table 4.13-3. Public Services and Religious Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Facility	Address	Proximity to Alignment (miles)[2]
2	Higashi Hongwanji Buddhist Temple	505 E. 3rd Street	0.13 ALRT 0.13 ULRT 0.17 LPA[4] 0.12 LTSM 0.10 UTSM
3	Koyasan Buddhist Temple	342 E. 1st Street	0.18 ALRT 0.05 ULRT 0.04 LPA[4] 0.04 LTSM 0.18 UTSM
4	Union Church of Los Angeles	401 E. 3rd Street	0.19 ALRT 0.12 ULRT 0.12 LPA 0.01 LTSM 0.36 UTSM
5	Centenary United Methodist Church	300 S. Central Avenue	0.22 ALRT 0.22 ULRT 0.27 LPA[4] 0.09 LTSM 0.45 UTSM
6	St. Francis Xavier Chapel Japanese Catholic Center	222 S. Hewitt Street	0.19 ALRT 0.19 ULRT 0.15 LPA 0.13 LTSM 0.33 UTSM
7	Zenshuji Soto Mission	123 S. Hewitt Street	0.12 ALRT 0.13 ULRT 0.08 LPA 0.12 LTSM 0.23 UTSM
8	Nishi Hongwanji Buddhist Temple	815 E. 1st Street	0.28 ALRT 0.20 ULRT 0.01 LPA 0.22 LTSM 0.28 UTSM

Table 4.13-3. Public Services and Religious Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Facility	Address	Proximity to Alignment (miles)[2]
9	Jodo Shu North America Buddhist	442 E. 3rd Street	0.13 ALRT 0.13 ULRT 0.16 LPA[4] 0.01 LTSM 0.36 UTSM
10	Vision Full Gospel Church	420 S. Grand Avenue	0.15 ALRT 0.15 ULRT 0.15 LPA 0.15 LTSM 0.01 UTSM
11	Church Federation of Southern California	401 E. 3rd Street	0.01 ALRT 0.13 ULRT 0.13 LPA 0.13 LTSM 0.36 UTSM
12	Cathedral of Our Lady of the Angels	555 W. Temple Street	0.30 ALRT 0.30 ULRT 0.30 LPA 0.30 LTSM 0.01 UTSM

Source: CDM, 2009

Notes:

[1] Map numbers correspond to Figures 4.13-5 through 4.13-8.

[2] Distance to At-Grade Emphasis (ALRT), Underground Emphasis (ULRT), Locally Preferred Alternative (LPA), TSM Lower Grand Shuttle Bus (LTSM), and TSM Upper Grand Shuttle Bus (UTSM) unless otherwise noted. Some distances may be greater than 0.25 mile since a facility would be included if it is within 0.25 of at least one of the proposed alignment and it may be farther away from other alignments.

[3] The Central Community Police Station of the Central Bureau serves the project area, but is not located within 0.25 mile of the proposed project alternatives (including the LPA).

[4] Instead of the alignment continuing east underneath 2nd Street to Central Avenue under the Fully Underground LRT Alternative, the LPA would travel underneath 2nd Street at approximately the pedestrian signal to the JVP would veer northeast under privately held property and Central Avenue to 1st/Central Avenue station.

Distances are approximate following a straight line from location to the alternative line.

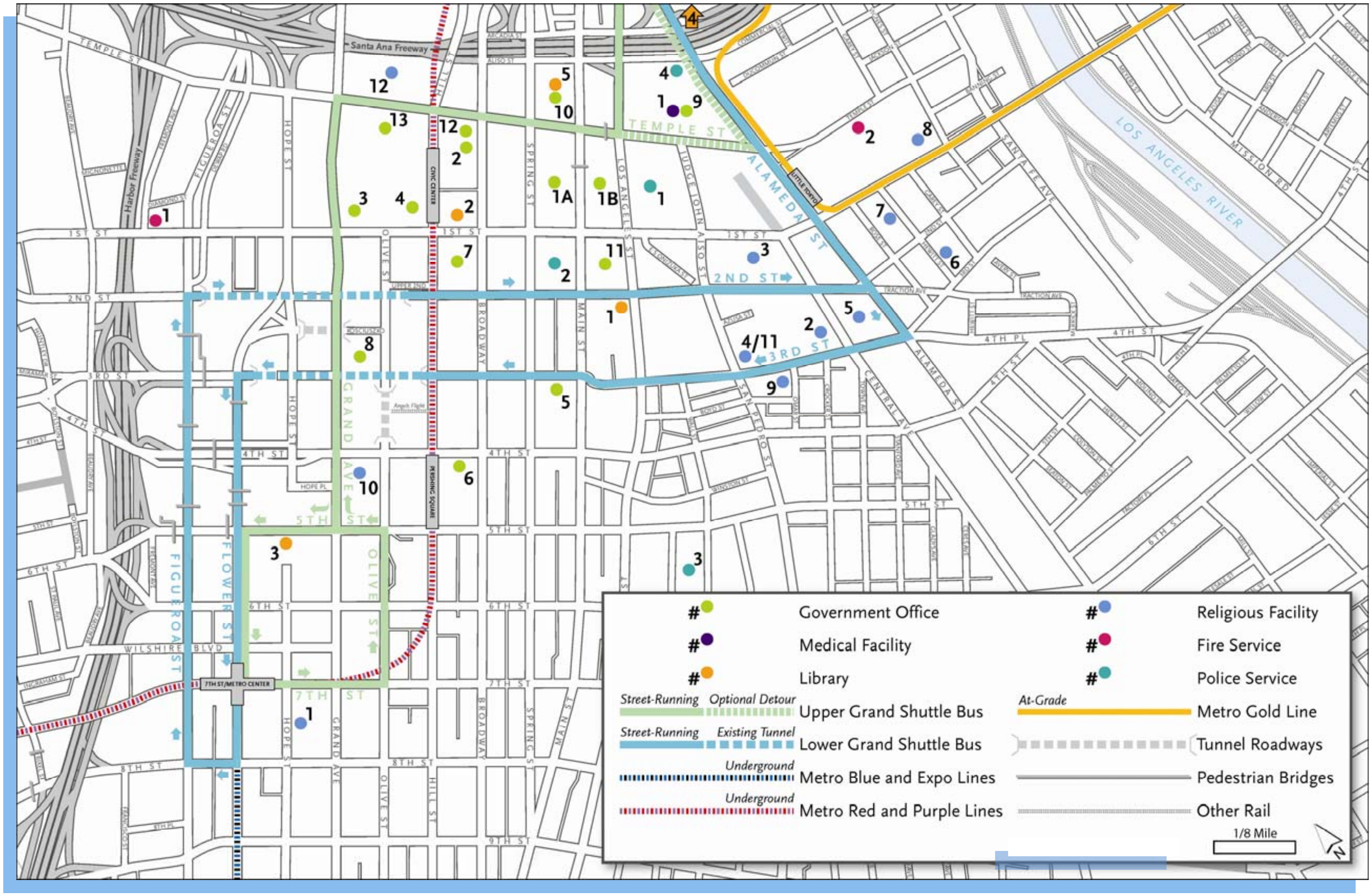


Figure 4.13-5. Public Services and Religious Facilities – TSM Alternative

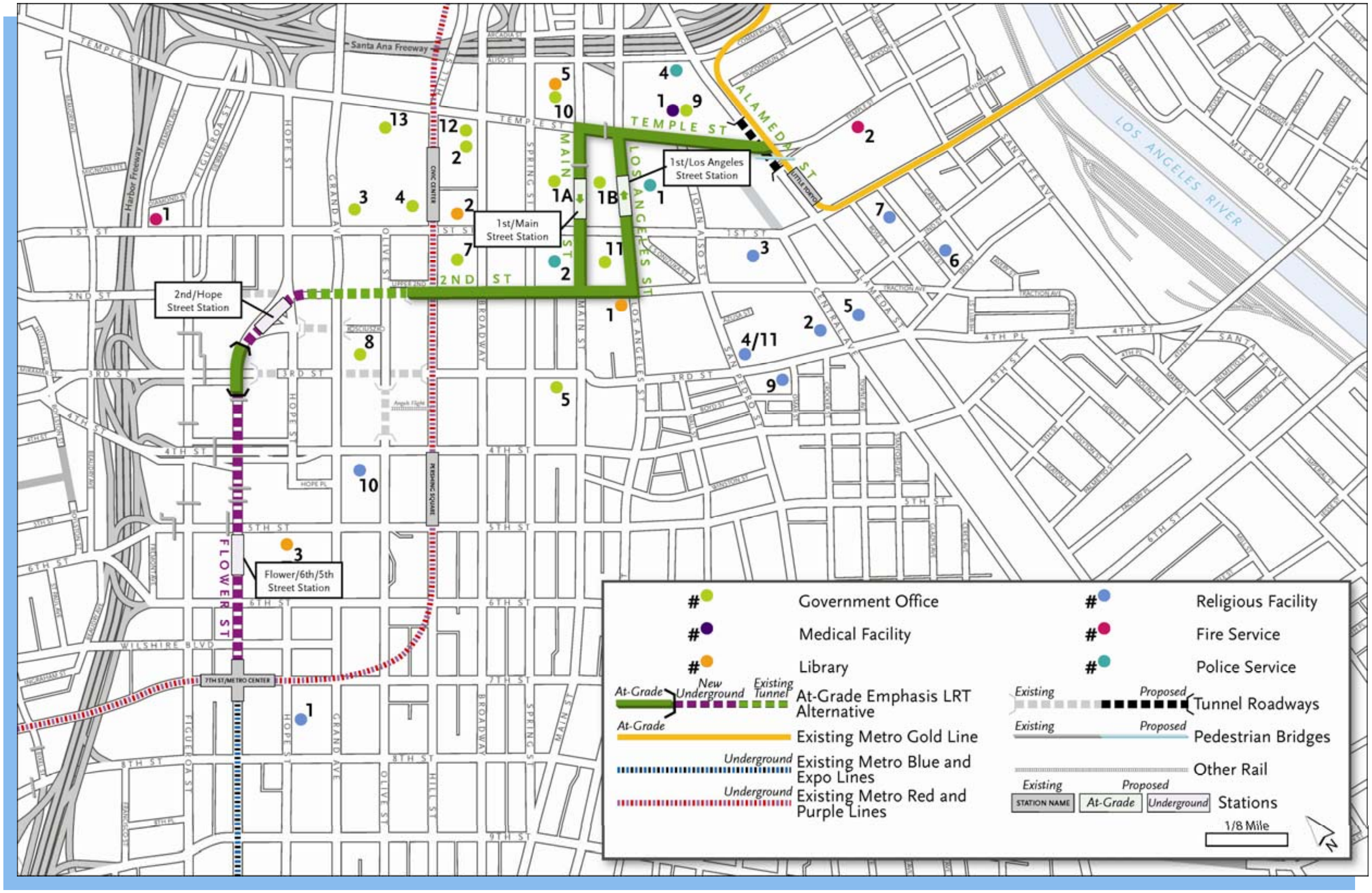


Figure 4.13-6. Public Services and Religious Facilities – At-Grade Emphasis LRT Alternative

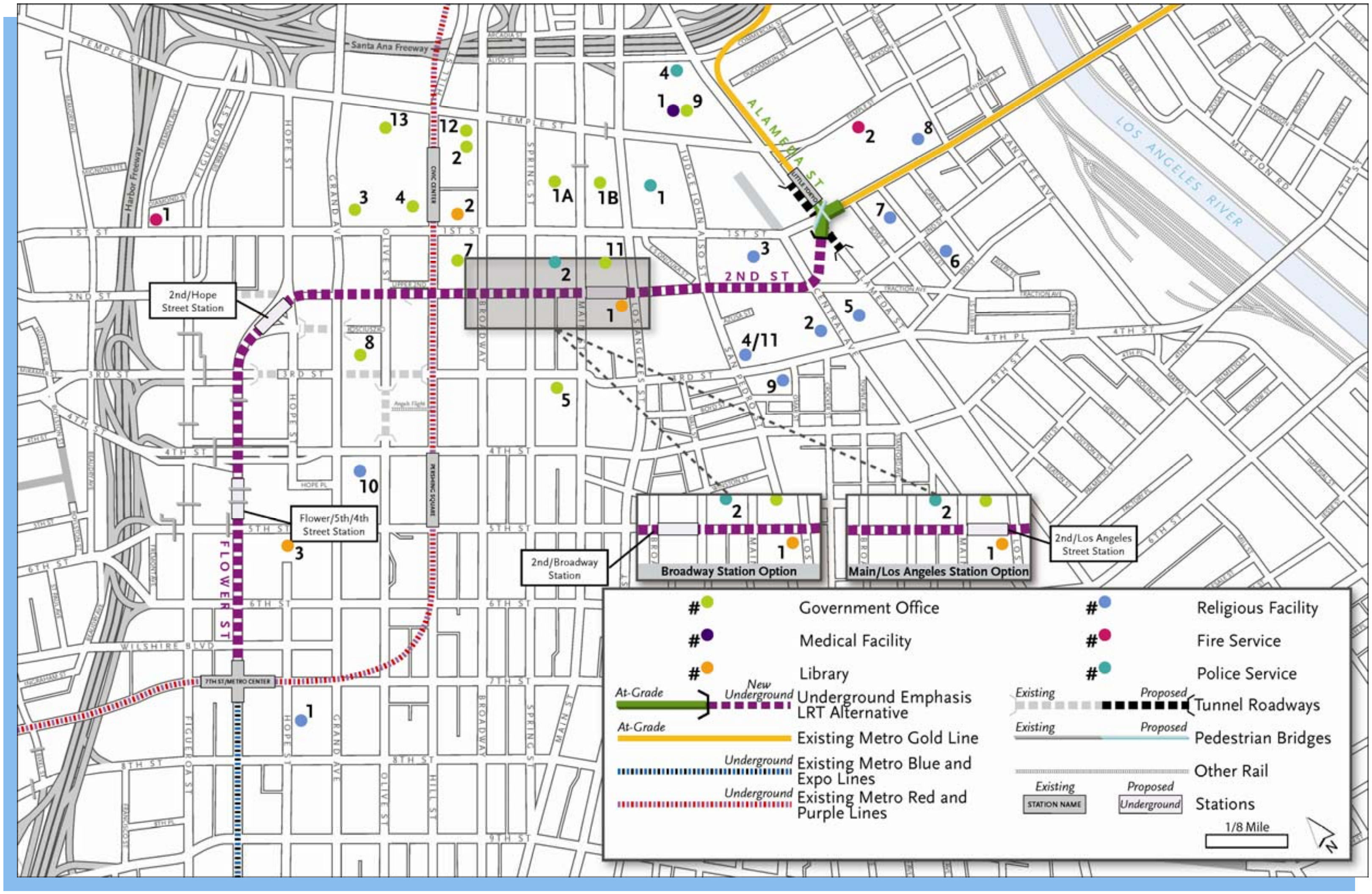


Figure 4.13-7. Public Services and Religious Facilities – Underground Emphasis LRT Alternative

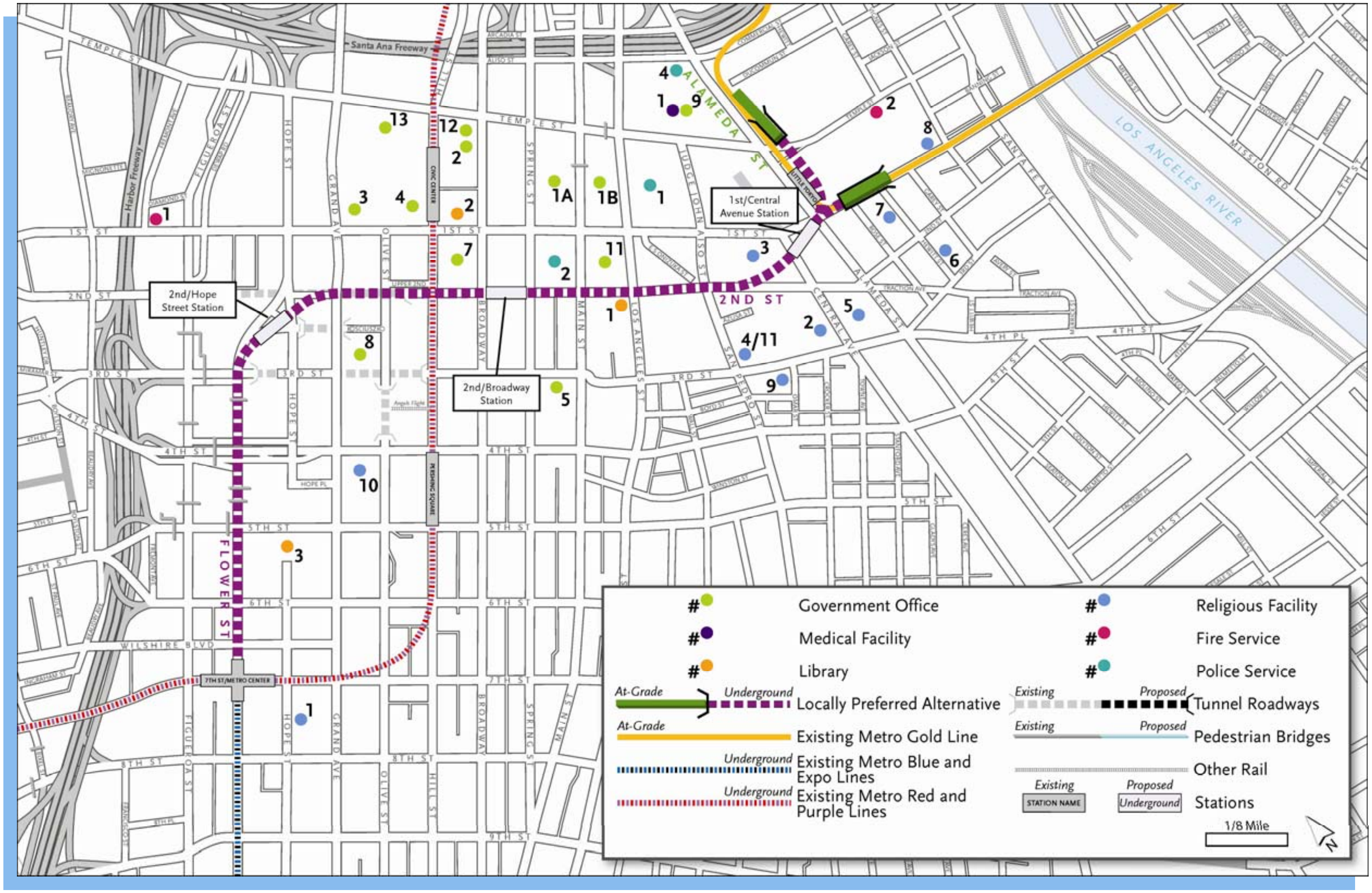


Figure 4.13-8. Public Services and Religious Facilities – Locally Preferred Alternative

Table 4.13-4. Educational Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative)

Map No[1]	Name	Location	Proximity to Alignment (miles)[2]
Day Care and Preschools			
1	Nishi Hongwanji Child Development Center	815 E. 1st Street	0.28 ALRT 0.20 ULRT 0.01 LPA 0.22 LTSM 0.28 UTSM
2	Lumbini Child Development Center	505 E. 3rd Street	0.33 ALRT 0.08 ULRT 0.14 LPA[3] 0.02 LTSM 0.32 UTSM
3	Cal Tot Child Care Center - a Serendipity School	300 S. Spring Street	0.13 ALRT 0.13 ULRT 0.13 LPA 0.01 LTSM 0.41 UTSM
4	H. Pregerson Child Care Center	255 E. Temple Street	0.01 ALRT 0.26 ULRT 0.20 LPA 0.26 LTSM 0.01 UTSM
5	Grace Lino Child Care Center	231 E. 3rd Street	0.12 ALRT 0.11 ULRT 0.11 LPA 0.03 LTSM 0.36 UTSM
6	Bright Horizons	550 S. Hope Street	0.15 ALRT 0.15 ULRT 0.15 LPA 0.10 LTSM 0.015 UTSM
7	Tiny DOTs – Early Education Center	100 S. Main Street, Suite 130	0.01 ALRT <0.01 ULRT <0.01 LPA 0.02 LTSM 0.25 UTSM

Table 4.13-4. Educational Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Name	Location	Proximity to Alignment (miles)[2]
8	Joy Picus Child Development Center	111 E. 1st Street	0.02 ALRT 0.13 ULRT 0.13 LPA 0.13 LTSM 0.13 UTSM
Public High Schools			
1	California Academy for Liberal Studies Early College High School	700 Wilshire Boulevard, 4th Floor	0.07 ALRT 0.07 ULRT 0.07 LPA 0.07 LTSM 0.04 UTSM
2	Oscar de la Hoya Animo Leadership Charter High School	350 S. Figueroa Street, Suite 100	0.07 ALRT 0.07 ULRT 0.07 LPA 0.01 LTSM 0.23 UTSM
3	High School for the Visual and Performing Arts (formerly known as Central Los Angeles Area New High School #9)	450 N. Grand Avenue	0.40 ALRT 0.40 ULRT 0.40 LPA 0.40 LTSM 0.15 UTSM
College or Trade Schools			
1	The Colburn School of Performing Arts	200 S. Grand Avenue	0.02 ALRT 0.02 ULRT 0.02 LPA 0.02 LTSM 0.01 UTSM
2	The Colburn School Conservatory of Music	200 S. Grand Avenue	0.02 ALRT 0.02 ULRT 0.02 LPA 0.02 LTSM 0.01 UTSM

Table 4.13-4. Educational Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Name	Location	Proximity to Alignment (miles)[2]
3	Chicago School of Professional Psychology	617 W. 7th Street, 8th Floor	0.12 ALRT 0.12 ULRT 0.12 LPA 0.12 LTSM 0.01 UTSM
4	Bukkyo University Los Angeles Extension	442 E. 3rd Street	0.27 ALRT 0.12 ULRT 0.15 LPA[3] 0.01 LTSM 0.35 UTSM
5	Golden Gate University	725 S. Figueroa Street, Suite 1550	0.08 ALRT 0.08 ULRT 0.08 LPA 0.01 LTSM 0.08 UTSM
6	Fashion Institute of Design & Merchandising (FIDM)	919 S. Grand Avenue	0.19 ALRT 0.19 ULRT 0.19 LPA 0.19 LTSM 0.27 UTSM
7	University of Southern California (Annenberg School for Communication; Institute for Justice and Journalism; Western Knight Center for Specialized Journalism)	300 S. Grand Avenue, Suite 3950	0.02 ALRT 0.02 ULRT 0.02 LPA 0.02 LTSM 0.04 UTSM
8	University of Southern California (Marshall School of Business; Institute for Communication Technology Management; Sports Business Institute)	444 S. Flower Street, Suite 1000	0.08 ALRT 0.08 ULRT 0.08 LPA 0.04 LTSM 0.01 UTSM

Table 4.13-4. Educational Facilities Within 0.25 Mile of the Project Alternatives (including the Locally Preferred Alternative) (continued)

Map No[1]	Name	Location	Proximity to Alignment (miles)[2]
9	Southern California Institute of Architecture	960 E. 3rd Street	0.35 ALRT 0.30 ULRT 0.20 LPA 0.30 LTSM 0.35 UTSM
10	University of California, Los Angeles (UCLA Extension at Figueroa Courtyard)	261 S. Figueroa Street	0.16 ALRT 0.16 ULRT 0.16 LPA 0.02 LTSM 0.23 UTSM

Source: CDM, 2009
Notes:
[1] Map numbers correspond to Figures 4.13-9 through 4.13-12.
[2] Distance to At-Grade Emphasis (ALRT), Underground Emphasis (ULRT), Locally Preferred Alternative (LPA), TSM Lower Grand Shuttle Bus (LTSM), and TSM Upper Grand Shuttle Bus (UTSM) unless otherwise noted. Some distances may be greater than 0.25 mile since a facility would be included if it is within 0.25 of at least one of the proposed alignment and it may be farther away from other alignments.
[3] Instead of the alignment continuing east underneath 2nd Street to Central Avenue under the Fully Underground LRT Alternative, the LPA would travel underneath 2nd Street at approximately the pedestrian signal to the JVP would veer northeast under privately held property and Central Avenue to 1st/Central Avenue station.
Distances are approximate following a straight line from location to the alternative line.

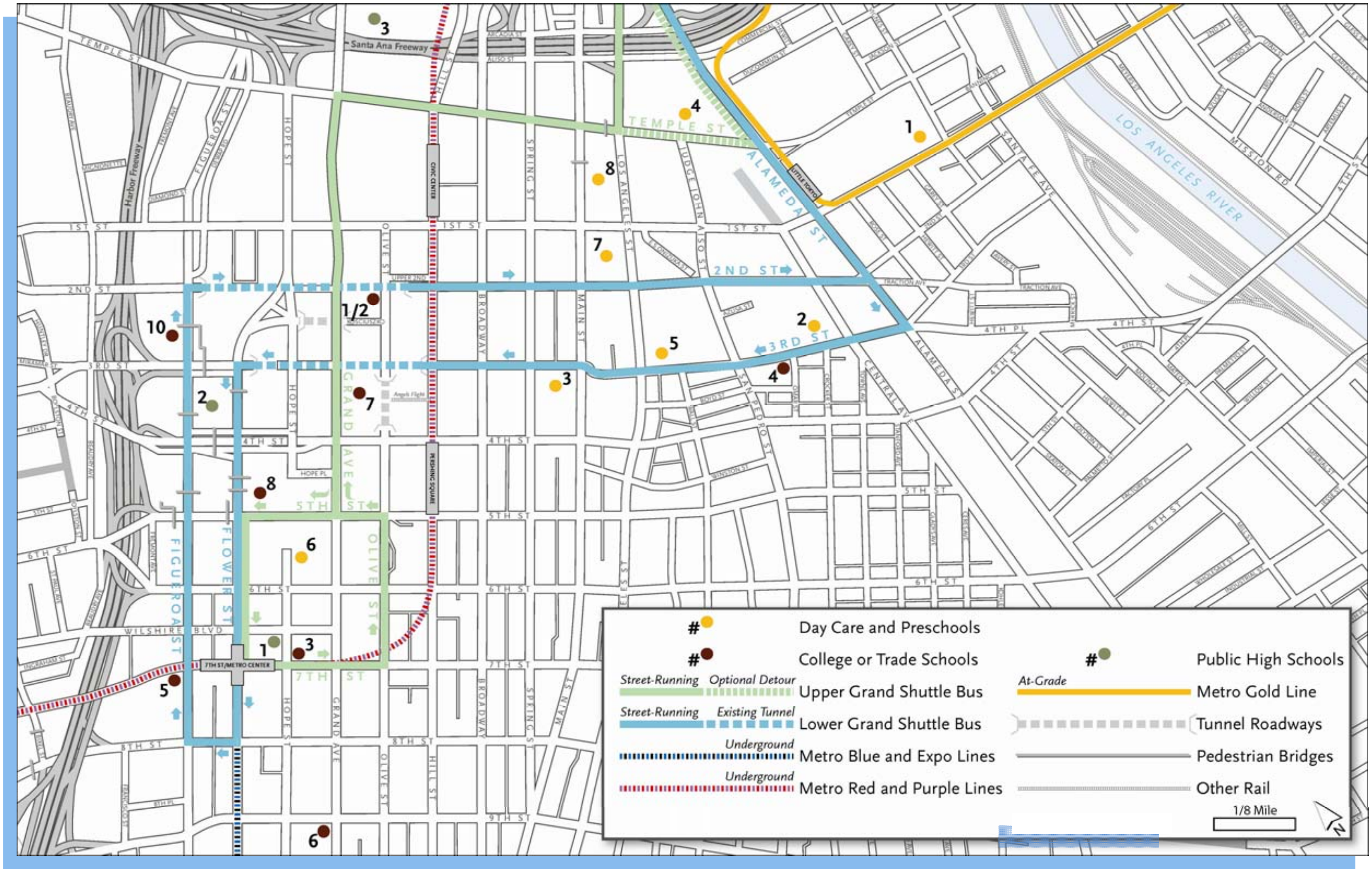


Figure 4.13-9. Educational Facilities – TSM Alternative

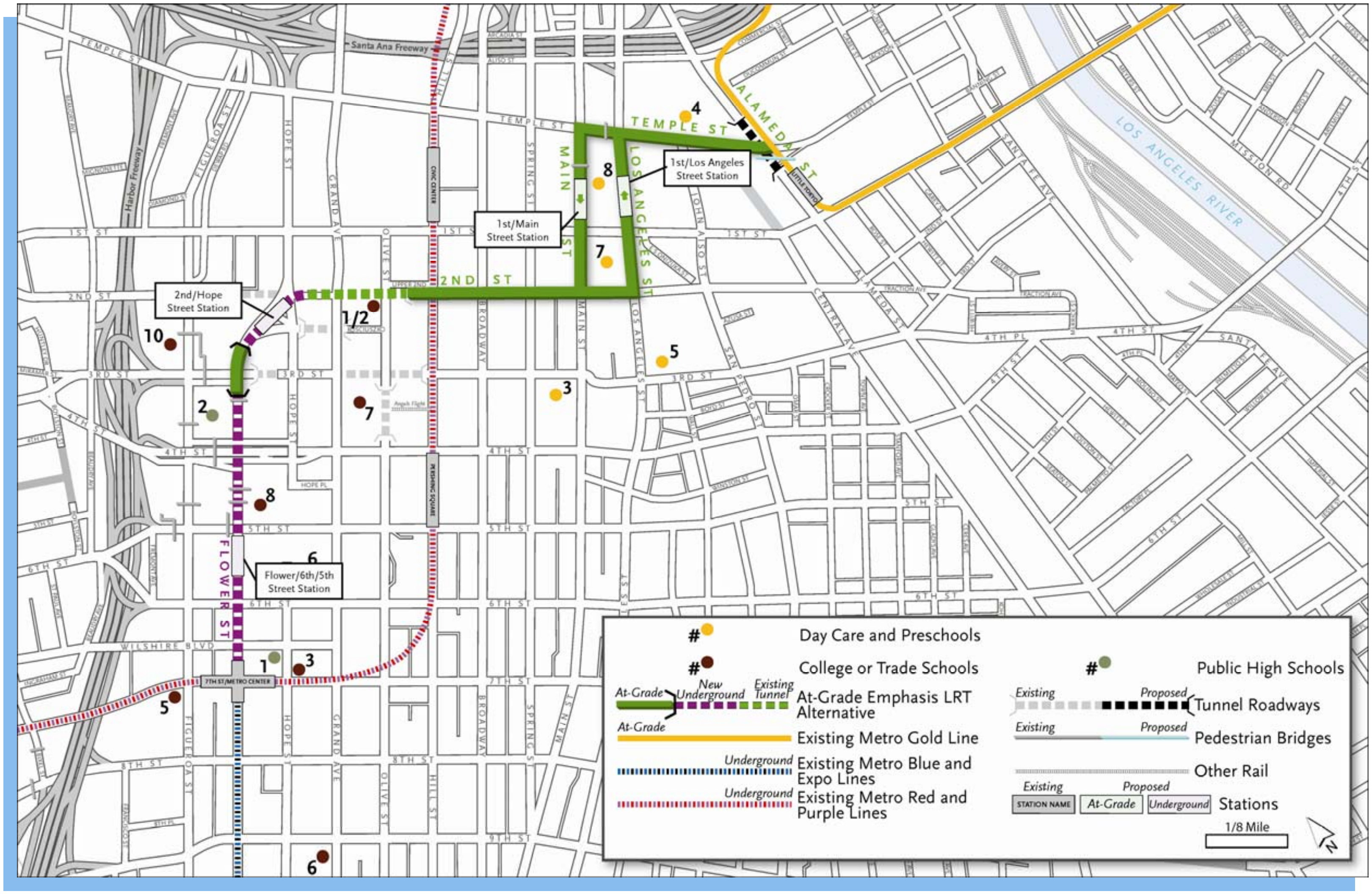


Figure 4.13-10. Educational Facilities – At-Grade Emphasis LRT Alternative

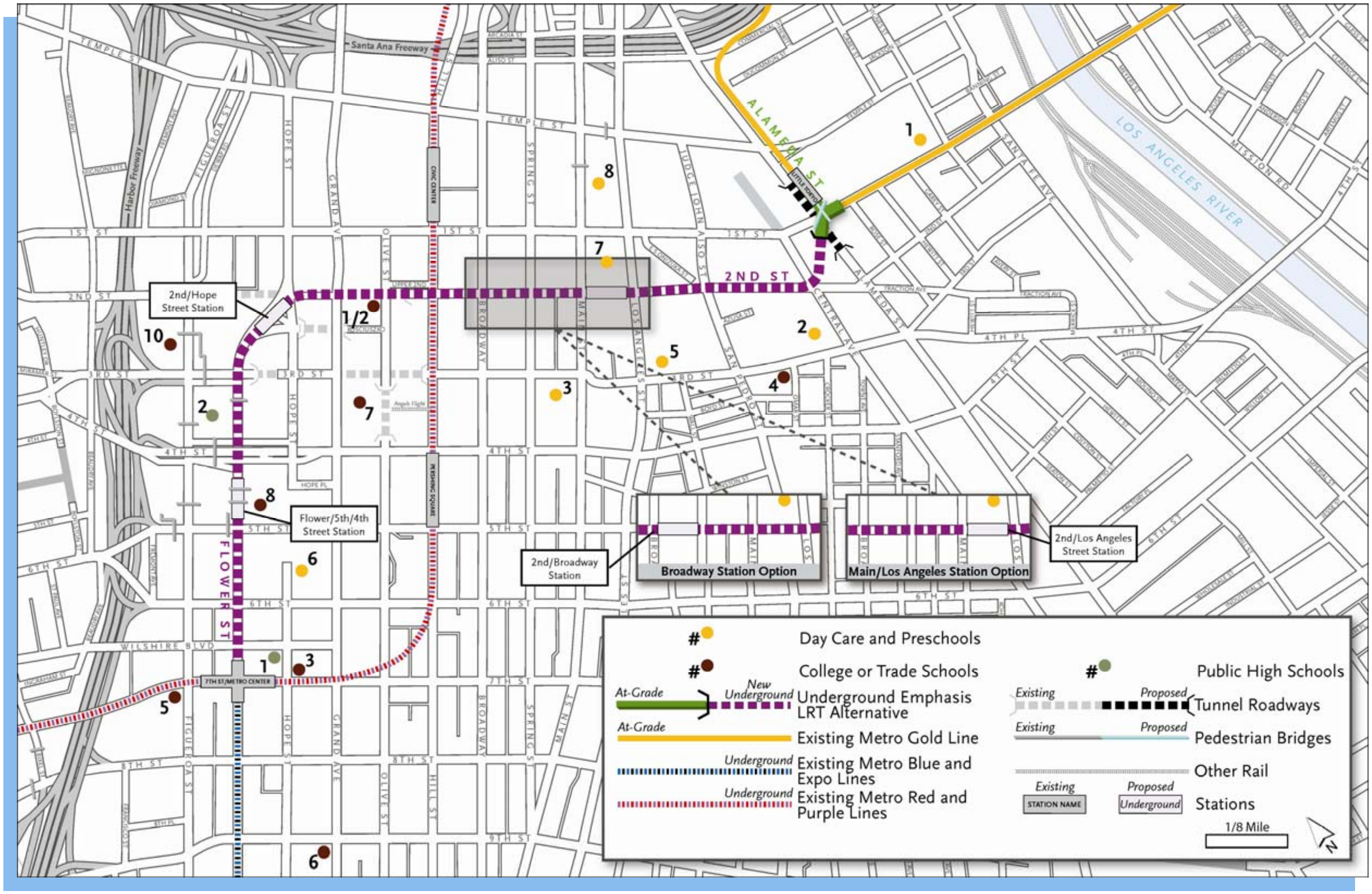


Figure 4.13-11. Educational Facilities – Underground Emphasis LRT Alternative

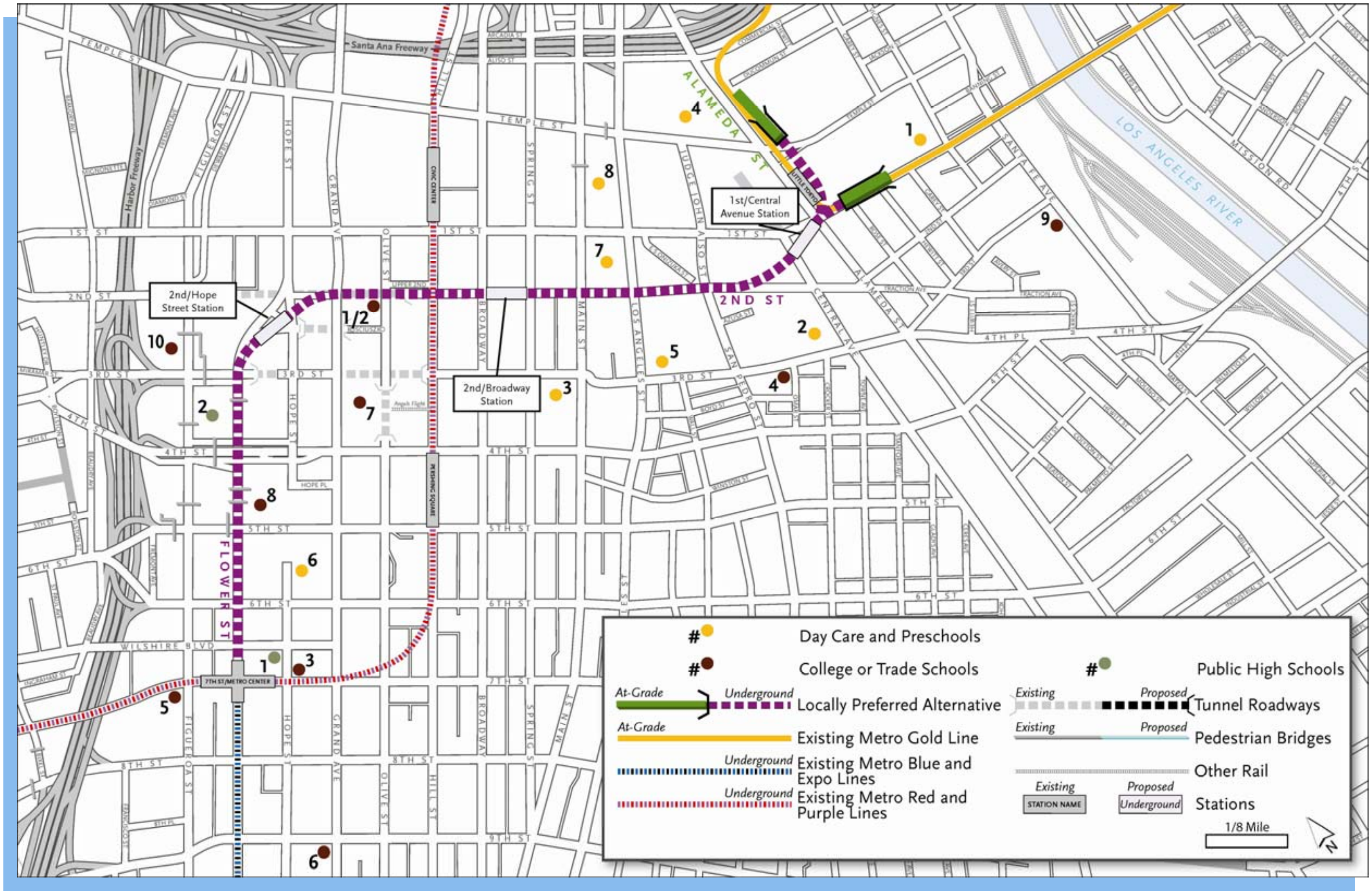


Figure 4.13-12. Educational Facilities – Locally Preferred Alternative

4.13.3 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential parkland and community facility impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.13.1. Table 4.13-5 summarizes the results of the analysis.

Table 4.13-5. Summary of Potential Impacts to Parklands and Other Community Facilities

Alternative	Parklands[1]	Deteriorate Condition[2]	New or Expanded Facilities[3]	Emergency Response Time[4]	Mitigation Measures
No Build	None	None	None	None	None
TSM	None	None	None	None	None
At-Grade Emphasis LRT	None	None	None	Potential significant impact near Temple and Alameda Streets avoided through coordination	None
Underground Emphasis LRT	None	None	None	Beneficial impact near Alameda and 1st Streets	None
LPA[5]	None	None	None	None	None

Notes:
[1] A direct impact could occur if a park or recreational facility were to be acquired, an easement obtained, or access blocked to the park.
[2] An impact would occur if use of a facility is increased to the extent that substantial physical deterioration of the facility would occur or be accelerated.
[3] An impact would occur if the use of a facility is increased to the extent that expansion or construction of new facilities is required.
[4] An impact could occur if there is an effect on emergency response times.
[5] Parklands and other community facilities potentially impacted by the LPA (which only includes three stations) would be less than or equal to the parklands and other community facilities impacted by the Fully Underground LRT Alternative (which included four stations).

4.13.3.1 No Build Alternative

The No Build Alternative would maintain existing transit service through the year 2035. New transit infrastructure would not be built aside from projects currently under construction or identified in Metro's *2009 LRTP*. Therefore, the No Build Alternative would not affect parklands and other community facilities.

The No Build Alternative would not result in significant adverse physical impacts. Potential impacts could occur if there was a need to provide new or physically altered parks or community facilities. The No Build Alternative also would not increase the use of existing neighborhood and regional parks or other recreational facilities to the extent that substantial physical deterioration would occur or be accelerated at the facility. The No Build Alternative would not require construction or expansion of parklands and recreational resources that might then have a physical impact on the environment. The No Build Alternative would not have the beneficial impact of increasing non-auto access to recreational and community facilities throughout the region, including to and from downtown.

4.13.3.1.1 NEPA Finding

The No Build Alternative would not result in adverse effects on parklands and community facilities.

4.13.3.1.2 CEQA Determination

The No Build Alternative would not result in significant impacts on parklands and community facilities.

4.13.3.2 TSM Alternative

The TSM Alternative would add two shuttle bus routes to provide a transit link between 7th Street/Metro Center and Union Stations. The TSM Alternative would be operated within existing public right-of-way (i.e., streets) and would not physically affect or increase the use of existing neighborhood and regional parks or other community facilities to the extent that substantial physical deterioration of the facility would occur or be accelerated.

The TSM Alternative would not result in physical environmental impacts that might otherwise occur if new or physically altered parks or community facilities were required. The alternative would not affect existing community facilities' ability to maintain acceptable service ratios, response times, or other performance objectives for police protection, fire protection, and other public services. The TSM Alternative would neither physically affect an adopted emergency response plan or evacuation plan, nor would it expose people or structures to a significant risk of loss, injury, or death.

4.13.3.2.1 NEPA Finding

The TSM Alternative would not have adverse effects on parklands or other community facilities.

4.13.3.2.2 CEQA Determination

The TSM Alternative would not have significant impacts on parklands or other community facilities.

4.13.3.3 At-Grade Emphasis LRT Alternative

Table 4.13-6 summarizes potential impacts related to the physical property (acquisitions), access, and parking associated with parklands and recreational resources located within 0.25 mile of the At-Grade Emphasis LRT Alternative. Parklands and other community facilities could experience potential impacts during construction of the At-Grade Emphasis LRT Alternative.

Pedestrian and vehicle access (including parking) could be affected at City Hall South Lawn Park, the Geffen Contemporary at MOCA, Japanese American National Museum (JANM), the future Broad Art Foundation Museum (currently under construction), and Walt Disney Concert Hall temporarily during construction. However, access to the facilities would be maintained throughout construction, though detours or alternate access routes may be needed, as noted in the transportation mitigation measures in Section 3.4. Impacts would be temporary and would not significantly affect the amenities or access to facilities.

The At-Grade Emphasis LRT Alternative would not result in direct impacts to parkland or other community facilities. The proposed At-Grade Emphasis LRT Alternative would potentially make surrounding parklands and other community facilities more accessible. However, the alternative would not increase use of existing parklands or other community facilities to the extent that substantial physical deterioration of the facility would occur or be accelerated, nor would it require the construction or expansion of parklands or other community facilities.

The At-Grade Emphasis LRT Alternative could potentially affect emergency vehicle routes in the vicinity of Temple and Alameda Streets, due to the proximity of the proposed junction and underpass to the fire station located near Temple and Garey Streets (Fire Station #4). However, Metro would coordinate with the Los Angeles Fire Department (LAFD) to minimize or avoid impacts to emergency vehicle response times. This alternative would not expose people or structures to any significant risk of loss, injury, or death.

4.13.3.3.1 NEPA Finding

The At-Grade Emphasis LRT Alternative would not have adverse effects to parklands or other community facilities. Metro would implement mitigation to further reduce impacts.

4.13.3.3.2 CEQA Determination

The At-Grade Emphasis LRT Alternative would not have significant impacts to parklands or other community facilities. Metro would implement mitigation to further reduce impacts.

Table 4.13-6. Parklands and Recreational Resources Within 0.25 Mile of the Proposed At-Grade Emphasis LRT Alternative

Map No[1]	Name	Location	Proximity to Alignment (miles)	Within ¼ Mile of Station	Land Acquisition	Loss of Street Parking	Affect Vehicle Access	Barrier to Pedestrian Access
Parklands								
1	Grand Hope Park	919 S. Grand Avenue	0.16	Yes	No	No	No	No
2	Pershing Square	532 S. Olive Street	0.24	Yes	No	No	No	No
3	City Hall South Lawn Park	200 N. Spring Street	0.04	Yes	No	Yes	No	Yes[2]

Table 4.13-6. Parklands and Recreational Resources Within 0.25 Mile of the Proposed At-Grade Emphasis LRT Alternative (continued)

Map No[1]	Name	Location	Proximity to Alignment (miles)	Within ¼ Mile of Station	Land Acquisition	Loss of Street Parking	Affect Vehicle Access	Barrier to Pedestrian Access
4	Civic Center Mall/Future Civic Park	Block bounded by S. Hill Street, S. Grand Ave, W. 1st Street, and W. Temple Street	0.14	Yes	No	No	No	No
5	Los Angeles Plaza Park	125 Paseo de la Plaza	0.25	No	No	No	No	No
Museums								
1	Museum of Contemporary Art (MOCA)	250 S. Grand Avenue	0.09	Yes	No	No	No	No
2	The Geffen Contemporary at MOCA	152 N. Central Avenue	0.09	Yes	No	Yes[2]	Yes[2]	Yes[2]
3	Los Angeles Children's Museum	310 N. Main Street	0.06	Yes	No	No	No	No
4	El Pueblo de Los Angeles State Historical Monument	500 Block of N. Main Street	0.24	Yes	No	No	No	No
5	Japanese American National Museum	369 E. 1st Street	0.13	Yes	No	Yes	Yes	Yes[2]
7	Future Broad Art Foundation Museum (currently under construction)	Block bounded by 2nd Street, Grand Avenue, Hope Street, and General Thaddeus Kosciuszko Way	<0.01	Yes	Subsurface Easement	No	Yes[2]	Yes[2]
Recreational Facilities								
1	The Walt Disney Concert Hall	111 S. Grand Avenue	0.06	Yes	No	Yes[2]	No	No

Table 4.13-6. Parklands and Recreational Resources Within 0.25 Mile of the Proposed At-Grade Emphasis LRT Alternative (continued)

Map No[1]	Name	Location	Proximity to Alignment (miles)	Within ¼ Mile of Station	Land Acquisition	Loss of Street Parking	Affect Vehicle Access	Barrier to Pedestrian Access
2	Union Center for the Arts	120 Judge John Aiso Street	0.10	Yes	No	No	No	No
4	Maryknoll Shotokan Karate Club	222 S. Hewitt Street	0.20	Yes	No	No	No	No
5	Japanese American Cultural and Community Center	244 S. San Pedro Street, Suite 505	0.13	Yes	No	No	No	No
6	Dorothy Chandler Pavilion	135 N. Grand Avenue	0.14	Yes	No	No	No	No
7	Mark Taper Forum	135 N. Grand Avenue	0.25	Yes	No	No	No	No

Source: CDM, 2009
Notes:
[1] Map numbers correspond to Figures 4.13-2.
[2] Temporary construction-related effects.

4.13.3.4 Underground Emphasis LRT Alternative

Table 4.13-7 summarizes impacts related to the physical property (acquisitions), access, and parking associated with parklands and recreational resources located within 0.25 mile of the Underground Emphasis LRT Alternative. The Underground Emphasis LRT Alternative would not have direct or indirect adverse impacts to parklands or community facilities.

Although most of construction and operation of the Underground Emphasis LRT Alternative would be underground, several public service and educational facilities could experience potential impacts during construction. These impacts, however, would be temporary and less than significant.

Pedestrian and vehicle access (including parking) could be affected at the Geffen Contemporary at MOCA, JANM, the future Broad Art Foundation Museum (currently under construction), and Walt Disney Concert Hall temporarily during construction. However, access to the facilities would be maintained throughout construction, though detours or alternate access routes may be needed, as noted in the transportation mitigation measures in Section 3.4. Impacts would be temporary and would not significantly affect the amenities or access to facilities.The Underground Emphasis LRT Alternative would not displace existing parklands. This Alternative would have the beneficial effect of potentially increasing accessibility to parklands and other community facilities adjacent to the alignment. However, the alternative would not increase use of existing parklands or other community facilities to the extent that substantial physical deterioration of the facility would occur or be accelerated, nor would it require the construction or expansion of parklands or other community facilities.

The Underground Emphasis LRT Alternative would not affect adopted emergency response plans or emergency evacuation plans or expose people or structures to a significant risk of loss, injury, or death.

This alternative may improve response times for emergency vehicles traveling on Alameda Street through the intersection with 1st Street because traffic would be grade-separated.

Table 4.13-7. Parklands and Recreational Resources Within 0.25 Mile of the Proposed Underground Emphasis LRT Alternative

Map No[1]	Name	Location	Proximity to Alignment (miles)	Within ¼ Mile of Station	Land Acquisition	Loss of Street Parking	Affect Vehicle Access	Barrier to Pedestrian Access
Parklands								
1	Grand Hope Park	919 S. Grand Avenue	0.16	Yes	No	No	No	No
2	Pershing Square	532 S. Olive Street	0.24	Yes	No	No	No	No
3	City Hall South Lawn Park	200 N. Spring Street	0.14	Yes	No	No	No	No
4	Civic Center Mall/Future Civic Park	Block bounded by S. Hill Street, S. Grand Ave, W. 1st Street, and W. Temple Street	0.14	Yes	No	No	No	No
5	Los Angeles Plaza Park	125 Paseo de la Plaza	0.25	No	No	No	No	No
Museums								
1	Museum of Contemporary Art (MOCA)	250 S. Grand Avenue	0.09	Yes	No	No	No	No
2	The Geffen Contemporary at MOCA	152 N. Central Avenue	0.09	Yes	No	Yes	Yes[2]	Yes[2]

Table 4.13-7. Parklands and Recreational Resources Within 0.25 Mile of the Proposed Underground Emphasis LRT Alternative (continued)

Map No[1]	Name	Location	Proximity to Alignment (miles)	Within ¼ Mile of Station	Land Acquisition	Loss of Street Parking	Affect Vehicle Access	Barrier to Pedestrian Access
5	Japanese American National Museum	369 E. 1st Street	0.02	Yes	No	Yes	Yes	Yes[2]
7	Future Broad Art Foundation Museum (currently under construction)	Block bounded by 2nd Street, Grand Avenue, Hope Street, and General Thaddeus Kosciuszko Way	<0.01	Yes	Subsurface Easement	No	Yes[2]	Yes[2]
Recreational Facilities								
1	The Walt Disney Concert Hall	111 S. Grand Avenue	0.06	Yes	No	Yes[2]	No	No
2	Union Center for the Arts	120 Judge John Aiso Street	0.14	Yes	No	No	No	No
4	Maryknoll Shotokan Karate Club	222 S. Hewitt Street	0.20	Yes	No	No	No	No
5	Japanese American Cultural and Community Center	244 S. San Pedro Street, Suite 505	0.07	Yes	No	No	No	No
6	Dorothy Chandler Pavilion	135 N. Grand Avenue	0.14	Yes	No	No	No	No
7	Mark Taper Forum	135 N. Grand Avenue	0.25	Yes	No	No	No	No

Source: CDM, 2009
Notes:
[1] Map numbers correspond to Figures 4.13-3.
[2] Temporary construction-related effects.

4.13.3.4.1 NEPA Finding

The Underground Emphasis LRT Alternative would not have adverse effects on parklands or other community facilities. Metro would implement mitigation to further reduce impacts.

4.13.3.4.2 CEQA Determination

The Underground Emphasis LRT Alternative would not have significant impacts on parklands or other community facilities. Metro would implement mitigation to further reduce impacts.

4.13.3.5 Locally Preferred Alternative

Table 4.13-8 summarizes impacts related to the physical property (acquisitions), access, and parking associated with parklands and recreational resources located within 0.25 mile of the LPA. The LPA would not result in direct or indirect impacts (i.e., acquisition or easement) to any parkland or recreational resource. Although most construction and operation of the LPA would be underground, several public service and educational facilities could experience potential impacts during construction. However, these impacts would be temporary and not significant. These impacts would not result in a considerable contribution to a cumulative impact.

Pedestrian and vehicle access (including parking) could be affected at the Geffen Contemporary at MOCA, JANM, the future Broad Art Foundation Museum (currently under construction), and Walt Disney Concert Hall temporarily during construction. However, access to the facilities would be maintained throughout construction, though detours or alternate access routes may be needed, as noted in the final mitigation measures for the LPA in Section 4.13.4.2 and Chapter 8. Impacts would be temporary and would not significantly affect the amenities or access to facilities. These impacts would not result in a considerable contribution to a cumulative impact.

The LPA would result in a beneficial impact by potentially making the parklands and community facilities adjacent to the alignment more accessible. However, the alternative would not increase the use of existing parklands and other community facilities to the extent that substantial physical deterioration of the facility would occur or be accelerated or require the construction or expansion of parklands and other community facilities.

The LPA would not affect adopted emergency response or emergency evacuation plans or expose people or structures to a significant risk of loss, injury, or death.

Effects on emergency vehicle response times are not anticipated.

4.13.3.5.1 NEPA Finding

The LPA would not have adverse effects on parklands or other community facilities. Metro will implement mitigation to further reduce impacts.

4.13.3.5.2 CEQA Determination

The LPA would not have significant construction, operation, or cumulative impacts on parklands or other community facilities. The LPA would not result in a considerable contribution to a cumulative impact. Metro would implement mitigation to further reduce impacts.

Table 4.13-8. Parklands and Recreational Resources Within 0.25 Mile of the Proposed Locally Preferred Alternative[3]

Map No[1]	Name	Location	Proximity to Alignment (miles)	Within ¼ Mile of Station	Land Acquisition	Loss of Street Parking	Affect Vehicle Access	Barrier to Pedestrian Access
Parklands								
1	Grand Hope Park	919 S. Grand Avenue	0.16	Yes	No	No	No	No
2	Pershing Square	532 S. Olive Street	0.24	Yes	No	No	No	No
3	City Hall South Lawn Park	200 N. Spring Street	0.14	Yes	No	No	No	No
4	Civic Center Mall/Future Civic Park	Block bounded by S. Hill Street, S. Grand Avenue, W. 1st Street, and W. Temple Street	0.14	Yes	No	No	No	No
5	Los Angeles Plaza Park	125 Paseo de la Plaza	0.25	No	No	No	No	No
Museums								
1	Museum of Contemporary Art (MOCA)	250 S. Grand Avenue	0.09	Yes	No	No	No	No
2	The Geffen Contemporary at MOCA	152 N. Central Avenue	0.09	Yes	No	Yes	Yes[2]	Yes[2]
4	El Pueblo de Los Angeles State Historical Monument	500 Block of N. Main Street	0.20	No	No	No	No	No
5	Japanese American National Museum	369 E. 1st Street	0.02	Yes	No	Yes	Yes[2]	Yes[2]
7	Future Broad Art Foundation Museum (currently under construction)	Block bounded by 2nd Street, Grand Avenue, Hope Street, and General Thaddeus Kosciuszko Way	<0.01	Yes	Subsurface Easement	No	Yes[2]	Yes[2]

Table 4.13-8. Parklands and Recreational Resources Within 0.25 Mile of the Proposed Locally Preferred Alternative[3] (continued)

Map No[1]	Name	Location	Proximity to Alignment (miles)	Within ¼ Mile of Station	Land Acquisition	Loss of Street Parking	Affect Vehicle Access	Barrier to Pedestrian Access
Recreational Facilities								
1	The Walt Disney Concert Hall	111 S. Grand Avenue	0.06	Yes	No	Yes[2]	No	No
2	Union Center for the Arts	120 Judge John Aiso Street	0.14	Yes	No	No	No	No
4	Maryknoll Shotokan Karate Club	222 S. Hewitt Street	0.10	Yes	No	No	No	No
5	Japanese American Cultural and Community Center	244 S. San Pedro Street, Suite 505	0.07	Yes	No	No	No	No
6	Dorothy Chandler Pavilion	135 N. Grand Avenue	0.14	Yes	No	No	No	No
7	Mark Taper Forum	135 N. Grand Avenue	0.25	Yes	No	No	No	No

Source: CDM, 2009
Notes:
[1] Map numbers correspond to Figures 4.13-4.
[2] Temporary construction-related effects.
[3] Parklands and other community facilities potentially impacted by the LPA (which only includes three stations) would be less than or equal to the number of parklands and other community facilities impacted by the Fully Underground LRT Alternative (which included four stations).

4.13.4 Mitigation Measures

4.13.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has added specificity to the candidate mitigation measures for parklands and other community facilities impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.13.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Addition of temporary roadway restriping during construction and provision of advance lane closure and relocation notices.
- Addition of temporary removal of street parking during construction to maximize vehicular capacity.
- Addition of detail to mitigation measures for consistency with other sections.

4.13.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

To mitigate the temporary restriction of access to public services that could occur during construction activities:

- Where feasible, temporary restriping of the roadway to maximize the vehicular capacity at locations affected by construction closures shall be performed. Metro shall provide notices of closures and relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. (PC-1)
- Where feasible and necessary, temporary removal of on-street parking to maximize the vehicular capacity at locations affected by construction closures shall be performed. Where temporarily eliminated, parking spaces will be restored to their prior striped or signed condition at the conclusion of the construction period. (PC-2)
- Construction activity that affects traffic flow on the arterial system, including the transportation of excavated materials, shall be primarily limited to off-peak hours. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-15)
- Accessible detours shall be provided whenever possible. Detours shall be compliant with the Americans with Disabilities Act (ADA). Signage shall be provided in those languages most commonly spoken in the immediate community. Signs shall mark detours in accordance with the Manual on Uniform Traffic Control Devices, and other applicable local and state requirements. Detours shall be designed to minimize cut-through traffic in adjacent residential areas. (CN-1)
- Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events. Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders. Crossing guards and other temporary traffic controls shall be provided in the vicinity of construction sites, haul routes, and other relevant sites as proposed in California

DOT Traffic Manual, Section 10-07.3, Warrants for Adult Crossing Guards, and as appropriate to maintain traffic flow during construction. (CN-3)

- A community outreach plan shall be developed and implemented to notify local communities and the general public of construction schedules and road and sidewalk detours. Metro shall coordinate with local communities during preparation of the traffic management plans to minimize potential construction impacts to community resources and special events. Construction activities shall be coordinated with special events. (CN-5)

- Metro shall develop a construction mitigation plan with community input to directly address specific construction impacts in the project area. Metro shall establish and receive input from the Regional Connector Community Leadership Council (RCCLC) in developing the construction mitigation plan. The RCCLC shall consist of representatives from all parts of the alignment area. Metro shall work with the RCCLC in developing the outreach plan. (CN-6)

- Safe pedestrian detours with handrails, fences, k-rail, canopies, and walkways shall be provided as needed. When a crosswalk is closed due to construction activities, pedestrians shall be directed to nearby alternate crosswalks. Access shall be ADA accessible at all times per existing Metro policy. (TR-4)

- Bicyclists shall be encouraged through signage to ride carefully in streets near construction activities, ride carefully on sidewalks (as City of Los Angeles municipal code permits), or choose nearby alternate routes around construction sites. Detours shall be provided as needed. Metro shall provide signage showing the alternate bicycle routes. Pedestrian and bicycle circulation and travel lanes temporarily impacted during construction shall be restored to their permanent configurations at the conclusion of the construction period and prior to operations. (TR-5)

- Metro shall maintain access to the Little Tokyo Library and other community facilities at all times during construction. (DR-6)

- The temporary displacement of three bus loading spaces on Alameda Street for the JANM shall be replaced nearby for the duration of construction activities. Metro shall work with JANM to confirm locations of temporary loading spaces. (EJ-1)

4.14 Economic and Fiscal Impacts

This section evaluates potential impacts to local and regional economies during construction and operation of each project alternative. The analysis for construction and property tax-related impacts focused on properties that would abut the proposed alignments. Information in this section is based on the Economic and Fiscal Impacts Technical Memorandum prepared for the project contained in Appendix BB, Economic and Fiscal Impacts Technical Memorandum, of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Since publication of the Draft EIS/EIR, refinements to the LPA have reduced the significance of potentially adverse economic and fiscal impacts during construction in Little Tokyo. The refinements reduce the amount of cut and cover, the need for roadway and sidewalk closures, property acquisitions, and overall disruption to businesses during construction. The refinements to the LPA have reduced the number of privately-owned parcels that would be completely or partially acquired from 17 to 11 parcels. As a result, the property tax loss for the LPA has also been reduced since publication of the Draft EIS/EIR. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.14.4.2 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA or other developments since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of potential economic and fiscal impacts associated with the LPA is detailed below in Section 4.14.3.5.

4.14.1 Regulatory Framework

NEPA does not include specific guidelines on measuring adverse economic impacts. Therefore, impacts were measured based on multipliers from the U.S. Department of Commerce (developed to estimate potential construction-related employment spending and economic impacts). The multipliers measure employment creation and total tax revenue generation.

The EIR process must adhere to CEQA guidelines which state that economic changes resulting from a project shall not be treated as significant effects on the environment. Economic effects of a physical change, however, may be used to determine that the physical change is a significant change to the environment (CEQA 15358b).

In the absence of specific thresholds of significance for economic impacts, CEQA guidelines encourage each public agency to develop its own set of thresholds. The following thresholds of significance for the purposes of CEQA were applied in the analysis of economic and fiscal impacts of the Regional Connector Transit Corridor project alternatives.

- The alternative would substantially reduce the amount or value of taxable property in the project area.
- Construction of the alternative would have substantial, adverse effects on businesses along the alignment.

4.14.2 Affected Environment

The project area, for purposes of evaluating economic and fiscal impacts, is generally the same as in Section 4.16, Growth-Inducing Impacts. The analysis for direct and indirect regional economic and fiscal impacts focused on downtown Los Angeles and areas served by the transit lines that would connect to the Regional Connector in Los Angeles County (Long Beach, Pasadena, Culver City, and East Los Angeles).

The project area lies within the geographic scope of the City of Los Angeles Council of Governments (CLACG), a subregion of the Southern California Association of Governments (SCAG), which includes Los Angeles, San Fernando, and portions of unincorporated areas of Los Angeles County. The analysis of potential property tax and construction-related impacts focuses on properties directly abutting the proposed alignments.

Table 4.14-1 shows employment growth for the project area, City of Los Angeles, and CLACG subregion. The table shows that the project area is expected to gain approximately 12,630 new jobs by 2035. This would be an increase in employment of approximately 0.28 percent per year between 2008 and 2035. The annual rate of growth for the project area would be similar to that in the City of Los Angeles, but lower than in the CLACG subregion.

Table 4.14-1. Local Area Employment Growth 2008-2035

Area	2008	2035	2008-2035 Employment Change	2008-2035 Annual Average % Change
CLACG	1,839,988	2,037,472	197,484	0.40
City of Los Angeles	1,879,666	1,994,134	114,468	0.23
Project Area	169,328	181,962	12,634	0.28

Source: Southern California Association of Governments 2008 Final Adopted Integrated Growth Forecast, May 2008

Windshield surveys were conducted to identify and categorize local businesses by use. Vehicular and pedestrian access was identified for each business along the proposed alignments. Properties adjacent to proposed alignments include high-density multi-family, commercial, industrial, and government-related uses. Approximately 112 businesses and commercial office buildings are in areas that could be impacted along the proposed alignments.

Under the At-Grade Emphasis LRT Alternative, 56 privately-owned properties would directly abut the alignment. Based on 2009 tax data, these businesses represent a total tax base of $21,867,759.

With the Underground Emphasis LRT Alternative, 82 privately-owned parcels would abut the alignment. Based on 2009 tax data, this represents a property tax base of $24,280,248.

With the LPA, 90 privately-owned properties would directly abut the alignment. Based on 2009 tax data, these properties represent a property tax base of $24,365,168.

4.14.3 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential economic and fiscal impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.14.1. Table 4.14-2 summarizes the results of the analysis.

Table 4.14-2. Summary of Potential Economic and Fiscal Impacts

Alternative	Tax Revenues[1] (CEQA)[2]	Effects on Businesses (CEQA)[2]	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
No Build	None (No beneficial effects either)	None (No beneficial effects either)	None	None
TSM	None	Potential impact would be mitigated if occurs	None	None
At-Grade Emphasis LRT	Reduction in property tax base due to acquisition less than significant	Significant construction impacts not significant after mitigation Beneficial operational effects	None	None
Underground Emphasis LRT	Reduction in property tax base due to acquisition less than significant	Significant construction impacts not significant after mitigation Beneficial operational effects	None	None
LPA	Reduction in property tax base due to acquisition less than significant	Significant construction impacts not significant after mitigation Beneficial operational effects	None	None

Notes:
[1] Includes property values and economic activity which affect tax revenues.
[2] In the absence of specific thresholds of significance for economic impacts, CEQA guidelines encourage each public agency to develop its own set of thresholds. The thresholds of significance for the purposes of CEQA were applied in the analysis of economic and fiscal impacts.

Construction activities under the build alternatives could affect the mix of business and government-related uses along the alignment. Acquisitions of privately-owned properties would affect city, county, and state property tax generation in this area. Each build alternative would require some acquisitions with a potential impact on property tax revenues.

Property tax losses would not occur from acquisitions of government-owned parcels. Thus, only partial and full takes of privately-owned parcels are analyzed. Using Los Angeles County Tax Assessor 2009 data, property tax loss was calculated based on the amount of square feet to be acquired (the impact area). In addition, property tax losses from the acquisition of privately-owned properties would likely be offset by increases in property values.

4.14.3.1 No Build Alternative

The No Build Alternative would not involve property acquisitions and therefore, would not have property tax revenue impacts. This alternative would not substantially alter the physical environment and would not have significant, adverse economic impacts within the project area. Given that an LRT system through downtown Los Angeles would not be constructed under the No Build Alternative, there would be no economic benefits from direct and indirect job creation, investment, or spending by suppliers whose goods and services are used in a project. Since the No Build Alternative would forego beneficial economic impacts, the regional economy could be adversely affected.

4.14.3.1.1 NEPA Finding

The No Build Alternative would not have adverse effects to economic or fiscal resources because it does not involve construction of a new LRT system in the project area. However, this alternative would forego the beneficial economic effects that would occur with development of the build alternatives.

4.14.3.1.2 CEQA Determination

No construction is involved with the No Build Alternative and therefore, this alternative would not have a significant impact to economic or fiscal resources.

4.14.3.2 TSM Alternative

The TSM Alternative would not involve property acquisitions or have property tax revenue impacts. The TSM Alternative could permanently displace up to 24 on-street parking spaces along its alignment to make way for new bus stops. The loss of on-street parking spaces could impact some businesses. It is difficult to estimate the exact impact because the bus station locations have yet to be determined. Nonetheless, the mitigation measure, which involves development of a parking mitigation program, identified in Section 4.2.4 of the Draft EIS/EIR for the build alternatives would apply to the TSM alternative to address impacts related to the potential loss of on-street parking associated with this alternative. However, like the No Build Alternative, the TSM Alternative is not anticipated to have adverse economic or fiscal impacts. The TSM Alternative would not result in beneficial economic impacts associated with construction-related spending and construction-related job creation to the extent associated with the build alternatives.

4.14.3.2.1 NEPA Finding

The TSM Alternative would not involve substantial physical changes to the environment and therefore, would not have any adverse economic or fiscal effects. However, the TSM Alternative would not result in beneficial economic effects to the extent associated with the build alternatives.

4.14.3.2.2 CEQA Determination

The TSM Alternative would not involve substantial physical changes to the environment and therefore, would not result in a significant economic or fiscal impact.

4.14.3.3 At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative would require partial takes of five privately-owned parcels for construction staging, new stations, a pedestrian overpass, and a traction power substation (TPSS) site. Total tax revenue loss due to land acquisitions with the At-Grade Emphasis LRT Alternative is estimated to be approximately $186,734. This loss would be approximately 0.85 percent of the total $21,867,759 property tax revenue from all privately-owned businesses that directly abut the proposed alignment. This loss in revenue could be offset by an increase in property values near station sites. Therefore, this alternative would not have an adverse impact to property tax revenues.

During construction, street closures would be implemented in phases. Construction effects that would disrupt business activities would be limited to areas of cut and cover construction. Typical impacts could include disruption of access for adjacent land uses, increased levels of noise, vibration and dust, utility disruptions, displacement of up to 80 on-street parking spaces, and a general disinterest in area businesses from potential customers due to construction. These impacts could have the secondary effect of reducing activity levels in the area and therefore, revenue for adjacent businesses.

Approximately 36 businesses along the At-Grade Emphasis LRT Alternative alignment could be significantly impacted by construction. Implementation of mitigation measures, such as compensation to property owners for acquisitions and assistance to business owners, would lessen construction impacts. Depending on the success of mitigation measures, some residual impacts could remain from construction.

During construction, the At-Grade Emphasis LRT Alternative is estimated to create approximately 13,800 direct and indirect employment opportunities and generate approximately $1.9 billion in direct and indirect revenues. Such employment projections are consistent with estimated levels of growth for the project area. This would represent a beneficial impact.

Once construction is complete and the LRT system is operational, transit usage would increase, enhancing accessibility and attractiveness of businesses surrounding station sites.

Related projects could be under construction during the same time as the proposed alternative. Therefore, construction of this alternative could result in a considerable contribution to cumulative impacts on activity levels and revenue of businesses along the alignment. Project operational impacts would be less than significant, so they would not contribute to cumulative, adverse, economic, or fiscal operational impacts.

4.14.3.3.1 NEPA Finding

Operation of the At-Grade Emphasis LRT Alternative would have beneficial economic and fiscal effects by improving transit accessibility and mobility and reducing travel time and costs in the region. This could increase economic activity and benefit businesses and employees traveling to and from work. This alternative would also result in an increase in employment and tax revenue, which would beneficially affect local and regional economies.

4.14.3.3.2 CEQA Determination

Construction of the At-Grade Emphasis LRT Alternative would have a significant economic and fiscal impact as it would affect activity levels and businesses along the alignment. The alternative would have less than significant impacts after implementation of proposed mitigation measures, although, if the mitigation is not effective there could be some residual impacts during construction.

Operation of the At-Grade Emphasis LRT Alternative would have beneficial economic and fiscal impacts by improving transit accessibility and mobility and reducing travel time and costs in the region. This could increase economic activity and benefit businesses and employees traveling to and from work. This alternative would also result in an increase in employment and tax revenue, which would beneficially impact local and regional economies.

4.14.3.4 Underground Emphasis LRT Alternative

The Underground Emphasis LRT Alternative would require the acquisition of more privately-owned parcels than the At-Grade Emphasis LRT Alternative. Acquisitions would be required for construction staging, new stations, portals, a bridge pier, and a pedestrian overpass. Both partial and full takes would be required. Twenty privately-owned parcels would be impacted under this alternative. Seven of these parcels are in the Little Tokyo area, on the block bounded by 1st, 2nd, and Alameda Streets, and Central Avenue.

Total tax revenue loss from property acquisitions under the Underground Emphasis LRT Alternative is estimated to be approximately $286,847. Losses to property tax revenues would be approximately 1.2 percent of the $24,280,248 total property tax base for properties that directly abut the proposed alignment. This would be a less than significant impact to revenues and offset by property value increases near stations.

The Underground Emphasis LRT Alternative would require acquisition of 20 privately-owned parcels for tunnel boring and station construction. Construction could significantly impact 38 businesses along the alignment due to street and sidewalk closures, the permanent displacement of up to 29 on-street parking spaces, dust, and noise.

Construction of the Underground Emphasis LRT Alternative could have significant construction impacts to businesses near station sites. Depending on tunneling and construction techniques used to construct the tunnel, phased street closures may be required. However, impacts would not be as significant as under the At-Grade Emphasis LRT Alternative. Economic impacts caused by the Underground Emphasis LRT Alternative would mostly be limited to businesses surrounding station sites and cut and cover construction areas. Cut and cover construction would generate temporary inconveniences such as increased noise, vibration, and dust, decreased views of signage, and limited access to businesses within close proximity of new station areas, and creating a general customer perception of disruption in the area.

Temporary and intermittent street closures for 1st and Alameda Streets throughout the 24- to 36-month construction process could significantly impact businesses in Little Tokyo. Implementation of mitigation measures (e.g., compensation to property owners for acquisitions and assistance to business owners) would lessen construction impacts. Depending on the success of mitigation measures, some residual impacts could remain during construction. However, once construction is complete and the LRT system is operational, transit usage would increase, enhancing accessibility and attractiveness of businesses surrounding stations sites.

During construction, this alternative would lead to a $2.8 billion increase in regional economic output and would create 20,700 direct and indirect employment opportunities. This increase in employment opportunities is within projected levels of growth for the project area and would be a beneficial impact. Additionally, new job growth and spending could increase income and sales tax revenues by $117 million.

Related projects would be under construction during the same time as the proposed alternative. Therefore, construction of this alternative could result in a considerable contribution to cumulative impacts on activity levels and revenue of businesses along the alignment. Project operational impacts would be less than significant, so they would not contribute to cumulative, adverse, economic, or fiscal operational impacts.

4.14.3.4.1 NEPA Finding

Operation of the Underground Emphasis LRT Alternative would have beneficial economic and fiscal effects by improving transit accessibility and mobility and reducing travel time and costs in the region. This could encourage greater economic activity and would benefit businesses and commuting employees. This alternative would also result in an increase in employment and tax revenue, which would benefit local and regional economies.

4.14.3.4.2 CEQA Determination

Construction of the Underground Emphasis LRT Alternative would have significant economic and fiscal impacts as it would affect activity levels and businesses along the alignment. Impacts associated with this alternative would be reduced to less than significant after implementation of proposed mitigation measures, although, if the mitigation is not effective there could be some residual impacts during construction.

Operation of the Underground Emphasis LRT Alternative would have beneficial economic and fiscal impacts by improving transit accessibility and mobility and reducing travel time and costs in the region. This could encourage greater economic activity and would benefit businesses and commuting employees. This alternative would also result in an increase in employment and tax revenue, which would benefit local and regional economies.

4.14.3.5 Locally Preferred Alternative

The LPA would have similar construction impacts to businesses as the Underground Emphasis LRT Alternative, except for businesses near the intersection of 1st and Alameda Streets. Neither a pedestrian overpass nor an automobile underpass would be built within the 1st and Alameda Streets intersection under this alternative. However, 1st Street would be relocated under the LPA, between Alameda and Garey Streets. Nonetheless, impacts to nearby businesses would be less than with the Underground Emphasis LRT Alternative.

Construction of the LPA could have significant construction impacts to businesses near station sites. Depending on tunneling and construction techniques used to construct the tunnel, phased street lane closures may be required. However, impacts would not be as significant as under the At-Grade Emphasis LRT Alternative. Economic impacts caused by the LPA would mostly be limited to businesses surrounding station sites and cut and cover and open cut construction areas. Cut and cover and open cut construction would generate temporary inconveniences such as increased noise, vibration, and dust, decreased views of signage, and limited access to businesses within close proximity of new station areas, and creating a general customer perception of disruption in the area.

During review of the Draft EIS/EIR the community expressed concerns regarding construction impacts to businesses. Based on comments received on the Draft EIS/EIR and input received from community meetings held during preparation of this Final EIS/EIR, refinements were made to the LPA. Overall, impacts to businesses during construction of the LPA would be less than the Underground Emphasis LRT Alternative due to the following: a station near 5th and Flower Streets is not proposed under the LPA and therefore construction associated with a station at this location would not occur; cut and cover on 2nd Street in Little Tokyo would not be required, which would result in less cut and cover overall during construction; and the majority of construction activities in Little Tokyo would be concentrated on the Mangrove property located northeast of the intersection of 1st and Alameda Streets, which is farther from the business areas of the community than the other potential construction sites studied. Refinements made to the LPA to reduce construction impacts are described in further detail in Chapter 2, Alternatives Considered.

Metro is committed to working with the community and businesses to ensure that the mitigation measures in the MMRP are effective. Implementation of mitigation measures identified in Section 4.14.4.2 below and Chapter 8, the MMRP for the LPA, of this Final EIS/EIR (e.g., compensation to property owners for acquisitions and assistance to business owners) would reduce construction impacts to less than significant. In addition, once construction is complete and the LRT system is operational, transit usage would increase, enhancing accessibility and attractiveness of businesses surrounding station sites.

The LPA would require removal of fewer on-street parking spaces than the At-Grade Emphasis LRT Alternative and the Underground Emphasis LRT Alternative. Approximately 13 on-street parking spaces would be displaced under this alternative. This would result in a less than significant impact to businesses.

Additionally, this alternative would necessitate complete or partial acquisition of 11 privately-owned parcels. Fewer parcels on the block bounded by 1st, 2nd, and Alameda Streets and Central Avenue would need to be fully acquired compared to the Underground Emphasis LRT Alternative. Only the parcels on the northern portion of the block, which includes the Señor Fish, Weiland Brewery, the former Café Cuba (The Spice Table) building, and associated parking, would need to be acquired for construction of the 1st/Central Avenue station. This acquisition is needed to stage construction and build a new underground station, station entrances, and ancillary facilities. The remaining businesses on that block would remain, including the Office Depot and associated parking. The property tax loss for the LPA would be less than the Underground Emphasis LRT Alternative. Property tax losses for the LPA would be approximately $179,692. Property tax revenue losses would equal approximately 0.74 percent of the $24,365,168 property tax base of properties that directly abut the proposed alignment. This loss would result in a less than significant impact and would be offset by increasing property values near stations.

Higher capital costs associated with this alternative could induce a total economic output of over $2.2 billion and create 16,469 direct and indirect jobs during construction with an increase in state and local tax revenues of over $93 million. The estimated increase in employment opportunities is within projected levels of growth for the project area and would result in a beneficial impact.

Related projects could be under construction during the same time as the proposed alternative and could result in cumulative economic or fiscal construction impacts. With implementation of mitigation, construction of the LPA would not result in a considerable contribution to cumulative economic or fiscal construction impacts. Project operational impacts would be less than significant, and would not contribute to cumulative, adverse, economic, or fiscal operational impacts.

4.14.3.5.1 NEPA Finding

Operation of the LPA would have beneficial economic and fiscal effects by improving accessibility and mobility and reducing travel time and costs in the region. This could encourage greater economic activity and would benefit businesses and commuters. This alternative would also increase employment and tax revenue; representing a beneficial effect to local and regional economies.

4.14.3.5.2 CEQA Determination

Construction of the LPA would have significant economic and fiscal impacts as it would affect activity levels and businesses along the alignment. The alternative would not have significant impacts after implementation of mitigation measures. With implementation of mitigation, construction of the LPA would not result in a considerable contribution to cumulative economic or fiscal construction impacts.

Operation of the LPA would have beneficial economic and fiscal impacts by improving accessibility and mobility and reducing travel time and costs in the region. This could encourage greater economic activity and would benefit businesses and commuters. This alternative would also increase employment and tax revenue; representing a beneficial impact to local and regional economies.

4.14.4 Mitigation Measures

4.14.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has added specificity to the candidate mitigation measures for economic and fiscal impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.14.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Additional detail provided to mitigation measures which involve measures to assist businesses affected by construction, such as develop a parking mitigation program and a Construction Mitigation Program.
- Additional detail provided to mitigation measures for consistency with other sections.

4.14.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

- Metro shall develop measures to assist business owners significantly impacted by construction. These shall include temporary parking, marketing programs, and other measures developed jointly between Metro and affected businesses. (EF-1)
- Metro shall work with the City to develop a parking mitigation program to mitigate the loss of public parking spaces during construction to the extent feasible. This could include, but is not limited to, restriping the existing street to allow for diagonal parking, reducing the number of inhibited parking areas, phasing construction activities in a way that minimizes parking disruption, and increasing the time limits for on-street parking. Restriping could occur where feasible on portions of Temple Street, Alameda Street, 1st Street, 2nd Street, Central Avenue, San Pedro Street, Judge John Aiso Street, 3rd Street, and Traction Avenue. Such parking mitigation shall be implemented on a temporary, tiered basis pending findings of the annual parking analysis described in Section 4.17, Environmental Justice. (DR-4)

- Metro shall not hinder access to other public parking lots during construction. (DR-5)
- Metro shall maintain access to the Little Tokyo Library and other community facilities at all times during construction. (DR-6)
- Metro shall develop a Construction Mitigation Program that includes protocol for community notification of construction activities, including traffic control measures, schedule of activities, and duration of operations, with written communications to the community translated into appropriate languages. (DR-7)
- Metro shall provide relocation assistance and compensation as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. (DR-8)

4.15 Safety and Security

This section summarizes Metro's existing safety and security measures, the existing police and fire protection services covering Metro facilities, and other safety and security issues in the project area. Potential impacts of the proposed alternatives on safety and security are evaluated in this section. Information in this section is based on the Safety and Security Technical Memorandum prepared for the project contained in Appendix CC of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, as indicated in the Responses to Comments, Volumes F-2 and F-3, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Minor modifications have been made to this section since publication of the Draft EIS/EIR, which include the addition of information from Appendix CC, Safety and Security Technical Memorandum. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.15.4.2 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of safety and security impacts associated with the LPA is detailed below in Section 4.15.3.5.

4.15.1 Regulatory Framework

NEPA does not include specific guidance or direction for evaluating alternatives and relative effects of alternatives on public safety and security.

Appendix G of the California State CEQA Guidelines draws particular attention to those projects that would create a potential public health hazard or interfere with emergency response plans or emergency evacuation plans. A significant safety and security impact would occur under CEQA if an alternative would:

- Create the potential for increased pedestrian and/or bicycle safety risks
- Create substantial adverse safety conditions, including station, boarding, and disembarking accidents, right-of-way accidents, collisions, fires, and major structural failures

- Substantially limit the delivery of community safety services, such as police, fire, or emergency services, to locations along the proposed alignment
- Create the potential for adverse security conditions, including incidents, offenses, and crimes

Other safety and security regulations that would be applicable to the proposed project include:

- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)
- Federal Transit Administration's (FTA's) State Safety Oversight Rule
- Uniform Fire Code
- California Public Utilities Commission (CPUC) Safety Rules and Regulations Governing Light-Rail Transit in California
- California Health and Safety Code
- Metro Emergency Response Plan
- Fire/Life Safety Design Criteria

More information regarding these regulations and criteria is available in Appendix CC, Safety and Security Technical Memorandum.

The evaluation of potential safety and security impacts focuses on criteria related to accident prevention (pedestrians, bicyclists, and employees), construction safety, fire protection and safety, security preventing criminal activity, security preventing terrorist attacks, and emergency response.

4.15.2 Affected Environment

Existing conditions along the Regional Connector Transit Corridor project's alternative alignments were assessed to establish a baseline for comparing alternatives. The assessment of existing safety and security conditions in the project area is described below.

4.15.2.1 Safety

Metro is the regional agency that serves as transportation planner and coordinator, designer, builder, and regional operator of transit services in Los Angeles County. Metro is regulated by the CPUC. Metro operates all transit-related vehicles according to the guidelines established by the CPUC. In operating light rail transit (LRT), subways, and bus transit (including dedicated bus transit ways) throughout Los Angeles County, Metro has established departments to address specific issues. One department is the Transit Education Programs Department, which creates programs to educate the public on proper safety practices with respect to LRT.

4.15.2.1.1 Pedestrian Safety

Downtown Los Angeles contains a great diversity of streets, places, buildings, and environments. A high level of pedestrian traffic occurs in the project area. Pedestrian density is most concentrated in the vicinity of commercial and governmental facilities in the Civic Center and Financial District. Most intersections in the project area allow pedestrian crossings along all four sides, though some crossings are prohibited, particularly at three-way intersections or intersections between two-way and one-way streets. Colored asphalt is used in many project area crosswalks for enhanced visibility. Since the streets are on a grid with few curves, sight distance is good overall, and there are only a handful of atypical intersections (five-way, frontage road, etc.). Streets are well-lit throughout the project area. More information about the existing at-grade intersection conditions applicable to pedestrian safety within the project area are provided in Appendix CC, Safety and Security Technical Memorandum.

4.15.2.2 Security

The affected environment is the security on the rail system, both at the stations and in the light rail vehicles. Passengers, transit employees, vendors, contractors, and the general public who come in contact with the system as well as the transit property and equipment would be susceptible to the same crimes as experienced in the surrounding neighborhoods of all four alternative alignments, such as assault or robbery.

Security issues may be related to police and fire response, emergency evacuation, and addressing criminal and terrorist activity. An at-grade system is vulnerable to both public demonstrations and vehicle-borne or other improvised explosive devices. The underground portions of the alignment are less vulnerable to these types of security concerns; however, in recent years terrorist acts have occurred at underground rail systems in some of the major capitols of the world. In addition, underground systems have a greater potential for safety issues related to evacuation needs. A complete Threat and Vulnerability Assessment in compliance with FTA regulations will be conducted for the LPA, or other project alternative, after it is adopted by the Metro Board of Directors.

Features included for passenger security are closed-circuit television cameras (CCTV), emergency call boxes, fully lighted station stops and transit parking areas. These features are within all trains and buses, as well as rail stations, and are designed to offer security and a personal sense of well being for passengers.

The Los Angeles Police Department (LAPD) has primary policing responsibility for this area. The Los Angeles County Sheriff's Department's (LACSD) Transit Services Bureau, the second largest transit services bureau in the country, already provides exclusive contract police services to Metro, which operates the public transit system serving Los Angeles County. Sheriff Deputies provide police services for both the light rail and bus transportation systems throughout 1,433 square miles.

The contract with LACSD would be extended to cover the Regional Connector Transit Corridor. LACSD security personnel and deputies patrol the transit system routes and stations. LACSD security personnel work primarily on fare evasion and passenger complaints. Both the LAPD and LACSD are active members of the Regional Transit Security Working Group. Additionally, Metro personnel receive Community Emergency Response Training in collaboration with the Los Angeles Fire Department (LAFD). This training includes earthquake awareness, disaster medical procedures, and rescue operations.

Metro and LACSD regularly coordinate with the Department of Homeland Security (DHS) at several levels. They both work through the Regional Transit Security Working Group, are members of the local Joint Terrorist Task Force, and both coordinate with the area Federal Security Director for the Transportation Security Administration (TSA). Metro is currently in compliance with all TSA directives as well as with 49 CFR 1580, which requires designating a rail security coordinator and reporting significant security concerns to TSA. For more information regarding existing security conditions and statistics on Metro operations within the project area, please refer to Appendix CC, Safety and Security Technical Memorandum.

4.15.3 Environmental Impacts/Environmental Consequences

The following sections summarize the evaluation of potential safety and security impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.15.1. Table 4.15-1 summarizes the results of the analysis.

Table 4.15-1. Summary of Potential Impacts to Safety and Security Conditions

Alternative	Potential Effects (NEPA/CEQA)	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
No Build	None	None	None
TSM	None	None	None
At-Grade Emphasis LRT	No adverse effect/less than significant impact after mitigation	None	None
Underground Emphasis LRT	No adverse effect/less than significant impact after mitigation (potential effect/impact less than At-Grade Emphasis LRT Alternative)	None	None
LPA	No adverse effect/less than significant impact after mitigation (potential effect/impact less than At-Grade Emphasis LRT and Underground Emphasis LRT Alternatives)	None	None

4.15.3.1 No Build Alternative

The No Build Alternative would maintain the current level of transit service in the project corridor and therefore, would not have a direct or indirect impact on public safety or accidents during construction or operation of the alternative. Given that the alternative would not have a direct or indirect impact on public safety or accidents, the No Build Alternative would not result in a cumulative impact.

4.15.3.1.1 NEPA Finding

The No Build Alternative would have no effect on safety or security within the project area.

4.15.3.1.2 CEQA Determination

The No Build Alternative would have no impact on safety or security within the project area.

4.15.3.2 TSM Alternative

The TSM Alternative would maintain the current level of transit service in the project corridor and also increase cross-station opportunities by adding two new express shuttle buses. The TSM Alternative would not have a detrimental and/or increased impact on public safety or accidents. Buses would operate on existing streets, so changes to the existing environment and direct impacts would not occur with this alternative. A potential indirect impact would be the "induced demand" created by better and more frequent service for the overall LRT system by providing the express shuttle buses. More people could be brought into a defined geographic area, possibly resulting in potential new conflicts between transit and pedestrians and motorists.

When considered in combination with other reasonably foreseeable projects in the project area, the TSM Alternative would not have either a construction-related or operational cumulative effect because there would not be direct or indirect effects.

4.15.3.2.1 NEPA Finding

The TSM Alternative would not result in adverse safety or security effects.

4.15.3.2.2 CEQA Determination

The TSM Alternative would not result in significant safety or security impacts.

4.15.3.3 At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative could affect the pedestrian environment, motorist safety, and emergency response times for emergency service providers during both construction and LRT operation.

4.15.3.3.1 Pedestrian Safety

Pedestrian safety was evaluated at proposed station locations (near the trackway) and at designated grade crossings. Adding light rail vehicles would be the primary new safety hazard for pedestrian traffic along the proposed alignment. The speed of the vehicles would be similar to or slower than adjacent automobile traffic. The light rail vehicles (LRVs) would be electrically powered and, therefore, quieter than most automobile traffic and may not be easily heard. This hazard includes crossings at intersections where pedestrians cross over the light rail tracks, and human intrusion on the right-of-way (jaywalking). Of the build alternatives, the At-Grade Emphasis LRT Alternative has the greatest length of street running alignment, and therefore more locations where pedestrian safety concerns could occur which could result in significant impacts.

4.15.3.3.2 Motorist Safety

Design solutions and operating characteristics would address potential motorist safety issues. Measures would include sizing stations to accommodate the anticipated number of passengers, channelization techniques to direct pedestrians to designated pedestrian crossings, "Train Approaching" signs, traffic-signal phasing (all-red phase and lagging left turns), low operating speeds of LRVs, left-turn restrictions along 2nd Street when LRVs are approaching, and preparation of grade crossing applications in coordination with the CPUC. These design solutions and LRT operating characteristics would reduce potential pedestrian and motorist safety concerns to a less than significant level.

4.15.3.3.3 Security

Security issues may be related to police and fire response, emergency evacuation, and addressing criminal and terrorist activity. The project would include coordination with police and fire services to develop construction and operation plans and provide appropriate public safety and security for the Metro system, employees, and surrounding communities. The LACSD policing contract with Metro would be extended to include the Regional Connector Transit Corridor project, and the project would be coordinated and compliant with TSA/DHS. To mitigate potential safety and security concerns, a complete Threat and Vulnerability Assessment in compliance with FTA regulations would be conducted for the adopted LPA, if approved.

Given project design features, the grade crossing application process, and the Threat and Vulnerability Assessment, potential indirect impacts associated with the At-Grade Emphasis LRT Alternative would not have a detrimental and/or increased impact on public safety or accidents during both construction and LRT operation.

As with the proposed project, other projects within the area of influence of this proposed alternative would address safety and security of pedestrians and motorists accessing the developments. From a cumulative perspective, potential impacts associated with the At-Grade Emphasis LRT Alternative would be mitigated to a less than significant level and would not have a cumulative effect on the safety and security environment in the project area during both construction and LRT operation.

4.15.3.3.4 NEPA Finding

The At-Grade Emphasis LRT Alternative would not have adverse effects on safety and security after proposed mitigation measures are implemented.

4.15.3.3.5 CEQA Determination

The At-Grade Emphasis LRT Alternative would not have significant impacts on safety and security after proposed mitigation measures are implemented.

4.15.3.4 Underground Emphasis LRT Alternative

The Underground Emphasis LRT Alternative could affect the pedestrian environment, motorist safety, and emergency response times for emergency service providers during both construction and LRT operation.

4.15.3.4.1 Pedestrian Safety

Pedestrian safety considerations would apply primarily to proposed at-grade segments. These concerns do not arise with underground LRT facilities (there are no trackway crossings for pedestrians or vehicles) and where applicable, stations could be designed to avoid these concerns (e.g., a design that avoids the need for pedestrians to cross tracks and the potential for collisions with LRVs). Since the Underground Emphasis LRT Alternative alignment would be almost entirely underground, few pedestrian safety concerns would arise, but could still be potentially significant. Pedestrian safety concerns associated with the Underground Emphasis LRT Alternative would be less compared to the At-Grade Emphasis LRT Alternative.

4.15.3.4.2 Motorist Safety

The only at-grade crossing proposed for the Underground Emphasis LRT Alternative is located at 1st and Alameda Streets. At this location, most vehicles and pedestrians would be grade-separated from the LRT tracks, with a potential pedestrian bridge proposed over the intersection and a new underpass allowing traffic on Alameda Street to travel below 1st Street and the LRT tracks. For motor vehicles and LRVs operating at-grade at this intersection, Metro would prepare grade crossing applications in coordination with the CPUC and local public agencies. The grade-separated nature of the Underground Emphasis LRT Alternative would avoid these potential effects which would not result in significant impacts to the project area.

4.15.3.4.3 Security

Security issues may be related to police and fire response, emergency evacuation, and addressing criminal and terrorist activity. The project would include coordination with police and fire services to develop construction and operation plans and provide appropriate public safety and security for the Metro system, employees, and surrounding communities. The LACSD policing contract with Metro would be extended to include the Regional Connector Transit Corridor project, and the project would be coordinated and compliant with TSA/DHS. To mitigate potential safety and security concerns, a complete Threat and Vulnerability Assessment in compliance with FTA regulations would be conducted for the adopted LPA. For the Underground Emphasis LRT Alternative, this would include a complete evacuation plan to mitigate any potential safety concerns.

Potential indirect impacts associated with the Underground Emphasis LRT Alternative would not have a detrimental or increased effect on public safety or accidents during both construction and LRT operation.

As with the proposed project, other projects within the area of influence of this proposed alternative would address safety and security of pedestrians and motorists accessing the developments. Potential impacts of the Underground Emphasis LRT Alternative would be mitigated to a less than significant level and therefore, would not have a cumulative effect on the safety and security environment in the project area during either construction or LRT operation.

4.15.3.4.4 NEPA Finding

The Underground Emphasis LRT Alternative would not have adverse effects on safety and security after proposed mitigation measures are implemented.

4.15.3.4.5 CEQA Determination

The Underground Emphasis LRT Alternative would not have significant impacts on safety and security after proposed mitigation measures are implemented.

4.15.3.5 Locally Preferred Alternative

The LPA could affect the pedestrian environment, motorist safety, and emergency response times for emergency service providers during both construction and LRT operation. The potential safety and security effects of the LPA would be similar to those for the Underground Emphasis LRT Alternative for all areas west of Central Avenue.

4.15.3.5.1 Pedestrian and Motorist Safety

Pedestrian and motorist safety considerations identified previously would apply primarily to proposed at-grade locations. The LPA results in the entire LRT facility being placed underground, eliminating all potential conflicts with at-grade roadway and pedestrian infrastructure. Therefore, the proposed alternative and associated design would avoid potential safety effects related to both pedestrian and motorist crossings during operations. The grade-separated nature of the LPA would avoid these potential effects and no impact would occur. Mitigation measures are proposed in Section 4.15.4.2 to offset potential safety concerns during construction.

4.15.3.5.2 Security

Security issues may be related to police and fire response, emergency evacuation, and addressing criminal and terrorist activity. The project would include coordination with police and fire services to develop construction and operation plans and provide appropriate public safety and security for the Metro system, employees, and surrounding communities. The LACSD policing contract with Metro would be extended to include the Regional Connector project, and the project would be coordinated and compliant with TSA/DHS. To mitigate potential safety and security concerns, a complete Threat and Vulnerability Assessment in compliance with FTA regulations would be conducted for the LPA, if adopted by the Metro Board of Directors. For the LPA, this would include a complete evacuation plan to mitigate any potential safety concerns.

Potential indirect impacts associated with the LPA would not have a detrimental or increased impact on public safety or accidents during both construction and LRT operation.

As with the proposed project, other projects within the area of influence of this proposed alternative would address safety and security of pedestrians and motorists accessing the developments. From a cumulative perspective, potential impacts associated with the LPA would be mitigated to a less than significant level and the LPA would not have a considerable contribution to cumulative effects on the safety and security environment in the project area during both construction and LRT operation.

The Broad Art Foundation Museum, currently under construction, is anticipated to include a pedestrian plaza above General Thaddeus Kosciuszko Way connecting to Upper Grand Avenue. In order to provide access from the 2nd/Hope Street station to Upper Grand Avenue, Metro would build an elevator from the station entrance to the plaza if one is not already provided by the Broad Art Foundation Museum project. If the plaza is not built, Metro would construct a pedestrian connection (such as a pedestrian bridge) from the elevator to Upper Grand Avenue. The proposed pedestrian bridge, whether built by the Broad Art Foundation or Metro, would reduce potential pedestrian/LRT/vehicle conflicts by providing a separated facility for pedestrians trying to reach the station, especially from the high pedestrian generator Walt Disney Concert Hall.

4.15.3.5.3 NEPA Finding

The LPA will not have adverse effects on safety and security with implementation of proposed mitigation measures.

4.15.3.5.4 CEQA Determination

The LPA would not have significant impacts on safety and security with implementation of proposed mitigation measures and, therefore, would not have a considerable contribution to cumulative effects on the safety and security environment in the project area during construction or LRT operation.

4.15.4 Mitigation Measures

4.15.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for safety and security impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.15.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Additional detail has been provided for the construction and operational mitigation measures for consistency with other sections, such as additional detail regarding Americans with Disabilities Act (ADA) requirements, the traffic management and construction mitigation plans, and the protection of public use areas.

4.15.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

4.15.4.2.1 Final Construction Mitigation Measures for the Locally Preferred Alternative

- Accessible detours shall be provided whenever possible. Detours shall be compliant with the ADA. Signage shall be provided in those languages most commonly spoken in the immediate community. Signs shall mark detours in accordance with the Manual on Uniform Traffic Control Devices, and other applicable local and state requirements. Detours shall be designed to minimize cut-through traffic in adjacent residential areas. (CN-1)

- Early notification of traffic disruption shall be given to emergency service providers. Work plans and traffic control measures shall be coordinated with emergency responders to prevent impacts to emergency response times. (CN-2)

- Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events. Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders. Crossing guards and other temporary traffic controls shall be provided in the vicinity of construction sites, haul routes, and other relevant sites as proposed in California DOT Traffic Manual, Section 10-07.3, Warrants for Adult Crossing Guards, and as appropriate to maintain traffic flow during construction. (CN-3)

- Metro shall protect public use of work areas involving sidewalks, entrances to buildings, lobbies, corridors, aisles, stairways, and vehicular roadways with appropriate guardrails, barricades, temporary fences, overhead protection, temporary partitions, shields, and adequate visibility. Metro shall keep sidewalks, entrances to buildings, lobbies, corridors, aisles, doors, or exits that remain in use by the public clear of obstructions. Metro shall post appropriate warnings, signs, and instructional safety signs. These requirements shall be included in the construction specifications. (SS-15)

- Safe pedestrian detours with handrails, fences, k-rail, canopies, and walkways shall be provided as needed. When a crosswalk is closed due to construction activities, pedestrians shall be directed to nearby alternate crosswalks. Access shall be ADA accessible at all times per existing Metro policy. (TR-4)

- Metro shall develop a Construction Mitigation Program that includes protocol for community notification of construction activities, including traffic control measures, schedule of activities, and duration of operations, with written communications to the community translated into appropriate languages. (DR-7)

4.15.4.2.2 Final Operational Mitigation Measures for the Locally Preferred Alternative

- Fire alarm protection shall be provided within station areas as required by applicable laws, regulations, and standards. (SS-1)

- A minimum of two fire emergency routes shall be provided from each station as required by applicable laws, regulations, and standards. (SS-2)

- Adequate emergency ventilation and lighting shall be provided in each station in accordance with Metro Fire/Life Safety Standards and City of Los Angeles building codes. (SS-3)

- Communication systems between adjoining fire agencies shall be provided as required by applicable laws, regulations, and standards. (SS-4)

- A methane detection system shall be provided in each station as required by applicable laws, regulations, and standards. (SS-5)

- Building construction for underground stations shall not be less than Type I Construction as defined in the Uniform Building Code. All stations with more than two levels below-grade or where the lowest occupied level is more than 80 feet below-grade shall have protected level separation or other protection features to provide safe egress to exits. (SS-6)

- All proposed mitigation measures regarding safety and security shall be implemented in a manner conformant to Metro's Rail Transit Design Criteria and Standards and Fire/Life Safety Criteria. A combination of the following measures shall be implemented as indicated by the Threat and Vulnerability Assessment: CCTV system, emergency push-button call system for patrons, intrusion detection system, dedicated security patrol protocols and procedures, and crime prevention through environmental design. (SS-7)

- Proposed station designs shall not include design elements that obstruct visibility or observation, nor provide discrete locations favorable to crime. Proposed stations shall be lighted to avoid shadows. Pedestrian pathways shall include clear sight lines whenever feasible. Project sidewalk widths and placements shall be appropriately designed to accommodate a wide variety of users. The following criteria shall be used when designing project sidewalks: sidewalk and pedestrian bridge widths shall be designed with the widest dimensions feasible (at least ten feet) in conformance with Metro's adopted land use and transportation policies; minimum sidewalk widths shall not be less than those allowed by the State of California Title 24 access requirements or the ADA design recommendations; where practicable, pedestrian movements and flows shall be favored over other transportation modes, such as automobile access; and stations shall be fully accessible as defined by ADA. (SS-8)

- An ADA accessible connection for the 2nd/Hope Street station to Upper Grand Avenue shall be provided. The future Broad Art Foundation Museum, currently under construction, is projected to include a plaza above General Thaddeus Kosciuszko Way connecting to Upper Grand Avenue. In order to provide access from the 2nd/Hope Street station to Upper Grand Avenue, an elevator from the station entrance to the plaza shall be built as part of this alternative if one is not already provided. If the plaza is not built, a pedestrian connection (such as a pedestrian bridge) shall be constructed. The connection shall reduce conflicts between pedestrians and vehicles. (SS-9)

- Adequate pedestrian queuing and refuge areas shall be provided at the proposed stations to facilitate pedestrian mobility. Adequately wide crosswalks shall be provided in the areas immediately around the proposed stations. (SS-10)

- All proposed stations shall be equipped with monitoring equipment, which shall primarily consist of video surveillance to monitor strategic areas of the stations and walkways and/or be monitored by Metro security personnel on a regular basis. (SS-11)
- Metro shall implement a security plan for LRT operations to include both in-car and station surveillance by Metro security or other local jurisdiction security personnel. Metro shall coordinate and consult with the LAFD, LAPD, and LACSD as appropriate to develop safety and security plans for the proposed alignment and station areas. (SS-12)
- Trains and/or platforms shall be equipped with safety features that reduce the potential for persons to contact the vehicle coupler and/or fall under the train. (SS-13)
- Fire separations shall be provided and maintained in public occupancy areas as required by regulation. (SS-14)
- An education safety and outreach campaign shall be implemented during construction to address public safety awareness in the vicinity of the project. The campaign would target the diverse community in the project area to educate them on proper system use and benefits of LRT ridership. (SS-16)

4.16 Growth-Inducing

This section summarizes the potential population, housing, and employment growth that may directly or indirectly occur due to the project. Although the Regional Connector Transit Corridor project does not include housing units, population could nevertheless increase due to the potential for transit-oriented development. This potential growth is analyzed at local and regional levels. Information in this section is based on the Growth-Inducing Impacts Technical Memorandum prepared for the project contained in Appendix DD of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, as indicated in the Responses to Comments, Volumes F-2 and F-3, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR.

The analysis of growth-inducing impacts associated with the LPA is detailed below in Section 4.16.3.5.

4.16.1 Regulatory Framework

NEPA requires projects to examine the indirect consequences or secondary impacts that may occur as a result of a proposed federal activity or action. NEPA guidelines require an evaluation of reasonably anticipated growth against the projections developed by a federally-designated metropolitan planning organization (MPO). The Southern California Association of Governments (SCAG) is the federally-designated MPO for Los Angeles County and it has developed regional growth management plans that contain growth projections.

A growth-inducing impact is considered to be significant under CEQA if the proposed project has the potential to induce substantial population growth in an area, either directly through new homes or business or indirectly by creating new infrastructure that could support new homes or businesses.

More information regarding these laws and policies is available in Appendix DD, Growth-Inducing Impacts Technical Memorandum.

4.16.2 Affected Environment

4.16.2.1 Regional Population, Housing, and Employment Growth

As shown in Table 4.16-1, the existing population for the region is more than 18 million persons. The region is estimated to have a population of more than 24 million persons (an increase of approximately 26 percent over existing), 7.7 million households, and 10.2 million persons employed by 2035.

Table 4.16-1. Regional Population, Households, and Employment from 2008-2035

County	2008 Population	2035 Population	2008 Households	2035 Households	2008 Employment	2035 Employment
Imperial	186,041	320,448	51,987	102,878	66,703	132,551
Los Angeles	10,449,883	12,338,620	3,298,886	4,003,501	4,498,598	5,041,172
Orange	3,210,499	3,653,990	1,015,502	1,118,490	1,698,090	1,981,901
Riverside	2,112,571	3,596,680	675,135	1,183,097	728,067	1,413,522
San Bernardino	2,095,180	3,133,801	612,123	972,561	766,044	1,254,749
Ventura	841,675	1,013,753	268,967	330,189	361,942	463,227
SCAG Region	**18,895,849**	**24,057,292**	**5,922,600**	**7,710,716**	**8,119,444**	**10,287,122**

Source: Southern California Association of Governments 2008 Final Adopted Integrated Growth Forecast, May 2008

4.16.2.2 Local Population, Housing, and Employment Growth

Table 4.16-2 shows population growth projections at the local level. The population within the project area is estimated to increase by approximately 3,200 persons by 2035, with an annual average increase of less than 1 percent (0.60). This would be a greater growth rate than either the City of Los Angeles Council of Governments (CLACG) subregion or the City of Los Angeles.

Table 4.16-3 shows the expected household growth for the project area, City of Los Angeles, and CLACG subregion. The City of Los Angeles is estimated to increase by 274,287 households and would be comprised of approximately 21 percent of the region's total households. The project area is estimated to increase by 2,552 households, which would be a minimal share of the City of Los Angeles' total. This annual rate of growth for the project area would be slightly greater (0.98 percent) compared to the City (0.76 percent) and the CLACG subregion (0.75 percent).

Table 4.16-4 includes employment growth for the project area, City of Los Angeles, and the CLACG subregion. The table shows that the project area is expected to gain approximately 12,634 new jobs by 2035. This would be an annual growth rate of approximately 0.28 percent. The annual rate of growth for the project area would be similar to that of the City of Los Angeles, but lower than the CLACG subregion rate.

More information regarding existing population, housing, and employment data and projected growth within the region is available in Appendix DD, Growth-Inducing Impacts Technical Memorandum, of this EIS/EIR.

Table 4.16-2. Local Area Population Growth 2008-2035

Area	2008	2035	2008-2035 Population Change	2008-2035 Annual Average % Change
CLACG	4,099,008	4,509,434	410,426	0.37%
City of Los Angeles	4,016,324	4,415,772	399,448	0.37%
Project Area[1]	19,912	23,123	3,211	0.60%

Source: Southern California Association of Governments 2008 Final Adopted Integrated Growth Forecast, May 2008
Note:
[1] The project area is comprised of the following census tracts: 2060.30, 2060.40, 2062, 2073, 2074, 2075, 2077.10.

Table 4.16-3. Local Area Household Growth 2008-2035

Area	2008	2035	2008-2035 Household Change	2008-2035 Annual Average % Change
CLACG	1,361,906	1,638,823	276,917	0.75%
City of Los Angeles	1,342,291	1,616,578	274,287	0.76%
Project Area	9,654	12,206	2,552	0.98%

Source: Southern California Association of Governments 2008 Final Adopted Integrated Growth Forecast, May 2008

Table 4.16-4. Local Area Employment Growth 2008-2035

Area	2008	2035	2008-2035 Employment Change	2008-2035 Annual Average % Change
CLACG	1,839,988	2,037,472	197,484	0.40%
City of Los Angeles	1,879,666	1,994,134	114,468	0.23%
Project Area	169,328	181,962	12,634	0.28%

Source: Southern California Association of Governments 2008 Final Adopted Integrated Growth Forecast, May 2008

4.16.3 Environmental Impacts/Environmental Consequences

Growth-inducing impacts would be considered significant if the proposed project has the potential to induce either directly (for example, by proposing new homes and businesses) or indirectly (for example, extending roads or other infrastructure) substantial population growth in an area.

The following sections summarize the evaluation of potential growth-inducing impacts for each alternative. Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.16.1. Table 4.16-5 summarizes the results of the analysis.

Table 4.16-5. Summary of Potential Growth-Inducing Impacts

Alternative	Direct Effects/Impacts (NEPA/CEQA)	Indirect Effects/Impacts (NEPA/CEQA)	Adverse NEPA Effects After Mitigation	Significant CEQA Impacts After Mitigation
No Build	None	None	None	None
TSM	None	None	None	None
At-Grade Emphasis LRT	None	None	None	None
Underground Emphasis LRT	None	None	None	None
LPA[1]	None	None	None	None

Note:
[1] Potential growth inducement from the LPA (which only includes three stations) would be less than or equal to the growth-inducing impacts from the Fully Underground LRT Alternative (which included four stations).

4.16.3.1 No Build Alternative

The No Build Alternative would not result in new homes or businesses and therefore, would not directly induce growth. Current development trends in the project area indicate that development would occur without the proposed project. As such, the No Build Alternative would not indirectly induce growth. Since the No Build Alternative would not directly or indirectly cause growth-inducing impacts, this alternative would not contribute to cumulative growth-inducing impacts.

4.16.3.1.1 NEPA Finding

There would be no construction in the project area associated with additional transit infrastructure investment or housing as a result of the No Build Alternative. The No Build Alternative would not have a direct or indirect growth-inducing effect.

4.16.3.1.2 CEQA Determination

There would be no construction in the project area associated with additional transit infrastructure investment or housing as a result of the No Build Alternative. The No Build Alternative would not have a direct or indirect growth-inducing impact.

Based on CEQA thresholds of significance, the No Build Alternative would not have a significant impact associated with growth-inducement because it would not include construction of any housing, commercial facilities, or infrastructure that might foster growth.

4.16.3.2 TSM Alternative

Only minor transportation improvements would occur under the TSM Alternative. The TSM Alternative would not add any new housing or commercial facilities, or otherwise foster growth through significantly expanding transportation infrastructure. Therefore, the TSM Alternative would not directly induce growth.

The TSM Alternative would not provide opportunities for secondary development. Therefore, the TSM Alternative would not indirectly induce growth.

Since the TSM Alternative would not directly or indirectly cause growth-inducing impacts, this alternative would not contribute to cumulative growth-inducing impacts.

4.16.3.2.1 NEPA Finding

The TSM Alternative would not have a direct or indirect growth-inducing effect as the alternative would not include the addition of any new housing or expanded infrastructure.

4.16.3.2.2 CEQA Determination

The TSM Alternative would not have a direct or indirect growth-inducing impact as the alternative would not include the addition of any new housing or expanded infrastructure.

4.16.3.3 At-Grade Emphasis LRT Alternative

4.16.3.3.1 Direct Impacts

An important objective of the proposed project is to meet existing transportation demand and accommodate potential increased demand due to regional growth. The proposed project would provide a linkage in the regional transportation network, thereby increasing overall system efficiency. The At-Grade Emphasis LRT Alternative does not include a housing element that would directly increase population or employment and it would not substantially change land use and development patterns at the regional scale. Therefore, this alternative would not directly induce population growth.

At the regional level, the proposed project would reduce the need to make several transfers to get from one destination to another, resulting in increased efficiency of travel between the San Gabriel Valley and the Westside or Long Beach. Although in some circumstances such transportation improvements could induce growth, this is unlikely in this case as the areas along these routes are fully urbanized so it would be unlikely that the increased regional connectivity would induce housing construction.

4.16.3.3.2 Indirect Impacts

At the corridor level, the Regional Connector project, combined with supportive public policies, plans, and favorable real estate conditions, could attract transit-supportive development, including employment opportunities, higher-density residential development, and new services and amenities. The pattern of land development could be affected by a greater concentration and intensity of land use activities along the proposed route and particularly along the station areas, making secondary land use impacts most notable close to stations.

Experience gained from existing Metro projects such as the Red and Purple Lines suggests that developers in the Los Angeles area are interested in creating transit- and pedestrian-oriented mixed-use development, and that these types of developments can be very successful. The experience in other cities with similar transit infrastructure also supports this idea. However, policies supportive of the desired type of development must usually be in place.

Even with no change in public policy, some changes in land use may potentially occur as a result of the proposed project; however, these changes would largely represent a redistribution of growth rather than an increase. Downtown Los Angeles and Little Tokyo are currently densely developed. The transit corridor stations could attract transit-supportive land uses to these areas. These uses could be developed in existing or new buildings on vacant lots close to the stations.

The proposed project would likely enhance the attractiveness of the corridor for living or conducting business. The project could improve transit accessibility for people desiring to come to destinations within the project area and for area residents or others bound for other regional locations.

Employment opportunities may increase in the project area, and these opportunities would be enhanced by the light rail project. The proposed project would provide new jobs, particularly during construction, and new access to local employment opportunities for all communities within or connected to the project corridor. Short-term construction-related jobs created by the proposed project and long-term employment opportunities created by improved access would benefit the entire community.

Under the At-Grade Emphasis LRT Alternative, the indirect impacts on neighborhoods would generally be positive. Station areas could become centers of neighborhood activity and investment and, therefore, could boost neighborhood social cohesion and improve economic conditions for commercial buildings within the corridor and, in particular, those adjacent to the stations. The Regional Connector could also encourage additional growth of existing street level retail uses in both downtown and Little Tokyo. This new accessibility could also act as a catalyst for using underutilized space in commercial buildings.

The At-Grade Emphasis LRT Alternative would not result in direct business displacement and, therefore, would not undermine the economic base of these communities. Commercial properties near stations would have a reasonable potential to increase in value - a potential secondary effect.

A low potential exists for the project to cause secondary adverse impacts to historic properties. This could occur through redevelopment at or near station areas that are adjacent to historic properties. Such development may potentially introduce new buildings at a scale and appearance that would be out of character with the historic properties, or may result in the demolition of historic buildings to accommodate new development. On the other hand, underutilized historic buildings in the corridor may increase in desirability due to their proximity to the proposed project. This could be considered a beneficial secondary impact if development is undertaken with the goal of complementing the historic setting of these resources.

Potential indirect growth-inducing effects may result from the micro-scale growth or development near proposed stations. These potential effects, described in more detail in Appendix DD, Growth-Inducing Impacts Technical Memorandum, would be due to implementation of local and state land use policies or local planning objectives, which may encourage transit-oriented development, station area planning, or housing density bonuses adjacent to transit corridors.

The At-Grade Emphasis LRT Alternative would not remove any barriers to growth, or otherwise directly or indirectly induce growth. The At-Grade Emphasis LRT Alternative would likely influence patterns of growth along the transit corridor, most notably in the proposed station areas. The most likely outcome would be an acceleration or redistribution of currently planned growth.

4.16.3.3.3 NEPA Finding

The At-Grade Emphasis LRT Alternative would not have a direct or indirect growth-inducing effect on the project area.

4.16.3.3.4 CEQA Determination

The At-Grade Emphasis LRT Alternative would not have a direct or indirect growth-inducing impact on the project area.

4.16.3.4 Underground Emphasis LRT Alternative

Like the At-Grade Emphasis LRT Alternative, the Underground Emphasis LRT Alternative would not include any housing and therefore, would not directly induce growth. The discussion of direct impacts in Section 4.16.3.3.1 is applicable to the Underground Emphasis LRT Alternative.

The potential indirect impacts associated with the Underground Emphasis LRT Alternative would be similar to those under the At-Grade Emphasis LRT Alternative. The Underground Emphasis LRT Alternative would likely complement patterns of growth along the transit corridor, most notably in the proposed station areas. The most likely outcome would be an acceleration and/or redistribution of currently planned growth rather than an increase. The Underground Emphasis LRT Alternative would not indirectly induce growth. The discussion of indirect impacts in Section 4.16.3.3.2 is applicable to the Underground Emphasis LRT Alternative.

4.16.3.4.1 NEPA Finding

The Underground Emphasis LRT Alternative would not have a direct or indirect growth-inducing effect on the project area.

4.16.3.4.2 CEQA Determination

The Underground Emphasis LRT Alternative would not have a direct or indirect growth-inducing impact on the project area.

4.16.3.5 Locally Preferred Alternative

4.16.3.5.1 Direct Impacts

An important objective of the proposed project is to meet existing transportation demand and accommodate potential increased demand due to regional growth. The proposed project would provide a linkage in the regional transportation network, thereby increasing overall system efficiency. Like the At-Grade Emphasis LRT Alternative, the LPA would not include a housing element that would directly induce growth and it would not substantially change land use and development patterns at the regional scale. Therefore, the LPA would not directly induce population growth.

At the regional level, the proposed project would reduce the need to make several transfers to get from one destination to another, resulting in increased efficiency of travel between the San Gabriel Valley and the Westside or Long Beach. The areas along these routes are fully urbanized so it would be unlikely that the increased regional connectivity would induce housing construction.

4.16.3.5.2 Indirect Impacts

Potential indirect impacts associated with the LPA would be similar to those under the At-Grade Emphasis LRT Alternative and Underground Emphasis LRT Alternative. At the corridor level, the Regional Connector project, combined with supportive public policies, plans, and favorable real estate conditions, could attract transit-supportive development, including employment opportunities, higher-density residential development, and new services and amenities. The pattern of land development could be affected by a greater concentration and intensity of land use activities along the proposed route and particularly along the station areas, making secondary land use impacts most notable close to stations.

Experience gained from existing Metro projects such as the Metro Red and Purple Lines suggests that developers in the Los Angeles area are interested in creating transit- and pedestrian-oriented mixed-use development, and that these types of developments can be very successful. The experience in other cities with similar transit infrastructure also supports this idea. However, policies supportive of the desired type of development must usually be in place.

Even with no change in public policy, some changes in land use may potentially occur as a result of the proposed project; however, these changes would largely represent a redistribution of growth rather than an increase. Downtown Los Angeles and Little Tokyo are currently densely developed. The transit corridor stations could attract transit-supportive land uses to these areas. These uses could be developed in existing or new buildings on vacant lots close to the stations.

The proposed project would likely enhance the attractiveness of the corridor for living or conducting business. The project could improve transit accessibility for people desiring to come to destinations within the project area and for area residents or others bound for other regional locations.

Employment opportunities may increase in the project area, and these opportunities would be enhanced by the light rail project. The proposed project would provide new jobs, particularly during construction, and new access to local employment opportunities for all communities within or connected to the project corridor. Short-term construction-related jobs created by the proposed project and long-term employment opportunities created by improved access would benefit the entire community.

Under the LPA, the indirect impacts on neighborhoods would generally be positive. Station areas could become centers of neighborhood activity and investment and, therefore, could boost neighborhood social cohesion and improve economic conditions for commercial buildings within the corridor and, in particular, those adjacent to the stations. The Regional Connector could also encourage additional growth of existing street level retail uses in both downtown and Little Tokyo. This new accessibility could also act as a catalyst for using underutilized space in commercial buildings. Additionally, commercial properties near stations would have a reasonable potential to increase in value - a potential secondary effect.

A low potential exists for the project to cause secondary adverse impacts to historic properties. This could occur through redevelopment at or near station areas that are adjacent to historic properties. Such development may potentially introduce new buildings at a scale and appearance that would be out of character with the historic properties, or may result in the demolition of historic buildings to accommodate new development. On the other hand, underutilized historic buildings in the corridor may increase in desirability due to their proximity to the proposed project. This could be considered a beneficial secondary impact if development is undertaken with the goal of complementing the historic setting of these resources.

Potential indirect growth-inducing effects may result from the micro-scale growth or development near proposed stations. These potential effects, described in more detail in Appendix DD, Growth-Inducing Impacts Technical Memorandum, would be due to implementation of local and state land use policies or local planning objectives, which may encourage transit-oriented development, station area planning, or housing density bonuses adjacent to transit corridors.

The LPA would not remove any barriers to growth, or otherwise directly or indirectly induce growth. The LPA would likely complement patterns of growth along the transit corridor, most notably in the proposed station areas. The most likely outcome would be an acceleration and/or redistribution of currently planned growth near the eastern end of the alignment. This potential effect would not be significant. The LPA would not indirectly induce new growth.

The LPA would not directly induce growth and would not indirectly induce new growth. Therefore, the LPA would not result in a considerable contribution to cumulative growth-inducing impacts.

4.16.3.5.3 NEPA Finding

The LPA would not have a direct or indirect growth-inducing effect on the project area.

4.16.3.5.4 CEQA Determination

The LPA would not have a significant direct or indirect growth-inducing impact on the project area and would not result in a considerable contribution to cumulative growth-inducing impacts.

4.16.4 Mitigation Measures

None of the alternatives, including the LPA, would directly or indirectly induce growth. Therefore, mitigation measures would not be required for this project.

4.17 Environmental Justice

This section summarizes the potential impacts described in Chapter 3, Transportation Impacts and Mitigation, and other sections of Chapter 4, Environmental Analysis, Consequences, and Mitigation, and identifies potentially disproportionate environmental justice impacts (i.e., impacts which would affect environmental justice populations more than others). Additional detail is provided in the Environmental Justice Technical Memorandum, which is incorporated into this EIS/EIR as Appendix EE.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, as indicated in the Responses to Comments, Volumes F-2 and F-3, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). Minor changes have also been made to this section in order to maintain consistency with other Metro projects. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Field work performed for the Draft EIS/EIR confirmed that outside of Little Tokyo there are no environmental justice populations (limited English proficiency (LEP), low-income, minority, elderly, etc.) that would be disproportionately impacted by any of the build alternatives' construction and operation. Due to its minority concentration as well as the cultural and historic significance of the community, this analysis treats potential environmental justice impacts to Little Tokyo with special attention. Refinements to the LPA since publication of the Draft EIS/EIR have reduced the significance of potentially disproportionate adverse impacts in Little Tokyo. Less cut and cover construction and fewer business acquisitions would be needed, and tunnel boring machine (TBM) staging would be in a less impactful location on the edge of Little Tokyo. By reducing the need for road and sidewalk closures, property acquisitions, job displacement, and overall neighborhood disruption during construction, the refinements have helped reduce potential impacts in Little Tokyo. Most of the mitigation measures listed for the LPA in this section (which were candidate mitigation measures in the Draft EIS/EIR) have been carried forward and included in the Mitigation Monitoring Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR. Some other measures have been refined and adapted for the MMRP, and some new measures have been substituted in the MMRP to address the same issues and concerns that were addressed by candidate mitigation measures in the Draft EIS/EIR.

Environmental justice consequences of the LPA are discussed in Section 4.17.3.5 and mitigation measures to address impacts associated with the LPA are provided in Section 4.17.4.3 and Chapter 8, MMRP for the LPA.

4.17.1 Regulatory Framework

Executive Order (E.O.) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to seek environmental justice by "identifying and addressing social and economic effects of... programs, policies, and activities on minority and low-income populations in the United States" (Federal Register, Volume 59, Number 32). It requires fair treatment and meaningful involvement of all people, and that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of negative environmental consequences resulting from federal projects. In response, the U.S. Department of Transportation (USDOT) issued the *Order to Address Environmental Justice in Minority Populations and Low-Income Populations* (Federal Register Volume 62, Number 72), which sets guidelines to ensure that all federally-funded transportation-related programs, policies, or activities that have the potential to adversely affect human health or the environment involve a planning and programming process that explicitly considers effects on minority and low-income populations. E.O. 13166 requires federally-funded programs to develop and implement a system to provide meaningful access for limited-English proficiency populations. As a result, NEPA requires projects that receive federal funding to analyze environmental justice concerns.

CEQA does not refer specifically to the topic of environmental justice nor does it have specific thresholds of significance for environmental justice. CEQA focuses primarily on identifying and disclosing potential significant impacts to the physical environment. CEQA does, however, place a particular emphasis on identifying potential effects on affordable housing stating that an adverse impact may occur if a project displaces affordable housing. Since affordable housing is by definition inhabited by low-income people, the displacement of affordable housing can be seen as an indicator of environmental justice impacts. However, the Regional Connector project would have no impact on affordable housing. Therefore, this environmental justice analysis focuses on E.O. 12898 and NEPA requirements.

In summary, the environmental justice impact analysis is guided by the following regulations:

- E.O. 12898
- E.O. 13166
- Civil Rights Act of 1964
- USDOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations
- Age Discrimination Act of 1975

4.17.2 Affected Environment

4.17.2.1 Methodology

The environmental justice analysis evaluates potentially disproportionate adverse impacts to environmental justice populations. This section describes how the environmental justice study area was developed and analyzed to determine the presence or absence of environmental justice communities.

In order to determine if an environmental justice population would be disproportionately adversely impacted by the project, the existence and location of environmental justice populations within the study area must first be determined. A minority population is considered present if the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. A minority population is always considered "meaningfully greater" when the percentage of minorities exceeds 50 percent, regardless of what the percentage of minority populations is in the comparison geographic unit.

Following the Office of Management and Budget's (OMB) Statistical Directive 14, the Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is poor. If a family's total income is less than that family's threshold, then that family, and every individual in it, is considered poor. The official poverty thresholds do not vary geographically, but they are updated annually for inflation using the Consumer Price Index (CPI-U). The official poverty definition counts money income before taxes and does not include capital gains and noncash benefits (such as public housing, Medicaid, and food stamps).

U.S. Census data for 2000, as well as more current demographic data including the 2008 American Community Survey, and the 2008 Downtown Demographic Study, was analyzed to determine if the environmental justice study area contained environmental justice communities exceeding 50 percent or that were meaningfully greater than the surrounding area.

The study area is located entirely within the City of Los Angeles. For the purposes of the environmental justice analysis, the study area contains the following U.S. Census Bureau 2000 Census Tracts: 2060.30, 2060.40, 2062, 2073, 2074, 2075, and 2077.10. The analyses included key socioeconomic indicators in the study area that influence the assessment of environmental justice concerns. Figure 4.17-1 illustrates the Census Tracts and environmental justice study area.

Portions of Census Tracts 2060.30, 2060.40, and 2077.10 were not included in the study area because they were well outside of the study area or otherwise geographically separated from the study area. As shown in Figures 4.17-2 through 4.17-7, the western portion of Census Tract 2060.30 is less than ten percent. The land uses within these areas are vacant or industrial/commercial with little, if any, residential land use. Thus, the population of Census Tract 2060.30 is predominately outside the study area and east of the Los Angeles River.

In addition, certain geographic features such as the Los Angeles River and I-110 act as physical barriers in downtown Los Angeles and are impediments to pedestrian access to the study area. The Los Angeles River is a geographic boundary within Census Tracts 2060.30 and 2060.40 that pedestrians would be unable to cross to reach the study area. The southern portion of Census Tract 2077.10 also exceeds the ½-mile distance that pedestrians are typically willing to walk to reach a transit station. For these reasons, portions of Census Tracts 2060.30, 2060.40, and 2077.10 are not included in the study area.

Since census tracts are geographically much larger than the alignments being evaluated and the extent of the project's potential impacts, field visits and interviews were conducted to augment the demographic analysis. The results of both investigations are presented below.

4.17.2.2 Demographics

Though the proposed Regional Connector project would be located in downtown Los Angeles, benefits of the project would be felt across the Los Angeles region. Therefore, the affected environment includes the entire region. The study area contains the communities of Little Tokyo, the Arts District, Bunker Hill, Historic Core, Financial District, Toy District, and South Park. The study area is surrounded by predominantly minority and low-income neighborhoods such as South Los Angeles, Pico-Union, Westlake-MacArthur Park, Chavez Ravine, Lincoln Heights, and Chinatown.

U.S. Census Bureau 2000 Data

According to the 2000 Census, the study area housed approximately 18,070 persons, living in 10,340 housing units. Minorities made up 83 percent of study area. Hispanic or Latinos made up 35 percent of the population in the study area. Asians were the second largest minority group and made up 26 percent of the population. Whites and Blacks or African American populations made up 19 percent and 17 percent of the population, respectively. A summary of the study area's characteristics compared to the City and County of Los Angeles is included in Table 4.17-1. The 2000 Census data indicated that the study area's low-income and minority populations were meaningfully greater than the general population of the City and County of Los Angeles.

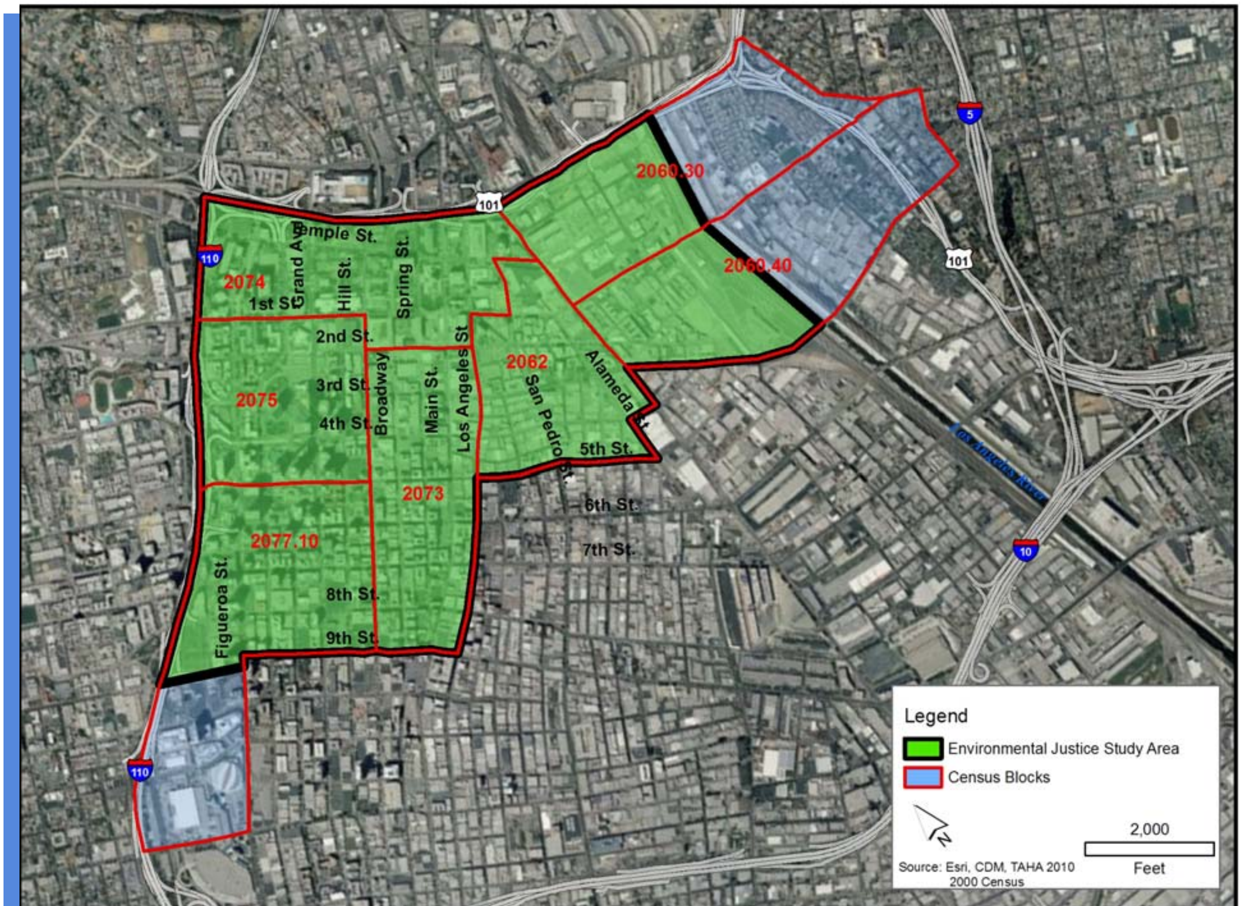
Table 4.17-1. Summary of Demographic Characteristics – Study Area Comparison to City and County of Los Angeles (Year 2000 Data)

Characteristic	Study Area	County of Los Angeles	City of Los Angeles
Total Population (persons)	18,067[a]	9,519,338	3,694,834
Total Housing Units	10,339	3,270,909	1,337,668
Percent Population Below Poverty Level	39%	18%	22%
Minority Percentage	83%	69%	53%

Source: U.S. Census Bureau, 2000; Bureau of Labor Statistics, 2009
[a] *Excludes homeless population.*

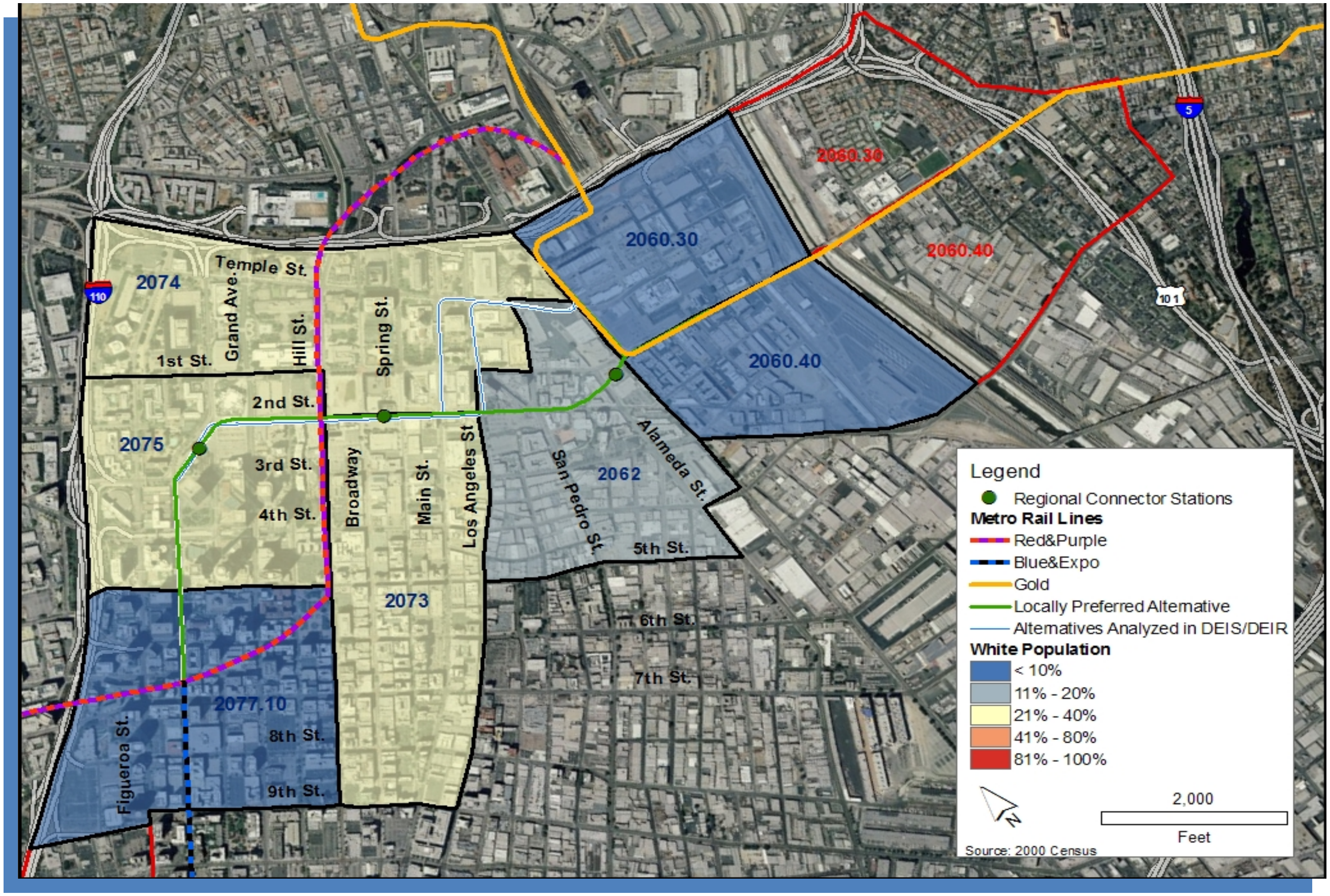
At the time of the 2000 Census, the study area was characterized by a diverse demographic. Economically, the study area housed a mostly low-wage workforce. In 2000, the median household income in the study area was approximately $15,630. The median household income in the study area was substantially lower than both the City's ($36,687) and the County's ($42,189) median household income. In the study area, 39 percent of the population lived below poverty thresholds. Additionally, approximately 60 percent of the population had no access to a vehicle. Thus, the resident population in 2000 was highly transit-dependent.

Residents in the age range of 35-49 made up 26 percent of the population. Approximately 25 percent of the study area population was 65 years or older (3,390 persons) compared to approximately 10 percent in the City and County of Los Angeles.



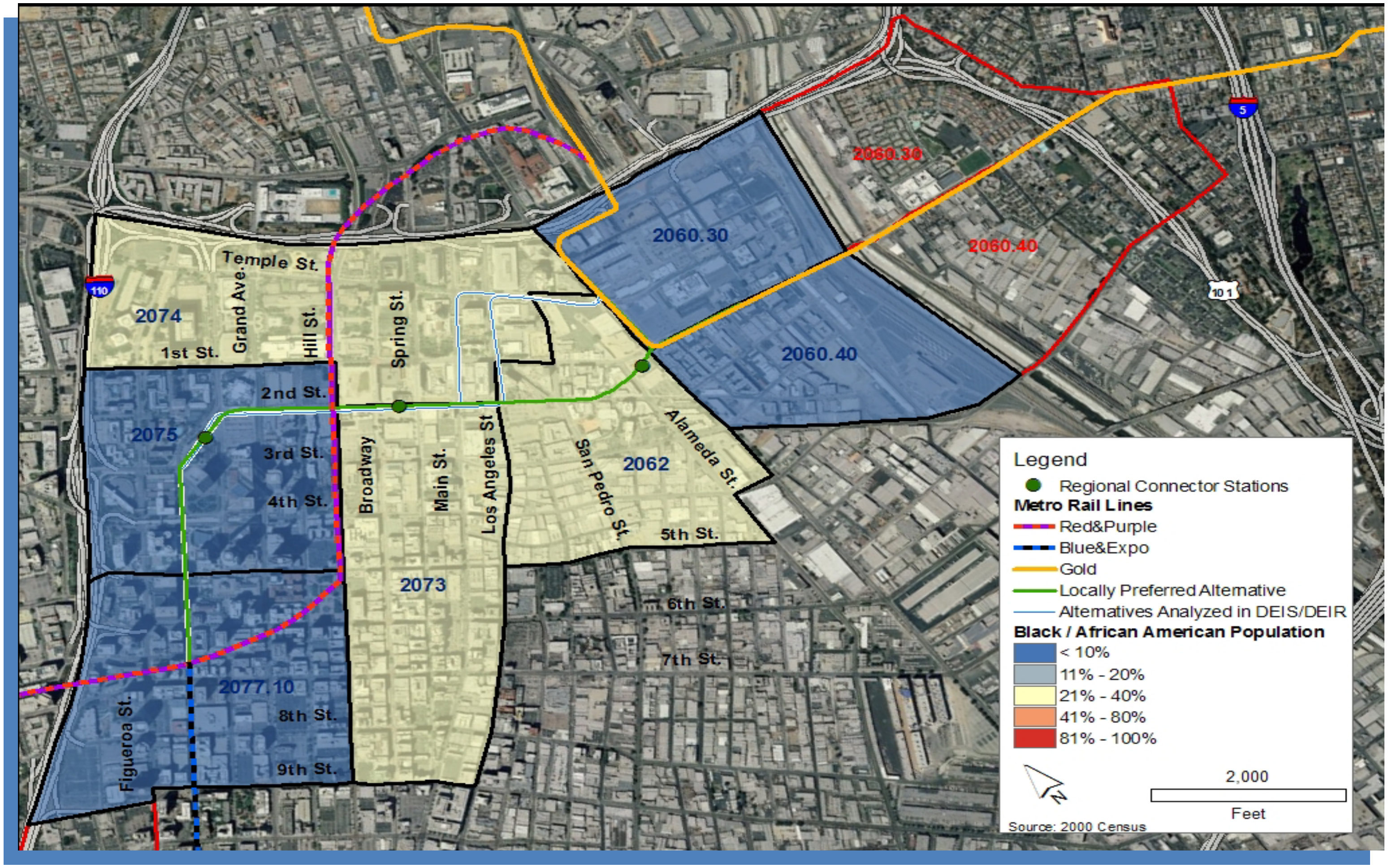
Source: U.S. Census Bureau, Summary File 3, 2000

Figure 4.17-1. Study Area



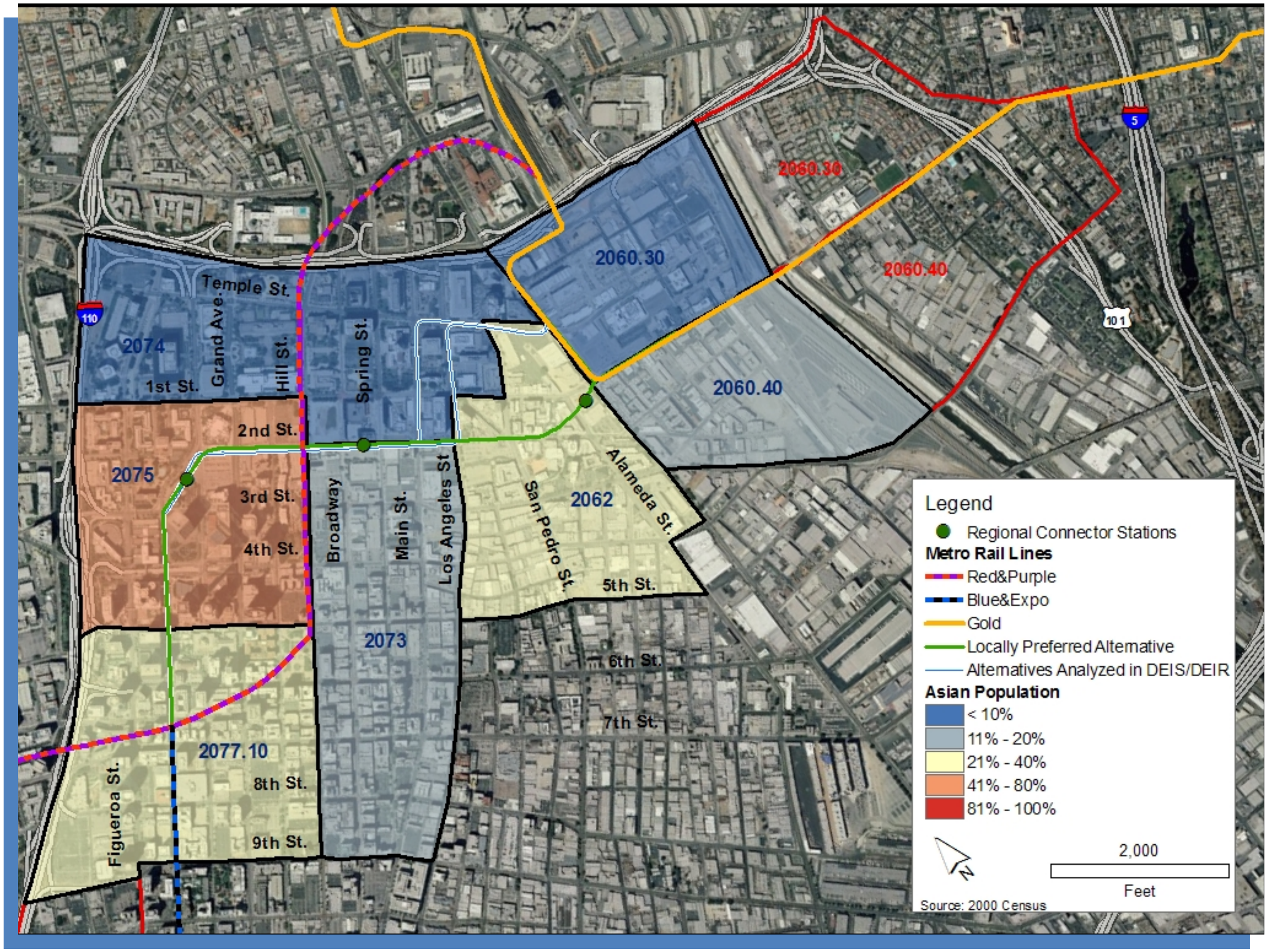
Source: U.S. Census Bureau, Summary File 3, 2000

Figure 4.17-2. Ethnicity, White Population in Study Area



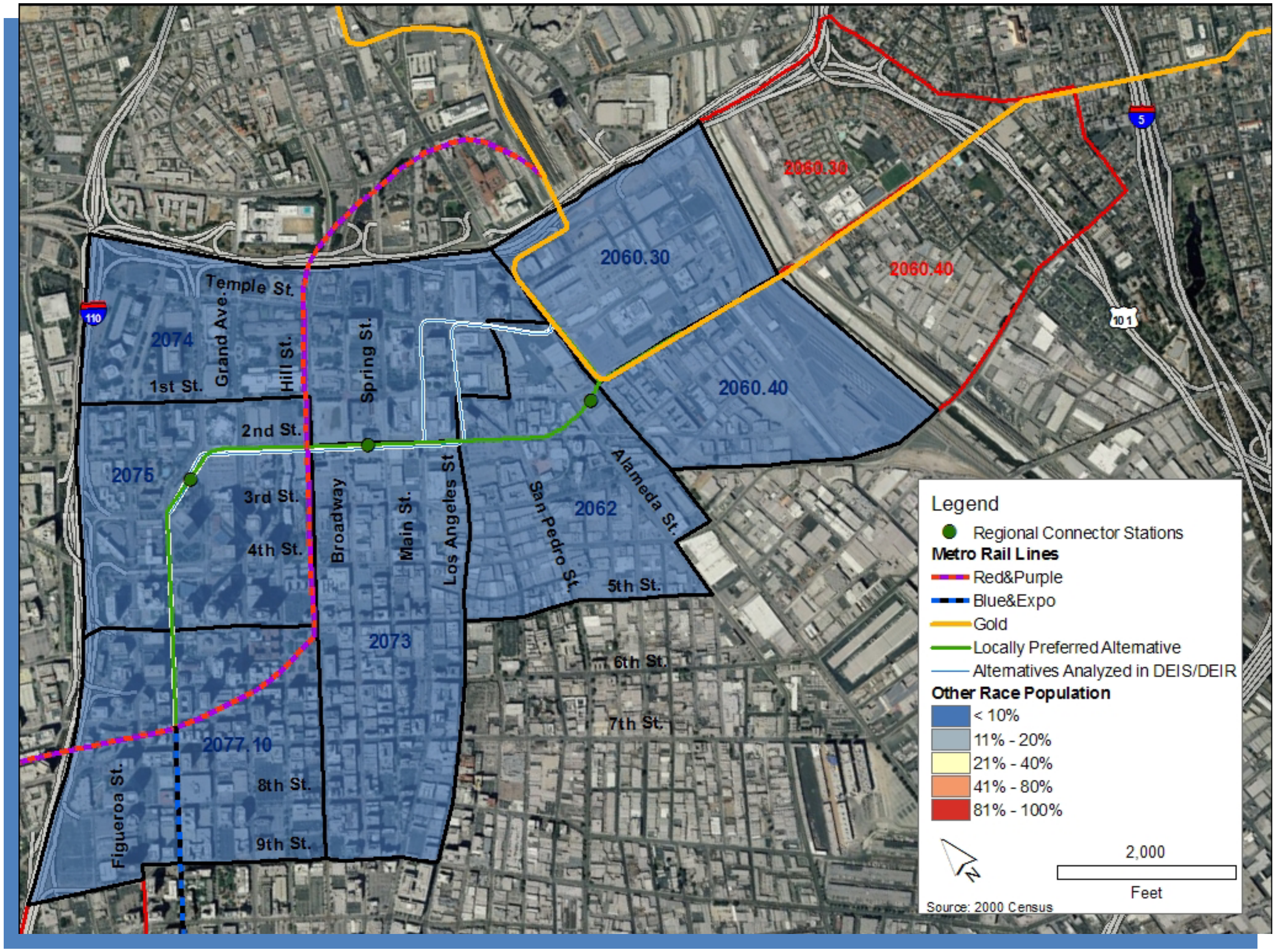
Source: U.S. Census Bureau, Summary File 3, 2000

Figure 4-17.3. Ethnicity, Black/African-American Population in Study Area



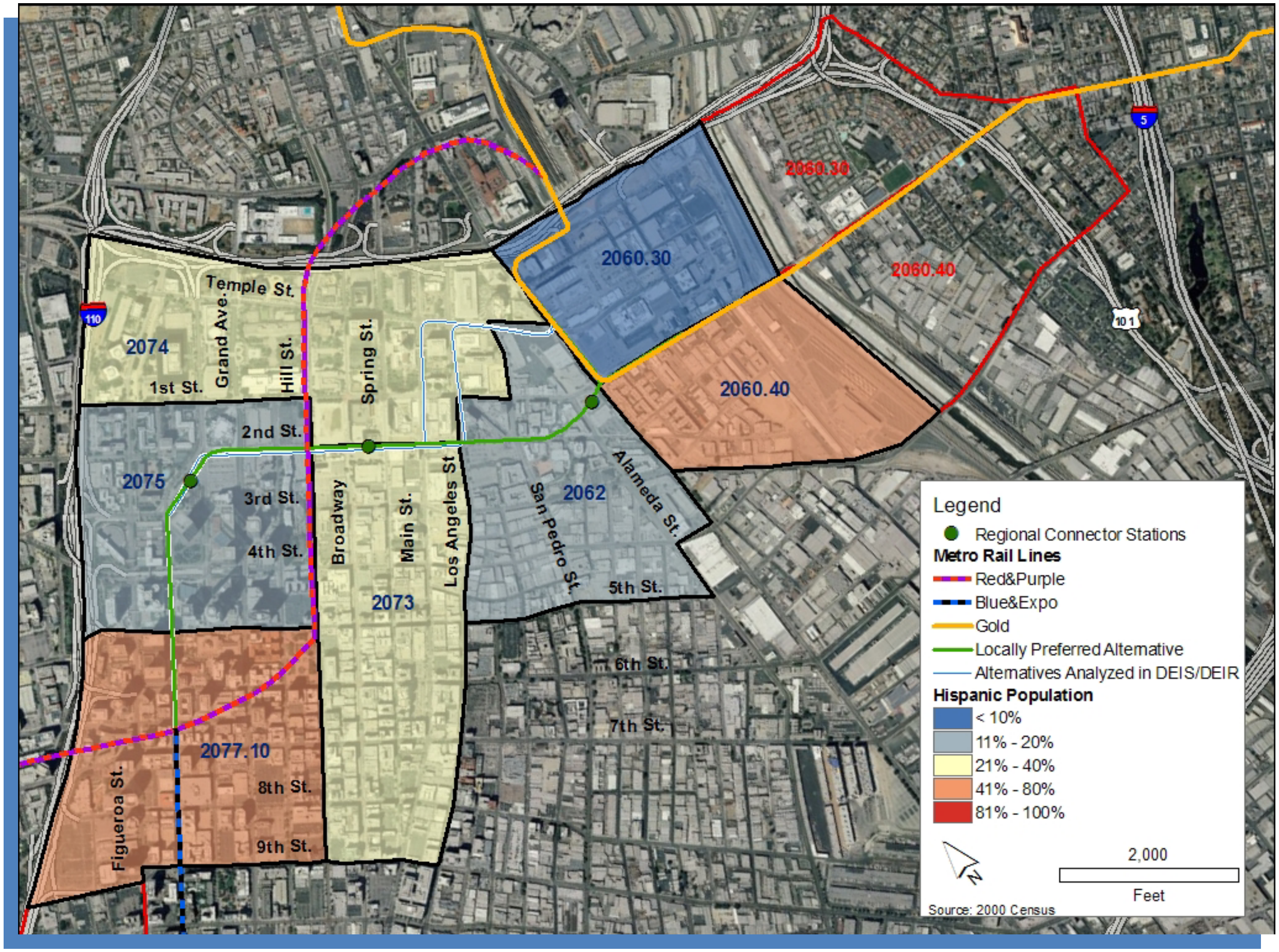
Source: U.S. Census Bureau, Summary File 3, 2000

Figure 4.17-4. Ethnicity, Asian Population in Study Area



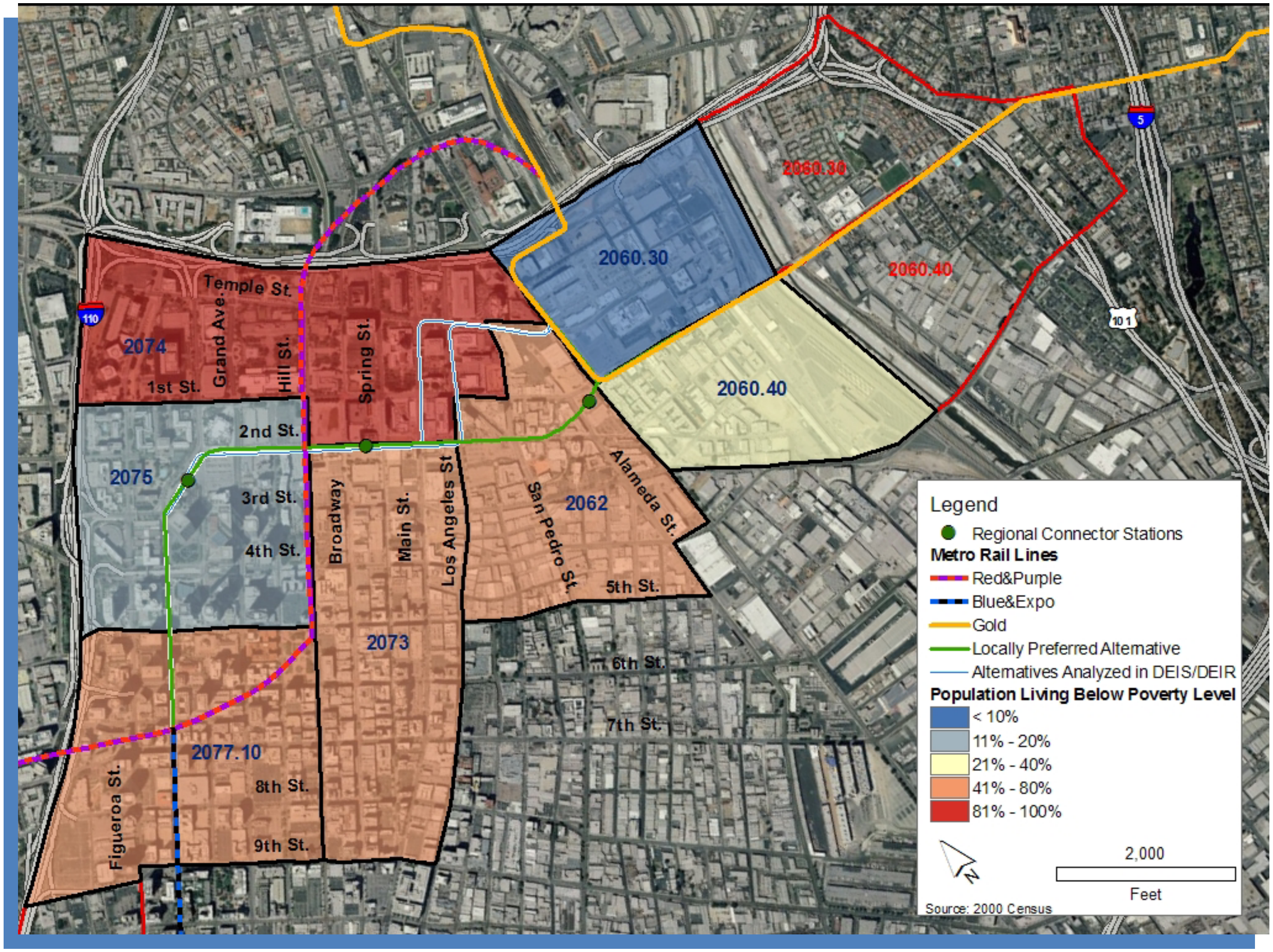
Source: U.S. Census Bureau, Summary File 3, 2000

Figure 4.17-5. Ethnicity, Other Races Population in Study Area



Source: U.S. Census Bureau, Summary File 3, 2000

Figure 4.17-6. Ethnicity, Hispanic Population in Study Area



Source: U.S. Census Bureau, Summary File 3. 2000

Figure 4.17-7. Percentage Population Living Below Poverty Level in Study Area

Limited English Proficiency

Based on 2000 Census data, approximately 30 percent of households in the study area were linguistically isolated. This means that all members in the household over age five either spoke English poorly or not at all. The percentage of LEP population in the study area was substantially higher than the County (16 percent) but lower than the City (33 percent). Approximately 63 percent of the linguistically isolated population (1,804 persons) in the study area spoke an Asian or Pacific Island language. Approximately 35 percent (971 persons) spoke Spanish, Japanese, and Korean. During both the Draft and Final EIS/EIR studies, Spanish, Korean, and Japanese translators were available at all public meetings. In addition, all printed outreach materials were also translated into these languages.

2008 Downtown Demographic Study

According to the *Downtown Demographic Study (2008)* conducted by the Downtown Center Business Improvement District, the ethnic composition of the downtown area changed from 17 percent white in 2000 to 54 percent White in 2008, 35 percent Hispanic in 2000 to 17 percent Hispanic in 2008, and from 19 percent African American in 2000 to eight percent African American in 2008. Overall, minority percentage changed from 83 percent in 2000 to 46 percent in 2008. Median Household income increased from $15,637 in 2000 to $96,200 in 2008. Table 4.17-2 compares data from the Downtown Demographic Study to data for both the City and the County of Los Angeles from the 2008 U.S. Census American Community Survey. While the 2000 Census data indicated that the low-income and minority populations in the study area were meaningfully greater than the City and County of Los Angeles, this more recent data no longer supports that conclusion.

Table 4.17-2. Summary of Demographic Characteristics – Downtown Comparison to City and County of Los Angeles (Year 2008 Data)

Characteristic	Downtown Demographic[a]	County of Los Angeles[b]	City of Los Angeles[b]
Total Population (persons)	40,000	9,862,049	3,803,383
Median Household Income	$96,200	$55,499	$48,882
Minority Percentage	46%	71%	71%

Sources:
[a] *2008 Downtown Demographic Study, Downtown Center Business Improvement District*
[b] *U.S. Census Bureau, 2008 American Community Survey*

Field Studies

The year 2000 Census data does not reflect the demographic and land use shifts that have occurred in downtown Los Angeles during the last ten years. 2000 Census data indicated that residents in each downtown tract were mostly low-income and racial minorities, though not ethnically homogenous. Field analysis undertaken for the Regional Connector project revealed that the downtown population through the Financial District and Bunker Hill areas is becoming more affluent and the percentage of minorities is decreasing as evidenced by the 2008 Downtown Demographic Study. Field analysis methods included walking the corridor and taking note of existing and new development. Over the last ten years, there have been many residential lofts created either by converting historic buildings, constructing new buildings, or converting apartment buildings to condominiums.

In addition to the proposed project alignments, the locations of truck haul routes with respect to environmental justice populations were also evaluated in the field. The proposed truck haul routes would travel through industrial areas directly to the freeway or along downtown streets. Environmental justice populations were not found in these areas.

The most visible minority community in the study area is Little Tokyo. According to the Little Tokyo Service Center (LTSC), the current population of Little Tokyo is approximately 2,300 persons. The demographic character of Little Tokyo is approximately 45 percent Japanese, 34 percent Korean, 8 percent White, 5 percent Chinese, 4 percent Hispanic or Latino, 2 percent Black or African American, 1 percent other Asian, and 1 percent other (LTSC 2009).

Like the rest of the study area, Little Tokyo contains a mix of income levels and ethnicities. However, it is one of only three remaining Japantowns in the United States, and is a historic cultural center of national importance. Prior to World War II, Little Tokyo was the largest Japanese American community in the country. Its Japanese American population has since decreased in size and most of the Japanese American population has migrated to the suburbs, but Little Tokyo remains a historic and cultural focal point for Japanese Americans both in Los Angeles and throughout the United States. It houses important cultural institutions, such as the Japanese American National Museum (JANM), and a portion of the neighborhood is designated as a historic district on the National Register of Historic Places. Impacts to Little Tokyo would affect not only local residents, but also the cultural footings of Japanese Americans nationwide. Comments received during scoping emphasized this unique national significance. As such, the environmental justice analysis focuses heavily on impacts to Little Tokyo.

4.17.3 Environmental Impacts/Environmental Consequences

The USDOT Order defines a disproportionately high and adverse effect on minority and low-income populations as “an adverse effect that:

(1) is predominantly borne by a minority population and/or a low-income population, or

(2) will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.”

In assessing a transit improvement project’s compliance with Executive Orders 12898 and 13166 regarding environmental justice and LEP populations, there are three major considerations:

- Whether the project provides transit service equity.
- Whether any potential adverse impacts during either construction or operations of the project would be disproportionately borne by low-income and minority communities.
- Whether low-income and minority communities have had opportunities to actively participate in the planning of the project in a manner to shape route alignment alternatives, design elements, or other project features that would minimize or avoid impact to their community.

The environmental justice impacts and consequences discussed in the following sections were determined using the above guidance. This section discusses the environmental topics where adverse impacts would occur and then determines if the adverse impact disproportionately affects an environmental justice population. If so, mitigation measures are discussed and the level of impact after mitigation is noted. Table 4.17-3 includes a summary of the adverse environmental justice impacts for all of the alternatives considered.

Field reconnaissance and extensive ongoing public outreach efforts have confirmed the change in demographics within the study area. Environmental justice populations in the study area declined between 2000 and 2008 (Downtown Demographic Study 2008). Field work performed for the Draft EIS/EIR found the most concentrated minority population located in Little Tokyo. Environmental justice populations (LEP, low-income, minority, elderly, etc.) elsewhere along the alignment were not observed either through more recent demographic data or field survey to be meaningfully greater than the surrounding areas. This was also confirmed by input received during the extensive public outreach process conducted for both the Draft and Final EIS/EIR. Due to its minority concentration as well as the cultural and historic significance of the community, Little Tokyo is the only geographic area and population considered an environmental justice population in the study area for the purposes of this analysis.

To address issues raised by the Little Tokyo community during and after scoping for the Draft EIS/EIR, Metro assisted the community in establishing the Little Tokyo Working Group (LTWG). At the group's request, Metro also provided funding for a consultant to assist the community in understanding the potential project impacts in order to develop mitigation that would be meaningful to the community. More detail about the working group may be found below in Section 4.17.3.5, LPA impacts, and in Section 4.17.4.2, Mitigation Measures Suggested by the LTWG. Additional demographic information about the study area and details regarding outreach activities conducted in Little Tokyo are available in Chapter 7, Public and Agency Outreach, Appendix EE, Environmental Justice Technical Memorandum, and summarized in this section.

Table 4.17-3. Summary of Adverse Environmental Justice Impacts

Topic	No Build	TSM	At-Grade Emphasis LRT	Underground Emphasis LRT	Locally Preferred Alternative
Transit Service Equity	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate
Traffic Circulation	Not Disproportionate	Not Disproportionate	Not Disproportionate After Mitigation	Disproportionate	Not Disproportionate After Mitigation
Parking	Not Disproportionate	Not Disproportionate After Mitigation	Not Disproportionate After Mitigation	Not Disproportionate After Mitigation	Not Disproportionate After Mitigation
Land Use	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate
Displacement	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate After Mitigation	Not Disproportionate After Mitigation
Community, Neighborhood	Not Disproportionate	Not Disproportionate	Not Disproportionate After Mitigation	Disproportionate	Not Disproportionate After Mitigation
Visual and Aesthetics	Not Disproportionate	Not Disproportionate	Disproportionate	Disproportionate	Not Disproportionate After Mitigation
Air Quality	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate
Noise and Vibration	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate After Mitigation	Not Disproportionate After Mitigation
Ecosystems	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate
Geotechnical	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate
Water	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate
Energy	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate

Table 4.17-3. Summary of Adverse Environmental Justice Impacts (continued)

Topic	No Build	TSM	At-Grade Emphasis LRT	Underground Emphasis LRT	Locally Preferred Alternative
Climate Change	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate
Historic	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate
Parklands, Community Facilities	Not Disproportionate	Not Disproportionate	Not Disproportionate After Mitigation	Not Disproportionate After Mitigation	Not Disproportionate After Mitigation
Economic, Fiscal	Not Disproportionate	Not Disproportionate	Not Disproportionate After Mitigation	Not Disproportionate After Mitigation	Not Disproportionate
Safety, Security	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate	Not Disproportionate

Source: TAHA, 2010; CDM 2011

4.17.3.1 No Build Alternative

Under the No Build Alternative, transit infrastructure investment would be limited to improvements planned in the 2009 Metro Long Range Transportation Plan (LRTP). By 2035, several new Metro rail lines would exist and bus services would have been reorganized and expanded to connect with these rail lines. The transit network within the study area would otherwise be largely the same as it is now. Compared to the build alternatives, including the LPA, transit accessibility and mobility would not improve.

The No Build Alternative would have effects on traffic congestion, air quality, and energy but these effects would extend across the region and would not disproportionately fall upon the Little Tokyo community or other environmental justice populations. Although some congestion relief would occur under the No Build Alternative with transit improvements planned in the Metro 2009 LRTP, traffic congestion is expected to increase in the study area. Air quality across the region would be adversely affected by increased congestion. Increased Vehicle Miles Traveled (VMT) would result in increased automobile fuel consumption throughout the study area and region. All communities, regardless of minority status or income, would be affected by these potential impacts to traffic congestion, air quality, and energy.

The No Build Alternative would not involve new infrastructure and therefore would not substantially change conditions with respect to parking; land use; visual resources or aesthetics; noise and vibration; water quality; climate change; ecosystems and biological resources; geotechnical/subsurface/seismic/hazardous materials; historic, archaeological, or paleontological resources; parklands and community facilities; economic vitality and employment opportunities; and safety and security. The No Build Alternative would not involve any right-of-way purchases and therefore would not involve any displacements or relocations.

The No Build Alternative would not affect communities and neighborhoods because it would not involve street closures or result in disproportionate adverse impacts pertaining to community cohesion, access, or new physical barriers in the community.

The potential construction and operational impacts discussed above are not disproportionately adverse to environmental justice populations.

4.17.3.1.1 Construction Impacts

No transit project would be constructed as part of the No Build Alternative. No direct, indirect, or cumulative disproportionate adverse impacts to environmental justice populations from construction would occur.

4.17.3.1.2 Operational Impacts

Transit Service Equity

The No Build Alternative would maintain local bus and rail transit in the study area. The No Build Alternative would not increase connectivity to regional mass transit as the build alternatives, including the LPA; therefore, low-income and minority populations in the study area may not have improved access to jobs and services. Traffic congestion throughout the region is anticipated to increase. Like automobile traffic, current transit services would be impacted by this congestion. This effect would occur throughout the study area and the Los Angeles region, and would not occur disproportionately in Little Tokyo. Therefore, the No Build Alternative would not result in direct, indirect, or cumulative disproportionate adverse impacts to environmental justice populations with respect to transit service equity.

The topics mentioned in this section would either affect the study area equally or there would not be adverse effects, therefore, there would not be disproportionate adverse impacts to environmental justice populations. As such, the No Build Alternative would not have direct, indirect, or cumulative disproportionate adverse impacts to environmental justice populations with respect to these topics.

4.17.3.1.3 NEPA Finding

The No Build Alternative would not result in disproportionate adverse effects to environmental justice populations.

4.17.3.1.4 CEQA Determination

CEQA does not have thresholds of significance specific to environmental justice.

4.17.3.2 TSM Alternative

The TSM Alternative would link the 7th Street/Metro Center Station and Union Station with two new express shuttle bus lines. These buses would run frequently, especially during peak hours. Additionally, like the No Build Alternative, other, unrelated transit projects would be constructed in the region.

Construction under the TSM Alternative would be minimal (new bus stops and signage). Typical construction methods for the minor work needed for bus stop installation would be used. Bus stops would use the existing right-of-way. Extended street closures would be unnecessary; therefore, mobility would not be limited. Construction impacts would not occur disproportionately to environmental justice populations within the study area.

There are already numerous transit lines in the study area and adding two new lines and new bus stops would not substantially change conditions with respect to land use; visual resources or aesthetics; noise and vibration; water quality; climate change; ecosystems and biological resources; geotechnical/subsurface/seismic/hazardous materials; historic, archaeological, or paleontological resources; parklands and community facilities; and economic and fiscal. The TSM Alternative would not involve any displacements or relocations. The potential construction and operational impacts related to remaining topical areas are discussed below.

Transit Service Equity

This section discusses the operational impacts of the TSM Alternative with respect to transit service equity. The TSM Alternative would maintain local bus and rail transit in the study area and add new shuttle bus lines that would serve Little Tokyo and low-income communities in the study area. The TSM alternative would not increase connectivity to regional mass transit as much as the build alternatives, including the LPA; therefore, low-income and minority populations in the study area may not have improved access to jobs and services. Traffic congestion throughout the region is anticipated to increase. Like automobile traffic, current transit services would be impacted by this congestion. This effect would occur throughout the study area and the Los Angeles region, and would not occur disproportionately in Little Tokyo. Therefore, the TSM Alternative would not result in direct, indirect, or cumulative disproportionate adverse impacts to environmental justice populations with respect to transit service equity.

Traffic Circulation

This section discussed the operational traffic impacts of the TSM Alternative. Traffic circulation impacts are measured by changes to intersection performance. Only two of the eight intersections adversely affected in the AM peak hour and one of the nine intersections adversely impacted in the PM peak hour would be located in Little Tokyo. There may be increased delays for vehicular traffic if new buses are given signal priority, but this would also occur evenly throughout the study area. There would not be a disproportionate adverse impact to environmental justice populations.

Parking

This section addresses the operational impacts of the TSM Alternative with respect to parking. The TSM Alternative would result in the permanent loss of up to 24 on-street parking spaces. Parking spaces would be lost from installation of new bus stops on 2nd Street between Hill Street and Central Avenue. Up to 12 of the lost spaces would be in Little Tokyo where the community has expressed concern over parking loss. Considering half of the lost parking spaces would be located in Little Tokyo, this alternative would result in a disproportionate adverse impact in regards to parking.

Mitigation measures in Section 4.17.4 of the Draft EIS/EIR have been proposed to address potential parking impacts. For example, prior to construction, Metro would conduct a parking needs assessment in Little Tokyo. If demand exceeds supply, Metro would provide replacement parking for spaces lost as a result of the project and would work with Little Tokyo and surrounding communities to show visitors and residents where parking is available. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Community and Neighborhood

This section examines the potential for community and neighborhood impacts from operation of the TSM Alternative. The TSM Alternative would not affect communities and neighborhoods because it would not involve street closures or result in disproportionate adverse impacts pertaining to community cohesion, access, or new physical barriers in the community. Construction of new bus stops and signage would not impact the viability of neighborhoods.

Air Quality

Operation of the TSM Alternative would have effects on traffic congestion and circulation, and air quality but these effects would extend across the region and would not disproportionately fall upon the Little Tokyo community or other environmental justice populations. The NOx emissions increase would exceed the NEPA significance threshold; however, the alternative would result in substantial reductions in peak daily emissions of CO, SO_2, and PM_{10}. To a limited extent, the enhanced connection across the study area provided by the TSM Alternative would increase transit ridership on connecting rail lines and reduce vehicle trips into the downtown area. This would provide some modest beneficial effects on traffic congestion and air quality. Adverse air quality impacts associated with additional pollutants emitted by new buses would be spread over the entire region and thus would not result in a disproportionate impact to environmental justice populations.

Safety and Security

This section discusses the operational impacts of the TSM Alternative with respect to safety and security. The TSM Alternative would change street crossing times along the alignment including Little Tokyo and impact safety for elderly pedestrians. However, these effects would be spread throughout the entire study area. In addition, Metro would coordinate with the Los Angeles Department of Transportation (LADOT) regarding the signalization of shuttle service along the alignment including Little Tokyo. Metro would conduct a pedestrian education program in Little Tokyo focusing on transit safety for the new shuttles. Disproportionate adverse impacts to environmental justice populations in regards to safety and security are not anticipated.

Beneficial Effects

The TSM Alternative would have beneficial effects with respect to energy, climate change, economic vitality, and employment opportunities. The increase in transit would reduce VMT and energy consumption. The new buses would run on compressed natural gas which would result in a one percent increase in energy consumption, but overall the TSM Alternative is expected to result in a decrease in energy consumption. Emissions from the new buses would have a regional, not a local, effect on climate change. The TSM Alternative would be consistent with SB 375 because it would increase regional transit capacity and decrease emissions from passenger vehicles. The increase in transit would also increase access to Little Tokyo and provide beneficial effects on economic vitality and employment opportunities.

4.17.3.2.1 NEPA Finding

Construction under the TSM Alternative would be minimal (new bus stops and signage). Typical construction methods for the minor work needed for bus stop installation would be used. Bus stops would use the existing right-of-way. Extended street closures would be unnecessary; therefore, mobility would not be limited. No direct, indirect, or cumulative disproportionate adverse construction-related impacts to environmental justice populations would occur.

Disproportionate impacts to environmental justice populations would occur with respect to parking. Mitigation measures to address these impacts are summarized above and presented in Section 4.17.4 of the Draft EIS/EIR. Disproportionate adverse impacts would not remain after mitigation. The remaining operational impacts mentioned above would either affect the study area equally or have no adverse effects; therefore, there would not be disproportionate impacts to environmental justice populations. As such, after parking mitigation, the TSM Alternative would not have direct, indirect, or cumulative disproportionate adverse impacts.

4.17.3.2.5 CEQA Determination

CEQA does not have thresholds of significance specific to environmental justice.

4.17.3.3 At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative would provide a direct connection from the existing underground 7th Street/Metro Center Station to the Metro Gold Line at Temple and Alameda Streets with three new station locations. This alignment includes a combination of underground and at-grade segments, with 46 percent of the route underground.

In areas designated for cut and cover construction, the top two to three feet of the roadway would be removed and decking would be installed over an approximate three- to four-month period. Construction of the stations would continue underground while traffic operates normally on the decking. This procedure would require temporary off-peak, nighttime or weekend street closures to install the decking.

Construction of the proposed Alameda Street underpass at Temple Street in Little Tokyo would also result in the temporary reduction of roadway capacity for extended periods of time. Adjacent to the Alameda Street underpass, the JANM tour bus loading zone on the west side of the street would be temporarily relocated for the duration of the construction period. In Little Tokyo, disruption to traffic along Alameda and Temple Streets would directly affect cultural institutions such as the JANM, the Go For Broke Monument, the Museum of Contemporary Art (MOCA), and other businesses during the excavation and construction of the Alameda Street underpass and the potential pedestrian bridge. The concentration of construction activities, including large infrastructure elements such as the Alameda Street underpass and pedestrian bridge, combined with the longer duration of construction and potential impacts to numerous cultural institutions occur only in Little Tokyo and are therefore disproportionate when compared to the remainder of the alignment.

The At-Grade Emphasis LRT Alternative wound not result in adverse impacts related to transit service equity, land use, displacements and relocation, air quality, noise and vibration, ecosystems, water quality, climate change, and historic resources and therefore would not have disproportionately adverse impacts to environmental justice populations for these disciplines. The construction and operational impacts of additional topical areas are discussed below.

Geotechnical/Subsurface/Seismic/Hazardous Materials

This section discusses the construction impacts of the At-Grade Emphasis LRT Alternative with respect to geotechnical/subsurface/seismic/hazardous materials. Construction impacts related to geotechnical/subsurface/seismic/hazardous materials would also be most likely to occur along the underground portions of the alignment. The underground portions of the alignment are located in the Bunker Hill and Financial District communities and the excavation for the underpass at Temple and Alameda Streets. Underground alignments may be subject to intrusion of subsurface gases or contaminated groundwater, but mitigation measures have been developed to address these impacts. In addition, these potential impacts would occur throughout the underground and excavated portions of the alignment and would not occur disproportionately in the Little Tokyo area.

Traffic Circulation

This section discusses the construction and operational impacts of the At-Grade Emphasis LRT Alternative on traffic circulation. Construction would result in temporary closure of several streets in the study area. Alameda Street is a major arterial that provides access to Little Tokyo and it could be closed for extended periods of time for construction of the underpass. In addition, 2nd Street would be temporarily closed from Bunker Hill to the western border of Little Tokyo. Traffic would likely divert to 1st Street, which is already congested in Little Tokyo. Impacts to traffic circulation as a result of the intensity and duration of construction, particularly of the Alameda Street underpass at Temple Street, would result in disproportionate adverse impacts to Little Tokyo and the JANM.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.1 of the Draft EIS/EIR. For example, Metro would work with the community to create signage showing detour routes. This would help drivers and pedestrians maintain access to Little Tokyo businesses. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Operation of the At-Grade Emphasis LRT Alternative would have effects on traffic circulation. Traffic circulation impacts are measured by changes to intersection performance. Only four of the 18 intersections adversely affected in the AM peak hour and four of the 26 intersections adversely impacted in the PM peak hour would be located in Little Tokyo. Traffic impacts would occur throughout the entire study area and would not result in disproportionate impacts to environmental justice populations.

Parking

This section describes the construction and operational impacts with respect to parking. Existing on-street parking spaces and loading stalls would be temporarily removed during construction. This would potentially impact parking space and loading areas on the east and west sides of Flower Street, the loading areas on the east side of Main and Los Angeles Streets, and the parking spaces on the south side of Temple Street. The track construction and permanent street configuration along 2nd Street would result in the temporary removal of several parking and loading stalls. Adjacent to the Alameda Street underpass, the JANM tour bus loading zone on the west side of the street would be temporarily relocated for the duration of the construction period.

Although impacts to parking as a result of construction would occur elsewhere along the alignment, impacts to parking in Little Tokyo were of great concern to this environmental justice population. Many other parking options are available elsewhere along the alignment whereas in Little Tokyo parking is perceived as being very limited. Construction would inhibit access to parking lots like the one at the southwest corner of the intersection of Alameda and Temple Streets. Access to this parking lot would be further inhibited once Alameda Street is closed for underpass construction. Inhibiting access to the parking lot and on-street parking would have disproportionate adverse impacts to Little Tokyo and the JANM because of the limited parking options available in Little Tokyo as compared to the remainder of the study area. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.1 of the Draft EIS/EIR. As an example, parking spaces temporarily displaced by construction would be either temporarily replaced nearby in the Nikkei Center lot or signage would be created indicating locations of nearby parking structures and parking lots. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Regarding operation, the At-Grade Emphasis LRT Alternative would result in the permanent loss of up to 51 on-street parking spaces, 29 on-street loading spaces, and 77 off-street spaces. Of these, 33 off-street spaces, 23 on-street parking spaces, and five on-street loading spaces are in Little Tokyo. Both on- and off-street parking is limited in Little Tokyo. The Little Tokyo community has expressed concern over potential loss of parking.

The removal of parking spaces would adversely impact businesses in the study area. Business revenue would drop if vehicular access to businesses is reduced. New transit would provide increased pedestrian access to businesses.

Transit projects compensate for loss of parking because they reduce vehicle traffic and the demand for parking. This alternative would increase non-automobile, transit access to the study area. Therefore, the proposed At-Grade Emphasis LRT Alternative would provide new access to the area despite potential adverse impacts to parking. Still, disproportionate direct, indirect, and cumulative impacts to environmental justice populations in regards to parking would occur.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.2 of the Draft EIS/EIR. For example, prior to construction, Metro would conduct a parking needs assessment in Little Tokyo. If demand exceeds supply, Metro would provide replacement parking for spaces lost as a result of the project and would work with Little Tokyo and surrounding communities to show visitors and residents where parking is available. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Community and Neighborhoods

This section addresses the construction, operational, and cumulative impacts of the At-Grade Emphasis LRT Alternative with respect to community and neighborhood resources. Construction of the At-Grade Emphasis LRT Alternative would temporarily inhibit, but not eliminate, access to the JANM. Access to the museum would be decreased during construction of the Alameda Street underpass and the potential pedestrian bridge. Loading spaces along Alameda Street would be temporarily displaced, and congestion would increase on 1st Street when 2nd Street is closed. Overall, access to the building would be maintained. Access to the JANM would be inhibited for a longer duration of construction, due to the Alameda Street underpass, as compared to other buildings elsewhere in the study area that would experience a similar impact.

Construction of the At-Grade Emphasis LRT Alternative would result in temporary closure of several streets near Little Tokyo. Although temporary, these closures would inhibit access to businesses and other cultural resources in Little Tokyo like the Go For Broke Monument and MOCA. Impacts to businesses would affect the entire community.

In particular, construction of the Alameda Street underpass and potential pedestrian bridge would result in disproportionate adverse impacts to Little Tokyo and the JANM. A closure of

Alameda Street here could last from 24 to 36 months and access to Little Tokyo from Alameda Street would be limited during this time. Alameda Street is one of the main arterials providing access to Little Tokyo. Due to the impacts to the JANM as well as other cultural resources, inhibited access to businesses, and the duration of construction of the Alameda Street underpass, construction impacts would result in disproportionate adverse impacts to environmental justice populations.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.1 of the Draft EIS/EIR. Mitigation measures for community and neighborhood impacts during construction would include maintenance of alternate access to community facilities, community outreach and early notification regarding street and sidewalk closures and detours, and assistance for businesses to maintain visibility during construction. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Regarding operation, this alternative would not adversely impact the cohesion or identity of Little Tokyo. However, this alternative would displace several on-street parking spaces in Little Tokyo. Increased access to and mobility within the study area would be a beneficial impact to the study area. This increased access through transit would represent a benefit.

The Alameda Street underpass at Temple Street would provide enough frontage road to continue to permit deliveries to the JANM along Alameda Street. Bus loading areas on Alameda Street in front of the museum would be removed. Other bus loading spaces would be available adjacent to the museum on 1st Street. Additional bus loading spaces would be created.

A loss of parking under the At-Grade Emphasis LRT Alternative would result in indirect disproportionate impacts to environmental justice populations because the majority of displaced parking would be in Little Tokyo. Increased transit access in the study area may generate a new benefit compared to the loss of parking, but Little Tokyo would be adversely impacted. Local businesses that rely on paid parking lots and on-street parking would be adversely impacted. The community of Little Tokyo has expressed concern over parking loss and the corresponding effect on businesses. Therefore, indirect disproportionate adverse impacts to the Little Tokyo community would occur.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.2 of the Draft EIS/EIR and are also noted above in the parking discussion. Disproportionate adverse impacts would not remain after mitigation.

Approximately 13 new land development construction projects are anticipated in the study area between now and 2014. An additional 54 new land development construction projects are anticipated between 2014 and 2019. Twelve major renovation projects are anticipated between now and 2014, and eight are expected between 2014 and 2019. Several projects would occur in Little Tokyo or the close vicinity and would remove public paid-parking lots. Thus, parking loss under the At-Grade Emphasis LRT Alternative would contribute cumulatively to parking loss in Little Tokyo. Loss of parking would result in cumulative disproportionate adverse impacts.

Visual and Aesthetic Resources

This section summarizes the construction and operational impacts with respect to visual and aesthetic resources. Most construction activities required for this alternative would occur outside Little Tokyo. However, several large components would occur in and near Little Tokyo, including the Alameda Street underpass and a potential pedestrian bridge. This construction would result in disproportionate adverse visual impacts to Little Tokyo and the JANM because of the scale and duration of the construction. Construction equipment and work areas in this area would be larger than most laydown areas in the alignment. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.1 of the Draft EIS/EIR. The pedestrian bridge would be constructed in a minimally obtrusive manner. However, construction of a bridge structure would be a unique visual disruption in Little Tokyo. Thus, temporary visual impacts from bridge construction may be significant and unavoidable. Having larger construction staging areas in Little Tokyo than in other parts of the study area may also be unavoidable, given the complexity of the LRT infrastructure to be built in Little Tokyo. Disproportionate adverse impacts would remain after mitigation.

Regarding operation, the At-Grade Emphasis LRT Alternative would run underground through the Financial District and at-grade in Bunker Hill, the Civic Center, and on the periphery of Little Tokyo. New visual elements such as pedestrian bridges, catenary poles and overhead wires, and stations would be created in the study area. Two major visual elements of the At-Grade Emphasis LRT Alternative, the Alameda Street underpass at Temple Street and the potential pedestrian bridge at Temple and Alameda Streets, would be located adjacent to Little Tokyo. This would result in a disproportionate adverse visual impact to environmental justice populations.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.2 of the Draft EIS/EIR. As noted above, disproportionate adverse visual impacts of the potential pedestrian overpass at Temple and Alameda Streets would remain after mitigation, and would be unavoidable to environmental justice populations.

Parklands and Other Community Facilities

This section discusses the construction and operational impacts of this alternative to parklands and other community facilities. During construction of the At-Grade Emphasis LRT Alternative, street closures would inhibit access to facilities adjacent to construction sites, such as the Little Tokyo Branch Public Library, MOCA, JANM, and the Go For Broke Monument, in addition to other facilities throughout the study area. Automobile and pedestrian detours would be needed. Annual festivals in the downtown area would also be temporarily affected. Emergency service response times would also be affected by the temporary street closures and detours. Due to the number of community facilities located in Little Tokyo potentially impacted by construction, as well as the intensity and duration of construction in Little Tokyo, construction impacts would be adverse and disproportionate.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.1 of the Draft EIS/EIR. For example, Metro would maintain adequate access to businesses and community facilities near the alignment and would coordinate with LADOT to create signage that would indicate new ways to access businesses affected by construction. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Regarding operation, the At-Grade Emphasis LRT Alternative would eliminate uncontrolled, mid-block left turns. This would impede access to community facilities on 2nd Street, Los Angeles Street, and Main Street. Disproportionate adverse impacts to community facilities would occur, but the increased access provided by the LRT would represent a benefit.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.2 of the Draft EIS/EIR. For example, Metro would coordinate with LADOT to create signage that would indicate new ways to access businesses affected by new turning restrictions necessitated by the At-Grade Emphasis LRT Alternative. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Economic and Fiscal

This section describes the economic and fiscal impacts resulting from construction. Construction of the At-Grade Emphasis LRT Alternative would result in temporary closure of several streets in the study area. Due to the duration of construction, construction of the Alameda Street underpass would result in disproportionate adverse impacts to Little Tokyo and the JANM. A closure of Alameda Street here could last from 24 to 36 months and access to Little Tokyo from Alameda Street would be limited during this time. Alameda Street is one of the main arterials providing access to Little Tokyo.

2nd Street would be closed for construction from Bunker Hill to the western border of Little Tokyo. Traffic would likely divert to 1st Street, which is already heavily congested in Little Tokyo. Construction impacts would adversely affect the economic viability of some businesses in Little Tokyo. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts.

Mitigation measures to address these impacts are presented in Section 4.17.4.3.1 of the Draft EIS/EIR. For example, Metro would provide measures to assist business owners significantly impacted by construction (temporary parking, marketing programs, and other measures as appropriate), and replacement parking locations. Disproportionate adverse impacts would not remain after mitigation.

Safety and Security

This section discusses the operational impacts to safety and security. Operation of the At-Grade Emphasis LRT Alternative would result in adverse impacts to pedestrian safety and security. This alternative would increase potential conflicts between pedestrians or vehicles and trains. Near Little Tokyo, particularly as the alignment crosses Alameda Street at Temple Street, there would be potential pedestrian train conflicts involving the elderly population. These safety and security issues are applicable to light rail regardless of the socioeconomic or ethnic status of the surrounding community.

In the Little Tokyo area, Metro would potentially build a pedestrian bridge, across Alameda Street, near the Little Tokyo/Arts District Station. This bridge would separate pedestrian movements from LRT and motorized vehicle movements. If the community opts against construction of the pedestrian bridge, Metro would use other urban design methods to enhance pedestrian safety. This would include creating pedestrian queuing and refuge areas around proposed stations. Adding wide crosswalks would also enhance pedestrian mobility and safety. No disproportionate safety and security impacts to environmental justice populations would occur.

Beneficial Effects

The At-Grade Emphasis LRT Alternative would have beneficial effects with respect to transit service equity, air quality, energy, climate change, economic vitality, and employment opportunities. While this alternative would not create a new station in Little Tokyo, it would connect to the Metro Gold Line, which currently serves Little Tokyo and it would expand the number of destinations reachable from the Little Tokyo/Arts District Station without transfers. This alternative would have direct, beneficial impacts to transit equity. The increase in transit would reduce VMT providing beneficial effects on air quality and energy consumption. The At-Grade Emphasis LRT Alternative would be consistent with SB 375 because it would increase regional transit capacity and decrease emissions from passenger vehicles. The increase in transit would also increase access to Little Tokyo and provide beneficial effects on economic vitality and employment opportunities.

4.17.3.3.1 NEPA Finding

From an environmental justice standpoint, the greatest impacts would occur during construction. Disproportionate adverse construction impacts to environmental justice populations would occur with respect to traffic circulation; parking; community and neighborhoods; visual and aesthetic resources; community facilities; and economic vitality. Mitigation measures to address these impacts are presented in Section 4.17.4.3.1 of the Draft EIS/EIR and summarized above.

Disproportionate operational impacts to environmental justice populations would occur with respect to parking; community and neighborhoods; visual and aesthetic resources; and community facilities. Mitigation measures to address these impacts are presented in Section 4.17.4.3.2 of the Draft EIS/EIR and summarized above.

The following adverse impacts of the At-Grade Emphasis LRT Alternative would weigh disproportionately on environmental justice populations under this alternative:

- Parking loss in Little Tokyo
- Decreased access to public facilities during operations
- Construction-related, decreased traffic circulation, parking, access to community facilities, and changed visual resources

- Construction-related, decreased economic and fiscal viability
- Visual impacts of the potential pedestrian overpass at Temple and Alameda Streets

Disproportionate adverse impacts to environmental justice populations would not remain after mitigation, except the visual impacts of the potential pedestrian overpass at Temple and Alameda Streets, which would be unavoidable.

4.17.3.3.2 CEQA Determination

CEQA does not have thresholds of significance specific to environmental justice.

4.17.3.4 Underground Emphasis LRT Alternative

The Underground Emphasis LRT Alternative would connect 7th Street/Metro Center Station and the Metro Gold Line with a new light rail connection that would be mostly underground. This alternative would not reduce existing bus service in the study area.

The cut and cover construction would be similar to that described for the At-Grade Emphasis LRT Alternative. Remaining portions of the underground portion of the alignment would be constructed using TBM. The installation of TBMs would occur either in the Little Tokyo or Bunker Hill areas. The Alameda Street underpass would be located at Alameda and 1st Streets under the Underground Emphasis LRT Alternative. Construction of the Underground Emphasis LRT Alternative would result in temporary closure of several streets in the study area. To minimize conflicts between rail, vehicular, and pedestrian traffic, and to minimize delays at the intersection of Temple and Alameda Streets, a vehicular underpass and a pedestrian overpass are proposed along Alameda Street to route through traffic beneath the rail tracks and Temple Street traffic.

Unlike other street closures within the study area, closure of Alameda Street would be long-term. Alameda Street is a major arterial providing access to Little Tokyo. In addition, 2nd Street would be temporarily closed between Alameda Street and Central Avenue. Traffic would likely divert to 1st Street which is already congested in Little Tokyo. In Little Tokyo, disruption to traffic along Alameda and Temple Streets would directly affect cultural institutions such as the JANM, the Go For Broke Monument, the MOCA, and other businesses during the excavation and construction of the Alameda Street underpass and the potential pedestrian bridge. The concentration of construction activities, including large infrastructure elements such as the Alameda Street underpass and pedestrian bridge and TBM insertion site, combined with the longer duration of construction and potential impacts to numerous cultural institutions would occur only in Little Tokyo and are therefore disproportionate when compared to the remainder of the alignment.

Many construction-related effects would occur equally along the entire alignment and would not disproportionately impact Little Tokyo. These effects include transit service equity, air quality, climate change, noise and vibration, and safety and security. There would be no construction-related effects on historic buildings in Little Tokyo since design measures would be implemented to protect historic resources. Construction would require the use of some parcels in Little Tokyo, but these temporary uses would not be incompatible with surrounding land uses and the effects would not be disproportionate.

Operation of the Underground Emphasis LRT Alternative within the Little Tokyo area would not result in impacts with respect to land use; water quality; ecosystems and biological resources; geotechnical/subsurface/seismic/hazardous materials; parklands and other community facilities; and historic, archaeological, or paleontological resources. Underground alignments may be subject to intrusion of subsurface gases or contaminated groundwater, but mitigation measures have been developed to address these impacts. In addition, these potential impacts would occur throughout the entire alignment and would not occur disproportionately in the Little Tokyo area.

Adverse construction-related impacts from the Underground Emphasis LRT Alternative would occur with respect to geotechnical/subsurface/seismic/hazardous materials; water quality; and archaeological and paleontological resources. Underground construction may encounter contaminated groundwater or affect archaeological, paleontological, and other geologic resources. Since the entire alignment would be underground, except for a short segment in Little Tokyo, no disproportionate adverse construction impacts to environmental justice populations would occur.

The construction and operational impacts of remaining topical areas are discussed below.

Traffic Circulation

This section discusses construction and operational impacts to traffic circulation. Construction of the Underground Emphasis LRT Alternative would result in temporary closure of several streets in the study area. In particular, construction of the Alameda Street underpass at 1st Street would result in disproportionate adverse impacts to Little Tokyo and the JANM because of the intensity and duration of construction. Unlike other street closures, closure of Alameda Street would be long-term, unless cut and cover methods are used to construct the underpass. Alameda Street is a major arterial providing access to Little Tokyo. In addition, 2nd Street would be temporarily closed between Alameda Street and Central Avenue. Traffic would likely divert to 1st Street, which is already congested in Little Tokyo. Although construction impacts would be short-term and intermittent, they would result in disproportionate adverse impacts to environmental justice populations.

The same mitigation measures identified for construction impacts under the At-Grade Emphasis LRT Alternative described above would also apply to the Underground Emphasis LRT Alternative. Mitigation measures to address these impacts are also presented in Section 4.17.4.4.1 of the Draft EIS/EIR. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Regarding operation, traffic at a few intersections would be adversely impacted by operations of the Underground Emphasis LRT Alternative. In the AM peak hours, two of the three intersections that would experience new traffic delays are located in the vicinity of Little Tokyo. In the PM peak hours, four of the seven intersections that would experience new traffic delays would be located in and around Little Tokyo. Traffic impacts are anticipated throughout the study area, but the majority would affect the Little Tokyo area. Therefore, disproportionate adverse impacts to environmental justice populations with respect to traffic congestion would occur.

Mitigation measures would address potential impacts to intersection operations by converting or modifying current lane designations, optimizing the signal phasing splits, or providing limited widening if right-of-way is available. Mitigation measures to address these impacts are presented in Section 4.17.4.4.2 of the Draft EIS/EIR. Disproportionate adverse traffic circulation impacts near 1st and Alameda Streets to environmental justice populations would remain after mitigation.

Parking

This section describes the construction, operational, and cumulative impacts to parking. Construction of the Underground Emphasis LRT Alternative would result in temporary displacement of on-street parking. Although on-street parking would be affected elsewhere along the alignment, parking in Little Tokyo is limited in comparison to the varied parking options in other areas of the alignment. Construction would inhibit access to parking lots like the one at the southeast corner of the intersection of Alameda and 1st Streets. Access to this parking lot would be further inhibited once Alameda Street is closed for underpass construction. Inhibiting access to the parking lot and on-street parking would have disproportionate adverse impacts to Little Tokyo and the JANM as compared to elsewhere along the alignment. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts.

The same mitigation measures identified for construction impacts under the At-Grade Emphasis LRT Alternative described above would also apply to the Underground Emphasis LRT Alternative. Mitigation measures to address these impacts are also presented in Section 4.17.4.4.1 of the Draft EIS/EIR. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Regarding operation, the Underground Emphasis LRT Alternative would permanently remove 148 to 281 off-street parking spaces, 26 on-street parking spaces, and three on-street loading spaces. Of these spaces, 139 (49 to 94 percent of the total parking loss) off-street spaces, 13 on-street parking spaces, and the three on-street loading spaces are located in Little Tokyo. Parking opportunities in Little Tokyo are already limited. The Little Tokyo community has expressed the importance of parking to their community. Increased transit use would constitute a benefit.

Removal of off-street parking spaces would indirectly impact businesses in Little Tokyo. Business revenue would decrease if vehicular access to businesses is reduced. New transit would provide increased pedestrian access to businesses and represent a benefit.

Transit projects compensate for loss of parking because they reduce vehicle traffic and the demand for parking. This alternative would increase non-automobile, transit access to the study area. Therefore, this alternative would yield a benefit. Still, disproportionate direct, indirect, and cumulative impacts to parking would occur because of the quantity of spaces affected in Little Tokyo compared to the remainder of the study area.

The same mitigation measures identified for operational impacts under the At-Grade Emphasis LRT Alternative described above would also apply to the Underground Emphasis LRT Alternative. Mitigation measures to address these impacts are also presented in Section

4.17.4.4.2 of the Draft EIS/EIR. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Displacement and Relocation

This section describes the displacements and relocation impacts with respect to construction and operation of the Underground Emphasis LRT Alternative. This alternative would require 18 partial takes, eight full takes, three temporary construction easements, and four permanent underground easements. This alternative would require these properties for traction power substations (TPSS) locations, construction staging, right-of-way, below grade tunneling, and stations. In Little Tokyo, seven full takes would be required. This is a greater impact due to displacement than would be experienced in the rest of the study area. Thus, there would be a disproportionate adverse impact to environmental justice populations associated with displacement.

Displacement of businesses and loss of the commercial space in Little Tokyo would have indirect, disproportionate, adverse impacts to the community. Little Tokyo is a redevelopment area. The Community Redevelopment Agency of the City of Los Angeles (CRA/LA) focuses on redevelopment of commercial areas for economic development. The reduction in physical commercial space would reduce the availability of area where additional development could occur. Therefore, potential for increased economic development in a primarily minority community would be reduced. However, this effect could be reversed by future growth encouraged by the new light rail service.

Mitigation measures to address these impacts are presented in Section 4.17.4.4.2 of the Draft EIS/EIR. As an example, Metro would comply with the Uniform Relocation Assistance and Real Property Acquisition Regulations for Federal and Federally Assisted Programs adopted by the USDOT. All real property acquired by Metro would be appraised to determine its fair market value. Metro would provide affected property holders just compensation not less than the approved appraisal value. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Community and Neighborhoods

This section describes the construction, operational, and cumulative impacts to community and neighborhoods. Construction of the Underground Emphasis LRT Alternative would temporarily inhibit access to the JANM. Loading spaces along Alameda Street would be temporarily displaced, and congestion would increase on 1st Street when 2nd Street is closed. School bus loading zones along 1st Street would be affected by construction-related traffic. While access to the museum would be maintained, access would be decreased during construction of the Alameda Street underpass and potential pedestrian bridge. Similar access issues to cultural resources would not occur elsewhere along the alignment.

Construction of the Underground Emphasis LRT Alternative would result in temporary closure of several streets near Little Tokyo. Although temporary, these closures would inhibit access to businesses in Little Tokyo. Impacts to businesses would affect the entire community. In particular, construction of the Alameda Street underpass would result in disproportionate adverse impacts to Little Tokyo and the JANM because of the scale and duration of construction.

A closure of Alameda Street here could last from 24 to 36 months, and access to Little Tokyo from Alameda Street would be limited during this time. Alameda Street is one of the main arterials providing access to Little Tokyo. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts.

The same mitigation measures identified for construction impacts under the At-Grade Emphasis LRT Alternative described above would also apply to the Underground Emphasis LRT Alternative. Mitigation measures to address these impacts are presented in Section 4.17.4.4.1 of the Draft EIS/EIR. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Construction of the Underground Emphasis LRT Alternative would displace approximately 13 businesses, most of which are in Little Tokyo. Displacement of properties would reduce the stock of commercial space in Little Tokyo. However, transit-oriented development could occur on properties where businesses were displaced. This development would generate additional commercial space and jobs. Since the number of displacements occurs disproportionately in Little Tokyo, compared to elsewhere in the study area, an adverse disproportionate impact to environmental justice populations would occur.

The loss of parking under this alternative would result in indirect disproportionate effects by decreasing business viability. The Little Tokyo community has expressed concern that a loss of parking would hurt businesses crucial to the area's cultural identity. This same concern was not heard from other community stakeholders elsewhere in the study area. The Underground Emphasis LRT Alternative would yield a benefit by increasing transit access. However, local businesses that rely on paid parking lots and on-street parking would be adversely impacted. Indirect, disproportionate, adverse impacts to environmental justice populations would occur due to the loss of parking.

Approximately 13 new construction projects are anticipated in the study area by 2014. Fifty-four new construction projects are planned between 2014 and 2019. Twelve major renovation projects are anticipated by 2014, and eight are anticipated between 2014 and 2019. Several of these projects would occur in Little Tokyo or its close vicinity and would remove public paid-parking lots. As such, parking loss that would occur under the Underground Emphasis LRT Alternative would contribute cumulatively to parking loss in Little Tokyo. Loss of parking would have cumulative, disproportionate, adverse impacts to environmental justice populations.

The Little Tokyo community has also indicated that 1st and Alameda is a key intersection in the neighborhood, and that the proposed underpass and at-grade junction would affect community cohesion. Also, the permanent conversion of the commercial block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street would pose a permanent community impact. These impacts would be disproportionate and adverse to environmental justice populations.

Mitigation measures to address these impacts are presented in Section 4.17.4.4.2 of the Draft EIS/EIR. Regarding parking loss, refer to mitigation measures identified for the At-Grade Emphasis LRT Alternative as noted above. This alternative could result in long-term displacement of commercial space. Displaced commercial space in Little Tokyo could be replaced with high quality commercial development opportunities consistent with Little Tokyo's community identity. This could include a development above the portal near 2nd Street and Central Avenue, or a possible future development at the Nikkei Center. New development would create at least as many jobs as had been displaced. Full mitigation of the community cohesion impacts of the proposed underpass and at-grade rail junction would not be possible. The new light rail service may encourage new growth that would minimize the permanent conversion of the block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street to transit facility use, but it would not necessarily occur at this central location. After mitigation, disproportionately adverse community cohesion impacts of the proposed underpass and at-grade junction at 1st and Alameda Streets, and the permanent conversion of the block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street to transit facility use would remain.

Visual and Aesthetic Resources

This section describes the construction and operational visual and aesthetic impacts. Several large components of construction would occur in and near Little Tokyo including the Alameda Street underpass and potential pedestrian bridge. This construction would result in disproportionate adverse impacts to Little Tokyo and the JANM because of the concentration and duration of construction. Construction equipment and work areas in this area would be larger than most laydown areas in the alignment. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts to environmental justice populations.

The same mitigation measures identified for construction impacts under the At-Grade Emphasis LRT Alternative described above would also apply to the Underground Emphasis LRT Alternative. Mitigation measures to address these impacts are also presented in Section 4.17.4.4.1 of the Draft EIS/EIR. Disproportionate adverse impacts to environmental justice populations would remain after mitigation.

Regarding operation, the majority of the Underground Emphasis LRT Alternative alignment would run below ground. This would minimize impacts to visual resources. Surface elements of the alignment would include station entrances, portals, and potential pedestrian bridges. A portal and potential pedestrian bridge would be located in Little Tokyo. Portal construction in Little Tokyo would remove the majority of structures in the block bounded by Alameda Street, 1st Street, 2nd Street, and Central Avenue. Depending on its final design, the pedestrian bridge could adversely impact the aesthetic character of the area. Disproportionate, adverse impacts to environmental justice populations in regards to visual resources would occur.

To minimize impacts associated with visual resources in Little Tokyo, Metro would design a portal trench. The portal trench would minimize the amount of track and tunnel visible to pedestrians, residences across Alameda Street and Central Avenue, and visitors to the JANM. Metro could build a pedestrian bridge under this alternative. The pedestrian bridge would be constructed to be minimally obtrusive. However, a bridge structure would be a unique visual element in Little Tokyo. Thus, visual impacts from the bridge may be significant and unavoidable. Mitigation measures to address these impacts are presented in Section 4.17.4.4.2 of the Draft EIS/EIR. After mitigation, disproportionately adverse visual and aesthetic impacts to environmental justice populations from the potential pedestrian overpass at 1st and Alameda Streets, which may be perceived as adverse depending upon design, would remain.

Noise and Vibration

This section describes the operational noise impacts. The operation of the Underground Emphasis LRT Alternative would have moderate noise impacts on one sensitive receptor, Savoy, which is a condominium complex in Little Tokyo. No potential noise impacts were identified elsewhere in the study area. This would result in a disproportionate adverse operational noise impact. No direct, indirect, or cumulative disproportionate adverse impacts to environmental justice populations associated with operational vibration are anticipated.

The noise impact would be due to track switches near the intersection of 1st and Alameda Streets. However, a spring-rail or movable frog switch could be used at this location to reduce potential noise by covering the gap in the central part of the switch. Mitigation measures to address these impacts are presented in Section 4.17.4.4.2 of the Draft EIS/EIR. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Parklands and Other Community Facilities

This section describes the construction impacts related to parklands and other community facilities. During construction of the Underground Emphasis LRT Alternative, street closures would inhibit access to facilities adjacent to construction sites, such as the Little Tokyo Branch Public Library and JANM, in addition to other facilities throughout the study area. Automobile and pedestrian detours would be needed. Annual festivals in the downtown area would also be temporarily affected. Emergency service response times would also be affected by the temporary street closures and detours. These construction activities would affect the entire proposed alignment. Cut and cover construction in the Financial District and Bunker Hill areas would require surface excavation along the entire LRT route. However, TBM construction would be used in Little Tokyo on 2nd Street; therefore, access modifications on 2nd Street would be less pronounced and limited to staging areas.

Construction of the proposed 2nd Street station - Los Angeles Street Option would impede access to the Little Tokyo Branch Public Library. Overall, access to the library branch would be maintained. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts to environmental justice populations as the only occurrence of this nature would be in Little Tokyo.

The same mitigation measures identified for construction impacts under the At-Grade Emphasis LRT Alternative described above would also apply to the Underground Emphasis LRT Alternative. Mitigation measures to address these impacts are also presented in Section 4.17.4.4.1 of the Draft EIS/EIR. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Economic and Fiscal

This section describes the construction and operational impacts related to economic and fiscal resources. Construction of the Underground Emphasis LRT Alternative would result in temporary, intermittent closures of several streets in the study area. Construction of the Alameda Street underpass would result in disproportionate adverse impacts to Little Tokyo and the JANM. A closure of Alameda Street here could last from 24 to 36 months, and access to Little Tokyo from Alameda Street would be limited during this time. Alameda Street is one of the main arterials providing access to Little Tokyo. Construction impacts would adversely affect the economic viability of some businesses in Little Tokyo. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts to environmental justice populations.

The same mitigation measures identified for construction impacts under the At-Grade Emphasis LRT Alternative described above would also apply to the Underground Emphasis LRT Alternative. Mitigation measures to address these impacts are also presented in Section 4.17.4.4.1 of the Draft EIS/EIR. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Regarding operation, businesses on the block bounded by Central Avenue, 1st Street, 2nd Street, and Alameda Street would be removed, though the ones directly facing Central Avenue (with the possible exception of Starbucks and Café Cuba) may be able to remain. This would reduce the amount of commercial space and jobs in Little Tokyo. However, Little Tokyo is a redevelopment area. As such, there are economic incentives for commercial redevelopment. No direct, indirect, or cumulative disproportionate, adverse impacts to environmental justice populations in regards to economic vitality or employment opportunities would occur.

Safety and Security

This section discusses the operational impacts to safety and security. The Underground Emphasis LRT Alternative would result in adverse impacts to pedestrian safety and security. A conflict would exist between pedestrians or vehicles and trains. The at-grade portion of the alignment under this alternative would run through Little Tokyo. A portal would be constructed adjacent to residences, museums, and commercial uses with high pedestrian and vehicle traffic. Residents around the portal would see increased pedestrian and vehicle activity around the egress/ingress area of the proposed alignment.

Underground stations could raise security concerns, particularly at night. These safety and security issues are applicable to light rail in general. They exist regardless of the socioeconomic or ethnic status of the surrounding community and thus would not disproportionately impact environmental justice populations.

In the Little Tokyo area, Metro would potentially build a pedestrian bridge, across Alameda Street, near the Little Tokyo/Arts District Station. This bridge would separate pedestrian movements from LRT and motorized vehicle movements. If the community opts against construction of the pedestrian bridge, Metro would use other urban design methods to enhance pedestrian safety. This would include creating pedestrian queuing and refuge areas around proposed stations. Adding wide crosswalks would also enhance pedestrian mobility and safety.

No disproportionate safety and security impacts to environmental justice populations would occur.

Beneficial Effects

Operation of the Underground Emphasis LRT Alternative would have beneficial effects with respect to transit service equity and economic vitality and employment opportunities. The alternative would increase transit mobility throughout the region by reducing the number of transfers on the rail system and introducing new stations in the downtown area. A potential new station at 2nd/Los Angeles Streets would benefit businesses in Little Tokyo. Another option would be to place the station at 2nd/Broadway instead, which is two blocks farther from Little Tokyo. The Underground Emphasis LRT Alternative would improve transit service in Little Tokyo and increase this area's connectivity to the region. This alternative would have direct, beneficial impacts to transit equity.

The Underground Emphasis LRT Alternative would also have beneficial effects with respect to air quality, energy, and climate change. The increase in transit would reduce VMT providing beneficial effects on air quality and energy consumption. The Underground Emphasis LRT Alternative would be consistent with SB 375 because it would increase regional transit capacity and decrease emissions from passenger vehicles.

4.17.3.4.1 NEPA Finding

Potential construction impacts to traffic circulation, parking, community and neighborhood, visual and aesthetic resources, parklands and other community facilities, and economic and fiscal were evaluated. Disproportionately adverse impacts to environmental justice populations would occur. Mitigation measures to address these impacts are summarized above and presented in Section 4.17.4.4.1 of the Draft EIS/EIR. Disproportionate adverse construction impacts to environmental justice populations would not remain after mitigation.

The sections above describe the adverse impacts that would take place during operation of the Underground Emphasis LRT Alternative. Mitigation measures to address these impacts are summarized above and presented in Section 4.17.4.4.2 of the Draft EIS/EIR. After mitigation, disproportionate impacts to environmental justice populations would remain to traffic circulation, community and neighborhood, and visual and aesthetics.

The following adverse impacts of the Underground Emphasis LRT Alternative would weigh disproportionately on relevant communities under this alternative:

- Parking loss and permanently increased traffic congestion in Little Tokyo
- Decreased access to public facilities during operations
- Construction-related, decreased traffic circulation, parking, access to community facilities, and changed visual resources

- Community cohesion impacts of the proposed underpass and at-grade junction at 1st and Alameda Streets, and the permanent conversion of the block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street to transit facility use
- Visual and aesthetic impacts of the potential pedestrian overpass at 1st and Alameda Streets, which may be perceived as adverse depending upon design
- Construction-related, decreased economic and fiscal viability
- Displacement of businesses in Little Tokyo
- Operational noise at the Savoy residential building in Little Tokyo

Disproportionate adverse impacts to environmental justice populations would not remain after mitigation, except:

- Visual and aesthetic impacts of the potential pedestrian overpass at 1st and Alameda Streets, which may be perceived as adverse depending upon design
- Traffic circulation impacts near 1st and Alameda Streets
- Community cohesion impacts of the proposed underpass and at-grade junction at 1st and Alameda Streets, and the permanent conversion of the block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street to transit facility use.

4.17.3.4.1 CEQA Determination

CEQA does not have thresholds of significance specific to environmental justice.

4.17.3.5 Locally Preferred Alternative

The Metro Board of Directors designated the Fully Underground LRT Alternative as the LPA on October 28, 2010, and further refinements have been made in close coordination with the LTWG to reduce impacts in Little Tokyo. The LTWG expressed support for the refinements during meetings held in February 2011.

The LPA was developed in collaboration with the Little Tokyo community to address concerns related to the other build alternatives. It became feasible after successful collaboration with the developers of the proposed Nikkei Center project and the Los Angeles Hompa Hongwanji Temple. The LPA would connect 7th Street/Metro Center Station and the Metro Gold Line with a new light rail connection that would be entirely underground. The alignment would follow Flower and 2nd Streets, and rise to connect to the existing Metro Gold Line tracks in the vicinity of 1st and Alameda Streets. This alternative would not reduce existing bus service in the study area.

During the preparation of the Draft EIS/EIR, community members viewed the Regional Connector as one more attempt to encroach into Little Tokyo, further reducing its size and negatively impacting the community's cultural identity and economic viability. This unease peaked when the Little Tokyo community coalesced against both of the build alternatives initially proposed for study in the Draft EIS/EIR, the At-Grade Emphasis LRT and Underground Emphasis LRT Alternatives, at several Metro Board and community meetings in the summer and fall of 2009. The opposition was based on the impacts both of these alternatives would have on the community during and after construction.

The Little Tokyo community has also indicated that 1st and Alameda Streets is a key intersection in the neighborhood, and expressed concern that the previously proposed underpass and at-grade junction for the Underground Emphasis LRT Alternative would affect community cohesion and character. Also, the permanent conversion of the commercial block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street would pose a permanent community impact and negatively affect community character. The LPA addressed these concerns by eliminating the proposed underpass and at-grade junction, and replacing the portal on the commercial block with an underground station that would allow a future development to be built on top. The future development could improve community character by integrating the proposed station into the neighborhood in a way that reflects the area's unique cultural identity. Refinements to the LPA since publication of the Draft EIS/EIR have reduced the amount of property on the block to be acquired.

The community also expressed concern over the Underground Emphasis LRT Alternative's permanent conversion of the block bounded by 2nd Street, Central Avenue, 1st Street, and Alameda Street to transit infrastructure use (a portal). The LPA addresses this concern by placing a station on the block instead of a portal, and future development above the station would be possible. The portal structures would instead be built east of Alameda Street. Refinements made during preliminary engineering have further reduced the need for property acquisition on the block bounded by 2nd Street, Central Avenue, 1st Street, and Alameda Street. As a result, most businesses on the block would not need to be acquired further reducing impacts to Little Tokyo.

At the same time, Metro recognized that the potential impacts of the Regional Connector on this important historical, cultural, and ethnic community would raise environmental justice concerns and proactively engaged the Little Tokyo community in a focused and collaborative dialogue to address their concerns. This outreach culminated in the formation of the LTWG, comprised of Metro staff and leaders of the Little Tokyo Community Council (LTCC), which represents over 100 business and community organizations. Additionally, at the community's request, Metro provided funding for a consultant to assist the community in understanding and interpreting the environmental analysis in order to develop effective mitigation that would be meaningful to the community. More information regarding the extensive public outreach efforts of this project is contained in Chapter 7, Public and Agency Outreach.

The Little Tokyo community supports the LPA that emerged from this intensive outreach. Appendix EE, Environmental Justice Technical Memorandum, includes a letter from the LTCC expressing support for this alternative. Included in Section 4.17.4.2 below are some of the potential mitigation measures suggested by the LTWG.

Refinements made to the LPA since publication of the Draft EIS/EIR include relocation of the proposed tunnel boring machine insertion site from 2nd Street in Little Tokyo to the Mangrove property. This would provide ample space for staging in an area that is less disruptive to the Little Tokyo community and businesses, and would allow haul trucks to access freeways using industrial side streets instead of commercial business streets. This relocation eliminates the need for cut and cover construction on 2nd Street in Little Tokyo, reduces the number of existing businesses that would be displaced, and reduces the amount of truck trips and overall construction activity within the Little Tokyo community. A portion of cut and cover construction on Flower Street between 3rd and 4th Streets could also be eliminated, thereby reducing overall construction-related disruption in the downtown area and allowing key freeway access routes for all downtown communities to operate with fewer impacts.

An alternate insertion site was considered at the 2nd/Hope Street station location, but this would have resulted in the tunnel boring machine removal site being located within the 1st/Central Avenue station area, closer to the heart of the Little Tokyo community than the Mangrove property. In this scenario, truck haul routes to and from the removal site would not be able to avoid passing through parts of the Little Tokyo community. The duration of construction activity may also be greater due to the suboptimal staging conditions (steep slope, small area) at the 2nd/Hope Street station site. More staging in the surrounding streets would be required, and the network of one-way streets in the area would require circuitous haul routes through several highly-developed blocks of the Financial District. Insertion at 2nd/Hope Street station would also result in greater disruption overall in the downtown area, which would also affect access to and from Little Tokyo.

The refinements to the LPA would reduce construction impacts in Little Tokyo; however, there would still be impacts as a result of construction activities. The insertion of the TBM at the Mangrove property is an improvement; however, truck trips and the concentration and duration of construction activity around the Mangrove property would only occur in Little Tokyo and is therefore disproportionate compared to other construction activity elsewhere in the study area. In addition, construction of the underground junction is specific to Little Tokyo. No other underground junctions would be constructed within the study area.

The LPA would have fewer potential disproportionate impacts to environmental justice populations than the other build alternatives for both construction and operation. Refinements to the LPA since publication of the Draft EIS/EIR were made to reduce impacts in Little Tokyo. Less cut and cover construction and fewer business acquisitions would be needed, and TBM staging would be in a less impactful location on the edge of Little Tokyo. By reducing the need for road and sidewalk closures, property acquisitions, job displacement, and overall neighborhood disruption during construction, the refinements have helped reduce, but not eliminate, potential impacts in Little Tokyo environmental justice study area.

Many construction-related effects would occur equally along the entire alignment and would not disproportionately impact Little Tokyo. These effects include transit service equity, air quality, and safety and security. There would be no disproportionate adverse construction-related effects on historic buildings since design measures would be implemented to protect historic resources and mitigate construction-related impacts to them. Construction would require the use of some parcels in Little Tokyo, but these temporary uses would not be incompatible with surrounding land uses and the effects would not be disproportionate.

Operation of the LPA within the Little Tokyo area would not result in impacts with respect to land use; water quality; ecosystems and biological resources; climate change; geotechnical/subsurface/seismic/hazardous materials; parklands and other community facilities; noise and vibration; and historic, archaeological, or paleontological resources. These topics would either affect the study area equally or would have no adverse effects; therefore, there would not be disproportionate adverse impacts to environmental justice populations related to these topics.

Adverse construction-related impacts from the LPA would occur with respect to geotechnical/ subsurface/seismic/hazardous materials; water quality; and archaeological and paleontological resources if they were encountered. Underground construction could encounter contaminated groundwater or affect archaeological, paleontological, and other geologic resources. Since the entire alignment would be underground, except for a short segment around the portals in Little Tokyo, no disproportionate adverse construction impacts to environmental justice populations would occur.

Traffic Circulation

This section describes the construction and operational impacts to traffic circulation. Construction of the underground junction beneath 1st and Alameda Streets would result in disproportionate adverse impacts to Little Tokyo and the JANM because of the concentration and duration of construction activity associated with the underground junction. This is the only location within the study area that an underground junction would be constructed. Unlike the Underground Emphasis LRT Alternative, the LPA would not require long-term continuous closure of the 1st and Alameda Streets intersection, since the excavation at this area could be conducted using the cut and cover method. Although construction impacts would be short-term and intermittent, they would result in disproportionate adverse impacts to environmental justice populations.

Mitigation measures to address these impacts are presented in Section 4.17.4.3 of this Final EIS/EIR and are summarized below. Mitigation measures include a traffic management and construction mitigation plan developed in coordination with the community to minimize disruption and limit construction activities during special events, provide accessible detours, and provide early notification of traffic disruption (See CN-2 and CN-3). Disproportionate adverse construction impacts to environmental justice populations would not remain after mitigation.

Regarding operation, under the LPA, the intersection of Alameda and 1st Streets would remain unchanged after construction. The proposed alignment would be separated from automobile and pedestrian traffic. Trains would not have to cross 1st Street when traveling to or from the Little Tokyo/Arts District Station since they would be running underground. The traffic signal operation at this intersection would be improved.

Under this alternative, traffic congestion would be reduced in Little Tokyo. Reduced congestion would benefit elderly and transit-dependent populations. Beneficial impacts to traffic congestion are anticipated in Little Tokyo. All adverse traffic congestion impacts of the LPA during operations would occur in the Financial District, a non-environmental justice community, and would not affect circulation in Little Tokyo.

Parking

This section describes the construction, operational, and cumulative impacts to parking. Construction of the LPA would temporarily displace on-street parking and inhibit use of some off-street parking lots. Portions of the Mangrove property parking lot and the entire lot around Señor Fish, Weiland Brewery, and The Spice Table would be closed to accommodate construction activities. Inhibiting access to the parking lot and on-street parking would have disproportionate adverse impacts to Little Tokyo and the JANM. Nowhere else within the study area would have as much off-street parking or a community resource, similar to the JANM, affected. Construction impacts would be short-term and intermittent, but they would result in disproportionate, potentially adverse impacts to environmental justice populations.

These impacts are addressed through mitigation measures included in the Environmental Justice section of the MMRP for the LPA (Chapter 8) and Section 4.17.4.3 below. For example, any unmet demand for parking spaces eliminated in Little Tokyo during construction shall be temporarily replaced within one block of the land uses that rely on those spaces, or through a combination of other measures (EJ-2). Disproportionate adverse construction impacts to environmental justice populations would not remain after mitigation.

Regarding operation, the LPA would permanently remove approximately 270 off-street parking spaces and 13 on-street parking spaces. Of these spaces, up to 130 off-street spaces and no on-street parking spaces are located in Little Tokyo. Parking opportunities in Little Tokyo are already limited. The Little Tokyo community has expressed the importance of parking to their community. This alternative would yield an access benefit compared to the loss of parking due to increased transit use. Overall, less parking would be removed in Little Tokyo for the LPA than for the Underground Emphasis LRT Alternative. However, approximately half of the off-street parking that would be removed is in Little Tokyo and is therefore a disproportionate impact when compared to the remainder of the study area.

Removal of off-street parking spaces would indirectly impact businesses in Little Tokyo. Business revenue would decrease if vehicular access to businesses is reduced. New transit would provide increased pedestrian access to businesses and may yield benefits from decreased vehicular access. This alternative would increase non-automobile, transit access to the study area. Still, disproportionate direct, indirect, and cumulative impacts to environmental justice populations in regards to parking would occur.

Mitigation measures to address these impacts are presented in Section 4.17.4.3 of this Final EIS/EIR and briefly summarized below. For example, Metro shall provide two acres of land on the Mangrove property (northeast of 1st and Alameda Streets) for the purposes of providing alternative parking services during construction, which could include satellite parking served by shuttle buses, valet parking from vehicle pick-up/drop-off in the central business areas of Little

Tokyo, and standard self-parking (EJ-3). Disproportionate parking impacts associated with operation of the LPA would not remain after mitigation.

Displacement and Relocation

The construction and operational impacts with respect to displacement and relocation are described below. The LPA would require seven partial takes, nine full takes, 12 temporary construction easements, and 26 permanent underground easements. This alternative would require these properties for construction staging, right-of-way, below grade tunneling, and stations. In Little Tokyo, six of the nine full takes would be required. This is a greater impact due to displacement than would be experienced in the rest of the study area. Thus, there would be a disproportionate adverse impact to environmental justice populations associated with displacement. The owner of record for these parcels is identified on the Right of Way Parcel Impacts Data Table in Appendix 1, Locally Preferred Alternative Drawings, of this Final EIS/EIR. Three full take parcels to be used for the 2nd/Broadway Station entrance are owned by the Tribune Company. The six parcels in Little Tokyo where full takes would be required are owned by either Robert Volk or Volk Trust. None of these property owners are minority or low-income.

Displacement of businesses and loss of the commercial space in Little Tokyo would have indirect, disproportionate, adverse impacts to the community. Mitigation measures to address these impacts are presented in Section 4.17.4.3 of this Final EIS/EIR and summarized below. For example, displaced commercial space in Little Tokyo shall be replaced with high quality commercial development opportunities consistent with Little Tokyo's community identity (EJ-14). Also, Metro shall work with the Little Tokyo and Arts District communities and CRA/LA to create joint development opportunities for the 1st/Central Avenue station site (EJ-15). Disproportionate impacts to environmental justice populations would not remain after mitigation.

Little Tokyo is a redevelopment area. The CRA/LA focuses on redevelopment of commercial areas for economic development. The reduction in physical commercial space would reduce the availability of areas for further development. Therefore, potential for increased economic development in a primarily minority community would be reduced. However, future growth encouraged by the new light rail service would generate a benefit.

Community and Neighborhoods

The construction, operational, and cumulative impacts to community and neighborhoods is described below. Construction of the LPA would temporarily inhibit access to the JANM. Access to the museum would be decreased during construction of the underground junction beneath 1st and Alameda Streets. Lane closures in the vicinity of 1st and Alameda Streets would be less frequent during the construction period of up to 48 months than they would be for the Underground Emphasis LRT Alternative yet would remain a disproportionally long duration with respect to the remainder of the study area. Loading spaces along Alameda Street would be temporarily displaced, and congestion would increase slightly, though truck trips would be routed onto primarily industrial streets and existing truck routes whenever practicable. School bus loading zones along 1st Street, which are frequently used by JANM visitors, would be affected by construction-related traffic. Overall, access to the museum building would be maintained.

Lane closures would inhibit access to businesses in Little Tokyo. Impacts to businesses would affect the entire community. Overall, business impacts of the LPA would be less than the Underground Emphasis LRT Alternative since the majority of construction activities in Little Tokyo would be concentrated on the Mangrove property, which is farther from the business areas of the community than the other potential construction sites studied. Lane closures would not similarly affect businesses elsewhere in the study area.

Construction of the LPA would temporarily inhibit access to the Los Angeles Hompa Hongwanji Temple. Specifically, access to the building would be inhibited intermittently on 1st Street. However, building access on Vignes Street would be maintained.

Construction of the LPA would displace three businesses. Approximately 30 jobs would be displaced, all of which would be in Little Tokyo. The displaced businesses do not contribute to the neighborhood's identity as a Japanese American cultural and historic center. Displacement of properties would reduce the stock of commercial space in Little Tokyo. However, transit-oriented development could occur on properties where businesses were displaced. This development could generate additional commercial space and jobs.

The loss of parking under this alternative would result in indirect disproportionate effects to environmental justice populations by decreasing business viability. The Little Tokyo community has expressed concern that a loss of parking would hurt businesses crucial to the area's cultural identity. The LPA could generate a benefit by increasing transit access. However, local businesses that rely on paid parking lots and on-street parking would be adversely impacted.

Approximately 13 new construction projects are anticipated in the study area by 2014. Fifty-four new construction projects are planned between 2014 and 2019. Twelve major renovation projects are anticipated by 2014, and eight are anticipated between 2014 and 2019. Several of these projects would occur in Little Tokyo or its close vicinity and would involve the removal of public paid-parking lots. As such, parking loss that would occur under the LPA would contribute cumulatively to parking loss in Little Tokyo. Loss of parking would have cumulative, disproportionate, adverse impacts to environmental justice populations.

In summary, construction of the LPA would:

- Inhibit access to the JANM
- Displace loading spaces along Alameda Street which also affect the JANM
- Inhibit access to businesses in Little Tokyo
- Inhabit access to the Los Angeles Hompa Hongwanji Temple
- Displace three businesses and 30 jobs
- Affect parking

Construction impacts would be short-term and intermittent. However, because of the impacts described in detail above that occur exclusively in Little Tokyo, construction would result in disproportionate adverse impacts to community facilities.

Mitigation measures in the Community and Neighborhood and Environmental Justice sections of the MMRP would help address these impacts. These mitigation measures are also included in Section 4.17.4.3 below and briefly summarized here. Disproportionate impacts to environmental justice populations would not remain after mitigation. Mitigation measures include:

- The temporary displacement of three bus loading spaces on Alameda Street for the JANM shall be replaced nearby for the duration of construction activities. Metro shall work with JANM to confirm locations of temporary loading spaces. (EJ-1)
- Metro shall provide assistance for businesses to maintain visibility during construction, including signage and advertisements. (EJ-12)
- Metro shall develop a construction mitigation plan with community input to directly address specific construction impacts in the study area. Metro shall establish and receive input from the Regional Connector Community Leadership Council (RCCLC) in developing the construction mitigation plan. The RCCLC shall consist of representatives from all parts of the alignment area. Metro shall work with the RCCLC in developing the outreach plan. (CN-6)
- Any unmet demand for parking spaces eliminated in Little Tokyo during construction shall be temporarily replaced within one block of the land uses that rely on those spaces, or through a combination of other measures. (EJ-2)

Visual and Aesthetic Resources

This section describes construction and operational impacts to visual and aesthetic resources. Several large components of construction would occur in and near Little Tokyo including the underground junction beneath 1st and Alameda Streets, the 1st/Central Avenue station, and the two portals. This construction is greater in both concentration and duration than elsewhere in the study area and would result in temporary disproportionate adverse impacts to Little Tokyo and the JANM. Construction equipment and work areas in this area would be larger than most laydown areas elsewhere along the alignment. Construction impacts would be short-term and intermittent, but they would result in disproportionate adverse impacts to environmental justice populations.

Mitigation measures to address these impacts are presented in Section 4.17.4.3 of this Final EIS/EIR. For example, Metro shall locate stockpile areas (storage areas for construction equipment, supplies, and excavated soil) primarily in less visually sensitive locations, where they are not visible from the road or to businesses or residents (VA-4). Disproportionate impacts to environmental justice populations would not remain after mitigation.

Regarding operation, the LPA would be entirely underground. Unlike the other build alternatives, no underpass or Alameda Street pedestrian bridge would be constructed; both of which were identified by the community as visually intrusive. However, the structures on the northern portion of the block bounded by Alameda Street, 1st Street, 2nd Street, and Central Avenue would be demolished. This would impact the visual character of Little Tokyo. Therefore, direct and indirect, disproportionate, adverse impacts to visual resources are anticipated. Mitigation measures to address these impacts are presented in Section 4.17.4.3 of this Final EIS/EIR and are consistent with displacement mitigation measures. Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

The LPA's 1st/Central Avenue station would include a ventilation shaft on the southwest corner of 1st and Alameda Streets that may extend up to one story above street level. This would not affect views of any historic buildings, and would not pose an adverse impact. Urban design measures would incorporate the ventilation structure into the existing street environment in a compatible way. No other ventilation shafts proposed for the LPA would extend above street level.

Noise and Vibration

This section describes the construction impacts due to noise and vibration. During construction, ground-borne noise (GBN) would impact the Hikari Lofts, office uses in the Japanese Village Plaza (JVP), and the Nakamura Tetsujiro Building in Little Tokyo and other sensitive receptors located along the alignment, such as the Walt Disney Concert Hall. GBN generated by LRT vehicle pass-bys associated with operation of the LPA would also impact sensitive receptors in Little Tokyo and other sensitive receptors located along the alignment, such as the Walt Disney Concert Hall. Mitigation measures have been developed to address these impacts. These effects would not disproportionately affect Little Tokyo.

During construction, ground-borne vibration (GBV) would also impact the Hikari Lofts, office uses in the JVP, and the Nakamura Tetsujiro Building in Little Tokyo. Other sensitive receptors along the alignment would not experience GBV impacts during construction. Thus, there would be a disproportionate adverse impact to environmental justice populations associated with GBV. Mitigation measures include the use of less vibration-intensive construction equipment or techniques near vibration-sensitive locations (NV-4); and construction activities that produce vibration, such as demolition, excavation, earthmoving, and ground impacting shall be sequenced so that the vibration sources do not operate simultaneously (NV-7). Additional vibration mitigation measures are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. Implementation of mitigation would reduce this impact to not adverse, and the impact would no longer be disproportionate.

Parklands and Other Community Facilities

This section describes construction impacts related to parklands and other community facilities. During construction of the LPA, lane closures would inhibit access to facilities adjacent to construction sites, such as JANM. Automobile and pedestrian detours would be needed. Annual festivals in the downtown area would also be temporarily affected. Impacts resulting from construction activities would disproportionately impact community facilities in Little Tokyo as compared to the remainder of the study area.

Cut and cover construction in the Financial District and Bunker Hill areas would require surface excavation along the entire LRT route. The cut and cover construction is limited in duration to a few months. However, TBM construction would be used in Little Tokyo on 2nd Street. While access modifications on 2nd Street would be less pronounced and limited to staging areas, the duration of TBM activity far exceeds that of the cut and cover elsewhere in the study area.

Unlike the Underground Emphasis LRT Alternative, no cut and cover construction would be needed at 2nd and Los Angeles Streets; therefore, access to the Little Tokyo Branch Public Library would be largely unaltered during construction, and maintained during business hours.

Although impacts have been reduced through the refinement of the LPA, adverse and disproportionate impacts to environmental justice populations, as described above, would occur during construction.

Mitigation measures to address these impacts are presented in Section 4.17.4.3 below. For example, early notification of traffic disruption shall be given to emergency service providers. Work plans and traffic control measures shall be coordinated with emergency responders to prevent impacts to emergency response times (CN-2). Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events (CN-5). Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders (CN-3). Disproportionate adverse impacts to environmental justice populations would not remain after mitigation.

Economic and Fiscal

This section describes the construction and operational impacts related to economic and fiscal topical areas. Construction of the LPA would result in temporary, intermittent closures of several street lanes in the study area. Unlike the Underground Emphasis LRT Alternative, long-term closure of the intersection of 1st and Alameda Streets would not be needed, and fewer adverse effects on the economic viability of businesses in Little Tokyo would occur. The introduction of construction workers in the area, who would be potential customers for restaurants and other local businesses, would yield a benefit. Construction at 1st and Alameda Streets would be performed using the cut and cover method, which would also be used in the Financial District and Bunker Hill areas. Construction would temporarily affect the adjacent JANM. Construction of the junction at the intersection of 1st and Alameda Streets could last up to 48 months on an intermittent basis. TBM operations would also be staged from the Mangrove property on the northeast corner of 1st and Alameda Streets, away from the community's business centers. Also, no cut and cover would occur on 2nd Street in Little Tokyo due to refinements made since publication of the Draft EIS/EIR, thus reducing potential impacts to businesses in the area. Alameda Street is one of the main arterials providing access to Little Tokyo, and it would be open for the duration of the construction period due to the use of temporary decking, though temporary lane closures would be needed. As such, economic and fiscal construction impacts would not affect Little Tokyo disproportionately.

Regarding operation, the LPA would enhance transportation access to Little Tokyo with a new underground station at 1st/Central Avenue. The existing Little Tokyo/Arts District Station would be removed from service once the Regional Connector opens. However, the new 1st/Central Avenue station would have more frequent direct trains to more destinations throughout Los Angeles County. This represents improved transportation benefits for Little Tokyo, which could bring more business to the community. Businesses on the northern portion of the block bounded by Central Avenue, 1st Street, 2nd Street, and Alameda Street (Señor Fish, Weiland Brewery, The Spice Table, and the associated parking lot) would be removed. This would reduce the amount of commercial space and jobs in Little Tokyo. However, Little Tokyo is a redevelopment zone, and the additional transit infrastructure would encourage economic growth in the area. Altogether, no disproportionate adverse impacts to environmental justice populations would occur.

Safety and Security

This section describes the operational impacts to safety and security. The LPA would run entirely underground, unlike the other build alternatives. There would be no grade crossings; therefore, the potential for conflict between pedestrians or vehicles and trains would be low. Underground stations could raise security concerns, particularly at night. These safety and security issues are applicable to light rail in general. They exist regardless of the socioeconomic or ethnic status of the surrounding community. No disproportionate direct, indirect, or cumulative adverse impacts to environmental justice populations in regards to safety and security are anticipated.

Beneficial Effects

The LPA would have beneficial effects with respect to transit service equity and economic vitality and employment opportunities. The LPA would increase transit mobility throughout the region by reducing the number of transfers on the rail system and introducing new stations in the downtown area. The new 1st/Central Avenue station would have more connectivity to the rest of the rail system than the existing Little Tokyo/Arts District Station, and would benefit the community. This alternative would have direct, beneficial impacts to transit equity.

As with the other build alternatives, the LPA would reduce regional VMT and result in a beneficial impact to the study area. New rail operations would increase energy consumption in the Los Angeles Department of Water and Power (LADWP) service area by less than one percent. Therefore, beneficial impacts to energy consumption are anticipated.

As with the other build alternatives, the LPA would reduce regional VMT and result in a beneficial effect to air quality. This alternative would result in the largest reduction in VMT and the greatest benefit to air quality of any of the alternatives.

4.17.3.5.1 NEPA Finding

From an environmental justice standpoint, the greatest impacts would occur during construction. Potentially disproportionate adverse construction impacts of the LPA to environmental justice populations are described above. A sample of committed mitigation measures are also noted above. Additional detail regarding mitigation measures to address these impacts is presented in Section 4.17.4.3 of this Final EIS/EIR.

Potentially disproportionate adverse operational impacts of the LPA to environmental justice populations are described above. These include direct, indirect, and cumulative operational impacts. Examples of the committed mitigation measures to offset these impacts are noted above. These are summaries drawn from other sections of this Final EIS/EIR and are not meant to be all inclusive. Mitigation measures to address these impacts are presented in greater detail in Section 4.17.4.3 of this Final EIS/EIR.

The following adverse impacts of the LPA would weigh disproportionately on relevant communities under this alternative:

- Construction-related parking loss in Little Tokyo
- Displacement of businesses in Little Tokyo
- Decreased community cohesion in Little Tokyo due to loss of commercial space
- Construction-related traffic congestion, decreased parking and access to community facilities
- Visual changes in the community due to the removal of structures from the block bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue
- GBV generated during construction in Little Tokyo

No disproportionate impacts to environmental justice populations will remain after mitigation.

4.17.3.5.5 CEQA Determination

CEQA does not have thresholds of significance specific to environmental justice.

4.17.4 Mitigation Measures

4.17.4.1 Updates to Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for environmental justice presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.17.4.3 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Addition of a parking needs assessment in Little Tokyo to confirm when and where there is demand for replacement parking during construction.
- Addition of coordination with the City to develop a parking mitigation program during construction, which could include restriping portions of streets in Little Tokyo for diagonal parking where feasible to temporarily increase parking supply.

- Addition of 200 standard or 300 valet parking spaces at the Mangrove property for use as replacement parking during construction.
- Addition of coordination with LADOT and private parking lot owners to develop advanced parking reservation systems and to keep lots open during evenings for short-term parking.
- Addition of a 24-hour hotline for community concerns regarding construction, and a project office within the Little Tokyo community.
- Addition of a RCCLC to provide input into the construction mitigation plan.
- Addition of business support services for affected Little Tokyo businesses and organizations, such as targeted advertising, sponsored coupons, incentives for construction worker patronage, and Metro-sponsored community events.
- Addition of detail to mitigation measures for consistency with other sections.

4.17.4.2 Mitigation Measures Suggested by the Little Tokyo Working Group

In response to the significant concerns of the Little Tokyo community about potential effects of the Regional Connector project construction, Metro assisted in forming a community working group to address these concerns by developing mitigation measures that would be meaningful to the Little Tokyo community. Assisted by a consultant funded through Metro, the LTWG developed a list of potential candidate mitigation measures for the LPA.

These LTWG proposed mitigation measures were included in Section 4.17.5 of the Draft EIS/EIR and Appendix EE, Environmental Justice Technical Memorandum, of this Final EIS/EIR to foster public discussion as part of the process of determining the ultimate mitigation program. Metro continued to work with the LTWG and the entire community to confirm and develop specific mitigation measures during preparation of this Final EIS/EIR. Additional discussion of the LTWG is provided in Chapter 7, Public and Agency Outreach.

It is important to note that Metro and FTA evaluated mitigation measures developed by the LTWG and included them in the Draft EIS/EIR as candidate mitigation measures for consideration during Draft EIS/EIR review. During preparation of this Final EIS/EIR, all potential mitigation measures were evaluated to determine efficacy, cost, community acceptance, and relevance to specific impacts. Metro continued to work closely with the LTWG and all affected components of the community to develop an effective mitigation program acceptable to the community, Metro, and FTA. The MMRP for the LPA in Chapter 8 of this Final EIS/EIR represents the culmination of Metro's efforts working with the community to develop appropriate mitigation measures for the LPA. Metro and FTA are fully committed to all mitigation measures in the MMRP. Metro will continue to work with the community to ensure that the MMRP is properly implemented.

4.17.4.3 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA to minimize adverse impacts associated with the construction and operation of the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure. Mitigation measures denoted as EJ-X are in addition to mitigation measures drawn from the other sections of the MMRP.

To offset the impacts associated with the temporary relocation of bus service around construction areas in Little Tokyo:

- Metro shall maintain access to bus stops and provide adequate signage to guide bus users to accessible stops. Metro shall minimize temporary closures or relocations of bus stops and layover zones. Metro shall provide notices of closures and relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. When closures of other bus operators' stops are needed, Metro shall work closely with the affected operators to provide notices. (TR-12)

- As needed, Metro shall temporarily relocate bus stops to nearby alternative locations based on the re-routing of bus service, and provide adequate signage and notices at strategic locations indicating the relocated bus stops. Metro shall provide notices of relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. Metro shall coordinate with municipal transit providers to temporarily relocate non-Metro bus stops. When bus re-routing is necessary, buses shall be re-routed to adjacent streets in a manner that minimizes inconvenience to bus passengers and to affected neighborhoods. (TR-13)

To offset the disproportionate amounts of parking spaces that would be temporarily removed in Little Tokyo during construction and the potential impacts to businesses:

- The temporary displacement of three bus loading spaces on Alameda Street for the JANM shall be replaced nearby for the duration of construction activities. Metro shall work with JANM to confirm locations of temporary loading spaces. (EJ-1)

- Metro shall not hinder access to other public parking lots during construction. (DR-5)

- Metro shall identify which restaurants within Little Tokyo would be interested in establishing curbside pickup. Metro shall work with the City of Los Angeles to allow temporary curbside parking during construction, which would allow Metro to establish curbside pickup for Little Tokyo restaurants. (EJ-10)

- Prior to construction, Metro shall conduct an annual parking needs assessment in Little Tokyo. Metro shall provide replacement parking for spaces lost as a result of the project as described in EJ-3 and to respond to the needs identified in the parking needs assessment. Metro shall work with Little Tokyo and surrounding communities to educate visitors and residents where parking is available during construction. Metro shall monitor parking, and the parking analysis shall be conducted on an annual basis throughout the duration of construction. This effort shall include new signage and other way finding features as appropriate. (EJ-11)

- Any unmet demand for parking spaces eliminated in Little Tokyo during construction shall be temporarily replaced within one block of the land uses that rely on those spaces, or through a combination of the following measures: (EJ-2)

- Metro shall work with the City to develop a parking mitigation program to mitigate the loss of public parking spaces during construction. This would include, but is not limited to, restriping the existing street to allow for diagonal parking, reducing the number of restricted parking areas, phasing construction activities in a way that minimizes parking disruption, and increasing the time limits for on-street parking. Restriping would occur on portions of Temple Street, Alameda Street, 1st Street, 2nd Street, Central Avenue, San Pedro Street, Judge John Aiso Street, 3rd Street, and Traction Avenue. Such parking mitigation shall be implemented on a temporary, tiered basis pending findings of the annual parking analysis described in EJ-11 in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. (DR-4)

- Metro shall provide two acres of land on the Mangrove property (northeast of 1st and Alameda Streets) for the purposes of providing alternative parking services during construction, which could include satellite parking served by shuttle buses, valet parking from vehicle pick-up/drop-off in the central business areas of Little Tokyo, and standard self-parking. The number of spaces provided would range from 200 standard spaces to approximately 300 spaces when supplemental parking services are operating. Any parking services shall be operated by a licensed/bonded parking company and shall be selected through a competitive request for proposal (RFP) process. Cost to park shall be comparable with current cost to park. This shall offset the temporary loss of parking available to patrons of Little Tokyo businesses, and other visitors, during construction. (EJ-3)

- Metro shall provide notices of traffic control plans and parking relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. (EJ-4)

- Metro shall support efforts to curb non-legitimate use of disabled parking spaces. (EJ-5)

- Metro shall work with LADOT, owners of private parking lots, and businesses to develop an advanced parking reservation system at cooperative and suitable locations during construction. (EJ-6)

- Metro shall work with LADOT to open city parking lots for short-term use on evenings and weekends during construction in the vicinity of Little Tokyo. (EJ-7)

- Metro shall work with the City of Los Angeles to reduce impacts of government vehicles parking on 2nd Street during construction, such as identification of alternate parking areas. (EJ-8)

- Metro shall work with the City of Los Angeles and the Little Tokyo Business Improvement District to facilitate creation of financial incentives such as parking validation programs to prioritize parking for Little Tokyo customers, residents, and businesses during construction. (EJ-9)

In addition to the mitigation measures above, any remaining disproportionate community and neighborhood impacts that occur in Little Tokyo during construction (including potentially disproportionate visual alteration due to the removal of structures) will be offset by the following mitigation measures:

- Metro shall provide assistance for businesses to maintain visibility during construction, including signage and advertisements. (EJ-12)
- Accessible detours shall be provided whenever possible. Detours shall be compliant with the Americans with Disabilities Act. Signage shall be provided in those languages most commonly spoken in the immediate community. Signs shall mark detours in accordance with the Manual on Uniform Traffic Control Devices, and other applicable local and state requirements. Detours shall be designed to minimize cut-through traffic in adjacent residential areas. (CN-1)
- Early notification of traffic disruption shall be given to emergency service providers. Work plans and traffic control measures shall be coordinated with emergency responders to prevent impacts to emergency response times. (CN-2)
- Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events. Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders. Crossing guards and other temporary traffic controls shall be provided in the vicinity of construction sites, haul routes, and other relevant sites as proposed in California DOT Traffic Manual, Section 10-07.3, Warrants for Adult Crossing Guards, and as appropriate to maintain traffic flow during construction. (CN-3)
- A 24-hour live hotline for community concerns regarding construction shall be provided, as well as a project office within the Little Tokyo community. Residents and businesses shall also be provided with comment/complaint forms during construction. A construction office shall also be placed within the community to provide in-person assistance and services. Metro shall negotiate with the JANM to locate the office within the museum's historic building on 1st Street. The hotline and office shall enable Metro to maintain day-to-day contact with the community during construction and provide community members with all project details that may be relevant to the public. (CN-4)
- A community outreach plan shall be developed and implemented to notify local communities and the general public of construction schedules and road and sidewalk detours. Metro shall coordinate with local communities during preparation of the traffic management plans to minimize potential construction impacts to community resources and special events. Construction activities shall be coordinated with special events. (CN-5)
- Metro shall develop a construction mitigation plan with community input to directly address specific construction impacts in the project area. Metro shall establish and receive input from the RCCLC in developing the construction mitigation plan. The RCCLC shall consist of

representatives from all parts of the alignment area. Metro shall work with the RCCLC in developing the outreach plan. (CN-6)

- Barriers shall be erected and security personnel provided during construction to minimize trespassing and vandalism. Barriers shall be enhanced with culturally-relevant artwork, attractive design features, and advertisements for parking locations and businesses. Signage shall also identify that businesses are open during construction. Community input shall be sought in determining artwork and design features. (CN-7)

- Metro shall maintain access to the Little Tokyo Library and other community facilities at all times during construction. (DR-6)

- Metro shall develop a Construction Mitigation Program that includes protocol for community notification of construction activities, including traffic control measures, schedule of activities, and duration of operations, with written communications to the community translated into appropriate languages. (DR-7)

- Prior to the initiation of localized construction activities, a traffic management and construction mitigation plan shall be devised. The closure schedules in the construction traffic plan shall be coordinated to minimize impacts to residences, businesses, special events, and traffic flow. During these times, traffic shall be re-routed to adjacent streets via clearly marked detours. The traffic management and construction mitigation plan shall identify, for instance, proposed closure schedules and detour routes; construction traffic routes, including haul truck route, and hours so as to avoid peak hours where feasible. It shall also account for the provisions below. Traffic flow shall be maintained, particularly during peak hours, to the degree feasible. Access to adjacent businesses shall be maintained via existing or temporary driveways at all times during business hours, and residences at all times. Metro shall provide signage to indicate new ways to access businesses and community facilities affected by construction. Metro shall post advance notice signs prior to construction in areas where business access could be affected. Metro shall also notify LADOT in advance of street closures, detours, or temporary lane reductions. Metro shall also inform advisory committees of known road closures during regularly scheduled meetings. (TR-1)

- Haul routes for trucks shall be confirmed during the final design phase of the project. The routes shall be located to minimize noise, vibration, and other possible impacts to adjacent businesses and neighborhoods. Truck trips shall be primarily scheduled at times when they would be least disruptive to the community. Lighted or reflective signage shall direct truck drivers to the haul routes. If physical damage to the haul route roads occurs due to project-related traffic, the roads shall be restored to their pre-construction condition as quickly as is practicable. Haul routes shall be discussed with and approved by the City of Los Angeles through the Transportation Construction Traffic Management Committee. (TR-2)

- Safe pedestrian detours with handrails, fences, k-rail, canopies, and walkways shall be provided as needed. When a crosswalk is closed due to construction activities, pedestrians shall be directed to nearby alternate crosswalks. Access shall be ADA accessible at all times per existing Metro policy. (TR-4)

- Bicyclists shall be encouraged through signage to ride carefully in streets near construction activities, ride carefully on sidewalks (as City of Los Angeles municipal code permits), or choose nearby alternate routes around construction sites. Detours shall be provided as needed. Metro shall provide signage showing the alternate bicycle routes. Pedestrian and bicycle circulation, and travel lanes temporarily impacted during construction shall be restored to their permanent configurations at the conclusion of the construction period and prior to operations. (TR-5)

- Metro shall work with the Little Tokyo and Arts District communities and the CRA/LA to create joint development opportunities for the 1st/Central Avenue station site. (EJ-15)

- Metro shall provide services to support affected Little Tokyo businesses and organizations during construction such as targeted advertising and marketing campaigns, Metro-sponsored coupons, incentives for construction worker patronage, and Metro-sponsored community events. Metro shall provide free technical support assistance (i.e., website development) to local businesses on strategies for business development that can minimize any adverse impacts of construction. This can include, but not be limited to, assistance with accounting or advertising. Metro shall work with the RCCLC including businesses, tenants, property owners, and government agencies with jurisdiction to make policy to resolve issues arising from adverse business issues during all phases of construction. The committee shall work to develop an implementation plan for these services and determine their content. The committee shall also be kept apprised of construction progress and upcoming transit, parking, or access changes. Metro shall provide maps showing existing and planned access during all phases of construction. Metro shall also provide directional signage to temporary parking facilities. These activities shall be conducted in a manner consistent with the similar program developed for the Crenshaw Transit Corridor Project. (EJ-16)

- Surface level construction activities shall be curtailed to the extent feasible during major Little Tokyo festivals and outdoor events to ensure that noise, air quality, traffic, and parking issues do not adversely affect these economically vital events. Metro shall request a list of events and festivities from the Little Tokyo community. (EJ-17)

- Metro shall work with the Little Tokyo community businesses to minimize adverse impacts to business operations associated with utility relocation and protection of existing utilities. Metro shall offer the services described above. (EJ-19)

In addition to the mitigation measures above, the following mitigation measures will offset the potentially disproportionate property acquisitions and business relocations that would occur in Little Tokyo:

- Should parcels used for construction staging be proposed for redevelopment in the future, Metro is committed to involving the community in the redevelopment of construction staging areas following completion of construction activities. Metro shall do this through its established Joint Development Policy. (EJ-13)

- Metro shall work with CRA/LA as described above in mitigation measure EJ-15 in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR.

- Metro shall provide relocation assistance and compensation as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. (DR-8)

In addition to the mitigation measures above, the following will offset the potentially disproportionate long-term displacement of commercial space:

- Displaced commercial space in Little Tokyo shall be replaced with high quality commercial development opportunities consistent with Little Tokyo's community identity. This could include development at the 1st/Central Avenue station site. Depending on the type of new development, it would potentially create at least as many jobs as had been displaced. (EJ-14)

In addition to the mitigation measures above, the following will offset the potentially disproportionate GBV impact during construction to the Hikari Lofts, office uses in the JVP, and the Nakamura Tetsujiro Building in Little Tokyo:

- Metro shall provide advance notice and coordinate with the affected property owners regarding schedules for tunneling and other activities prior to the commencement of those activities. (NV-25)

- Metro shall provide advanced notification and coordination by doing the following:

  - Metro shall establish a Construction Community Relation Program to inform and coordinate construction activities including notification to all occupants at the Hikari Lofts, the interior designer office at the JVP, and the Nakamura Tetsujiro Building about the schedule of tunneling activities at least one month prior to the start of the activities.

  - Metro shall monitor GBN and GBV levels in the in the building adjacent to TBM activity during its operation in that area.

  - During the few days the TBM will be operating in this area, should GBN or GBV measurements exceed FTA annoyance criteria for short-term impacts during construction, Metro shall offer to temporarily relocate affected residents. (NV-26)

In addition to the mitigation measures above, the following will offset the potentially disproportionate economic and fiscal impacts to businesses during construction in Little Tokyo:

- Metro shall work with the Little Tokyo Business Association to help offset the neighborhood impacts associated with reduced revenue from the Business Improvement District funds during construction due to the removal of acquired businesses. Metro shall also offer the services described above. Metro shall use Metro's existing claims process to address physical damage (utility interruption, for example). (EJ-18)

In addition to the mitigation measures above, the following will address the potentially adverse transportation impacts in Little Tokyo during construction:

- Metro shall provide advertising on its transit buses and other typical means of communication publicizing construction plans and alternatives to travel and park in Little Tokyo during the construction period. Metro shall also place these advertisements on construction site walls if the community desires. (EJ-20)

- Metro shall avoid haul routes along 1st Street or along Alameda Street between 3rd Street and US 101 where possible. Haul routes shall be confirmed with the input of the community. (EJ-21)

In addition to the mitigation measures above, to address the effects of construction activities and the associated safety and security needs being disproportionately centered in Little Tokyo:

- Metro shall publish safety and security information at stations in Japanese, Korean, and Spanish. This includes both written and verbal announcements at stations. (EJ-22)

- Metro shall publish materials for the project's safety education campaign in Japanese, Korean, and Spanish. (EJ-23)

- Metro shall involve the Little Tokyo Public Safety Association in the development of safety and security plans. (EJ-24)

- Metro shall monitor and ensure implementation of committed mitigation measures designed to address safety and security concerns. (EJ-25)

More operation noise may be audible in Little Tokyo than other parts of the alignment due to the portals and open-roof station:

- Depending on the potential location and scope of the system's ventilation equipment, orient the exhaust away from downwind receptors to minimize noise from ventilation as well as underground train horns and related operational sounds. (EJ-26)

In addition to the mitigation measures above, the following will offset the effects of construction activities and the associated air quality impacts being centered in Little Tokyo:

- Metro shall implement receptor-based mitigation where needed to reduce construction-related pollutant levels below significance thresholds. This could include installation of high efficiency particulate air filters on HVAC equipment at downwind receptors during construction activities. (EJ-27)

- Contractors shall be required to adhere to South Coast Air Quality Management District (SCAQMD) standards for off-road engine emissions (refer to Section 4.5.1.1). Examples of how the contractors could ensure adherence include retrofitting off-road engines with add-on control devices such as catalytic oxidizers and diesel particulate filters where feasible. (AQ-1)

- Metro shall require contractors to use equipment that meets up-to-date specifications (equivalent to models manufactured from 2013 to 2017) for pollutant emissions during project construction. (AQ-2)
- Contractors shall be required to adhere to SCAQMD standards for dust emissions such as SCAQMD Rule 403. Examples of how the contractors could ensure adherence include applying water or a stabilizing agent to exposed surfaces in sufficient quantity to prevent generation of dust plumes. (AQ-3)
- Dirt from construction equipment shall not extend 25 feet or more from an active operation, and shall be removed at the conclusion of each workday (refer to Section 4.5.3.3). Street sweeping services shall be coordinated with construction activity to minimize impacts to surrounding businesses and residences. (AQ-4)
- Contractors shall be required to utilize at least one of the measures set forth in the SCAQMD Rule 403 Section (d)(5) to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site. (AQ-5)
- All haul trucks hauling soil, sand, and other loose materials shall be covered (e.g., with tarps or other enclosures that would reduce dust emissions) (refer to Section 4.5.1.1). (AQ-7)
- Traffic speeds on unpaved roads shall be limited to 15 MPH. (AQ-8)
- Heavy equipment operations shall be suspended during second stage smog alerts as issued by the SCAQMD. (AQ-10)

In addition to the mitigation measures above, the following will mitigate land use impacts in Little Tokyo:

- Metro shall maximize opportunities to the extent feasible for enhancing access from existing land uses to the new station. (EJ-28)

To offset the potential risk of subsurface impacts associated with tunneling beneath existing buildings in Little Tokyo:

- Design of underground facilities shall avoid potential subsurface impacts to adjacent buildings. (EJ-29)
- Before any construction, a survey of structures within the anticipated zone of construction influence shall be conducted in order to establish baseline conditions. A geotechnical instrumentation and settlement monitoring plan and mitigation measures shall be developed and adhered to during construction to ensure appropriate measures are taken to address any construction-induced movement. If assessments indicate the necessity to

proactively protect nearby structures, additional support for the structures by underpinning or other ground improvement techniques shall be required prior to the underground construction. Metro shall require the construction contractor to limit movement to less than acceptable threshold values for vertical, horizontal, and angular deformation as a performance standard. These acceptable threshold values shall be established such that the risk of damage to buildings and utilities will be negligible to very slight. For buildings, these threshold values will be based on the relationship of building damage to angular distortion and horizontal strain consistent with Boscardin and Cording (1989) and qualitative factors including but not limited to the type of structure and its existing condition. For utility mains, these threshold values shall be those established by the utility owners. Additional data and survey information shall be gathered during final design for each building and utility main to enable assessment of the tolerance of potentially affected structures and utilities. Additional engineering and design level geotechnical studies shall be performed to define the nature of the soils and to refine the means of achieving each performance specification. (GT-1)

- Ground improvement such as grouting or other methods shall be required to fill voids where appropriate and offset potential settlement when excess material has been removed during excavation. The criteria for implementing grouting or ground improvement measures shall be based on the analysis described in mitigation measure GT-1. (GT-2)

- The tunnel alignment shall be grouted in advance to provide adequate soil support and minimize settlement as geotechnical conditions require. (GT-3)

- Settlement along the project alignment shall be monitored using a series of measuring devices above the route of the alignment. Leveling surveys shall be conducted prior to tunneling to monitor for possible ground movements. (GT-4)

- Tunnel construction monitoring requirements shall be described and defined in design contract documents. Additional geotechnical provisions shall be included to the extent feasible, including use of an Earth Pressure Balance or Slurry TBM for tunnel construction to minimize ground loss. During tunnel construction, the soils encountered shall be monitored relative to anticipated soil conditions as described in a Geotechnical Baseline Report. (GT-5)

To offset the effects of tree removal in Little Tokyo:

- New trees planted at station locations shall be regularly monitored by Metro to ensure healthy growth and development. Metro shall replace trees as close as possible to original locations. (EJ-30)

- Metro shall provide the Little Tokyo and Arts District communities with opportunities for input into the development of landscape plans for the 1st/Central Avenue station throughout the preliminary engineering and final design processes. (EJ-31)

To ensure that foreign-language speakers have access to project meetings and information:

- Information shall be made available in Japanese and Korean, and flyers for project meetings shall indicate that there will be both Japanese and Korean translators present. (EJ-32)

To offset the disproportionate concentration of TBM activities being disproportionately concentrated in the vicinity of Little Tokyo:

- Metro shall require the construction contractor to perform TBM operations for a period not extending beyond 48 months. This limit may need to be raised should circumstances arise that are beyond the control of Metro and the construction contractor. The community shall be notified if such a situation occurs. (EJ-33)
- Metro shall prepare a procedure for rapid shut-down of construction should maximum acceptable vibration thresholds be reached. (EJ-34)
- Metro shall prepare a cost-benefit analysis of using one versus two TBMs, and shall select the least impactful cost-effective solution. (EJ-35)

4.18 Construction Impacts

This section summarizes the potential construction impacts of the proposed alternatives, including the Locally Preferred Alternative (LPA). These impacts are drawn from the construction impact findings of the other environmental sections in Chapter 3, Transportation Impacts and Mitigation, Chapter 4, Environmental Analysis, Consequences, and Mitigation, and the technical appendices. The construction methods that would be employed for each of the alternatives, including the LPA, are described in Chapter 2, Alternatives Considered. Construction methods specific to the LPA are described in Section 4.18.2 below. The information in this section is described in more detail in the Construction Impacts Technical Memorandum, which is incorporated into this Final EIS/EIR as Appendix FF.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR and the Supplemental Environmental Assessment/Recirculated Sections of the Draft EIR (Supplemental EA/Recirculated Draft EIR Sections), as indicated in the Responses to Comments, Volumes F-2 through F-4, of this Final EIS/EIR, and based on refinements to the LPA. Some revisions to this section were necessary to maintain consistency with revisions made in response to comments on other analysis sections. Minor changes have also been made to this section in order to maintain consistency with other Metro projects. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.18.4.2 below, based on input received during the Draft EIS/EIR and Supplemental EA/Recirculated Draft EIR Sections public review periods. Environmental consequences associated with construction of the LPA are discussed in Section 4.18.3.4 below and mitigation measures associated with construction are referenced in Section 4.18.4.2.

Refinements made since publication of the Draft EIS/EIR have reduced overall construction impacts by eliminating cut and cover construction on 2nd Street in Little Tokyo, eliminating cut and cover construction in the Financial District on Flower Street between 3rd and 4th Streets, moving tunnel boring machine (TBM) construction staging away from the center of Little Tokyo onto the Mangrove property, and reducing the acquisition of businesses and privately-owned property. The eliminated cut and cover segments would be constructed using TBM excavation.

Refinements to the LPA since publication of the Draft EIS/EIR have reduced the significance of potential construction impacts. Less cut and cover construction and fewer business acquisitions would be needed, and TBM staging would be in a less impactful location on the edge of Little Tokyo. By reducing the need for road and sidewalk closures, property acquisitions, job displacement, and overall neighborhood disruption during construction, the refinements have helped reduce potential construction impacts throughout the project area. The mitigation measures listed for the LPA in this section have been refined and expanded in the Mitigation Monitoring and Reporting Program (MMRP), Chapter 8, of this Final EIS/EIR.

4.18.1 Regulatory Framework

NEPA requires an assessment of construction impacts from proposed projects. The following federal regulations also apply to the evaluation of construction impacts for the Regional Connector Transit Corridor project:

- Federal Clean Air Act (CAA)
- National Ambient Air Quality Standards (NAAQS)
- National Pollutant Discharge Elimination System (NPDES)
- Resource Conservation and Recovery Act of 1976 (RCRA)
- Toxic Substances Control Act of 1976 (TSCA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

In addition, the State of California augments the requirements of federal regulations in the areas of air and water quality. This supplements the CAA with the more stringent California CAA. Also, the State's Regional Water Quality Control Board (RWQCB) oversees water quality. CEQA does not provide specific construction thresholds for many of the environmental topics analyzed in this EIS/EIR, so the general thresholds were used to analyze impacts for those topics in this section.

At the local level, construction-related air quality regulation imposed by the South Coast Air Quality Management District (SCAQMD) and construction noise ordinances in the Los Angeles Municipal Code (LAMC) would apply to the Regional Connector project.

More information about NEPA, CEQA, and local guidance for each environmental topic is available in the respective sections of Chapter 3, Chapter 4, and the technical appendices.

4.18.2 Affected Environment

This section describes the affected environment as it relates to construction activities for the LPA. Construction activities for the other build alternatives, and the locations along each proposed alignment where different techniques would be used, are described in Section 2.4 and in Appendix K, Description of Construction, of this Final EIS/EIR.

4.18.2.1 Locally Preferred Alternative Construction Scenario Overview

Typical construction activities for the LPA are described in Chapter 2 of this Final EIS/EIR (Section 2.4). The construction duration for the LPA would be approximately four years. However, construction activities at any one location may be shorter. In the vicinity of cut and cover construction, surface streets would be impacted intermittently over a period of 24 to 48 months. Construction could begin simultaneously at several locations along the selected route to minimize the overall construction times. Facilities requiring the lengthiest construction work, such as tunnels and underground stations, could potentially be started first so that the entire alignment is completed at approximately the same time.

Construction of the LPA would involve conventional techniques and equipment typically used on similar projects in the Southern California region. Methods would include cut and cover and open cut excavation for certain segments of tunnels, crossovers, portals, stations, and ancillary facilities; and TBM excavation for most of the LPA alignment beneath 2nd Street. The portions of the 2nd/Hope Street station and 1st/Central Avenue station within the street right-of-way would be constructed using the cut and cover method, and off-street portions would be constructed using the open cut method. Part of the 2nd/Hope Street station and the crossover near 2nd/Broadway station may also be constructed using the Sequential Excavation Method (SEM). Also, the proposed portal on 1st Street would be constructed using either the open cut or cut and cover method. More information on these construction methods is provided in Section 2.4 and Appendix K, Description of Construction, of this Final EIS/EIR. Figure 4.18-1 shows the approximate locations where these construction methods would be used.

The equipment that would be used during construction may include rail-mounted vehicles, earth moving vehicles, cranes, concrete mixers, flatbed trucks, sand and gravel delivery trucks, dump trucks, and TBMs. These construction vehicles may temporarily impede traffic mobility in areas of construction and, therefore, traffic detours, designated truck routes, and off-peak hauling schedules could be required during construction. Traffic management and traffic control measures would be coordinated with the City of Los Angeles Department of Transportation (LADOT).

Construction would follow all applicable local, state, and federal laws for building and safety. The Metro Fire Life Safety Committee, composed of members from the City and County of Los Angeles Fire Departments and Metro specialists, would approve all construction methods. Working hours could be varied to meet special circumstances. Standard construction methods and best management practices (BMPs) would be used for traffic, noise, vibration, and dust control, consistent with all applicable laws.

To provide an understanding of the likely steps involved, the anticipated construction activities are described below. This potential construction sequence does not represent the order in which construction activities would be performed. Actual construction would be a complex process with many activities taking place simultaneously. Some of the construction methods and sequences would be left to the discretion of the construction contractor.

4.18.2.2 Utility Relocation and Street Closures

Prior to beginning construction, it would be necessary to relocate, modify, or protect in place all utilities and below-grade structures that would conflict with excavations for street level track work and underground structures (cut and cover sections, tunneling, and station structures). Shallow utilities that would interfere with guideway excavation work, such as maintenance holes or pull boxes, would require relocation. This includes some shallow off-street utilities, such as the underground fuel tank on the proposed 2nd/Broadway station site. These utilities would be modified and moved away from the construction area.

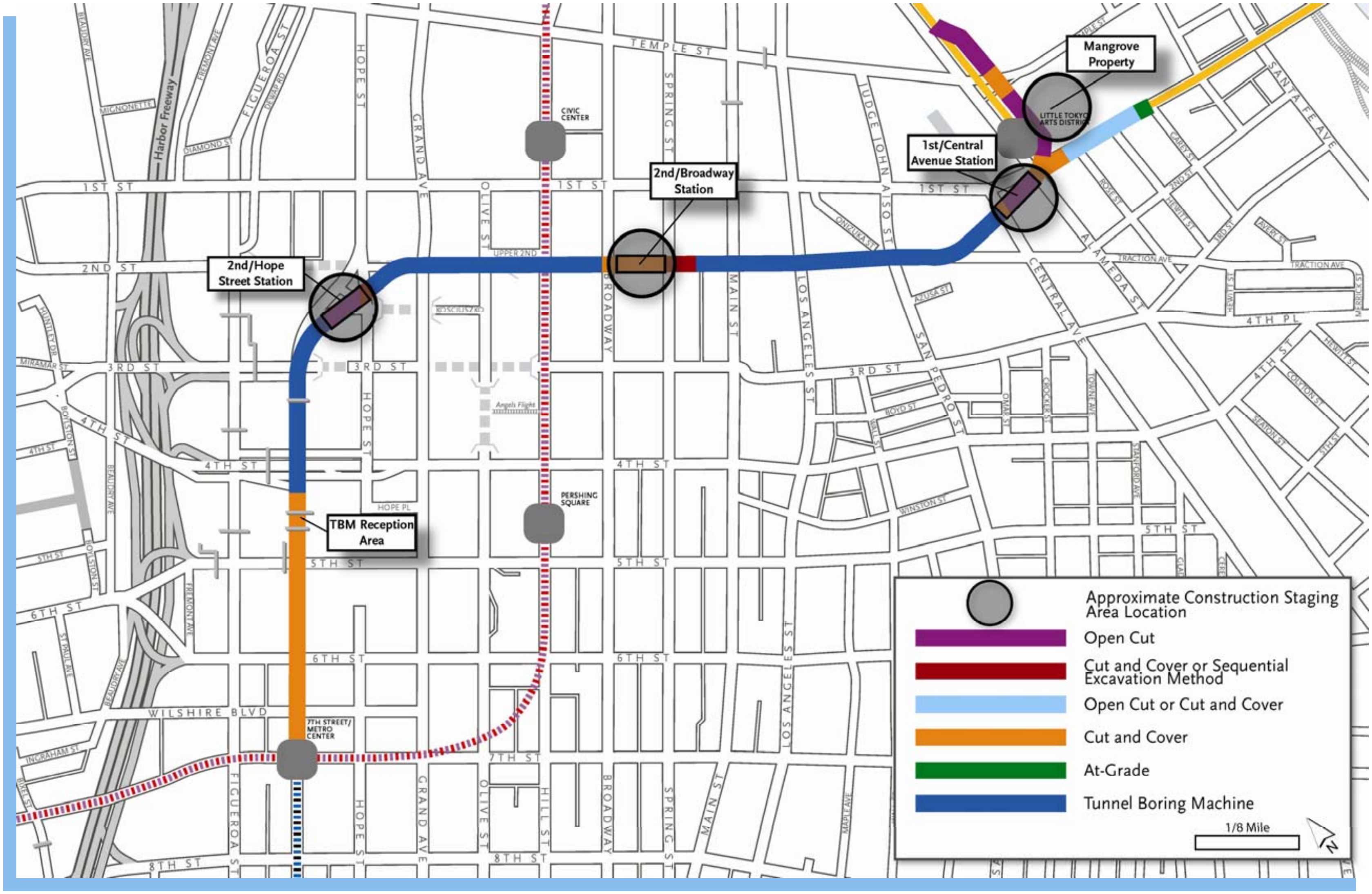


Figure 4.18-1. Locally Preferred Alternative Construction Methods

Travel lanes would need to be temporarily occupied during utility relocation for approximately two to three blocks at a time. Closures could potentially occur in stages and alternate between opposite sides of the street. Depending on the extent of utility relocation work, construction could last up to four months on each two-block segment. Some of the major utilities (greater than 18 to 24 inches in diameter), such as the storm drains on 2nd and Flower Streets, may require more complex construction sequences and schedules for relocations and supports. Other pre-construction activities, such as soldier piling or installation of geotechnical instrumentation, may require temporary partial street closures and the use of drilling equipment and excavators.

4.18.2.3 Staging Areas and Haul Routes

Various locations would be used for construction staging. Typically, a temporary easement would be acquired to reserve portions of the sidewalk and street, and sometimes private property for construction staging. Site clearance and demolition of existing structures at the construction staging areas would be necessary before major construction begins. Construction staging activities are described further in Section 2.4.1 and Appendix K, Description of Construction.

Excavated soils and excess material would be transported off-site to approved disposal sites. To facilitate the removal of excavated materials, haul routes to disposal sites would be pre-determined by agreement with local authorities prior to construction. Testing of materials would be required prior to transportation. Depending on the test results of the soils, disposal options could include the following sites:

California Hazardous (metals) Class I facilities:

- Waste Management Inc., Kettleman City, CA
- Clean Harbors Environmental Services, Buttonwillow, CA
- Veolia Environmental Services, Azusa, CA
- US Ecology Nevada, Inc., Beatty, NV

Non-hazardous, Total Petroleum Hydrocarbon-containing wastes:

- Thermal Processing Systems Treatment, Adelanto, CA

Non-hazardous soil:

- Philadelphia Recycling, Mira Loma, CA
- Municipal landfills
- Other locations identified by the contractor

Routes would follow streets and highways that form the safest, shortest route with the fewest adverse effects on traffic, residences, and businesses. Highways could include Interstate 5 (I-5), State Route 60 (SR 60), US 101, SR 110, I-110, I-10, I-710, and others as appropriate. In addition, the transportation of excavated materials would occur during off-peak hours. The potential staging areas under consideration for the LPA are presented in Chapter 2 and the construction staging drawings in Appendix 1, Locally Preferred Alternative Drawings, of this Final EIS/EIR.

Haul routes would be along major arterial streets. These could include Aliso Street, Temple Street, Commercial Street, 1st Street, 2nd Street, 3rd Street, 4th Street, 5th Street, 6th Street, Wilshire Boulevard, 7th Street, Figueroa Street, Flower Street, Hope Street, Grand Avenue, Olive Street, Hill Street, Broadway, Spring Street, Main Street, Los Angeles Street, San Pedro Street, Central Avenue, and Alameda Street. Due to the large number of industrial and warehouse land uses in the project area, all of these streets currently carry large truck traffic. Precise routes would be confirmed prior to construction.

4.18.2.4 Surface LRT Track Construction Methods

Areas of the LPA where at-grade track work would occur, namely the portal areas near 1st and Alameda Streets and the underground junction, are outlined in Chapter 2. Typical construction activities involved in surface track work are described in Section 2.4.2. Construction would be performed within the roadway median and existing trackway near 1st and Garey Streets, and alongside the roadway, potentially with some temporary staging in the travel lanes. Typical drilling of the shafts for catenary pole and track installation is relatively shallow.

Periodic lane closures, typically on just one side of the work zone, would be required for delivery of materials and other construction activities such as concrete pours.

During construction, cross street and alleyway lanes may be temporarily closed. Depending on allowable working hours, multiple lanes may require closure during excavation, preparation of subgrade, drilling for soldier pile installation, and track foundation placement. Closures would be staggered to facilitate traffic control. Where possible, two-way traffic could potentially be allowed on half of the street.

4.18.2.5 Below Ground LRT Construction Methods

4.18.2.5.1 Cut and Cover Construction

Cut and cover construction would be utilized in various portions of the LPA alignment, as outlined in Chapter 2. These areas include underground cut and cover and trackway construction on Flower Street between Wilshire Boulevard and 4th Street, underground stations, crossovers, portals, and the TBM reception area.

Cut and cover construction is one of various traditional construction methods for underground facilities. Open cut construction method is similar to cut and cover, but does not include temporary decking. Typical activities involved in cut and cover construction are described in Section 2.4.3 and Appendix K, Description of Construction, of this Final EIS/EIR. Cut and cover entails a construction shoring system, excavating down from the ground surface, placing a temporary deck over the excavated area, constructing the underground facilities beneath the deck, and then backfilling and restoring the surface once the facilities are completed (Figure 4.18-2). Temporary concrete decking can be placed over the cut immediately following the first part of excavation (at about 12 to 15 feet below ground surface) to allow traffic to pass above. The deck may be either flush with the existing street surface, or raised above the street surface with Americans with Disabilities Act (ADA)-compliant ramps to allow continued vehicle and pedestrian access. Once the deck is in place, excavation and internal bracing would continue beneath the deck to the required depth. Once the desired construction is completed inside the excavated area, the deck would be removed, the excavation would be backfilled, and the surface would be restored permanently.

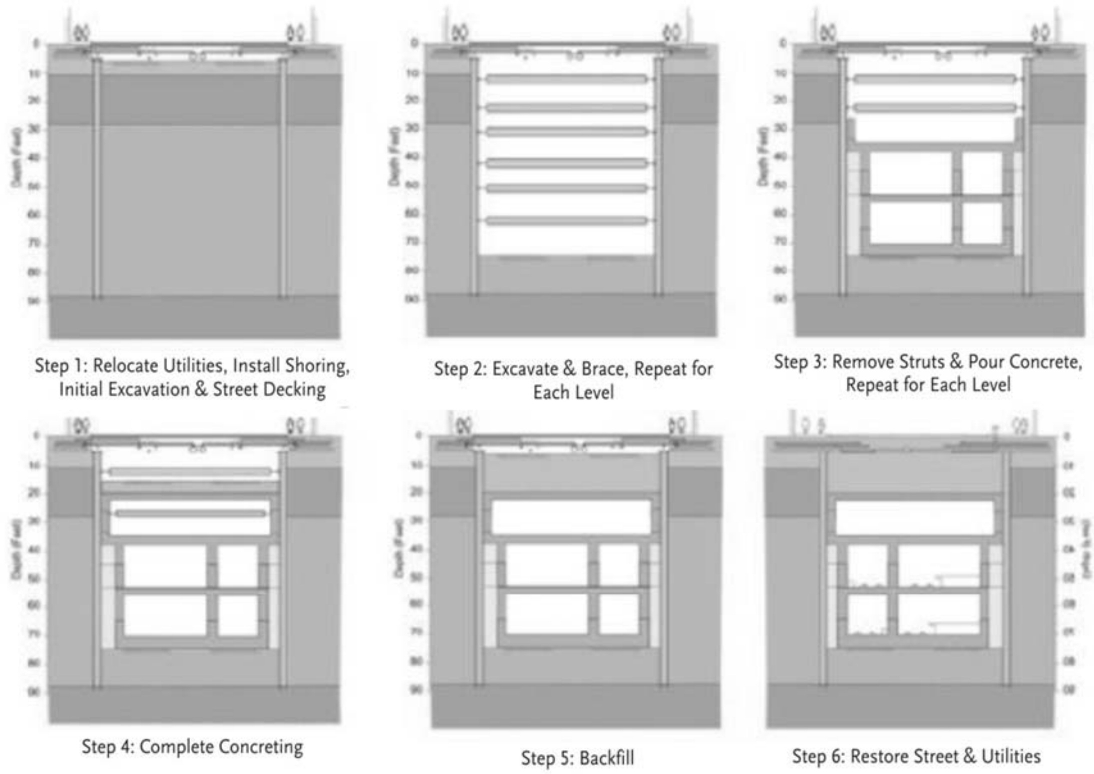


Figure 4.18-2. Cut and Cover Construction Method

Dewatering may be required at underground station locations and tunnel sites to temporarily lower the groundwater level below the excavation depth or to an impermeable layer. Dewatering facilitates installation of shoring systems, improves soil stability, and allows excavation in dry conditions. To dewater an area, groundwater would be pumped from wells installed around the perimeter of the excavation, limiting impacts to surrounding structures, ground, and utilities adjacent to the excavation. Any contaminated groundwater would be properly treated prior to being discharged. Uncontaminated groundwater may be treated and pumped back into the groundwater table, pumped to the sewer or storm drain system, or used on-site for dust control purposes.

Based on experience with the cut and cover construction of the two underground stations on the Metro Gold Line Eastside Extension, after the shoring system was in place, decking installation occurred in only several weekends with non-stop activity from Friday at 5:00 p.m. to Monday morning at 6:00 a.m. with community and local agency approval. Similar progressive staging could be performed for the Regional Connector project, and schedules would be developed in coordination with the affected communities. Portal construction would employ construction methods similar to those used for station excavations and retaining walls, but the portal would remain permanently open and no decking would be required during construction. However, decking may be used during construction of the portal on 1st Street for the LPA.

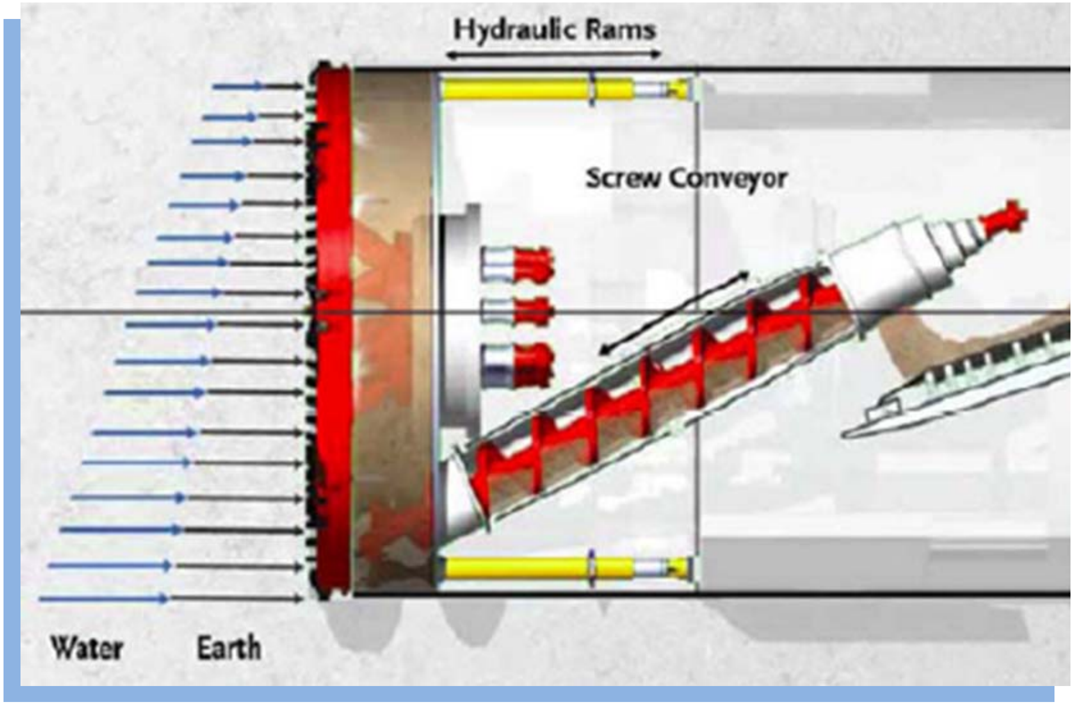
For the LPA, the trackway planned under Flower Street between Wilshire Boulevard and 4th Street, and all underground stations and crossovers would be built with the cut and cover technique. A potential exception is the 2nd/Hope Street station and the crossover near the 2nd/Broadway station, where open cut and SEM construction methods are being considered. Open cut construction would also be used for portions of the 1st/Central Avenue station for the LPA. Underground station construction could last up to 48 months at each underground station location.

Based on the anticipated volume of excavation for the cut and cover tunnel and stations, it is estimated that an average of 20 to 30 dump truck trips per day would be required to haul and dispose of the excavated soils.

4.18.2.5.2 Tunnel Construction and Tunnel Boring Machine (TBM)

Portions of the LPA along 2nd and Flower Streets are anticipated to be bored using a pressurized face TBM(s), as indicated in Chapter 2. Typical activities involved in cut and cover construction are described in Section 2.4.3 and Appendix K, Description of Construction, of this Final EIS/EIR. TBMs are large-diameter horizontal drills that continuously excavate circular tunnel sections. Compared to the cut and cover method, tunnel boring is far less disruptive to surface traffic and adjacent land uses. The excavated materials would be removed through the tunnel using hopper type rail cars or a conveyor system. As the TBM advances, it would support both the ground in front of it and the hole it creates using a shield and pre-cast concrete tunnel liners (Figure 4.18-3). This method creates a tunnel with little disruption at the surface, and is especially suitable for creating a circular opening at depths that would not be practical for cut and cover construction. Concrete tunnel liner segments would have rubber gaskets between them where necessary to prevent water from entering the tunnel, allowing excavation to proceed below the groundwater level.

TBMs require an insertion shaft to start the tunneling operation. For the LPA, the TBM would be inserted into the ground on the Mangrove property on the northeast corner of 1st and Alameda Streets and into Central Avenue through the 1st/Central Avenue station box. The TBM would then excavate toward the 4th and Flower Streets reception area. The TBM would then be dismantled and retrieved through a vertical shaft at the reception area. It would then be transported back to the insertion shaft, and reassembled to repeat its journey for the second twin tunnel. Inserting two TBMs simultaneously, therefore eliminating the need to dismantle and transport a TBM back to the Mangrove property, is an option as well.



Source: CDM, 2009

Figure 4.18-3. Tunnel Boring Machine (TBM) Method

Based on comments received on the Draft EIS/EIR and input received from community meetings held during preparation of this Final EIS/EIR, the TBM insertion site options at 2nd Street and Central Avenue and at 2nd/Hope Street station are no longer being considered for the LPA. Instead, the property at the northeast corner of 1st and Alameda Streets, known as the Mangrove property, would be the insertion site for construction of the LPA. This site is bounded by the Metro Gold Line to the west, Temple Street to the north, 1st street to the south, and Hewitt Street to the east. The property to be used for staging is currently used as an undeveloped surface parking lot with one storage building on-site and is owned by the City of Los Angeles. The TBM would be inserted into the ground on the Mangrove property instead of at the originally proposed 2nd/Central Avenue insertion area, which would reduce the intensity of construction on the block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street and result in fewer acquisitions. Spoils (excavated soil) would be removed within the Mangrove property, and trucks would be routed to the east and/or north to reach the freeway, and would not pass through Little Tokyo. Tunnel boring activities from this site would proceed farther down Flower Street to 4th Street, instead of ending at the proposed 2nd/Hope Street station. No cut and cover on 2nd Street in Little Tokyo would be required with use of this TBM insertion site, which would result in less cut and cover overall during construction.

The pre-cast concrete liners would be fabricated off-site and delivered by truck. Segment delivery would require six to ten truck trips per day for the duration of tunneling, assuming an average excavation rate of 35 feet per day for a single tunnel. Should simultaneous tunneling occur, 12 to 20 truck trips would be required for segment delivery. Table 4.18-1 shows the number of truck trips that would be needed to support TBM activities for the LPA. All delivery and hauling would be performed from Temple Street, Hewitt Street, Vignes Street, and Santa Fe Avenue. Tunneling operation would typically be continuous, occurring seven days a week, 20 hours per day.

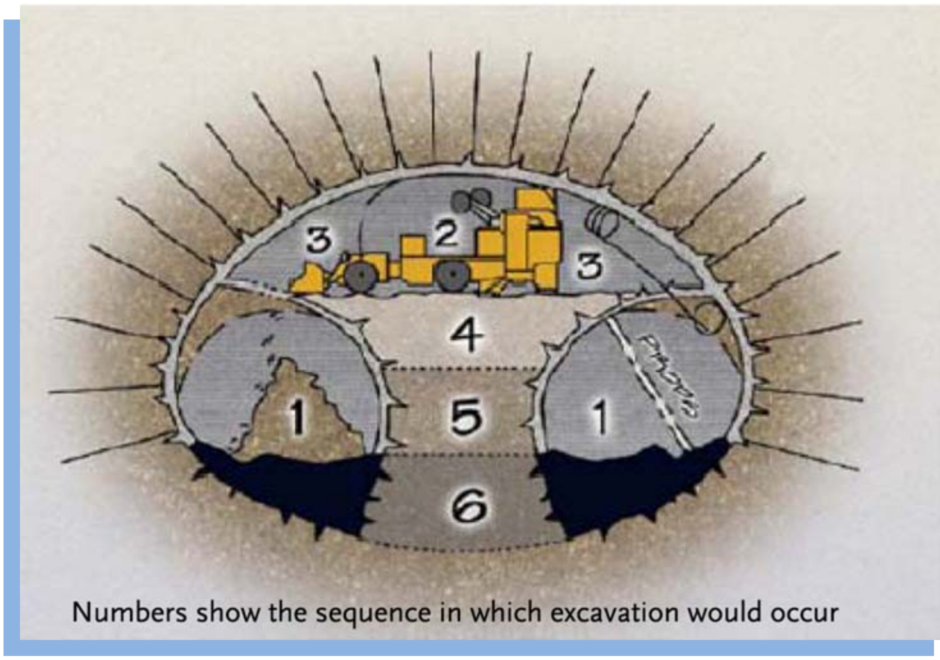
Table 4.18-1. Tunneling Activity Truck Trips for the Locally Preferred Alternative

Activity	Duration (months)	Truck Trips per Day
Pre-Construction	4-6	5
Site Preparation	12-18	10-20
Flower Street Cut and Cover Tunnel	24-48	20-30
2nd/Hope Street Station (SEM)	24-48	10-15
2nd/Hope Street Station (Open Cut)	24-48	20-30
2nd Street TBM Tunnel	24-48	35-70
2nd/Broadway Cut and Cover Station	24-48	15-20
TBM Insertion Site (Mangrove Property)	2-4	5-10
Cut and Cover Tunnel near 1st/Central Avenue Station	12-24	15-20
1st/Central Avenue Open Cut Station	18-36	20-30
Open Cut/Cut and Cover from 1st/Central Avenue to East Portal	12-24	15-20
Open Cut/Cut and Cover from 1st/Central Avenue to North Portal	12-24	15-20
Improvements near 1st and Alameda Streets	12-24	15-20

4.18.2.5.3 Sequential Excavation Method (SEM)

SEM construction involves excavating incrementally in small areas and supporting with steel supports beyond the opening and sprayed concrete as shown in Figure 4.18-4 and described in Section 2.4.4 and Appendix K, Description of Construction, of this Final EIS/EIR. While TBMs can only excavate a fixed circular shape, SEM can be used to construct a tunnel with a horseshoe or sub-rounded shape. This construction technique would be considered in special instances where the planned depth, shape, or length of the tunnel may render it not cost-effective using other methods.

Due to the depth of the 2nd/Hope Street station for the LPA, SEM construction is being considered as an alternative to the open cut and cut and cover methods. Application of SEM would have less surface disruption than these methods since the excavation would be performed mostly underground and accessed via a vertical shaft. SEM can be substituted for cut and cover construction without causing additional impacts.



Source: CDM, 2009

Figure 4.18-4. Sequential Excavation Method (SEM)

4.18.2.6 Additional Construction Activities

4.18.2.6.1 Construction of Underground Station and Portal Structures

Underground stations would be constructed in the following steps: excavation of the station box, followed by the pouring of the foundation base slab, followed by the installation of exterior walls and any interior column elements. Portal structures would use similar construction methods involving placement of concrete inverts, walls, and walkways. Some temporary lane closures would be needed. Station entrance locations would likely be used as access points to underground stations during the construction process. Exterior entrances would be constructed after the station structure has been completed.

Connecting the Regional Connector to the existing Metro Gold Line would require temporary and intermittent interruption of rail service for critical construction activities. There would be two primary closures of the tracks between the intersection of Alameda and Temple Streets, and the intersection of 1st and Vignes Streets, lasting up to six weeks.

In order to maintain rail service to the Eastside Gold Line during construction, Metro would construct a temporary bypass rail connection around the 1st and Alameda Streets intersection.

Approximately one year after start of the construction contract, Metro Gold Line service would be temporarily halted for a period of approximately two to four weeks in order to connect the temporary bypass with existing track immediately south of the existing Little Tokyo/Arts District Station to existing track on 1st Street at Garey Street. During this period, rail service would continue to be provided to the existing Little Tokyo/Arts District Station from Union Station and Pasadena. However, a bus bridge would be needed from Little Tokyo/Arts District Station to all stations further east in the direction of Atlantic Station. Metro would evaluate the possibility of running train service from Atlantic Station to Pico/Aliso Station during this period. Once the temporary bypass is completed and tested, rail service would resume along the entire Metro Gold Line.

Following approximately three to four years of construction, another service interruption of approximately four to six weeks in duration would be required to construct the final section of tracks along 1st Street between Vignes and Hewitt Streets, and to connect the new rail line to the existing Metro Gold Line. During the service interruption, rail service could be maintained from Union Station to the existing Little Tokyo/Arts District Station. Again, a bus bridge would service stations along the Metro Gold Line east of Little Tokyo/Arts District Station.

A likely subsequent scenario would be completion and testing of the Regional Connector, then beginning service along the proposed East-West Line, allowing the new 1st/Central Avenue station to have regional rail service from the Eastside through the Regional Connector to 7th Street/Metro Center Station, continuing on to Santa Monica via the Metro Expo Line.

Once the new East-West Line service is operating, the bus bridge would be shortened to run only between the new 1st/Central Avenue station and Union Station for a period of approximately one year. During this time, construction and testing of the segment of the Regional Connector from the new 1st and Alameda junction to the existing embankment north of Temple Street, would be completed.

As with any existing operating lines, maintenance of tracks and overhead power lines may result in incidental service interruptions along the temporary bypass or the Metro Gold Line during construction. Metro will attempt to minimize closures and shorten the overall project construction schedule in order to reduce customer inconvenience.

4.18.2.6.2 Operating Systems Installation

Operating systems for the LPA would include traction power, an overhead catenary system (OCS), a communications system, and a signal system. An at-grade OCS consists of poles connected to drilled shaft foundations with overhead wires to supply power to the trains. Within the tunnel segments, the OCS would be connected to the top of the tunnels. The system would include Traction Power Substations (TPSS) to provide direct power to the trains. TPSS equipment would need to be installed within station boxes along underground segments of the alignment. Signaling and communications systems would be installed inside the stations and tunnels, and equipment would be housed in ancillary rooms. Communications antennas would be installed on poles or incorporated into existing or planned structures, as described in Section 2.3.3.7.

4.18.2.6.3 Ventilation Shafts and Emergency Exits

The underground segments would include a number of ventilation and emergency exit areas in the vicinity of the underground stations. The stations would house emergency ventilation fan shafts, as well as separate emergency exit shafts at both ends of the stations. Ventilation fans would be installed to extract smoke from tunnels and stairs for evacuation in the event of an emergency, such as a fire in the underground areas. The exact location of these facilities would be determined during the final design. These shafts would be built as extensions of the station excavations using cut and cover construction methods. In some cases, ventilation shafts can extend above ground level, but this is anticipated only at the LPA's 1st/Central Avenue station.

4.18.2.7 Protection of Existing Structures

The alignment of the Regional Connector project and stations have been planned to minimize construction near or beneath the existing structures. However, there are areas where this cannot be avoided. Existing structures along both sides of the LPA alignment on Flower and 2nd Streets would be close to the excavation sites or the tunnel alignment. Building assessments would be necessary as part of the pre-construction evaluation of existing structures along the alignment. During preliminary and final design of the project, subsurface (geotechnical) investigations would be undertaken to evaluate soil, groundwater, and environmental conditions along the alignment. The geologic conditions will influence design and construction methods specified for stations and tunnels and protection of existing facilities and foundations.

Before any construction, a survey of structures within the anticipated zone of construction influence would be conducted in order to establish baseline conditions. A geotechnical instrumentation and settlement monitoring plan and mitigation measures would be developed and adhered to during construction to ensure appropriate measures are taken to address any construction-induced movement.

If assessments indicate the necessity to proactively protect nearby structures, additional support for the structures by underpinning or other ground improvement techniques would be required prior to the underground construction.

For buildings adjacent to cut and cover construction, it is anticipated that the shoring system in conjunction with internal bracing could provide a temporary support for the proposed excavation that would result in deformation generally within the tolerable limits of the structures. Evaluations during future phases of design would help confirm the appropriate levels of monitoring, protection, and mitigation measures required during construction.

To reduce surface settlement and the potential for ground loss and soil instability (sloughing, caving) at the tunnel face due to tunneling, closed pressure-face TBMs and pre-cast, bolted and gasketed segmental lining systems would be employed. In combination with the face pressure, grout would be injected immediately behind the TBM, in the annular space between the installed precast concrete liners (tunnel rings) and the excavated ground. The closed pressure-face TBM can tunnel below the groundwater table without requiring dewatering or lowering of the groundwater table.

Where conditions warrant, for example shallow tunnels directly below sensitive structures or utilities, additional methods to reduce settlement would be specified. The following is a brief summary of the various types of protective methods that could be employed along the alignment.

4.18.2.7.1 Permeation and/or Jet Grouting to Improve the Ground Prior to Tunneling

Chemical (sodium silicate) or cement-based grouts are injected into the ground to fill voids between soil particles and provide greater strength and stand-up time for the soil. This grout can be placed through pipes from the surface before the tunnel reaches the grouted area or from pits or shafts adjacent to the grouted area. The permeation methods have been used successfully for the Metro Red Line in instances where the tunnel passed under potentially sensitive or important structures such as the US 101 Freeway (downtown, Hollywood and at Universal City).

4.18.2.7.2 Compaction Grouting as the Tunnel is Excavated

This method involves injection of a stiff "grout," typically sand with small amounts of cement, above the tunnel crown as the tunnel advances. The grout increases soil density above the tunnel crown and replaces some of the lost ground, thereby preventing settlement from propagating to the surface. This method was used in several instances for the Metro Red Line project in the downtown Los Angeles area and along portions of Hollywood Boulevard.

4.18.2.7.3 Compensation Grouting

Compensation grouting involves carefully controlled injection of grout between underground excavations and structures requiring protection from settlement. For tunnel applications, the pipes for grouting are installed above the intended tunnel position, in advance of tunneling. A major key component in controlling compensation grouting is careful monitoring of both structure and ground movements to allow the timing and quantities of grout injected to be optimized. Grout injection can take place before, during, and after tunneling activity with grout pipes that are designed for multiple grout injections.

For grouting methods, surface preparation would likely be required (removal of landscaping etc.) to allow space for drilling equipment, installation of grout pipes, and injection of grout. In cases where large structures are directly over the tunnel, access into the building or basements, where basements exist, could be required for grouting operations, and use of the building could be limited during the grouting operations. After grouting is completed, the area would be restored to its existing condition.

4.18.2.7.4 Underpinning

Underpinning involves providing a direct support of the foundations of an existing building by carrying its load bearing element to deeper levels than its previous configuration. This method of protection provides positive protection of the building from settlement that may be caused by tunneling operations or open cut station excavations below the bottom of adjacent foundations. It permanently extends the foundations of a structure to an appropriate level beyond the range of influence of the construction activity. This can be accomplished by providing deeper piles adjacent to or directly under the existing foundation and transferring the building foundation loads onto the new system.

4.18.3 Environmental Impacts/Environmental Consequences

Potential construction impacts would be temporary, short-term effects during construction. Long-term operational impacts are discussed in their respective environmental topic sections in Chapters 3 and 4 and the EIS/EIR technical appendices.

The following sections summarize the evaluation of potential construction impacts for each alternative, including the LPA. Table 4.18-2 summarizes the results of the analysis. Impact conclusions for all of the alternatives are based on the thresholds referenced above in Section 4.18.1.

Table 4.18-2. Summary of Potential Construction Impacts

Alternative	Potential Effects/ Impacts Before Mitigation	Unavoidable Impacts Remaining After Mitigation (NEPA and CEQA)
No Build	None	None
TSM	None	None
At-Grade Emphasis LRT	Adverse effects/ significant impacts	Transportation (traffic circulation, transit, pedestrian, bicycle), air quality
Underground Emphasis LRT	Adverse effects/ significant impacts	Transportation (traffic circulation, transit, pedestrian, bicycle), air quality, paleontological resources
Locally Preferred Alternative	Adverse effects/ significant impacts	Transportation (traffic circulation, transit, pedestrian, bicycle), air quality, paleontological resources

4.18.3.1 No Build and TSM Alternatives

The No Build Alternative would not involve any new construction as part of the Regional Connector project. The TSM alternative would involve installation of new bus shelters and associated safety features to accommodate two new shuttle bus routes between 7th Street/Metro Center Station and Union Station. This construction would be very short-term (days) and would not result in any adverse impacts.

4.18.3.1.1 NEPA Finding

Neither the No Build Alternative nor the TSM Alternative would result in any adverse construction-related effects. Therefore, no mitigation measures would be required.

4.18.3.1.2 CEQA Determination

Neither the No Build Alternative nor the TSM Alternative would result in any significant construction-related impacts. Therefore, no mitigation measures would be required.

4.18.3.2 At-Grade Emphasis LRT Alternative

The potentially significant adverse construction impacts for the At-Grade Emphasis LRT Alternative are described in this section. Other environmental topics and less than significant potential impacts are further discussed in Appendix FF, Construction Impacts Technical Memorandum.

4.18.3.2.1 Traffic, Circulation, and Parking

Construction of the At-Grade Emphasis LRT Alternative would require the loss of on-street parking and reduction in travel lanes in certain locations. In most instances, these would be temporary conditions during the construction phase.

In areas designated for cut and cover construction, the top two to three feet of the roadway would be removed and decking would be installed over a series of long weekends (or other suitable times during the week) spanning an approximate three- to four-month period. Construction of the stations would continue underground while traffic operates normally on the decking. This procedure would require temporary off-peak, nighttime or weekend street closures to install the decking. The closure schedules would be coordinated to minimize impacts to residences, businesses, special events, and traffic flow. During these times, traffic would be re-routed to adjacent streets via clearly marked detours.

Utility relocations, construction of the trackway, stations, and the proposed Alameda Street underpass at Temple Street would require the temporary closure of lanes on Flower Street, Hope Street in the vicinity of General Thaddeus Kosciuszko Way, Main Street, Los Angeles Street, Temple Street, 2nd Street, and Alameda Street. The track construction and permanent street configuration along 2nd Street would result in the elimination of eastbound vehicular travel on the segment of roadway between Hill and Main Streets as well as the permanent closure of one eastbound travel lane between Main and Los Angeles Streets. For the westbound direction of 2nd Street, a one lane permanent closure has been identified between Hill and Los Angeles Streets. Travel times for vehicles traveling along the westbound direction of 2nd Street are expected to increase and eastbound vehicular through traffic would likely shift to 4th and 1st Streets. This shift would result in increased delays at several intersections between Hill Street and Los Angeles Street. Vehicular travel times and intersection operations along these roadways would potentially be impacted.

Construction of the proposed Alameda Street underpass at Temple Street would also result in the temporary reduction of roadway capacity for extended periods of time. In order to maintain two through travel lanes in each direction during construction activities, the two-way left turn median in the mid-block area and the exclusive right and left turn lanes at the intersection approaches would be temporarily eliminated over the two to three year period estimated to construct the underpass. The north and south intersection lane configurations would consist of a shared through and right turn lane and a shared through and left turn lane for the segment of Alameda Street between Aliso and 1st Streets.

The existing signal phasing may be changed to split phasing in order to minimize conflicts between left turns and opposing through movements. This would minimize the formation of queues that could result from a vehicle waiting for a gap in the opposing traffic to complete a left turn movement. Consequently, travel times along this segment of Alameda Street are expected to increase due to the potential for additional traffic congestion. Also, operating conditions for the Alameda Street intersections between Aliso and 1st Streets are expected to experience increased delays.

Construction of the At-Grade Emphasis LRT Alternative would require use of heavy-duty trucks to transport equipment and excavated soil. The addition of these truck trips to the existing street network has the potential to adversely affect traffic and parking. Haul and delivery truck routes would affect residents and commuters along the alignment. Soil hauling, rail and catenary deliveries, and general construction traffic would impact traffic flow patterns as well. Roadway surface restoration may be needed in areas that experience frequent project-related truck trips. These would be temporary conditions during the construction phase.

Existing on-street parking spaces and loading stalls would be temporarily removed during construction. This would potentially impact parking space and loading areas on the east and west sides of Flower Street, the loading areas on the east side of Main and Los Angeles Streets, and the parking spaces on the south side of Temple Street. In addition, the realigned intersection of Hope Street in the vicinity of General Thaddeus Kosciuszko Way may temporarily remove several parking spaces along both the east and west sides of the roadway segment. The track construction and permanent street configuration along 2nd Street would result in the temporary removal of several parking and loading stalls. Adjacent to the Alameda Street underpass, the Japanese American National Museum (JANM) tour bus loading zone on the west side of the street would be temporarily relocated for the duration of the construction period.

As noted earlier, the construction along 2nd Street would shift some of the through traffic movements on to 1st Street, which is designated as a Class III bicycle route. Consequently, the flow of bicycle traffic could be hampered due to increased auto traffic volumes on 1st Street. The additional automobile traffic would result in increased turning movements, potentially reducing bicycle operating speeds or resulting in a greater risk of bicycle-automobile conflict, since Class III routes do not have bicycle-designated lanes.

The construction of the underpass on Alameda Street may result in localized shifts in traffic to adjacent streets such as Central Avenue, which is also designated as a Class III bicycle route. Similarly, the increase in traffic volumes could potentially impact the flow of bicycle traffic.

Track construction, permanent street configuration changes along 2nd Street, and the construction of an underpass on Alameda Street may also require temporary sidewalk detours. Temporary sidewalk detours during the construction of this alternative would impact pedestrian flow.

Restoration of these parking, pedestrian and bicycle circulation, and travel lanes to their permanent configurations would occur prior to operations. Although short-term, potentially adverse impacts are anticipated during construction of this alternative. Potentially adverse impacts due to the rerouting of transit service could also occur during construction. Combined with the effects of other projects in the downtown area, potential cumulative adverse impacts could occur.

4.18.3.2.2 Displacements and Relocation

During construction of the At-Grade Emphasis LRT Alternative, staging of construction equipment and materials would require temporary construction easements that would impact six parcels. The portions of these parcels that would be utilized would be plazas and open areas. Access to businesses and buildings would be maintained. Some sidewalk detours would be necessary. Mitigation would minimize the adverse impacts associated with this type of displacement during construction. Specific measures are identified in Section 4.2. In addition, once construction is completed, the sites would be restored to their permanent conditions.

4.18.3.2.3 Community and Neighborhood Impacts

Mobility would be reduced in the Civic Center, Historic Core, and Little Tokyo areas due to street closures associated with construction activities including track work, cut and cover excavation, and structural support work. Disruption of traffic patterns would require detours for persons accessing nearby residences and businesses. In Little Tokyo, disruption to traffic along Alameda and Temple Streets would directly affect cultural institutions such as JANM, the Go For Broke Monument, and the Museum of Contemporary Art (MOCA) and other businesses during the excavation and construction of the Alameda Street underpass and the potential pedestrian bridge. This could impact the economic vitality of some businesses, particularly in Little Tokyo, where the community has expressed concern about construction activities. Prolonged disruption to businesses could affect community cohesion. Without mitigation, potential adverse construction impacts associated with community and neighborhoods are anticipated under the At-Grade Emphasis LRT Alternative.

4.18.3.2.4 Visual and Aesthetic Resources

During construction of the At-Grade Emphasis LRT Alternative, several construction staging areas would be utilized. Construction areas would be protected by barriers. The placement of concrete barriers and fencing would be visible from multi-family residences and other sensitive uses adjacent to the alignment, particularly the Bunker Hill Towers, the Higgins Building, Hikari, and Savoy. Viewers would see construction equipment, construction-related activities, and stockpiles of dirt and debris, and the urban streetscape would be temporarily altered. Screening of construction staging areas would minimize aesthetic impacts at street level. The project would be constructed in a heavily urbanized environment where construction activities are not uncommon, and the construction of the project would not noticeably reduce visual quality or alter viewing context. In Little Tokyo, large construction equipment would be required for the excavation and construction of the Alameda Street underpass and of the potential pedestrian bridge. This impact would be temporary and would be considered less than significant. Overall, less than significant impacts associated with views and visual character are anticipated due to construction activities.

Temporary lighting may be necessary for nighttime construction, which minimizes disruption to daytime traffic and business activities and at night for security of staging sites. However, nighttime construction activities would be limited to non-residential areas and nighttime illumination of staging areas would be directed towards the site and away from sensitive uses. Therefore, less than significant impacts are anticipated.

4.18.3.2.5 Air Quality

An analysis of construction-related emissions was completed in accordance with SCAQMD requirements. The estimate included emissions from off-road construction equipment, fugitive dust, construction worker commuting, and haul truck emissions. Daily regional construction emissions are anticipated to exceed SCAQMD regional significance thresholds for VOC, NO_x, CO, PM_{10} and $PM_{2.5}$ and would result in a potential adverse effect without mitigation. Daily regional emissions of VOC, NO_x, and CO would remain significant after mitigation.

In addition to evaluating emissions on a regional level, construction emissions were also compared to SCAQMD's localized significance thresholds. The methodology includes using look-up tables for NO_x, CO, PM_{10}, and $PM_{2.5}$. The tables show the maximum allowable emission levels given the project location, acreage, and distance to the nearest receptor. It was assumed that most project construction sites would be approximately one acre in size and located within 25 meters of a receptor. Cut and cover construction along Flower Street would generate the maximum localized construction emissions. Daily construction emissions are anticipated to exceed SCAQMD localized significance thresholds for NO_x, PM_{10}, and $PM_{2.5}$, and would result in a potentially adverse localized air quality effect, which could be mitigated below the level of significance.

Daily regional and localized construction emissions are anticipated to exceed SCAQMD regional significance thresholds and would result in a potentially adverse cumulative effect without mitigation.

4.18.3.2.6 Noise and Vibration

Construction of the At-Grade Emphasis LRT Alternative would potentially generate noise and vibration from excavators, bulldozers, trenchers, drill rigs, cranes, and heavy-duty trucks used to transport construction equipment. The construction activities and locations with the greatest potential for noise impacts are: the Flower Street cut and cover tunnel, Flower/6th/5th Street station cut and cover construction, 2nd/Hope Street station open cut construction, and construction of the junction and underpass at Temple and Alameda Streets. These four activities have the greatest potential for noise impacts due to the extended duration of work and proximity to noise-sensitive land uses. Potential adverse effects from construction noise are anticipated if mitigation measures are not implemented.

Vibration from large bulldozers and drill rigs could exceed the FTA annoyance criteria for sensitive land uses identified in the Noise and Vibration Technical Memorandum (Appendix S). However, perceptible vibration from construction equipment would be short-term and intermittent. Therefore, perceptible vibration from the construction equipment is considered an "infrequent event," less than 30 events a day as defined by FTA. Occupants would not be subject to vibration levels above the FTA annoyance criteria. It should be noted that large bulldozers and drill rigs would operate intermittently and would not be used during every day of construction. Without the implementation of mitigation measures, potentially adverse effects from vibration could occur.

4.18.3.2.7 Geotechnical/Subsurface/Seismic/Hazardous Materials

The At-Grade Emphasis LRT Alternative proposed alignment does not cross any known faults. However, portions of the proposed alignment occur in areas mapped with the potential for liquefaction based on soil stability. Areas susceptible to liquefaction are located along Flower Street between Wilshire Boulevard and 2nd Street, and along 2nd Street between Hill and San Pedro Streets. The eastern edge of the alignment near the intersection of 1st and Temple Streets is within the mapped Inundation Hazard Area. In addition, the proposed 2nd/Hope Street station is within the Hillside Ordinance area (Bunker Hill).

During construction of underground stations, portal structures, and the Alameda Street underpass, there is the potential for adverse impacts related to ground settlement and differential settlement on adjacent structures including historical buildings. Further evaluation and survey would be performed during final design to confirm building types and existing conditions, and to develop criteria to limit potential movement to acceptable threshold values. Protection of buildings could involve design of adequately rigid excavation support systems, underpinnings, and ground improvements to minimize settlement to tolerable limits. A pre-construction survey of the adjacent structures and all historical buildings in the vicinity would be conducted to establish a baseline for measuring potential construction-induced damage. Construction monitoring would be required to ensure that ground movement does not exceed threshold values. With mitigation, less than significant impacts would be anticipated.

Construction of surface track work, stations, and portals would likely require removal of protective vegetation or pavement that would increase the potential for soil erosion. With mitigation, potential adverse construction impacts associated with subsurface soils would be less than significant.

4.18.3.2.8 Water Quality

There is known and suspected soil and groundwater contamination along the proposed At-Grade Emphasis LRT Alternative alignment. Construction activities have the potential to increase erosion and sedimentation around proposed construction and staging areas. Grading activities associated with construction could potentially result in a temporary increase in the amount of suspended solids running off construction sites. In a storm event, construction site runoff could result in sheet erosion of exposed soil. Groundwater may be encountered during trenching or tunneling, and would require dewatering. Dewatering activity would result in the potential release of contaminated water due to the presence of relatively shallow groundwater (located at depths ranging from 14 to 36 feet) that is contaminated with pollutants common to urban development. All dewatering activity would occur with a NDPES permit. Testing would occur prior to construction and on-site treatment and discharge in accordance with applicable standards or transport to a treatment or disposal facility would be required. Without mitigation, potential adverse construction impacts associated with water quality would be anticipated under the At-Grade Emphasis LRT Alternative.

4.18.3.2.9 Historic Built Environment Resources

An adverse effect would occur to the 2nd Street Tunnel according to the criteria for adverse effect to a historic property (36 CFR 800.5(a)(1)) due to the demolition of a portion of the National Register of Historic Places (NRHP)-eligible 2nd Street Tunnel and the subsequent change in use. The changes would directly alter a characteristic of the historic property in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Seven other NRHP- and/or California Register of Historical Resources (CRHR)-eligible properties could be potentially affected by differential settlement due to cut and cover construction, differential settlement, and construction noise and vibration associated with construction of the At-Grade Emphasis LRT Alternative. The implementation of design measures would protect and stabilize the ground near historic properties as noted in Section 4.12.1.4 of the Draft EIS/EIR. These measures would avoid adverse effects to all of these properties. If properly implemented, short-term construction activities would not directly alter a characteristic of the historic property in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

4.18.3.2.10 Archaeological Resources

The At-Grade Emphasis LRT Alternative has the potential to alter, remove, or destroy archaeological resources within the area of potential effect (APE). A historic brick alignment may be affected during ground disturbance from construction of a proposed pedestrian bridge at the intersection of Temple and Alameda Streets. The site appears to be not eligible for NRHP or CRHR listing. However, previously unrecorded parts of the site that retain substantial integrity may be present. This alternative also has the potential to affect previously unrecorded archaeological resources during ground disturbance from constructing new underground tunnel segments on Flower Street, new stations, and an automobile underpass and pedestrian overpass on Alameda Street at Temple Street. Such damage to archaeological resources would represent a significant effect that could be mitigated. Implementing mitigation measures described in Section 4.12.2.4 of the Draft EIS/EIR would reduce this effect to a less than significant level.

4.18.3.2.11 Paleontological Resources

The At-Grade Emphasis LRT Alternative would have the potential to adversely impact paleontological resources at the surface and at depth within the project area as a result of ground disturbance related to construction of new underground tunnel segments and at new proposed stations. Any ground disturbances in areas of high sensitivity (see Section 4.12.3) would have the potential to impact paleontological resources at the surface and at depth. Ground disturbance in areas of sensitivity ranging from low to high have the potential to impact paleontological resources at a depth of five feet or greater below the ground surface. In areas where proper mitigation measures in Section 4.12.3.4 of the Draft EIS/EIR can be implemented, potential impacts can be reduced to a less than significant level.

4.18.3.2.12 Ecosystems and Biological Resources

During construction of the At-Grade Emphasis LRT Alternative, some mature trees located along the proposed alignment could be removed. As these mature trees may provide potential nesting and roosting habitat for bird species, including raptors, removal or disturbance of this vegetation during the nesting season could directly impact this habitat and any bird species that are present. There are currently approximately 250 mature trees in the area that could potentially be affected by construction, and some of these trees could be removed or disturbed. Approximately 60 of the trees are native California sycamore trees, a protected species. Potential mitigation measures are described in Section 4.8.4 of the Draft EIS/EIR and include a removal permit from the Los Angeles Board of Public Works, if construction of the project requires removal of any of the native trees, in accordance with the City of Los Angeles Native Tree Protection Ordinance. The tree removal permit may require replanting of native trees within the project area or at another location within the City of Los Angeles to mitigate for the removal of these trees. Implementation of mitigation identified in Section 4.8.4 of the Draft EIS/EIR would reduce this potential impact to a less than significant level.

4.18.3.2.13 Parklands and Other Community Facilities

During construction of the At-Grade Emphasis LRT Alternative, access to the parking structure beneath Maguire Gardens and pedestrian access to the gardens and the City Hall Park could potentially be reduced, but not eliminated, due to street closures and construction activities. Discrete locations along the alignment that could experience modified pedestrian and vehicle access during construction and operation include the new Los Angeles Police Department (LAPD) headquarters, the State of California Department of Transportation (Caltrans) building, City Hall, City Hall East, the U.S. Federal Government Building (Roybal Center), the Los Angeles Ambulatory Care Center, the fire station on Temple Street, and the Little Tokyo Branch Public Library. Disruption of traffic patterns would temporarily impede access to certain community resources such as the MOCA, the Geffen Contemporary at MOCA, City Hall South Lawn Park, Walt Disney Concert Hall, JANM, and the Go For Broke Monument. However, access to the facilities would be maintained throughout construction, though detours or alternate access routes may be needed. Although construction impacts are direct by nature, the construction of the At-Grade Emphasis LRT Alternative alignment could potentially discourage patrons of community facilities and parks to visit them due to impeded access and temporary parking restrictions. This would have the potential to affect annual festivals and events held in the downtown area during the construction period. Response times for emergency services could also be impacted due to street closures and detours, but this would be avoided through mitigation. As such, no adverse construction impacts associated with parklands and other community facilities are anticipated under the At-Grade Emphasis LRT Alternative.

4.18.3.2.14 Economic and Fiscal Impacts

Construction of the At-Grade Emphasis LRT Alternative would directly impact several businesses located along the alignment due to lane closures, sidewalk detours and restricted street parking during track installation and cut and cover activities. These businesses primarily rely on vehicular and pedestrian traffic for revenue generation. Appendix BB, Economic and Fiscal Impacts Technical Memorandum, lists businesses along the proposed alignment that would likely be affected by the track installation and street closures during construction. In addition, temporary closures or impeded access to Alameda Street during construction of the underpass and potential pedestrian bridge would impact a heavily utilized truck route and impede freeway access to Little Tokyo. Cultural institutions, such as MOCA and JANM, could potentially be impacted directly, and other businesses could be impacted indirectly.

Investment in transportation, including direct investment in the form of capital construction and operation costs, provides economic benefits in several basic ways: the creation of direct and indirect jobs, and spending by suppliers whose goods and services are used in the project. These benefits are discussed in Section 4.14 and Appendix BB, Economic and Fiscal Impacts Technical Memorandum. Overall, the short-term impacts and long-term benefits of the project would result in a net benefit.

4.18.3.2.15 Safety and Security

The contractor would have a safety plan and be responsible for construction site security consistent with local regulations and standards. Construction activities are not anticipated to affect security in the project area. Typically construction areas are fenced off with restricted access and are well lit. Direct adverse impacts are not anticipated with regards to safety or security.

4.18.3.2.16 NEPA Finding

The At-Grade Emphasis LRT Alternative would have adverse construction effects related to the environmental topics shown in Table 4.18-3. Most of these potential effects could be reduced to a not substantially adverse level by the mitigation measures proposed in resource-specific sections in Chapters 3 and 4. However, there would still be unavoidable adverse effects with respect to transportation (traffic circulation, transit, pedestrian, and bicycle) and air quality.

Table 4.18-3 also indicates which of these potential effects would remain adverse after implementation of the mitigation measures referenced in Section 4.18.4 of the Draft EIS/EIR.

4.18.3.2.17 CEQA Determination

The At-Grade Emphasis LRT Alternative would have significant construction impacts related to the environmental topics shown in Table 4.18-3. Most of these potential impacts could be reduced to a less than significant level by the mitigation measures proposed in resource-specific sections in Chapters 3 and 4. However, there would still be unavoidable significant impacts with respect to transportation (traffic circulation, transit, pedestrian, and bicycle) and air quality.

Table 4.18-3 also indicates which of these potential impacts would remain significant after implementation of the mitigation measures referenced in Section 4.18.4 of the Draft EIS/EIR.

Table 4.18-3. NEPA Findings and CEQA Determinations for Potential Construction Impacts of the At-Grade Emphasis LRT Alternative

Topic	Potentially Adverse Effect or Significant Impact Before Mitigation?		Potentially Adverse Effect or Significant Impact After Mitigation?	
	NEPA	CEQA	NEPA	CEQA
Transportation (Traffic Circulation, Transit, Pedestrian, and Bicycle)	Yes	Yes	Yes	Yes
Displacements and Relocation	Yes	Yes	No	No
Air Quality	Yes	Yes	Yes	Yes
Noise and Vibration	Yes	Yes	No	No
Community and Neighborhood Impacts	Yes	No	No	No
Visual and Aesthetic Resources	No	No	No	No
Geotechnical/Subsurface/Seismic/ Hazardous Materials	Yes	Yes	No	No
Historic Built Environment/ Archaeological Impacts	Yes	Yes	No	No
Paleontology	Yes	Yes	No	No
Water Resources	Yes	Yes	No	No
Economic and Fiscal Impacts	Yes	Yes	No	No
Ecosystems and Biological Resources	Yes	Yes	No	No
Parklands and Other Community Facilities	No	No	No	No
Safety and Security	No	No	No	No

4.18.3.3 Underground Emphasis LRT Alternative

The potential adverse construction impacts of the Underground Emphasis LRT Alternative would be similar to those of the At-Grade Emphasis LRT Alternative. Only the differences in impacts between the two alternatives are noted in this section.

4.18.3.3.1 Traffic, Circulation, and Parking

The Alameda Street underpass would be located at Alameda and 1st Streets under the Underground Emphasis LRT Alternative. Other than the difference in location, the construction activities would be the same as described in Section 4.18.3.2.1. Travel times along this segment of Alameda Street are expected to increase due to the potential for increased traffic congestion. Also, operating conditions for the Alameda Street intersections between Aliso and 1st Streets are expected to deteriorate.

Construction of the Underground Emphasis LRT Alternative would require the use of heavy-duty trucks to transport equipment and excavated soil. The additional excavated soil necessary to construct the underground segment along 2nd Street would require more haul trucks than the At-Grade Emphasis LRT Alternative. Haul and delivery truck routes would affect residents and commuters along the proposed alignment. Tunnel spoil hauling, rail and catenary deliveries, and general construction traffic would impact traffic flow as well. Roadway surface restoration may be needed in areas that experience frequent project-related truck trips. These would be temporary conditions during the construction phase.

Lane closures during construction on Flower Street, Hope Street in the vicinity of General Thaddeus Kosciuszko Way, Main Street, 2nd Street, 1st Street, and Alameda Street would result in the temporary removal of existing on-street parking spaces and loading stalls. This would impact parking spaces and loading areas on both sides of Flower Street, on 2nd Street between Spring and Alameda Streets, on Central Avenue and Alameda Street between 1st and 2nd Streets, and on 1st Street between San Pedro and Hewitt Streets. In addition, the realigned intersection of Hope Street in the vicinity of General Thaddeus Kosciuszko Way may temporarily remove several parking spaces along both the east and west sides of the roadway segment. In the vicinity of the Alameda Street underpass, the JANM tour bus loading zone on the west side of the street would be temporarily removed and relocated for the duration of the construction period. Overall, parking impacts during construction would not be considered adverse.

Cut and cover station construction along segments of Flower Street and construction of the underpass on Alameda Street may require temporary sidewalk detours, which could potentially impede pedestrian flow. However, pedestrian flow on 2nd Street would be better under this alternative than the At-Grade Emphasis LRT Alternative.

In addition, the construction of the underpass on Alameda Street may result in localized shifts in traffic to adjacent streets such as Central Avenue, which is designated as a Class III bicycle route. The flow of bicycle traffic could potentially be impacted due to increased traffic volumes on Central Avenue. The additional automobile traffic would result in increased turning movements, potentially reducing bicycle operating speeds or resulting in a greater risk of bicycle-automobile conflict, since Class III routes do not have bicycle-designated lanes.

Impacts to transportation (traffic circulation, transit, pedestrian, and bicycle) during construction would be short-term. However, they would contribute to a potential cumulative adverse effect when combined with other projects in the downtown area. Therefore, potential cumulative adverse transportation impacts are anticipated under the Underground Emphasis LRT Alternative.

4.18.3.3.2 Community and Neighborhood Impacts

Mobility would be reduced in the Financial District, Bunker Hill, Civic Center, Historic Core, and Little Tokyo areas due to street closures associated with construction activities including track installation at 1st and Alameda Streets, cut and cover excavation, and structural support work. Disruption of traffic patterns would impede, but not eliminate, access to residences and businesses.

In Little Tokyo, disruption to traffic along Alameda and 1st Streets would directly affect cultural institutions such as JANM, the Go For Broke Monument, MOCA, the Geffen Contemporary at MOCA, and other businesses during the excavation and construction of the Alameda Street underpass and the potential pedestrian bridge. Disruption would also temporarily impede access to community resources such as City Hall South Lawn Park and Walt Disney Concert Hall. In addition, the installation of TBMs either in the Little Tokyo or Bunker Hill areas would temporarily disrupt communities, businesses, and residents. Buildings likely to experience disruption include Savoy and Honda Plaza in Little Tokyo, and the Bunker Hill Towers. However, access to facilities would be maintained throughout construction, though detours or alternate access routes may be needed, as noted in the transportation mitigation measures in Section 3.4 of the Draft EIS/EIR. Although construction impacts are direct by nature, the construction of the Underground Emphasis LRT Alternative alignment could potentially discourage patrons of community facilities and parks from visiting them due to impeded access and temporary parking restrictions. Without mitigation, potential adverse construction impacts associated with community and neighborhoods would be anticipated under the Underground Emphasis LRT Alternative.

During utility relocation, mobility would be temporarily reduced in the Financial District, Bunker Hill, Civic Center, Historic Core, and Little Tokyo areas. Disruption of traffic patterns would temporarily impede access to residences and businesses. This could impact the economic vitality of some businesses, particularly in Little Tokyo, where the community has expressed concern about construction activities. Prolonged disruption to businesses could affect community cohesion. Without mitigation, potential adverse indirect construction impacts associated with communities and neighborhoods would be anticipated under the Underground Emphasis LRT Alternative.

4.18.3.3.3 Visual and Aesthetic Resources

Visual character impacts would be limited to construction staging areas and would occur to a lesser extent than under the At-Grade Emphasis LRT Alternative, since portions of the Underground Emphasis LRT Alternative alignment would be constructed using TBMs.

4.18.3.3.4 Air Quality

The maximum localized construction emissions would occur during cut and cover construction of the tunnel on Flower Street, the Flower/5th/4th Street station, and the 2nd Street station (either option). The additional soil removal necessary for the underground segment along 2nd Street would also intensify the localized emissions compared to the At-Grade Emphasis LRT Alternative. Daily localized construction emissions are anticipated to exceed SCAQMD significance thresholds for NO_X, PM_{10}, and $PM_{2.5}$ and would result in a potential adverse localized air quality construction effect. Daily regional construction emissions are anticipated to exceed SCAQMD regional significance thresholds for VOC, NO_x, CO, and $PM_{2.5}$ and would result in a potential adverse effect without mitigation. Daily regional emissions of VOC, NO_x, and CO would remain significant after mitigation. Daily regional and localized construction emissions would also result in a potential adverse cumulative effect without mitigation.

4.18.3.3.5 Noise and Vibration

The Underground Emphasis LRT Alternative would require the same construction equipment as the At-Grade Emphasis LRT Alternative, with the addition of TBMs. TBMs, large bulldozers, and drill rigs would be the main construction vibration sources that could potentially exceed the FTA annoyance criteria for sensitive land uses (Appendix S, Noise and Vibration Technical Memorandum).

Perceptible vibration from construction equipment would be short-term and intermittent, and considered an "infrequent event," (less than 30 events per day) as defined by FTA. Short-term vibration levels during construction could exceed the FTA annoyance criteria. Building occupants would not be subject to vibration levels above the FTA annoyance criteria. It should be noted that large bulldozers and drill rigs would operate intermittently and would not be used during every day of construction. As such, associated noise and vibration impacts would be less than significant.

TBM operation occurs underground and produces little to no noise at the surface. The activity at the potential installation and recovery sites account for most of the noise associated with TBM use. These would be the potential locations where excavated material would be treated and removed. Other construction noise along the TBM segment would be produced by haul trucks and equipment needed to perform utility relocations. Noise from these sources would generate a maximum of 90 dBA at 50 feet and would occur less frequently and for a shorter duration than construction of the At-Grade Emphasis LRT Alternative along 2nd Street.

Using the minimum safe distance, the potential worst-case vibration category, vibration from construction equipment during utility relocation lane closures would result in a potential adverse effect if it occurred less than 21 feet from buildings. A pre-construction survey of structures within 21 feet of the anticipated zone of construction would be conducted to assess the potential for ground-borne vibration (GBV) to cause damage, and to establish baseline pre-construction conditions. Without the implementation of mitigation measures, vibration impacts would be potentially significant.

4.18.3.3.6 Geotechnical/Subsurface/Seismic/Hazardous Materials

Geotechnical, subsurface, seismic, and hazardous materials impacts for the Underground Emphasis LRT Alternative would be similar to those of the At-Grade Emphasis LRT Alternative. In addition to those impacts previously discussed, a limited portion of the alignment near 1st and Alameda Streets would be within the mapped Inundation Hazard Area.

4.18.3.3.7 Historic Built Environment Resources

The Underground Emphasis LRT Alternative's effects on the built environment would be roughly similar to those of the At-Grade Emphasis LRT Alternative, except near the 1st and Alameda underpass. The proposed train portal at the intersection of Alameda and 1st Streets would be within the viewshed of two historic properties: the Little Tokyo National Historic Landmark District and the NRHP-eligible John A. Roebling Sons Co. Building. However, the portal area is not encompassed within the boundary of a historic property, historical resource, or a contributing element to the significance of either property. An asphalt paved parking lot currently occupies the majority of the parcel. No adverse effect would occur to the Little Tokyo National Historic Landmark District or the John A. Roebling Sons Co. Building from the construction of the portal.

4.18.3.3.8 Archaeological Resources

The Underground Emphasis LRT Alternative would involve substantial ground disturbance, and therefore would have the potential to alter, remove, or destroy archaeological resources within the APE. It has the potential to affect archaeological resources during ground disturbance from constructing a new underground tunnel along its entire route, underground stations, an automobile underpass on Alameda Street between 2nd and Temple Streets, and a potential pedestrian bridge at the intersection of Alameda and 1st Streets.

Potentially affected resources include portions of the Los Angeles Zanja System. Although the precise location and local integrity of the zanjas have not been established, the alternative's 2nd Street alignment would likely cross the system multiple times.

Archaeological sites may extend into the project area and be subject to direct alteration. This would result in a significant effect that could be mitigated. Construction of new stations would almost certainly affect any extant archaeological resources within their footprints. Construction of new tunnel segments through deep tunneling, as opposed to cut and cover techniques, could avoid effects to shallow archaeological resources, although the maximum depth of these resources and minimum depth of construction would both need to be established. Implementing the mitigation measures in Section 4.12.2.4 of the Draft EIS/EIR would reduce this effect to a less than significant level.

4.18.3.3.9 Paleontological Resources

The Underground Emphasis LRT Alternative would involve ground disturbance and therefore has the potential to adversely impact paleontological resources within the project area. This disturbance would result from excavations related to construction of a new tunnel, stations, the Alameda Street underpass and potential pedestrian bridges. Any ground disturbances in areas of high sensitivity would have the potential to impact paleontological resources at the surface and at depth. Ground disturbance in areas of sensitivity ranging from low to high have the potential to impact paleontological resources at a depth of five feet or more below the ground surface. In areas where proper mitigation measures could implemented (see Section 4.12.3.4 of the Draft EIS/EIR), potential impacts can be reduced to a less than significant level. In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and are thus unavoidable (see Section 4.12.3.4 of the Draft EIS/EIR).

4.18.3.3.10 Ecosystems and Biological Resources

The Underground Emphasis LRT Alternative's impacts to ecosystems and biological resources are similar to those of the At-Grade Emphasis LRT Alternative. However, there are currently 170 mature trees in the area that could potentially be affected by construction of the Underground Emphasis LRT Alternative, and some could be removed or disturbed. It is unknown at this time exactly how many trees could be affected. An estimated 40 native California sycamore trees are located in the potential area of impact and could be affected by this alternative.

4.18.3.3.11 NEPA Finding

The Underground Emphasis LRT Alternative would have adverse construction effects related to the environmental topics shown in Table 4.18-4. Most of these potential effects could be reduced to a not substantially adverse level by the mitigation measures proposed in resource-specific sections in Chapters 3 and 4. However, there would still be unavoidable adverse effects with respect to transportation (traffic circulation, transit, pedestrian, and bicycle), air quality, and paleontological resources.

Table 4.18-4 also indicates which of these potential effects would remain adverse after implementation of the mitigation measures referenced in Section 4.18.4 of the Draft EIS/EIR.

4.18.3.3.12 CEQA Determination

The Underground Emphasis LRT Alternative would have significant construction impacts related to the environmental topics shown in Table 4.18-4. Most of these potential impacts could be reduced to a less than significant level by the mitigation measures proposed in resource-specific sections in Chapters 3 and 4. However, there would still be unavoidable significant impacts with respect to transportation (traffic circulation, transit, pedestrian, and bicycle), air quality, and paleontological resources.

Table 4.18-4 also indicates which of these potential impacts would remain significant after implementation of the mitigation measures referenced in Section 4.18.4 of the Draft EIS/EIR.

4.18.3.4 Locally Preferred Alternative

The potentially significant adverse construction impacts for the LPA are described in this section. Operational impacts and less than significant construction impacts are discussed in the topic-specific sections of Chapters 3 and 4.

Table 4.18-4. NEPA Findings and CEQA Determinations for Potential Construction Impacts of the Underground Emphasis LRT Alternative

Topic	Potentially Adverse Effect or Significant Impact Before Mitigation?		Potentially Adverse Effect or Significant Impact After Mitigation?	
	NEPA	CEQA	NEPA	CEQA
Transportation (Traffic Circulation, Transit, Pedestrian, and Bicycle)	Yes	Yes	Yes	Yes
Displacements and Relocation	Yes	Yes	No	No
Air Quality	Yes	Yes	Yes	Yes
Noise and Vibration	Yes	Yes	No	No
Community and Neighborhood Impacts	Yes	No	No	No
Visual and Aesthetic Resources	No	No	No	No
Geotechnical/Subsurface/Seismic/ Hazardous Materials	Yes	Yes	No	No
Historic Built Environment/ Archaeological Impacts	Yes	Yes	No	No
Paleontology	Yes	Yes	Yes	Yes
Water Resources	Yes	Yes	No	No
Economic and Fiscal Impacts	Yes	Yes	No	No
Ecosystems and Biological Resources	Yes	Yes	No	No
Parklands and Other Community Facilities	No	No	No	No
Safety and Security	No	No	No	No

4.18.3.4.1 Traffic, Circulation, and Parking

In areas designated for cut and cover construction, the top 12 to 15 feet of the roadway would be removed and decking would be installed intermittently over a series of weekends (or other suitable times) spanning an approximate three- to four-month period. Construction of the stations would continue underground while traffic operates normally on the decking. This procedure would require temporary off-peak street closures to install the decking, such as weekends or other suitable times. The closure schedules would be coordinated to minimize impacts to residences, businesses, and traffic flow. During these times, traffic would be re-routed to adjacent streets via clearly marked detours. Temporary sidewalk detours in the cut and cover areas could potentially impede pedestrian flow, but access would be maintained throughout the construction period.

In addition, the construction of the underground junction on Alameda Street and cut and cover activity on Central Avenue may result in localized shifts in traffic to adjacent streets. The flow of bicycle traffic on some streets could potentially be impacted due to increased traffic volumes. The additional automobile traffic would result in increased turning movements, potentially reducing bicycle speeds or resulting in a greater risk of bicycle-automobile conflict, since all bicycle routes in the downtown area are Class III routes, which do not have bicycle-designated lanes.

Lane closures during construction on Flower Street, Hope Street in the vicinity of General Thaddeus Kosciuszko Way, 2nd Street, Central Avenue, 1st Street, and Alameda Street would result in the temporary removal of existing on-street parking spaces and loading stalls. This would impact parking spaces and loading areas on both sides of Flower Street, on 2nd Street at the 2nd/Broadway station site, on Central Avenue and Alameda Street between 1st and 2nd Streets, and on 1st Street between Central Avenue and Vignes Street. In addition, the realigned intersection of Hope Street in the vicinity of General Thaddeus Kosciuszko Way may temporarily remove several parking spaces along both the east and west sides of the roadway segment. In the vicinity of the Alameda Street underpass, the JANM tour bus loading zone on the west side of the street would be temporarily removed and relocated for the duration of the construction period. Off-street parking needs would be monitored and addressed as described in the Environmental Justice section of the MMRP. Overall, street parking impacts during construction would not be considered adverse.

Construction of the proposed Alameda Street portal north of Temple Street would result in the reduction of roadway capacity for extended time periods during construction. Two through travel lanes would be maintained in each direction along Alameda Street from Temple Street northwards, tapering back to three through lanes in each direction near Aliso Street. As a result of this configuration, the two-way left turn median in the mid-block area and the exclusive right and left turn lanes at the southbound intersection approach at Temple Street would be temporarily eliminated during the period needed to construct the portal. The southbound intersection lane configuration at Temple Street would consist of a shared through and right turn lane and a shared through and left turn lane.

The existing signal phasing may be changed to split phasing to minimize conflicts between southbound left turns and the opposing northbound through movements. This would help prevent the formation of queues behind vehicles waiting for a gap in opposing traffic to complete left turn movements. Consequently, travel times for vehicles along this segment of Alameda Street would be expected to increase due to the potential for additional congestion and changed operating conditions at the intersection of Temple and Alameda Streets.

On 1st Street between Alameda and Vignes Streets, one through travel lane in each direction would need to be removed temporarily during construction. This could cause additional congestion. However, the 1st Street bridge is currently operating one-way eastbound with only two lanes, and lengthy delays do not frequently occur.

The conclusion of the construction phase would include restoration of the travel lanes and parking, pedestrian, and bicycle facilities to their permanent configurations. Potential short-term, adverse impacts are anticipated during construction of this alternative. Potentially adverse impacts due to the rerouting of transit service could also occur during construction. Impacts to transportation (traffic circulation, transit, pedestrian, and bicycle) during construction would be short-term, but they would result in a considerable contribution to a potential cumulative adverse effect when added to other projects in the downtown area. Therefore, potential cumulative adverse transportation impacts are anticipated under the LPA, and these impacts may remain significant after mitigation.

4.18.3.4.2 Displacements and Relocation

During construction of the LPA, staging of construction equipment and materials would require 12 temporary construction easements. The portions of these parcels that would be utilized would be plazas and open areas, and no buildings would be removed on these construction easement parcels. Access to businesses and existing buildings would be maintained. Sidewalks and detour routes would also be reconfigured as needed. Mitigation would minimize the potential adverse impacts associated with this type of displacement during construction. The LPA would not result in a considerable contribution to a cumulative impact. Specific measures are provided in Section 4.2.4.2 and the MMRP for the LPA (Chapter 8) of this Final EIS/EIR. In addition, once construction is completed, the sites would be restored to their permanent configurations.

4.18.3.4.3 Community and Neighborhood Impacts

Disruption of traffic patterns would impede, but not eliminate, access to residences and businesses, though to a lesser extent than the other build alternatives. In Little Tokyo, there would be less disruption to traffic along Alameda and 1st Streets than with the Underground Emphasis LRT Alternative because this alternative does not include the excavation and construction of the Alameda Street underpass or construction of the potential pedestrian bridge across Alameda Street. However, the cut and cover construction of the rail junction beneath the intersection of 1st and Alameda Streets would still cause disruption. Since preparation of the Draft EIS/EIR, the proposed TBM insertion area has been moved from 2nd Street to the Mangrove property (northeast of 1st and Alameda Streets), thereby eliminating the need for cut and cover construction on 2nd Street in Little Tokyo, removing some construction truck trips from the community, and reducing potential business impacts. Cut and cover impacts would also be reduced in the Financial District, because proposed TBM operation would extend to 4th Street, thus eliminating cut and cover activities on Flower Street between 3rd and 4th Streets. This constitutes an overall reduction in community and neighborhood impacts during construction.

Compared to the Underground Emphasis LRT Alternative, the LPA would have a larger construction area because two portals would need to be built east of Alameda Street. The impacts of these two portals would be less than those of the single portal proposed as part of the Underground Emphasis LRT Alternative because they would be located further from most

Little Tokyo businesses and community resources. As noted in Chapter 3, no additional traffic impacts would occur, and community disruption during construction would be reduced.

During utility relocation and rail construction, mobility would be reduced in the Financial District, Bunker Hill, Civic Center, Historic Core, and Little Tokyo areas. Disruption of traffic patterns would affect access for residents and businesses, though to a lesser extent than the other two build alternatives. This could impact the economic vitality of some businesses, particularly in Little Tokyo, where the community has expressed concern about construction activities. Access to cultural institutions such as JANM, the Go For Broke Monument, and MOCA would also be affected, though access routes would be maintained at all times. Prolonged disruption to businesses and cultural institutions could affect the cohesion of some communities, including Little Tokyo. Potential adverse indirect construction impacts associated with community and neighborhoods would be anticipated under the LPA, but can be mitigated through measures in Section 4.18.4.2.3 below and the MMRP for the LPA (Chapter 8). This adverse impact would not result in a considerable contribution to a cumulative impact. Construction activities would introduce construction employees into the area temporarily, who could become new customers of neighborhood restaurant and retail establishments.

4.18.3.4.4 Visual and Aesthetic Resources

During construction of the LPA, several construction staging areas would be utilized. Construction areas would be protected by barriers. The placement of concrete barriers and fencing would be visible from multi-family residences and other sensitive uses adjacent to the alignment, particularly the Bunker Hill Towers, the Higgins Building, Hikari, and Savoy. Viewers would see construction equipment, construction-related activities, and stockpiles of dirt and debris, and the urban streetscape would be temporarily altered. Screening of construction staging areas with art-enhanced construction walls and fencing would minimize aesthetic impacts at street level. In some locations where the proposed construction staging areas are currently occupied by empty lots or surface parking, the art-enhanced construction barriers may constitute a visual improvement at street level. The project would be constructed in a heavily urbanized environment consisting of high- and mid-rise buildings, where construction activities are not uncommon, and the construction of the project would not noticeably reduce visual quality or alter viewing context. In Little Tokyo, large construction equipment would be required for the excavation and construction of the Alameda Street underground junction and for construction of the 1st/Central Avenue station. Large equipment would also be needed on the Mangrove property to support TBM operations. This impact would be temporary and would be considered less than significant. Overall, less than significant impacts associated with views and visual character are anticipated due to construction activities.

Temporary lighting may be necessary for nighttime construction, which minimizes disruption to daytime traffic and business activities, and at night for security of staging sites. However, nighttime construction activities would be limited to non-residential areas to the extent practicable, and nighttime illumination of staging areas would be directed towards the site and away from sensitive uses. Therefore, less than significant impacts are anticipated.

During construction, nighttime lighting would predominantly consist of security lighting, and light would be directed on-site. As such, nighttime lighting impacts would not be adverse or significant during construction. Shade and shadow impacts associated with construction-related facilities and equipment located aboveground would be minimal compared to those currently created by the high- and mid-rise buildings along the alignment's corridors. Therefore, no shade or shadow impacts would result. Construction of the LPA would not result in significant impacts to scenic resources. Therefore, construction of this alternative would not result in a considerable contribution to a cumulative scenic resource impact.

4.18.3.4.5 Air Quality

An analysis of construction-related emissions was completed in accordance with SCAQMD requirements using the methodology presented in Section 4.5.1.2. The estimate included emissions from off-road construction equipment, fugitive dust, construction worker commuting, and haul truck emissions. Daily regional construction emissions are anticipated to exceed SCAQMD regional significance thresholds for VOC, NO_x, CO, and $PM_{2.5}$ and would result in a potential adverse effect without mitigation. Daily regional emissions of VOC, NO_x, and CO would remain significant after mitigation.

The maximum localized construction emissions would occur during cut and cover construction of the tunnel along Flower Street and cut and cover construction of the 2nd Street/Broadway station. Daily localized construction emissions are anticipated to exceed SCAQMD significance thresholds for NO_x, PM_{10}, and $PM_{2.5}$ and would result in a potential adverse localized air quality construction effect.

The LPA would have greater construction emissions than the other build alternatives because of the additional excavation needed for the underground station at 1st Street and Central Avenue as well as the underground junction beneath Alameda and 1st Streets. Additional truck trips to dispose of excavated material would also be needed. This would result in an increase in NO_x and diesel particulate matter emissions.

Daily regional and localized construction emissions would result in a considerable contribution to a cumulative effect without mitigation. Regional construction emissions would remain cumulatively significant after mitigation.

4.18.3.4.6 Noise and Vibration

For the LPA, the following construction activities would have the most potential for construction-related noise and vibration impacts: cut and cover construction of a tunnel at Flower Street; cut and cover construction of the approach to the proposed 2nd/Hope Street station and cut and cover or SEM construction of the station itself; construction of the proposed 2nd Street/Broadway station; construction of the proposed 1st/Central Avenue station; and TBM tunneling beneath 2nd Street and the insertion site northeast of the 1st and Alameda Streets intersection. These seven activities have the most potential for noise and vibration impacts due to their duration and their proximity to noise sensitive land uses.

Estimated construction noise levels (as indicated in Table 4.7-15) would not exceed FTA construction noise criteria identified in Section 4.7.3 above, and impacts would be less than significant. Consistency with the goals of applicable local ordinances and implementation of BMPs, listed in Section 4.7, would ensure that noise associated with construction of the LPA would not result in a significant adverse impact to sensitive land uses as classified by the FTA (e.g., residences, hospitals, and hotels are Category 2 land uses). Mitigation has also been incorporated to ensure that the FTA construction noise criteria is not exceeded.

The FTA provides short-term GBV and ground-borne noise (GBN) impact criteria for project operations, which may also be used to assess human annoyance caused by vibration from construction activities. These criteria, identified in Section 4.7.1, were used for evaluating the LPA's potential GBV and GBN impacts during construction. Large bulldozers and drill rigs, the main at-grade sources of construction vibration, could exceed levels specified in FTA annoyance criteria for sensitive land uses. Taking into account a 10 dBA reduction in vibration for coupling to building foundation loss (Table 10-1, FTA 2006), occupants would not be subjected to vibration annoyance impacts. It should be noted that large bulldozers and drill rigs would operate intermittently and would not be used every day of construction. In addition, construction of the alignment would not dwell in one location for the entire duration of construction. Therefore, vibration impacts (including GBN) associated with large bulldozers and drill rigs would be less than significant.

Additional noise and vibration studies (contained in Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of this Final EIS/EIR) were performed for refinements to the alignment associated with the LPA. Due to refinements to the LPA, the TBM and delivery trains used in the tunnel during construction could exceed levels specified in FTA annoyance criteria (See Tables 4.7-2 and 4.7-3) for the following sensitive land uses: the Walt Disney Concert Hall; office uses in the JVP; the Hikari Lofts; and the Nakamura Tetsujiro Building. During construction, GBV and GBN generated by the TBM would result in significant and adverse impacts to the Japanese Village Plaza (JVP); the Hikari Lofts, and the Nakamura Tetsujiro Building. The TBM and Delivery trains would result in a significant GBN noise impact to the Walt Disney Concert Hall, and the Broad Art Foundation Museum, which is currently under construction. With implementation of mitigation measures identified in Section 4.18.4.2.6, GBV and GBN impacts would be reduced to less than significant.

As a school, the Colburn School is properly considered as a Category 3 land use in Section 4.7, which determined that no significant impacts would occur to the school during construction. However, at the request of the Colburn School, additional noise analysis was undertaken, treating the school as a Category 1 land use. If the Colburn School were a Category 1 land use, a potentially significant GBN impact could occur at the Colburn School due to operation of the TBM and delivery trains during construction. Thus, in an abundance of caution, the mitigation identified for the Walt Disney Concert Hall in Section 4.18.4.2.6 below has been modified to ensure that GBN generated by the TBM and delivery trains would not impact the sensitive activity occurring at the Colburn School.

For the LPA, the at-grade junction and underpass on Alameda Street proposed for the other build alternatives would not be constructed. This would remove a construction noise source in the Little Tokyo community that would last for a two to three year period under the At-Grade and Underground Emphasis LRT Alternatives. However, noise would still be generated by construction of the underground rail junction beneath 1st and Alameda Streets and the new portals on 1st Street and near Temple and Alameda Streets. Consistency with the goals of applicable local ordinances and implementation of BMPs, listed in Section 4.7, would ensure that noise associated with construction of the LPA would not result in a significant adverse impact.

FTA guidelines, identified in Section 4.7.1.1, address the potential for construction-activity-induced vibration to damage buildings. With regard to the physical structure of the building, sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4), or historic buildings in the vicinity of construction may be susceptible to vibration damage. Large bulldozers and drill rigs would be the main source of construction vibration that could have the potential to cause vibration damage. Using the minimum safe distance, the potential worst-case vibration category, sensitive buildings (Category I, II, III, IV buildings as defined in Table 4.7-4) or historic buildings within 21 feet of construction may be susceptible to vibration damage and impacts could be significant. As part of mitigation for the LPA, a pre-construction survey of all structures within 21 feet of the anticipated vibration-producing construction activity would be conducted to confirm the building category, structural condition, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. Potentially adverse effects from vibration could occur, but could be mitigated below the level of significance. With implementation of mitigation measures identified in Section 4.18.4.2.6 below, construction of the LPA would not result in a considerable contribution to potentially significant cumulative noise or vibration impacts.

4.18.3.4.7 Geotechnical/Subsurface/Seismic/Hazardous Materials

The proposed LPA alignment does not cross any known faults. However, portions of the proposed alignment occur in areas mapped with the potential for liquefaction based on soil stability. Areas susceptible to liquefaction are located along Flower Street between Wilshire Boulevard and 2nd Street, and along 2nd Street between Hill and San Pedro Streets. The eastern edge of the alignment along 1st Street is within the mapped Inundation Hazard Area. In addition, the proposed 2nd/Hope Street station is within the Hillside Ordinance area (Bunker Hill).

During construction of underground stations, portal structures, and the underground rail junction at 1st and Alameda Streets, there would be potential for adverse impacts related to ground settlement and differential settlement on adjacent structures including historical buildings. Further evaluation and survey would be performed during final design to confirm building types and existing conditions, and to develop criteria to limit potential movement to acceptable threshold values. Protection of buildings could involve design of adequately rigid excavation support systems, underpinnings, and ground improvements to minimize settlement to tolerable limits. A pre-construction survey of the adjacent structures and all historical buildings in the vicinity would be conducted to establish a baseline for measuring potential construction-induced damage. Construction monitoring would be required to ensure that ground movement does not exceed threshold values. With mitigation, less than significant impacts would be anticipated.

Construction of surface track work, underground stations, and portals would likely require removal of protective vegetation or pavement that would increase the potential for soil erosion. With mitigation, potential adverse construction impacts associated with subsurface soils would be less than significant. Implementation of mitigation measures identified in Section 4.18.4.2.7, along with compliance with applicable hazardous waste laws and regulations, would ensure the LPA would not result in a considerable contribution to cumulative impacts.

4.18.3.4.8 Water Quality

There is known and suspected soil and groundwater contamination along the proposed LPA alignment. Construction activities have the potential to increase erosion and sedimentation around proposed construction and staging areas. Grading activities associated with construction could potentially result in a temporary increase in the amount of suspended solids running off construction sites. In a storm event, construction site runoff could result in sheet erosion of exposed soil. Groundwater may be encountered during trenching or tunneling, and would require dewatering. Dewatering activity would result in the potential release of contaminated water due to the presence of relatively shallow groundwater (located at depths ranging from 14 to 36 feet) that is contaminated with pollutants common to urban development. All dewatering activity would occur with a NDPES permit. Testing would occur prior to construction and on-site treatment and discharge in accordance with applicable standards or transport to a treatment or disposal facility would be required. Potential adverse construction impacts associated with water quality would be anticipated, but could be mitigated below the level of significance. Overall, construction and operation of the LPA would not result in a considerable contribution to significant cumulative water quality, hydrology, and/or drainage impacts.

4.18.3.4.9 Historic Built Environment Resources

Differential settlement during construction would potentially affect eight historic resources in the project area, but these effects could be mitigated below the level of significance by mitigation measures listed in Section 4.18.4.2.9. These include implementation of design measures that would protect and stabilize the ground near historic properties. Mitigation measures would also avoid short-term construction effects that could directly alter a characteristic of historic properties in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

The use of large bulldozers and drill rigs may cause construction-related GBV to 12 historic properties. Potential impacts to these properties could also be mitigated using measures listed in Section 4.18.4.2.9, including the same ground stabilization techniques used to address differential settlement.

TBM construction activities have the potential to introduce GBN that would cause a moderate impact under FTA's noise guidance at the Walt Disney Concert Hall. This effect has the potential to alter the building's use and diminish its historical integrity if not mitigated. This impact can be mitigated to reduce the noise impact below significance so that the concert hall and recording facility use would not be adversely affected. The effect would not be adverse in nature, if mitigation measures described in Sections 4.18.4.2.9 are implemented.

The proposed portal within 1st Street between Alameda and Garey Streets would be within the viewshed of two historic properties: the Little Tokyo National Historic Landmark District and the NRHP-eligible John A. Roebling Sons Co. Building. However, the portal is not encompassed within the boundary of a historic property, historical resource, or a contributing element to the significance of either property. Potential effects would not alter the setting of historic properties in a manner that would diminish the integrity of the historic district.

Implementation of mitigation measures identified in Section 4.18.4.2.9 would ensure the LPA would not result in a considerable contribution to cumulative impacts.

4.18.3.4.10 Archaeological Resources

Construction of the LPA has the potential to directly affect archaeological resources within the APE, including previously unidentified archaeological resources, the Los Angeles Zanja System, and three other known archaeological sites. Although the precise location and local integrity of the zanjas have not been established, the project's 2nd Street alignment likely crosses the system multiple times.

As with the Underground Emphasis LRT Alternative, archaeological features associated with these sites may extend into the project area and be subject to direct alteration. This would result in a significant effect. Construction of new tunnel segments through deep tunneling, as opposed to cut and cover techniques, could avoid effects to shallow archaeological resources, although the maximum depth of these resources and minimum depth of construction would both need to be established to ascertain actual effects. Implementation of mitigation measures described in Section 4.18.4.2.10 would reduce potential direct impacts to identified and previously unidentified archaeological resources to a less than significant level.

The LPA would not result in a considerable contribution to a cumulative impact on unidentified archaeological resources. Potential destruction of portions of the Los Angeles Zanja System could result in a considerable contribution to a cumulative impact to this resource. Implementation of the mitigation measures described in Section 4.18.4.2.10 would reduce both direct and cumulative impacts to known archaeological resources, including the Zanja System, to a less than significant level.

4.18.3.4.11 Paleontological Resources

The LPA would involve ground disturbance associated with excavations to construct three new stations and an entirely underground tunnel located from the 7th Street/Metro Center Station to the east and north of the intersection of 1st and Alameda Streets. Any ground disturbances in areas of high sensitivity would have the potential to impact paleontological resources at the surface and at depth; areas of ground disturbance in areas of sensitivity ranging from low to high have the potential to impact paleontological resources at a depth of five feet or more below the ground surface. In areas where mitigation measures can be implemented, potential impacts could be reduced to a less than significant level. In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible resulting in significant and unavoidable impacts.

4.18.3.4.12 Ecosystems and Biological Resources

During construction of the LPA, some mature trees located along the proposed alignment could be removed. As these mature trees may provide potential nesting and roosting habitat for bird species, including raptors, removal or disturbance of this vegetation during the nesting season could directly impact this habitat and any bird species that are present. There are currently approximately 87 mature trees in the area that could potentially be affected by construction, and some of these trees could be removed or disturbed. Approximately 25 of the trees are native California sycamore trees, a protected species. These tree counts were performed for the four-station Fully Underground LRT Alternative from the Draft EIS/EIR. It is unknown at this time exactly how many trees could be affected by the three-station LPA, but the number would be less than or equal to the four-station Fully Underground LRT Alternative. Cumulative impacts would be less than significant with respect to biological resources. The LPA would not result in a considerable contribution to a cumulative impact.

Potential mitigation measures are described in Section 4.18.4.2.12 and include a removal permit from the Los Angeles Board of Public Works, if construction of the project requires removal of any of the native trees, in accordance with the City of Los Angeles Native Tree Protection Ordinance. The tree removal permit may require replanting of native trees within the project area or at another location within the City of Los Angeles to mitigate for the removal of these trees. Implementation of mitigation identified in Section 4.18.4.2.12 would reduce this potential impact to a less than significant level.

4.18.3.4.13 Parklands and Other Community Facilities

Some parklands and recreational resources near the proposed LPA alignment would be affected by temporary loss of street parking and impairment of pedestrian and vehicle access during construction. Pedestrian and vehicle access (including parking) could be affected at the Geffen Contemporary at MOCA, JANM, the future Broad Art Foundation Museum (currently under construction), and Walt Disney Concert Hall temporarily during construction. However, access to the facilities would be maintained throughout construction, though detours or alternate access routes may be needed, as noted in the final mitigation measures for the LPA in Section 4.18.4.2.13 and the MMRP for the LPA (Chapter 8). Impacts would be temporary and would not significantly affect the amenities or access to facilities. These impacts would not result in a considerable contribution to a cumulative impact. Community resources in Little Tokyo would experience fewer impacts associated with impaired access compared to the other build alternatives because the LPA would not include surface track work, an underpass, or a pedestrian bridge at the intersection of Alameda and 1st Streets. Instead, an underground junction would be built at this location using the cut and cover method, along with portals near Temple and Alameda Streets and on 1st Street east of Alameda Street.

Effects on emergency vehicle response times are not anticipated, and the LPA would not affect adopted emergency response or emergency evacuation plans or expose people or structures to a significant risk of loss, injury, or death. The LPA may also make parklands and community facilities adjacent to the alignment more accessible, which would be a beneficial impact. No significant adverse construction impacts associated with parklands and community facilities are anticipated.

4.18.3.4.14 Economic and Fiscal Impacts

Construction of the LPA would directly impact several businesses located along the alignment due to lane closures, sidewalk detours and restricted on- and off-street parking. These businesses primarily rely on vehicular and pedestrian traffic for revenue generation. Appendix

BB, Economic and Fiscal Impacts Technical Memorandum, and Section 4.14, Economic and Fiscal Impacts, discuss businesses along the proposed alignment that would likely be affected by the track installation and street closures during construction. In addition, temporary closures or restricted access to Alameda Street during construction of the underground rail junction and adjacent portals would impact a heavily utilized truck route and impede freeway access to Little Tokyo. Overall, this disruption would be lesser in magnitude than construction of the proposed underpasses and pedestrian bridges for the other build alternatives. Cultural institutions, such as the Geffen Contemporary at MOCA and JANM, could potentially be impacted directly, and other businesses could be impacted indirectly. Related projects could be under construction during the same time as the proposed alternative and could result in a considerable contribution to cumulative economic or fiscal construction impacts. With implementation of mitigation, construction of the LPA would not result in a considerable contribution to cumulative economic or fiscal construction impacts.

Investment in transportation, including direct investment in the form of capital construction and operation costs, provides economic benefits in several basic ways: the creation of direct and indirect jobs, and spending by suppliers whose goods and services are used in the project. These benefits are discussed in Section 4.14 and Appendix BB, Economic and Fiscal Impacts Technical Memorandum. Overall, the short-term impacts and long-term benefits of the project would result in a net benefit.

4.18.3.4.15 Safety and Security

The contractor would have a safety plan and be responsible for construction site security consistent with local regulations and standards. Construction activities are not anticipated to affect security in the project area. Typically construction areas are fenced off with restricted access and are well lit. Direct adverse impacts are not anticipated with regards to safety or security. From a cumulative perspective, potential impacts associated with the LPA would be mitigated to a less than significant level and the LPA would not result in a considerable contribution to cumulative effects on the safety and security environment in the project area during construction.

4.18.3.4.16 NEPA Finding

The LPA would have adverse construction effects related to the environmental topics shown in Table 4.18-5. Most of these potential effects will be reduced to a not substantially adverse level by the mitigation measures under resource-specific sections in Section 4.18.4.2. However, there will still be unavoidable adverse effects with respect to transportation (traffic circulation, transit, pedestrian, and bicycle), air quality, and paleontological resources.

Table 4.18-5 also indicates which of these potential effects will remain adverse after implementation of the mitigation measures discussed in Section 4.18.4.2.

4.18.3.4.17 CEQA Determination

The LPA would have significant construction impacts related to the environmental topics shown in Table 4.18-5. Most of these potential impacts could be reduced to a less than significant level by the mitigation measures under resource-specific sections in Section 4.18.4.2. However, there would still be unavoidable significant impacts with respect to transportation (traffic circulation, transit, pedestrian, and bicycle), air quality, and paleontological resources.

Table 4.18-5 also indicates which of these potential impacts would remain significant after implementation of the mitigation measures discussed in Section 4.18.4.2.

Table 4.18-5. NEPA Findings and CEQA Determinations for Potential Construction Impacts of the Locally Preferred Alternative

Topic	Potentially Adverse Effect or Significant Impact Before Mitigation?		Potentially Adverse Effect or Significant Impact After Mitigation?	
	NEPA	CEQA	NEPA	CEQA
Transportation (Traffic Circulation, Transit, Pedestrian, and Bicycle)	Yes	Yes	Yes	Yes
Displacements and Relocation	Yes	Yes	No	No
Air Quality	Yes	Yes	Yes	Yes
Noise and Vibration	Yes	Yes	No	No
Community and Neighborhood Impacts	Yes	No	No	No
Visual and Aesthetic Resources	No	No	No	No
Geotechnical/Subsurface/Seismic/ Hazardous Materials	Yes	Yes	No	No
Historic Built Environment/ Archaeological Impacts	Yes	Yes	No	No
Paleontology	Yes	Yes	Yes	Yes
Water Resources	Yes	Yes	No	No
Economic and Fiscal Impacts	Yes	Yes	No	No
Ecosystems and Biological Resources	Yes	Yes	No	No
Parklands and Other Community Facilities	No	No	No	No
Safety and Security	No	No	No	No

4.18.4 Mitigation Measures

4.18.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for construction impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.18.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Transportation, Circulation, and Parking
  - Addition of consultation with the City of Los Angeles Transportation Construction Traffic Management Committee (TCTMC) regarding haul routes.
  - Addition of provision for shuttle bus drop-off areas at City National Plaza during construction.
- Displacements and Relocation
  - Addition of coordination with LADOT to open city parking lots in the evenings for short-term parking during construction and to reduce the impacts of government vehicles parking on 2nd Street.
- Community and Neighborhood Impacts
  - Addition of a 24-hour live hotline for community concerns regarding construction, as well as a project office within the Little Tokyo community, in order to maintain day-to-day contact with the community during construction.
  - Addition of the Regional Connector Community Leadership Council (RCCLC) to provide input into the construction mitigation and outreach plans.
  - Addition of measures to mitigate possible temporary intermittent utility disruption, including field verification of underground utility line locations, coordination with utility providers, protective construction measures, and immediate technician response in the event of unplanned outages.
- Visual Resources and Aesthetics
  - Revisions based on comments on the Draft EIS/EIR.
  - Mitigation measures to further reduce less than significant impacts associated with construction of the LPA.

- Air Quality
  - Projects are required to follow the SCAQMD Rule 403 and all of the Best Available Control Measures described in the rule. Nonetheless, several Rule 403 standards applicable to this project have been included as mitigation measures.
  - The addition of the California Vehicle Code for haul trucks.
  - The addition of California Air Resources Board (CARB) requirements.
  - The addition of EPA emission standards.
- Noise and Vibration
  - The addition of mitigation during construction and operation of the LPA to reduce GBN levels that could occur at the Colburn School and the Broad Art Foundation Museum, currently under construction.
- Geotechnical/Subsurface/Seismic/Hazardous Materials
  - Additional detail provided for mitigation measures that assess the potential for hazardous materials and hazardous building materials to be encountered during construction.
- Water Resources
  - No substantial new mitigation measures have been added.
- Historic Built Environment
  - Addition of protection for facades of historic buildings adjacent to construction areas.
  - Addition of mitigation measures to offset potential GBN impacts at the Walt Disney Concert Hall.
- Archaeological Resources
  - No substantial new mitigation measures have been added.
- Paleontological Resources
  - No substantial new mitigation measures have been added.
- Ecosystems and Biological Resources
  - No substantial new mitigation measures have been added.

- Parklands and Other Community Facilities
  - Addition of temporary roadway restriping during construction and provision of advance lane closure and relocation notices.
  - Addition of temporary removal of street parking during construction to maximize vehicular capacity.
- Economic and Fiscal
  - Additional detail provided to mitigation measures which involve measures to assist businesses affected by construction, such as develop a parking mitigation program and a Construction Mitigation Program.
- Safety and Security
  - No substantial new mitigation measures have been added.

4.18.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

4.18.4.2.1 Transportation, Circulation, and Parking

To mitigate the transportation disruption that would occur during construction:

- Prior to the initiation of localized construction activities, a traffic management and construction mitigation plan shall be devised. The closure schedules in the construction traffic plan shall be coordinated to minimize impacts to residences, businesses, special events, and traffic flow. During these times, traffic shall be re-routed to adjacent streets via clearly marked detours. The traffic management and construction mitigation plan shall identify, for instance, proposed closure schedules and detour routes; construction traffic routes, including haul truck route, and hours so as to avoid peak hours where feasible. It shall also account for the provisions below. Traffic flow shall be maintained, particularly during peak hours, to the degree feasible. Access to adjacent businesses shall be maintained via existing or temporary driveways at all times during business hours, and residences at all times. Metro shall provide signage to indicate new ways to access businesses and community facilities affected by construction. Metro shall post advance notice signs prior to construction in areas where business access could be affected. Metro shall also notify LADOT in advance of street closures, detours, or temporary lane reductions. Metro shall also inform advisory committees of known road closures during regularly scheduled meetings. (TR-1)
- Accessible detours shall be provided whenever possible. Detours shall be compliant with the ADA. Signage shall be provided in those languages most commonly spoken in the

immediate community. Signs shall mark detours in accordance with the Manual on Uniform Traffic Control Devices, and other applicable local and state requirements. Detours shall be designed to minimize cut-through traffic in adjacent residential areas. (CN-1)

- Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events. Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders. Crossing guards and other temporary traffic controls shall be provided in the vicinity of construction sites, haul routes, and other relevant sites as proposed in California DOT Traffic Manual, Section 10-07.3, Warrants for Adult Crossing Guards, and as appropriate to maintain traffic flow during construction. (CN-3)

- A 24-hour live hotline for community concerns regarding construction shall be provided, as well as a project office within the Little Tokyo community. Residents and businesses shall also be provided with comment/complaint forms during construction. A construction office shall also be placed within the community to provide in-person assistance and services. Metro shall negotiate with the JANM to locate the office within the museum's historic building on 1st Street. The hotline and office shall enable Metro to maintain day-to-day contact with the community during construction and provide community members with all project details that may be relevant to the public. (CN-4)

- A community outreach plan shall be developed and implemented to notify local communities and the general public of construction schedules and road and sidewalk detours. Metro shall coordinate with local communities during preparation of the traffic management plans to minimize potential construction impacts to community resources and special events. Construction activities shall be coordinated with special events. (CN-5)

To mitigate the effects of construction haul routes along project area streets:

- Haul routes for trucks shall be confirmed during the final design phase of the project. The routes shall be located to minimize noise, vibration, and other possible impacts to adjacent businesses and neighborhoods. Truck trips shall be primarily scheduled at times when they would be least disruptive to the community. Lighted or reflective signage shall direct truck drivers to the haul routes. If physical damage to the haul route roads occurs due to project-related traffic, the roads shall be restored to their pre-construction condition as quickly as is practicable. Haul routes shall be discussed with and approved by the City of Los Angeles through the TCTMC. (TR-2)

To mitigate the effects of street parking needing to be temporarily removed during construction:

- To avoid impacts to neighborhood parking supplies, Metro shall require the contractor to designate areas for construction/contractor employee parking and shall not allow employees to park in other lots or unauthorized areas. Metro shall identify and implement measures to reduce the need for parking by construction workers, including carpool incentives, transit passes, or designated on-site or off-site parking. Metro shall direct construction workers not to park on the street. (TR-3)

- Metro shall work with the City to develop a parking mitigation program to mitigate the loss of public parking spaces during construction. This would include, but is not limited to, restriping the existing street to allow for diagonal parking, reducing the number of restricted parking areas, phasing construction activities in a way that minimizes parking disruption, and increasing the time limits for on-street parking. Restriping would occur on portions of Temple Street, Alameda Street, 1st Street, 2nd Street, Central Avenue, San Pedro Street, Judge John Aiso Street, 3rd Street, and Traction Avenue. Such parking mitigation shall be implemented on a temporary, tiered basis pending findings of the annual parking analysis described in EJ-11 in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. (DR-4)

- Metro shall not hinder access to other public parking lots during construction. (DR-5)

To mitigate the effects of rerouting pedestrian and bicycle traffic during construction:

- Safe pedestrian detours with handrails, fences, k-rail, canopies, and walkways shall be provided as needed. When a crosswalk is closed due to construction activities, pedestrians shall be directed to nearby alternate crosswalks. Access shall be ADA accessible at all times per existing Metro policy. (TR-4)

- Bicyclists shall be encouraged through signage to ride carefully in streets near construction activities, ride carefully on sidewalks (as City of Los Angeles municipal code permits), or choose nearby alternate routes around construction sites. Detours shall be provided as needed. Metro shall provide signage showing the alternate bicycle routes. Pedestrian and bicycle circulation, and travel lanes temporarily impacted during construction shall be restored to their permanent configurations at the conclusion of the construction period and prior to operations. (TR-5)

To mitigate the effects on shuttle bus drop-off areas for City National Plaza during construction:

- Metro shall ensure that shuttle bus drop-off areas at City National Plaza are provided throughout construction. (TR-9)

To mitigate the restriction of access to some bus stops in the project area during construction:

- Metro shall maintain access to bus stops and provide adequate signage to guide bus users to accessible stops. Metro shall minimize temporary closures or relocations of bus stops and layover zones. Metro shall provide notices of closures and relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. When closures of other bus operators' stops are needed, Metro shall work closely with the affected operators to provide notices. (TR-12)

To mitigate the effects of temporarily relocating some bus stops in the project area during construction due to street closures and detours around construction areas:

- As needed, Metro shall temporarily relocate bus stops to nearby alternative locations based on the re-routing of bus service, and provide adequate signage and notices at strategic locations indicating the relocated bus stops. Metro shall provide notices of relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. Metro shall coordinate with municipal transit providers to temporarily relocate non-Metro bus stops. When bus re-routing is necessary, buses shall be re-routed to adjacent streets in a manner that minimizes inconvenience to bus passengers and to affected neighborhoods. (TR-13)

4.18.4.2.2 Displacements and Relocation

Due to the partial taking of parking and primary access to the Central Plant (APN 5151-014-032, Parcel 3 in Figures 4.2-1 and 4.2-2, and Parcel 4 in Figure 4.2-5; 703 W. 3rd Street):

- Metro shall provide replacement parking elsewhere on the parcel or on a nearby parcel during construction.(DR-1)
- Metro shall maintain access to the Central Plant at all times during construction. (DR-2)

Since some privately-owned parcels needed for construction staging currently contain buildings, but would be owned by Metro and may be vacant after construction:

- Upon completion of construction, property needed for construction but not required to maintain the physical infrastructure or necessary for access shall be included in the Metro Joint Development Program for possible development. Any development shall be environmentally and separately cleared from this project and shall undergo its own community input process. Until a development is approved, the remaining underutilized property may be used for public parking spaces or at the very least shall be graded and fenced to a higher standard that reflects the community's identity and character more than typical gravel and chain link. Per Metro's Joint Development Policy, the community shall be included in the development process. (DR-3)

To offset the public parking spaces that would be lost in Little Tokyo during construction:

- Metro shall work with the City to develop a parking mitigation program to mitigate the loss of public parking spaces during construction. This would include, but is not limited to, restriping the existing street to allow for diagonal parking, reducing the number of restricted parking areas, phasing construction activities in a way that minimizes parking disruption, and increasing the time limits for on-street parking. Restriping would occur on portions of Temple Street, Alameda Street, 1st Street, 2nd Street, Central Avenue, San Pedro Street, Judge John Aiso Street, 3rd Street, and Traction Avenue. Such parking mitigation shall be implemented on a temporary, tiered basis pending findings of the annual parking analysis described in mitigation measureEJ-11 in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. (DR-4)

- Metro shall not hinder access to other public parking lots during construction. (DR-5)

- Prior to construction, Metro shall conduct an annual parking needs assessment in Little Tokyo. Metro shall provide replacement parking for spaces lost as a result of the project as described in EJ-3 and to respond to the needs identified in the parking needs assessment. Metro shall work with Little Tokyo and surrounding communities to educate visitors and residents where parking is available during construction. Metro shall monitor parking, and the parking analysis shall be conducted on an annual basis throughout the duration of construction. This effort shall include new signage and other way finding features as appropriate. (EJ-11)

- Any unmet demand for parking spaces eliminated in Little Tokyo during construction shall be temporarily replaced within one block of the land uses that rely on those spaces, or through a combination of: (EJ-2)

  - Metro shall work with the City of Los Angeles to develop a parking mitigation program, as described above in mitigation measure DR-4.

  - Metro shall provide two acres of land on the Mangrove property (northeast of 1st and Alameda Streets) for the purposes of providing alternative parking services during construction, which could include satellite parking served by shuttle buses, valet parking from vehicle pick-up/drop-off in the central business areas of Little Tokyo, and standard self-parking. The number of spaces provided would range from 200 standard spaces to approximately 300 spaces when supplemental parking services are operating. Any parking services shall be operated by a licensed/bonded parking company and shall be selected through a competitive request for proposal (RFP) process. Cost to park shall be comparable with current cost to park. This shall offset the temporary loss of parking available to patrons of Little Tokyo businesses, and other visitors, during construction. (EJ-3)

  - Metro shall provide notices of traffic control plans and parking relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. (EJ-4)

- Metro shall support efforts to curb non-legitimate use of disabled parking spaces. (EJ-5)
- Metro shall work with the LADOT, owners of private parking lots, and businesses to develop an advanced parking reservation system at cooperative and suitable locations during construction. (EJ-6)
- Metro shall work with LADOT to open city parking lots for short-term use on evenings and weekends during construction in the vicinity of Little Tokyo.(EJ-7)
- Metro shall work with the City of Los Angeles to reduce impacts of government vehicles parking on 2nd Street during construction, such as identification of alternate parking areas. (EJ-8)
- Metro shall work with the City of Los Angeles and the Little Tokyo Business Improvement District to facilitate creation of financial incentives such as parking validation programs to prioritize parking for Little Tokyo customers, residents, and businesses during construction. (EJ-9)
- Metro shall develop measures to assist business owners significantly impacted by construction. These shall include temporary parking, marketing programs, and other measures developed jointly between Metro and affected businesses. (EF-1)

In order to offset the potential for reduction of access to the Little Tokyo Library and other community destinations due to construction:

- Metro shall maintain access to the Little Tokyo Library and other community facilities at all times during construction. (DR-6)
- Metro shall develop a Construction Mitigation Program that includes protocol for community notification of construction activities, including traffic control measures, schedule of activities, and duration of operations, with written communications to the community translated into appropriate languages. (DR-7)

To offset the impacts of necessary displacement and relocation of businesses:

- Metro shall provide relocation assistance and compensation as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. (DR-8)

Due to the permanent acquisition of a portion of the Los Angeles Department of Water and Power (LADWP) site on APNs 5173-007-901 and 5173-006-900 for right-of-way:

- Metro shall consult LADWP during the design phase to accommodate its operational needs during construction and operation of the project. (DR-9)

4.18.4.2.3 Community and Neighborhood Impacts

To mitigate the temporary disruption of traffic patterns and access to residences and businesses during construction, which could affect the economic vitality of some businesses:

- Accessible detours shall be provided whenever possible. Detours shall be compliant with the ADA. Signage shall be provided in those languages most commonly spoken in the immediate community. Signs shall mark detours in accordance with the Manual on Uniform Traffic Control Devices, and other applicable local and state requirements. Detours shall be designed to minimize cut-through traffic in adjacent residential areas. (CN-1)

- Early notification of traffic disruption shall be given to emergency service providers. Work plans and traffic control measures shall be coordinated with emergency responders to prevent impacts to emergency response times. (CN-2)

- Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events. Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders. Crossing guards and other temporary traffic controls shall be provided in the vicinity of construction sites, haul routes, and other relevant sites as proposed in California DOT Traffic Manual, Section 10-07.3, Warrants for Adult Crossing Guards, and as appropriate to maintain traffic flow during construction. (CN-3)

- A 24-hour live hotline for community concerns regarding construction shall be provided, as well as a project office within the Little Tokyo community. Residents and businesses shall also be provided with comment/complaint forms during construction. A construction office shall also be placed within the community to provide in-person assistance and services. Metro shall negotiate with the JANM to locate the office within the museum's historic building on 1st Street. The hotline and office shall enable Metro to maintain day-to-day contact with the community during construction and provide community members with all project details that may be relevant to the public. (CN-4)

- A community outreach plan shall be developed and implemented to notify local communities and the general public of construction schedules and road and sidewalk detours. Metro shall coordinate with local communities during preparation of the traffic management plans to minimize potential construction impacts to community resources and special events. Construction activities shall be coordinated with special events. (CN-5)

- Metro shall develop a construction mitigation plan with community input to directly address specific construction impacts in the project area. Metro shall establish and receive input from the RCCLC in developing the construction mitigation plan. The RCCLC shall consist of representatives from all parts of the alignment area. Metro shall work with the RCCLC in developing the outreach plan. (CN-6)

- Metro shall work with the City to develop a parking mitigation program to mitigate the loss of public parking spaces during construction. This would include, but is not limited to, restriping the existing street to allow for diagonal parking, reducing the number of restricted parking areas, phasing construction activities in a way that minimizes parking disruption, and increasing the time limits for on-street parking. Restriping would occur on portions of Temple Street, Alameda Street, 1st Street, 2nd Street, Central Avenue, San Pedro Street, Judge John Aiso Street, 3rd Street, and Traction Avenue. Such parking mitigation shall be implemented on a temporary, tiered basis pending findings of the annual parking analysis described in EJ-11 in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. (DR-4)

- Metro shall not hinder access to other public parking lots during construction. (DR-5)

To mitigate the negative impact construction sites could have on the community if left unsecured:

- Barriers shall be erected and security personnel provided during construction to minimize trespassing and vandalism. Barriers shall be enhanced with culturally-relevant artwork, attractive design features, and advertisements for parking locations and businesses. Signage shall also identify that businesses are open during construction. Community input shall be sought in determining artwork and design features. (CN-7)

To mitigate the temporary intermittent utility disruption that could occur as part of construction:

- Metro shall field verify (by potholing or other methods) the exact locations and depths of underground utilities and conduct condition checks prior to utility relocation. (CN-10)

- Metro shall coordinate closely with utility providers to develop a service plan as needed to address planned and unplanned utility service interruptions. Should an unplanned outage occur as a result of construction activities, Metro shall contact the appropriate utility provider immediately to restore service. Metro shall also maintain access to utilities for providers' technicians. Metro shall provide protective measures such as pipe and conduit support systems, vibration and settlement monitoring, trench sheeting, and shoring during construction to avoid potential damage to utilities. (CN-11)

4.18.4.2.4 Visual Resources and Aesthetics

While no significant impacts to the Historic Core, Civic Center, or Little Tokyo communities would result from construction of the LPA, the following mitigation measures will further reduce less than significant impacts.

- Metro shall shield temporary lighting during construction to reduce spillover lighting. (VA-3)

- Metro shall locate stockpile areas (storage areas for construction equipment, supplies, and excavated soil) primarily in less visually sensitive locations, where they are not visible from the road or to businesses or residents. (VA-4)

- Temporary construction sheds and barricades shall be located so as to avoid obscuring significant views of historic properties. (VA-5)

4.18.4.2.5 Air Quality

- Contractors shall be required to adhere to SCAQMD standards for off-road engine emissions (refer to Section 4.5.1.1). Examples of how the contractors could ensure adherence include retrofitting off-road engines with add-on control devices such as catalytic oxidizers and diesel particulate filters where feasible. (AQ-1)

- Metro shall require contractors to use equipment that meets up-to-date specifications (equivalent to models manufactured from 2013 to 2017) for pollutant emissions during project construction. (AQ-2)

- Contractors shall be required to adhere to SCAQMD standards for dust emissions such as SCAQMD Rule 403. Examples of how the contractors could ensure adherence include applying water or a stabilizing agent to exposed surfaces in sufficient quantity to prevent generation of dust plumes. (AQ-3)

- Dirt from construction equipment shall not extend 25 feet or more from an active operation, and shall be removed at the conclusion of each workday (refer to Section 4.5.3.3). Street sweeping services shall be coordinated with construction activity to minimize impacts to surrounding businesses and residences. (AQ-4)

- Contractors shall be required to utilize at least one of the measures set forth in the SCAQMD Rule 403 Section (d)(5) to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site. (AQ-5)

- All haul trucks hauling soil, sand, and other loose materials shall maintain at least six inches of freeboard (not filling trucks all the way to the top) in accordance with California Vehicle Code 23114. (AQ-6)

- All haul trucks hauling soil, sand, and other loose materials shall be covered (e.g., with tarps or other enclosures that would reduce dust emissions) (refer to Section 4.5.1.1). (AQ-7)

- Traffic speeds on unpaved roads shall be limited to 15 MPH. (AQ-8)

When wind gusts exceed 25 MPH, Metro shall require the contractor to implement the following provisions, consistent with the requirements of SACQMD Rule 403, as they apply to each of the construction activities identified below: (AQ-9)

- Earth-moving activities:

  - (1A) Cease all active operations; or

  - (2A) Apply water to soil not more than 15 minutes prior to moving such soil.

- Disturbed surface areas:
  - (OB) On the last day of active operations prior to a weekend or holiday: apply water with a mixture of chemical stabilizer diluted with not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; or
  - (1B) Apply chemical stabilizers prior to wind event; or
  - (2B) Apply water to all unstabilized disturbed areas three times per day. If there is evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; or
  - (3B) Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; or
  - (4B) Utilize any combination of control actions (1B), (2B) and (3B) such that, in total, these actions apply to all disturbed surface areas.
- Unpaved roads:
  - (1C) Apply chemical stabilizers prior to wind event; or
  - (2C) Apply water twice per hour during active operation; or
  - (3C) Stop all vehicular traffic.
- Open storage piles:
  - (1D) Apply water twice per hour; or
  - (2D) Install temporary coverings.
- Paved road track-out:
  - (1E) Cover all haul vehicles; or
  - (2E) Comply with vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
- All categories:
  - (1F) Any other control measures approved by the Executive Officer and the United States Environmental Protection Agency as equivalent to the methods specified may be used.
- Heavy equipment operations shall be suspended during second stage smog alerts as issued by the SCAQMD. (AQ-10)

- On-site stockpiles of debris, dirt, or rusty materials shall be covered or watered at least two times per day. (AQ-11)
- Contractors shall utilize electricity supplied by LADWP rather than temporary diesel or gasoline generators, as feasible. (AQ-12)
- Heavy-duty trucks shall be prohibited from idling in excess of five minutes, both on- and off-site. Metro shall employ CARB anti-idling requirements during construction, which would reduce emissions generated from construction vehicles. Metro shall require the contractor to regularly perform unscheduled inspections of construction equipment and activities to ensure minimization of associated air quality impacts. (AQ-13)
- Construction worker parking shall be configured to minimize traffic interference. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-14)
- Construction activity that affects traffic flow on the arterial system, including the transportation of excavated materials, shall be primarily limited to off-peak hours. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-15)
- Metro shall require ongoing maintenance and adherence to manufacturer's specifications for all construction equipment engines and vehicles. (AQ-16)
- Dedicated turn lanes for the movement of trucks and equipment to and from construction sites shall be provided where appropriate. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-17)
- Metro shall require on-site construction equipment to meet EPA Tier 2 or higher emission standards according to the January 1, 2012 to December 31, 2014 and post-January 15, 2015 criteria. (AQ-18)
- Metro shall maintain and clean all trucks and construction equipment. (AQ-19)
- Metro shall use low-sulfur fuel where possible. (AQ-20)
- The project and stations shall be designed and constructed in a manner consistent with Metro's sustainability policies (such as Metro’s Energy and Sustainability Policy). (AQ-21)
- Detour routes shall be designed to ensure that traffic does not idle for extended periods of time, thus reducing the potential for localized exceedence of federal CO/CO_2 standards. (AQ-22)

4.18.4.2.6 Noise and Vibration

During the construction phase of the LPA, sensitive or historic buildings within 21 feet of construction may be susceptible to vibration damage. The following mitigation measures shall be implemented:

- A survey of historic properties and/or historical resources within 21 feet of vibration producing construction activity shall be conducted to confirm the building category, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. The survey shall also be used to establish baseline, pre-construction conditions for historic properties and historical resources. During preliminary engineering and final design of the project, additional subsurface (geotechnical) investigations shall be undertaken to further evaluate soil, groundwater, seismic, and environmental conditions along the alignment. The analysis shall assist in the selection and development of appropriate support mechanisms for cut and cover construction areas and any SEM (mining) construction areas, in accordance with industry standards and the Building Code. The subsurface investigation shall also identify areas that could experience differential settlement as a result of using a TBM in close proximity to historic properties and/or historical resources. An architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards shall provide input and review of design contract documents prior to implementation of the mitigation measures. (CR/B-2)

- The mitigation measure above shall also apply to sensitive, non-historic structures (Category I, II, III, IV buildings as defined in Table 4.7-4) located within 21 feet of vibration producing construction activity. However, design contract documents shall not require input or review by an architectural historian or historical architect under this mitigation measure. (NV-1)

- A vibration monitoring plan shall be developed during Final Design to ensure appropriate measures are taken to avoid any damage to sensitive buildings (Category I, II, III, IV buildings as defined by FTA in Table 4.7-4)or historic buildings due to construction-induced vibration. This shall include pre-construction surveys of all buildings within 21 feet of vibration producing construction activity to confirm the building category (Category I, II, III, IV buildings as defined in Table 4.7-4), structural condition of the building, and to provide a baseline for monitoring of GBV and measuring the potential for GBV to cause damage where needed. Any damage caused by Metro's construction activities shall be repaired. (NV-2)

The following mitigation measures will further reduce annoyance to sensitive land uses caused by GBV. All or a combination of the following measures will be used to mitigate adverse noise and vibration impacts:

- Distances greater than those provided in EIS/EIR Table 4.7-5 shall be maintained near vibration-sensitive locations to avoid potential construction-related vibration impacts. (NV-3)

- Less vibration-intensive construction equipment or techniques shall be used near vibration-sensitive locations. (NV-4)

- Heavily laden vehicles shall be routed away from vibration-sensitive locations. (NV-5)
- Earthmoving equipment shall be operated as far as possible from vibration-sensitive locations. (NV-6)
- Construction activities that produce vibration, such as demolition, excavation, earthmoving, and ground impacting shall be sequenced so that the vibration sources do not operate simultaneously. (NV-7)
- Nighttime construction activities that produce noticeable vibration shall be avoided near vibration-sensitive locations. (NV-8)
- Devices with the least impact shall be used to accomplish necessary tasks. (NV-9)
- Non-impact demolition and construction methods, such as saw or torch cutting and removal for off-site demolition, chemical splitting, and hydraulic jack splitting, shall be used instead of high impact methods near vibration-sensitive locations. (NV-10)
- Building protection measures such as underpinning, soil grouting, or other forms of ground improvement shall be used where needed to prevent deterioration of building condition due to construction. (NV-11)
- Pavement breakers, vibratory rollers, and packers shall operate as far as possible from vibration-sensitive locations. (NV-12)

If a noise complaint is filed during project construction, noise monitoring shall be conducted in the vicinity of the area in question. If monitored noise levels exceed FTA construction noise criteria, the contractor shall use all or a combination of the following measures to reduce construction noise levels below FTA construction noise criteria: (NV-13)

- Temporary noise barriers around the construction sites and localized barriers around specific items of equipment or smaller areas shall be provided as needed. (NV-14)
- Alternative back-up alarms/warning procedures shall be used where feasible as needed. (NV-15)
- Higher performance mufflers shall be used on equipment used during nighttime hours near sensitive land uses as needed near sensitive land uses. (NV-16)
- Portable noise sheds for smaller, noisy equipment, such as air compressors, dewatering pumps, and generators shall be provided as needed. (NV-17)

In addition to the construction mitigation measures listed above, the following mitigation measures will also reduce the potential annoyance to the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, caused by GBN associated with construction of the LPA. The following measures shall be used to mitigate adverse GBN impacts, and with respect to the Colburn School, are adopted in an abundance of caution:

- Construction of the LPA, in the vicinity of the Walt Disney Concert Hall, shall be done in accordance with the Memorandum of Agreement (MOA) between FTA and the State Historic Preservation Officer (SHPO), which includes stipulations that outline the specific requirements for consultation and decision-making between the lead federal agency and consulting parties, specify the level of Historic American Building Survey/Historic American Engineering Record (HABS/HAER) recordation, and outline specific requirements for pre- and post-construction surveys, geotechnical investigations, building protection measures, and TBM specifications(for the Walt Disney Concert Hall only). (NV-18)

Tunnel Boring Machine

- Maintenance and Operation: The construction contractor shall minimize vibration from jacking or pressing operations (if applicable, the action could be smoothed out to avoid a sharp push), and maintain machinery in good working order. (NV-19)

- Coordination and Notification: There would be times when the Main Auditorium of the Walt Disney Concert Hall is vacant or not used for a noise-sensitive activity, thereby eliminating any noise impact from TBM. Similarly, there would be times at the Los Angeles Philharmonic Association (LAPA) Conference Room (and offices) of the Walt Disney Concert Hall and at the recording/performance halls of the Colburn School when activities are not particularly noise-sensitive. Metro shall coordinate closely with the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, to ensure that the noise-generating parts of TBM operations shall be conducted to avoid noise-sensitive periods. (NV-20)

Delivery Train

- Speed: Delivery train speed shall be limited to 5 MPH in the vicinity of the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, currently under construction, which would reduce the GBN to the lower range, or 5 dBA from the maximum range. (NV-21)

- Resilient Mat: A resilient system to support and fasten the delivery train tracks shall be used during construction, which would reduce GBN levels by at least 4 dBA. (NV-22)

    - Such as system shall include a) resilient mat under the tracks and b) a resilient grommet or bushing under the heads of any track fasteners (assuming some kind of anchor or bolt system). The hardness of the resilient mat shall be in the 40 to 50 durometer range, and be about one to two inches thick, depending on how heavily loaded the cars would be. The contractor shall select the mat thickness so that the rail does not bottom out during a car pass-by.

- Conveyor: The delivery train shall be replaced with a conveyor system to transport materials in the tunnel if GBN exceeds the FTA annoyance criteria at the Walt Disney Concert Hall, the Colburn School, or the Broad Art Foundation Museum, which is currently under construction. (NV-23)

- Coordination and Notification: There would be times when the Main Auditorium and Choral Hall of the Walt Disney Concert Hall, and the recording/performance halls of the Colburn School are vacant or not used for noise-sensitive activities, thereby eliminating any noise impact from the delivery train. Metro shall coordinate closely with the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, to ensure that the delivery train pass-bys would be conducted to avoid noise-sensitive periods. (NV-24)

In addition to the general construction mitigation measures listed above, the following mitigation measures will also reduce the potential annoyance to the Hikari Lofts, office uses in the JVP, and the Nakamura Tetsujiro Building caused by GBV and/or GBN associated with construction of the LPA. The following measures shall be used to mitigate adverse GBV and GBN impacts:

- Metro shall provide advance notice and coordinate with the affected property owners regarding schedules for tunneling and other activities prior to the commencement of those activities. (NV-25)

- Metro shall provide advanced notification and coordination by doing the following. (NV-26)

  - Metro shall establish a Construction Community Relation Program to inform and coordinate construction activities including notification to all occupants at the Hikari Lofts, the interior designer office at the JVP, and the Nakamura Tetsujiro Building about the schedule of tunneling activities at least one month prior to the start of the activities.

  - Metro shall monitor GBN and GBV levels in the in the building adjacent to TBM activity during its operation in that area.

  - During the few days the TBM will be operating in this area, should GBN or GBV measurements exceed FTA annoyance criteria for short-term impacts during construction, Metro shall offer to temporarily relocate affected residents.

4.18.4.2.7 Geotechnical/Subsurface/Seismic/Hazardous Materials

- Before any construction, a survey of structures within the anticipated zone of construction influence shall be conducted in order to establish baseline conditions. A geotechnical instrumentation and settlement monitoring plan and mitigation measures shall be developed and adhered to during construction to ensure appropriate measures are taken to address any construction-induced movement. If assessments indicate the necessity to proactively protect nearby structures, additional support for the structures by underpinning or other ground improvement techniques shall be required prior to the underground construction. Metro shall require the construction contractor to limit movement to less than acceptable threshold values for vertical, horizontal, and angular deformation as a performance standard. These acceptable threshold values shall be established such that the risk of damage to buildings and utilities will be negligible to very slight. For buildings, these threshold values will be based on the relationship of building damage to angular distortion and horizontal strain consistent with Boscardin and Cording (1989) and qualitative factors including but not limited to the type of structure and its existing condition. For utility mains, these threshold values shall be those established by the utility owners. Additional data and survey information shall be gathered during final design for each building and utility main to enable assessment of the tolerance of potentially affected structures and utilities. Additional engineering and design level geotechnical studies shall be performed to define the nature of the soils and to refine the means of achieving each performance specification. (GT-1)

- Ground improvement such as grouting or other methods shall be required to fill voids where appropriate and offset potential settlement when excess material has been removed during excavation. The criteria for implementing grouting or ground improvement measures shall be based on the analysis described in the above mitigation measure. (GT-2)

- The tunnel alignment shall be grouted in advance to provide adequate soil support and minimize settlement as geotechnical conditions require. (GT-3)

- Settlement along the project alignment shall be monitored using a series of measuring devices above the route of the alignment. Leveling surveys shall be conducted prior to tunneling to monitor for possible ground movements. (GT-4)

- Tunnel construction monitoring requirements shall be described and defined in design contract documents. Additional geotechnical provisions shall be included to the extent feasible, including use of an Earth Pressure Balance or Slurry Tunnel Boring Machine for tunnel construction to minimize ground loss. During tunnel construction, the soils encountered shall be monitored relative to anticipated soil conditions as described in a Geotechnical Baseline Report. (GT-5)

- A survey of historic properties and/or historical resources within 21 feet of vibration producing construction activity shall be conducted to confirm the building category, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. The survey shall also be used to establish baseline, pre-construction conditions for historic properties and historical resources. During preliminary engineering and final design of the project, additional subsurface (geotechnical) investigations shall be undertaken to further evaluate soil, groundwater, seismic, and environmental conditions along the alignment. The analysis shall assist in the selection and development of appropriate support mechanisms for cut and cover construction areas and any SEM (mining) construction areas, in accordance with industry standards and the Building Code. The subsurface investigation shall also identify areas that could experience differential settlement as a result of using a TBM in close proximity to historic properties and/or historical resources. An architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards shall provide input and review of design contract documents prior to implementation of the mitigation measures. (CR/B-2)

- A Contaminated Soil/Groundwater Management Plan shall be implemented during construction to establish procedures to follow if contamination is encountered in order to minimize associated risks. The plan shall be prepared during the Final Design phase of the project, and the construction contractor shall be held to the level of performance specified in the plan. The plan shall include procedures for the implementation of the following mitigation measures. (GT-6)

  - Appropriate regulatory agencies shall be contacted if contaminated soil or groundwater is encountered. (GT-7)

  - Sampling and analysis of soil and/or groundwater known or suspected to be impacted by hazardous materials shall be conducted. (GT-8)

  - Procedures for the legal and proper handling, storage, treatment, transport, and disposal of contaminated soil and/or groundwater shall be delineated and conducted in consultation with regulatory agencies and in accordance with established statutory and regulatory requirements (refer to Section 4.9.1). (GT-9)

  - Dust control measures such as soil wetting, wind screens, etc. shall be implemented for contaminated soil. (GT-10)

  - Groundwater collection, treatment, and discharge shall be performed according to applicable standards and procedures (refer to Section 4.10.1). (GT-11)

- Worker Health and Safety Plan shall be implemented prior to the start of construction activities. All workers shall be required to review the plan, receive training if necessary, and sign the plan prior to starting work. The plan shall identify properties of concern, the nature and extent of contaminants that could be encountered during excavation activities, appropriate health and environmental protection procedures and equipment, emergency response procedures including the most direct route to a hospital, contact information for the Site Safety Officer. (GT-12)

- Impermeable grout and other appropriate measures shall be used where necessary to fill gaps between the tunnels and the surrounding earth to address the potential for creation of a preferential pathway and resulting spread of existing contaminated groundwater. (GT-13)

- Testing for subsurface gases shall be conducted along all portions of the underground alignment. (GT-14)

- Construction of the project shall be consistent with the City of Los Angeles Methane Mitigation Standards, established in accordance with City of Los Angeles Ordinance No. 175790 and No. 180619, which provide detailed installation procedures, design parameters, and test protocols for the methane gas mitigation system as well as methods to control methane intrusion emanating from geologic formations. (GT-15)

- Specialized excavation methods shall be implemented to protect workers and the public from exposure to toxic gases and prevent explosions. For instance, pressurized closed-face TBMs and other equipment outfitted with ventilation systems would be used, as needed, to excavate the tunnels associated with the LPA, including Slurry Face Machines (SFMs) and Earth Pressure Balance Machines (EPBMs). During tunneling, the volume of gas (or water containing dissolved gas) released from the soil is confined to the excavated material chamber of the TBM because of the closed-face and gas-tight lining that is installed immediately behind the TBM. The project shall also comply with the City's Methane Mitigation Standards, which include provisions to protect workers and the public. (GT-16)

- Prior to building demolition, surveys of asbestos containing materials and lead-based paint shall be conducted. If necessary, destructive sampling shall be used. All asbestos containing materials and lead-based paint shall be removed or otherwise abated prior to demolition in accordance with all applicable laws and regulations. (GT-17)

- The construction contractor shall be required to implement BMPs for handling hazardous materials in compliance with existing regulations. These shall include requirements for proper use, storage, and disposal of chemical products and hazardous materials used in construction; spill control and countermeasures, including employee spill prevention/response training; vehicle fueling procedures to avoid overtopping construction equipment fuel tanks; procedures for routine maintenance of construction equipment, including the proper containment and removal of grease and oils; procedures for the proper disposal of discarded containers of fuels and other chemicals. (GT-18)

- Metro shall develop and implement an Environmental Site Assessment program in accordance with appropriate laws and regulations (refer to Section 4.9.1) to assess the potential for hazardous materials that may be encountered during construction. (GT-20)

- Metro shall develop and implement plans for pre-demolition and demolition abatement of hazardous building materials (i.e., asbestos, lead-based paint, PCB-light ballasts) in accordance with appropriate laws and regulations such as the Toxic Substances Control Act (refer to Section 4.9.1). (GT-21)

4.18.4.2.8 Water Resources

An erosion control plan shall be prepared prior to construction and shall specify procedures for implementing the following mitigation measures:

- Natural drainage, detention ponds, sediment ponds, or infiltration pits shall be used to allow runoff to collect and reduce or prevent erosion. (WR-2)

- Barriers shall be used to direct and slow the rate of runoff and to filter out large-sized sediments. (WR-3)

- Down-drains or chutes shall be used to carry runoff from the top of a slope to the bottom. (WR-4)
- Use of water for irrigation and dust control shall be controlled so as to avoid off-site runoff. (WR-5)

Potentially significant impacts to water quality stemming from both construction and operation of the LPA will be mitigated with the following measures as appropriate:

- Project design shall include properly designed and maintained biological oil and grease removal systems in new storm drain systems to treat water before it leaves project sites. (WR-6)
- Hazardous materials shall be stored properly to prevent contact with precipitation and runoff. (WR-7)
- An effective monitoring and cleanup program for spills and leaks of hazardous materials shall be developed and maintained. (WR-8)
- Equipment to be repaired or maintained shall be placed in covered areas on a pad of absorbent material to contain leaks, spills, or small discharges. (WR-9)
- Periodic and consistent removal of landscape and construction debris shall be performed. (WR-10)
- Any significant chemical residue on the project sites shall be removed through appropriate methods. (WR-11)
- Non-toxic alternatives for any necessary applications of herbicides or fertilizers shall be used. (WR-12)
- Detention basins shall be installed to remove suspended solids by settlement. (WR-13)
- Water quality or runoff shall be periodically monitored before discharge from project sites and into the storm drainage system. (WR-14)

4.18.4.2.9 Historic Built Environment

To offset construction-related direct and indirect adverse impacts, the following mitigation measures shall be applied as indicated in 4.12.1.3.5:

- Documentation of historic properties and historical resources adversely affected by the project shall consist of the development of individual HABS/HAER submissions. The appropriate level of recordation shall be established in consultation with the California SHPO and formalized as a part of a MOA as described in Section 4.12.1.4.5 of the Draft EIS/EIR and included in Appendix 3 of this Final EIS/EIR. The HABS/HAER documents shall be offered to the Library of Congress and the documents shall be prepared so that the original archival-quality documentation would be suitable for inclusion in the Library of

Congress if the National Park Service accepts these materials. Archival copies of the documentation shall also be offered for donation to local repositories, including the Los Angeles Central Library and the Los Angeles Conservancy. (CR/B-1)

- A survey of historic properties and/or historical resources within 21 feet of vibration producing construction activity shall be conducted to confirm the building category, and to provide a baseline for monitoring of GBV and the potential for GBV to cause damage. The survey shall also be used to establish baseline, pre-construction conditions for historic properties and historical resources. During preliminary engineering and final design of the project, additional subsurface (geotechnical) investigations shall be undertaken to further evaluate soil, groundwater, seismic, and environmental conditions along the alignment. The analysis shall assist in the selection and development of appropriate support mechanisms for cut and cover construction areas and any SEM (mining) construction areas, in accordance with industry standards and the Building Code. The subsurface investigation shall also identify areas that could experience differential settlement as a result of using a TBM in close proximity to historic properties and/or historical resources. An architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards shall provide input and review of design contract documents prior to implementation of the mitigation measures. (CR/B-2)

- The historic property and historical resource protection measures as well as the geotechnical and vibration monitoring program shall be reviewed by an architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards to ensure that the measures would adequately protect the properties/resources. A post-construction survey shall also be undertaken to ensure that adverse effects or significant impacts have not occurred to historic properties or historical resources. (CR/B-3)

- For those historic properties and historical resources where adverse impacts are anticipated, a MOA has been developed to resolve those adverse effects consistent with 36 CFR 800. This agreement, developed by FTA and Metro in consultation with the California SHPO and other consulting parties shall resolve and/or avoid, minimize, or mitigate potential effects to historic properties and/or historical resources. The agreement includes stipulations that outline the specific requirements for consultation and decision-making between the lead federal agency and consulting parties, specify the level of HABS/HAER recordation, and outline specific requirements for pre- and post-construction surveys, geotechnical investigations, building protection measures, and TBM specifications. See Appendix 3 (Memorandum of Agreement) of this Final EIS/EIR for specific requirements. (CR/B-4)

- The S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building (to be removed) shall be offered for a period of one year following certification of the Final EIS/EIR for the price of $1 to any party willing to move it off of the 1st/Central Avenue station site at their own expense. Should no parties come forward, Metro shall incorporate materials from the building into the project facilities. Metro shall explore keeping portions of the building intact for use in the 1st/Central Avenue station. Metro shall also offer to provide an exhibit commemorating the building at the JANM, the 1st/Central Avenue station site, or other suitable location. An individual HABS/HAER submission shall be developed. (CR/B-5)

- Facades of historic buildings adjacent to the construction areas shall be protected from accumulation of excessive dirt or shall be cleaned in an appropriate manner periodically while construction activities are occurring nearby. (CR/B-6)

In order to mitigate potential ground movement associated with cut and cover construction and potential ground loss due to tunneling that could affect historic resources:

- Before any construction, a survey of structures within the anticipated zone of construction influence shall be conducted in order to establish baseline conditions. A geotechnical instrumentation and settlement monitoring plan and mitigation measures shall be developed and adhered to during construction to ensure appropriate measures are taken to address any construction-induced movement. If assessments indicate the necessity to proactively protect nearby structures, additional support for the structures by underpinning or other ground improvement techniques shall be required prior to the underground construction. Metro shall require the construction contractor to limit movement to less than acceptable threshold values for vertical, horizontal, and angular deformation as a performance standard. These acceptable threshold values shall be established such that the risk of damage to buildings and utilities will be negligible to very slight. For buildings, these threshold values will be based on the relationship of building damage to angular distortion and horizontal strain consistent with Boscardin and Cording (1989) and qualitative factors including but not limited to the type of structure and its existing condition. For utility mains, these threshold values shall be those established by the utility owners. Additional data and survey information shall be gathered during final design for each building and utility main to enable assessment of the tolerance of potentially affected structures and utilities. Additional engineering and design level geotechnical studies shall be performed to define the nature of the soils and to refine the means of achieving each performance specification. (GT-1)

- Ground improvement such as grouting or other methods shall be required to fill voids where appropriate and offset potential settlement when excess material has been removed during excavation. The criteria for implementing grouting or ground improvement measures shall be based on the analysis described in the preceding mitigation measure. (GT-2)

- The tunnel alignment shall be grouted in advance to provide adequate soil support and minimize settlement as geotechnical conditions require. (GT-3)

- Settlement along the project alignment shall be monitored using a series of measuring devices above the route of the alignment. Leveling surveys shall be conducted prior to tunneling to monitor for possible ground movements. (GT-4)

- Tunnel construction monitoring requirements shall be described and defined in design contract documents. Additional geotechnical provisions shall be included to the extent feasible, including use of an Earth Pressure Balance or Slurry Tunnel Boring Machine for tunnel construction to minimize ground loss. During tunnel construction, the soils encountered shall be monitored relative to anticipated soil conditions as described in a Geotechnical Baseline Report. (GT-5)

To offset the potentially significant GBN impacts that could occur during construction at Walt Disney Concert Hall:

- Construction of the LPA, in the vicinity of the Walt Disney Concert Hall, shall be done in accordance with the MOA between FTA and the SHPO, which includes stipulations that outline the specific requirements for consultation and decision-making between the lead federal agency and consulting parties, specify the level of HABS/HAER recordation, and outline specific requirements for pre- and post-construction surveys, geotechnical investigations, building protection measures, and TBM specifications (for the Walt Disney Concert Hall only). (NV-18)

Tunnel Boring Machine

- Maintenance and Operation: The construction contractor shall minimize vibration from jacking or pressing operations (if applicable, the action could be smoothed out to avoid a sharp push), and maintain machinery in good working order. (NV-19)

- Coordination and Notification: There would be times when the Main Auditorium of the Walt Disney Concert Hall is vacant or not used for a noise-sensitive activity, thereby eliminating any noise impact from TBM(s). Similarly, there would be times at the LAPA Conference Room (and offices) of the Walt Disney Concert Hall and the recording/performance halls of the Colburn School when activities are not particularly noise-sensitive. Metro shall coordinate closely with the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, to ensure that the noise-generating parts of TBM operations shall be conducted to avoid noise-sensitive periods. (NV-20)

Delivery Train

- Speed: Delivery train speed shall be limited to 5 MPH in the vicinity of the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, currently under construction, which would reduce the GBN to the lower range, or 5 dBA from the maximum range. (NV-21)

- Resilient Mat: A resilient system to support and fasten the delivery train tracks shall be used during construction, which would reduce GBN levels by at least 4 dBA.

  - Such as system shall include a) resilient mat under the tracks and b) a resilient grommet or bushing under the heads of any track fasteners (assuming some kind of anchor or bolt system). The hardness of the resilient mat shall be in the 40 to 50 durometer range, and be about one to two inches thick, depending on how heavily loaded the cars would be. The contractor shall select the mat thickness so that the rail doesn't bottom out during a car pass-by. (NV-22)

- Conveyor: The delivery train shall be replaced with a conveyor system to transport materials in the tunnel if GBN exceeds the FTA annoyance criteria at the Walt Disney Concert Hall, the Colburn School, or the Broad Art Foundation Museum, which is currently under construction. (NV-23)

- Coordination and Notification: There would be times when the Main Auditorium and Choral Hall of the Walt Disney Concert Hall, and the recording/performance halls of the Colburn School are vacant or not used for noise-sensitive activities, thereby eliminating any noise impact from the delivery train. Metro shall coordinate closely with the Walt Disney Concert Hall, the Colburn School, and the Broad Art Foundation Museum, which is currently under construction, to ensure that the delivery train pass-bys would be conducted to avoid noise-sensitive periods. (NV-24)

4.18.4.2.10 Archaeological Resources

To offset the impacts of unknown archaeological impacts potentially being disturbed during construction:

- Construction personnel shall be trained on proper procedures by a qualified lead archaeologist. (CR/A-1)

- An archaeological monitor shall be present during ground-disturbing activities. The archaeological monitor shall have authority to halt operations to examine potential resources and recover artifacts using professional archaeological methods. (CR/A-2)

- A Native American cultural resources consultant from the Gabrielino/Tongva San Gabriel Band of Mission Indians and/or the Tongva Ancestral Territorial Tribal Nation shall be contacted to monitor ground-disturbing work if Native American cultural resources are discovered. (CR/A-3)

- Work shall stop if human remains are found, and the Los Angeles County Coroner shall be notified immediately. If the remains are determined to be prehistoric, the Coroner shall notify the Native American Heritage Commission, which will arrange for a most likely descendent to inspect the site within 48 hours and issue recommendations for scientific removal and nondestructive analysis. (CR/A-4)

- If no cultural resources are discovered during construction monitoring, the archaeological monitor shall submit a brief letter to that effect. If previously unidentified cultural resources are discovered in the course of construction monitoring, a report shall be prepared following Archeological Resource Management Report (OHP 1990) guidelines that documents field and analysis results and interprets the data within an appropriate research context. (CR/A-5)

To offset impacts caused by disturbance of the Los Angeles Zanja System (CA-LAN-887H and other unnumbered zanjas), and sites CA-LAN-3588, P-19-003338, and P-19-003339, which could occur during construction:

- A proactive identification and documentation program that would facilitate preservation or mitigation in a cost-effective manner shall be undertaken. This shall include using documentary research to identify, as accurately as possible, the precise alignments of the zanjas within the APE. Where these alignments are expected to be affected by the proposed project, particularly where cut and cover or other near-surface construction techniques are planned in the vicinity of mapped zanja segments, full-time archaeological monitoring shall be instituted to ensure documentation consistent with Section 4.12.2.4.2 of the Draft EIS/EIR. (CR/A-6)

4.18.4.2.11 Paleontological Resources

To offset the impacts of previously undiscovered paleontological resources potentially being disturbed during construction:

- A qualified paleontologist shall prepare a Paleontological Monitoring and Mitigation Plan for the proposed project and supervise monitoring of construction excavations within sensitive geologic sediments. The monitor shall have authority to temporarily divert grading away from exposed fossils to professionally and efficiently recover the fossil specimens and collect associated data. (CR/P-1)

- All project-related ground disturbances that could potentially affect the Puente Formation, Fernando Formation, and Quaternary older alluvium and terrace deposits would be monitored by a qualified paleontological monitor on a full-time basis (where feasible) because these geologic sediments are determined to have a high paleontological sensitivity. Very shallow surficial excavations (less than five feet) within Quaternary younger alluvium would be monitored on a part-time basis to ensure that underlying sensitive units are not adversely affected. Construction monitoring during any tunneling activity is not warranted as any potential fossil specimens present within sensitive geologic units would be crushed and destroyed by the nature of tunneling methodology. (CR/P-2)

- At each fossil locality, field data forms shall be used to record pertinent geologic data, stratigraphic sections shall be measured, and appropriate sediment samples shall be collected and submitted for analysis. (CR/P-3)

- Due to the likelihood of the presence of microfossils, matrix samples shall be collected and tested within the Puente Formation and Fernando Formation. Testing for microfossils shall consist of screen-washing samples (approximately 30 pounds) to determine if significant fossils are present. Productive tests shall result in screen-washing of additional bulk matrix up to a maximum of 2,000 pounds per locality to ensure recovery of a scientifically significant sample. (CR/P-4)

- Recovered fossils shall be prepared to the point of curation, identified by qualified experts listed in a database to facilitate analysis, and reposited in a designated paleontological curation facility such as the Natural History Museum of Los Angeles County. (CR-P/5)

- The paleontologist shall prepare a final monitoring and mitigation report to be filed, at a minimum, with Metro and the identified repository. (CR/P-6)

4.18.4.2.12 Ecosystems and Biological Resources

In order to reduce the number of trees potentially removed or disturbed during construction of the LPA, the following mitigation measures shall be implemented:

- The construction contractor shall minimize disturbance to trees through avoidance or fencing. (EB-1)
- If disturbance is unavoidable, the construction contractor shall trim individual trees instead of removing them completely where feasible to reduce the scale of disturbance. (EB-2)
- The construction contractor shall replant or replace disturbed or removed trees as soon as practicable. (EB-3)
- The construction contractor shall schedule necessary tree removal and trimming activities that would affect bird nesting outside of the bird breeding season, which can extend from February 1 to August 31. (EB-4)

If it is not feasible to avoid tree removal and trimming related to construction during the breeding bird season from February 1 to August 31, breeding bird surveys shall be conducted as recommended by the California Department of Fish and Game.

- A qualified biologist shall conduct two biological surveys, one 15 days prior and a second 72 hours prior to construction activities that would remove or disturb suitable nesting habitat. The biologist shall prepare survey reports documenting the presence or absence of active nests of any protected native bird (as identified in the Migratory Bird Treaty Act) in the habitat to be removed and any other such habitat within 300 feet of the construction work area (within 500 feet for raptors). (EB-5)
- If an active native bird species nest is located, construction within 300 feet of the nest (500 feet for raptor nests) shall be postponed or modified in consultation with the qualified biologist until the nest is vacated, juveniles have fledged, and there is no evidence of a second attempt at nesting. (EB-6)

A tree survey shall be conducted by a qualified arborist to identify native trees that could be affected by project construction. If construction of the project requires removal of any of the native trees located along the proposed alignment and stations for the LPA, the following mitigation measure shall be applied:

- A removal permit shall be obtained from the Los Angeles Board of Public Works in accordance with the City of Los Angeles Native Tree Protection Ordinance. Tree replacement shall comply with the ordinance and the terms of the removal permit. If construction would require pruning of any protected native tree, the pruning shall be performed in a manner that does not cause permanent damage or adversely affect the health of the trees. (EB-7)

- New trees planted at station locations shall be regularly monitored by Metro to ensure healthy growth and development. Metro shall replace trees as close as possible to original locations. (EJ-30)

4.18.4.2.13 Parklands and Other Community Facilities

To mitigate the temporary restriction of access to public services that could occur during construction activities:

- Where feasible, temporary restriping of the roadway to maximize the vehicular capacity at locations affected by construction closures shall be performed. Metro shall provide notices of closures and relocations on its website, smart phone apps, and other modes typically used to communicate service announcements. (PC-1)

- Where feasible and necessary, temporary removal of on-street parking to maximize the vehicular capacity at locations affected by construction closures shall be performed. Where temporarily eliminated, parking spaces will be restored to their prior striped or signed condition at the conclusion of the construction period. (PC-2)

- Construction activity that affects traffic flow on the arterial system, including the transportation of excavated materials, shall be primarily limited to off-peak hours. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-15)

- Accessible detours shall be provided whenever possible. Detours shall be compliant with the ADA. Signage shall be provided in those languages most commonly spoken in the immediate community. Signs shall mark detours in accordance with the Manual on Uniform Traffic Control Devices, and other applicable local and state requirements. Detours shall be designed to minimize cut-through traffic in adjacent residential areas. (CN-1)

- Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events. Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders. Crossing guards and other temporary traffic controls shall be provided in the vicinity of construction sites, haul routes, and other relevant sites as proposed in California DOT Traffic Manual, Section 10-07.3, Warrants for Adult Crossing Guards, and as appropriate to maintain traffic flow during construction. (CN-3)

- A community outreach plan shall be developed and implemented to notify local communities and the general public of construction schedules and road and sidewalk detours. Metro shall coordinate with local communities during preparation of the traffic management plans to minimize potential construction impacts to community resources and special events. Construction activities shall be coordinated with special events. (CN-5)

- Metro shall develop a construction mitigation plan with community input to directly address specific construction impacts in the project area. Metro shall establish and receive input from the RCCLC in developing the construction mitigation plan. The RCCLC shall consist of representatives from all parts of the alignment area. Metro shall work with the RCCLC in developing the outreach plan. (CN-6)

- Safe pedestrian detours with handrails, fences, k-rail, canopies, and walkways shall be provided as needed. When a crosswalk is closed due to construction activities, pedestrians shall be directed to nearby alternate crosswalks. Access shall be ADA accessible at all times per existing Metro policy. (TR-4)

- Bicyclists shall be encouraged through signage to ride carefully in streets near construction activities, ride carefully on sidewalks (as City of Los Angeles municipal code permits), or choose nearby alternate routes around construction sites. Detours shall be provided as needed. Metro shall provide signage showing the alternate bicycle routes. Pedestrian and bicycle circulation, and travel lanes temporarily impacted during construction shall be restored to their permanent configurations at the conclusion of the construction period and prior to operations. (TR-5)

- Metro shall maintain access to the Little Tokyo Library and other community facilities at all times during construction. (DR-6)

- The temporary displacement of three bus loading spaces on Alameda Street for the JANM shall be replaced nearby for the duration of construction activities. Metro shall work with JANM to confirm locations of temporary loading spaces. (EJ-1)

4.18.4.2.14 Economic and Fiscal

- Metro shall develop measures to assist business owners significantly impacted by construction. These shall include temporary parking, marketing programs, and other measures developed jointly between Metro and affected businesses. (EF-1)

- Metro shall work with the City to develop a parking mitigation program to mitigate the loss of public parking spaces during construction. This would include, but is not limited to, restriping the existing street to allow for diagonal parking, reducing the number of restricted parking areas, phasing construction activities in a way that minimizes parking disruption, and increasing the time limits for on-street parking. Restriping would occur on portions of Temple Street, Alameda Street, 1st Street, 2nd Street, Central Avenue, San Pedro Street, Judge John Aiso Street, 3rd Street, and Traction Avenue. Such parking mitigation shall be implemented on a temporary, tiered basis pending findings of the annual parking analysis described in EJ-11 in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. (DR-4)

- Metro shall not hinder access to other public parking lots during construction. (DR-5)

- Metro shall maintain access to the Little Tokyo Library and other community facilities at all times during construction. (DR-6)

- Metro shall develop a Construction Mitigation Program that includes protocol for community notification of construction activities, including traffic control measures, schedule of activities, and duration of operations, with written communications to the community translated into appropriate languages. (DR-7)

- Metro shall provide relocation assistance and compensation as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. (DR-8)

4.18.4.2.15 Safety and Security

- Accessible detours shall be provided whenever possible. Detours shall be compliant with the ADA. Signage shall be provided in those languages most commonly spoken in the immediate community. Signs shall mark detours in accordance with the Manual on Uniform Traffic Control Devices, and other applicable local and state requirements. Detours shall be designed to minimize cut-through traffic in adjacent residential areas. (CN-1)

- Early notification of traffic disruption shall be given to emergency service providers. Work plans and traffic control measures shall be coordinated with emergency responders to prevent impacts to emergency response times. (CN-2)

- Traffic management and construction mitigation plans shall be developed in coordination with the community to minimize disruption and limit construction activities during special events. Worksite Traffic Control Plans shall be developed in conjunction with LADOT and surrounding communities to minimize impacts to traffic, businesses, residents, and other stakeholders. Crossing guards and other temporary traffic controls shall be provided in the vicinity of construction sites, haul routes, and other relevant sites as proposed in California DOT Traffic Manual, Section 10-07.3, Warrants for Adult Crossing Guards, and as appropriate to maintain traffic flow during construction. (CN-3)

- Metro shall protect public use of work areas involving sidewalks, entrances to buildings, lobbies, corridors, aisles, stairways, and vehicular roadways with appropriate guardrails, barricades, temporary fences, overhead protection, temporary partitions, shields, and adequate visibility. Metro shall keep sidewalks, entrances to buildings, lobbies, corridors, aisles, doors, or exits that remain in use by the public clear of obstructions. Metro shall post appropriate warnings, signs, and instructional safety signs. These requirements shall be included in the construction specifications. (SS-15)

- Safe pedestrian detours with handrails, fences, k-rail, canopies, and walkways shall be provided as needed. When a crosswalk is closed due to construction activities, pedestrians shall be directed to nearby alternate crosswalks. Access shall be ADA accessible at all times per existing Metro policy. (TR-4)

- Metro shall develop a Construction Mitigation Program that includes protocol for community notification of construction activities, including traffic control measures, schedule of activities, and duration of operations, with written communications to the community translated into appropriate languages. (DR-7)

4.19 Cumulative Impacts

This section summarizes potential cumulative impacts that could result from the Regional Connector Transit Corridor project in combination with identified past, present, and reasonably foreseeable projects. Information in this section is based on the Cumulative Impacts Technical Memorandum prepared for the project contained in Appendix GG, Cumulative Impacts Technical Memorandum, of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. Changes in the cumulative impacts analysis since publication of the Draft EIS/EIR consist only of the addition of two additional projects (the Flower Street Fire/Life/Safety Project and The Broad Art Foundation Museum and Pedestrian Plaza) to the list of reasonably foreseeable future projects. Since designation of an LPA, mitigation measures within the specific EIS/EIR section for each environmental resource have been refined and confirmed for the LPA, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA or other developments since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA, within the specific EIS/EIR section for each environmental resource, have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of potential cumulative impacts during construction and operation of the LPA is detailed below in Section 4.19.3.5.

4.19.1 Regulatory Framework

4.19.1.1 NEPA Guidance

An analysis of cumulative impacts is required by NEPA, as defined in 40 CFR 1508.7. The NEPA analysis of cumulative impacts follows the guidance of the Council on Environmental Quality (CEQ) 1997 document, *Considering Cumulative Effects Under the National Environmental Policy Act*. In accordance with this guidance, the significance of impacts is evaluated based on context and intensity. Considerations of context and intensity also include a discussion of the severity of the impacts and the likelihood of their occurrence.

The standards of significance for cumulative impacts depend on "the type of resource being analyzed, the condition of the resource, and the importance of the resource as an issue (as identified through scoping)" (CEQ 1997, p.45). Therefore, the standards of significance used for cumulative impacts are discipline-specific and may follow the same standards of significance established for the direct and indirect impacts of the project on each resource area. For some resources, limited details about other projects may prevent analysis from reaching the level of precision implied in the standards of significance for the direct and indirect impacts.

4.19.1.2 CEQA Guidance

In accordance with CEQA, a significant adverse cumulative impact would occur if an alternative would have environmental effects that are individually limited but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects or expected growth.

As noted in the State *CEQA Guidelines*, the discussion of cumulative impacts should reflect the severity of the impacts and their likelihood of occurrence, but cumulative impacts do not need to be discussed in as great of detail as project-level impacts. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact. The *L.A. CEQA Thresholds Guide* provides some guidance for the cumulative analysis for some resource areas, but does not contain specific standards of significance for each resource area with regard to cumulative impacts.

Determining whether a cumulative impact is "considerable" should also consider the effect of mitigation measures in reducing the effect on a resource. Compliance with previously approved plans or mitigation programs may also be a guide to determining that an effect is not significant. Depending on the discipline area, demonstrating that the project is included in a regional plan or projection may be a measure of whether the project is contributing cumulative effects. Regional plans developed by the Southern California Association of Governments (SCAG) such as the Regional Transportation Plan (RTP), the Regional Comprehensive Plan and Guide (RCPG), or the Regional Transportation Improvement Program (RTIP) may provide appropriate thresholds or mitigation measures for particular project-related effects.

4.19.2 Affected Environment

The cumulative context includes the geographic area, timeframe, and/or type of projects that would contribute to the potential cumulative effect. This context differs for each discipline. Each discipline identifies a relevant geographic area for evaluation of direct, indirect, and cumulative impacts. The geographic range considered for the cumulative analysis can vary based on the resource area.

For example, the geographic range over which air quality impacts would occur would not necessarily be the same as the geographic range considered for traffic impacts. In addition, for some disciplines the scope of analysis for cumulative impacts is based on a list of reasonably foreseeable related projects while for others it is be based on general trends in demographics or other regional forecasts. The forecast approach was used in the analysis of cumulative operational impacts for the transportation and air quality disciplines. This approach was also used in the analysis of cumulative impacts for the climate change discipline, which combined construction and operational emissions per the South Coast Air Quality Management District's recommendation. The general geographic range used to forecast cumulative conditions for these three disciplines was the SCAG region, which also assumed operation of the rail projects identified in Figure 4.19-2. All other disciplines used the list of reasonably foreseeable related projects as the scope of analysis for cumulative impacts, including the cumulative construction impacts analysis for the transportation and air quality disciplines. For these disciplines, the general geographic range considered for the cumulative analysis are shown in Figures 4.19-1 and 4.19-3, along with the rail projects identified in Figure 4.19-2.

4.19.2.1 Project Time Frames

Construction Period: 2014 -2019

The construction period is assumed to extend from 2014 to 2019. A worst-case (i.e., maximum potential impact) scenario was assumed for each discipline. For example, it is assumed that all other related projects for which there is no current construction schedule will be under construction during the project construction period. Related projects within the general project area that may be under construction during this project's proposed construction period of 2014 to 2019 are listed in Tables 4.19-3 through 4.19-5.

Year of Opening: 2019

During 2019, any potential effects from operation of the system would begin to be seen. The planning horizon for the project is 2035.

Project Baseline Year: 2035

The future year 2035 is the baseline year for assumptions regarding the No Build Alternative.

4.19.2.2 Current and Reasonably Foreseeable Related Actions

There are two ways to address the question of what is reasonably foreseeable within the project area. The first is to evaluate the project effects in combination with a summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. The second method is to generally review a list of past, present, and probable future projects within the project area that are expected to be under construction or in operation during the same time frames as the proposed project. The most appropriate method may vary by discipline.

Forecasts for elements such as population, employment, land use, air quality, and transportation from regional plans were used in the analysis. Regional plans prepared by SCAG and general plans prepared by the City and County of Los Angeles and other nearby cities provided information on trends and forecasts relevant to the impact analysis for specific disciplines.

The following tables identify projects within the general project area that are either anticipated to be completed prior to start of construction in 2014 or which may be under construction during this project's proposed construction period of 2014 to 2019. There are several subcategories identified, including major renovations, new construction, transportation, and utility projects. The locations of the new construction projects are also indentified in Figures 4.19-1 through 4.19-3.

The project lists were developed from information available from the Los Angeles Downtown Center Business Improvement District's (DCBID) fourth quarter 2008 project database and the utility district CIP. The Community Redevelopment Agency of Los Angeles (CRA) also maintains lists of potential projects. However, it would appear that the projects listed in the DCBID database better meet the definition of "reasonably foreseeable". Many of these potential projects are only in the conceptual planning stages and the timing of construction or operations are unknown. Projects that do not have reported completion dates have been compiled in the tables of projects assumed to be under construction or completed between 2014 and 2019 as a worst-case scenario.

4.19.2.3 Projects Anticipated to be Completed Prior to 2014

Many of the projects identified in Tables 4.19-1, 4.19-2, and 4.19-3 are currently under construction and have identified completion dates prior to 2014. These lists may also include some projects which have recently been completed. The locations of related projects anticipated to be completed prior to 2014 are illustrated in Figure 4.19-1.

Transportation

The following transportation capital improvements within the project area are currently identified as funded under Metro's 2009 Long Range Transportation Plan and SCAG's 2008 RTIP. The transit projects listed in this section are anticipated to be completed prior to 2014 and are shown in Figure 4.19-2.

- Metro Gold Line Eastside Extension from Union Station to East Los Angeles and I-605: The first phase of this project was a six mile light rail extension of the Metro Gold Line from its current southern terminus at Union Station eastward to East Los Angeles, which opened in 2009. From Union Station, the tracks cross over the Santa Ana Freeway (US 101) and veer west toward Alameda Street. The tracks then follow along the east side of Alameda Street and come down to grade at the intersection of Temple and Alameda Streets. After crossing Temple Street at-grade, the tracks reach the Little Tokyo/Arts District Station on the northeast corner of 1st and Alameda Streets. The tracks then turn eastward on 1st Street and continue to East Los Angeles. With this extension, the Metro Gold Line will provide service from East Los Angeles to Pasadena. The further extension to I-605 in the San Gabriel Valley is anticipated to open in 2032.

- Eastside Four Quadrant Gate Project: This project, sponsored by Metro, would install rail crossing gates at at-grade intersections located along the portion of the Metro Gold Line to East Los Angeles. This project would include some intersections located along Alameda and 1st Streets in Little Tokyo.

- Metro Expo Line from 7th Street/Metro Center Station to the City of Santa Monica: The first phase of this project is a nine mile light rail line, which will extend from the 7th Street/Metro Center Station to Culver City and is expected to be open in 2011. It will share the boarding platforms at the 7th Street/Metro Center and Pico Stations and the tracks between 7th Street/Metro Center Station and the intersection of Flower Street and Washington Boulevard with the Metro Blue Line. The next phase of this route, which would extend the first phase to the Westside, is scheduled to open by 2016.

- Flower Street Fire/Life/Safety Project: As part of this project, Metro plans to address Fire/Life/Safety concerns along three stations (7th Street/Metro Center Station, Pico Station, and Grand Avenue Station [Blue Line]) on Flower Street and Washington Boulevard as a result of the expanding LRT system.

In addition to the projects listed above, the Metro Gold Line from Pasadena to Azusa and the Metro Expo Line from Culver City to Santa Monica are expected to be completed prior to 2014. These projects are outside of the project area and may only present potential cumulative impacts for operational considerations in a few disciplines. Some cumulative impacts may be beneficial depending upon the alternative.

Major Renovations

Projects located within the project area that propose to convert offices to residential housing and/or which involve a major renovation of an existing structure are listed in Table 4.19-1.

Table 4.19-1. Major Renovation Projects Anticipated to be Completed Prior to 2014[1]

Number	Project Name	Address[1]	Land Use	Units	Completion
CR1	Rowan Building Lofts	460 S. Spring Street	Residential	206	2009 Q4
CR2	Great Republic Lofts	756 S. Spring Street	Residential	72	2009 Q1
CR3	Metropolitan Lofts	315 W. 5th Street	Residential	84	2009 Q1
CR4	SB Spring	650 S. Spring Street/111 W. 7th Street	Residential	195	2009 Q1
CR5	El Dorado	416 S. Spring Street	Residential	65	2009 Q4
CR6	SB Tower	600 S. Spring Street	Residential	250	2009 Q2
CR7	Rosslyn Lofts	116 W. 5th Street	Residential	297	2009 Q4
CR8	308 E. Ninth Street	308 E. 9th Street	Residential	38	2009 Q1
CR9	Broadway Exchange Building	219 W. 7th Street/660 Broadway	Residential	68	2009 Q1
CR10	Factory Place Arts Complex	1330 Factory Place	Residential	63	2009 Q1
CR11	655 Hope	655 S. Hope Street	Residential	80	2009 Q3
CR12	Barn Lofts	940 E. 2nd Street	Residential	39	2009 Q3
CR13	7+Fig	735 S. Figueroa Street	Commercial	N/A	2012 Q3

Note:
[1] All projects are located within the City of Los Angeles.

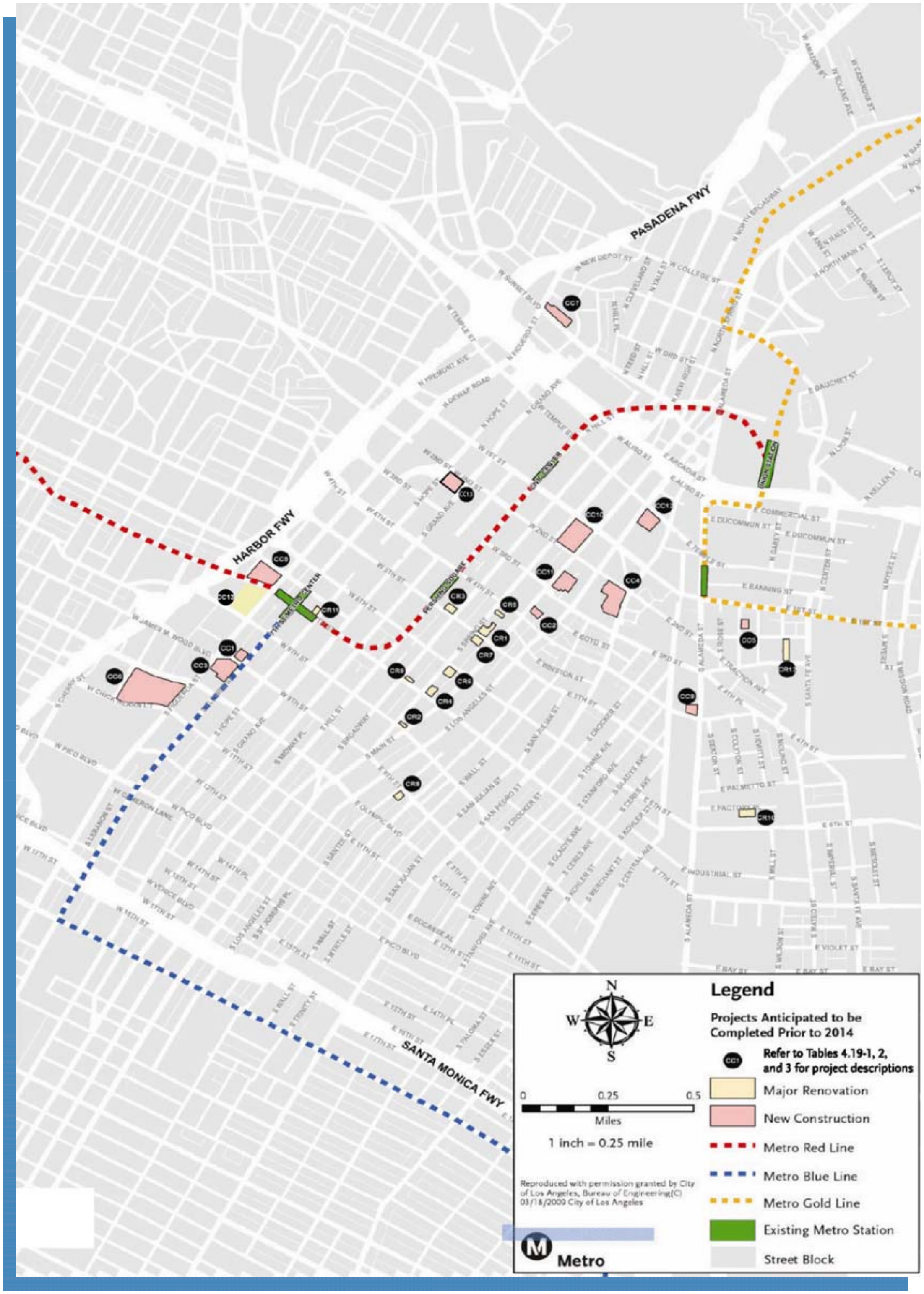


Figure 4.19-1. Projects Anticipated to be Completed Prior to 2014

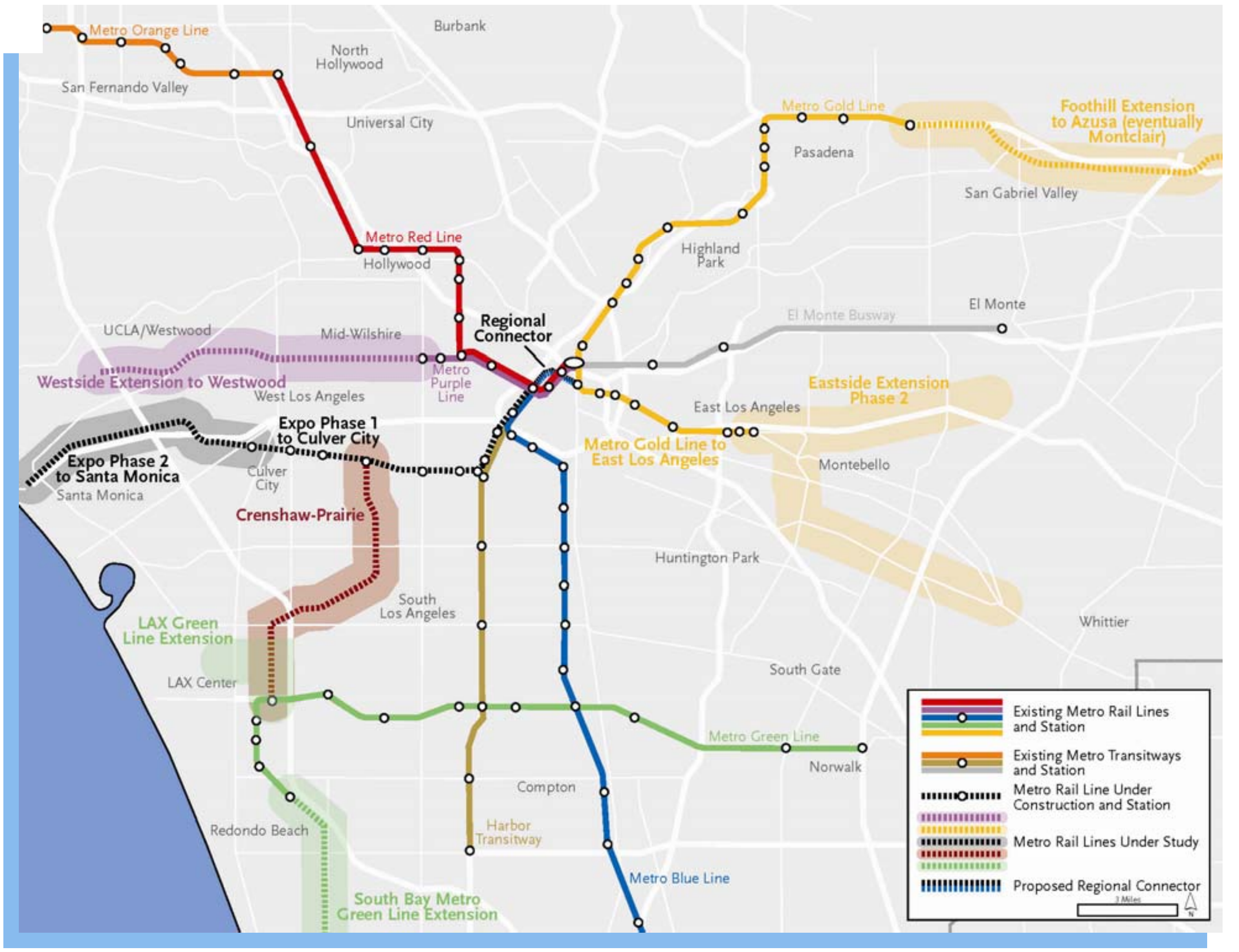


Figure 4.19-2. Year 2035 Rail Transit Projects

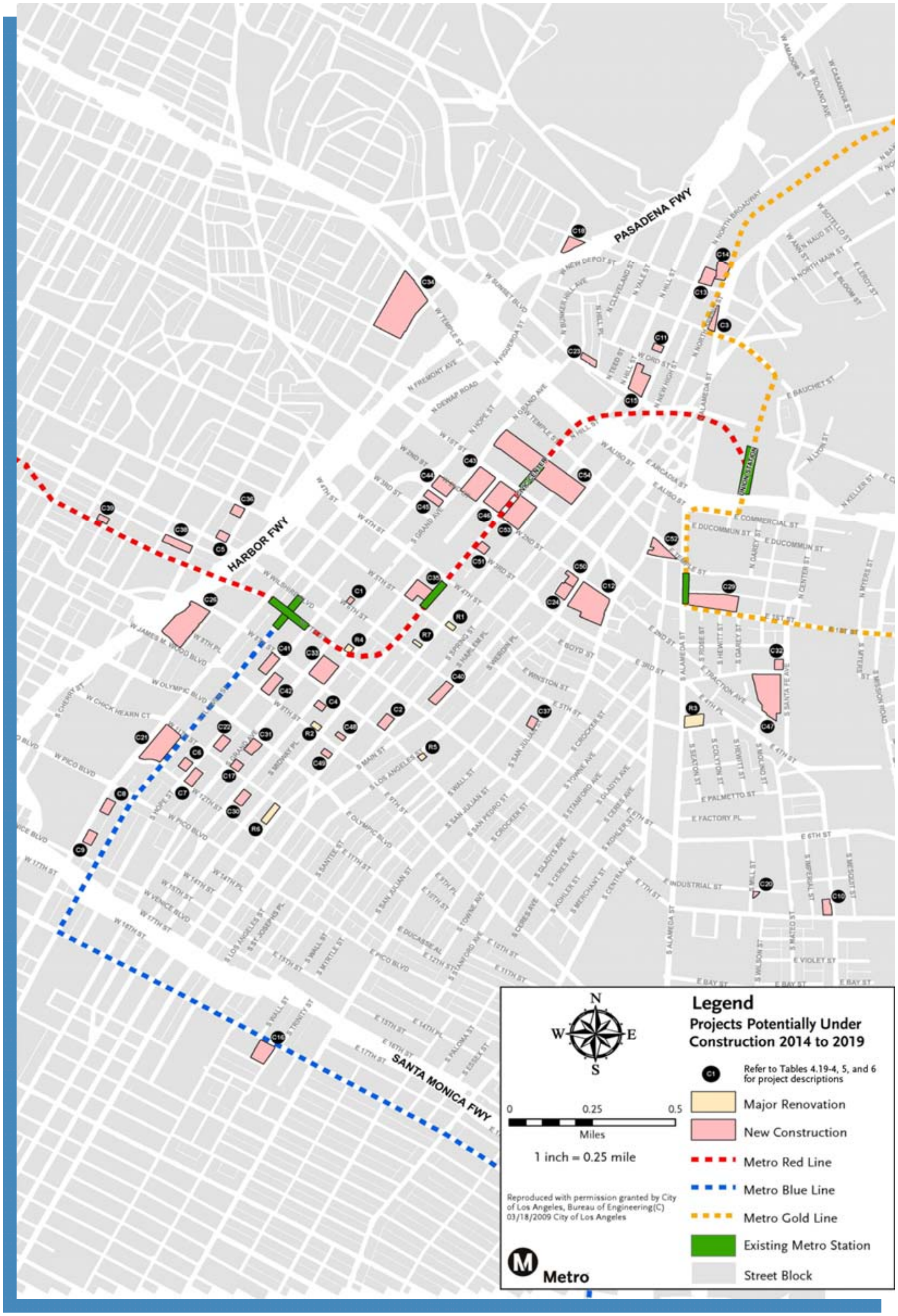


Figure 4.19-3. Projects Potentially Under Construction 2014 to 2019

New Construction

Table 4.19-2 lists new potential construction projects in the project area. New construction encompasses building new structures on vacant lots, as well as any demolition of older structures needed to clear the lots for construction.

Table 4.19-2. New Construction Projects Anticipated to be Completed Prior to 2014[1]

Number	Project Name	Address[1]	Land Use	Units	Completion
CC1	717 Ninth	845 S. Flower Street	Residential	214	2009 Q3
CC2	The Medallion	334 S. Main Street	Mixed-Use	200	2009 Q4
CC3	Concerto	900 Figueroa Street	Mixed-Use	629	2009 Q3
CC4	Sakura Crossing	235 S. San Pedro Street	Mixed-Use	230	2009 Q2
CC5	Hewitt-First Lofts	120-130 S. Hewitt Street	Residential	33	2009 Q3
CC6	LA Live	777 W. Chick Hearn Court	Mixed-Use	224	2010 Q1
CC7	The Orsini (Phase III)	867 W. Cesar E Chavez Avenue	Residential	210	2010 Q3
CC8	Alameda and Fourth Condos	4th & Alameda Street	Residential	52	2011 Q1
CC9	Hanjin Group	7th and Figueroa	Mixed-Use	unknown	2014

Note:
[1] All projects are located within the City of Los Angeles.

Utility Projects

The City of Los Angeles maintains an extensive project list of public works projects. One utility project has been identified for construction prior to year 2014. This related project involves the development of the District Cooling System proposed by the City of Los Angeles, Department of Water and Power. The District Cooling System would provide air conditioning to office buildings in downtown Los Angeles. The project involves a cooling plant, which would be constructed near 1st Street and Beaudry Avenue with distribution lines located in 1st Street from the cooling plant to San Pedro Street. The projected build out year for this related project is 2014. Given that the project involves operation of a district cooling system with trunk lines in 1st Street, it is unlikely that it would change the existing baseline conditions. No other projects are planned before 2014 within the project area that would change the existing baseline conditions. Most of the planned projects within the City are related to ongoing maintenance or replacement in-kind of existing infrastructure.

4.19.2.4 Projects Potentially Under Construction 2014 to 2019

Tables 4.19-4, 4.19.5, and 4.19.6 show projects which are currently in some stage of conceptual planning, but which do not have a defined schedule. Given the uncertainties of project development compounded by the current economic conditions, the probability that these projects will occur is unknown. It may be reasonable to assume that this compilation of projects represents a worst-case condition for the construction period. The locations of these related projects are shown in Figure 4.19-3.

Transportation

The following transportation capital improvements within the project area are currently identified as funded under Metro's 2009 Long Range Transportation Plan and SCAG's 2008 RTIP. In addition to the projects listed below, the Metro Crenshaw Line and the Metro Purple Line from Wilshire/Western to Westwood will be under construction, although they are located well outside of the project area and are not likely to present construction-related cumulative impacts.

- Congestion Reduction Demonstration Program: This program will convert existing high-occupancy vehicle (HOV or carpool) lanes to high-occupancy toll (HOT) lanes, where solo drivers could pay a toll to use the lanes. Several stretches of Los Angeles County freeway HOV lanes have been identified for this pilot program, including the El Monte Busway, which runs parallel to the Santa Ana (US 101) and San Bernardino (I-10) Freeways from Alameda Street to El Monte.

- SR 110 Auxiliary Lanes: This project would reconfigure ramp structures and construct northbound and southbound auxiliary lanes on the Harbor Freeway (SR 110) between 8th Street and the Santa Monica Freeway (I-10).

- Angels Flight Railway Rehabilitation: This project would involve an easement between Hill and Olive Streets and 3rd and 4th Streets for the construction of a new propulsion system. The rehabilitation will allow for service along the currently inactive rail line to be restored. The Angels Flight is a short funicular (cable) railway that travels the length of one city block up the side of Bunker Hill.

- Eastside Light Rail Pedestrian Linkages: This project, sponsored by the City of Los Angeles, would improve pedestrian access to the Metro Gold Line to East Los Angeles stations, including the Little Tokyo/Arts District Station at 1st and Alameda Streets.

- Fashion District Streetscape Phase II: This project would provide streetscape and sidewalk enhancements to facilitate increased pedestrian activity between the Fashion District and the 7th Street transit corridor. The Fashion District is roughly bounded by 7th Street, Main Street, San Pedro Street, and the Santa Monica Freeway (I-10).

- Downtown Los Angeles Alternative Green Transit Modes Trial Program: This program would offer shared-ride bicycles and neighborhood electric vehicles as an alternative to existing DASH shuttle services for the purpose of accessing City Hall. City Hall is located within the block bounded by 1st, Spring, Temple, and Main Streets.

- Little Tokyo Pedestrian Linkages: This City of Los Angeles project would create sidewalk and crosswalk enhancements to encourage pedestrian activity within the Little Tokyo area. The project also calls for new landscaping and street furniture.

- East Downtown Truck Access Improvements: This City of Los Angeles project calls for roadway improvements, widening, and restriping to facilitate truck access to the industrial area in the southeastern portion of the project area.

- Route 101 Southbound Improvements: This State of California Department of Transportation (Caltrans) project calls for replacement of the southbound Vignes Street and Hewitt Street ramps with new ramps at Garey Street on the northeast corner of the project area.

- Route 101 Pedestrian Bridge Enhancement: This City of Los Angeles project calls for the enhancement of pedestrian bridges across the Santa Ana Freeway (US 101) along the northern edge of the project area.

The following two projects are not currently included in the regional transportation plans listed above; however, these projects are in some stage of planning and could potentially occur during the construction period for the Regional Connector project.

- Resurrection of the Red Car Trolley Services in the Downtown Los Angeles Area: This project seeks to implement a historic streetcar service connecting the South Park, Financial District, South Broadway, and Little Tokyo areas of downtown Los Angeles. The service would be primarily, if not entirely, at-grade and the tracks could potentially be constructed in existing mixed-flow lanes. Though streetcar technology is similar to light rail, the Red Car service would be more local in scope, with stops spaced every two blocks or so.

- Broadway Transit Mall: This project would close part of South Broadway to auto traffic, tentatively from 2nd Street to 9th Street, in order to create a pedestrian and transit mall. Under this plan, only transit buses and delivery trucks would be permitted to drive through the transit mall. Broadway currently experiences among the highest volumes in pedestrian traffic in Los Angeles, and this project would help alleviate crowding on the sidewalks.

The California High-Speed Rail (CAHSR) project proposes to construct a 700-mile long electric-power, steel-wheel-on-steel-rail, high-speed train system from Sacramento to San Diego. The Los Angeles portion of the project would provide a connection between Palmdale and Orange County utilizing existing Metrolink right-of-way to connect to Union Station. The high-speed rail system would likely be built as an elevated guideway connecting to the upper level of Union Station and transitioning to an at-grade system in or near the Burlington Northern Santa Fe/Metrolink rail corridor (LOSSAN rail corridor). The high-speed rail system would either share tracks with existing non-electric trains or operate using dedicated tracks within the LOSSAN rail corridor. Project build out is anticipated for year 2030. The CAHSR project is designed to interface with existing passenger rail service and to provide additional capacity to meet increases in intercity travel demand in California. The Regional Connector project would be constructed and operated in coordination with the CAHSR project. Metro would also coordinate and interface with the County of Los Angeles portion of the CAHSR project. Metro has designated a high-speed rail coordinator who would handle coordination with the CAHSR authority.

Institutional and Public Facility

Institutional and public facility projects located within the project area are listed in Table 4.19-3.

Table 4.19-3. Institutional and Public Facility Projects Expected to be Completed by 2014[1]

Number	Project Name	Address[1]	Land Use
CC10	Police Headquarters Building	1st Street between Main and Spring	Institution
CC11	Police Headquarters Vehicle Maintenance Facility	Main Street between 2nd and 3rd Streets	Institution
CC12	Metropolitan Detention Center	Temple & Los Angeles Street	Institution
CC13	The Broad Art Foundation Museum and Pedestrian Plaza	Southwest corner of Grand Avenue and 2nd Street	Museum

Note:
[1] All projects are located within the City of Los Angeles.

Major Renovations

Projects located within the project area that propose to convert offices to residential housing and/or which involve a major renovation of an existing structure are listed in Table 4.19-4.

Table 4.19-4. Major Renovation Projects Potentially Under Construction 2014-2019[1]

Number	Project Name	Street Address[1]	Land Use	Units
R1	Chester Williams Building	5th Street & Broadway	Residential	82
R2	Cosavings Building	315 W. 9th Street	Residential	98
R3	Former Beacon Storage Building	350 S. Alameda Street	Residential	59
R4	Giannini Place	649 S. Olive Street	Residential	100
R5	Gill Lofts	752-756 S. Los Angeles	Residential	9
R6	Herald Examiner	1111 S. Broadway	Mixed-Use	587
R7	Mercantile Arcade Building	541 S. Broadway	Residential	140
R8	Chinatown Lofts	Not Mapped	Mixed-Use	318

Note:
[1] All projects are located within the City of Los Angeles.

Table 4.19-5. New Residential and Mixed-Use Construction Projected For 2014-2019[1]

Number	Project Name	Street Address[1]	Land Use	Units
C1	611 Place	611 W. 6th Street	Mixed-Use	402
C2	751 S. Spring Street	751 S. Spring Street	Residential	257
C3	808 N. Spring Street	808 N. Spring Street	Residential	123
C4	808 S. Olive Street	808 S. Olive Street	Residential	N/A
C5	1027 Wilshire	1027 Wilshire Blvd.	Residential	402
C6	1133 S. Hope Street	1133 S. Hope Street	Residential	159
C7	1150 Grand	1150 Grand Avenue	Residential	374
C8	1340 S. Figueroa Street	1340 S. Figueroa Street	Mixed-Use	N/A
C9	1500 Figueroa	1500 S. Figueroa Street	Mixed-Use	195
C10	AMP Lofts	695 S. Santa Fe Street	Mixed-Use	180
C11	BC Plaza Lofts	711 N. Broadway	Residential	53
C12	Block 8	200 S. Los Angeles Street	Residential	510
C13	Blossom Plaza	900 N. Broadway	Mixed-Use	262
C14	Capitol Milling Building	1231 N. Spring Street	Mixed-Use	40
C15	Chinatown Gateway Plaza	617 N. Broadway	Mixed-Use	280
C16	City Front Place	530 E. Washington Blvd.	Residential	136
C17	Glass Tower	1050 S. Grand Avenue	Residential	128
C18	Hai Wei	871 Figueroa Terrace	Residential	102
C19	Holland Partners Project	Not Mapped	Residential	360
C20	Industrial Lofts	1800 E. Industrial Street	Residential	36
C21	L.A. Central	11th & Figueroa Street	Mixed-Use	860
C22	L.A. Lofts	1024 S. Hope Street	Residential	250
C23	Lucia Tower	Grand Ave & Cesar Chavez	Residential	200

Table 4.19-5. New Residential and Mixed-Use Construction Projected For 2014-2019[1] (continued)

Number	Project Name	Street Address[1]	Land Use	Units
C24	Matsu	2nd & Los Angeles Street	Residential	N/A
C25	McGregor Company Tower	Not Mapped	Mixed-Use	123
C26	Metropolis Phase I	831 Francisco Street	Mixed-Use	351
C27	Metropolis Phase II	831 Francisco Street	Mixed-Use	388
C28	Metropolis Phase III	831 Francisco Street	Mixed-Use	88
C29	Nikkei Center	1st & Alameda Street	Mixed-Use	390
C30	Olive Street Lofts	1103 S. Olive Street	Residential	105
C31	Olympic	Olympic & Grand	Residential	150
C32	One Santa Fe	230 S. Santa Fe Avenue	Mixed-Use	440
C33	Opus	718 S. Grand Avenue	Residential	875
C34	Pacific Exchange	233 Beaudry Avenue	Residential	850
C35	Park Fifth	5th between Hill & Olive Streets	Mixed-Use	790
C36	Piero II	1052 W. 6th Street	Mixed-Use	340
C37	Renato Apartments	527-531 S. San Julian Street	Residential	123
C38	Residences @ Bixel	1110 Ingraham Street	Mixed-Use	334
C39	Seven West	1401 W. 7th Street	Residential	62
C40	Shy Barry Tower II	Main & 6th Street	Residential	700
C41	South Village	8th & Hope Street	Residential	225
C42	South Village - Park Tower	9th & Hope Street	Residential	300
C43	The Grand Phase I (Parcel Q)	121 S. Olive Street	Mixed-Use	500
C44	The Grand Phase II (Parcel L)	220 S. Hope Street	Mixed-Use	720
C45	The Grand Phase II (Parcel M2)	236 S. Hope Street	Mixed-Use	720

Table 4.19-5. New Residential and Mixed-Use Construction Projected For 2014-2019[1] (continued)

Number	Project Name	Street Address[1]	Land Use	Units
C46	The Grand Phase III (Parcel W2)	440 W. 1st Street	Mixed-Use	720
C47	The Yards	875 E. Traction Avenue	Residential	400
C48	Ullman Tower I	Broadway between 8th & 9th Streets	Residential	320
C49	Ullman Tower II	Broadway between 9th Street & Olympic Blvd.	Residential	195
C50	Vibiana Phase II	114 E. 2nd Street	Mixed-Use	300
C51	Zen	250 S. Hill Street	Residential	302

Note:
[1] *All projects are located within the City of Los Angeles.*

Table 4.19-6. New Institutional and Public Facility Construction Projected For 2014-2019[1]

Number	Project Name	Street Address[1]	Land Use
C52	Children's Museum and Art Park	Temple & Judge Aiso Street	Public
C53	Federal Courthouse	1st Street & Broadway	Institution
C54	Proposed Civic Park	Main Street to Grand Avenue	Public

Note:
[1] *All projects are located within the City of Los Angeles.*

New Construction

Figure 4.19-3 provides a map of the location of new potential construction projects in the project area. New construction encompasses building new structures on vacant lots, as well as any demolition of older structures needed to clear the lots for construction.

Utility Projects

No major utility projects have been identified within the project area during the construction period of 2014 to 2019. The City of Los Angeles maintains an extensive list of public works projects. However, there do not appear to be many projects planned after 2014 within the City and there do not appear to be any planned within the project area. Most of the planned projects within the City are related to ongoing maintenance or replacement in-kind of existing infrastructure.

4.19.2.5 Projects Potentially Under Construction post-2019

The existing databases and long-range plans do not include any reasonably foreseeable projects beyond 2019. For potential cumulative impacts beyond the year of opening, trend information on land use, and population and employment growth from adopted regional plans have been used. The cumulative impacts analysis includes positive impacts as well as adverse effects, particularly with respect to the enhancements in regional mobility that may be represented by the build alternatives when compared to the No Build Alternative.

4.19.3 Environmental Impacts/Environmental Consequences

Impact conclusions for all of the alternatives are based on the thresholds identified above in Section 4.19.1. Appendix GG, Cumulative Impacts Technical Memorandum, summarizes the potential cumulative impacts that could result from the Regional Connector Transit Corridor project in combination with the identified past, present and reasonably foreseeable projects for the following resource areas:

- Transit, Traffic, Circulation, and Parking
- Land Use
- Displacement and Relocation
- Community and Neighborhood
- Visual and Aesthetics
- Air Quality Impacts and Health Risk Assessment
- Climate Change
- Noise and Vibration
- Ecosystems and Biological Resources
- Geotechnical/Subsurface/Seismic/Hazardous Materials
- Water Resources
- Energy
- Cultural Resources
- Parklands and Other Community Facilities
- Economic and Fiscal
- Safety and Security

- Growth-Inducing
- Environmental Justice

Cumulative impacts are analyzed in more detail in each of the technical memoranda prepared for each resource area, which are contained in Appendix L through Appendix EE of this EIS/EIR. For more information about potential cumulative impacts see the resource specific technical memoranda. Cumulative impacts and related mitigation measures for each of the resource areas identified above that would occur with implementation of the alternatives are described in Chapters3 and 4 of this EIS/EIR. The following provides a summary of the significant and unavoidable cumulative adverse effects/impacts for each alternative as discussed in Chapters 3 and 4.

4.19.3.1 No Build Alternative

The No Build Alternative would not involve any construction. Therefore, the No Build Alternative would add no incremental contribution to cumulative impacts, if any, with the exception of transit systems. Cumulative transit impacts associated with the No Build Alternative would be adverse as this alternative would not close the gap in the rail transit system and would not provide the travel time and convenience benefits for transit users associated with the build alternatives. There would be a negative transit impact upon those that rely on the public transit system, for east-west and north-south travel through the downtown area. This would result in an adverse cumulative transit impact.

4.19.3.1.1 NEPA Finding

The No Build Alternative would result in an adverse cumulative transit effects. All other cumulative effects would not be adverse.

4.19.3.1.2 CEQA Determination

The No Build Alternative would result in a significant cumulative transit impact.

4.19.3.2 TSM Alternative

With implementation of mitigation, the TSM Alternative would not contribute to any cumulative impacts, with the exception of transit systems. Cumulative transit impacts associated with the TSM Alternative would be adverse as this alternative would not close the gap in the rail transit system and would not provide the travel time and convenience benefits for transit users associated with the build alternatives. There would be a negative transit impact upon those that rely on the public transit system, for east-west and north-south travel through the downtown area. This would result in an adverse cumulative transit impact.

4.19.3.2.1 NEPA Finding

The TSM Alternative would result in an adverse cumulative transit effect. All other cumulative effects would not be adverse.

4.19.3.2.2 CEQA Determination

The TSM Alternative would result in a significant cumulative transit impact.

4.19.3.3 At-Grade Emphasis LRT Alternative

Even with implementation of possible mitigation measures, construction of the At-Grade Emphasis LRT Alternative could result in a considerable contribution to cumulative construction impacts associated with bus transit, traffic circulation, and pedestrian and bicycle movements. Given the related projects that could be under construction during the same time as the proposed alternative, construction of the alternative could result in a considerable contribution to cumulative construction impacts on activity levels and revenue of businesses along the alignment.

Construction and operation of the At-Grade Emphasis LRT Alternative would result in a considerable contribution to adverse cumulative impacts at 11 intersections during the AM peak hour and 15 intersections during the PM peak hour. Refer to Section 3.4.2.2.2 of Chapter 3, Transportation Impacts and Mitigation, of this Final EIS/EIR for further information.

Although regional construction emissions under the At-Grade Emphasis LRT Alternative would be significant and unavoidable, operation of this alternative would reduce regional vehicle miles traveled (VMT), which would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality. Refer to Section 4.5.3 of Chapter 4, Environmental Analysis, Consequences, and Mitigation, of this Final EIS/EIR for further information.

Cumulative impacts to all other environmental resources are anticipated to be less than significant, or less than significant after mitigation.

Development of this alternative would result in the following beneficial impacts. The At-Grade Emphasis LRT Alternative would result in a significant beneficial impact to transit systems compared to the No Build and TSM Alternatives. With implementation of this alternative, transit patrons could travel from east-west or north-south without having to make a transfer in the downtown area. A number of intersections would improve with operation of the At-Grade Emphasis LRT Alternative over the No Build Alternative by virtue of a reduction in delays. During the AM peak hour, seven intersections show delay improvements and eight intersections show delay improvements in the PM peak hour. Refer to Section 3.3.3.2.2 of Chapter 3, Transportation Impacts and Mitigation, of this Final EIS/EIR for further information.

The alignment passes near several potential development sites, and plans for these sites include high-density employment and residential facilities. The At-Grade Emphasis LRT Alternative combined with other projects could help reduce the adverse effects of these land use changes within the project area by providing a better alternative to driving, which would be a beneficial land use effect.

Implementation of the At-Grade Emphasis LRT Alternative would result in a decrease in highway VMT, which would subsequently result in a net decrease in energy consumption measured in both British Thermal Units (BTUs) and barrels of oil. This net decrease in BTUs and barrels of oil would result in a beneficial impact to energy resources.

Potential beneficial economic impacts associated with the At-Grade Emphasis LRT Alternative include improved accessibility and mobility for the region, which would potentially encourage greater economic activity; and beneficial impacts for businesses and employees traveling to and from work.

4.19.3.3.1 NEPA Finding

Construction of the At-Grade Emphasis LRT Alternative would result in a considerable contribution to cumulative effects associated with bus transit, traffic circulation, pedestrian and bicycle movements, and activity levels and revenue of businesses along the alignment.

Operation of the At-Grade Emphasis LRT Alternative would result in a considerable contribution to adverse cumulative effects at 11 intersections during the AM peak hour and 15 intersections during the PM peak hour. Refer to Section 3.4.2.2.2 of Chapter 3, Transportation Impacts and Mitigation, of this Final EIS/EIR for further information.

All other cumulative effects would not be adverse, or not adverse after mitigation.

In addition, the At-Grade Emphasis LRT Alternative would result in regional VMT reductions, which would result in beneficial effects to air quality and energy consumption. The At-Grade Emphasis LRT Alternative would also result in beneficial effects to transit systems, several intersections within the project area, residential land uses, and accessibility and mobility in the region, which would potentially encourage greater economic activity.

4.19.3.3.2 CEQA Determination

Construction of the At-Grade Emphasis LRT Alternative would result in a considerable contribution to cumulative impacts associated with bus transit, traffic circulation, pedestrian and bicycle movements, and activity levels and revenue of businesses along the alignment.

Operation of the At-Grade Emphasis LRT Alternative would result in a considerable contribution to significant cumulative impacts at 11 intersections during the AM peak hour and 15 intersections during the PM peak hour. Refer to Section 3.4.2.2.2 of Chapter 3, Transportation Impacts and Mitigation, of this Final EIS/EIR for further information.

All other cumulative impacts would be less than significant, or less than significant after mitigation.

In addition, the At-Grade Emphasis LRT Alternative would result in regional VMT reductions, which would result in beneficial impacts to air quality and energy consumption. The At-Grade Emphasis LRT Alternative would also result in beneficial impacts to transit systems, several intersections within the project area, residential land uses, and accessibility and mobility in the region, which would potentially encourage greater economic activity.

4.19.3.4 Underground Emphasis LRT Alternative

With incorporation of possible mitigation measures, construction of the Underground Emphasis LRT Alternative could still result in a considerable contribution to cumulative construction impacts associated with bus transit, traffic circulation, and pedestrian and bicycle movements.

Given the related projects that could be under construction during the same time as the proposed alternative, construction of the alternative could result in a considerable contribution to cumulative construction impacts on activity levels and revenue of businesses along the alignment.

Implementation of the Underground Emphasis LRT Alternative would result in a considerable contribution to significant cumulative impacts at two intersections (Alameda Street/2nd Street and Flower Street/4th Street) during the AM peak hour and three intersections (Judge John Aiso Street/1st Street; Alameda Street/2nd Street; and Judge John Aiso Street/Temple Street) during the PM peak hour. Refer to Section 3.4.2.2.3 of Chapter 3, Transportation Impacts and Mitigation, of this Final EIS/EIR for further information.

In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible. Therefore, cumulative construction impacts to paleontological resources would be significant and unavoidable.

Although regional construction emissions under the Underground Emphasis LRT Alternative would be significant and unavoidable, operation of this alternative would reduce regional VMT, which would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality.

Cumulative impacts to all other environmental resources are anticipated to be less than significant, or less than significant after mitigation.

Development of this alternative would result in the following beneficial impacts. The Underground Emphasis LRT Alternative would result in a significant beneficial impact to transit systems compared to the No Build and TSM Alternatives. With implementation of this alternative, transit patrons could travel from east-west or north-south without having to make a transfer in the downtown area. A number of intersections would improve under the Underground Emphasis LRT Alternative from the No Build Alternative by virtue of a reduction in delays. During the AM peak hour, five intersections show delay improvements and eight intersections show delay improvements in the PM peak hour. It should also be noted that the inclusion of the Regional Connector would increase the person-carrying capacity through the downtown transportation environment without adversely impacting overall traffic operations.

The alignment passes near several potential development sites, and plans for these sites include high-density employment and residential facilities. The Underground Emphasis LRT Alternative combined with other projects could help reduce the adverse effects of these land use changes within the project area by providing a better alternative to driving, which would be a beneficial land use effect.

Implementation of the Underground Emphasis LRT Alternative would result in a decrease in highway VMT, which would subsequently result in a net decrease in energy consumption measured in both BTUs and barrels of oil. This net decrease in BTUs and barrels of oil would result in a beneficial impact to energy resources.

Potential beneficial economic impacts associated with the Underground Emphasis LRT Alternative include improved accessibility and mobility for the region, which would potentially encourage greater economic activity; and beneficial impacts for businesses and employees traveling to and from work.

4.19.3.4.1 NEPA Finding

With incorporation of possible mitigation, construction of the Underground Emphasis LRT Alternative would still result in a considerable contribution to cumulative effects associated with bus transit, traffic circulation, pedestrian and bicycle movements, and activity levels and revenue of businesses along the alignment.

Operation of the Underground Emphasis LRT Alternative would result in a considerable contribution to adverse cumulative effects at two intersections (Alameda Street/2nd Street and Flower Street/4th Street) during the AM peak hour and three intersections (Judge John Aiso Street/1st Street; Alameda Street/2nd Street; and Judge John Aiso Street/Temple Street) during the PM peak hour.

In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and thus cumulative construction effects to paleontological resources would be unavoidable.

All other cumulative effects would not be adverse, or not adverse after mitigation.

In addition, the Underground Emphasis LRT Alternative would result in regional VMT reductions, which would result in beneficial effects to air quality and energy consumption. The Underground Emphasis LRT Alternative would also result in beneficial effects to transit systems, several intersections within the project area, residential land uses, and accessibility and mobility in the region, which would potentially encourage greater economic activity.

4.19.3.4.2 CEQA Determination

With incorporation of possible mitigation, construction of the Underground Emphasis LRT Alternative would still result in a considerable contribution to cumulative impacts associated with bus transit, traffic circulation, pedestrian and bicycle movements, and activity levels and revenue of businesses along the alignment.

Operation of the Underground Emphasis LRT Alternative would result in a considerable contribution to significant cumulative impacts at two intersections (Alameda Street/2nd Street and Flower Street/4th Street) during the AM peak hour and three intersections (Judge John Aiso Street/1st Street; Alameda Street/2nd Street; and Judge John Aiso Street/Temple Street) during the PM peak hour.

In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and thus cumulative construction impacts to paleontological resources would be significant and unavoidable.

All other cumulative impacts would be less than significant, or less than significant after mitigation.

In addition, the Underground Emphasis LRT Alternative would result in regional VMT reductions, which would result in beneficial impacts to air quality and energy consumption. The Underground Emphasis LRT Alternative would also result in beneficial impacts to transit systems, several intersections within the project area, residential land uses, and accessibility and mobility in the region, which would potentially encourage greater economic activity.

4.19.3.5 Locally Preferred Alternative

The thresholds identified in Section 4.19.1 above were used for evaluating whether the LPA would contribute to cumulative impacts. With incorporation of mitigation measures, construction of the LPA could still result in a considerable contribution to cumulative construction impacts associated with bus transit, traffic circulation, and pedestrian and bicycle movements.

Implementation of this alternative would result in a considerable contribution to a cumulative impact at one intersection (Flower Street/4th Street) during the AM peak hour.

Although regional construction emissions under the LPA would be significant and unavoidable, operation of this alternative would reduce regional VMT, which would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality.

In areas where new underground TBM segments would be constructed, which include the non-station portions of the alignment beneath 2nd Street and beneath Flower Street north of 4th Street, mitigation for paleontological resources would not be feasible. Therefore, cumulative construction impacts to paleontological resources would be significant and unavoidable.

The LPA would not result in a considerable contribution or would not result in a considerable contribution after mitigation to cumulative impacts for all other environmental resources.

Development of this alternative would result in the following beneficial impacts. The LPA would result in a significant beneficial impact to transit systems compared to the No Build and TSM Alternatives. With implementation of this alternative, transit patrons could travel from east-west or north-south without having to make a transfer in the downtown area. A number of intersections would improve under the LPA compared to the No Build Alternative by virtue of a reduction in delays. During the AM peak hour, four intersections show delay improvements and seven intersections show delay improvements in the PM peak hour. Refer to Section 3.3.5.2.2 of Chapter 3, Transportation Impacts and Mitigation, of this Final EIS/EIR for further information. It should also be noted that the inclusion of the Regional Connector would increase the person-carrying capacity through the downtown transportation environment without adversely impacting overall traffic operations.

The alignment passes near several potential development sites, and plans for these sites include high-density employment and residential facilities. The LPA combined with other projects could help reduce the adverse effects of these land use changes within the project area by providing a better alternative to driving, which would also be a beneficial land use effect.

Implementation of the LPA would result in a decrease in highway VMT, which would subsequently result in a net decrease in energy consumption as measured in both BTUs and barrels of oil. This net decrease in BTUs and barrels of oil would result in a beneficial impact to energy resources.

Potential beneficial economic impacts associated with the LPA include improved accessibility and mobility for the region, which would potentially encourage greater economic activity; and beneficial impacts for businesses and employees traveling to and from work.

4.19.3.5.1 NEPA Finding

With implementation of mitigation, construction of the LPA will still result in a considerable contribution to cumulative effects associated with bus transit, traffic circulation, and pedestrian and bicycle movements.

Operation of the LPA would result in a considerable contribution to an adverse cumulative effect at one intersection (Flower Street/ 4th Street) during the AM peak hour.

Although regional construction emissions under the LPA would be adverse and unavoidable, operation of the LPA would result in regional VMT reductions, which would result in beneficial effects to air quality and energy consumption.

In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and thus cumulative construction effects to paleontological resources will be unavoidable.

All other cumulative effects would not be adverse, or not adverse after mitigation.

The LPA would also result in beneficial effects to transit systems, several intersections within the project area, residential land uses, and accessibility and mobility in the region, which would potentially encourage greater economic activity.

4.19.3.5.2 CEQA Determination

With implementation of mitigation, construction of the LPA would still result in a considerable contribution to cumulative impacts associated with bus transit, traffic circulation, and pedestrian and bicycle movements.

Operation of the LPA would result in a considerable contribution to a significant cumulative impact at one intersection (Flower Street/ 4th Street) during the AM peak hour.

Although regional construction emissions under the LPA would be significant and unavoidable, operation of the LPA would result in regional VMT reductions, which would result in beneficial impacts to air quality and energy consumption.

In areas where new underground TBM segments would be constructed, mitigation for paleontological resources would not be feasible and thus cumulative construction impacts to paleontological resources would be significant and unavoidable.

All other cumulative impacts would be less than significant, or less than significant after mitigation.

The LPA would also result in beneficial impacts to transit systems, several intersections within the project area, residential land uses, and accessibility and mobility in the region, which would potentially encourage greater economic activity.

4.19.4 Mitigation Measures

4.19.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has adjusted and added specificity to the candidate mitigation measures for each environmental resource presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in the specific EIS/EIR section for each environmental resource, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR.

4.19.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA contained within the specific EIS/EIR section for each environmental resource have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA.

4.20 Relationship Between Short-Term Uses of the Environment and Long-Term Productivity

Minor modifications and updates have been made to this section since publication of the Draft EIS/EIR. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. These revisions do not change the NEPA impact findings or CEQA impact determinations of this section.

Pursuant to NEPA and CEQA, significant irreversible environmental changes are described as the use of nonrenewable resources during the initial and continued phases of a project that may be irreversible (losses that cannot be recovered or reversed) if removal of the resources occurs, or if there is the loss of future options and the resource cannot be recovered or reused. Primary and secondary impacts, such as dedication of right-of-way to transportation uses, typically commit future generations to similar uses. In addition, irreversible damage can result from environmental accidents associated with a project (CEQA Guidelines 15126.2(c)). These thresholds were used to determine potential significant irreversible environmental changes associated with all of the alternatives.

The Regional Connector Transit Corridor project is included in the Metro *Long Range Transportation Plan* (LRTP) and the Southern California Association of Governments (SCAG) *Regional Transportation Plan*, which consider the need for present and future transportation systems within the context of present and future land use development. The local short-term impacts and use of resources through implementation of any of the build alternatives would be consistent with the maintenance and enhancement of long-term productivity for the local area and region.

The No Build Alternative would not entail construction beyond the projects that are currently under construction or planned for operation by the year 2035 in Metro's LRTP. It would not result in short- or long-term losses or gains nor would it resolve worsening congestion on local streets and highways. As a result, it would not enhance the project area or regional long-term productivity.

The TSM Alternative would include construction of new bus stops, which would not be considered major construction, and it would not result in short-term losses or gains associated with construction. By adding new shuttle bus service, the TSM Alternative would offer long-term gains associated with reducing traffic on local streets and increasing mobility within the downtown area. However, congestion would continue to be problematic across the Los Angeles region. The TSM Alternative would increase jobs and revenue through expanded transit services. It would enhance local and regional long-term productivity.

The three build alternatives (At-Grade Emphasis LRT Alternative, Underground Emphasis LRT Alternative, and LPA) would result in economic losses experienced by businesses that relocate, and construction impacts (e.g., noise, visual quality, air quality, and motorized and non-motorized traffic delays or detours). A short-term loss of plant resources would occur from removing street trees and landscaping in the construction areas. This would be considered a short-term loss since Metro would comply with local tree ordinances and replace trees, as necessary. Short-term benefits would include increased jobs and revenue generated during construction.

Long-term losses associated with the build alternatives would include use of construction materials and energy. Construction activities may result in loss of paleontological and archaeological site values. Long-term losses associated with the build alternatives would include the demolition of up to two historic properties. The At-Grade Emphasis LRT Alternative would result in the demolition of a portion of the 2nd Street Tunnel, which is eligible for listing in the National Register of Historic Places (NRHP), and a portion of the Belmont Tunnel, which is eligible for listing in the California Register of Historical Resources (CRHR); and the Underground Emphasis LRT Alternative and the LPA would result in the removal of the S. Kamada Restaurant, Atomic Café, Señor Fish, and Coast Imports building, which is considered historic by the CRHR, and would result in the demolition of a portion of the Belmont Tunnel.

Long-term gains would include transit network improvement, increased regional and local activity center access, reduced local street and highway congestion, and increased jobs and revenue through expanded transit services. Equally as important, the build alternatives would locate transit alignments and stations in areas where existing land uses are conducive to transit use and have the potential to develop additional transit-supportive land uses. Development of the construction staging sites after the project is completed would also offer an opportunity for transit-oriented development. Therefore, the build alternatives would enhance local and regional long-term productivity.

4.21 Irreversible and Irretrievable Commitments of Resources

This section has been updated since publication of the Draft EIS/EIR based on refinements to the LPA. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors. These revisions do not change the CEQA impact determinations of this section.

CEQA Section 15126.2(c) requires a discussion of any significant irreversible environmental impacts that would be caused by implementation of a proposed project. Generally, a project would result in significant irreversible environmental impacts if any of the following would occur:

- The project would involve a large commitment of nonrenewable resources.
- The project consumption of resources is not justified (i.e., the project involves wasteful energy use).
- The primary and secondary impacts would generally commit future generations to similar uses.
- The project involves uses in which irreversible damage could result from any potential environmental accidents associated with the project.

These thresholds were used to determine significant irreversible environmental impacts that would potentially occur under all of the alternatives.

Under the No Build Alternative, no new infrastructure would be built within the project area, aside from projects currently under construction or funded for construction and operation by 2035 in Metro's *Long Range Transportation Plan* (LRTP).

The TSM Alternative does not have a construction component, beyond installation of bus stops and minor curb modifications, and would not have an irreversible and irretrievable commitment of nonrenewable resources associated with construction. Operating new shuttle bus service under the TSM Alternative would rely on the use of nonrenewable resources or a commitment of physical resources, such as metal, for the expanded bus fleet. Operation of the TSM Alternative would increase energy consumption due to maintenance and operation of the expanded bus fleet. The use of fossil fuel would be necessary to provide electricity and fuel for buses, worker vehicles, and maintenance operations.

Construction of the build alternatives, including the LPA, would entail the one-time, irreversible, and irretrievable commitment of nonrenewable resources, such as energy (fossil fuels used for construction equipment) and construction materials (such as lumber, sand, gravel, metals, and water). Additionally, labor and natural resources would be used to produce construction materials that are not generally retrievable. However, these materials are not in short supply and usage would not result in a significant impact on continued availability of these resources. Construction of one of the build alternatives, including the LPA, would also require a substantial one-time expenditure, which is not retrievable, of both local and federal funds.

Land used to construct proposed facilities is considered an irreversible commitment during the period the land is used. After construction is completed, land used for construction staging would be available for other uses. The project would potentially commit land at stations, potential portal and pedestrian bridge sites, and street right-of-way to transit uses. Some station pedestrian entrances and other aboveground elements of the project would be located on sites with existing commercial and retail uses, and would not require a substantial land commitment. The commitment of long-term land resources is consistent with the policies of the City of Los Angeles which promote transit uses.

The consumption of nonrenewable resources related to the build alternatives, including the LPA, would include water, petroleum products, and electricity. Tunneling activities would require water for slurry for the tunnel boring machines and in water cooling towers. While much of this water can be recycled and reused, these processes would also create wastewater that would require disposal. In addition, fossil fuels would be used for transporting workers and materials during construction, and electricity and fuel would be used for trains, stations, and worker vehicles for maintenance and operation during the life of the project. The amount and rate of consumption of these resources would not result in significant environmental impacts or the unnecessary, inefficient, or wasteful use of such resources because they would increase transit use (which increases energy efficiency) and decrease automobile use (which uses fossil fuels).

The Regional Connector Transit Corridor project benefits would include improved mobility, transit accessibility, and energy and time savings. The resources committed and consumed for the build alternatives, including the LPA, would be considered appropriate because regional and area residents and visitors would benefit from improved transit services, which, in turn, would result in an overall decrease in the irreversible and irretrievable commitment of nonrenewable resources. For example, transportation sources account for over 40 percent of the energy consumed in California. The project is expected to remove passenger cars from the regional roadway network, easing the increase in vehicle miles traveled, and the usage of fossil fuels. The build alternatives, including the LPA, would annually reduce regional vehicle miles traveled by approximately 96 to 102 million miles, and reduce annual mobile source energy consumption by approximately 596 to 635 billion British Thermal Units (BTUs). Therefore, the project can substantially decrease the irreversible and irretrievable commitment of resources. Refer to Section 4.11, Energy Resources, of this Final EIS/EIR for more detail regarding reductions in annual mobile source energy consumption.

The project consists of a light rail connector, which would include transit stations, pedestrian station entrances and train portals, potential pedestrian bridges, and a potential automobile underpass. These components of the project would use household-type cleaning materials, such as detergents and cleansers. Oil, solvents, and other materials would be used for train maintenance in relatively small volumes and are not considered acutely hazardous materials according to the National Institute of Health. There is the potential for hazardous materials/waste spills to occur; however, the storage and disposal of hazardous materials/waste would be conducted in accordance with all federal and state requirements to prevent or manage hazards. In the unlikely event that a spill does occur, remediation would be conducted accordingly. Therefore, there would be a minimal risk of irreversible damage caused by an environmental accident associated with hazardous or acutely hazardous materials.

4.22 Anticipated Permits and Approvals

Minor revisions have been made to this section since publication of the Draft EIS/EIR. A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Permits (or approvals) would not be required for the No Build Alternative.

The TSM Alternative would require compliance with Construction General Permit (Order 2009-0009-DWQ) and local City of Los Angeles grading, construction, street use, and tree protection ordinances.

The build alternatives, including the LPA, would require compliance with the State General Permit for Storm Water Discharges Associated with Construction Activity (Order No. 99-08-DWQ), Construction General Permit (Order 2009-0009-DWQ), and Industrial General Permit (Order No. 97-03-DWQ).

In addition, tunneling would likely occur at or below groundwater levels and dewatering is anticipated. A Los Angeles Regional Water Quality Control Board (LARWQCB) dewatering permit would be required. Waste discharges must comply with LARWQCB Municipal National Pollutant Discharge Elimination System (NPDES) Permit (LARWQCB Order No. R4-2008-0032) and waste discharge requirements (WDRs) (Order No. 93-010 and Order No. 91-93). Approvals for discharges into drainage and sewer systems would be required from the City of Los Angeles, the County Sanitation District, and the Los Angeles County Flood Control District under Municipal Separate Storm Sewer System (MS4) Permits (Order No. 01-182) (NPDES No. CAS004001).

Grading and construction permits and compliance with the tree protection ordinance would be required by the City of Los Angeles. A Caltrans Transportation Permit would be required for the transport of any over-size or over-weight construction equipment on State highways. Metro is regulated by the California Public Utilities Commission (CPUC). Metro is required to operate all transit-related vehicles according to the guidelines established by the CPUC. The CPUC will provide regulatory oversight for all phases of the project. Coordination and approvals from communications and utility purveyors (including, but not limited to, Southern California Gas Company, AT&T, Verizon, Metropolitan Water District (MWD), Los Angeles Department of Water and Power (LADWP), etc.) would be needed for temporary or permanent utility relocation or service interruption.