California High-Speed Rail Authority

Los Angeles to Anaheim Project Section

Transportation Technical Report

October 2025



CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 22, 2024, and executed by the Federal Railroad Administration and the State of California.

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ACRONYMS AND ABBREVIATIONS

Term	Definition
AADT	average annual daily traffic
ADA	Americans with Disabilities Act
AMP	airport master plan
Amtrak	National Railroad Passenger Corporation
ARTIC	Anaheim Regional Transportation Intermodal Center
Authority	California High-Speed Rail Authority
BNSF	BNSF Railway
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMA	Congestion Management Agency
CMP	Congestion Management Program
CSMP	Corridor System Management Plan
CTP	Construction Transportation Plan
DSMP	District System Management Plan
EIR	environmental impact report
EIS	environmental impact statement
FRA	Federal Railroad Administration
FTIP	Federal Transportation Improvement Program
GHG	greenhouse gas
HCM	Highway Capacity Manual
HOV	high-occupancy vehicle
HSR	high-speed rail
I-	Interstate
IAMF	impact avoidance and minimization feature
LAUS	Los Angeles Union Station
LAX	Los Angeles International Airport
LGB	Long Beach Airport
LMF	light maintenance facility
LOS	level of service
LOSSAN Corridor	Los Angeles – San Diego – San Luis Obispo Rail Corridor
LRTP	Long Range Transportation Plan
Metro	Los Angeles County Metropolitan Transportation Authority
NEPA	National Environmental Policy Act
OCS	overhead contact system

Term	Definition
OCTA	Orange County Transportation Authority
ONT	Ontario International Airport
PEPD	Preliminary Engineering for Project Definition
project section	Los Angeles to Anaheim Project Section
PUDO	pick-up/drop-off
RSA	resource study area
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SCS	sustainable communities strategy
SR	State Route
Statewide Program EIR/EIS	*Final Program Environmental Impact Report/Environmental Impact Statement for the Proposed California High-Speed Train System*
STIP	Statewide Transportation Improvement Program
TAZ	Traffic Analysis Zone
TPSS	traction power substation
U.S.C.	U.S. Code
UPRR	Union Pacific Railroad
US 101	U.S. Highway 101
V/C	volume to capacity
VMT	vehicle-miles traveled

EXECUTIVE SUMMARY

The Los Angeles to Anaheim Project Section of the California High-Speed Rail (HSR) System would extend approximately 30 miles and travels through the cities of Los Angeles, Vernon, Bell, Commerce, Montebello, Pico Rivera, Santa Fe Springs, Norwalk, La Mirada, Buena Park, Fullerton, and Anaheim. This corridor runs through a narrow and constrained urban environment, and this project's alignment would share the existing Los Angeles – San Diego – San Luis Obispo Rail Corridor (LOSSAN Corridor) with other existing rail operators in the area, including trains operated by the National Railroad Passenger Corporation (Amtrak), the Southern California Regional Rail Authority, the Union Pacific Railroad (UPRR), and BNSF Railway (BNSF). In addition to new tracks for HSR, this project section would include a HSR station in Anaheim, as well as a maintenance of infrastructure siding, a light maintenance facility (LMF) with alternatives at 26th Street and 15th Street, and electric power utility improvements. One HSR station option is included in either Norwalk/Santa Fe Springs or Fullerton, which would consist of adding HSR station platforms and facilities to the existing Metrolink or Metrolink/Amtrak stations, respectively.

This Transportation Technical Report is intended to provide the technical foundation and transportation analyses to be used to determine significant impacts and mitigation measures in the project-level environmental impact report (EIR)/environmental impact statement (EIS) for the Los Angeles to Anaheim Project Section of the California HSR System.

Shared Passenger Track Alternative A and Shared Passenger Track Alternative B includes a combination of at-grade, elevated, and below-grade track, depending on corridor and design constraints. The HSR project seeks to maintain existing operations in the corridor while minimizing impacts outside of the existing right-of-way. To accomplish this, the HSR project would add one new mainline track from south of Los Angeles Union Station (LAUS) to Fullerton Junction and would use existing tracks where possible, so that there would be two electrified tracks throughout the corridor used for HSR and shared with other operators. Additionally, ancillary facilities (e.g., traction power substations, radio towers) would be installed adjacent to the right-of-way and would require additional right-of-way.

For the HSR System, the California High-Speed Rail Authority (Authority) is the lead federal agency for compliance with the National Environmental Policy Act (NEPA) and other federal laws. The Authority is also serving as the lead agency for compliance with the California Environmental Quality Act (CEQA).

The Los Angeles to Anaheim Project Section includes an alternative with the LMF at 26th Street (Shared Passenger Track Alternative A) and an alternative with the LMF at 15th Street (Shared Passenger Track Alternative B). A description of the alternatives and their locations can be found in Chapter 2 of the Draft EIR/EIS. This technical report focuses on analyses carried out for the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B exclusively within the project section between Los Angeles and Anaheim.

The resource study area (RSA) is the area in which all environmental investigations specific to transportation are conducted in order to determine the resource characteristics and potential effects of the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B. The RSA is defined based on anticipated increased or decreased measures of effectiveness, such as control delay or traffic density.

The report provides the following analysis scenarios for traffic, rail, bus, pedestrian, and bicycle modes of travel:

- Environmental Baseline #1: Existing Conditions (Year 2015)
  - No Project (Existing roadway configuration)
  - Existing + Project Section Construction (with Project Section roadway configuration)
- Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040)
  - No Project Alternative
  - Shared Passenger Track Alternative A

- Shared Passenger Track Alternative A With Norwalk/Santa Fe Springs HSR Station Option
- Shared Passenger Track Alternative A With Fullerton HSR Station Option
- Shared Passenger Track Alternative B
- Shared Passenger Track Alternative B With Norwalk/Santa Fe Springs HSR Station Option
- Shared Passenger Track Alternative B With Fullerton HSR Station Option

The Authority has established a target level of service (LOS) of D. As detailed in Table 6-57, Table 6-58, and Table 6-59, respectively, of this technical report, Horizon Year 2040 Plus Project creates LOS effects through build out of either Shared Passenger Track Alternative A or B that meet the applicable thresholds at 20 roadway segments, 20 signalized intersections, and two unsignalized intersections. As detailed in Table 6-67, Table 6-68, and Table 6-69, respectively, of this report, Horizon Year 2040 Plus Project with inclusion of the Norwalk/Santa Fe Springs HSR Station Option creates LOS effects that meet the applicable thresholds at 26 roadway segments, 31 signalized intersections, and eight unsignalized intersections. As detailed in Table 6-72, Table 6-73, and Table 6-74, respectively, of this report, Horizon Year 2040 Plus Project with inclusion of the Fullerton HSR Station Option creates LOS effects that meet the applicable thresholds at 21 roadway segments, 23 signalized intersections, and two unsignalized intersections.

Of the 252 roadway segments, 265 signalized intersections, and 37 unsignalized intersections evaluated along the project section alignment and at station areas, the following one roadway segment and three unsignalized intersections would improve from either LOS E to LOS D (or higher) or LOS F to LOS E (or higher) in the Plus Project scenario for Shared Passenger Track Alternatives A and B:

- Soto Street, from East 26th Street to Washington Boulevard
- G208, Downey Road and East 26th Street
- G211, Telegraph Road and Maple Avenue
- F25, Lemon Street and Santa Fe Avenue

The following one roadway segment, one signalized intersection, and four unsignalized intersections would improve from either LOS E to LOS D (or higher) or LOS F to LOS E (or higher) in the Plus Project scenario with inclusion of the Norwalk/Santa Fe Springs HSR Station Option:

- Soto Street, from East 26th Street to Washington Boulevard
- G46, East Street and South Street
- G106, Ayers Avenue and East 26th Street
- G208, Downey Road and East 26th Street
- G211, Telegraph Road and Maple Avenue
- F25, Lemon Street and Santa Fe Avenue

The following one roadway segment and three unsignalized intersections would improve from either LOS E to LOS D (or higher) or LOS F to LOS E (or higher) in the Plus Project scenario with inclusion of the Fullerton HSR Station Option:

- Soto Street, from East 26th Street to Washington Boulevard
- G208, Downey Road and East 26th Street
- G211, Telegraph Road and Maple Avenue
- F25, Lemon Street and Santa Fe Avenue

In all project scenarios, two intersections (G170, Pioneer Boulevard and Wheelock Circle and G211, Telegraph Road and Maple Avenue) would be upgraded to a signalized intersection in the Plus Project condition, which would result in improved overall LOS.

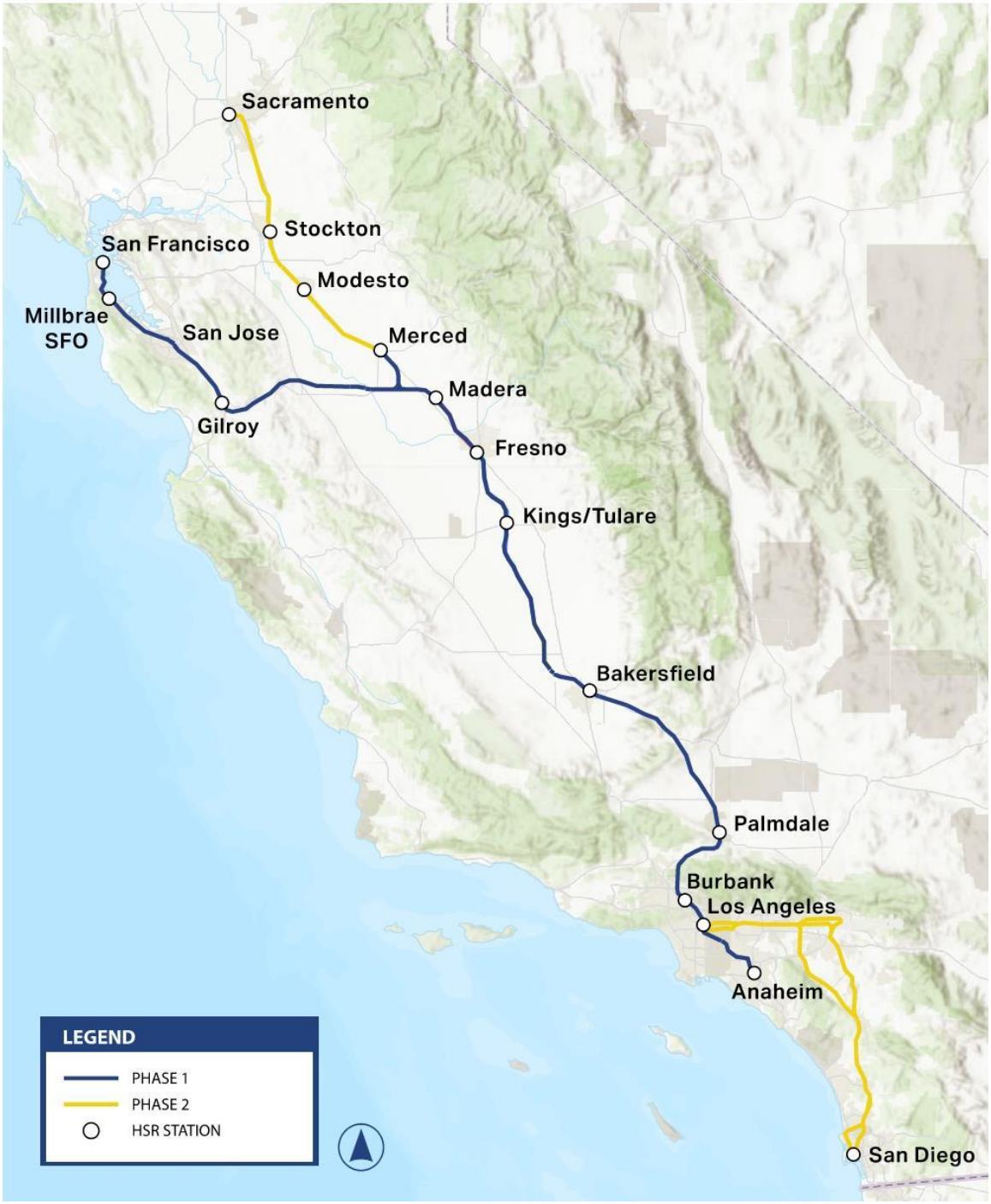
1 INTRODUCTION

1.1 California High-Speed Rail System Background

The California High-Speed Rail Authority (Authority), a state governing board formed in 1996, is responsible for planning, designing, building, and operating the California High-Speed Rail (HSR) System. Its statutory mandate is to develop an HSR system that coordinates with the state's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports. The California HSR System will provide intercity, high-speed service on more than 800 miles of tracks throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the southern Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego, as depicted on Figure 1-1.[1] It will use state-of-the-art, electrically powered, high-speed, steel-wheel-on-steel-rail technology, including contemporary safety, signaling, and automated train control systems, with trains capable of operating up to 220 miles per hour.

The California HSR System is planned to be implemented in two phases. Phase 1 would connect San Francisco to Los Angeles and Anaheim via the Pacheco Pass and the Central Valley. Phase 2 would extend the HSR system from the Central Valley (starting at the Merced Station) to the state's capital in Sacramento and from Los Angeles to San Diego.

[1] The alignments depicted on Figure 1-1 reflect the Authority/Federal Railroad Administration decisions made in the 2005, 2008, and 2012 Programmatic Environmental Impact Report/Environmental Impact Statement documents.



Source: Authority 2023a

Figure 1-1 California High-Speed Rail System

1.2 Los Angeles to Anaheim Project Section Background

The Los Angeles to Anaheim Project Section (project section) of the HSR system would extend approximately 30 miles between Los Angeles Union Station (LAUS) in Los Angeles and Anaheim Regional Transportation Intermodal Center (ARTIC) in Anaheim. This narrow, existing railroad corridor is constrained by the surrounding urban environment and other existing rail operators in

the area, including trains operated by the National Railroad Passenger Corporation (Amtrak), Metrolink (governed by the Southern California Regional Rail Authority), the Union Pacific Railroad (UPRR), and BNSF Railway (BNSF).

The Authority, in cooperation with the Federal Railroad Administration (FRA), completed the *Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System* in November 2005 (Authority and FRA 2005). For the Los Angeles to Anaheim Project Section, the Authority and FRA selected the existing Los Angeles – San Diego – San Luis Obispo Rail Corridor (LOSSAN Corridor), with the intent of sharing the existing right-of-way as the alignment.

In 2007, the Authority and FRA released the Notice of Preparation/Notice of Intent to inform the public of the beginning of the preparation of a Draft EIR/EIS for the project section.[2] The Authority and FRA engaged in project scoping, completed a Preliminary Alternatives Analysis Report in 2009, and completed Supplemental Alternatives Analysis Reports in 2010 and 2016. The 2016 Supplemental Alternatives Analysis considered two alternatives: Alternative 1 (formerly called the Dedicated High-Speed Track Alternative) and Alternative 2 (formerly called the Consolidated Shared-Track Alternative), and advanced Alternative 2 (HSR Project Alternative) for analysis in the project Draft EIR/EIS.

In 2017 and 2018, BNSF conducted operational modeling that indicated a need for additional capacity during construction and operation of this project section. Consequently, the Authority added BNSF staging tracks in Lenwood (Lenwood Component) and a Colton Intermodal Facility (Colton Component) in San Bernardino County to the project. In 2020, the Authority initiated revised scoping to include the Lenwood and Colton Components in the project section. Stakeholder feedback received during scoping included substantial opposition to the BNSF Components far outside the project corridor.

In response, the Authority prepared a Supplemental Alternatives Analysis (Authority 2023b) to evaluate a new alternative that would eliminate the need for a BNSF Intermodal Facility in San Bernardino County. The 2023 Supplemental Alternatives Analysis examined three new build alternatives that did not include an Intermodal Facility and proposed advancing the Shared Passenger Track Alternative for further consideration in the EIR/EIS, which closely resembled the 2018 HSR Project Alternative without the Lenwood and Colton Components. Operationally, the Shared Passenger Track Alternative would reduce the peak service level for HSR trains to two trains per hour per direction, and up to 10 freight trains per day could operate on the passenger tracks, eliminating the need for the BNSF Intermodal Facility.

Additional design refinements and outreach occurred, and in May 2024, a Preliminary Impacts Assessment Report further defined elements of the Shared Passenger Track Alternative, such as HSR station options, light maintenance facility (LMF) sites, and grade crossings. The Preliminary Impacts Assessment Report recommended the Shared Passenger Track Alternative be split into two build alternatives, Shared Passenger Track Alternative A and Shared Passenger Track Alternative B, which are similar in all aspects, except for the LMF size and location. Shared Passenger Track Alternative A proposes an LMF at 26th Street in Vernon, and Shared Passenger Track Alternative B proposes an LMF at 15th Street in Los Angeles. In May 2024, the Board identified Shared Passenger Track Alternative A as the Preferred Alternative.

1.3 Project Description Purpose

This project description provides a condensed version of the technical information discussed in Chapter 2, Alternatives, of the Draft EIR/EIS and includes references to other documents for additional details and discussion. The basis of this project description is the Draft Los Angeles to Anaheim Preliminary Engineering for Project Definition document. Chapter 2 of the Draft EIR/EIS

[2] The Notice of Intent was issued in the *Federal Register* on March 15, 2007 (72 Fed. Reg. 12,250).

includes additional details beyond the content discussed herein, including information on the proposed operating plans and scenarios, construction plans, and capital and operating costs.

2 PROJECT DESCRIPTION

The project section is approximately 30 miles long and travels through the cities of Los Angeles, Vernon, Commerce, Bell, Montebello, Pico Rivera, Santa Fe Springs, Norwalk, La Mirada, Buena Park, Fullerton, and Anaheim. The project's alignment would share a portion of the existing LOSSAN Corridor with existing rail operators. The Authority adopted a strategy of sharing the existing corridor and blending HSR with existing rail systems on shared infrastructure (referred to as "blended operations"[3]) to accelerate and broaden benefits, improve efficiency, minimize community impacts, and reduce construction costs.

This section describes the No Project Alternative and Shared Passenger Track Alternatives A and B.

2.1 No Project Alternative

Under the No Project Alternative, the project section would not be built. The No Project Alternative represents the condition of the project section as it currently exists in the base year, and as it would exist without the California HSR System at the planning horizon year of 2040.

In assessing future conditions, it was assumed that all currently known, programmed, and funded improvements to the statewide transportation system (highway, rail, and transit) and reasonably foreseeable local land development projects would be implemented by the year 2040. The No Project Alternative is based on a review of and consultation with several documents and data sources, including, but not limited to, transportation plans such as the 2020 Southern California Association of Governments' Regional Transportation Plan[4]; the Governor's Office of Land Use and Climate Innovation CEQAnet Database; the Federal Aviation Administration's Air Carrier Activity Information System and Airport Improvement Plan grant data; the California State Transportation Commission's State Transportation Improvement Program; airport master plans and interviews with airport officials; intercity passenger rail plans; and city and county general plans and planning officials.

2.2 High-Speed Rail Build Alternatives

The project proposes two build alternatives: Shared Passenger Track Alternative A and Shared Passenger Track Alternative B. Shared Passenger Track Alternative A proposes an LMF at 26th Street, whereas Shared Passenger Track Alternative B proposes an LMF at 15th Street. Both alternatives include an HSR station option in either Norwalk/Santa Fe Springs or Fullerton. The main elements of the build alternatives are summarized in Table 2-1 and depicted on Figure 2-1.

Table 2-1 Summary of Design Features of Shared Passenger Track Alternative A and Shared Passenger Track Alternative B

Feature	Total
Total length (linear miles)	29.7
At-grade profile (linear miles)	23.8
Elevated profile (linear miles)	5
Below-grade/braced trench profile (linear miles)	0.9

[3] California High-Speed Rail Business Plans (California High-Speed Rail 2022 Business Plan) suggest blended railroad systems and operations. These terms refer to integrating the HSR system with existing intercity, and commuter and regional rail systems through coordinated infrastructure (blended systems) and scheduling, ticketing, and other means (blended operations).

[4] The No Project Alternative uses the 2020 Southern California Association of Governments Regional Transportation Plan as the basis for analysis, with the exception of the transportation analysis, which uses the 2016 Regional Transportation Plan as the baseline. This is because of the date and availability of traffic counts collected for the project.

Feature	Total
Number of straddle bents[1]	16
Number of at-grade railroad crossings[2]	8
Number of major water crossings[3]	9
Number of roadway overcrossings and undercrossings	58

[1] A straddle bent is a pier structure that spans (or "straddles") the functional/operational limit of a roadway, highway, or railway.
[2] Railroad crossing means a railroad crossing another railroad.
[3] Features considered major water crossings are Los Angeles River, Rio Hondo (and basins), San Gabriel River, North Fork Coyote Creek, La Mirada Creek, Coyote Creek, Brea Creek, Fullerton Creek, and Carbon Creek.



Source: Authority 2025

Figure 2-1 Los Angeles to Anaheim Project Section Alignment

Currently, two to three mainline tracks occur throughout the corridor, with a variable number of freight siding tracks. The HSR project seeks to maintain existing operations in the corridor while minimizing impacts outside of the existing right-of-way. To accomplish this, the HSR project would add one new mainline track from LAUS to Fullerton Junction and would use existing tracks, where possible, to ensure that, overall, the project section includes two electrified tracks along the corridor for HSR, which would be shared with other passenger rail operators. These two electrified tracks are referred to herein as *shared tracks*. The specific details of Shared Passenger Track Alternative A and Shared Passenger Track Alternative B are discussed further below.

2.2.1 Shared Passenger Track Alternative A

2.2.1.1 Alignment

Table 2-2 summarizes the alignment of Shared Passenger Track Alternative A through the corridor cities. Figure 2-2 depicts the northern project section limit and its relationship with Los Angeles County Metropolitan Transportation Authority's proposed Link Union Station Project. Figure 2-3 through Figure 2-8, as referenced therein, provide cross-sections of various points along the project alignment discussed in Table 2-2. Where applicable, Table 2-2 also provides references to later sections of this project description that provide further details of other project components including, but not limited to, ancillary facilities, HSR and passenger rail stations, and the LMFs.

Table 2-2 Shared Passenger Track Alternative A Alignment

Project Section Segment	Segment Alignment Description
Los Angeles and Vernon	▪ The project section would begin immediately south of LAUS, at the northern edge of US 101, where a viaduct built as part of the Link US Project would begin. The installation of the OCS north of US 101 was previously approved as part of the Burbank to Los Angeles Project Section in January 2022. From US 101 to 1st St, the Authority would build the OCS for HSR. At 1st St, Shared Passenger Track Alternative A would include the HSR project tracks and all other project infrastructure south to ARTIC. ▪ Starting at the LAUS platforms, HSR trains would run on tracks built as part of Link US, cross over US 101, Commercial St, and Ducommun St on a viaduct, and come down to grade just before 1st St, joining the existing railroad right-of-way. From this tie-in point south, the HSR trains would use the existing tracks, which would be upgraded with an OCS. Refer to Figure 2-3 for a cross section of the track between 1st St and 4th St. ▪ Between 7th St and I-10, two HSR layover tracks would be added west of the shared tracks; refer to Section 2.2.1.2, Ancillary Facilities, for more information. The shared tracks would cross under the Olympic Blvd roadway overcrossing and rise onto an existing railroad bridge to cross over Washington Blvd and the Los Angeles River. The shared tracks would return to at grade east of Soto St and enter Vernon. ▪ The BNSF and shared tracks would pass by the BNSF Los Angeles Intermodal Facility (referred to as Hobart Yard). The proposed 26th St LMF would be south of Hobart Yard and is described in more detail in Section 2.2.1.4, Light Maintenance Facility.
Commerce, Bell, Montebello, and Pico Rivera	▪ East of Hobart Yard, the tracks would cross at grade under I-710 and enter Commerce. Starting from west of Eastern Ave, the shared tracks would rise onto a new elevated structure, referred to as the *Commerce Flyover*; refer to Section 2.2.1.5, Freight or Passenger Railroad Modifications, and Figure 2-4 for more information on the Commerce Flyover, which is designed to pass by the BNSF Commerce Intermodal Facility (referred to as *Commerce Yard*). ▪ The Commerce Flyover would cross over Eastern Ave and pass by the existing Commerce Metrolink Station. The elevated shared tracks would not connect with the Commerce Metrolink Station's existing location, which would be relocated. Refer to Section 2.2.1.5 for more information on the Commerce Metrolink Station's relocation. The elevated tracks would return to grade before I-5 and would remain so throughout Montebello and Pico Rivera.

Project Section Segment	Segment Alignment Description
Santa Fe Springs and Norwalk	▪ The tracks would continue east into Santa Fe Springs and cross over Pioneer Blvd, Norwalk Blvd, and Los Nietos Rd. All of these would be new grade separations, with the roadway lowered and tracks crossing over on new railroad bridges; refer to Section 2.2.1.6, State Highway or Local Roadway Modifications. ▪ From Slauson Ave to Telegraph Ave, the track configuration would remain at grade with four tracks, as depicted on Figure 2-5. ▪ South of Telegraph Rd, the shared tracks would diverge outside of the existing railroad right-of-way and rise onto retained fill to cross over Florence Ave on a new bridge, while three BNSF mainline tracks would cross Florence Ave on the existing railroad bridge. The shared tracks would transition from retained fill onto an elevated structure that crosses over Lakeland Rd, while the BNSF tracks would remain at grade in their current configuration throughout this segment. The elevated structure would continue south and transition from the west side of the corridor over to the east side. Figure 2-6 depicts the track configuration south of Lakeland Rd. ▪ The elevated structure would veer east out of the existing railroad corridor and cross over Imperial Hwy, necessitating modifications to the existing Norwalk/Santa Fe Springs Metrolink Station, described in Section 2.2.1.3, High-Speed Rail Station Facilities, in more detail. Under Shared Passenger Track Alternative A, HSR trains would not stop at the Norwalk/Santa Fe Springs Metrolink Station. ▪ South of the station, the elevated structure would rejoin the existing railroad corridor and transition back down to at grade just west of Carmenita Rd.
La Mirada and Buena Park	▪ The tracks would continue at grade through La Mirada and Buena Park. In Buena Park, the track design would conflict with the location of the existing Buena Park Metrolink Station platform, necessitating the station's relocation (refer to Section 2.2.1.5 for more information).
Fullerton	▪ East of Dale St, the tracks would enter Fullerton. The Fullerton Municipal Airport is south of the railroad corridor, and the shared tracks would require lowering as they pass by the airport to prevent the HSR project, including the OCS, trains, and all other project components, from conflicting with the airport runway protection zone. The shared tracks on the north side of the corridor would also need to transition to the south side in order to serve the existing Fullerton Metrolink/Amtrak Station farther south. ▪ The shared tracks would transition underneath the BNSF tracks via a short below-grade section, in a braced trench. The trench would start approximately 850 feet east of Dale St and, approaching the eastern end of the Fullerton Airport, would cross under the BNSF tracks to the south side of the corridor, continuing adjacent to the existing BNSF tracks (which would remain at grade). Refer to Figure 2-7 for a cross section of the shared tracks in the trench after they transition to the south side of the corridor. ▪ The shared tracks would return to grade just before Gilbert St. Continuing east, a fourth track would be added to the south side of the corridor at the Fullerton Metrolink/Amtrak Station, which would require modifications, described in more detail in Section 2.2.1.3. Under Shared Passenger Track Alternative A, HSR trains would not stop at the Fullerton Metrolink/Amtrak Station. ▪ East of the station at Fullerton Junction, the three tracks along the north side of the corridor would be dedicated to BNSF trains and would continue east through Fullerton Junction. The tracks along the south side of the corridor would be dedicated to passenger trains and travel south to ARTIC.

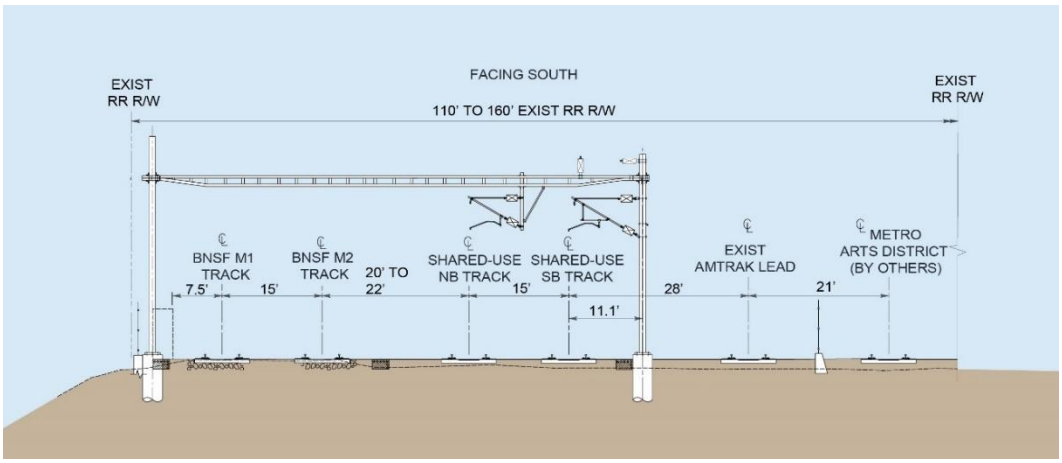
Project Section Segment	Segment Alignment Description
Anaheim	▪ South of Fullerton Junction, the tracks would enter Anaheim. From Fullerton Junction to ARTIC, the two existing tracks would be electrified to allow for shared operations with Metrolink. Several freight trains per day currently run on the existing tracks and would retain operation rights in the future. The two shared tracks would remain at grade through the rest of Anaheim. ▪ The existing at-grade crossings at Orangethorpe Ave, La Palma Ave, Sycamore St, Broadway St, Santa Ana St, South St, Vermont Ave, and Ball Rd would be maintained. Refer to Figure 2-8 for the cross section that is representative of the two-track configuration throughout this segment. ▪ From south of Ball Rd to south of Cerritos Ave, two HSR layover tracks would be added along the west side of the corridor. Cerritos Avenue and State College Blvd would be grade separated, with the roadways lowered and the tracks crossing over the road on new railroad bridges. ▪ The tracks would end at ARTIC, where HSR platforms and station facilities would be added to the existing station, described in more detail in Section 2.2.1.3.

ARTIC = Anaheim Regional Transportation Intermodal Center; Authority = California High-Speed Rail Authority; BNSF = BNSF Railway; HSR = high-speed rail; I = interstate; LAUS = Los Angeles Union Station; Link US = Link Union Station; OCS = overhead contact system; project section = Los Angeles to Anaheim Project Section; US 101 = U.S. Highway 101



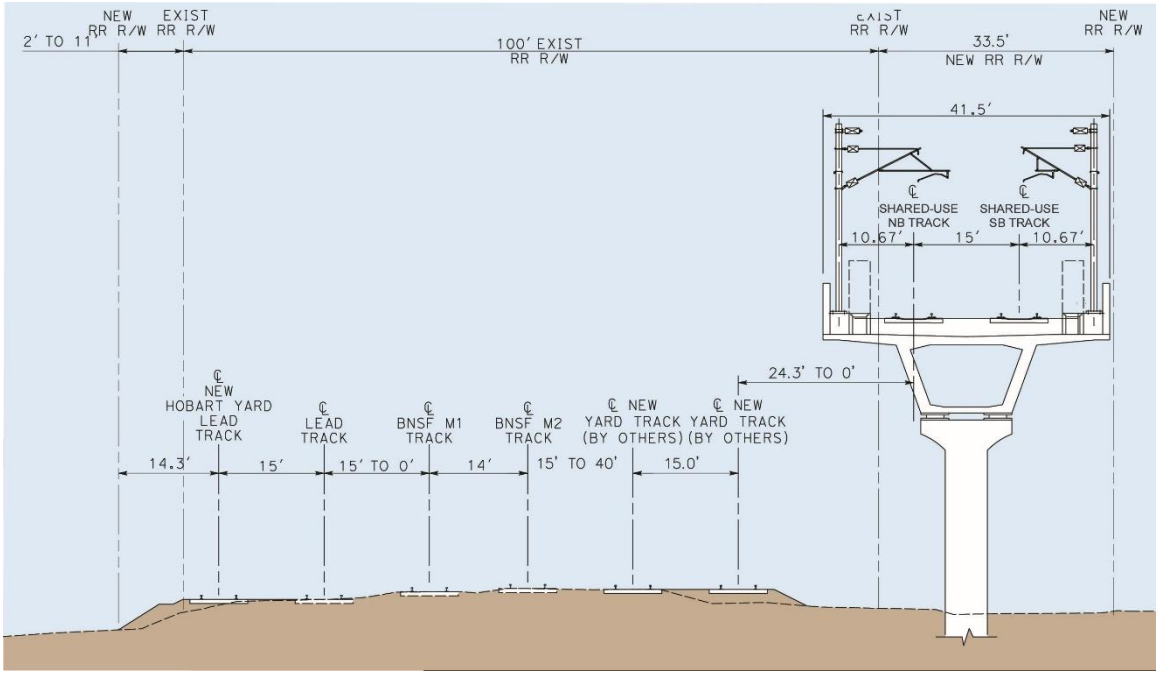
Source: Authority 2025
Link US = Link Union Station; Metro = Los Angeles County Metropolitan Transportation Authority; OCS = overhead contact system

Figure 2-2 High-Speed Rail and Link Union Station Project



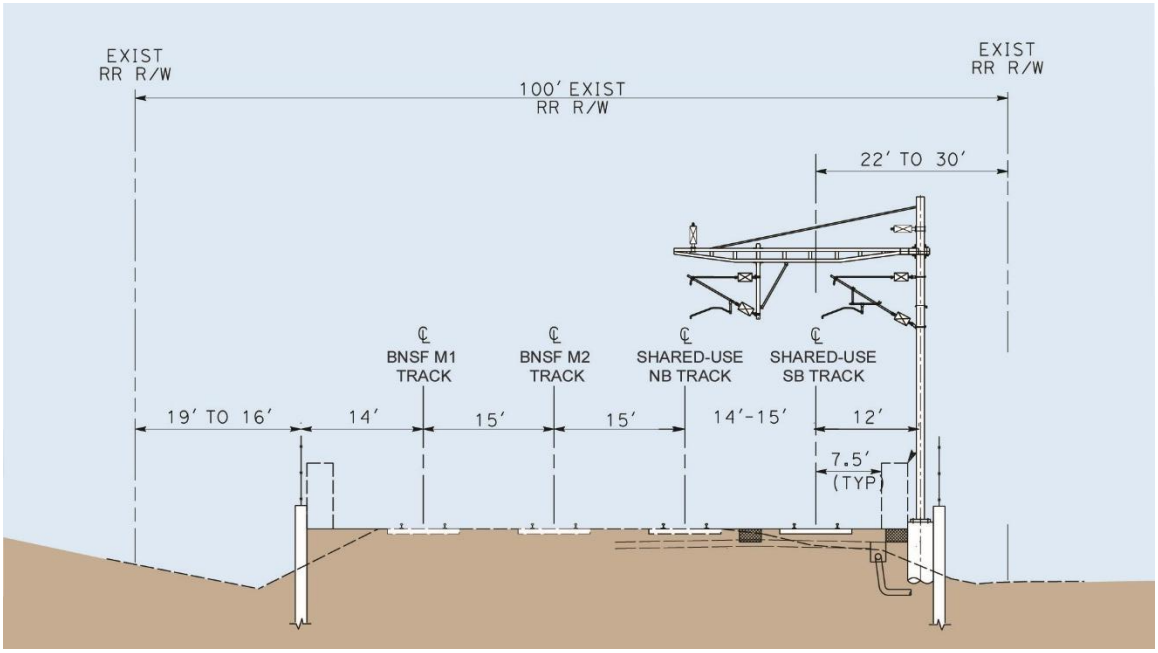
Source: Authority 2025
M = main track; RR = railroad; R/W = right-of-way; NB = northbound; SB = southbound

Figure 2-3 At-Grade Cross Section between 1st Street and 4th Street



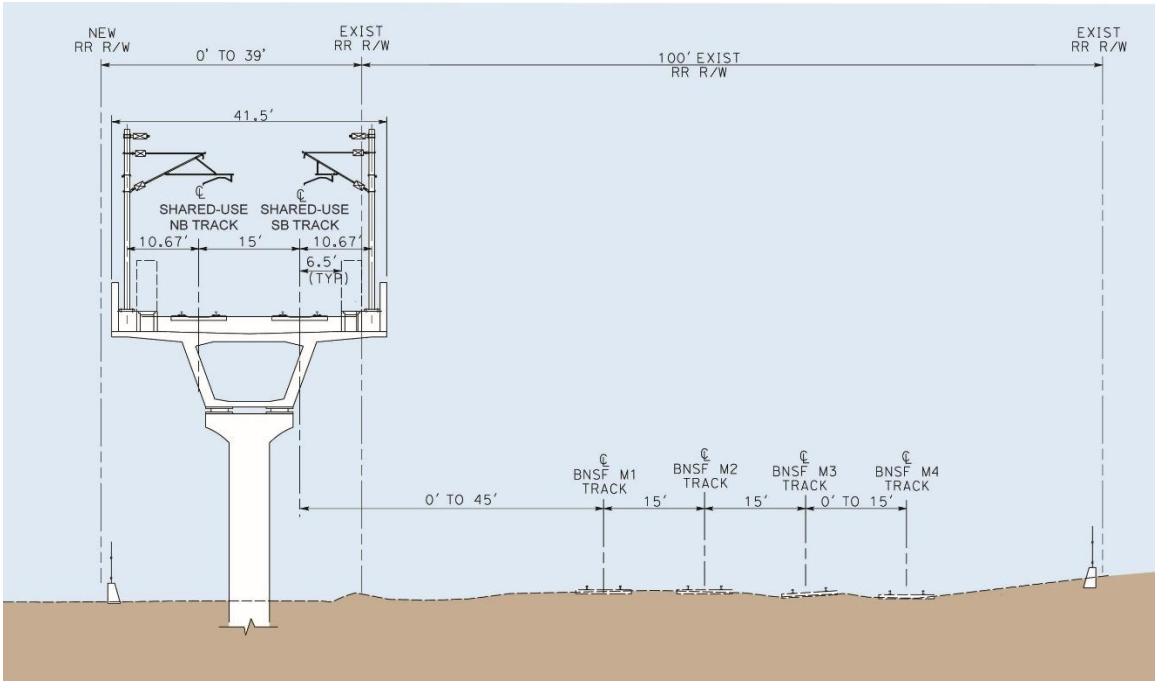
Source: Authority 2025
M = main track; RR = railroad; R/W = right-of-way; NB = northbound; SB = southbound

Figure 2-4 Elevated Cross Section between Atlantic Boulevard and Eastern Avenue (Commerce Flyover)



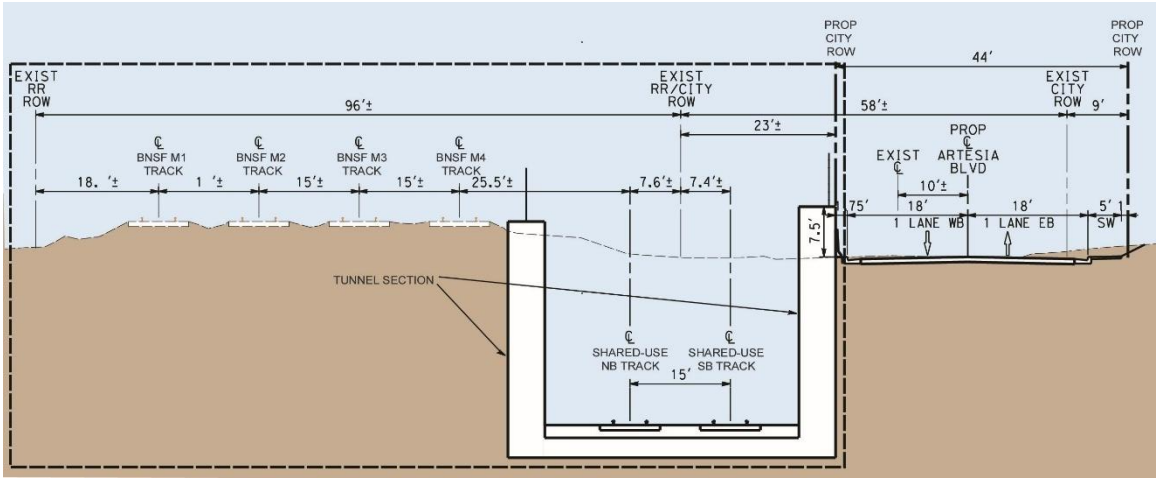
Source: Authority 2025
M = main track; RR = railroad; R/W = right-of-way; NB = northbound; SB = southbound

Figure 2-5 At-Grade Cross Section from Slauson Avenue to Telegraph Road



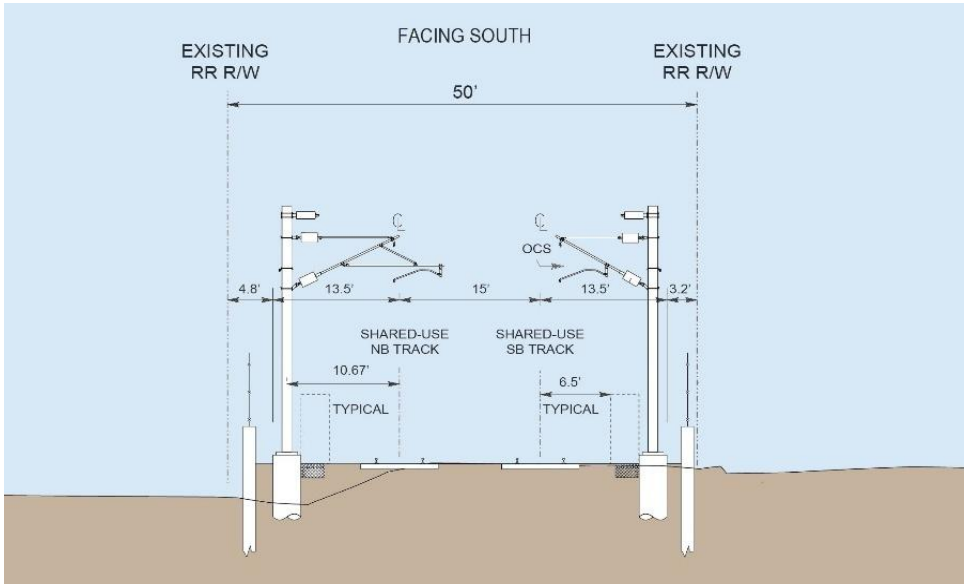
Source: Authority 2025
M = main track; RR = railroad; R/W = right-of-way; NB = northbound; SB = southbound

Figure 2-6 Elevated Cross Section South of Lakeland Road



Source: Authority 2025
Figure not to scale
M = main track; OCS = overhead contact system; RR R/W = railroad right-of-way

Figure 2-7 Braced Trench Cross Section East of Fullerton Airport



Source: Authority 2025
OCS = overhead contact system; RR = railroad; R/W = right-of-way; NB = northbound; SB = southbound

Figure 2-8 At-Grade Cross Section between La Palma Avenue and Ball Road

2.2.1.2 Ancillary Facilities

Systems Facilities

HSR trains would draw power from California's existing electricity grid, with power distributed to the trains via the overhead contact system (OCS). The project would not include construction of a separate power source; rather, the existing grid would supply power to the OCS through the extension of underground or overhead transmission lines to a series of power substations positioned along the railroad corridor. The transformation and distribution of electricity would occur through the following three types of stations:

- Traction power substations (TPSS), which would transform high-voltage electricity supplied by public utilities to the train operating voltage. The project section would include two TPSS sites (Los Angeles and Anaheim), which would both be adjacent to existing utility transmission lines and outside of the existing right-of-way. The TPSS sites would be spaced apart by approximately 30 miles along the project alignment and each include an approximately 450-square-foot control room and two 115/50-kilovolt or 230/50-kilovolt, single-phase transformers that would both be rated at 60 megavolt-amperes. The foregoing components would be installed within an approximately 32,000-square-foot area, and screening of each TPSS would be provided by a wall or fence.
- A switching station to connect and balance the electrical load between tracks and switch OCS power on or off in the event of a power outage or emergency. A switching station would be installed in Santa Fe Springs, generally midway between the two TPSS sites, approximately 15 miles from the nearest TPSS and 0.1 mile northeast of the project alignment. Installation of the station's equipment would require approximately 9,600 square feet.
- Paralleling stations, or autotransformer stations, to provide voltage stabilization and equalize current flow. Two paralleling stations would be installed along the project alignment, with one each along the segments between the Santa Fe Springs switching station and the Los Angeles and Anaheim TPSS sites. Each paralleling station would be adjacent to the HSR right-of-way, include an approximately 450-square-foot control room, and require approximately 8,000 square feet.

Table 2-3 provides the locations of the proposed TPSSs, switching station, and paralleling stations.

Table 2-3 Traction Power, Paralleling, and Switching Station Locations

Traction Power Station Type	Location
Traction power substation (two sites)	**City of Los Angeles:** South of Washington Blvd, and west of Soto St, adjacent to the existing railroad viaduct **City of Anaheim:** On the northeast corner of Lewis St and Cerritos Ave, southwest of the HSR tracks
Paralleling station (two sites)	**City of Montebello:** Southwest corner of Maple Ave and Sycamore St, south of the HSR tracks (co-located with the relocated Commerce Metrolink Station) **City of Fullerton:** Northwest corner of Dale St and Artesia Ave, south of the HSR tracks
Switching station	**City of Santa Fe Springs:** Northeast corner of Los Nietos Rd and Santa Fe Springs Rd, north of BNSF Railway tracks

Source: Authority 2025
HSR = high-speed rail

Signaling and Train-Control Elements

The National Transportation Safety Board, FRA, and other agencies mandate Positive Train Control, a train safety system designed to automatically implement safety protocols and provide communication with other trains to reduce the risk of a potential collision. Because of the lower operating speed of HSR trains in this project section compared to other HSR project sections, this project section would operate using conventional Positive Train Control signaling rather than a specialized HSR signaling system. This project section would use a radio-based communications network, including a fiber optic backbone and communications towers approximately every 2 to 3 miles, depending on the terrain and selected radio frequency. The towers would be in the HSR corridor in a fenced area of approximately 20 feet by 15 feet, including a 10- by 8-foot communications shelter and a 6- to 8-foot diameter, 100-foot-tall communications pole. These

communications facilities could be co-located within the TPSSs. Where communications towers cannot be located with TPSSs or other HSR facilities, they would be within or near the HSR corridor in an approximately 20- by 15-foot fenced area.

Layover Tracks

Layover tracks are used to store and restock trains during the day, in between service runs, and to store trains at night at terminus stations when they are not in service. Layover tracks are required where high-speed trains would end their runs, near LAUS and ARTIC, to support layover functions such as overnight storage, draining of waste tanks, filling of potable water tanks, and cleaning of windows, among others, as well as daily scheduled interior cleaning of passenger areas that would occur prior to the train entering revenue service. The Los Angeles layover tracks would be between Seventh Street and Interstate (I-) 10, and could be accessed for cleaning activities through the Amtrak Eighth Street Yard. The Anaheim layover tracks would be from south of Ball Road to south of Cerritos Avenue, and would have a layover support facility at the northeast corner of Lewis Street and Cerritos Avenue.

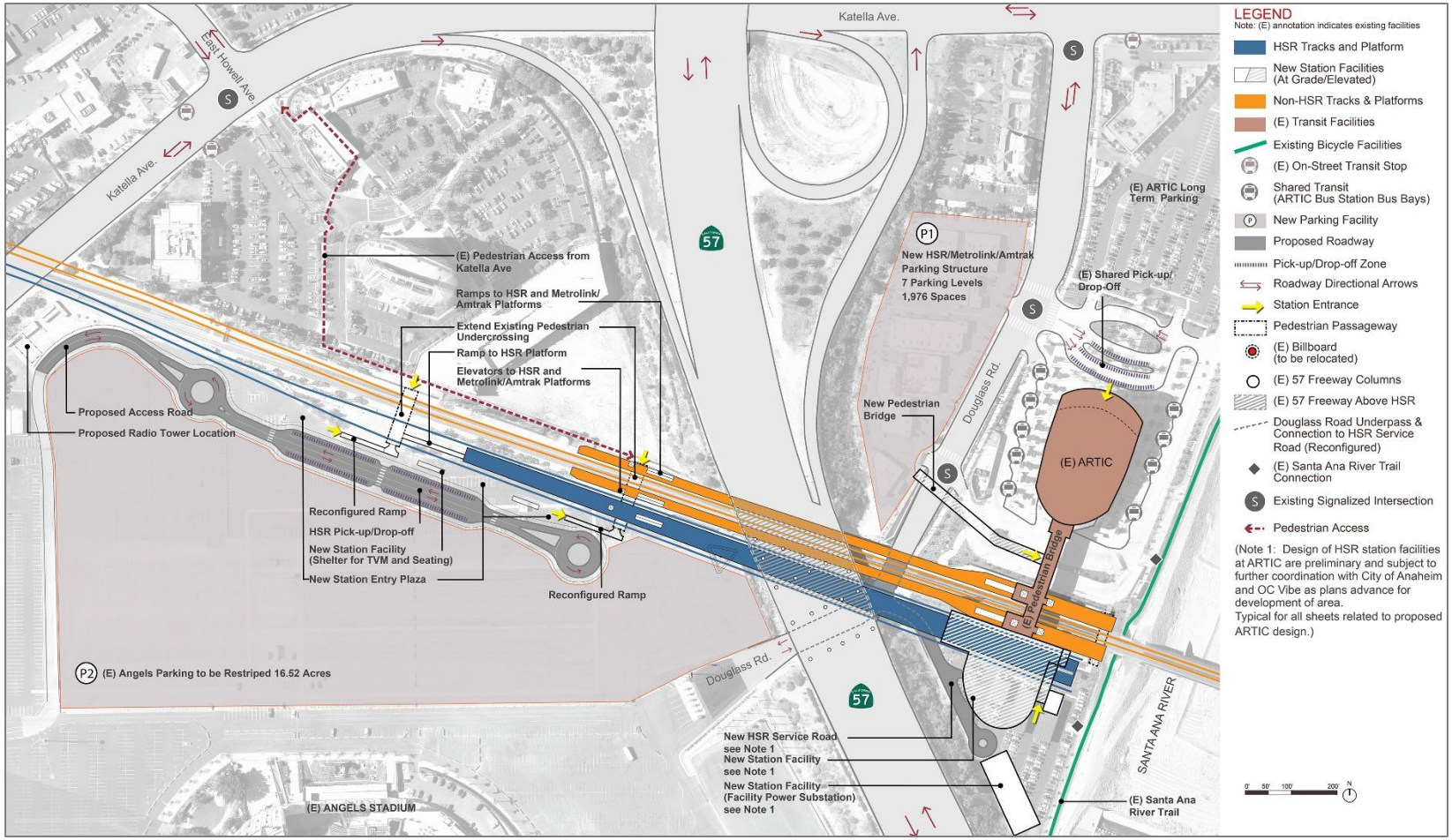
2.2.1.3 High-Speed Rail Station Facilities

Because the project section is within an existing corridor with passenger rail service, Shared Passenger Track Alternative A does not propose new HSR stations but rather modifies existing passenger rail stations to allow for shared operations with HSR. Shared Passenger Track Alternative A would include an HSR station platform and facilities at ARTIC, described below.

ARTIC High-Speed Rail Platform and Station Facilities

The proposed HSR platform and station facilities at the existing ARTIC station would be at grade, with two new HSR tracks and a single 1,410-foot center platform for HSR, south of and parallel to the existing Metrolink/Amtrak tracks and platforms. The HSR platform would be accessed through an extension of ARTIC's existing pedestrian bridge from the northeast and through an extension of two existing pedestrian tunnels on the western end of the existing ARTIC platforms. The Authority would work with the City of Anaheim, as the ARTIC passenger terminal owner, to share the passenger amenities inside ARTIC in the near term. Once ridership increases enough that combined HSR and local-provider passenger volumes exceed the design capacity of the ARTIC passenger terminal building, the Authority would build a separate HSR passenger terminal. This new HSR station building, included within the project footprint and depicted on Figure 2-9, would be at the southern end of the pedestrian bridge, along with a facility power substation to provide electricity to the building. The existing Metrolink/Amtrak parking lot north of Angel Stadium would be reconfigured into a pick-up/drop-off area and connected to the existing access road from Katella Avenue. The project would maintain the two existing access points between the Santa Ana River Trail and ARTIC. Radio towers would be built adjacent to the access road at Katella Avenue.

This project would include a new parking structure adjacent to State Route 57 and Katella Avenue, providing 1,350 HSR parking spaces and 626 replacement parking spaces to account for existing parking spaces at ARTIC that would be displaced by the HSR tracks and platform, for a total of 1,976 parking spaces. Figure 2-9 provides an illustration of the HSR platform and station facilities at ARTIC.



Source: Authority 2025

Figure 2-9 High-Speed Rail Platform and Facilities at ARTIC

2.2.1.4 Light Maintenance Facility

HSR operations in Southern California would require a Level III[5] LMF for fleet storage, cleaning, repair, overnight layover accommodations, and servicing facilities, including the necessary water cistern and power facilities. The 26th Street LMF is designed to follow the Authority's *Requirements for High-Speed Trainset Fleet and Infrastructure Maintenance Facilities Technical Memorandum* (Authority 2024).

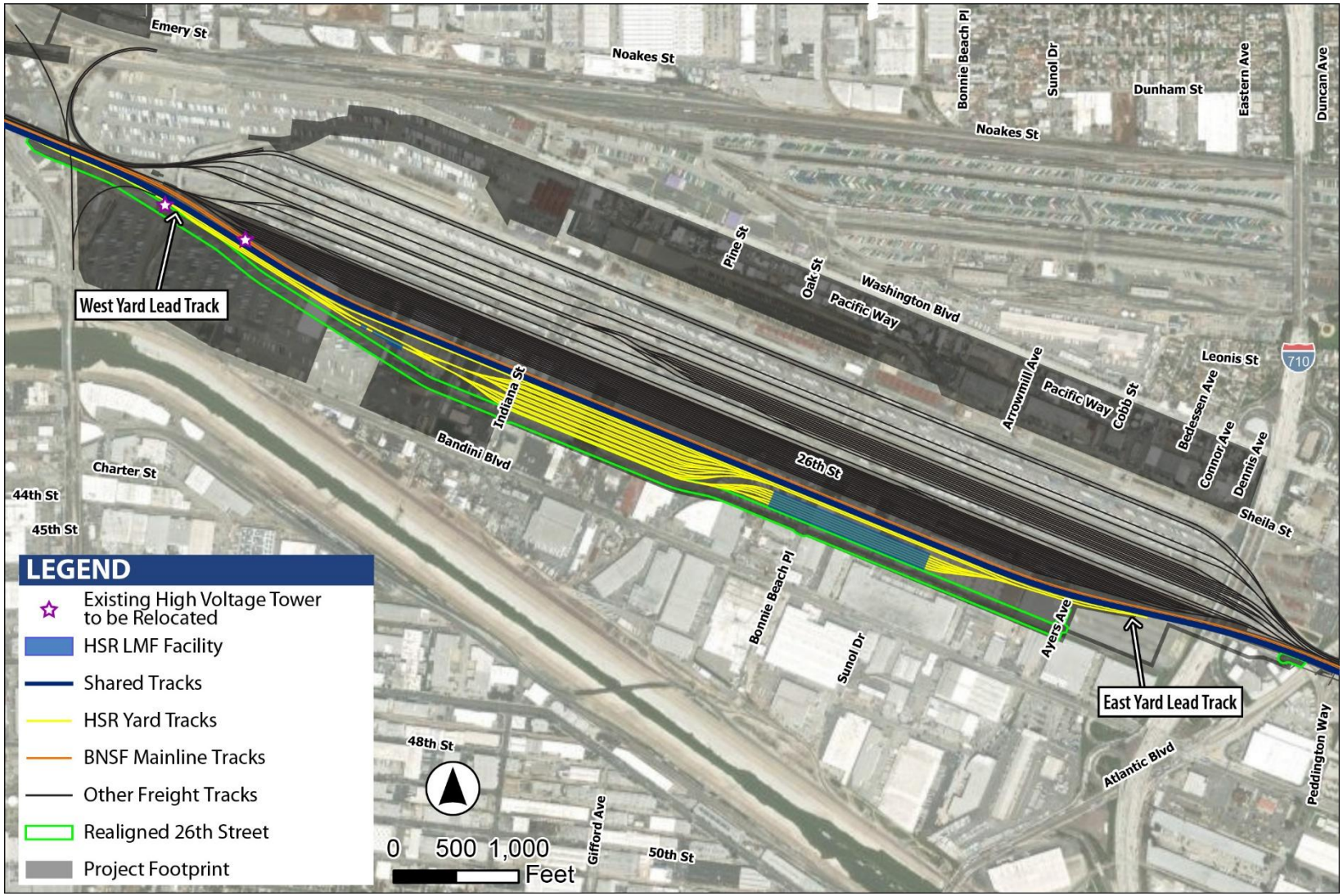
Refer to Figure 2-10 for an overview of the 26th Street LMF, which would have an overall size of 50 acres and be roughly bounded by the realigned mainline tracks on the north, a relocated 26th Street on the south, Downey Road on the west, and I-710 on the east. The changes on the south side of Hobart Yard would require 26th Street to be realigned, which would provide access to the LMF. Two high-voltage utility towers would be relocated to accommodate the 26th Street realignment. Refer to Section 2.2.1.5 for more details on changes adjacent to Hobart Yard.

The LMF would be double-ended, with all tracks having access from the mainline on both the eastern and western sides. HSR trains would access the LMF from the east and west on two new yard lead tracks, which would be south of the mainline tracks. Within the 26th Street LMF, there would be an outdoor train yard with 12 yard tracks to allow for the storage of 24 single trainsets, along with a 1,345-foot-long, six-track shop building, which could accommodate 12 trainsets. The internal LMF access roads would be wide enough to accommodate service vehicles, consolidate commissary functions, and provide more clearance from the OCS poles to the yard tracks.

2.2.1.5 Freight or Passenger Railroad Modifications

Shared Passenger Track Alternative A would modify the existing rail corridor to create a corridor that is primarily four mainline tracks (two electrified and shared with other passenger rail operators) from Los Angeles to Fullerton, and two mainline tracks (electrified and shared with both passenger rail and freight operators) from Fullerton to Anaheim. Freight rail would operate primarily on the nonelectrified tracks, although the electrified tracks could accommodate freight traffic if necessary (up to 10 BNSF freight trains per day would be able to use the two passenger rail tracks), while maintaining service and operation levels for all operators within the corridor. The following sections describe the freight and passenger railroad modifications in more detail, which include modifications to BNSF storage and intermodal facilities as well as modifications to and relocations of existing passenger rail stations.

[5] The Authority defines three levels of maintenance to be conducted at an LMF.



Source: Authority 2025

Figure 2-10 Shared Passenger Track Alternative A: 26th Street Light Maintenance Facility

BNSF Railway Storage and Intermodal Facilities

Adding and electrifying tracks in the existing right-of-way would require the Authority to remove or modify track and right-of-way that is currently used or planned for future use by BNSF for train storage and intermodal operations. This requires modifications to BNSF's plans for expansion at its yards in Vernon and Commerce. In several locations, Shared Passenger Track Alternative A would require removal/relocation of existing BNSF infrastructure. Thus, Shared Passenger Track Alternative A would replace the affected BNSF infrastructure, primarily adjacent to Hobart Yard, to maintain BNSF capacity and avoid disruptions to operations.

Table 2-4 lists the BNSF storage capacity that would be removed from the corridor and relocated to the new consolidated storage yard adjacent to Hobart Yard; refer to Figure 2-11 for an overview of the relocated infrastructure. The new storage yard would provide 101,094 track feet of storage, including 5,850 track feet for a new runaround track,[6] which is slightly more than the amount removed from the corridor (90,940 track feet). This is a result of the layout and overall length of the new consolidated yard. The tracks need to be operational while fitting within the new yard space and maintaining the removed storage capacity, and therefore some replacement tracks would be longer than the ones that are being removed from the corridor. In addition to the relocations described in Table 2-4, some BNSF yard lead and storage tracks throughout the corridor would be relocated and replaced within the same area, with the same level of storage capacity and operational functionality maintained. This includes the Pico Rivera Yard north and south lead tracks, La Mirada Yard lead track and storage track, and Fullerton storage track on the southern side between Commonwealth Avenue and Highland Avenue.

Table 2-4 BNSF Railway Facility or Track to Be Removed or Modified

HSR Project Element Affecting BNSF Infrastructure	BNSF Facility/Track to Be Removed/Relocated/Modified	Length of Removed/ Relocated Tracks (TF)
HSR mainline and layover tracks	BNSF 8th St Yard (BNSF storage tracks between 1st St and I-10 along West Bank)	35,000
Relocated Commerce Metrolink Station	South Vail Support Track (between Vail St and Minson Wy)	3,800
4th mainline track	Pico Rivera Storage Tracks	4,000
4th mainline track	Norwalk Support Track (between Telegraph Rd and Florence Ave)	4,400
4th mainline track	Santa Fe Springs Staging Track (through existing Norwalk/Santa Fe Springs Metrolink Station area)	14,600
Fullerton braced trench	Buena Park/Fullerton Storage Tracks (on north side between Dale St and Gilbert St)	15,840
4th mainline track	Fullerton support track (north of Fullerton Amtrak/Metrolink Station)	4,500
4th mainline track	Fullerton storage track (on north side between Commonwealth Ave and Highland Ave)	8,800
Total		**90,940**

Source: STV 2025

[6] Runaround tracks allow a locomotive to move around the train and attach to the opposite end, enabling the train to be switched or moved in the desired direction. The runaround track must be as long as the longest set of cars that would be pulled. A runaround track is generally recommended for all modern rail yards to reduce overall freight congestion.

BNSF = BNSF Railway; HSR = high-speed rail; I = interstate; TF = track feet



Source: STV 2025

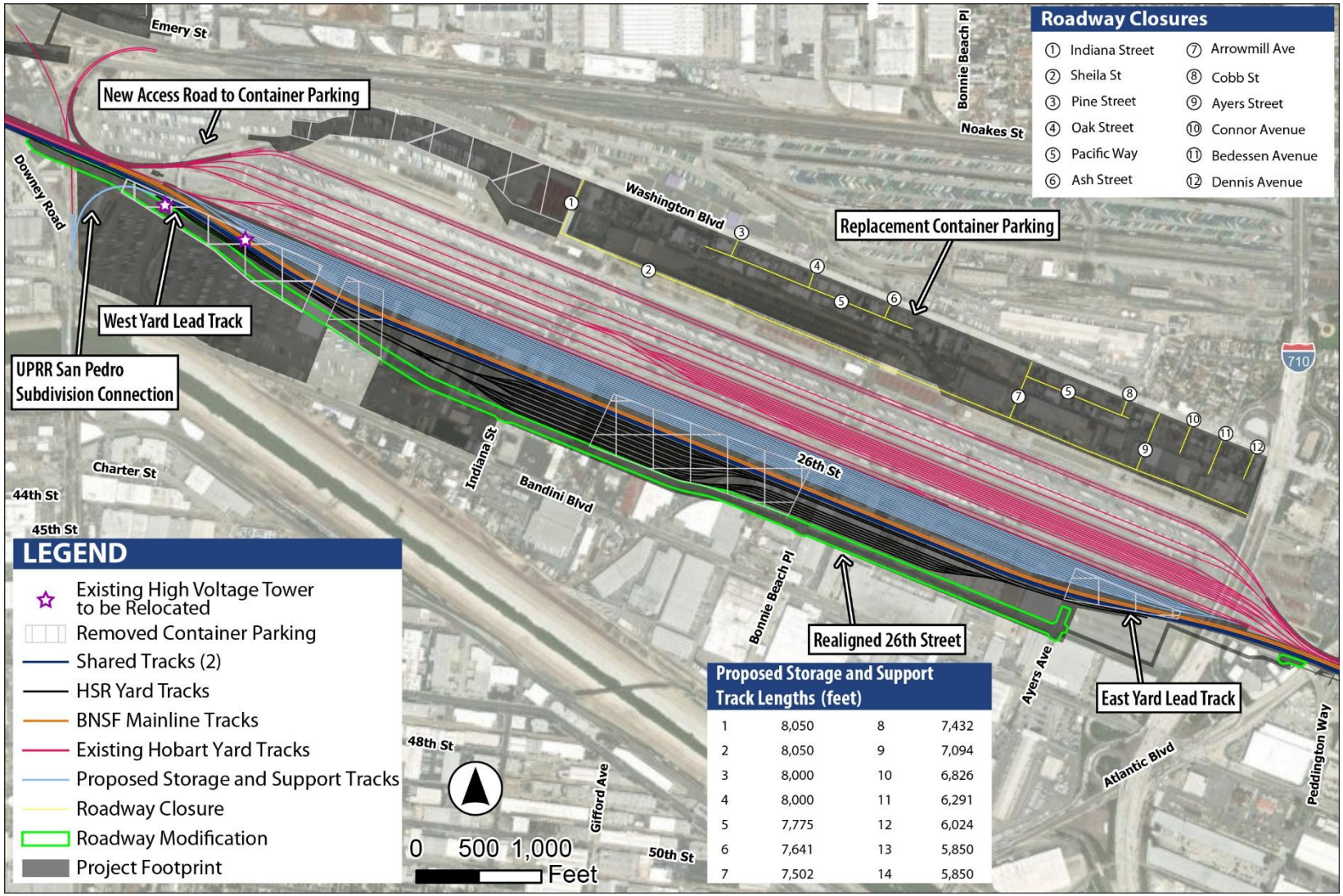
Figure 2-11 BNSF Railway Infrastructure Affected by the Los Angeles to Anaheim Project Section

BNSF Railway Los Angeles Intermodal Facility (Hobart Yard)

Figure 2-12 depicts the proposed changes at Hobart Yard. The consolidated storage yard, BNSF mainline tracks, shared tracks, and new connection to the UPRR San Pedro Subdivision would be up to 250 feet south of the current southern limit at Hobart Yard and into properties south of 26th Street. New second lead tracks into Hobart Yard from the west and east would also be added. These additional lead tracks would allow freight trains to move off the mainline tracks at speed and avoid delays and backups in an already heavily congested corridor. These track changes would require the vacation and realignment of the 26th Street right-of-way from Downey Road to Atlantic Boulevard.

The changes described above, along with LMF yard lead tracks, would displace some existing BNSF container parking south of the railroad corridor. This container parking would be replaced by acquiring properties north of Hobart Yard along the south side of Washington Boulevard, which would require a new access road north of Hobart Yard and the closure of several roads between Washington Boulevard and Sheila Street (refer to Section 2.2.1.6, State Highway or Local Roadway Modifications, for more details on roadway changes related to Hobart Yard). The new access road would also displace some existing container parking that would be replaced in the new container parking area.

Additionally, two high-voltage utility towers would be relocated to accommodate the 26th Street realignment.



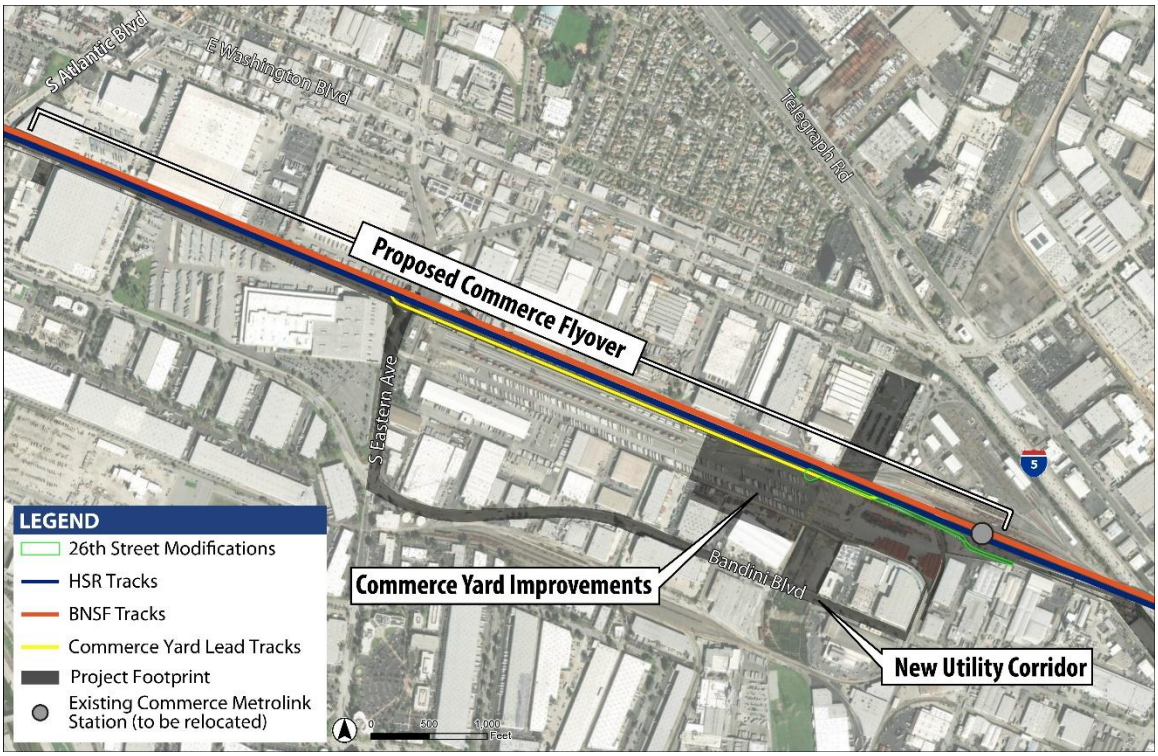
Sources: Authority 2025; ESRI 2020

Figure 2-12 Hobart Yard Modifications (Shared Passenger Track Alternative A)

BNSF Railway Commerce Intermodal Facility (Commerce Yard)

Adjacent to Commerce Yard, the Commerce Flyover would separate passenger trains on an elevated structure from the freight trains running at grade. Figure 2-13 depicts the modifications required throughout the Commerce Yard area to maintain operations. Two new BNSF yard tracks would be added, converging into a new BNSF stub lead track west of I-5, with additional connector tracks. Improvements would include reconstructing several of the lead tracks, relocating the truck entrance gates and internal access road, and adding truck storage parking and a switching tail track. These yard improvements would require a portion of 26th Street to be closed; 26th Street currently provides access to the yard from the east, but the new entrance to the yard would require approximately 1,300 feet of the road to be closed.

Existing utilities along the south side of the railroad corridor would be relocated to the south in a new utility corridor, within Bandini Boulevard. Additionally, the high-voltage power lines currently running south of and parallel to the railroad corridor must be raised to provide the required clearance from the Commerce Flyover structure.



Sources: Authority 2025; ESRI 2020

Figure 2-13 Commerce Flyover and Commerce Yard Modifications

Modified Metrolink Stations

Norwalk/Santa Fe Springs Metrolink Station Modifications

HSR trains would not stop at the Norwalk/Santa Fe Springs Metrolink Station, but modifications would be required for HSR operations, as depicted on Figure 2-14. The existing platforms at Norwalk/Santa Fe Springs Metrolink Station are in an area that would not be able to accommodate an additional mainline track and shared operations between HSR and Metrolink. Adding the additional mainline track would require shifting the existing platforms to an area with a straight section of track. Therefore, the Metrolink platforms would be moved to be served by the shared tracks on the new elevated structure, approximately 350 feet east of the existing alignment (at their farthest points). The modified station would be elevated, with two 680-foot side

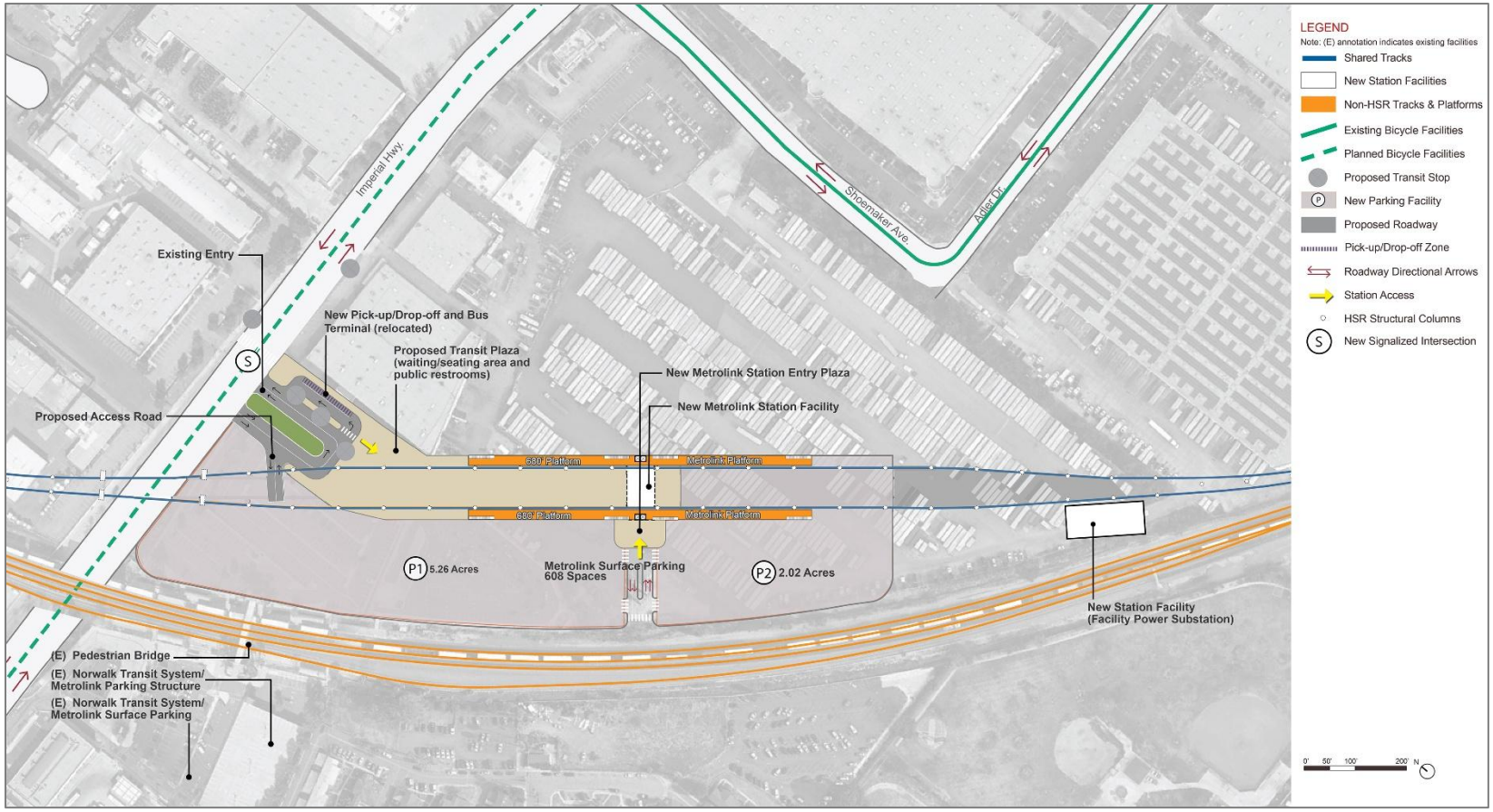
platforms, capable of future extension to 1,000 feet; the space for the future extension is included within the project footprint.

The existing Metrolink parking and bus drop-off west of the railroad corridor would be relocated to the east of the elevated structure to provide better access to the modified Metrolink platforms. Station entry points would be on Imperial Highway to the north and at Shoemaker Avenue and Adler Drive to the east and would require new access roadways. On Imperial Highway, the signalization leading into the parking garage would require modifications, as required by the City of Norwalk. The project would provide 608 surface parking spaces west of the modified platforms to replace the parking spaces at the existing Norwalk/Santa Fe Springs Metrolink Station displaced by the HSR modifications. Parking and pick-up/drop-off for Metrolink passengers would be within surface parking lots.

Fullerton Metrolink/Amtrak Station Modifications

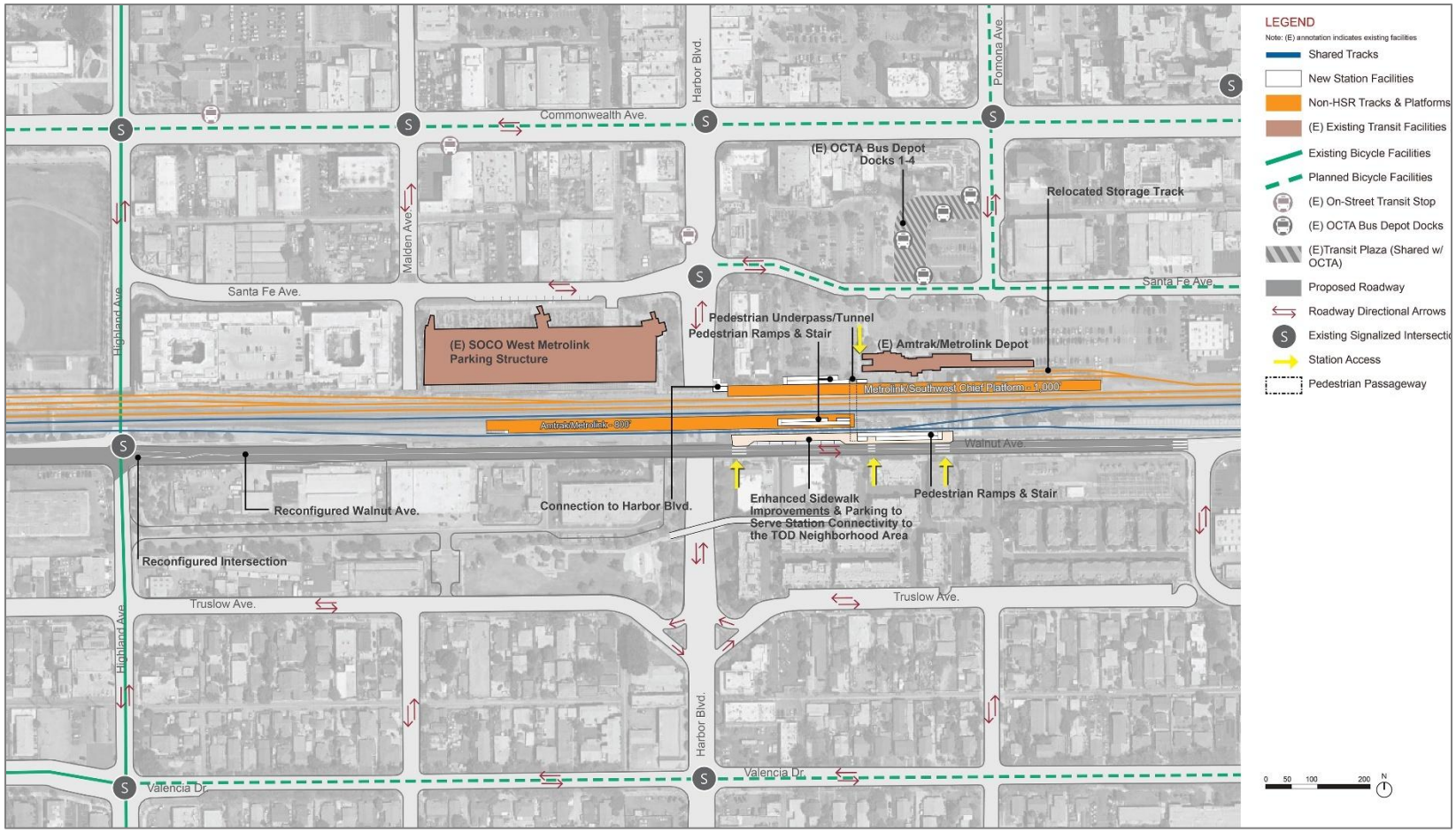
HSR trains would not stop at the Fullerton Metrolink/Amtrak Station, but modifications would be required for HSR operations, as depicted on Figure 2-15. At the Fullerton Metrolink/Amtrak Station, a fourth mainline track would need to be added on the southern side of the corridor, outside of the existing railroad right-of-way, to allow HSR trains to pass through the station. A new railroad bridge would be built over Highland Avenue to accommodate the new shared track, which requires Walnut Avenue to be slightly realigned to the south, and the intersection of Walnut Avenue and Highland Avenue would need to be redesigned.

Several modifications would occur for the Metrolink/Amtrak station platforms. The two existing platforms on the southern side would be removed, and a new 800-foot center platform would be added over Harbor Boulevard. The existing pedestrian bridge east of Harbor Boulevard that connects the two side platforms would be removed and replaced by a new pedestrian underpass that connects the existing northern platform, new center platform, and Walnut Avenue to the south, with ramps and stairs providing access. South of the new Metrolink/Amtrak center platform, Walnut Avenue would be slightly narrowed, and sidewalk improvements and crosswalks would be added east of Harbor Boulevard to improve station connectivity to the neighborhood.



Source: Authority 2025

Figure 2-14 Modified Norwalk/Santa Fe Springs Metrolink Station Site Plan



Source: Authority 2025

Figure 2-15 Modified Fullerton Metrolink/Amtrak Station Site Plan

Relocated Metrolink Stations

Commerce Metrolink Station Relocation

As stated in Section 2.2.1.1, the Commerce Flyover would require the Commerce Metrolink Station to be relocated to an area northeast of the intersection of Telegraph Road and Maple Avenue, which is approximately 0.75 mile to the east of its current location. The relocated Commerce Metrolink Station would be for Metrolink trains only; no HSR trains would stop at this station. An HSR paralleling station would be co-located at the relocated station site. Most of the relocated station would be within Montebello, including the replacement surface parking, plaza, and internal access roads; the platform and nonpublic station facilities north of the railroad corridor would be within Commerce.

The relocated station would have a center platform along the southern side of the rail corridor, accessible from the north via Sycamore Street via a new pedestrian underpass, and from the south via Maple Avenue. The intersection of Sycamore Street and Supply Avenue would be modified with pedestrian crosswalks, and the intersection of Telegraph Road and Maple Avenue would have a new signal and crosswalks to provide safe access to the new station location. All the existing station facilities, such as a transit plaza for buses, bicycle parking, vehicle parking (140 spaces), and a pick-up/drop-off area for motorists, would be replaced south of the corridor, to be accessed via Maple Avenue.

Buena Park Metrolink Station Relocation

As stated in Section 2.2.1.1, the HSR project would add and realign tracks through the existing Buena Park Metrolink Station, necessitating the relocation of the station. The Buena Park Metrolink Station would be relocated to between South Coyote Creek and Beach Boulevard, approximately 0.75 mile northwest of its current location within Buena Park. The proposed relocated Buena Park Metrolink Station would be for Metrolink trains only; no HSR trains would stop at this station.

The relocated station would have a center platform provided along the northern side of the existing rail corridor, accessible from the north via Stage Road and from the east via Beach Boulevard. A new signalized intersection is proposed at the intersection of Coyote Creek and Stage Road. All existing station facilities would be replaced, including a transit plaza for buses, bicycle parking, vehicle parking (313 spaces), and a pick-up/drop-off area for motorists.

2.2.1.6 State Highway or Local Roadway Modifications

Modifications at Roadway Crossings

Shared Passenger Track Alternative A would cross 58 federal, state, and locally controlled roadways, most of which are currently grade separated. A portion of the foregoing roadway crossings would require, in general, one of the following three types of roadway modifications:

- **New grade separations:** There are six roadway crossings where new railroad grade separations (railroad bridge crossings) would be needed. Five of the existing at-grade roadways would be fully grade separated and lowered to cross under the proposed railroad bridges. One roadway (Lakeland Road) would be partially grade separated and would not require vertical realignment, because the shared tracks would cross over the roadway on a new bridge.
- **Modified existing grade separations (roadway vertical realignment):** The alignment would use existing railroad bridges throughout the corridor, most of which would need to be widened or new bridges would need to be added adjacent to the existing bridges to accommodate new tracks. At nine of these existing grade separations, the roadways would require vertical realignments (i.e., be lowered) to provide the required clearances between the road and the railroad bridge.

- **Modified existing grade separations (new piers and abutments):** Thirteen existing grade separations would require modified piers or abutments to accommodate new or widened railroad bridges. No vertical realignment of the roadway would be required.

Eight at-grade crossings at Orangethorpe Avenue, La Palma Avenue, Sycamore Street, Broadway, Santa Ana Street, Sixth Street, Vermont Avenue, Ball Road, and Lewis Street would remain at grade and would be modified only to add OCS to the existing tracks.

Additionally, all existing roadway overcrossings that would span over the shared tracks would be modified to have protective barriers on the top to prevent people or objects from entering the HSR right-of-way from the bridge. Detailed plans of barrier type and installation details will be determined during the Preliminary Engineering for Procurement design phase and coordination with the corridor stakeholders.

Table 2-5 lists all the crossings and any modifications that would be required along the Shared Passenger Track Alternative A alignment.

Table 2-5 Modifications to Roadway Crossings (from northwest to southeast)

Roadway	City	Current Crossing Configuration	Proposed Modification
1st St	Los Angeles	Overcrossing	None
4th St	Los Angeles	Overcrossing	None
6th St/Whittier Blvd	Los Angeles	Overcrossing	None
7th St	Los Angeles	Overcrossing	None
I-10 (Santa Monica freeway)	Los Angeles	Overcrossing	None
Olympic Blvd	Los Angeles	Overcrossing	None
Washington Blvd	Los Angeles	Undercrossing	None
Soto St	Los Angeles	Undercrossing	None
Downey Rd	Vernon	Undercrossing	New pier and abutments within roadway
Private access road	Vernon	Overcrossing	None
I-710 (Long Beach freeway)	Vernon	Overcrossing	None
Atlantic Blvd	Commerce	Undercrossing	New piers and abutments within roadway
Eastern Ave	Commerce	Undercrossing	New piers and abutments within roadway
I-5 (Santa Ana freeway)	Commerce	Undercrossing	None
Telegraph Rd	Commerce	Undercrossing	None
Garfield Ave	Commerce	Undercrossing	None
Greenwood Ave	Montebello	Undercrossing	None
Paramount Blvd	Pico Rivera	Undercrossing	None
SR 19 (Rosemead Blvd)	Pico Rivera	Undercrossing	Road vertical realignment, new abutments within roadway
Passons Blvd	Pico Rivera	Undercrossing	New pier and abutments within roadway
Slauson Ave	Santa Fe Springs	Overcrossing	Pier modifications

Roadway	City	Current Crossing Configuration	Proposed Modification
I-605 (San Gabriel freeway)	Santa Fe Springs	Overcrossing	None
Pioneer Blvd	Santa Fe Springs	At grade	New grade separation; roadway lowered to cross under tracks on a new railroad bridge
Norwalk Blvd	Santa Fe Springs	At grade	New grade separation; roadway lowered to cross under tracks on a new railroad bridge
Los Nietos Rd	Santa Fe Springs	At grade	New grade separation; roadway lowered to cross under tracks on a new railroad bridge
Santa Fe Springs Rd	Santa Fe Springs	Undercrossing	New piers and abutments within roadway
Telegraph Rd	Santa Fe Springs	Undercrossing	New pier and abutments within roadway
Florence Ave	Santa Fe Springs	Undercrossing	New pier and abutments within roadway
Lakeland Rd	Santa Fe Springs	At grade	New grade separation (for HSR only); roadway remains at grade and shared tracks on elevated structure
Imperial Hwy	Santa Fe Springs, Norwalk	Undercrossing	None
Carmenita Rd	Santa Fe Springs	Undercrossing	Roadway vertical realignment, new piers and abutments within roadway
Rosecrans Ave/Marquardt Ave	Santa Fe Springs	Overcrossing	None
Valley View Ave	Santa Fe Springs, La Mirada	Undercrossing	New piers and abutments within roadway
Alondra Blvd	La Mirada	Overcrossing	Bridge replacement, roadway vertical realignment
SR 39 (Beach Blvd)	Buena Park	Undercrossing	New piers and abutments within roadway
Dale St	Buena Park	Undercrossing	Roadway vertical realignment, new piers and abutments within roadway
Gilbert St	Fullerton	Undercrossing	Roadway vertical realignment, new pier and abutments within roadway
Commonwealth Ave	Fullerton	Undercrossing	Roadway vertical realignment, new piers and abutments within roadway
Euclid St	Fullerton	Undercrossing	New pier and abutments within roadway
Highland Ave	Fullerton	Undercrossing	New abutments within roadway
Harbor Blvd	Fullerton	Undercrossing	New piers and abutments within roadway
Lemon St	Fullerton	Undercrossing	None

Roadway	City	Current Crossing Configuration	Proposed Modification
Orangethorpe Ave	Anaheim	At grade	None
SR 91 (Riverside freeway)	Anaheim	Overcrossing	None
La Palma Ave	Anaheim	At grade	None
Sycamore St	Anaheim	At grade	None
Lincoln Ave	Anaheim	Undercrossing	None
Broadway	Anaheim	At grade	None
Santa Ana St	Anaheim	At grade	None
South St	Anaheim	At grade	None
Vermont Ave	Anaheim	At grade	None
Ball Rd	Anaheim	At grade	None
Lewis St	Anaheim	Undercrossing	Roadway vertical realignment, new piers and abutments within roadway
Cerritos Ave	Anaheim	At grade	New grade separation; roadway lowered to cross under tracks on a new railroad bridge
State College Blvd	Anaheim	At grade	New grade separation; roadway lowered to cross under tracks on a new railroad bridge
Katella Ave	Anaheim	Undercrossing	Roadway vertical realignment, roadway widening, new piers and abutments within roadway
SR 57 (Orange freeway)	Anaheim	Overcrossing	None
Douglass Rd	Anaheim	Undercrossing	Roadway vertical realignment, new piers and abutments within roadway

Source: Authority 2025
Authority = California High-Speed Rail Authority; HSR = high-speed rail; I = interstate; overcrossing = road over train tracks; SR = State Route; undercrossing = road under train tracks

New Grade Separations

As indicated in Table 2-5, five existing at-grade roadways would be grade separated for passenger rail and freight, with the roadway lowered to cross under new railroad bridges. These new grade separations are described in detail in Table 2-6, which includes references to the temporary and permanent footprints depicted on Figure 2-16 through Figure 2-19. The temporary project footprint includes areas such as utility easements and construction staging areas while the permanent project footprint includes areas that would be needed permanently for operation of HSR or areas that would permanently lose access from changes in roadway elevation. These grade separations are early action projects, which are described further in Section 2.3.1, Grade Separations.

Lakeland Avenue would be grade separated for HSR and passenger rail on a new elevated structure, but the freight tracks would remain at grade, with a minimal area of temporary and permanent impacts. Therefore, it is not included in Table 2-6.

Table 2-6 New Grade Separations with Roadway Vertical Realignments

Roadway	Grade Separation Description
Pioneer Boulevard (Figure 2-16)	▪ The existing roadway configuration at the Pioneer Blvd crossing in Santa Fe Springs consists of two northbound and two southbound traffic lanes and left-turn lanes to Rivera Rd (which is immediately adjacent and to the north of the railroad corridor) in both directions, with sidewalks on both sides of the road. ▪ The at-grade crossing would be grade separated as a roadway undercrossing, with the railroad tracks on a bridge structure. Approximately 1,275 feet of Pioneer Blvd would be lowered, with the roadway approximately 20 feet below its current elevation at the lowest point of the undercrossing. Additional excavation depths would be required for bridge footings, utilities, pump station, and roadway subbase. ▪ Direct access to Rivera Rd would be removed and a new roadway that loops west and south just north of the crossing would provide access from Pioneer Blvd to Rivera Rd.
Norwalk Boulevard (Figure 2-17)	▪ The existing roadway configuration at the Norwalk Blvd crossing in Santa Fe Springs consists of two northbound and two southbound traffic lanes and a southbound left-turn lane to eastbound Los Nietos Rd (which is immediately south of the crossing), with sidewalks on both sides of the roadway. ▪ The at-grade crossing would be grade separated as a roadway undercrossing, with the railroad tracks on a bridge structure. Approximately 1,325 feet of Norwalk Blvd would be lowered by approximately 20 feet below its current elevation at the lowest point. Roadway clearance from bottom of bridge to top of pavement would be approximately 15 to 16.5 feet. Additional excavation depths would be required for bridge footings, utilities, pump station, and roadway subbase. ▪ The intersection of Norwalk Blvd and Los Nietos Rd would also be lowered, as also described below.
Los Nietos Road (Figure 2-17)	▪ The existing roadway configuration at the Los Nietos Rd crossing in Santa Fe Springs consists of two westbound and two eastbound traffic lanes and a westbound left-turn lane to Norwalk Blvd (which is immediately west of the crossing), with sidewalks on both sides of the roadway. ▪ The at-grade crossing would be grade separated as a roadway undercrossing, with the railroad tracks on a bridge structure. Approximately 1,700 feet of Los Nietos Rd would be lowered, with the roadway elevation approximately 25 feet below its current elevation at the lowest point. Roadway clearance from bottom of bridge to top of pavement would be approximately 15 to 16.5 feet. Additional excavation depths would be required for bridge footings, utilities, pump station, and roadway subbase. ▪ The intersection of Norwalk Blvd and Los Nietos Road would also be lowered as part of this and the Norwalk Blvd grade separation.
Cerritos Avenue (Figure 2-18)	▪ The existing roadway configuration at the Cerritos Ave crossing in Anaheim consists of two westbound and two eastbound traffic lanes with sidewalks on both sides of the roadway. ▪ The at-grade crossing would be grade separated as a roadway undercrossing, with the railroad tracks on a bridge structure. Approximately 1,850 feet of Cerritos Ave would be lowered by 25 feet below its current elevation at the lowest point. Roadway clearance from bottom of bridge to top of pavement would be approximately 15 to 16.5 feet. Additional excavation depths would be required for bridge footings, utilities, pump station, and roadway subbase. ▪ In order to maintain its intersection with Cerritos Ave, Vernon St would need to be lowered about 5 feet below its existing elevation. Similarly, Lewis St would need to be lowered to maintain the intersection with Cerritos Ave.

Roadway	Grade Separation Description
State College Boulevard (Figure 2-19)	▪ The existing roadway configuration at the State College Blvd crossing in Anaheim consists of three northbound and three southbound traffic lanes with sidewalks on both sides of the roadway. ▪ The at-grade crossing would be grade separated as a roadway undercrossing, with the railroad tracks on a bridge structure. Approximately 1,660 feet of State College Blvd would be lowered below its current elevation, up to 25 feet at the lowest point. Roadway clearance from bottom of bridge to top of pavement would be approximately 17.5 feet. Additional excavation depths would be required for bridge footings, utilities, pump station, and roadway subbase. ▪ In order to maintain its intersections with State College Blvd, Howell Ave and Wright Circle would also need to be lowered below its existing elevation, along with multiple driveways and access roads along State College Blvd.



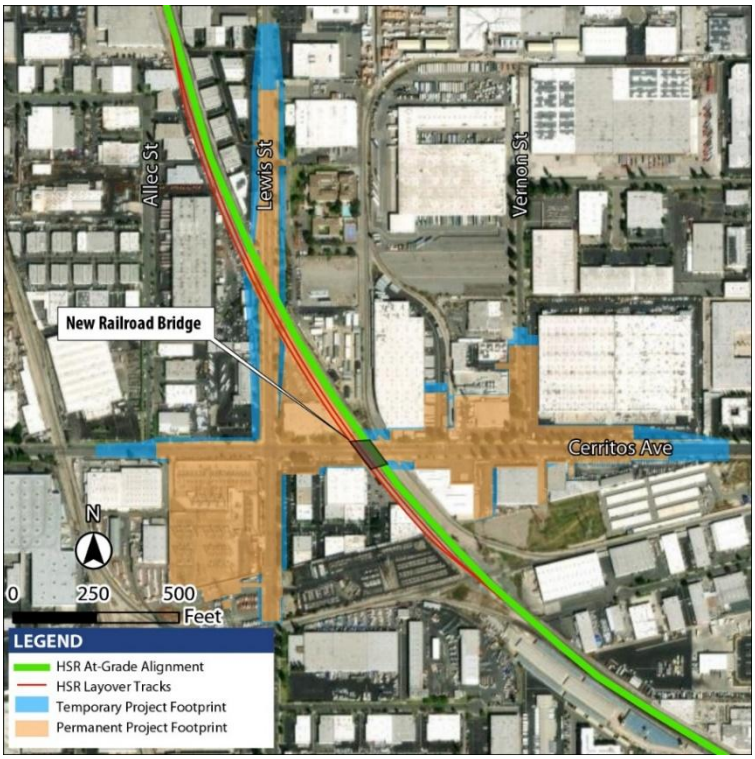
Sources: Authority 2025; ESRI 2020

Figure 2-16 Pioneer Boulevard Grade Separation



Sources: Authority 2025; ESRI 2020

Figure 2-17 Norwalk Boulevard and Los Nietos Road Grade Separations



Sources: Authority 2025; ESRI 2020

Figure 2-18 Cerritos Avenue Grade Separation



Sources: Authority 2025; ESRI 2020

Figure 2-19 State College Boulevard Grade Separation

Modifications to Other Roadways

In addition to modifications to roadway crossings described above for the railway alignment, several other roadways along the alignment would require modifications as a result of other project elements.

Roadway Modifications by Hobart Yard

The addition of new storage tracks and realignment of existing tracks throughout the Hobart Yard area would require 26th Street to be realigned. The roadway currently forms the southern boundary of Hobart Yard. At the eastern end of the yard, at Atlantic Boulevard, 26th Street connects to Pennington Way. From the UPRR San Pedro Subdivision track to Atlantic Boulevard, 26th Street would be realigned about 500 feet south from its existing location, at the farthest point. The realigned 26th Street would provide access to the 26th Street LMF, just north of the street. Currently, 26th Street intersects with Indiana Avenue, Bonnie Beach Place, and Ayers Avenue. Indiana Avenue and Bonnie Beach Place would connect with the realigned 26th Street, and the segments north of the realigned 26th Street would be closed. The realigned 26th Street would not connect to Pennington Way; it would end at Ayers Avenue, and Pennington Way would end in a cul-de-sac west of Atlantic Boulevard, accessible only from Bandini Boulevard. The existing segment of 26th Street between Ayers Avenue and Pennington Way would be closed.

Several roads between Sheila Street and Washington Boulevard are proposed to be closed because of the relocated BNSF truck parking. These roadway closures include the following, and are depicted on Figure 2-12 in yellow:

- Indiana Street
- S Pine Street
- Pacific Way
- Oak Street

- Ash Street
- Arrowmill Avenue
- Ayers Avenue
- Bedessen Avenue
- Connor Avenue
- Dennis Avenue

Roadway Modifications by Commerce Yard

Access is provided by 26th Street to BNSF's Commerce Yard from the east, but the yard improvements would require the entrance to the yard to be relocated approximately 1,300 feet to the east. This segment of 26th Street, within BNSF property, would be closed, and a new cul-de-sac would be provided at the end of the road.

Roadway Modifications by the Fullerton Braced Trench

The braced trench in Fullerton would be located partially outside the existing railroad right-of-way along the south side of the corridor, within the existing Artesia Boulevard right-of-way. Artesia Boulevard would be realigned slightly south, from approximately Pritchard Avenue to Gilbert Street. The intersection of Artesia Avenue and Gilbert Street would be reconfigured.

Roadway Modifications by Fullerton Metrolink/Amtrak Station

The changes at the Fullerton Metrolink/Amtrak Station would require Walnut Avenue to be realigned. Walnut Avenue currently runs east to west from Richman Avenue to Lawrence Avenue, south of and adjacent to the existing railroad corridor. With the addition of a fourth mainline track, Walnut Street would be slightly realigned south, from Richman Avenue to Lemon Street. All existing lanes and sidewalks would be maintained. At Highland Avenue, Walnut Street would be lowered slightly to meet the new, lowered grade of Highland Avenue, and the intersection would be reconfigured.

2.2.2 Shared Passenger Track Alternative B

Shared Passenger Track Alternative B would follow the same alignment and share the same project features and operational assumptions as Shared Passenger Track Alternative A, except for the location of the LMF as discussed below.

2.2.2.1 Alignment

The BNSF mainline and shared tracks for Shared Passenger Track Alternative B would be the same as those discussed for Shared Passenger Track Alternative A, as described in Section 2.2.1.1, because the LMF location would not affect the BNSF mainline and shared tracks.

2.2.2.2 Ancillary Facilities

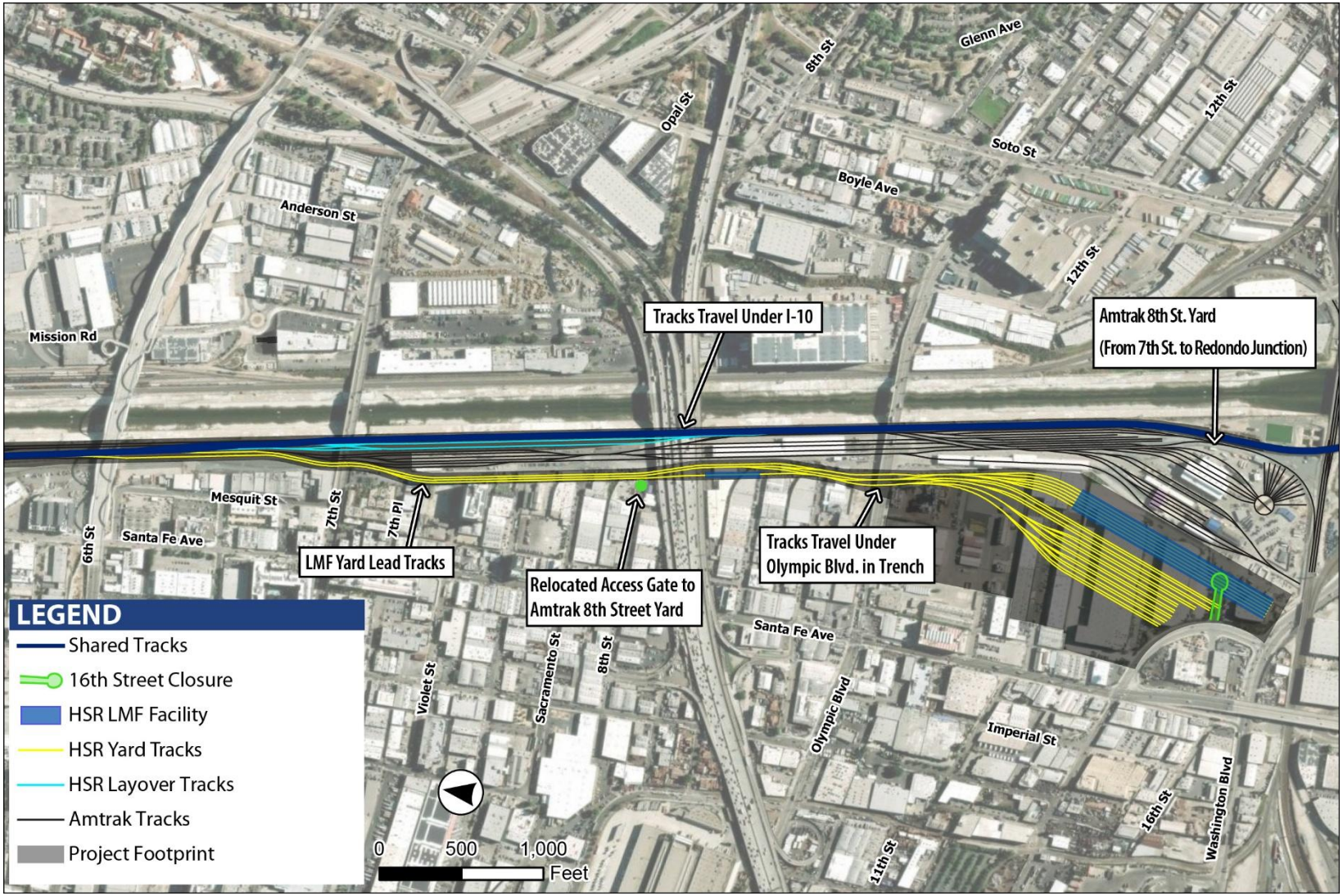
The proposed ancillary facilities for Shared Passenger Track Alternative B would be the same as those discussed for Shared Passenger Track Alternative A. Refer to Section 2.2.1.2 for more information on proposed ancillary facilities.

2.2.2.3 High-Speed Rail Station Facilities

Under Shared Passenger Track Alternative B, the proposed HSR station facilities at ARTIC would be the same as for Shared Passenger Track Alternative A. Refer to Section 2.2.1.3 for more information on proposed station sites.

2.2.2.4 Light Maintenance Facility

Shared Passenger Track Alternative B proposes an LMF between Olympic Boulevard and 15th Street, immediately adjacent to the existing Amtrak Eighth Street Yard. The 15th Street LMF would include the same maintenance operation facilities as the 26th Street LMF under Shared Passenger Track Alternative A, described in Section 2.2.1.4. Refer to Figure 2-20 for an overview of the 15th Street LMF.



Source: Authority 2025

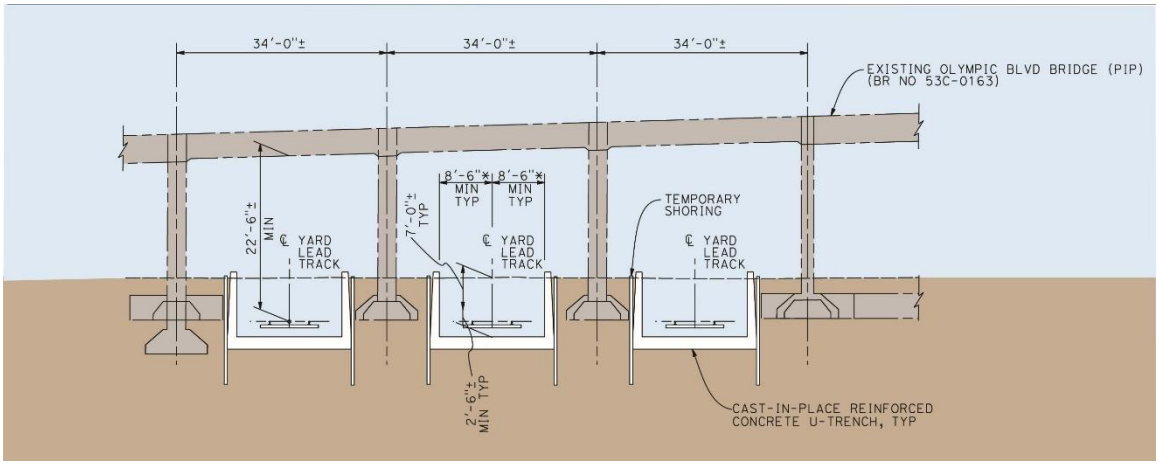
Figure 2-20 Shared Passenger Track Alternative B: 15th Street Light Maintenance Facility

The 15th Street LMF would have an overall size of 52 acres and would include a six-track shop building able to accommodate 12 trainsets, along with an outdoor train yard with a storage capacity of 20 HSR trainsets. The 15th Street LMF would be a single-ended yard, with access to and from the mainline tracks provided only from one side, at the northern end.

Primary roadway access to the 15th Street LMF would be from Washington Boulevard and 15th Street. HSR trains would access the yard via new yard lead tracks, which would start north of Seventh Street; the HSR project has been designed in coordination with the Los Angeles County Metropolitan Transportation Authority so that it would not conflict with the planned Metro Arts District Station, proposed north of Seventh Street. Two yard lead tracks would diverge from the mainline tracks out of the existing railroad right-of-way, cross under Seventh Street, and then branch into three tracks. Continuing south, the tracks would cross through part of Amtrak's existing primary access road to its Eighth Street Yard, which is currently gated at Eighth Street; these gates would need to be relocated to the west, but Amtrak would still be able to use the road to access its Eighth Street Yard. The three 15th Street LMF yard lead tracks would continue south to cross under I-10.

Approaching Olympic Boulevard, the tracks would descend to provide the minimum required 24-foot clearance between the OCS and the historic Olympic Boulevard overpass. Only one track would fit between each of the Olympic Boulevard overpass' four piers. As depicted on Figure 2-21, each track would pass through the piers within a separate trench at a finished depth of 7 feet. The Olympic Boulevard piers would not be altered during construction and would remain in place during HSR operations.

South of Olympic Boulevard, the 15th Street LMF yard lead tracks would connect to the yard on a curve, which requires special trackwork (turnout tracks). To make this connection, the LMF site would be lowered to meet the yard lead tracks. This is because the yard lead tracks would still be below grade as they come out of the Olympic Boulevard trenches, and there would not be enough room to transition the tracks back up to the existing elevation of the LMF site. Additionally, the special trackwork to connect the yard leads to the LMF tracks needs to be located on flat sections of track, not on a slope. Therefore, to make the connection between the below-grade yard lead tracks and the yard tracks, the northern portion of the LMF site (approximately 25 acres) would be excavated up to an approximate depth of 8 feet and regraded at a finished depth of approximately 5 feet to match the grade of the yard lead tracks.



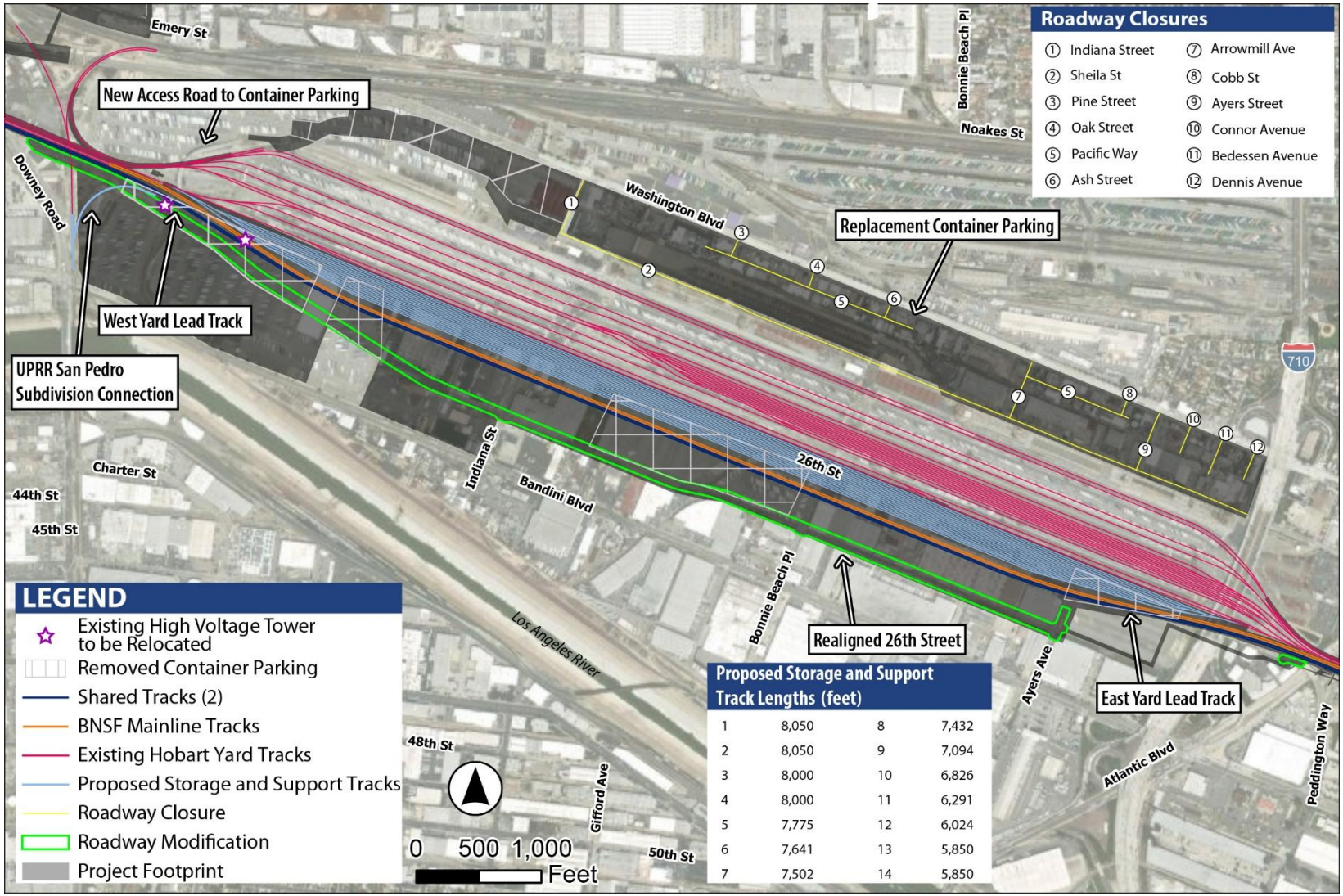
Source: Authority 2025

Figure 2-21 Trenches for 15th Street Light Maintenance Facility Yard Lead Tracks Under Olympic Boulevard

2.2.2.5 Freight or Passenger Railroad Modifications

Freight and passenger railroad modifications for Shared Passenger Track Alternative B would be the same as for Shared Passenger Track Alternative A, except for one difference at Hobart Yard. Figure 2-22 illustrates Hobart Yard without the 26th Street LMF. Because there would not be LMF lead tracks or yard tracks running through BNSF's existing container parking areas, Shared Passenger Track Alternative B would displace slightly less container parking compared to Shared Passenger Track Alternative A.

The two passenger rail station modifications (Norwalk/Santa Fe Springs and Fullerton) and two Metrolink station relocations (Buena Park and Commerce) would be the same for Shared Passenger Track Alternative B as described for Shared Passenger Track Alternative A.



Sources: Authority 2025; ESRI 2020

Figure 2-22 Shared Passenger Track Alternative B: Hobart Yard

2.2.2.6 State Highway or Local Roadway Modifications

The proposed modifications to roadways for Shared Passenger Track Alternative B would be the same as for Shared Passenger Track Alternative A, described in Section 2.2.1.6, except for the area around the 15th Street LMF site. Note that although the 26th Street LMF would not be included under Shared Passenger Track Alternative B, the realignment of 26th Street would still occur.

At the 15th Street LMF, Shared Passenger Track Alternative B would cross through part of Amtrak's access road to its Eighth Street Yard and through its existing access gate at Eighth Street. The access gate would be shifted to the west, and Amtrak would still be able to use its access road, but it would have to cross the three HSR yard lead tracks at grade to reach the road. The 15th Street LMF would also require the closure of a small portion of 16th Street, and the intersection of 15th Street and 16th Street would be reconfigured as a T-intersection. This portion of 16th Street, which is an existing cul-de-sac, serves the properties that would be acquired for construction of the 15th Street LMF. Refer to Figure 2-20, which depicts the portion of 16th Street that would be closed in green.

2.3 Early Action Projects

As described in the 2023 Project Update Report, the Authority has committed to investing in regionally important early action projects to provide early benefits to transit riders and local communities in Southern California, while laying a solid foundation for implementation of the HSR system. These early investments would be made by the Authority in collaboration with local and regional agencies. The types of projects include grade separations, track enhancements, and improvements at passenger rail stations, which would increase capacity, improve safety and air quality, and provide immediate mobility and reliability benefits for existing freight and passenger rail operations. The potential temporary construction and permanent operational environmental effects associated with these early action projects are included in the total evaluation of the Shared Passenger Track Alternatives. These early action projects may be implemented as standalone projects by other local agencies relying on the environmental analyses and conclusions of the Los Angeles to Anaheim Project Section in advance of the HSR system. The early action projects described below would be the same for both Shared Passenger Track Alternatives.

2.3.1 Grade Separations

The following five new railroad/roadway grade separations would be built as part of buildout of the project section and are identified as early action projects:

- Pioneer Boulevard
- Norwalk Boulevard and Los Nietos Road (considered a single early action project because of the adjacency of the two crossings)
- Cerritos Avenue
- State College Boulevard

The potential temporary construction and permanent operational environmental effects associated with these early action projects are analyzed in site-specific detail and included in the total evaluation of the project. Refer to Section 2.2.1.6 for more information.

2.3.2 Metrolink Station Relocations

Passenger rail currently operates within the LOSSAN Corridor and would continue to do so with the introduction of HSR service. The relocations of the existing Commerce and Buena Park Metrolink Stations are necessary for implementation of either of the Shared Passenger Track Alternatives for reasons described in more detail in Section 2.2.1.5.

Existing transit service to the current Metrolink station locations would need to be modified to serve the relocated Metrolink station locations. Future coordination with Metrolink, Amtrak, and transit service providers would be necessary to determine bus routes and schedules for the relocated Metrolink station locations and to inform final design of bus facilities at and near the

station. Access roads, curb space, and passenger and operations facilities for buses have been included in the footprint in anticipation of this reconfigured service.

2.3.3 Fullerton Metrolink/Amtrak Modifications (Fullerton Interlocker)

The Shared Passenger Track Alternatives would modify the tracks and platforms throughout the Fullerton Metrolink/Amtrak Station, as well as the tracks east to Fullerton Junction, as described in Section 2.2.1.1. However, some of these proposed HSR modifications could be completed as an early action project to support the Metrolink Fullerton Interlocker Project, which is being planned by BNSF in coordination with Metrolink and the Authority. This project is critical to Metrolink's Southern California Optimized Rail Expansion Program and will allow for more frequent and regular service in Southern California. The Authority has incorporated the Fullerton Interlocker Project design as part of HSR's Fullerton/Metrolink Amtrak modifications, based on coordination with BNSF and Metrolink and on the anticipated timelines of the two projects.

If the Fullerton Interlocker Project occurs prior to HSR implementation, the early action project would consist of the same modifications described in Section 2.2.1.3 to the Fullerton Metrolink/Amtrak Station, with one exception. The fourth mainline track on the southern side of the corridor would only extend from east of Highland Avenue to Fullerton Junction because, in the absence of HSR, a fourth mainline track would not be added throughout the entire segment between LAUS and Fullerton Junction. All other modifications would be included: the removal of the southern side platforms, addition of a new center platform over Harbor Boulevard, new pedestrian underpass, and realignment and modifications to Walnut Avenue. If the HSR project is implemented later, the southern track would be extended west past Highland Avenue to connect to the fourth mainline track of the HSR alternatives.

2.3.4 Reconfiguration of Freight Rail Facilities

As discussed in Section 2.2.1.5, the project requires new or modified BNSF facilities to add and electrify tracks in the existing BNSF right-of-way between Los Angeles and Fullerton. The Hobart Yard modifications and Commerce Yard modifications (including the Commerce Flyover) could be implemented as early action projects to allow for improvements to existing Amtrak and Metrolink service in the LOSSAN Corridor.

2.4 Optional High-Speed Rail Station

HSR trains would not stop at the Norwalk/Santa Fe Springs Metrolink Station or Fullerton Metrolink/Amtrak Station under either Shared Passenger Track Alternative A or Shared Passenger Track Alternative B. However, an option for a full-stop HSR station is considered, at either Norwalk/Santa Fe Springs or Fullerton. The inclusion of the HSR station option would require additional elements to support full-stop HSR service, in addition to the modifications described in Section 2.2.1.5. These HSR station elements are described in detail below.

2.4.1 High-Speed Rail Station Option: Norwalk/Santa Fe Springs

If the Norwalk/Santa Fe Springs Metrolink Station HSR Station Option is included, several additional elements would be included along with the station modifications described above for Shared Passenger Track Alternative A. An overview of the HSR station option elements is depicted on Figure 2-23, with the additional HSR station elements highlighted in green. The other elements depicted on Figure 2-23 would be completed as part of Shared Passenger Track Alternative A.

The Norwalk/Santa Fe Springs HSR Station Option would add two more electrified passenger rail tracks, for a total of four tracks through the station. The two tracks described under Section 2.2.1.1, Alignment, would serve the modified Metrolink side platforms; the two tracks added as part of the HSR station option would serve an HSR center platform in between the modified Metrolink side platforms. The HSR platform would be 1,000 feet long and capable of future extension to 1,410 feet.

The HSR station option would also require more parking to be added to serve HSR passengers. Parking and pick-up/drop-off for HSR and Norwalk/Santa Fe Springs Metrolink passengers would

be combined within new surface parking lots. The HSR station option at Norwalk/Santa Fe Springs would provide 640 more parking spaces compared to what Shared Passenger Track Alternative A would otherwise provide, for a total of 1,248 parking spaces. A new access road would be provided from Imperial Highway, along the east side of the site, to the Shoemaker Avenue/Adler Drive intersection, with new signalized intersections.

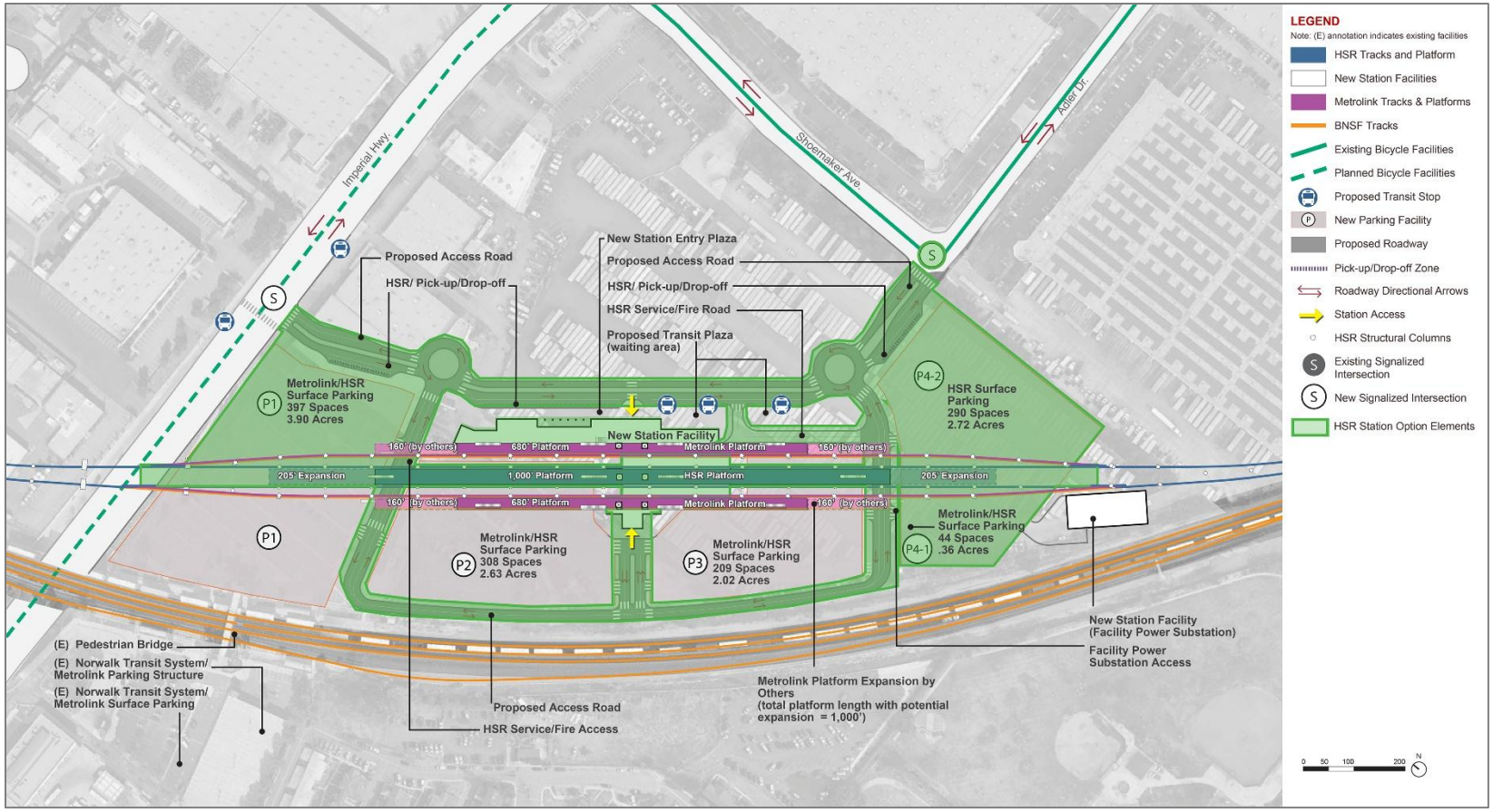
2.4.2 High-Speed Rail Station Option: Fullerton

If the Fullerton HSR Station Option is included, several additional elements would be included along with the station modifications described above for Shared Passenger Track Alternative A. An overview of the HSR station option elements is depicted on Figure 2-24, with the additional HSR station elements highlighted in green. The other elements depicted on Figure 2-24 would be completed as part of Shared Passenger Track Alternative A.

The overall track configuration would be the same as described in Section 2.2.1.1, but the southernmost shared track would be shifted south to accommodate a 1,000-foot HSR platform extending over Highland Avenue. The platform would be 48 inches above the rail on retained fill, at 10 feet at the highest point. A pedestrian ramp would connect the HSR platform to the Metrolink/Amtrak platform.

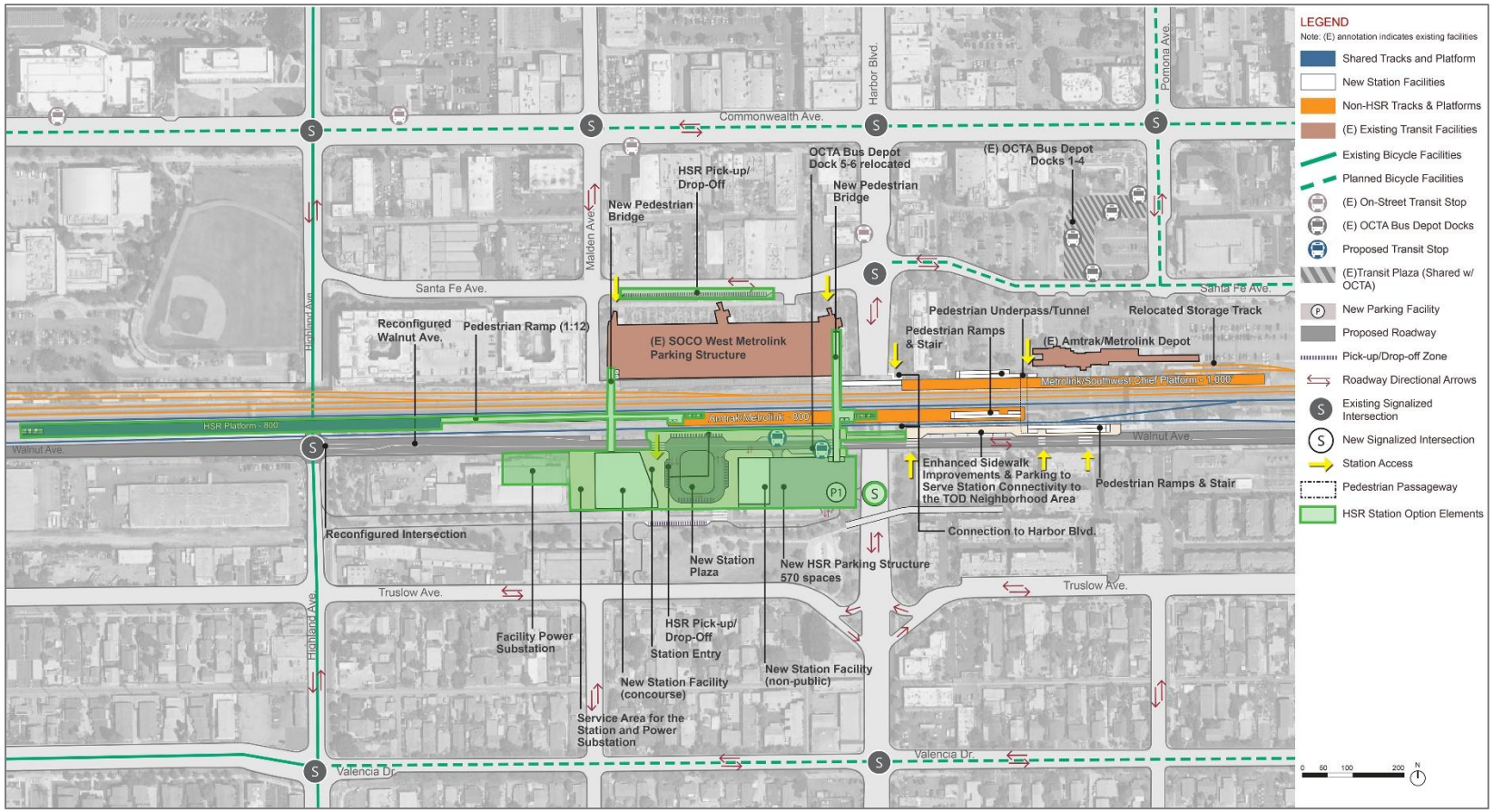
South of Walnut Avenue, the HSR station option would add HSR station buildings, a facility power substation, and a new multilevel parking structure that would provide a total of 570 new HSR parking spaces. The intersection of Highland Avenue and Walnut Avenue would be reconfigured to accommodate the new track and the Highland Avenue railroad bridge, along with improvements for transit stops and pedestrian crossings.

The HSR station option would add two pedestrian bridges: one west of Harbor Boulevard to connect the existing Metrolink parking structure to the HSR parking structure, and another east of Malden Avenue to connect the existing Metrolink parking structure to the HSR station building. A new signalized intersection on Harbor Boulevard would also be required to provide access to the HSR parking garage.



Source: Authority 2025
Future platform extension not included in project definition for the environmental impact report/environmental impact statement.

Figure 2-23 Norwalk/Santa Fe Springs High-Speed Rail Station Option



Source: Authority 2025

Figure 2-24 Fullerton High-Speed Rail Station Option

2.5 Project Construction

For the Los Angeles to Anaheim Project Section of the California HSR System, specific construction elements would include surface and elevated track; track work; grade-separated roadway crossings; and installation of a Positive Train Control system, as summarized in Table 2-7. Construction would take approximately 7.5 to 8 years.

Surface track sections would be built using conventional railroad construction techniques. A typical construction sequence includes clearing, grubbing, grading, and compacting the railbed; applying crushed rock ballast; laying track; and installing electrical and communications systems.

Elevated track sections would use the precast, segmented construction method. In this construction method, large concrete bridge segments are mass-produced at an on-site, temporary casting yard. Precast segments are then elevated atop the already completed portions of the elevated viaduct or embankment, and installed using a special gantry crane positioned on the aerial structure. Although the precast segmental method is the favored technique for aerial structure construction, other methods may be used, including cast-in-place, box girder, or precast, span-by-span techniques.

Preconstruction activities would occur during final design and would include geotechnical investigations, identification of staging areas, initiation of site preparation and demolition, relocation of utilities, and implementation of temporary, long-term, and permanent road closures. Additional studies and investigations to develop construction requirements and worksite traffic control plans would occur as needed.

Major construction activities for the project section would include earthwork and excavation support, systems construction, bridge and aerial structure construction, and railway systems construction (including trackwork, traction electrification, signaling, and communications).

During peak construction periods, work would be under way at several locations along the route simultaneously, with overlapping construction of various project elements. Working hours and the number of workers present at any time would vary depending on the activities being performed.

Table 2-7 Los Angeles to Anaheim Project Section Construction Schedule

Activity	Tasks	Schedule[7]
Right-of-way acquisition	Commencement of right-of-way acquisitions once State Legislature appropriates funds in annual budget, environmental due diligence	Prior to construction
Survey and preconstruction	Location of utilities, establishment of right-of-way and project control points and centerlines, establishment/relocation of survey monuments	Prior to construction
Mobilization	Safety devices and special construction equipment mobilization	Prior to construction
Site preparation	Utilities relocation; clearing/grubbing right-of-way; establishment of detours and haul routes; preparation of construction equipment yards, stockpile materials, and precast concrete segment casting yard	January 2031–January 2034
Earth moving	Excavation and earth support structures	April 2031–October 2036

[7] Schedule as of September 2023.

Activity	Tasks	Schedule[7]
Construction of road crossings	Surface street modifications, grade separations	July 2031–July 2037
Construction of aerial structures	Aerial structure and bridge foundations, substructure, and superstructure	July 2032–July 2036
Construction of underground structures	Straddle bent trench	October 2032–April 2036
Track laying	Includes backfilling operations and drainage facilities	July 2033–December 2037
Systems	Train control systems, OCS, communication system, signaling equipment	October 2035–October 2037
Demobilization	Includes site cleanup	At completion of construction
HSR stations and station relocations	Demolition, site preparation, foundations, structural frame, electrical and mechanical systems, finishes	Commerce Metrolink Station relocation: January 2031–January 2032
		Buena Park Metrolink Station Relocation: January 2034–March 2035
		Norwalk/Santa Fe Springs HSR/Metrolink Station: July 2033–July 2036[1]
		Fullerton HSR/Metrolink Station: January 2033–June 2035[1]
		Anaheim HSR platform and facilities: November October 2034–September 2037

Source: Authority 2024
[1] Construction schedule for Norwalk/Santa Fe Springs and Fullerton Station dependent on station selection.
OCS = overhead contact system; HSR = high-speed rail

2.6 Independent Utility of the Los Angeles to Anaheim Project Section

The Authority and FRA divided the HSR system they established with Tier 1 process into individual project sections for Tier 2 planning, environmental review, and decision making. The FRA, consistent with regulations issued by the Federal Highway Administration, considers three criteria when determining the scope of a project to be considered in an EIS: (1) whether it connects "logical termini" and has "sufficient length to address environmental matters on a broad scope"; (2) whether it has "independent utility or independent significance," meaning that it will "be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made"; and (3) whether it will "restrict consideration of alternatives for other reasonably foreseeable transportation improvements" (23 Code of Federal Regulations Part 771.111(f)). *Logical termini* is defined by the Federal Highway Administration as the rational starting and ending points for a transportation improvement project and for review of the environmental impacts of the project (FHWA 1993).[8] The project section connects logical termini

[8] The Federal Highway Administration criteria for determining project scope, as established in 23 Code of Federal Regulations Part 771.11(f), do not specifically address the scope of individual projects considered in the second tier of a tiered National Environmental Policy Act process. With the tiered National Environmental Policy Act process, the same general principles apply, but they are applied in the context of the decisions made in Tier 1—in this case, the decision to build the HSR system as a whole. Therefore, in determining the scope of individual project sections for Tier 2 studies, the Authority and FRA focused primarily on determining whether each project section could serve a useful transportation

at planned passenger stations where HSR service would be provided, at LAUS to the north and at ARTIC to the south. If other sections of the HSR system are not completed, the infrastructure could be used by regional and intercity services to improve their capacity, reliability, and performance (Authority 2009).

2.7 Operation of the Los Angeles to Anaheim Project Section

The conceptual HSR service plan for Phase 1 begins with service between Los Angeles/Anaheim running through the Central Valley from Bakersfield to Merced, and traveling northwest into the Bay Area. Subsequent sections in Phase 2 of the HSR system include a southern extension from Los Angeles to San Diego and an extension from Merced to Sacramento, which do not have an anticipated implementation date.

The Shared Passenger Track Alternatives would be within an active passenger and freight rail corridor, which would require a change in operational patterns and frequency for users. Because the project proposes new and realigned tracks throughout the corridor shared by other passenger rail and freight operators, implementation would change the tracks on which the various users operate. Currently, the Metrolink Orange County line and 91 line, Amtrak Pacific Surfliner, BNSF, and UPRR freight trains operate within the project section. The introduction of HSR service between Los Angeles and Anaheim would not conflict with the California State Rail Plan (Caltrans 2023).

Under the Shared Passenger Track Alternatives, there would be up to two HSR passenger trains per hour (peak) in each direction. Up to 10 freight trains per day could operate on the passenger tracks. The Shared Passenger Track Alternatives would maintain current and projected freight train volume within the corridor.

purpose on its own, and ensuring that a decision in one project section does not limit consideration of reasonable alternatives for completing the HSR system in an adjacent section for which the National Environmental Policy Act process has not yet been completed.

3 LAWS, REGULATIONS, ORDERS, AND POLICIES

This section describes the federal, state, and local laws, regulations, orders, and plans that are relevant to transportation.

3.1 Federal

Federal law requires the State of California to prepare the federal Statewide Transportation Improvement Program (STIP) every 4 years. The federal STIP compiles all projects that have been programmed in the state using federal funds. The California Department of Transportation (Caltrans) and the California Transportation Commission are responsible for producing the federal STIP.

In accordance with the Federal Passenger Rail Investment and Improvement Act of 2008, the State of California adopted the *2018 California State Rail Plan* in September 2018. Federal law requires the State of California to update its California State Rail Plan every 5 years as a condition of eligibility for federal funding for HSR and intercity passenger rail programs.

Federal law does not directly stipulate criteria for the analysis of federal-aid eligible roadways and highways. However, certain conditions must be met in order to maintain the funding eligibility of facilities. Federal agencies such as the Federal Highway Administration, Federal Transit Administration, and FRA are also delegated the authority to interpret and enforce most federal environmental protection laws.

3.1.1 Railroad Revitalization and Regulatory Reform Act of 1976 (45 U.S. Code [U.S.C.])

The Railroad Revitalization and Regulatory Reform Act provides the means to rehabilitate and maintain the physical facilities, improve the operations and structure, and restore the financial stability of the nation's railway systems and to promote its revitalization.

3.1.2 Federal Transit Act (49 U.S.C.)

The Federal Transit Act fosters the development and revitalization of public transportation systems that maximize safe, secure, and efficient personal mobility; minimize environmental impacts; and minimize transportation-related fuel consumption and reliance on foreign oil.

3.1.3 Highways, Statewide Planning (23 U.S.C. 135)

Title 23 of the U.S.C. for Highways and Statewide Planning provides the general requirements for statewide planning to encourage and promote the safe and efficient management, operation, and development of surface transportation system.

3.1.4 Persons and Agencies Consulted

- November 9, 2015: Los Angeles County Department of Public Works. Subject: Coordination to determine local projects for purposes of assessing cumulative effects.
- December 12, 2015: City of Los Angeles Department of Transportation. Subject: Coordination to determine local projects for purposes of assessing cumulative effects.
- April 9, 2016: City of Los Angeles Department of Transportation, Los Angeles and Orange. In Los Angeles County, Metro. Subject: Coordination with LAUS Master Plan and Link US projects.
- March 8, 2017: Gateway Cities Council of Governments Technical Advisory Committee. Subject: Discuss Transportation Technical Report study procedures and timeline.

3.1.5 Procedures for Considering Environmental Impacts (64 *Federal Register* 28545)

The FRA procedures state that an EIS should consider possible impacts on transportation, including impacts of passengers and freight transportations; impacts by all modes of transport

(including bicycle and pedestrian transport); impacts from relevant perspectives (including local, regional, and state perspectives); and impacts on roadway traffic congestion.

3.2 State

Designated state route and interstate highway facilities are operated and maintained under the jurisdiction of Caltrans, except where management of the facility has been delegated to the county transportation authority. Caltrans and the California Transportation Commission are responsible for producing a long-range transportation plan for the planning of statewide facilities. Caltrans and the California Transportation Commission are also responsible under California law for assembling a statewide short-term improvement plan called the STIP. California law requires the State of California to update and adopt this document every 2 years. The STIP Program (which is often prepared prior to the federal STIP document) compiles all projects programmed through the state using state or federal funds.

3.2.1 California Transportation Plan 2050

This plan is a core document that helps tie several internal and external interrelated plans and programs to help define and plan transportation in California. It exists within the larger context of long-range transportation planning that considers other relevant local, regional, and statewide plans and programs that may affect the transportation system.

The plan integrates findings and recommendations from key documents from various statewide programs. The plan also identifies a sustainable transportation system by pulling together these statewide long-range modal plans to envision the future system:

- Interregional Transportation Strategic Plan
- California Freight Mobility Plan
- California State Rail Plan
- California High-Speed Rail Business Plan
- Statewide Transit Strategic Plan
- California Aviation System Plan
- Bicycle and Pedestrian Plan

3.2.2 California State Rail Plan (Gov. Code, Section 14036)

This law requires Caltrans to produce a State Rail Plan that includes a passenger and freight rail component. The California State Rail Plan (Caltrans 2018) was developed to meet this requirement. It establishes a statewide vision and objectives, sets priorities, and develops policies and implementation strategies to enhance passenger and freight rail service in the public interest. It also details a long-range investment program for California's passenger and freight infrastructure. The Final State Rail Plan was adopted in September 2018 (Caltrans 2018).

3.2.3 Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375, Chapter 728, Statutes of 2008) and Global Warming Solutions Act (Assembly Bill 32)

Adopted in September 2008, SB 375 provides a new planning process to coordinate community development and land use planning with regional transportation plans (RTP) to reduce sprawling land use patterns and dependence on private vehicles and thereby reduce vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions associated with VMT. SB 375 is one major tool being used to meet the goals in Assembly Bill 32, the Global Warming Solutions Act. Under SB 375, the California Air Resources Board sets GHG emissions reductions targets for 2020 and 2035 for metropolitan planning organizations in the state. Each metropolitan planning organization must then prepare a sustainable communities strategy (SCS) that meets the GHG emissions reduction targets set by the board. Once adopted, the SCS is incorporated into the region's RTP.

3.2.4 California State Senate Bill 743 and California Environmental Quality Act (CEQA) Guidelines Section 15064.3

Senate Bill 743, codified in California Public Resources Code Section 21099, created a shift in transportation impact analysis under CEQA from a focus on automobile delay, as measured by level of service (LOS) and similar metrics, toward a focus on reducing VMT and GHG emissions. The Legislature required the Governor's Office of Planning and Research to propose new criteria for determining the significance of transportation. The statute states that upon certification of the new criteria, automobile delay (as described solely by LOS or similar measures of vehicular capacity or traffic congestion) shall not be considered a significant impact on the environment under CEQA except in any locations specifically identified in the new criteria. Lead agencies are still required to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, and other resource areas that may be associated with transportation. The statute states that the adequacy of parking for a project shall not support a finding of significance.

The new criteria, contained in State CEQA Guidelines Section 15064.3, were certified and adopted in December 2018. Section 15064.3 provides that VMT is the most appropriate metric to assess transportation impacts; with limited exceptions (applicable to roadway capacity projects, which this project is not), a project's effect on automobile delay does not constitute a significant environmental impact. Other relevant considerations may include the project's effects on transit and nonmotorized travel. Section 15064.3 further provides that transportation projects that reduce VMT should be presumed to cause a less-than-significant impact. A lead agency can elect to be governed by Section 15064.3 immediately (which the Authority has done) and is required to shift to a VMT metric by July 1, 2020.

The California Governor's Office of Planning and Research has provided a technical advisory on evaluating transportation impacts in CEQA (OPR 2018) and further information related to the change in the guidelines in its 2018 Statement of Reasons supporting the guideline change (California Natural Resources Agency 2018), and related to LOS and VMT on its CEQA Update website (OPR 2018).

3.2.5 State Greenhouse Gas Reduction Goals

The following recommendations, developed by the State Operations Group of the Climate Action Team, were adopted by the Climate Action Team at its June 23, 2010, public meeting. These policies commit the state to reduce the GHG intensity of its operations through gains in efficiency and adoption of sustainable business practices. These policies commit all Executive Branch agencies to actions leading to reductions in GHG emissions.

- Include both direct and indirect (as defined) emissions from Executive Branch agencies in the scope of emissions considered for reduction activities.
- Require each state agency to develop and implement a GHG reduction policy that reduces its GHG emissions by 30 percent by 2020, while allowing some flexibility for the agencies based on their individual characteristics, operations, and resources.
- Create a uniform GHG reporting protocol appropriate to state government operations, and establish and maintain a statewide inventory of GHG emissions from state government projects and operations based on this protocol.
- Establish a GHG emission goal (in tons of carbon dioxide equivalent) for state government projects and operations that is based on the findings of the inventory. (i.e., a state operations "cap").
- Conduct a review of laws, regulations, policies, and procedures to evaluate their effect on state agencies' ability to manage GHG emissions.
- Implement existing Green Building Executive orders and reduce electricity purchased for buildings by 20 percent by 2015.

- Support the implementation of the Governor's Information Technology Executive Order (S-3-10), which seeks a 30 percent reduction in energy consumption by IT and telecommunications equipment by 2012.
- Support ongoing efforts by California Department of Water Resources to reduce the carbon intensity of the electricity purchased for the operation of the California Water Project, and to increase the efficiency of pumps and motors used in its operation.
- Improve the efficiency and efficient use of vehicles in the state fleet.
- Reduce business related employee travel, and explore additional resources and infrastructure needed to facilitate this reduction in travel.
- Reduce emissions associated with employee commuting.
- Adopt Employee Best Practices throughout state government, aimed at reducing GHG emissions up the supply chain and improving overall sustainability of state government operations.
- Pursue greener lease terms and specify additional green requirements in new and renewed building leases.
- Require participation in California Energy Commission Energy Performance Rating by California State-owned buildings.

3.2.6 California Government Code Section 65080

The State of California requires transportation planning agencies to prepare and adopt a regional transportation plan directed at achieving a coordinated and balanced regional transportation system.

3.2.7 California Streets and Highways Code Section 1 et seq.

The code provides the standards for administering the statewide streets and highways system. Designated state route and interstate highway facilities are under the jurisdiction of Caltrans, except where facility management has been delegated to the county transportation authority.

3.2.8 California Department of Transportation District Plan

Caltrans long-range plans, including System Management Plans at the District level (DSMP) and Corridor level (CSMP), provide information on future development affecting state facilities. DSMPs and CSMPs are comprehensive and integrated management plans that address transportation options, congestion, and improving travel times. Whereas CSMPs are isolated to specific transportation corridors, DSMPs are long-range strategic plans that are inclusive of all systems within the District's jurisdiction. DSMPs present goals, policies, and programs that serve to provide guidance to federal, state, regional, and local agencies, as well as to the public and private sectors regarding the maintenance, management, and development of the evolving transportation system. Similarly, CSMPs include all travel modes in a defined corridor—highways and freeways, parallel and connecting roadways, public transit (local and intercity), and bikeways. Intelligent transportation technologies can also be addressed, including ramp metering, coordinated traffic signals, incident management, bus/carpool lanes and car/vanpool programs, and transit strategies. Each CSMP identifies existing travel conditions, corridor performance management, planning management strategies, and capital improvements. Information from both District-level and Corridor-level plans is relevant for the affected environment and supports the assessment of baseline and project conditions.

Table 3-1 contains a summary of relevant DSMPs and CSMPs. Caltrans District 7 is currently in the process of preparing a DSMP; CSMPs have been prepared by Caltrans District 7 for I-5 South. Caltrans District 12 has prepared a DSMP and CSMPs for I-5, SR 91, and SR 57.

Table 3-1 Relevant District and Corridor System Management Plans

SMP	Summary
Caltrans District 7	
Corridor System Management Plan for I-5 (from I-710 to Orange County Line) (2010)	▪ Benefit-cost ratios of about 4 to 6 are expected for operational improvements ▪ HOV Lane Widening from I-605 to I-710 and I-710 Interchange modification produces a relatively low benefit-cost ratio of below 1, but the analysis assumes a very high cost at $1.2 billion ▪ Benefit-cost ratio of all scenarios combined is less than 1. ▪ Projects alleviate GHG emissions by about 1.3 million tons over 20 years, averaging a reduction of nearly 64,000 tons per year ▪ Combination of all scenarios significantly reduces overall congestion on corridor
Caltrans District 12	
Caltrans District 12 District System Management Plan (2014)	▪ Highway systems evaluated and planned based on a combination of the traditional expansion concepts and other complementary strategies ▪ Strategic goals include safety and health; stewardship and efficiency; sustainability, livability and economy; system performance; and organizational excellence ▪ Three key strategies include: System Maintenance and Preservation, Congestion Management and Operational Improvements, and System Completion and Refinements
Corridor System Management Plan for I-5 (2012)	▪ Subsequent adaptive ramp metering and connector metering deployment provides a high benefit-cost ratio because of the low costs to implement such improvements ▪ Capacity-enhancing projects included generate a significant improvement in operations of the corridor, producing a benefit-cost ratio of 3.3 ▪ I-5 corridor is an example of an extremely congested urban corridor that benefits from operational strategies ▪ After these improvements are completed, congestion is still expected to double what it is today because of increases in demand ▪ Enhanced incident management shows promise, with an average delay savings of over 10,000 vehicle-hours per incident
Corridor System Management Plan for SR 57 (2010)	▪ Because of high capital cost of expansion, the overall benefit-cost is a modest 1.7 ▪ Addition of northbound truck climbing lane from Lambert Road to the Orange/Los Angeles County Line and the Lambert Road interchange modification project provides significant operational benefits to the mainline by removing heavy truck traffic from the mainline ▪ Operational projects such as adaptive ramp metering with queue control and construction of acceleration lanes, auxiliary lanes, and ramp reconfigurations in the southbound corridor should be considered and evaluated further ▪ Benefits of HOV conversion to continuous access will improve mobility on corridor ▪ Addition of southbound truck climbing lane and lane addition and interchange modifications from north of Lincoln Avenue to SR 91 would provide congestion relief in the areas that have not previously been addressed ▪ Enhanced incident management shows an average delay savings of nearly 70 vehicle-hours per incident, which would amount to a total annual delay savings of over 110,000 vehicle-hours for the corridor

SMP	Summary
Corridor System Management Plan for SR 91 (2010)	▪ Although the costs of completed or programmed and committed projects are high at over $350 million combined, model results indicate that benefits could outweigh costs by over 10:1 with benefits exceeding $3.5 billion over a 20-year lifecycle ▪ Low-cost improvements, such as advanced ramp metering with connector metering, seem to show relatively reasonable investment results ▪ Enhanced incident management shows the delay savings could be substantial when both peak and off peak benefits are considered ▪ There is very little noticeable congestion by year 2020 after all of the scenarios are implemented

Sources: Caltrans 2010a, 2010b, 2010c, 2012, 2014b
Caltrans = California Department of Transportation; I = Interstate; HOV = high-occupancy vehicle; GHG = greenhouse gas; SR = State Route

3.2.9 California Streets and Highways Code Section 890

California law defines bicycle facilities, as presented in Table 3-2.

Table 3-2 California Statutory Bicycle Facility Definitions

Facility	Statutory Definition
Class I (Bike Path or Shared Use Path)	Provide a completely separated right-of-way designated for the exclusive use of bicycles and pedestrians with crossflows by motorists minimized.
Class II (Bike Lane)	Provide a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and crossflows by pedestrians and motorists permitted.
Class III (Bike Route)	Provide a right-of-way on-street or off-street, designated by signs or permanent markings and shared with pedestrians and motorists.
Class IV (Cycle Track or Separated Bikeways)	Promote active transportation and provide a right-of-way designated exclusively for bicycle travel adjacent to a roadway and which are separated from vehicular traffic. Types of separation include, but are not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

Source: California Streets and Highways Code, Section 890

3.3 Regional and Local

Caltrans governs the state highways in the RSA; local city or county public works departments or the Congestion Management Agencies (CMA) govern all other roads. SCAG is the regional transportation planning authority and Metropolitan Planning Organization for six counties, including Metro serves as the CMA. In Orange County, OCTA serves as the CMA.

The following sections describe relevant regional and local transportation plans and policies that guide regional and local transportation planning, funding, and project implementation. These regional and local plans and policies were considered in the preparation of this analysis.

3.3.1 Regional Transportation Plans

Senate Bill 375, adopted in September 2008, provided a new planning process to coordinate the community development and land use planning process with RTPs. Senate Bill 375 sets priorities to help California meet GHG reduction goals and requires the RTPs prepared by Metropolitan Planning Organizations to include an SCS or, if infeasible, an “alternative planning strategy” that would support the GHG emission reduction targets for automobiles and light trucks.

Assembly Bill 32 requires California to reduce its GHG emissions to 1990 levels by 2020; a reduction of approximately 15 percent below emissions expected under a “business as usual”

scenario. Pursuant to Assembly Bill 32, the California Air Resources Board must adopt regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. The full implementation of Assembly Bill 32 will help mitigate risks associated with climate change, while improving energy efficiency, expanding the use of renewable energy resources, cleaner transportation, and reducing waste.

As the federal Metropolitan Planning Organization for the greater Los Angeles-Orange County-Inland Empire-High Desert region, SCAG is responsible for producing an RTP/SCS report every 4 years. This document serves as the primary planning resource for the region. Every 2 years, SCAG is required under state and federal law to produce a Federal Transportation Improvement Program (FTIP) for the federal government based on Regional Transportation Improvement Programs developed by the respective CMAs. These documents lay out the financial plan for capital improvements within the next 6 years.

The FTIP lists every transportation project that will receive federal funds or is subject to a federally required action (e.g., review for air quality effect). They also cover all capacity-enhancing and noncapacity transportation projects programmed with federal, state, or local funds, as well as the capital and operational details of highway and transit projects.

Lastly, the FTIP lists all of the following projects that are defined by SCAG as regionally significant whether or not they require federal funding:

- Freeways
- State highways
- Principal arterials (eight-lane divided roadways)
- Major arterials (as defined by county)
- Routes to major activity centers
- Goods movement routes
- Intermodal transfer facilities (e.g., rail stations, airports)
- Fixed transit routes (e.g., light and heavy rail, commuter rail, bus)

All transportation projects must be listed in the FTIP to be eligible for federal and state funding, federal and state permits, and review of the EIR and EIS.

Smaller-scale regional planning for transportation infrastructure and programs, management of transport-related air quality effects, and guidance for local land use decisions related to transportation is governed by state-designated agencies. These agencies often correspond to geographical boundaries and are consolidated into one organization (referred to as the Regional Transportation Planning Agency).

Each county also contains a CMA. The regional entity that is responsible for CMA actions may be a council of governments, county association of governments, county or local transportation commission, transportation or transit authority or agency or district, or joint powers agency, depending upon local agency preferences, population density (e.g., urban or rural counties or municipalities), or transportation purpose. CMAs are responsible for preparing Regional Transportation Improvement Program plans, metropolitan transportation plans, regional transportation plans, and local transportation plans.

Each Regional Transportation Planning Agency's Congestion Management Program (CMP) has been developed to meet the federal requirements for a Congestion Management System as required under federal law. The federal Congestion Management System requirement was modeled after California's CMP. Like the CMP, the Congestion Management System requires monitoring, performance measures, and, in certain cases, mitigation measures. Without the Regional Transportation Planning Agency's CMP, the SCAG would need to develop a separate Congestion Management System. The State of California also requires that CMAs prepare long- and short-range improvement plans and governing policies for evaluating proposed improvements.

In Los Angeles County, Metro serves as the Regional Transportation Planning Agency and CMA. The Los Angeles County CMP serves as the governing policy for Metro. Metro is responsible for planning and implementation of countywide transportation systems and projects.

OCTA is the Regional Transportation Planning Agency and CMA for Orange County, and is a consolidation of seven entities (Orange County Transportation Commission, Orange County Transit District, Consolidated Transportation Services Agency, Orange County Local Transportation Authority, Orange County Service Authority for Freeway Emergencies, Orange County Congestion Management Agency, and Orange County Service Authority for Abandoned Vehicles). The Orange County CMP serves as the governing policy for OCTA. OCTA is responsible for planning and implementation of countywide transportation systems and projects.

Table 3-3 contains a summary of the relevant regional plans and policies.

Table 3-3 Regional Transportation Plans and Policies Summary

Policy Title	Summary
Southern California	
SCAG 2024–2050 Connect SoCal RTP/SCS (2024)	The SCAG RTP/SCS is a long-range metropolitan transportation plan that is developed and updated by SCAG every 4 years. The SCAG 2024 RTP/SCS, also known as Connect SoCal, outlines a comprehensive vision for transportation and land use planning in Southern California. Its primary goals are to: ▪ (Policy #7) Encourage and support the implementation of projects, both physical and digital, that facilitate multimodal connectivity, prioritize transit and shared ▪ (Policy #14) Encourage the development of transportation projects that provide convenient, cost-effective and safe alternatives to single-occupancy vehicle travel (e.g., trips made by foot, on bikes, via transit, etc.) ▪ (Policy #54) Accelerate the deployment of a zero-emission transportation system and use near-zero-emission technology to offer short-term benefits where zero-emissions solutions are not yet feasible or commercially viable ▪ (Policy #70) Prioritize community and environmental justice concerns, together with economic needs, and support workforce development opportunities, particularly around deployment of zero-emission and clean technologies and their supporting infrastructure.
SCAG FTIP (2023)	The SCAG FTIP is a listing of multi-modal transportation projects proposed over a six-year period for the SCAG region. The projects include highway improvements, transit, rail and bus facilities, high occupancy vehicle lanes, active transportation, signal synchronization, intersection improvements, freeway ramps, etc. SCAG produces a biennial FTIP update for the region on an even-year cycle. The FTIP is prepared to implement projects and programs listed in the RTP/SCS and is developed in compliance with state and federal requirements. The six County Transportation Commissions (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) in the SCAG region have the responsibility under State law of proposing their county program, using current RTP/SCS policies, programs, and projects as a guide, from among submittals by cities and local agencies. The locally prioritized lists of projects are forwarded to SCAG for review. From their lists, SCAG develops the FTIP based on consistency with the current RTP/SCS, inter-county connectivity, financial constraint, and conformity determination: ▪ Document all projects for the following 6 years that will receive federal funds or are subject to a federally required action ▪ Document all projects for the following 6 years that are defined by SCAG as regionally significant and indicate whether or not they require federal funding

Policy Title	Summary
SCAG Sustainable Communities Program (2020)	SCAG's SCP is a technical assistance program that strengthens partnerships with local agencies and strategic partners who are responsible for land use and transportation decisions to help the region achieve its unified goals. The SCP provides opportunities to secure resources to meet the diverse planning needs of local communities and support implementation of regional planning policies and strategies. Specific funding categories are developed every four years alongside the adoption of Connect SoCal – the RTP/SCS, with Calls for Applications released on a rolling basis thereafter. SCAG is currently providing technical assistance to 57 local agencies and has funded 110 projects totaling over $21.6 million since 2016. Goals include: ▪ Provide needed planning resources to local jurisdictions for active and multimodal transportation, sustainability, land use, and affordable housing; ▪ Promote, address and ensure health and equity in regional land use and transportation planning and close the gap of racial injustice and better serve communities of color; ▪ Encourage regional planning strategies to reduce motorized vehicle miles traveled and greenhouse gas emissions, particularly in environmental justice communities where there is the highest need for air quality improvements; ▪ Develop local plans that support the implementation of key strategies and goals outlined in Connect SoCal's Sustainable Communities Strategy; ▪ Develop resources that support the key strategies and policy direction of the adopted Connect SoCal; ▪ Support a resilient region that looks at climate adaptation and public health preparedness as key strategies to address community prosperity, transportation safety, economic recovery and sustainability; and ▪ Increase the region's competitiveness for federal and state funds, including, but not limited to the California Active Transportation Program and Greenhouse Gas Reduction Funds.
SCAG Regional Comprehensive Plan (2008)	The RCP is a problem-solving guidance document that directly responds to Southern California's challenges according to the annual State of the Region report card. It responds to SCAG's Regional Council directive in the 2002 Strategic Plan to develop a holistic, strategic plan for defining and solving California's inter-related housing, traffic, water, air quality, and other regional challenges. The RCP sets a path forward in two key ways. First, it ties together SCAG's role in transportation, land use, and air quality planning and demonstrates the need to do more than is being done today. Second, it recommends key roles and responsibilities for public and private sector stakeholders and invites them to implement reasonable policies that are within their control. The result is a proactive, unconstrained, big-picture advisory plan that envisions what a livable, sustainable, successful region could look like and challenges us to tackle difficult issues. Goals include: ▪ Improving mobility for all residents ▪ Fostering livability in all communities ▪ Enabling prosperity for all people ▪ Promoting sustainability for future generations

Policy Title	Summary
SCAG Sustainability Planning Grant Program/Compass Blueprint Plan (2005)	SCAG's Sustainability Planning Grant Program/Compass Blueprint Plan was established as an innovative vehicle for promoting local jurisdictional efforts to test local planning tools. Since the plan started in 2005, 202 projects have been completed through the program. The Sustainability Planning Grants Program provides direct technical assistance to SCAG member jurisdictions to complete planning and policy efforts that enable implementation of the regional SCS. Goals include: ▪ Highlighting the value that effective growth planning can bring to regional partners and regions as a whole ▪ Supporting projects that promote: integrated land use, active transportation, and green region planning

Sources: SCAG 2005, 2008, 2020, 2023, 2024
FTIP = Federal Transportation Improvement Program; LOSSAN = Los Angeles – San Diego – San Luis Obispo; RCP = Regional Comprehensive Plan; RTP = Regional Transportation Plan; SCAG = Southern California Association of Governments; SCS = Sustainable Communities Strategy; SCP = Sustainable Communities Program; STIP = Statewide Transportation Improvement Program

3.3.2 County or Municipal General Plans or Community Plans

Counties and cities must prepare general plans with transportation policies and ordinances. General plans provide important context information for effective assessment, while the transportation (or circulation) element of the local comprehensive plan articulates the policies and priorities that govern the establishment of local transportation performance standards, such as LOS, and capital investment programs to achieve local transportation objectives. The transportation element also contains an inventory of primary facilities, presented in descriptive text, as well as a circulation diagram.

Table 3-4 contains a summary of the relevant county and city general plans and policies.

Table 3-4 Transportation Plans and Policies Summary

Policy Title	Summary
Los Angeles County Local Agencies	
Los Angeles County 2035 General Plan (2025)	Los Angeles County's jurisdiction for planning purposes is generally the unincorporated areas of the county, including the communities of South Whittier, West Whittier, Whittier Narrows, South San Gabriel, and East Los Angeles. The plan has no established criteria of significance for traffic operations. The general plan establishes policies and goals to: ▪ Ensure the efficient movement of people and goods ▪ Promote compatibility between transportation modes and land use ▪ Reduce the adverse air quality impacts of transportation
Los Angeles County Transportation Impact Analysis Guidelines (2020)	The guidelines provide detailed guidance on acceptable traffic- and transportation-related operations. Public Works generally will require the preparation and submission of a Transportation Impact Analysis for projects that meet the following criteria: ▪ Development Projects: Estimated to generate a net increase of 110 or more daily vehicle trips. ▪ Transportation Projects: Likely to induce additional vehicle miles traveled (VMT) by increasing vehicle capacity. ▪ Projects for which a Transportation Impact Analysis is required by County ordinance; regulation; resolution; court order; or directive from the Board of Supervisors, Regional Planning Commission.

Policy Title	Summary
Los Angeles County Bicycle Master Plan (2012)	The County of Los Angeles adopted the *County of Los Angeles Bicycle Master Plan* in March of 2012. The plan includes the following goals and policies: ▪ Goal 1 – Bikeway System: Expanded, improved, and interconnected system of County bikeways and bikeway support facilities to provide a viable transportation alternative for all levels of bicycling abilities, particularly for trips of less than five miles. – Policy 2.4 – Evaluate impacts on bicyclists when designing new or reconfiguring streets.
City of Los Angeles General Plan, Mobility Element, Mobility Plan 2035 (2024)	The City of Los Angeles General Plan, last updated in 2024, is a dynamic document consisting of several elements, including the Land Use Element, which consists of the plans for each of the city's 35 community plan areas. Recently adopted elements are Mobility Plan 2035, the Transportation Element of the General Plan, and the Plan for a Healthy Los Angeles, a new Health and Wellness Element of the General Plan. Mobility Plan 2035 provides the policy foundation for achieving a transportation system that balances the needs of all road users. The plan has no established criteria of significance for traffic operations. Although an LOS of D is the desired minimum, significance is determined on a case-by-case basis. Mobility Plan 2035 includes goals that are equal in weight and define the city's high-level mobility priorities: ▪ Safety first ▪ Access for all Angelinos ▪ World class infrastructure ▪ Collaboration, communication, and informed choices ▪ Clean environments and healthy communities
Los Angeles River Revitalization Master Plan (2007)	The goals of the master plan include revitalization of the river, greening area neighborhoods, capturing community opportunities, and creating value. In 2009, the Los Angeles River Improvement Overlay was established to implement the urban design goals and principles within the master plan. The RSA is included in the eastern San Fernando Valley area. The project will consider the Los Angeles River Improvement Overlay when evaluating the RSA corridors because the plan requires special permit clearance for certain properties within 300 feet of the river.
City of Los Angeles 2010 Bicycle Plan (2011)	The City of Los Angeles adopted the *2010 Bicycle Plan* in March of 2011. The plan contains the following goals and policies: ▪ Policy 2.2.2: Reduce impediments to bicycle lane mobility and safety. ▪ Policy 2.3.1: Upgrade bridges, intersections, freeway ramps, tunnels, and grade separations that impede safe and convenient bicycle passage. ▪ Policy 2.3.2: Mitigate obstacles or obstructions that impede safe and convenient bicycle passage. ▪ Policy 2.3.4: Maintain and facilitate best bikeway design practices.

Policy Title	Summary
Downtown Community Plan (2024)	The City of Los Angeles adopted the *Downtown Community Plan* on May 3, 2023 and amended it in 2024. The plan contains the following goals and policies: ▪ MC Goal 2: An integrated and sustainable Downtown circulation system that provides access between districts through physical connections and information. – Policy MC 2.1: Establish a mode share goal of 75% for transit, walking, and biking for the year 2040 to improve the sustainability of Downtown's mobility network and increase access for residents, workers, and visitors. – Policy MC 2.2: Implement strategies to reduce vehicle miles travelled per capita. – Policy MC 2.5: Facilitate integration between different modes of travel to create a seamless experience as users switch between modes and to promote transit use and active transportation. ▪ MC Goal 3: A safe and inviting pedestrian environment. – Policy MC 3.3: Prioritize pedestrian safety for construction detours. First contain construction staging onsite, then consider using parking and travel lanes before significantly disrupting pedestrian routes. ▪ MC Goal 5: A comprehensive transit system that connects Downtown's districts and Downtown to communities throughout the region. – Policy MC 5.1: Support major regional rail infrastructure projects, such as Link US and California High Speed Rail that will improve connectivity between Downtown and the surrounding region and reduce travel times. ▪ MC Goal 7: A vehicular transportation network that encourages sharing, greater efficiencies, and is balanced with other modes. – Policy MC 7.1: Balance vehicular circulation with other modes of transportation to improve safety and sustainability for all Downtown stakeholders.
Boyle Heights Community Plan: Circulation Element (2024)	Boyle Heights has high levels of transit ridership, making transit options a high priority to create better connectivity throughout the community, as well as to neighboring communities. The plan supports transportation improvements identified through Mobility Plan 2035.
City of Vernon General Plan (2023)	The *City of Vernon General Plan* establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. Vernon, being a primarily industrial city, concentrates its efforts on: ▪ Mobility for commercial traffic, as well as providing services for industrial and commercial clients ▪ Maintain an established ICU LOS standard of D as an acceptable operating LOS
City of Vernon Bicycle Master Plan (2017)	The City of Vernon adopted the *City of Vernon Bicycle Master Plan* in 2017. The plan contains the following strategy: Strategy 1.A.2: Coordinate with Metro and other regional rail providers to establish appropriate designs for existing and future transit stops and station accessways.

Policy Title	Summary
City of Commerce 2020 General Plan (2008)	The *City of Commerce 2020 General Plan* serves as a blueprint for future planning and development in the city. The general plan indicates the city's vision of the future through the policies and plans that are designed to shape the physical development of the community. The general plan: ▪ Acknowledges the city's previous planning efforts, the established land use patterns in the community, and adopted development policy ▪ Establishes an ICU LOS D as a target LOS standard, and ICU LOS E as a threshold standard
City of Commerce Bicycle & Pedestrian Plan (2020)	The City of Commerce adopted the *Bicycle & Pedestrian Plan* in 2020. The plan contains the following strategy: ▪ Goal 1: Increase Rates of Walking And Bicycling – Objective: Ensure all bikeways and pedestrian right-of-way is comfortable to use and maintained Objective: Increasing bike and pedestrian facility options
City of Bell Bicycle Master Plan (2016)	The City of Bell adopted the *City of Bell Bicycle Master Plan* in June of 2016. The plan contains the following goals: ▪ Goal 1: Improve bicycle safety ▪ Goal 2: Increase bicycling – Create a safe and connected bikeway network
City of Montebello General Plan (2024)	The general plan is Montebello's blueprint for meeting the community's long-term vision for the future. The general plan establishes policies and goals to: ▪ Promote the use of public transit through high-quality local and regional transit service and facilities. ▪ Foster multimodal accessibility between transit services and destinations within the city.
Montebello Bicycle Master Plan (2024)	The City of Montebello adopted the *Montebello Bicycle Master Plan* in April of 2024. The plan contains the following goals: ▪ Goal 1: Accessibility – Provide bicycle facilities to and from important local and regional and destinations, and coordinate with adjacent jurisdictions and other agencies to ensure bikeway connectivity and consistency. – Improve bicycling connectivity to existing and planned transit stations. ▪ Goal 2: Safety – Implement designs that reduce conflicts between bicycles and other modes such as automobiles, pedestrians, and transit vehicles along roads, at intersections, and at local destinations.

Policy Title	Summary
City of Pico Rivera General Plan (2014)	The City of Pico Rivera General Plan establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. The plan's Circulation Element seeks to: ▪ Establish and maintain a safe and efficient roadway and highway network with adequate carrying capacity during peak travel hours; ▪ Make provisions for local and regional transit services that represent viable alternatives to automobile travel during peak commuting hours as well as adequately accommodating the needs of transit-dependent residents throughout the day; ▪ Support the community's local economy by providing for the movement of needed goods by truck and rail without impacting the community's residential neighborhoods; ▪ Enhance the ability of children to safely access schools, parks, and library facilities by walking or riding bicycles; ▪ Provide adequate and accessible parking facilities; and ▪ Build a walkable city, reduce traffic congestion, improve transit, and expand the bicycle network.
Re-Imagine Santa Fe Springs General Plan (2022)	The Re-Imagine Santa Fe Springs General Plan establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. The plan also seeks to provide: ▪ A comprehensive transit system that provides convenient and reliable transit access to residential neighborhoods and activity destinations ▪ A multi-modal freight transportation system that facilitates the effective transport of goods while minimizing negative impacts on the community. ▪ Street designs that accommodate transportation modes and users of all abilities ▪ Transportation system designed to reduce vehicle miles traveled ▪ A street network managed to minimize congestion and traffic impacts ▪ Sufficient, well-designed, and convenient off-street parking facilities
Vision Norwalk: The City of Norwalk General Plan (2023)	*Vision Norwalk: The City of Norwalk General Plan* establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. The plan also seeks to: ▪ Provide adequate parking, encourage alternative means of transportation, and contribute toward air quality improvements ▪ Maintain established ICU LOS thresholds of C and D for ADT link volumes and peak hour intersection volumes, respectively
City of La Mirada General Plan (2003)	The *City of La Mirada General Plan* establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. The plan also seeks to: ▪ Provide adequate parking, encourage alternative means of transportation, and contribute toward air quality improvements ▪ Maintain the established V/C LOS thresholds of D for residential streets and E for non-residential streets

Policy Title	Summary
Metro Regional Transportation Improvement Program (2023)	The RTIP is a federal- and state-mandated program document that includes information concerning local highway, state highway, and transit projects and services for the following 6 years. It is revised in its entirety every 2 years and is open for amendment submissions once a month. All transportation projects must be listed in the RTIP to be eligible for federal and state funding, federal and state permits, and review of EIRs and EISs. In order for federal funds to be released to the listed project sponsors, the RTIP must be reviewed for air quality conformity with federal and state laws, as well as SCAG, Caltrans, and USDOT regulations. Upon approval, the RTIP is incorporated into the TIP by SCAG, the STIP prepared by Caltrans, and the FTIP approved by the USDOT. The goals of the RTIP are to: ▪ Document all projects for the following 6 years that will receive federal funds or are subject to a federally required action ▪ Document all projects for the following 6 years that are defined by SCAG as regionally significant and indicate whether or not they require federal funding
Metro Long Range Transportation Plan (2020)	The LRTP provides the funding plan and policies needed to move toward a future Los Angeles County that is environmentally and economically sustainable, while continuing to reduce congestion. General goals of the LRTP are to: ▪ Providing more transit options with improved quality and service ▪ Managing the transportation system to reduce the amount of time people spend in traffic ▪ Making streets and sidewalks safe and convenient for everyone, to support healthy neighborhoods ▪ Investing in communities to expand access to jobs, housing, and mobility options
Metro Vision 2028 Strategic Plan (2018)	The Vision 2028 Strategic Plan provides a guideline that outlines specific infrastructure improvement strategies designed to facilitate easy, safe, and efficient access to the Metro system. The strategic plan coincides with Metro's plans to develop a world-class rail system with stations that will be a short distance (3 miles or less) from the homes of 7.8 million Los Angeles County residents. Goals include: ▪ Providing high-quality mobility options that enable people to spend less time traveling ▪ Delivering outstanding trip experiences for all users of the transportation system ▪ Enhancing communities and lives through mobility and access to opportunity ▪ Transforming LA County through regional collaboration and national leadership ▪ Providing responsive, accountable, and trustworthy governance within the Metro organization
Metro Short Range Transportation Plan (2014)	The SRTP is a focused 10-year plan that guides actions through 2024. The plan will advance the long-term goals outlined in the 2009 LRTP, a 30-year vision for addressing growth in Los Angeles County. The goal of the plan is to: ▪ Monitor progress in moving projects and programs forward to ensure the system moves people and goods safely

Policy Title	Summary
Metro Los Angeles County CMP (2010)	Metro's Los Angeles County CMP is Intended to address the effect of local growth on the regional transportation system and to comply with statutory requirements of the CMP, including monitoring LOS on the CMP Highway and Roadway network, measuring frequency and routing public transit, and implementing the Transportation Demand Management and Land Use Analysis. Goals include: ▪ Providing program ordinances ▪ Helping local jurisdictions meet their responsibilities under the CMP ▪ Establishing conditions for significant impact analysis of CMP monitoring for arterial intersections (where projects add 50 or more trips during either the AM or PM weekday peak hours of adjacent street traffic) ▪ Establishing conditions for significant impact analysis of CMP monitoring for mainline freeway (where projects add 150 or more trips during either the AM or PM weekday peak hours)
Orange County Local Agencies	
County of Orange General Plan (2025)	The *County of Orange General Plan* establishes policy direction for the long-range planning and growth of the county. Goals and policies have been updated to respond to changing conditions within the county. The general plan: ▪ Provides a jurisdiction with a consistent framework for land use decision-making ▪ Establishes that for unincorporated areas all streets and arterials shall maintain HCM LOS D or better, and LOS C or better on Santiago Canyon Rd, and that CMP intersections shall maintain an HCM LOS of E or better
OCTA Directions 2045: Long Range Transportation Plan (2023)	OCTA updates the LRTP about every 4 years. The multimodal projects and programs included are the basis for the RTP. The LRTP provides a visionary blueprint for transportation improvements for Orange County and input into the development of the RTP. General goals of the LRTP are to: ▪ Assess the performance of the transportation system over a 20+ year horizon ▪ Identify the projects that best address the needs of the system based on expected population, housing, and employment growth, while taking forecast financial assumptions into account
Orange County Active Transportation Plan (2023)	OC Public Works "OC on the Move" Active Transportation Plan establishes a vision and a roadmap for implementation of pedestrian and bicyclist facilities within the County's unincorporated communities and along County-owned flood control channel maintenance roads. General goals include: ▪ Reduce the number, rate, and severity of collisions involving people walking, biking, and rolling. ▪ Provide a comprehensive, continuous network of safe and convenient active transportation facilities. ▪ Ensure that investments are made in historically disadvantaged communities and those dependent on active transportation and transit. ▪ Facilitate an increase in trips via active travel modes. ▪ Develop consistent facility design and branding, maintaining a clear identity for residents and visitors. ▪ Create a seamless walking and biking network throughout the County. ▪ Pursue local, state, and federal grant funding for new projects, and establish regular facility maintenance strategies.

Policy Title	Summary
OCTA Next 10 Delivery Plan (2023)	In 2006, Orange County voters, approved the renewal of OC Go (also known as Measure M2), the half-cent sales tax for transportation improvements. Since then, the OCTA has continued to advance implementation of OC Go through the adoption of a series of early delivery plans. Annually, OCTA reviews and updates the cash flow for the complete OC Go Plan to ensure that all projects and programs can be delivered through 2041 consistent with commitments to voters. ▪ Complete 14 freeways projects through construction and prepare the remaining three freeway projects for delivery. ▪ Enhance access and amenities to rail and transit, including Metrolink operations, OC Streetcar, mobility for seniors and persons with disabilities, community-based circulators, and transit stops. ▪ Provide annual competitive funding opportunities and flexible formula funding to local jurisdictions for streets and roads improvements. ▪ Ensure ongoing preservation of open space preserves and provide local jurisdictions opportunities for water quality grants.
OCTA Orange County CMP (2023)	The purpose of the Orange County CMP is to support regional mobility and air quality objectives through these goals: ▪ Reducing traffic congestion ▪ Providing mechanism for coordinating land use and development decisions that support the regional economy ▪ Determining gas tax fund eligibility ▪ Establishing conditions for significant impact analysis of CMP monitoring locations (where projects add 2,400 or more daily trips) ▪ Establishing conditions for significant impact analysis of locations with direct access to a CMP link (where projects add 1,600 or more daily trips)
OCTA Commuter Bikeways Strategic Plan (2009)	OCTA developed the Commuter Bikeways Strategic Plan to encourage the enhancement of Orange County's regional bikeway network in order to make bicycle commuting a more viable and attractive travel option. Goals include providing: ▪ A strategy for improving the regional bikeway network ▪ Eligibility for state Bicycle Transportation Account funds ▪ Identification of roles and responsibilities for OCTA regarding bikeways ▪ Documentation of existing and planned Orange County bikeways
OCTA OC Loop 70/30 Plan (2015)	The OC Loop 70/30 Plan summarizes engineering recommendations to finish the last 30 percent of the route in an easy-to-read document for use by community stakeholders and to be used in pursuit of funding for implementation. Completing the OC Loop benefits the entire community with increased access to employment and popular attractions, enhanced mobility, reduced car-dependency, and improved quality of life. Goals include: ▪ Attracting a wider variety of riders from all age groups and skill levels by providing low-stress bicycling and walking routes ▪ Providing connectivity by introducing first and last mile connections to numerous bus stops and three Metrolink stations ▪ Improving the quality of life by providing access to recreational opportunities and the ability to bike and walk in neighborhoods ▪ Transforming underutilized and abandoned spaces along rivers and railroad rights-of-way into a community amenity

Policy Title	Summary
Orange County Highway Design Manual (2005)	The manual establishes the following design and operations parameters for roads built in unincorporated Orange County. Goals include: ▪ Providing updated design criteria, policies, and procedures for use as a guide ▪ Providing guidance in the design of new and major reconstruction projects
City of Anaheim General Plan (2025)	The *City of Anaheim General Plan* establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. The plan also seeks to: ▪ Provide adequate parking, encourage alternative means of transportation, and contribute toward air quality improvements ▪ Maintain an established ICU LOS threshold of D for major intersection and a peak hour ICU LOS of E or better for CMP intersections (the plan does not specify criteria for roadway segments)
City of Anaheim Criteria for Preparation of Traffic Impact Studies (2007)	The Criteria for Preparation of Traffic Impact Studies provides detailed guidance on acceptable traffic- and transportation-related operations. Goals include: ▪ Establishing procedures to ensure consistency of analysis, adequacy of information presented, and timely review by county staff ▪ Defining significant transportation impacts as a difference in intersection V/C ratio of ≥ 0.05 for LOS C, ≥ 0.03 for LOS D, and ≥ 0.01 for LOS E and LOS F ▪ Establishing that all intersections and segments where at least 51 trips during either peak hour will be added must be studied (certain exceptions may exist for intersections already at ICU LOS E or LOS F) ▪ Establishing that projects that generate more than 100 vehicle trips in either the AM or PM peak hour must be studied
City of Anaheim Bicycle Master Plan (2020)	The City of Anaheim adopted the *City of Anaheim Bicycle Master Plan Update* in July of 2020. The plan is a policy document that guides the City of Anaheim in its implement of citywide bicycle facilities and is intended to improve bicycling safety, comfort, and accessibility. The plan does not contain any explicit plans or goals, but identifies priority projects for the city.
City of Brea General Plan (2022)	The *City of Brea General Plan* establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. The plan also seeks to: ▪ Provide adequate parking, encourage alternative means of transportation, and contribute toward air quality improvements ▪ Maintain an established V/C LOS threshold of D or better for CMP intersections (the plan does not specify criteria for other intersections or segments)
City of Buena Park 2035 General Plan (2022)	The *City of Buena Park 2035 General Plan* establishes policy direction for the long-range planning and growth of the city. Goals and policies have been updated to respond to changing conditions within the city. The plan also seeks to: ▪ Maintain an established HCM and ICU LOS standard of E for CMP intersections and D for all other intersections and arterials

Policy Title	Summary
The Fullerton Plan (2025)	The Fullerton Plan establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. The plan also seeks to provide adequate parking, encourage alternative means of transportation, ensure bicycling is a safe and convenient alternative to motorized transportation and a recreational opportunity for people of all ages and abilities, and contribute toward air quality improvements. The Fullerton Plan includes a Bicycle Element, which guides bikeway development in the city. The City of Fullerton has no established criteria of significance for traffic operations.
City of Placentia General Plan (2019)	The *City of Placentia General Plan* establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land use, and reduce the adverse air quality impacts of transportation. The City of Placentia has no established criteria of significance for traffic operations. The plan also seeks to: ▪ Provide adequate parking, encourage alternative means of transportation, and contribute toward air quality improvements
Orange General Plan (2025)	The *Orange General Plan* is the primary source of long-range planning and policy direction that will be used to guide growth and change, and to preserve and enhance the quality of life within the community. The plan seeks to: ▪ Maintain an established V/C LOS threshold of D as the general standard for street and highway links, with a peak hour V/C LOS of D or better at intersections (LOS E at intersections along CMP routes) (the city does not have a specific unsignalized intersection threshold)
City of Orange Bikeways Master Plan (2001)	The City of Orange adopted the *Bikeways Master Plan* in 2001. The master plan contains the following policies: ▪ Goal 1: To Provide a safe citywide bikeway system which is integrated with other transportation systems such as buses, trains, park and ride facilities, in an effort to help reduce vehicle trips and vehicle emissions. – Objective 1.1: Develop a bikeway system that links all transportation systems together.

Sources: City of Anaheim 2007, 2020, 2025; City of Bell 2016; City of Brea 2022; City of Buena Park 2022; City of Commerce 2008, 2020; City of Fullerton 2025; City of La Mirada 2003; City of Los Angeles 2007, 2011, 2022, 2024a, 2024b; City of Montebello 2024a, 2024b; City of Norwalk 1996; City of Pico Rivera 2014; City of Placentia 2019; City of Orange 2001, 2025; City of Santa Fe Springs 2022; City of Vernon 2017, 2023; County of Los Angeles 2012, 2020, 2025; County of Orange 2005, 2025; Metro 2010, 2014, 2018, 2020, 2023; OCTA 2009, 2015, 2023a, 2023b, 2023c

ADT = average daily traffic; Caltrans = California Department of Transportation; CMP = Congestion Management Program; EIR = environmental impact report; EIS = environmental impact statement; FTIP = Federal Transportation Improvement Program; HCM = Highway Capacity Manual; ICU = intersection capacity utilization; LA = Los Angeles; Link US = Link Union Station; LOS = level of service; LRTP = Long Range Transportation Plan; Metro = Los Angeles County Metropolitan Transportation Authority; OC = Orange County; OCTA = Orange County Transportation Authority; RSA = resource study area; RTIP = Regional Transportation Improvement Program; RTP = Regional Transportation Plan; SCAG = Southern California Association of Governments; SCS = Sustainable Communities Strategy; SRTP = Short Range Transportation Plan; STIP = State Transportation Improvement Program; TIP = Transportation Improvement Program; USDOT = U.S. Department of Transportation; V/C = volume to capacity; VMT = vehicle miles traveled

3.3.3 Airport Master Plans

Airport authorities prepare airport master plans (AMP) that identify future air travel demand and development strategies to meet this demand. The master plans provide forecasts for future aviation demand and airport projects and programs to support this demand. While both general and commercial aviation are addressed in AMPs, information on intercity demand by commercial aviation will be of particular relevance to this project-related environmental assessment. Information on intercity air travel demand will help to inform the development of information relating to the affected environmental and baseline demand.

3.3.3.1 Los Angeles International Airport

Los Angeles International Airport (LAX) is owned and operated by Los Angeles World Airports. LAX, the seventh busiest airport in the world and the second busiest in terms of passengers and the third busiest airport in terms of total operations in the United States. It is the primary airport serving the Los Angeles area. LAX is west of I-405 (San Diego Freeway), approximately 20 driving miles from LAUS, and can be directly accessed via Century Boulevard. It occupies approximately 3,500 acres and is equipped with nine terminals including one international terminal, four runways, and one helipad. The most recent update to the LAX AMP was competed in 2004 (Los Angeles World Airports 2004). The LAX AMP was conceived for the purpose of producing plans, policies, and mitigation programs that would strike an appropriate balance between community, passenger, environmental, and economic forces. The Draft LAX AMP presented four build alternatives (Alternatives A, B, C, and D) and a no action/no project alternative. Alternative D ultimately became the Final LAX AMP.

3.3.3.2 Long Beach Airport

Long Beach Airport (LGB) is owned and operated by the City of Long Beach. It is north of I-405 and west of Lakewood Boulevard, approximately 25 driving miles from LAUS. LGB covers 1,166 acres and is equipped with five runways, the longest being 10,000 feet. LGB does not currently have an AMP, though planning-related work efforts have been completed to ensure that the airport is compliant with federal regulations and well equipped to support development if warranted (e.g., an Airport Layout Plan, a Terminal Area Improvement Project EIR, a Federal Inspection Service Study, and an Airfield Geometry Study). Recently, there has been interest in developing a long-range AMP for LGB; whether a plan is recommended is currently under review (Long Beach Airport 2016).

3.3.3.3 Fullerton Municipal Airport

Fullerton Municipal Airport is a small, general aviation airport owned and operated by the City of Fullerton. It is approximately 4 miles from the Fullerton Transportation Center (Fullerton Metrolink/Amtrak Station), with access via Artesia Avenue from the north and Commonwealth Avenue from the south. It is the only airport in Orange County serving general aviation only. It is equipped with one runway and three heliports. Fullerton Municipal Airport's most recent update to the AMP was completed in May 2004; many of the objectives and timeframes set forth by the AMP have since been met (City of Fullerton 2016). However, the goals of Fullerton Municipal Airport remain the same: to administer a safe, efficient airport with sensitivity to environmental issues, plan and execute business plans to ensure financially sound operations, provide an aviation gateway to the National Transportation System, and to provide a user-friendly aviation facility for personal and business travel.

3.3.3.4 John Wayne Airport

John Wayne Airport is owned and operated by the County of Orange and is the only commercial airport in the county. It is in an unincorporated area of Orange County along MacArthur Boulevard, south of I-405 and east of SR 55, and approximately 18 driving miles from Fullerton Metrolink/Amtrak Station. It is equipped with two runways, which serve ten commercial air carriers, two all-cargo air carriers, and the general and commercial aviation community (John Wayne Airport 2013).

3.3.4 Public Transportation Plans

Public transportation agencies serve the public interest by adopting plans that guide future services and facilities developments. The Moving Ahead for Progress in the 21st Century Act requires that projects selected for Section 5310 funding awards (as listed in the 2020 SCAG RTP/SCS) be included in a locally developed, coordinated public transit-human services transportation plan (otherwise known as a Coordinated Plan). The Moving Ahead for Progress in the 21st Century Act also requires updating an approved Coordinated Plan every 4 years in air quality nonattainment areas.

3.3.4.1 Los Angeles County

Los Angeles County's transit providers operate over 4,000 buses and serve 1.6 million bus daily passengers operated by Los Angeles Metro. Metro Rail and the Metrolink commuter train system combined carry over 330,000 daily passengers and operate nearly 300 miles of rail. In order to advance transit goals and further Metro's vision of transit in Los Angeles County, Metro included transit in both the *Short Range Transportation Plan* and *Long Range Transportation Plan* (LRTP), as well as the *2016–2019 Coordinated Public Transit – Human Services Transportation Plan for Los Angeles County* (July 2015).

The Metro *Short Range Transportation Plan* focuses on transit services through 2024. This plan monitors both the progress in moving projects and the programs forward to ensure the system moves people and goods safely. The Metro LRTP ultimately advances Metro's long-term transit goals. The LRTP, currently being updated since adopted in 2009, provides a visionary blueprint for transit improvements in Los Angeles County. General goals of the LRTP are to assess the performance of the transit system over a 20-year horizon, and to identify the projects that best address the needs of the system based on expected population, housing, and employment growth, while taking forecast financial assumptions into account at the same time. The LRTP provides both a financially constrained plan, which takes into account funding limitations, and an unconstrained plan, which contains a vast array of potential improvements should additional funding sources become available.

The *2016–2019 Coordinated Public Transit – Human Services Transportation Plan for Los Angeles County* (July 2015) covers all urbanized and nonurbanized areas in Los Angeles County and targeted individuals with disabilities, seniors, people with low incomes, and military veterans. This plan also provided strategies for how these can be addressed, and it documented the considerable investment in transportation that has been made within Los Angeles County and its benefits to address some of the mobility needs of these target populations. The plan concluded that addressing the remaining mobility gaps and needs of the target populations would require maintaining the breadth of existing transportation options that are already in place and expanding these to accommodate demographic and other changes. It would also require supporting nontraditional modes that provide transportation alternatives to the target populations and encouraging innovation and pilot efforts to meet some hard-to-serve trip needs. Finally, it would require more collaboration and coordination among the different transportation service providers. It would also require coordination with agencies that fund, but which do not necessarily operate the services.

3.3.4.2 Orange County

Public transportation in Orange County includes local, express and community buses, Amtrak and Metrolink trains, and paratransit services. OCTA, the local bus transit system operator, operates 77 bus routes with nearly 6,200 bus stops in Orange County. New transit services and expanded service hours are planned for areas with high ridership potential, consistent with the recommendations of the Transit System Study. Recently, OCTA began implementing limited-stop services with the "Bravo!" service and planned intra-county and inter-county express routes. Similar to Metro, OCTA's LRTP and *2014–2019 Strategic Plan* offer guidance for the advancement and improvements of the transit system in Orange County, as well as a transit plan called the *OC Transit Vision*, which is expected to be approved in late 2017.

The *2014–2019 Strategic Plan* is a living document that is regularly updated and provides guidance and balance to OCTA transit programs and projects. The LRTP, updated every 4 years (the most recent update in 2014), sets general goals with the purpose of assessing the performance of the transit system over a 20-year horizon, and to identify projects that best address the needs of the system based on expected population, housing and employment growth while taking forecast financial assumptions into account.

The *State of OC Transit* (February 2017) is a precursor document to the forthcoming *Transit Master Plan* and was an important first step in that process. By providing an overview of transit in Orange County, including existing service, as well as the context in which it operates, the built

environment, travel patterns, and Orange County demographics, the report established the starting place for the OC Transit Vision. The report found that approximately 19 routes, out of a total of 65 in the system, carry 75 percent of riders. OCTA and Orange County cities operate more than 30 intermodal transfer facilities ranging from Metrolink stations to park-and-ride facilities. The report concluded that Orange County's auto-oriented land use patterns are not especially conducive to effective transit service and that results in both positive and negative signs for future growth in Orange County transit ridership.

3.3.5 Transportation Plans, Policies, and Programs for Nonmotorized Transportation

Both regional and local governments adopt plans for nonmotorized transportation to guide public investment in capital infrastructure and operational programs. Table 3-5 contains a summary of relevant regional, county, and city plans and policies pertaining to nonmotorized transportation.

Table 3-5 Nonmotorized Transportation Plans, Policies, and Programs Summary

Agency	Plans and Policies
State Agencies	
Caltrans	Complete Streets Implementation Action Plan 2.0 (2014) California State Bicycle and Pedestrian Plan (2017)
Regional Agencies	
SCAG	2012–2035 RTP/SCS Active Transportation Chapter (2012) Regional Comprehensive Plan (2008)
Metro	First-Last Mile Strategic Plan (2014) Complete Streets Policy (2014) Active Transportation Strategic Plan (2023)
OCTA	Commuter Bikeways Strategic Plan (2009) OC Loop 70/30 Plan (2015)
Los Angeles County and Cities	
County of Los Angeles	Los Angeles County 2035 General Plan (2025) Los Angeles County Bicycle Master Plan (2012) Metro Active Transportation Strategic Plan (2023)
City of Los Angeles	City of Los Angeles General Plan, Mobility Plan 2035 (2024) City of Los Angeles 2010 Bicycle Plan (2011)
City of Bell	City of Bell Bicycle Master Plan (2016)
City of Commerce	City of Commerce 2020 General Plan (2008) City of Commerce Bicycle & Pedestrian Plan (2020)
City of La Mirada	City of La Mirada General Plan (2003)
City of Montebello	City of Montebello General Plan (2024) Montebello Bicycle Master Plan (2024)
City of Norwalk	Vision Norwalk: The City of Norwalk General Plan (2023)
City of Pico Rivera	City of Pico Rivera General Plan (2014)
City of Santa Fe Springs	Re-Imagine Santa Fe Springs 2040 General Plan (2022)

Agency	Plans and Policies
City of Vernon	City of Vernon General Plan (2023) City of Vernon Bicycle Master Plan (2017)
Orange County and Cities	
County of Orange	County of Orange General Plan (2025) Orange County Active Transportation Plan (2023)
City of Anaheim	City of Anaheim General Plan (2025) City of Anaheim Bicycle Master Plan (2020)
City of Brea	City of Brea General Plan (2022)
City of Buena Park	Buena Park 2035 General Plan (2022)
City of Fullerton	The Fullerton Plan (2025)
City of Orange	Orange General Plan (2025) City of Orange Bikeways Master Plan (2001)
City of Placentia	City of Placentia General Plan (2019)

Sources: Caltrans 2014a, 2017; SCAG 2008, 2012; Metro 2014b, 2014c, 2023; OCTA 2009, 2015; County of Los Angeles 2012, 2023, 2025; City of Commerce 2008; City of La Mirada 2003; City of Montebello 2024a, 2024b; City of Norwalk 2023; City of Santa Fe Springs 2022; City of Pico Rivera 2014; City of Vernon 2017, 2023; County of Orange 2025; City of Anaheim 2020, 2025; City of Brea 2022; City of Buena Park 2022; City of Fullerton 2025; City of Placentia 2019; City of Orange 2025

Caltrans = California Department of Transportation; Metro = Los Angeles County Metropolitan Transportation Authority; OCTA = Orange County Transportation Authority; RTP = Regional Transportation Plan; SCAG = Southern California Association of Governments; SCS = Sustainable Communities Strategy

4 METHODS FOR EVALUATING EFFECTS

This section describes the methodology for developing the resource study area (RSA) and for evaluating effects under CEQA and the National Environmental Policy Act (NEPA). Subsequent sections in this methodology provide direction for the design of mitigation measures and the structure for presenting content related to transportation in the EIR/EIS documents.

4.1 Definition of Resource Study Area

The RSA is the area in which all environmental investigations specific to transportation are conducted in order to determine the resource characteristics and potential effects of the project section. The boundaries of the RSA for transportation extend beyond the project footprint.

Because the area of potential effects for transportation typically extend beyond the physical project section improvements, the RSA is defined based on anticipated increased or decreased measures of effectiveness, such as control delay or traffic density. LOS calculation methods and thresholds for roadways, signalized intersections, and unsignalized intersections are described later in Section 4.2.2, Traffic Operational Standards.

Determination of the transportation RSA has followed the guidelines summarized below:[9]

- Roadway segments the project section crosses (whether grade separated or proposed to be closed)
- If roadways are proposed to be closed, the most likely alternate routes that would be taken, if the alternate routes are expected to have an increase of 50 or more vehicles in the peak hour
- All major existing intersections that the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B would expand, signalize, or physically re-configure the paved area
- All major new intersections created by the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B
- Intersection analysis includes signalized and unsignalized intersections
- Critical intersections of collector (or higher) facility types that have an increase of 50 or more vehicles in the peak hour in the area of HSR stations created by project section station area activity
- Other modes must also be considered (particularly bicycle and pedestrian) per the *Project EIR/EIS Environmental Methodology Guidelines, Version 5.09, Version 5.10, and Version 5.11* (June 2022, as amended)
- Freeway mainline segments that are expected to have an increase of 100 or more vehicles in the peak hour created by project section station area activity
- Freeway ramps in which there is an increase of more than 100 vehicles on the ramp created by project section station area activity
- Freight and passenger rail facilities that are proposed to be removed, added, or modified

The initial transportation study locations selected were defined based on a tentative RSA, and used the most recent available ridership and trip projections available at the time. The RSA for the project section was refined after comparing to the following geometric and ridership updates:

- Revisions to the Draft PEPD, including station area adjustments, completed in July 2016

[9] Per guidance provided in the December 15, 2015, traffic methodology meeting.

- Revised ridership and vehicle trip projections, including peak period splits and post-processed mode splits, completed in June 2016
- Revisions to the project environmental footprint as a result of the inclusion of subsequent design refinements completed in November 2016

The RSA was compared to these changes, and supplemental transportation study locations were selected. This finalized RSA analyzed for this report included 358 study intersections and 248 study roadway segments.

For analysis purposes, the RSA is further subdivided into two categories in this report:

- Corridor improvements outside of station areas
- Station area operations

4.2 Methodology for Effect Analysis

The efficiency of traffic operations at a location is measured in terms of LOS. For intersections, LOS is commonly measured by the ratio of volume to capacity (V/C) or by the average delay experienced by vehicles, pedestrians, and bicycles during peak hours. For roadway segments, LOS is usually expressed in terms of the calculated V/C ratio of vehicles in the peak hour for local roads and in terms of the calculated density in the peak hour for freeways. The methodology discussed below is primarily based on information contained in Appendices A through E of this technical report.

4.2.1 Study Approach and Baselines

The methodology for analyzing potential transportation effects begins with defining the study approach and the scenarios to be analyzed and compared. Providing a side-by-side comparison between existing and future conditions, and a thorough methodology,[10] allows for an organized and defensible analysis of potential effects.

The first step is to define baseline conditions for each analysis. Existing conditions data were collected within the project section RSA to develop a real-life snapshot of operations prior to potential changes. Vehicle, pedestrian, and bicycle counts were obtained during two weekday peak periods, with the selection of peak hours at each intersection selected.[11]

The *Project EIR/EIS Environmental Methodology Guidelines, Version 5.09, Version 5.10, and Version 5.11* defines specific environmental baselines for environmental effect assessment purposes. The specific details of each baseline and each scenario to be analyzed under each baseline are explained further below.

Because of the potential for the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B to affect roadway facilities, the transportation analysis focused on the roadway facilities that the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B would cross, roadway facilities that would be modified by the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B as part of construction, and new roadway facilities that would be built by the project. These issues were analyzed for existing, opening year, and horizon year conditions leading to analysis of the following scenarios:

- Environmental Baseline #1: Existing Conditions (Year 2015)

[10] An extensive coordination effort has been conducted between Authority representatives, local agencies, and other Regional Consultants within Southern California. The intent of this effort was to develop a uniform methodology based on the information that was produced from the *California High-Speed Rail 2024 Business Plan, Ridership, and Revenue Forecasting Model.* These methodology guidelines have been documented in the *Revised Final Traffic Methodology Guidance Review and Response* (June 2016), and subsequent *Revised Transportation Traffic Methodology Memorandum* (October 2016).

[11] Based on guidance received, this was determined to be the AM peak hour and PM peak hour for existing traffic.

  - No Project (Existing roadway configuration)
  - Existing + Project Section Construction (with project section roadway configuration)

- Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040)
  - No Project Alternative
  - Shared Passenger Track Alternative A
  - Shared Passenger Track Alternative A With Norwalk/Santa Fe Springs HSR Station Option
  - Shared Passenger Track Alternative A With Fullerton HSR Station Option
  - Shared Passenger Track Alternative B
  - Shared Passenger Track Alternative B With Norwalk/Santa Fe Springs HSR Station Option
  - Shared Passenger Track Alternative B With Fullerton HSR Station Option

4.2.1.1 Environmental Baseline #1: Existing Conditions (Year 2015)

This baseline contains three scenarios:

- Existing No Project Alternative (Existing roadway configuration)
- Existing Plus Project Alternative (Permanent project section roadway configuration)
- Existing Plus Construction of Project Section (Temporary effects during construction)

Existing No Project Scenario

As documented and described in Appendix C, traffic counts taken in November 2015 are deemed appropriate to represent the project section baseline conditions. As such, the existing year transportation operations analysis assumed that the traffic counts taken in November 2015 represent Year 2015 conditions. Projects that are currently under construction were assumed to be completed.

Most notable of the projects currently under construction was for the I-5 South Program Improvements. As of the estimated completion date of this report, I-5 between SR 91 and I-605 construction is completed as part of an improvement program of multiple projects for this highly congested segment. Because of the numerous concurrent projects (such as overcrossing reconstruction, long term and permanent ramp closures, and overlapping detour routes) when the 2015 traffic counts data were collected, traffic volumes and operations observed during that time period would result in skewed and unusable data for analysis. Therefore, the transportation analysis used Caltrans forecasted 2015 volumes for those study locations within the construction limits and along major detour routes in the I-5 South Program Improvements corridor. To verify the validity of these projections, forecasted counts were compared to actual 2015 volumes obtained outside the construction vicinity. As a further check on the validity of these projections, 2012, 2013, and 2014 freeway volumes were compared to recently sampled 2015 freeway volumes. Based on a screenline analysis, freeway volumes were similar, and forecasted volumes were comparable to actual 2015 volumes, making further adjustments unnecessary.

The most credible data sources available were used. Initial traffic intersection turning movement counts and 24-hour segment counts were completed between September 14, 2015 and November 19, 2015. Supplemental traffic counts were taken in November 2016 to support the revised RSA resulting from geometry and trip forecast updates.

On-ramp and off-ramp daily traffic counts were obtained using the Caltrans Performance Measurement System online system. Health indices of each detector within the Performance Measurement System network are reported. The health index is an algorithm that has been developed to automatically detect problems in the hardware, which signifies the validity and quality of the data. A higher index indicates the detector is operating accurately, with the goal of obtaining an average health index per station of 90 or higher.

On-ramp and off-ramp daily traffic counts from the Performance Measurement System were sampled from specific days between September 14, 2015, and November 19, 2015, where the data health indices were 90 or greater, and no anomalous traffic patterns were evident (such as

blocked lanes on the mainline).[12] When the indices during this timeframe did not exceed 90, data was obtained during a comparable timeframe in 2014, or alternately, 2013. Where data were not available for specific on-ramps or off-ramps, upstream and downstream mainline volumes with health indices of 90 or greater were sampled, to reconstruct these ramp volumes. Where credible data was not available in the Performance Measurement System, daily ramp volumes were estimated using intersection turning movement counts and nearby 24-hour segment counts and verified by comparing to the most recent Caltrans Traffic Census volumes.

To provide consistency in data usage, and use the most credible data source available, freeway on-ramp and off-ramp queue calculations were based on ramp volumes sampled in the previously referenced intersection turning movement counts.

Existing Plus Project Scenario

The intent of this analysis was to document permanent roadway changes that result in rerouting of traffic (for example, at proposed permanent road closures at Sycamore Street and South Street in Anaheim). The Existing No Project scenario serves as the basis for this scenario, and the Plus Project scenario is a theoretical scenario that assumes Shared Passenger Track Alternative A and Shared Passenger Track Alternative B would be built immediately. The resulting change would then reflect the immediate effects caused by the project, and therefore provide an equal comparison for effects analysis. Quantitative Existing Plus Project analysis was conducted at the viaduct crossings and new/improved grade separations or at-grade crossings, as well as all infrastructure that is expected to be built as a result of these Shared Passenger Track Alternative A and Shared Passenger Track Alternative B.

Existing Plus Project roadway and intersection analysis is discussed in Section 6.7.1.1, Permanent Conditions (Existing Year 2015 Plus Project). Existing Plus Project freeway analysis is discussed in Section 6.7.2.1, Permanent Conditions (Existing Year 2015 Plus Project). Refer to Appendix D of this technical report for further details on the Existing Year 2015 Plus Project LOS calculations.

Existing Plus Construction Scenario

The intent of this analysis was to document temporary construction activities during the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B construction. The Existing No Project scenario serves as the basis for this scenario. Qualitative Existing Plus Construction analysis was conducted at the viaduct crossings and new/improved grade separations or at-grade crossings, as well as all infrastructure that is expected to be built as a result of the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B. Existing Plus Construction effects on circulation and emergency access are discussed in Section 6.7.1.2, Temporary Conditions (Existing Year 2015 Plus Construction). Existing Plus Construction effects on freeway circulation are discussed in Section 6.7.2.2, Temporary Conditions (Existing Year 2015 Plus Construction).

4.2.1.2 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040)

The Horizon Year 2040 represents the year that the project section has attained full ridership with the remainder of the statewide HSR system. This year was assumed to include ambient growth and cumulative projects that are currently approved in the SCAG 2020 RTP/SCS. This baseline contains the following scenarios:

- No Project Alternative
- Shared Passenger Track Alternative A
- Shared Passenger Track Alternative A With Norwalk/Santa Fe Springs HSR Station Option

[12] Because traffic collisions on freeway mainlines can affect adjacent on-ramp and off-ramp operations, and because these incidents often affect other nearby mainline freeways, the dates selected for each sample vary.

- Shared Passenger Track Alternative A With Fullerton HSR Station Option
- Shared Passenger Track Alternative B
- Shared Passenger Track Alternative B With Norwalk/Santa Fe Springs HSR Station Option
- Shared Passenger Track Alternative B With Fullerton HSR Station Option

According to ITE Trip Generation Manual, 11th Edition, the LMF facility differences between Shared Passenger Track Alternative A and Shared Passenger Track Alternative B will not result in significant changes in trip generation and distribution in the vicinity of these facilities. Therefore, the impact analysis remains the same between the two alternatives.

Horizon Year 2040 No Project Scenario

The SCAG 2020 RTP/SCS Travel Demand Model was used to estimate future growth rates for both baseline scenarios. The ratio of the base year (2016) and future year (2045) link volumes in the SCAG model were used to compute separate growth factors for entering and exiting volumes for each leg of each study intersection during both AM and PM peak periods. The growth factor for the AM and PM peak period was applied using the continuous compound growth formula to the base year AM and PM peak hour traffic counts (respectively) to produce future initial link volumes for analysis. To calculate future intersection turning movement counts, a procedure based on the National Cooperative Highway Research Program Report 765 “Iterative Method” (also referred to as the Furness Method) was used (NCHRP 2014).

In general, balancing did not need to be performed on traffic between intersections. The rationale is that there are usually driveways and side streets between major intersections so that the traffic leaving one major intersection is usually not equal to the traffic arriving at the next major intersection. In rare cases where there are no intervening driveways or side streets, such as the adjacent ramp intersections at an interchange, then balancing was performed, which resulted in adjusted link volumes (rounded up to the nearest 100 and averaged between each intersection) and intersection turning movement volumes (rounded up to the nearest 10). Volume adjustments, when performed, generally assumed that traffic volumes did not decrease in future years. For intersections near Hobart Yard and Commerce Intermodal Yard, volume smoothing was conducted on arterials leading into the area to account for the larger growth factor in ambient traffic.

The resulting future link volumes and intersection turning movement volumes serve as the basis for traffic operations in Phase 1 Horizon Year 2040.

For purposes of baseline analysis, the SCAG 2020 RTP/SCS Travel Demand Model is assumed to contain all other cumulative projects. Future lane configurations were based on:

- The committed mitigations which can be found in the approved SCAG 2020 fiscally constrained RTP (with amendments incorporating FTIP and federal STIP project lists)
- Changes proposed by the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B

Horizon Year 2040 Plus Project Scenario

The volumes and lane configurations developed for the No Project scenario were used as the basis for applying trip generation, distribution, and assignment related to station area activities.

The analysis used estimated daily project ridership generated by the Authority for the date of the implementation. The ridership models were developed in support of 2023 Project Update Report to better capture the updated travel patterns, population trends, and service assumptions for the California High-Speed Rail system. Vehicle trips were included in the ridership projections, which included both auto trips and bus trips.

On February 9, 2024, the Authority released its Draft 2024 Business Plan for public review and comment (Authority 2024). The draft business plan included new Phase 1, from San Francisco and Merced to Los Angeles and Anaheim, systemwide ridership projections. The projections rely on the California Rail Ridership Model, prepared by the Authority in collaboration with the

California Department of Transportation Division of Rail and Mass Transportation. The Draft 2024 Business Plan forecasts annual ridership at 28.4 million riders.[13] As a result, the activity levels at the project's HSR station locations, as analyzed in the Transportation Technical Report, would be conservative compared to using the latest ridership forecasts forecasted in the 2024 Business Plan (i.e., because the scenario with less ridership would mean the project would take fewer passengers, and cars, accessing stations off the road and would represent a more conservative analysis).

As lower ridership levels are projected in the 2024 Business Plan, compared to the 2023 Project Update Report, this would result in fewer trains operating in 2040. Therefore, the impacts associated with train operations in 2040 would be somewhat less than the impacts presented in this EIR/EIS, and the benefits accruing to the project (e.g., reduced vehicle miles traveled, reduced greenhouse gas emissions, reduced energy consumption) also would be less than the benefits presented in this report.

Additionally, the methodology used the year that trains would begin operation on this segment. According to the *California High-Speed Rail 2024 Business Plan, Ridership, and Revenue Forecasting Model*, this is 2040 for Phase 1.

Station area trip generation, distribution, and assignment related to station activity were calculated based on the following procedure.[14] General details for this procedure are found in Appendix A. Further details on project traffic counts are provided in Appendix 3.2-C of the Draft EIR/EIS and the Authority's ridership update for the traffic model (Authority 2025). Trip generation, distribution, and assignment calculations specific to each station area are provided in Section 6.3, Shared Passenger Track Alternatives: Project Trip Generation and Distribution.

Trip Generation

Given the complex nature of the ridership data generated by the Authority, the trip generation calculation was completed in a series of progressive steps.

Step 1: Trip aggregation along station area network perimeter

Daily passenger trips were generated by the Authority as originating and destination passenger trips for each station for the project section Implementation Condition (Phase 1 Horizon Year 2040). Originating and destination passenger trips were calculated by mode (in this case, auto and bus) at the Traffic Analysis Zone (TAZ) level using the Statewide Model.

The daily passenger trips were then assigned to designated roadways at the periphery of each station area, based on the proximity of each TAZ to the nearest entrance point. These entrance points were placed conservatively far from the station to encompass the points either at which trips continue on a freeway facility, or for surface streets, diffused to fewer than 50 trips in the peak hour. Trips internal to the station area network were also considered.

Step 2: Conversion to vehicle trips

The passenger trips were converted to vehicle trips, based on vehicle occupancy rates for buses and autos calculated from the ridership data generated by the Authority.

Step 3: Split between modes

The passenger trips by auto mode were split into park-and-ride trips and pick-up/drop-off (PUDO) trips, based on the mode share percentages from the Authority. The PUDO mode includes taxi,

[13] For ridership forecasting purposes, the Authority's 2016 through 2022 Business Plans assumed that high-speed passenger fares would be approximately 80% of the cost of air travel. In producing updated ridership estimates for the 2024 Business Plan, the fare is now assumed to be between 80% and 90% of the cost of air travel. This range retains the 80% as a potential fare and thus the Authority determined that it was reasonable to continue to use this percentage as an analytical assumption in this document.

[14] This procedure was developed based on the latest guidance received in the *Revised Final Traffic Methodology Guidance Review and Response* (June 2016).

rental car, and kiss-and-ride. These percentages were used to calculate the daily vehicle passenger trips by mode.

Step 4: Conversion to peak hour trips

Based on the data generated by the Authority used in the *California High-Speed Rail 2016 Business Plan, Ridership, and Revenue Forecasting Model*, percentages of daily trips incurred during the 6-hour peak period were provided at each station for Phase 1 Horizon Year 2040. The AM peak hour and PM peak hour were assumed to have an identical share of the peak period trips. Because the peak hour reflects 1 hour out of the 6-hour peak period, a peak hour factor of 0.167 was applied to the peak period trips, which represented both AM and PM peak hour trips.

Step 5: In and out trip calculation

The passenger trips and vehicle trips calculated so far only represent inbound trips. Per the *Draft Station Boardings, Access, Egress and Parking Planning Memorandum* (Authority and FRA 2015), originating or destination trips were modeled to represent both an inbound and an outbound trip. An example of this scenario is with kiss-and-ride trips, where there is both an inbound trip (either a solo driver picking up an alighting passenger, or a drop-off vehicle with a boarding passenger) and outbound trip (either with the picked up alighting passenger, or after the boarding passenger has been dropped off). Not all originating or destination trips have both inbound and outbound trips; an example of this situation is with park-and-ride trips, where the vehicle remains at the station. Outbound trips were assumed to approximately follow a symmetric pattern as inbound trips in most cases.

The peak hour vehicle bus trips calculated for each network perimeter entrance resulted in decimal values less than a single bus. Rounded values were adjusted manually so that the aggregate sum of buses assigned to each network perimeter entrance equaled the total buses calculated during the peak hour.

Trip Distribution

Trip distribution for station activity trips were determined based on each station area's facilities as depicted on the conceptual site plans provided in Section 5.8, Existing Conditions around High-Speed Rail Stations.

Trip Assignment

The trip generation and distribution were coded into a roadway network developed using Traffix for Windows software version 7.9.0415, and the trips were assigned to the study intersections and roadway segments.

Auto paths of travel were determined by visually assessing the network at each station area and assigning the most logical and direct routes between each network perimeter entrance and trip distribution facility. For buses, the trip assignment generally followed existing and future bus routes for regional and inter-city routes.

A new statewide ridership model was completed in December 2023 for the HSR project. These data were generated to support the 2023 Project Update Report and are used in this analysis, because they include the Shared Passenger Track Alternatives and considered various intermediate station scenarios. These data are different from the 2016 model data with respect to passenger volumes and origin/destination information and are reflected in the traffic analysis. To incorporate this updated ridership information, the Authority assumed that traffic patterns and routes from trip origins to HSR stations (and vice versa) remained the same between 2016 and 2023, but volumes of riders transiting each traffic study intersection/link would be different. The number of HSR trips heading through each intersection and link were estimated by comparing proximity and direction of travel for each HSR station along the project section and factoring the 2016 with-project volumes up or down to establish 2023 with-project volumes.

The resulting trip volumes at each study intersection and roadway segment were added to the volumes of the Horizon Year 2040 No Project scenario volumes to determine the Horizon Year 2040 Plus Project scenario intersection and roadway segment volumes.

4.2.1.3 Approach for Transit Effect Analysis

Effects analysis was conducted on rail and bus transit. Based on ridership supplied by the Authority and information in the approved *California High-Speed Rail 2016 Business Plan, Ridership, and Revenue Forecasting Model*, the Statewide Demand Model was used to develop forecasted daily rail and bus transit trips that would result from Shared Passenger Track Alternative A and Shared Passenger Track Alternative B implementation for Phase 1 Full Operation Condition Horizon Year 2040.

Daily passenger trips were generated by the Authority as originating and destination passenger trips for each station for both baseline years. Originating and destination passenger trips were calculated by mode (in this case, bus and rail) at the TAZ level using the Statewide Model.

Effects on transit travel times were assessed qualitatively.

4.2.1.4 Approach for Bicycle and Pedestrian Analysis

Effects analysis was conducted on nonmotorized modes of travel (specifically, pedestrian and bicycle). Based on ridership supplied by the Authority and information in the approved *California High-Speed Rail 2016 Business Plan, Ridership, and Revenue Forecasting Model*, the Statewide Demand Model was used to develop forecasted daily nonmotorized trips that would result from Shared Passenger Track Alternative A and Shared Passenger Track Alternative B implementation for Phase 1 Full Operation Condition Horizon Year 2040.

Daily passenger trips were generated by the Authority as originating and destination passenger trips for each station for both baseline years. Originating and destination passenger trips were calculated by mode (in this case, nonmotorized) at the TAZ level using the Statewide Model.

Effects on nonmotorized facilities were assessed qualitatively.

4.2.2 Traffic Operational Standards

This section describes transportation operating conditions standards and analysis procedures such as delay in terms of LOS and V/C ratio. The Transportation Research Board's *2010 Highway Capacity Manual* (HCM) (TRB 2010) procedures were followed in measuring transportation facility performance.

4.2.2.1 Roadway Segment Operational Standards

The LOS indicators for the roadway system are based on the volume of traffic along designated sections of roadway during a typical peak hour and the attainable vehicular capacity of that segment. These two measures for each monitored segment of the roadway system are expressed as a ratio. The V/C ratio is then identified as an LOS from LOS A through LOS F. LOS A identifies the best operating conditions along a section of roadway and is characterized by free-flow traffic, low volumes, and little or no restrictions on maneuverability. LOS F characterizes forced traffic flow with high traffic densities, slow travel speeds, and often stop-and-go conditions. The V/C ratio was calculated using the roadway segment capacities contained in the SCAG 2020 RTP/SCS Traffic Demand Model.

Table 4-1 contains the V/C thresholds for roadway segments.

Table 4-1 Level of Service and Volume-to-Capacity Definitions for Roadway Segments

Level of Service	Volume-to-Capacity Ratio	Definition
A	< 0.60	Free-flow speeds prevail. Vehicles are almost unimpeded in their ability to maneuver within the traffic stream.
B	0.61–0.70	Reasonably free-flow speeds are maintained. The ability to maneuver within traffic is only slightly restricted.

Level of Service	Volume-to-Capacity Ratio	Definition
C	0.71–0.80	Flow with speeds at or near free-flow speed of the roadway. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more care and vigilance on the part of the driver.
D	0.81–0.90	Speeds begin to decline slightly with increasing flows. In this range, density begins to increase somewhat more quickly with increasing flow. Freedom to maneuver within the traffic stream is noticeably limited.
E	0.91–1.00	Operation at capacity with no usable gaps in the traffic stream. Any disruption to the traffic stream has little or no room to dissipate.
F	> 1.00	Breakdown in the traffic flow with long queues of traffic. Unacceptable conditions.

Source: TRB 2010

4.2.2.2 Intersection Operational Standards

Using the HCM 2010 procedures, the quality of intersection operation is graded into one of six LOS designations: A, B, C, D, E, or F with A representing excellent (free-flow) conditions and F representing extreme congestion (forced or breakdown flow). The HCM 2010 methodology utilizes control delay performance measure to determine the overall intersection LOS. Synchro 12 software was used to calculate HCM 2010 control delay and resulting LOS. HCM 2000 was used to analyze nonstandard intersection types such as 5-leg intersection types. Synchro 12 software was used to calculate HCM 2000 control delay and resulting LOS.

Table 4-2 presents the signalized intersection control delay threshold criteria and accompanying LOS descriptions. The LOS thresholds for signalized intersections and unsignalized intersections vary, and are described in Table 4-3 and Table 4-4.

Table 4-2 Signalized Intersections Level of Service Thresholds and Definitions

LOS	Definition	Control Delay (sec per veh)
A	Describes operations with a control delay of 10 sec/veh or less and a volume-to-capacity ratio no greater than 1.0. Under favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Describes operations with a control delay between 10 and 20 sec/veh and a volume to capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable. More vehicles stop than the LOS A.	>10–20
C	Describes operations with a control delay between 20 and 35 sec/veh and a volume to capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable, or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart because of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20–35
D	Describes operations with a control delay between 35 and 55 sec/veh and a volume to capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35–55

LOS	Definition	Control Delay (sec per veh)
E	Describes operations with a control delay between 55 and 80 sec/veh and a volume to capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is high, and progression is unfavorable, or the cycle length is long. Individual cycle failures are frequent.	>55–80
F	Describes operations with a control delay exceeding 80 sec/veh when the volume-to-capacity ratio greater than 1.0. This level is typically assigned when volume-to-capacity ratio is high, progression is very poor, ineffective and the cycle length is long. Most cycles fail to clear the queue.	>80

Source: *TRB 2010*
LOS = level(s) of service; sec/veh = seconds per vehicle

Table 4-3 Control Delay and Level of Service Criteria for Operational Analysis of Signalized Intersections

Control Delay (sec/veh)	LOS by Volume-to-Capacity Ratio	
	≤1.0	>1.0
≤10	A	F
> 10–20	B	F
> 20–35	C	F
> 35–55	D	F
> 55–80	E	F
> 80	F	F

Source: *TRB 2010*
LOS = level of service; sec/veh = seconds per vehicle

Table 4-4 Control Delay and Level of Service Criteria for Operational Analysis of Unsignalized Intersections

Control Delay (sec/veh)	LOS by Volume-to-Capacity Ratio	
	≤1.0	>1.0
0–10	A	F
> 10–15	B	F
> 15–25	C	F
> 25–35	D	F
> 35–50	E	F
> 50	F	F

Source: TRB 2010
LOS = level of service; sec/veh = seconds per vehicle

4.2.2.3 Freeway Mainline Segments

Freeway mainline segment analysis is based on the use of the V/C ratio, which is a surrogate measure for the LOS approach often used to determine the performance of freeway segments. The freeway mainline capacities were sourced from the 2016 SCAG Regional Travel Demand Model and Model Validation Report. By definition, LOS A represents a freeway mainline segment with a V/C ratio less than or equal to 0.35, while LOS F represents a freeway mainline segment

with a V/C ratio greater than 1. The V/C ratio thresholds used for the freeway analysis were adopted from the 2010 Los Angeles Congestion Management Program report (Metro 2010).

Table 4-5 presents the correlation between freeway mainline segment capacity and free-flow speeds. Table 4-6 defines the LOS criteria for the freeway segment analysis.

Table 4-5 Freeway Segment Peak Hour Capacities

Posted Speed Limit (miles per hour)	Capacity (Passengers car per lane per hour)
55 and below	1,900
60 and 65	2,000
70 and above	2,100

Source: SCAG 2020

Table 4-6 Level of Service and Volume-to-Capacity Ratio Definition for Freeway Segments

Volume-to-Capacity Ratio	Level of Service
0.00–0.35	A
> 0.35–0.54	B
> 0.54–0.77	C
> 0.77–0.93	D
> 0.93–1.00	E
> 1.00	F

Source: *Metro 2010*

4.2.2.4 Freeway Ramp Traffic Operational Standards

The guidance or standards for evaluating queue lengths on freeway ramps are contained in Caltrans' *Ramp Metering Design Manual* (April 2016).

For purposes of analysis, peak hour queue lengths were calculated at all freeway on-ramp and off-ramp locations where project trips are expected to add 100 or more trips in the peak hour to the ramp.

For on-ramps, capacity was estimated by the existing geometry, using maximum throughput capacities in the Caltrans *Ramp Metering Design Manual* (April 2016). Peak hour queue length was determined in a similar method to the procedure for calculating minimum queue length storage for new or reconstructed ramps, as described in the Caltrans *Ramp Metering Design Manual* (April 2016) using a conservative assumption of no high-occupancy vehicles (HOV). This method provides the maximum total queue storage needed for all storage lanes.[15]

For off-ramps, ramp capacity, volume approaching the intersection, and queue length was determined from the resulting Synchro 12 intersection analysis and 95th percentile queue length output.

4.2.3 Vehicle Miles Traveled Calculations

VMT is calculated based on the number of vehicles multiplied by the distance traveled by each vehicle. The 2023 Project Update Report was not used for VMT calculations since the methodology did not allow for calculating No Project and Plus Project VMTs. The 2023 Project

[15] $Total\ Queue\ Storage\ Length = 7\%\ of\ peak\ hour\ demand \times On\text{-}ramp\ volume\ per\ peak\ hour \times 29 \frac{ft}{veh}$

Update Report only provided a proxy by which to obtain VMT avoidance. Hence, total VMT was derived from the statewide travel demand model estimate of daily VMT using medium and high ridership forecasts, as defined within the Authority's 2024 Business Plan (Authority 2024). The methodology used to estimate VMT is summarized below.

The Authority developed ridership forecasts for the HSR system using the 2024 version of the statewide California High-Speed Rail Ridership and Revenue Model in California High-Speed Rail Ridership and Revenue Model, Business Plan Model-Version 4 (BPM-V4). The model incorporates socioeconomic growth assumptions (population, housing, and employment forecasts) consistent with the California Statewide Travel Demand Model and adjusts them for the 2045 forecast year. The statewide conventional passenger rail and urban transit networks are consistent with current and planned routes in the 2023 California State Rail Plan and plans for individual regional rail operators. The Authority provided station mode-of-access forecasts. Estimates were made for vehicle trip forecasts through the analysis of comparable systems, the local context at each HSR station, existing conditions and constraints, planned land uses, transportation facilities and services, vehicle parking availability, and the mode-of-access forecasts.

VMT on roadway networks is a performance measure highly correlated with transportation GHG emissions. VMT is calculated based on the number of vehicles multiplied by the distance traveled by each vehicle. The Ridership and Revenue Model was used to forecast annual VMT for Southern California future conditions. Forecasts were developed for vehicles that would travel on the freeways and roads in the RSA using a version of the SCAG Regional Travel Demand Model. This forecasting tool was identified as the most appropriate for the project because it encompasses several of the RSA intersections and freeway segments, as well as all local counties.

The Authority calculated 2040 statewide VMT associated with Shared Passenger Track Alternatives A and B using the 2024 Business Plan ridership data. However, the 2024 Business Plan did not model the intermediate station options and, therefore, did not reflect VMT with implementation of either the Norwalk/Santa Fe Springs or Fullerton HSR Station Options. The 2023 Project Update Report ridership data did include the two intermediate station option scenarios. Therefore, the Authority developed a methodology to calculate statewide VMT with implementation of the HSR station options, using a blend of data from the 2023 Project Update Report and 2024 Business Plan. Refer to Appendix 1-A, Changes in Project Benefits and Impacts, of the Draft EIR/EIS for further information on said methodology.

4.3 Evaluating Impacts Under NEPA

NEPA does not provide a definitive threshold to determine effects or potential effects on transportation. Procedures for considering environmental effects (64 *Federal Register* 28545) indicate that an EIS should consider possible effects on all modes of transportation, including passenger and freight rail, as well as potential effects on roadway traffic congestion. In cases where there are no defined thresholds, professional judgment should be used when considering the resource context, the intensity and duration of the potential effect, along with implementation of mitigation measures to determine whether an effect meets criteria or does not meet criteria.

NEPA and NEPA implementing procedures, regulations, and guidance provide the basis for evaluating project effects (as described in Section 3.1.5.4 of the Draft EIR/EIS). The criteria of context and intensity are considered together when determining the severity of changes introduced by the project:

The Authority's *Revised Transportation Traffic Methodology Memorandum* (October 2016) established a policy that a project effect is considered to have substantial intensity under NEPA if the following occurs:

- For roadway segments, if the Plus Project condition has an LOS of E or F and the Project increases the V/C ratio by 0.04 or more over the baseline condition.

- For signalized intersections, if the Plus Project condition has an LOS of E or F and the Project increases the average traffic delay by 4 seconds or more.
- For unsignalized intersections, if the Plus Project condition has an LOS of E or F and the Project increases the traffic delay by 5 seconds or more (measured as average delay for all-way stop or worst-movement delay for a side-street-stop intersection), and if the intersection satisfies one or more traffic signal warrants per Chapter 4C of the *California Manual on Uniform Traffic Control Devices* (Caltrans 2017) for at least 1 hour of the day.
- For freeway mainline segments, if the Plus Project condition has an LOS of E or F and the Plus Project condition increases V/C ratio by 2 percent or more over the baseline condition.
- For freeway ramps, if the Plus Project condition has an increase in queuing that would cause the ramp queues to exceed the ramp facility's available storage capacity, which would substantially increase hazards.

4.4 Determining Effects Under CEQA

4.4.1 State

Based on the State CEQA Guidelines, the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B would have a transportation effect if conditions change as described below. These changes involve both the construction and operational phases of the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B. Shared Passenger Track Alternative A and Shared Passenger Track Alternative B would have an effect on the environment if it were to do any of the following:

- Result in inadequate emergency access
- Substantially increase hazards associated with a design feature (such as sharp curves or dangerous intersections) or incompatible uses (such as farm equipment)
- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities
- Result in a net increase in VMT over baseline conditions, or otherwise conflict with State CEQA Guidelines Section 15064.3, Subdivision (b)[16]

Note that impacts related to increases in hazards because of geometric design features or incompatible uses and impacts resulting in inadequate emergency access are not evaluated in this Transportation Technical Report. They are included in Section 3.11 of the Draft EIR/EIS.

4.4.2 Local

Local CEQA criteria[17] are covered in Section 3.3.2, County or Municipal General Plans or Community Plans.

4.4.3 High-Speed Rail Recommended Criteria

Input from the affected agencies is requested while reviewing potential effects. For the HSR system, the Authority is the lead federal agency for compliance with NEPA and other federal laws. The Authority is serving as a joint-lead agency under NEPA and is the lead agency for compliance with CEQA. The planning, design, construction, and operation of the California HSR System are the responsibility of the Authority, a state governing board formed in 1996. The Authority's statutory mandate is to develop an HSR system that is coordinated with the state's

[16] Impacts on signalized intersections and roadway segments related to delay increase are only under NEPA because LOS is no longer the performance standard for transportation impacts under CEQA.
[17] Although local agency criteria were considered and documented, locally adopted criteria do not apply to state agencies and this statewide project.

existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports.

4.4.3.1 Vehicle Miles Traveled for Operational Phases

The CEQA Transportation Technical Advisory (2018) lists the following thresholds of significance for VMT evaluation:

> Section 150.64.3(b)(2): Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

It should be noted that while the LOS effects under NEPA are local and, thus, can be analyzed for individual HSR project sections, most VMT effects of HSR system from medium- and long-distance travel involve multiple sections. The VMT analysis must, therefore, be conducted at the systemwide level (i.e., for all project sections combined).

4.4.3.2 Operational Phase

The Shared Passenger Track Alternative A and Shared Passenger Track Alternative B would have an effect on the environment if it were to do any of the following:

- Result in inadequate emergency access
- Substantially increase hazards associated with a design feature (such as sharp curves or dangerous intersections) or incompatible uses (such as farm equipment)
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or otherwise materially decrease the performance or safety of such facilities

4.4.3.3 Construction Phase

The Shared Passenger Track Alternative A and Shared Passenger Track Alternative B would have an effect on the environment if it were to do any of the following:

- Result in inadequate emergency access
- Substantially increase hazards associated with a design feature (such as sharp curves or dangerous intersections) or incompatible uses (such as farm equipment) or create safety risks for pedestrians and bicyclists

5 AFFECTED ENVIRONMENT

5.1 Regional and Local Roadway Network

The system of major roadways in the vicinity of the HSR corridor is part of the local and regional network serving the communities along the RSA. The HSR corridor crosses several cities. Federal Highway Administration highway functional classifications are summarized in Table 5-1, while roadway classifications in these cities are summarized in Table 5-2.

Table 5-1 Federal Highway Administration Highway Functional Classifications

Functional Classification	Description
Arterials	
Interstates	Interstates are the highest classification of Arterials and were designed and built with mobility and long-distance travel in mind. Roadways in this functional classification category are officially designated as Interstates by the Secretary of Transportation. In addition, all routes that comprise the Dwight D. Eisenhower National System of Interstate and Defense Highways belong to the Interstate functional classification category and are considered Principal Arterials.
Other Freeways and Expressways	Roadways in this functional classification category look very similar to Interstates. While there can be regional differences in the use of the terms 'freeway' and 'expressway', for the purpose of functional classification the roads in this classification have directional travel lanes are usually separated by some type of physical barrier, and their access and egress points are limited to on- and off-ramp locations or a very limited number of at-grade intersections. Like Interstates, these roadways are designed and built to maximize their mobility function, and abutting land uses are not directly served by them.
Other Principal Arterials	These roadways serve major centers of metropolitan areas, provide a high degree of mobility and can also provide mobility through rural areas. Unlike their access-controlled counterparts, abutting land uses can be served directly. Forms of access for Other Principal Arterial roadways include driveways to specific parcels and at-grade intersections with other roadways.
Minor Arterials	Minor Arterials provide service for trips of moderate length, serve geographic areas that are smaller than their higher Arterial counterparts and offer connectivity to the higher Arterial system. In an urban context, they interconnect and augment the higher Arterial system, provide intra-community continuity and may carry local bus routes.
Collectors	
Major Collector	Collectors serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the Arterial network. Major Collectors serve both land access and traffic circulation in higher density residential, and commercial/industrial areas. Operating characteristics include higher speeds and more signalized intersections.
Minor Collector	Collectors serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the Arterial network. Minor Collectors serve both land access and traffic circulation in lower density residential and commercial/industrial area. Operating characteristics include lower speeds and fewer signalized intersections. Generally, Major Collector routes are longer in length; have lower connecting driveway densities; have higher speed limits; are spaced at greater intervals; have higher annual average traffic volumes; and may have more travel lanes than their Minor Collector counterparts.

Functional Classification	Description
Local Roads	
Local Roads	Locally classified roads account for the largest percentage of all roadways in terms of mileage. They are not intended for use in long distance travel, except at the origin or destination end of the trip, because of their provision of direct access to abutting land. Bus routes generally do not run on Local Roads. They are often designed to discourage through traffic. As public roads, they should be accessible for public use throughout the year. Local Roads are often classified by default. In other words, once all Arterial and Collector roadways have been identified, all remaining roadways are classified as Local Roads.

Source: FHWA 2013

Table 5-2 Roadway Classifications for Local Agencies in Resource Study Area

Functional Classification	Number of Lanes	Right-of-Way Width (ft)	Curb to Curb Width (ft)
County of Los Angeles			
Major Highway	4 or more	100	N/A
Secondary Highway	4	80	N/A
Limited Secondary Highway	2	64	N/A
City of Los Angeles			
Major Highway	4–6	100–104	80–84
Secondary Highway	4	80–90	60–70
Collector	2	64	44
City of La Mirada			
Major Arterial	4 divided	100	80
Minor Arterial	4 divided or undivided	80–88	64–68
Local Street	2 undivided	50	36
City of Norwalk			
Freeway	6–10 divided	>150	N/A
Major Highway	5–6 divided	100	80
Secondary Highway	4 divided or undivided	80	64
Collector Street	2 undivided	54–60	40
City of Santa Fe Springs			
Major Highway	4–6 divided	100–120	80–104
Secondary Highway	2–4 undivided	80	64
Local Street	2 undivided	60	36–40
City of Anaheim			
Major Arterial	6 divided	120	N/A
Primary Arterial	4–6 divided	106	N/A
Secondary Arterial	4 undivided	90	N/A
Collector Street	2 undivided	64	N/A

Functional Classification	Number of Lanes	Right-of-Way Width (ft)	Curb to Curb Width (ft)
City of Fullerton			
Major Arterial	6 divided	100–120	N/A
Primary Arterial	4 divided	80–84	N/A
Second Arterial	4 undivided	80–84	N/A
Local Collector Street	2 undivided	60–84	N/A
Residential Street	2 undivided	50–60	N/A
City of Orange			
Smart Street	4–8 divided	134–144	N/A
Principal Street	8 divided	134–144	N/A
Major Arterial	6 divided	120	104
Primary Arterial	4 divided	100	84
Secondary Arterial	4 undivided	86	70
Collector Street	2	66	46

Sources: County of Los Angeles 2025; City of La Mirada 2003; City of Norwalk 1996; City of Santa Fe Springs 1994; City of Anaheim 2025; City of Fullerton 2025; City of Orange 2025
N/A = not available

5.1.1 Major Freeways and State Routes

Regional access to each proposed station and the RSA is provided by US 101, I-5, I-105, I-605, SR 19, SR 39, SR 57, SR 90, and SR 91. These roadways are described in detail below.

5.1.1.1 United States Highway 101

This pre-Interstate-era freeway facility runs northwest-southeast and provides access to east Los Angeles, the north side of downtown Los Angeles, Hollywood, and the San Fernando Valley within Los Angeles County. US 101 generally provides four lanes in each direction near the proposed project section. Access to and from the proposed project section is provided via ramps at Vignes Street and Alameda Street.

5.1.1.2 Interstate 5

I-5 is a freeway facility running northwest-southeast and generally provides four mixed-flow lanes and one HOV lane in each direction near the proposed project section. Access to and from the proposed project section is provided via ramps at Imperial Highway, Norwalk Boulevard, and Bloomfield Boulevard.

5.1.1.3 Interstate 105

I-105 is a freeway facility running east-west and generally provides four mix-flow lanes and one HOV lane in each direction near the proposed project section. General access to and from the proposed project section is provided via ramps at Firestone Boulevard, while access from HOV is provided via the easterly terminus of I-105 at Studebaker Road.

5.1.1.4 Interstate 605

I-605 is a freeway facility running north-south and generally provides four mix-flow lanes and one HOV lane in each direction near the proposed project section. Access to and from the proposed project section is provided via ramps at Rosecrans Avenue and Telegraph Road.

5.1.1.5 State Route 19

SR 19 is a surface highway running north-south and generally provides two mixed-flow lanes in each direction near the proposed project section. SR 19 provides direct access to and from the proposed project section. SR 19 runs concurrent with Rosemead Boulevard, between Gallatin Road in Pico Rivera and Telegraph Road in Pico Rivera; and runs concurrent with Lakewood Boulevard, between Gardendale Street in Downey and Del Amo Boulevard in Long Beach.

5.1.1.6 State Route 39

SR 39 is a surface highway running north-south and generally provides three mixed-flow lanes in each direction near the proposed project section. SR 39 provides direct access to and from the proposed project section. SR 39 runs concurrent with Beach Boulevard, between Whittier Boulevard (SR 72) in La Habra and Pacific Coast Highway (SR 1) in Newport Beach.

5.1.1.7 State Route 57

SR 57 is a freeway facility running north-south and generally provides four to five mixed-flow lanes and one HOV lane in each direction near the proposed project section. Access to and from the proposed project section is provided via ramps at Chapman Avenue and Nutwood Avenue.

5.1.1.8 State Route 90

SR 90 is a surface highway running east-west and generally provides three mix-flow lanes in each direction near the proposed project section. SR 90 provides direct access to and from the proposed project section. SR 90 runs concurrent with Imperial Highway, between Beach Boulevard (SR 39) in La Habra and the interchange with SR 91 in Yorba Linda.

5.1.1.9 State Route 91

SR 91 is a freeway facility running east-west and generally provides four mix-flow lanes and one HOV lane in each direction near the proposed project section. Access to and from the proposed project section is provided via ramps at Harbor Boulevard and Lemon Street.

The roadway volumes are expressed as the average annual daily traffic (AADT) volumes, which are total daily volumes factored over a 365-day year and adjusted for seasonal variations. The AADT volumes are presented in Table 5-3.

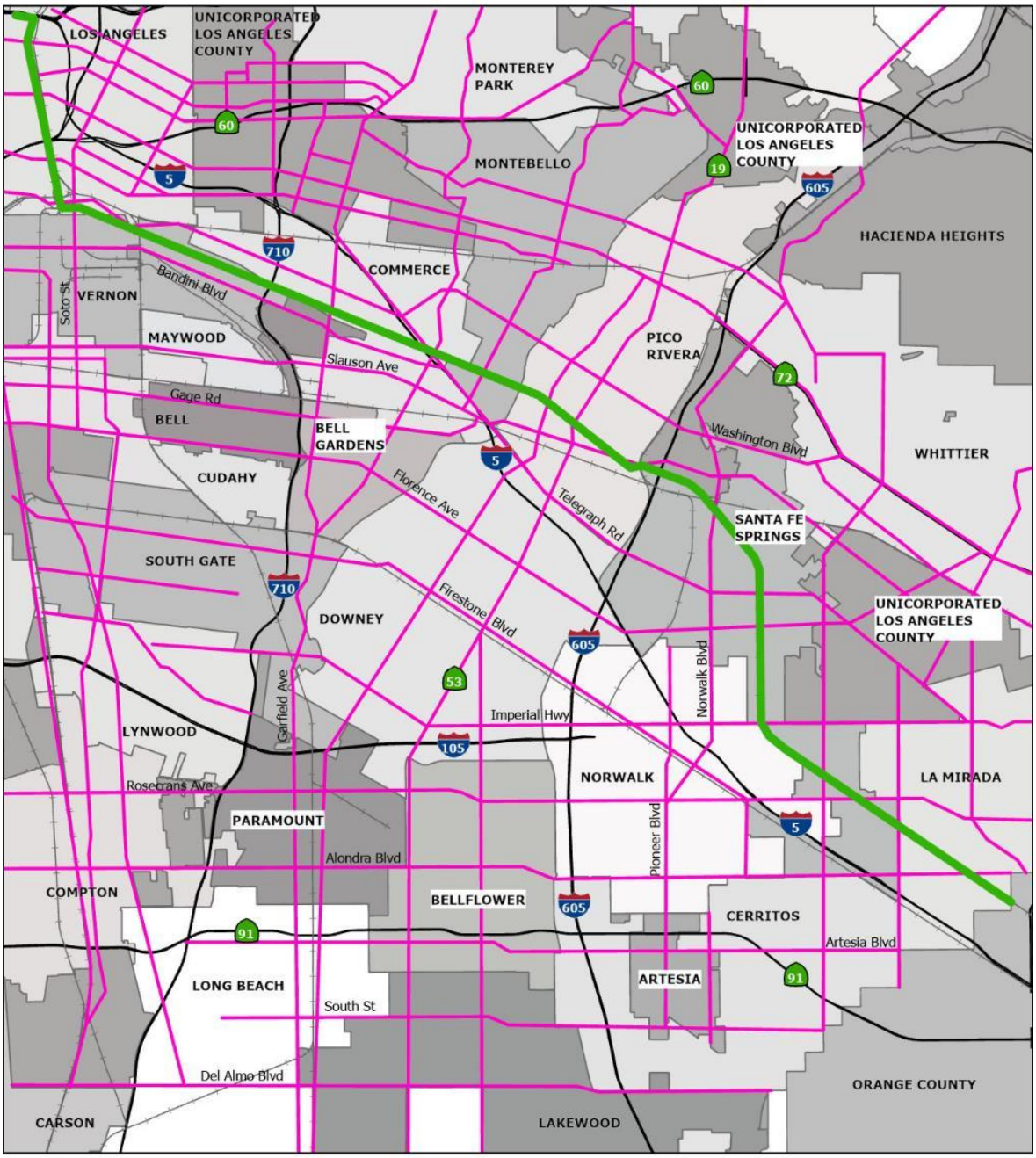
Table 5-3 Average Annual Daily Traffic Volumes Along Interstates and Major Freeways

Interstate or Major Freeway Route	AADT (Year 2014)
I-5 at Katella Avenue	264,700
I-605 at I-5 Interchange	295,000
I-105 at I-605 Interchange	208,000
SR 91 at Harbor Avenue	266,000
SR 57 at SR 91 Interchange	279,000

Source: Caltrans 2014
AADT = average annual daily traffic; I = Interstate; SR = State Route

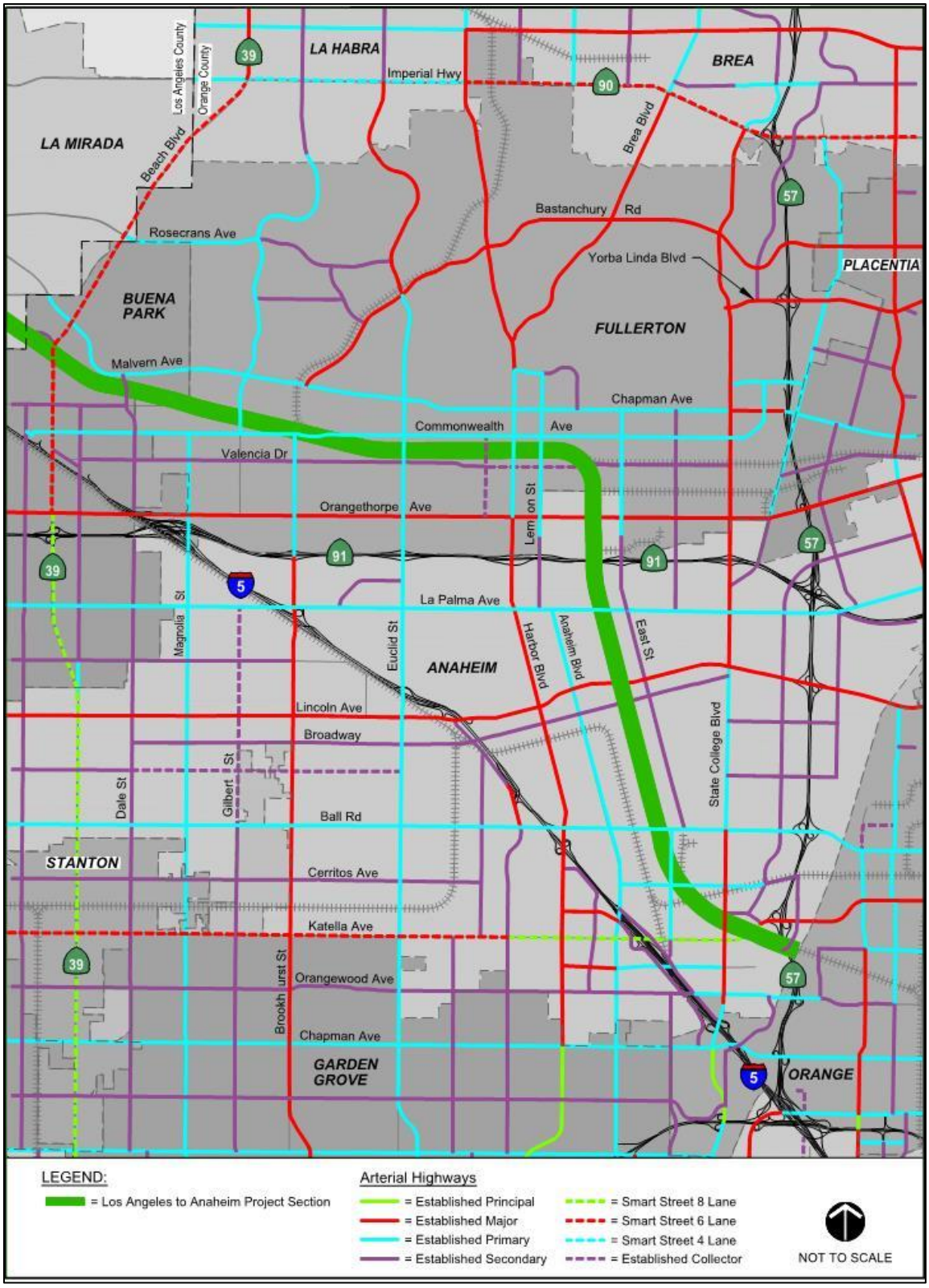
5.1.2 Regionally Significant Roadways

Regionally significant roadways within Los Angeles County are depicted in Metro's Countywide Significant Arterial Network map. Similarly for Orange County, OCTA developed a Master Plan of Arterial Highways in 2004, which depicts regionally significant roadways in Orange County. The maps of the Countywide Significant Arterial Network and Master Plan of Arterial Highways are depicted on Figure 5-1 and Figure 5-2, respectively.



Source: Metro 2016

Figure 5-1 Los Angeles County: Countywide Significant Arterial Network



Source: OCTA 2015

Figure 5-2 Orange County: Master Plan of Arterial Highways

In addition to major, primary, and secondary arterials, the Master Plan of Arterial Highways distinguishes Smart Streets, and "establishes" arterial streets in order to be eligible for funding under certain local programs. A summary of roadway classifications recognized by the Master Plan of Arterial Highways are presented in Table 5-4.

Table 5-4 Orange County Transportation Authority Master Plan of Arterial Highways Roadway Classifications

Functional Classification	Number of Lanes	Description
Principal Arterial	4 divided	A principal arterial is designed with the intent of moving automobiles, goods, and transit, accommodating up to 60,000 vehicles trips per day at an LOS of C
Major Arterial	3 divided	A major arterial is designed with the intent of moving automobiles, goods, and transit, accommodating up to 45,000 vehicles trips per day at an LOS of C
Primary Arterial	2 divided	A primary arterial is designed with the intent of moving automobiles, goods, and transit, accommodating up to 30,000 vehicles trips per day at an LOS of C
Secondary Arterial	2 undivided	A secondary arterial is designed with the intent of moving automobiles and bicycles, accommodating up to 20,000 vehicles trips per day at an LOS of C
Collector Arterial	1 undivided	A collector arterial is designed with the intent of accommodating up to 10,000 vehicles trips per day at an LOS of C
Smart Street	2–4 undivided	A smart street are arterials with enhanced traffic-carrying capacity with the intent of minimizing conflicts with cross traffic

Source: OCTA 2012
LOS = level of service

5.1.3 Regional Truck Routes

The federal Surface Transportation Assistance Act of 1982 defined a system to describe truck routes. The Surface Transportation Assistance Act truck routes within the RSA include national network and terminal access routes as follows:

- National Network (federal): The national network truck routes are federal highways. US 101, I-5, I-105, I-605, I-710, SR 22, SR 57, and SR 91 are the national network truck routes within the RSA.
- Terminal Access (state, local): The terminal access routes are portions of state routes or local roads that can accommodates trucks. Within the RSA, terminal access routes include SR 39 (concurrent with Beach Boulevard) and SR 90 (concurrent with Imperial Highway).

Similar to the roadway volumes, the truck volumes are also expressed as AADT truck volumes, which is total truck volume factored over a 365-day year with seasonal adjustments. The total truck volume includes the number of trucks with two or more axles. The total truck AADT expressed as a percentage of the total AADT volumes are presented on Table 5-5.

Table 5-5 Truck Average Annual Daily Traffic Volumes Along Regional Truck Routes

Truck Route	Truck AADT (Year 2014)	Percent Trucks
I-5 at Katella Avenue	25,411	9.6
I-605 at I-5 Interchange	23,867	8.1
I-105 at I-605 Interchange	18,409	8.9
SR 91 at Harbor Avenue	18,088	6.8
SR 57 at SR 91 Interchange	17,133	6.1

Source: Caltrans 2014
AADT = average annual daily traffic; I = Interstate; SR = State Route

5.1.4 Road Network in Vicinity of Stations

5.1.4.1 LAUS

In the vicinity of LAUS, the following roadways provide direct access to/from the existing station site and the proposed HSR station elements:

Alameda Street

This north-south roadway borders and provides primary access to the west side of the LAUS site. Access to existing station short-term vehicle parking areas and the main passenger loading area is provided via this roadway at the Alameda Street/Los Angeles Street intersection.

Cesar E. Chavez Avenue

This east-west roadway borders the north side of the LAUS site, and provides secondary access to the west side of the site and access to the subterranean parking structure at the Metro headquarters building.

Vignes Street, South of Cesar E. Chavez Avenue

This north-south roadway segment borders and provides primary access to the east side of the LAUS site. Direct access is provided at the west leg of the Vignes Street/Ramirez Street intersection, where vehicles can enter and exit the main accessway for the Metro headquarters parking structure, and buses and shuttles can access the Patsaouras Transit Plaza.

Vignes Street, North of Cesar E. Chavez Avenue

Parcels on the west/south side of this roadway are planned to be developed as part of the HSR project to provide passenger loading, kiss-and-ride, and similar direct access and support facilities for HSR passengers.

The area roadway network would be used to access remote parking sites in the following nearby areas:

- Chinatown Parking Cluster
  - Roughly bounded by College Street, Grand Avenue, Alameda Street, and Cesar E Chavez Avenue
- Pueblo Parking Cluster
  - Roughly bounded by Cesar E Chavez Avenue, Grand Avenue, Alameda Street, and US 101
- South of US 101 Parking Cluster
  - Roughly bounded by US 101, Grand Avenue, Second Street, and the Los Angeles River

5.1.4.2 Norwalk/Santa Fe Springs High-Speed Rail Station Option

Studebaker Road

Studebaker Road runs north-south to the west of the proposed station option. Studebaker Road has two travel lanes in each direction near the station and is classified as a Major Highway in the City of Norwalk General Plan.

Pioneer Boulevard

Pioneer Boulevard runs north-south to the west of the proposed station option. Pioneer Boulevard has two travel lanes in each direction near the station and is classified as a Major Highway in the City of Norwalk General Plan.

Norwalk Boulevard/San Antonio Drive

Norwalk Boulevard runs north-south to the west of the proposed station option and becomes San Antonio Drive south of I-5. Norwalk Boulevard has three travel lanes in each direction near the station and is classified as a Major Highway in the City of Norwalk General Plan.

Santa Fe Springs Road/Bloomfield Avenue

Santa Fe Springs Road runs north-south to the west of the proposed station option and becomes Bloomfield Avenue south of Imperial Highway. It has two travel lanes in each direction near the station and is classified as a Major Highway in the City of Santa Fe Springs General Plan.

Shoemaker Avenue

Shoemaker Avenue runs north-south on the east of the proposed station option. It has two travel lanes on each direction near the station and is classified as a Secondary Highway in the general plans of both the City of Norwalk and City of Santa Fe Springs.

Carmenita Road

Carmenita Road runs north-south to the east of the proposed station option. Carmenita Road has two travel lanes near the station and is classified as a Major Highway in the City of Norwalk General Plan.

Marquardt Avenue

Marquardt Avenue runs north-south to the east of the proposed station option. It has one travel lane in each direction near the station and is classified as a Local Street in the City of Santa Fe Springs General Plan.

Valley View Avenue

Valley View Avenue runs east-west to the east of the proposed station option. It has two travel lanes in each direction near the station and is classified as a Major Arterial in the City of La Mirada General Plan.

Telegraph Road

Telegraph Road run east-west to the north of the proposed station option. Telegraph Road has three travel lanes in each direction near the station and is classified as a Major Highway in the City of Santa Fe Springs General Plan.

Florence Road

Florence Road runs east-west to the north of the proposed station option. It has two travel lanes in each direction near the station and is classified as a Major Highway in the City of Santa Fe Springs General Plan.

Lakeland Road

Lakeland Road runs east-west to the north of the proposed station option. Lakeland Road has one travel lane in each direction near the station and is classified as a Local Street in the City of Santa Fe Springs General Plan.

Imperial Highway

Imperial Highway runs east-west to the north of proposed station option. It has three travel lanes in each direction near the station and is classified as a Major Highway in the City of Santa Fe Springs General Plan.

Leffingwell Road

Leffingwell Road runs east-west to the north of the proposed station option. It has two lanes in each direction near the station and is classified as a Secondary Highway in the County of Los Angeles General Plan.

Orden Drive

Orden Drive runs east-west to the south of the proposed station option. It has one travel lane in each direction and is an unclassified street in the City of Santa Fe Springs General Plan.

Foster Road

Foster Road runs east-west to the south of the proposed station option. It has one travel lane in each direction and is classified as a Local Street in the City of Santa Fe Springs General Plan.

Rosecrans Avenue

Rosecrans Avenue runs east-west to the south of the proposed station option. It has two westbound travel lanes and three eastbound travel lanes near the station. In the City of Santa Fe Springs General Plan, it is classified as a Major Highway.

5.1.4.3 Fullerton High-Speed Rail Station Option

Euclid Street

Euclid Street runs north-south to the west of the proposed station option. It has two travel lanes in each direction near the station and is classified as a Primary Arterial within the proposed station vicinity in the City of Fullerton General Plan.

Highland Avenue

Highland Avenue runs north-south on the west of the proposed station option. It has one travel lane in each direction near the station and is classified as a Secondary Arterial within the proposed station vicinity in the City of Fullerton General Plan.

Malden Avenue

Malden Avenue runs north-south in the middle of the proposed station option (discontinuous between Santa Fe Avenue and Walnut Avenue). It has one travel lane in each direction and is a residential street in the City of Fullerton General Plan.

Harbor Boulevard

Harbor Boulevard runs north-south on the east of the proposed station option. It has two travel lanes in each direction near the station and is classified as a Primary Arterial close to the proposed station in the City of Fullerton General Plan.

Brea Boulevard

Brea Boulevard runs north-south to the northeast of the proposed station option. It has two travel lanes in each direction and is classified as a Major Arterial in the vicinity of the proposed station in the City of Fullerton General Plan.

Lemon Street

Lemon Street runs north-south to the east of the proposed station option. It has two travel lanes in each direction and is classified as a Primary Arterial near the station in the City of Fullerton General Plan.

Raymond Avenue

Raymond Avenue runs north-south to the east of the proposed station option. Raymond Avenue has two travel lanes in each direction near the station. It is classified as a Primary Arterial south of Chapman Avenue near the station in the City of Fullerton General Plan.

State College Boulevard

State College Boulevard runs north-south to the east of the proposed station option. It has three travel lanes in each direction in the vicinity of the station. It is classified as a Major Arterial near the station in the City of Fullerton General Plan.

Imperial Highway (State Route 90)

Imperial Highway (SR 90) runs east-west to the north of the proposed station option. It has three travel lanes in each direction and is classified as a Major Arterial near the station in the City of Fullerton General Plan.

Bastanchury Road

Bastanchury Road runs east-west to the north of the proposed station option. It has two to three travel lanes in each direction and is classified as a Major Arterial near the station in the City of Fullerton General Plan.

Yorba Linda Boulevard

Yorba Linda Boulevard runs east-west to the north of the proposed station option. It has three travel lanes in each direction in the vicinity of the station and is classified as a Major Arterial near the station in the City of Fullerton General Plan.

Nutwood Avenue

Nutwood Avenue runs east-west to the north of the proposed station option. It has three travel lanes in each direction in the vicinity of the station and is classified as a Primary Arterial near the station in the City of Fullerton General Plan.

Berkeley Avenue

Berkeley Avenue runs east-west to the north of the proposed station. It has two travel lanes in each direction between Harbor Boulevard and Lemon Street. It is classified as a Primary Arterial between Harbor Boulevard and Lemon Street in the City of Fullerton General Plan.

Chapman Avenue/Malvern Avenue

Chapman Avenue runs east-west to the north of the proposed station option and turns into Malvern Avenue at west of Euclid Street. Chapman Avenue has two travel lanes in each direction and is classified as a Primary Arterial near the proposed station in the City of Fullerton General Plan.

Commonwealth Avenue

Commonwealth Avenue runs east-west to the north of the proposed station option. It has two travel lanes in each direction and is classified as a Primary Arterial near the station in the City of Fullerton General Plan.

Santa Fe Avenue

Santa Fe Avenue runs east-west to the north of the proposed station option. It has one travel lane in each direction and is a residential street in the City of Fullerton General Plan.

Walnut Avenue

Walnut Avenue runs east-west on the north of the proposed station option. It has one travel lane in each direction and is a residential street in the City of Fullerton General Plan.

Truslow Avenue

Truslow Avenue runs east-west on the south of the proposed station option. It has one travel lane in each direction and is a residential street in the City of Fullerton General Plan.

Valencia Drive

Valencia Drive runs east-west to the south of the proposed station option. Valencia Drive has one travel lane in each direction and is classified as a Local Collector Street within the proposed station vicinity in the City of Fullerton General Plan.

Orangethorpe Avenue

Orangethorpe Avenue runs east-west to the south of the proposed station option. It has three travel lanes in each direction near the station and is classified as a Major Arterial in the City of Fullerton General Plan.

5.1.4.4 ARTIC

Disneyland Drive

Disneyland Drive runs north-south to the west of the proposed station. It has three lanes in each direction and is classified as a Secondary Arterial in the City of Anaheim General Plan.

Harbor Boulevard

Harbor Boulevard runs north-south to the west of the proposed station. It has three lanes in each direction and is classified as a Major Arterial in the City of Anaheim General Plan.

Anaheim Boulevard/Haster Street

Anaheim Boulevard runs north-south to the west of the proposed station and becomes Haster Street south of Katella Avenue. Anaheim Boulevard has three lanes in each direction near the proposed station and it is classified as a Primary Arterial in the City of Anaheim General Plan.

East Street

East Street runs north-south to the west of the proposed station. East Street has two travel lanes in each direction near the proposed station. East Street is classified as a Secondary Arterial in the City of Anaheim General Plan.

Lewis Street

Lewis Street runs north-south to the west of the proposed station. Lewis Street has two travel lanes in each direction near the proposed station. It is classified as a Primary Arterial in the vicinity of the station in the City of Anaheim General Plan.

State College Boulevard

State College Boulevard runs north-south to the west of the proposed station. It has three lanes in each direction near the proposed station and is classified as a Primary Arterial in the vicinity of the station in the City of Anaheim General Plan.

Sunkist Street

Sunkist Street runs north-south to the northwest of the proposed station. It has two travel lanes in each direction and is classified as Secondary Arterial in the City of Anaheim General Plan.

Douglass Road

Douglass Road runs north-south to the west of the proposed station. It has two to three travel lanes in each direction and is classified as a Primary Arterial between Cerritos Avenue and

Katella Avenue and as a Secondary Arterial south of Katella Avenue in the City of Anaheim General Plan.

Main Street

Main Street runs north-south to the east of the proposed station. It has two lanes in each direction and is classified as a Major Arterial in the City of Orange General Plan.

Santa Ana Street

Santa Ana Street runs east-west to the north of the proposed station. Santa Ana Street has one travel lane in each direction near the proposed station and is classified as a Collector Street in the City of Anaheim General Plan.

South Street

South Street runs east-west to the north of the proposed station. South Street has one travel lane in each direction near the proposed station and is classified as a Collector Street in the City of Anaheim General Plan.

Vermont Avenue

Vermont Avenue runs east-west to the north of the proposed station. Vermont Avenue has one travel lane in each direction near the proposed station and is classified as a Collector Street in the City of Anaheim General Plan.

Ball Road/Taft Avenue

Ball Road runs east-west to the north of the proposed station. Ball road has three travel lanes in each direction near the proposed station and is classified as a Primary Arterial in the City of Anaheim General Plan. East of the Santa Ana River, Ball Road becomes Taft Avenue. Taft Avenue is classified as a Major Arterial between the Santa Ana River and Tustin Street in the City of Orange General Plan.

Winston Road

Winston Road runs east-west to the north of the proposed station. It has one travel lane in each direction near the proposed station and is classified as an unclassified Street in the City of Anaheim General Plan.

Cerritos Avenue

Cerritos Avenue runs east-west to the north of the proposed station. It has two travel lanes in each direction near the proposed station and is classified as a Primary Arterial in the vicinity of the station in the City of Anaheim General Plan.

Howell Avenue

Howell Avenue runs east-west to the north of the proposed station. It has one travel lane in each direction near the proposed station and is classified as a Secondary Arterial in the City of Anaheim General Plan.

Katella Avenue

Katella Avenue runs east-west to the north of the proposed station. It has three travel lanes in each direction near the proposed station. In Anaheim, Katella Avenue is classified as a Major Arterial between Magnolia Avenue and Walnut Street. In Orange, Katella Avenue is classified as a Smart Street between Orange's western boundary and SR 55.

Gene Autry Way

Gene Autry Way runs east-west to the south of the proposed station. It has two travel lanes in each direction near the proposed station and is classified as a Secondary Arterial in the City of Anaheim General Plan.

Orangewood Avenue/Walnut Avenue

Orangewood Avenue runs east-west to the south of the proposed station. Orangewood Avenue has two travel lanes in each direction near the proposed station. In the City of Anaheim General Plan, Orangewood Avenue is classified as a Primary Arterial between State College Boulevard and the City eastern boundary. Orangewood Avenue becomes Walnut Avenue and is classified as a Primary Arterial between SR 57 and Eckhoff Street and as a Major Arterial between Eckhoff Street and Main Street (according to the City of Orange General Plan).

Chapman Avenue

Chapman Avenue runs east-west to the south of the proposed station. It has three travel lanes in each direction near the proposed station and is classified as a Primary Arterial in the City of Anaheim General Plan. In the City of Orange General plan, Chapman Avenue is classified as a Major Arterial west of Main Street.

5.2 Corridor Traffic Volumes

As discussed in Section 4.1, Definition of Resource Study Area, the RSA effects extend as far from the project section footprint as the project-created traffic changes that can be meaningfully detected. This is accomplished by estimating traffic that would be potentially shifted or added as a result of the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B.

To better identify potential effects that would result from the project, the RSA comprises several distinct analysis areas. The intent of this distinction is to provide a layered approach to Shared Passenger Track Alternative A and Shared Passenger Track Alternative B construction packaging and the environmental effects associated with each improvement along the corridor. Additionally, specific grade-separation projects may be built during later interim phases of the HSR Phase 1 implementation, during which mitigations for the construction of the project would already need to be implemented.

The Shared Passenger Track Alternative A and Shared Passenger Track Alternative B corridor analysis area contains all of the physical improvements required along the project section outside of station areas to build the actual HSR track facility. This analysis area definition includes possible effects on other existing facilities (such as the Buena Park Metrolink Station, maintenance facility, or traction power substations), because the track alignment would not be physically possible to build without these improvements.

The LMF operations analysis area is defined as that area within the RSA for which operations related to trips generated to and from the facility, ingress and egress at the facility, parking, or modifications to the roadway network needed to build the station, can be meaningfully detected. Level 1 LMFs have been determined to not have meaningfully detectable trips during peak hours.[18]

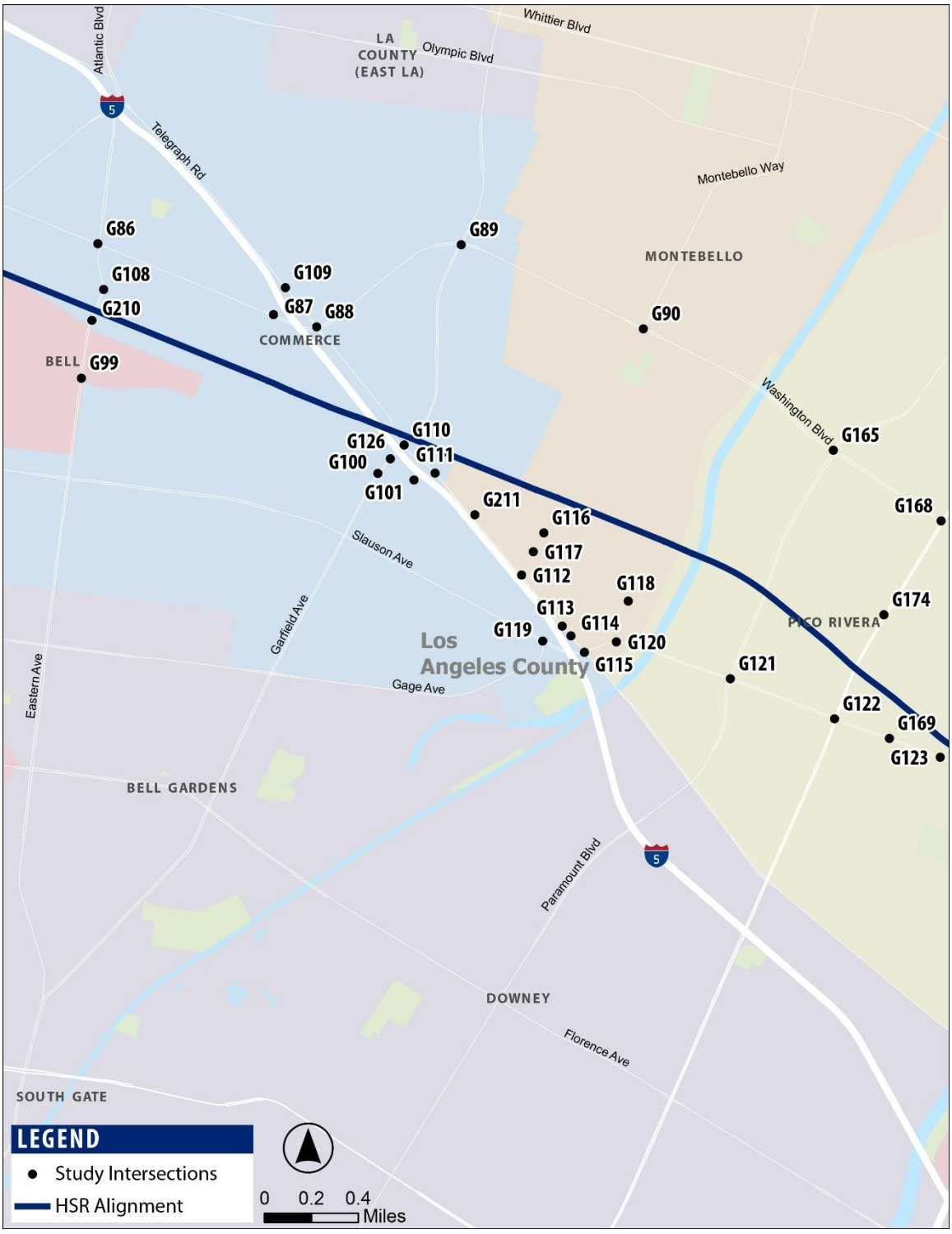
Project corridor RSA study intersections, including those outside the vicinity of station areas, are depicted on Figure 5-3, sheets 1 to 7. RSA intersections along the corridor within the vicinity of stations are covered in further detail in Section 5.8, Existing Conditions around High-Speed Rail Stations.

[18] As explained in the *Summary of Requirements for Maintenance Facilities* (March 2016), and *Information Provided from Operations and Maintenance Team (Network Rail) for Purposes of EIS/EIR Clearance* (April 2016), Level 1 LMFs are primarily for storage, and minor operations undertaken during daytime hours are “primarily the movement of trains into and out of the storage tracks,” with more intense use during off-peak hours. Staffing at LMFs higher than Level 1 is expected to be approximately 40 persons per shift with shifts staggered to avoid traffic peak hours, which would result in the peak hour number of trips to and from the Level 1 LMF being below the threshold for study.



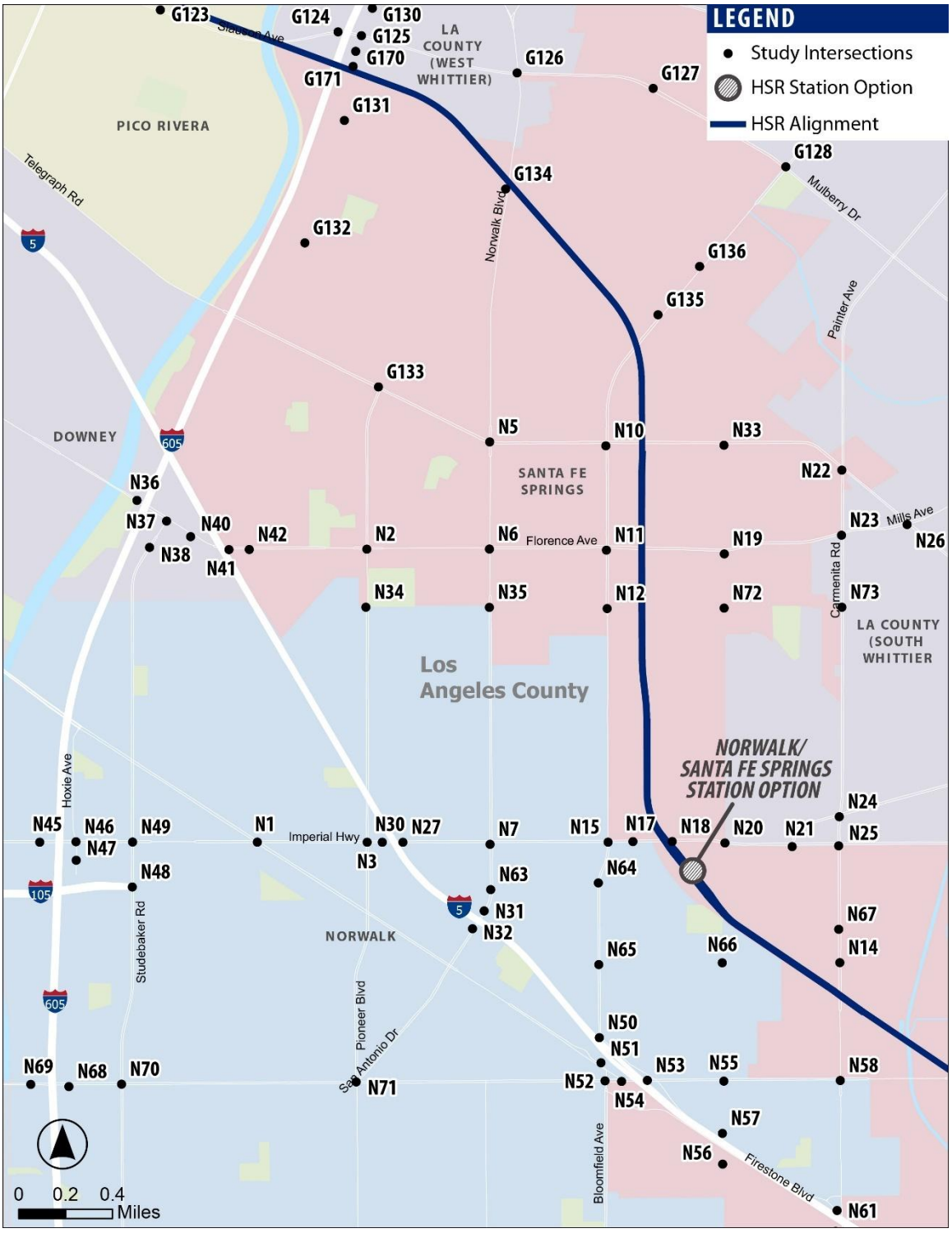
G intersection number prefix indicates intersections outside of station areas.

Figure 5-3 Resource Study Area Study Intersections (Sheet 1 of 7)



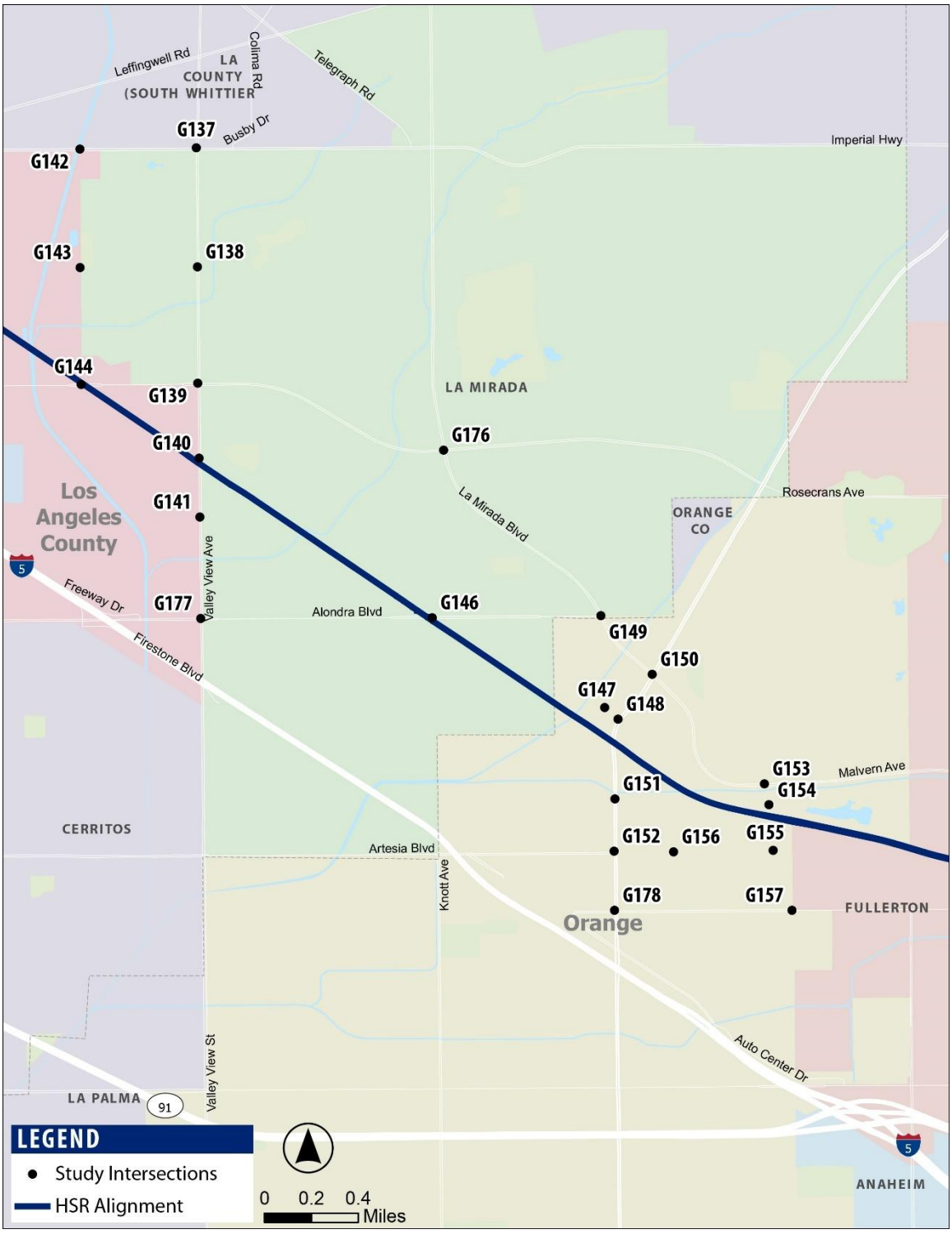
G intersection number prefix indicates intersections outside of station areas.

Figure 5-3 Resource Study Area Study Intersections (Sheet 2 of 7)



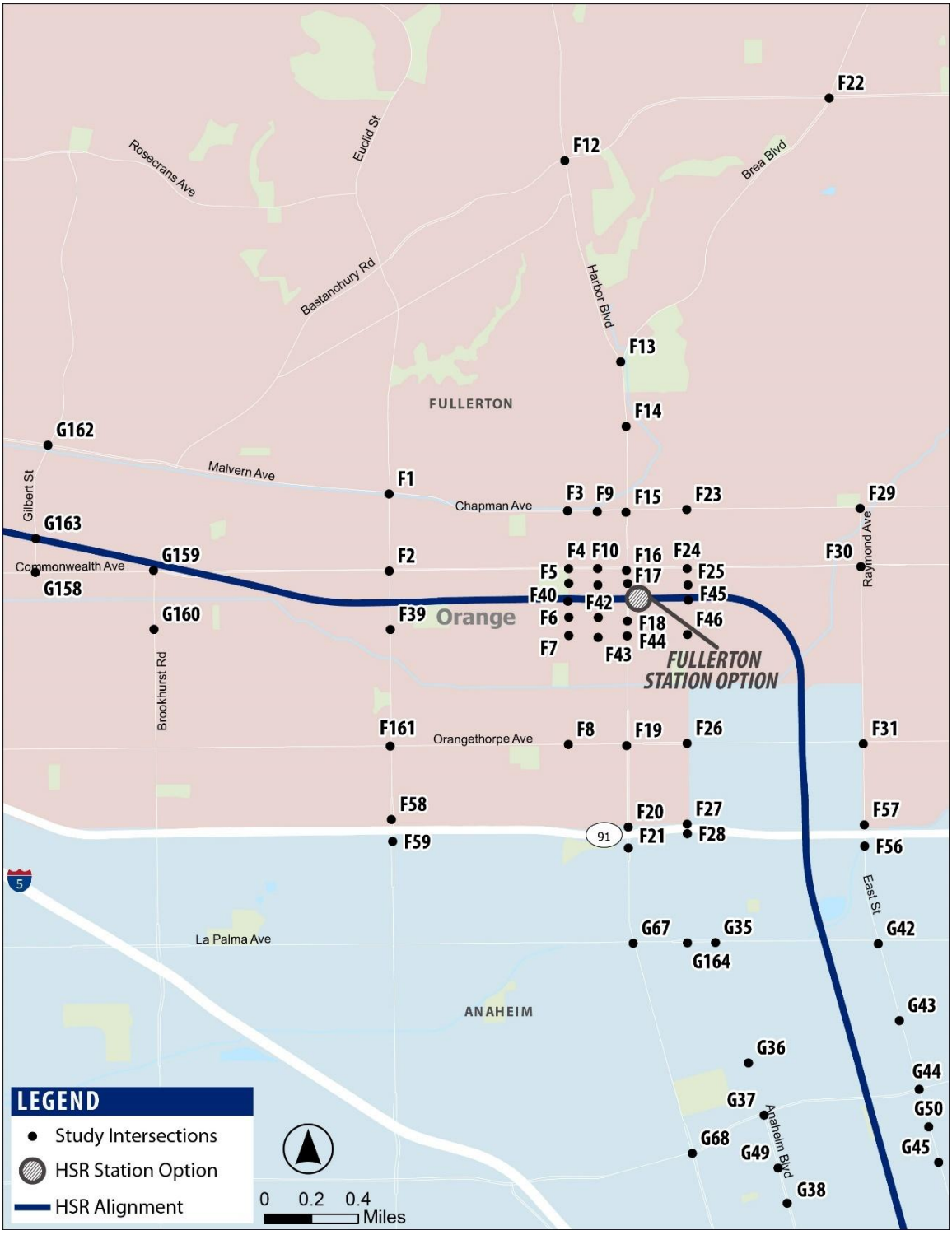
G intersection number prefix indicates intersections outside of station areas.
N intersection number prefix indicates intersections within the Norwalk/Santa Fe Springs Metrolink High-Speed Rail Station Option area.

Figure 5-3 Resource Study Area Study Intersections (Sheet 3 of 7)



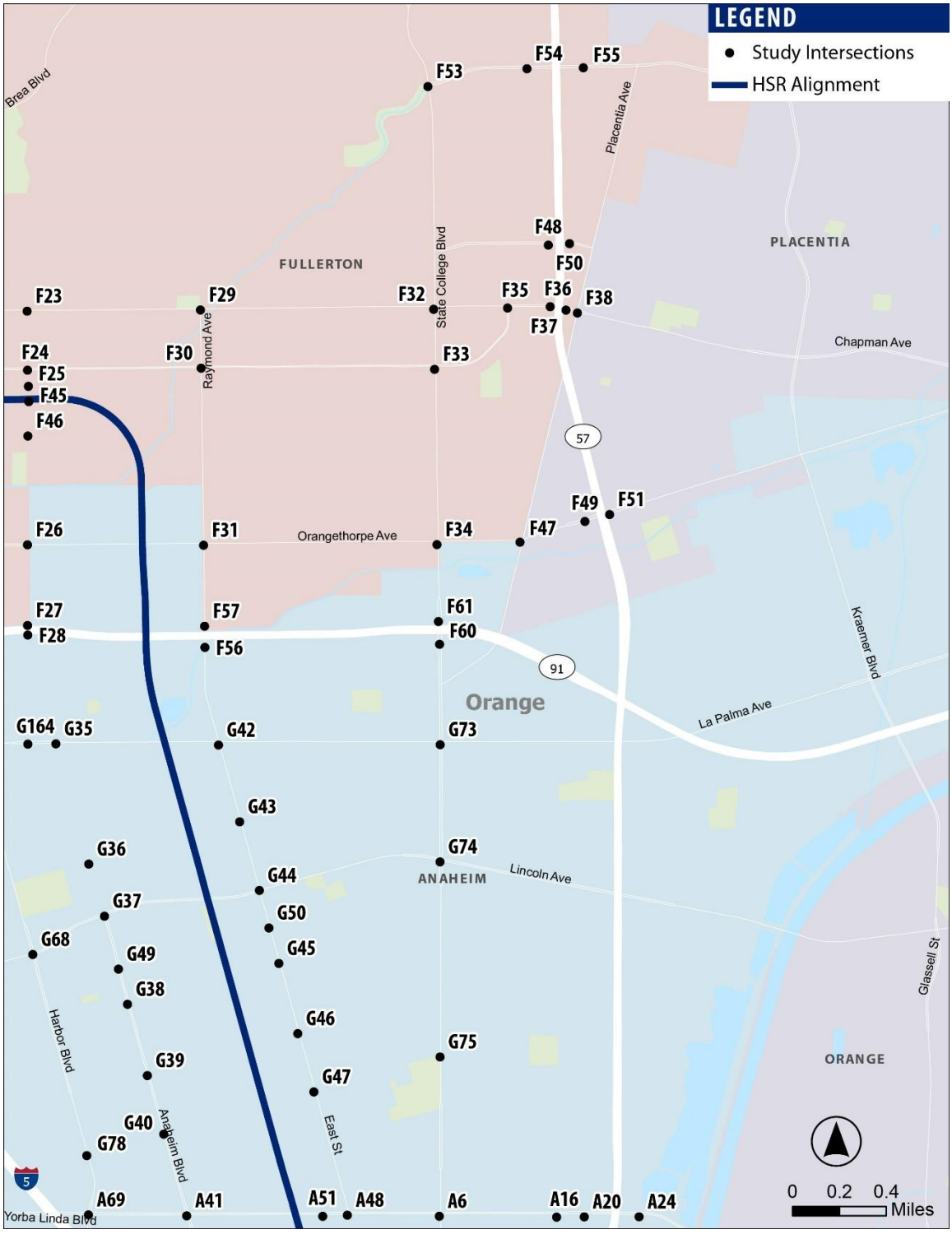
G intersection number prefix indicates intersections outside of station areas.

Figure 5-3 Resource Study Area Study Intersections (Sheet 4 of 7)



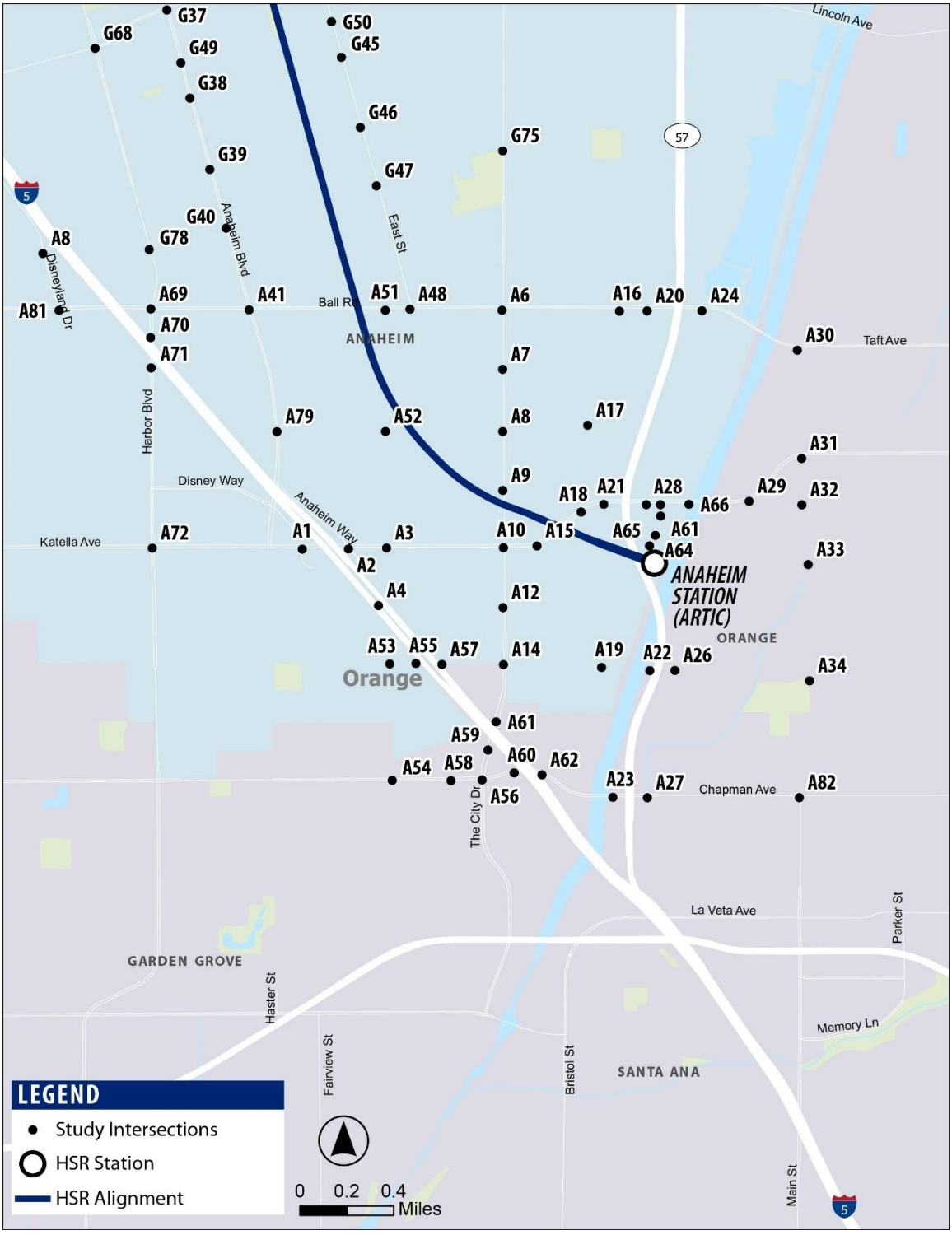
G intersection number prefix indicates intersections outside of station areas.
F intersection number prefix indicates intersections within Fullerton High-Speed Rail Station Option area.

Figure 5-3 Resource Study Area Study Intersections (Sheet 5 of 7)



G intersection number prefix indicates intersections outside of station areas.
F intersection number prefix indicates intersections within Fullerton High-Speed Rail Station Option area.
A intersection number prefix indicates intersections within Anaheim Regional Transportation Intermodal Center station area.

Figure 5-3 Resource Study Area Study Intersections (Sheet 6 of 7)



G intersection number prefix indicates intersections outside of station areas.
A intersection number prefix indicates intersections within Anaheim Regional Transportation Intermodal Center station area.

Figure 5-3 Resource Study Area Study Intersections (Sheet 7 of 7)

5.2.1 Major Roadway Traffic Volumes

The major roadway daily volumes were counted from September 2015 to November 2015, or were obtained from annual counts compiled by OCTA and Metro. Supplemental manual counts were collected in November 2016. These numbers represent the total volume across all lanes in both directions. Figure 5-4, sheets 1 to 5 depict daily volumes and truck daily volumes along the corridor for major roadway segments outside the station area vicinity. Daily volumes, location of traffic counts, and speed limits along the corridor on major roadways outside the station area vicinity are presented in Table 5-6.

Daily volumes, traffic counts, and speed limits for major roadways along the corridor within the vicinity of stations are covered in further detail in Section 5.8, Existing Conditions around High-Speed Rail Stations.



Figure 5-4 Alignment: Existing Average Daily Traffic and Truck Routes (Sheet 1 of 5)

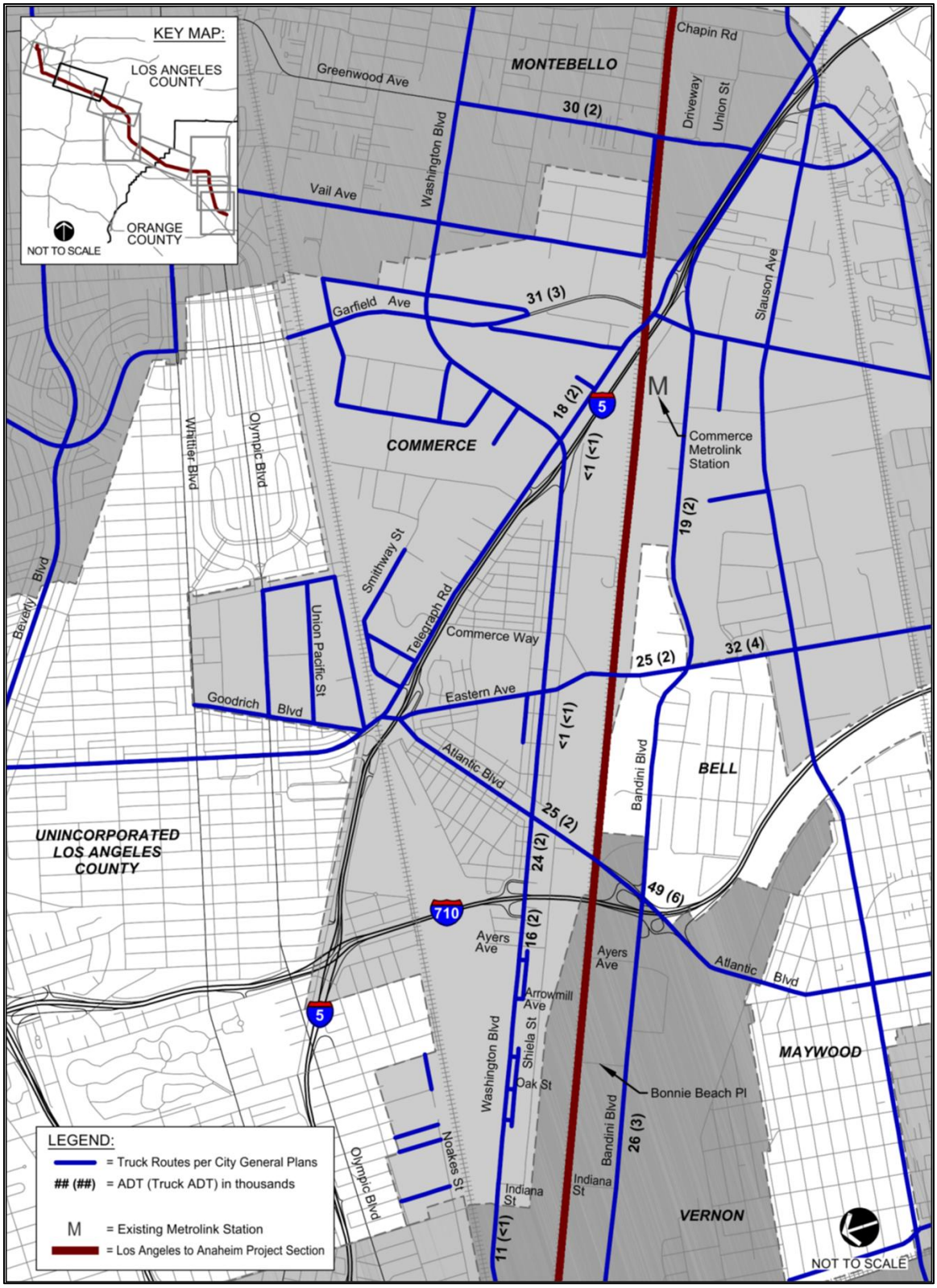


Figure 5-4 Alignment: Existing Average Daily Traffic and Truck Routes (Sheet 2 of 5)

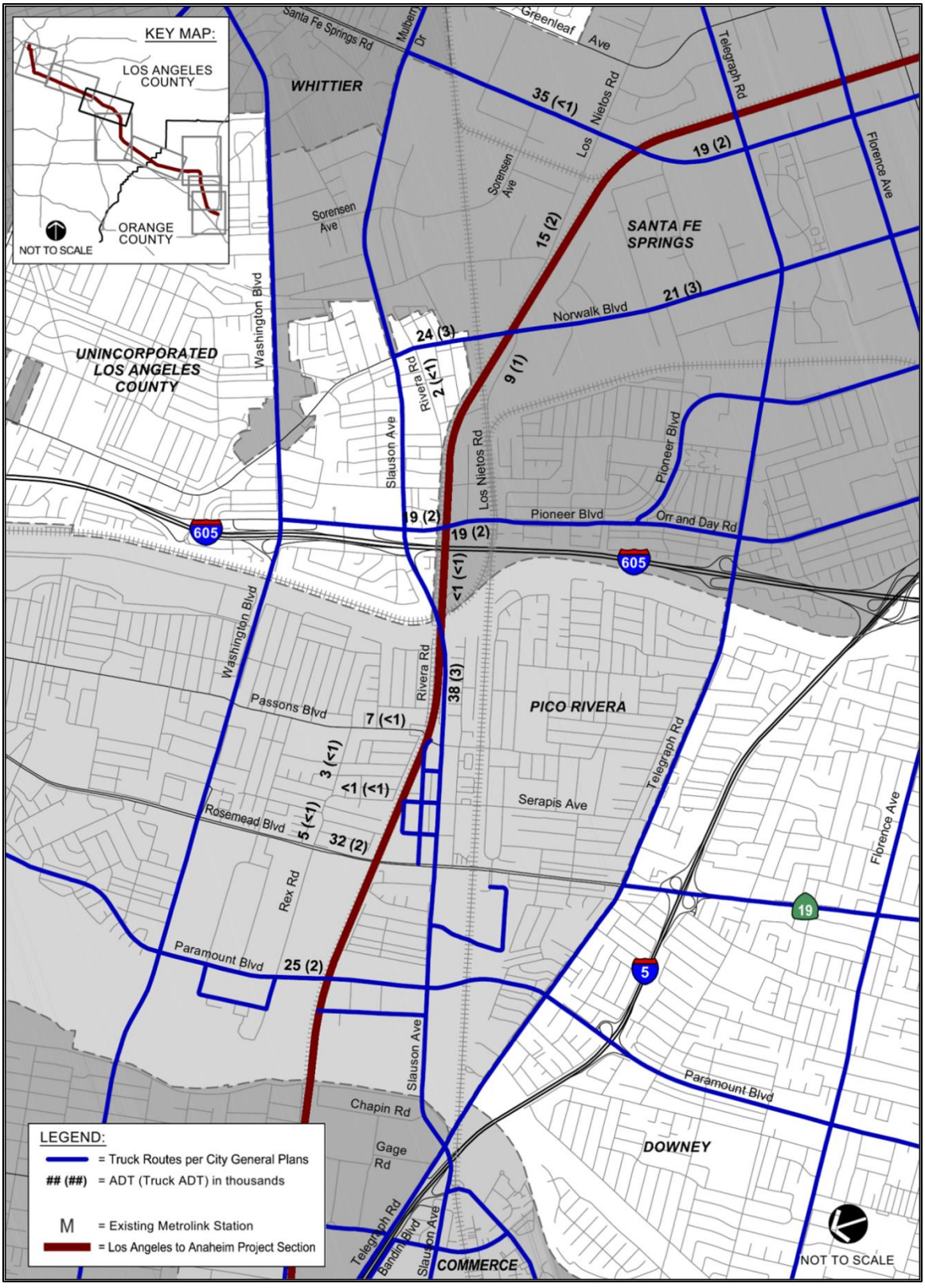


Figure 5-4 Alignment: Existing Average Daily Traffic and Truck Routes (Sheet 3 of 5)

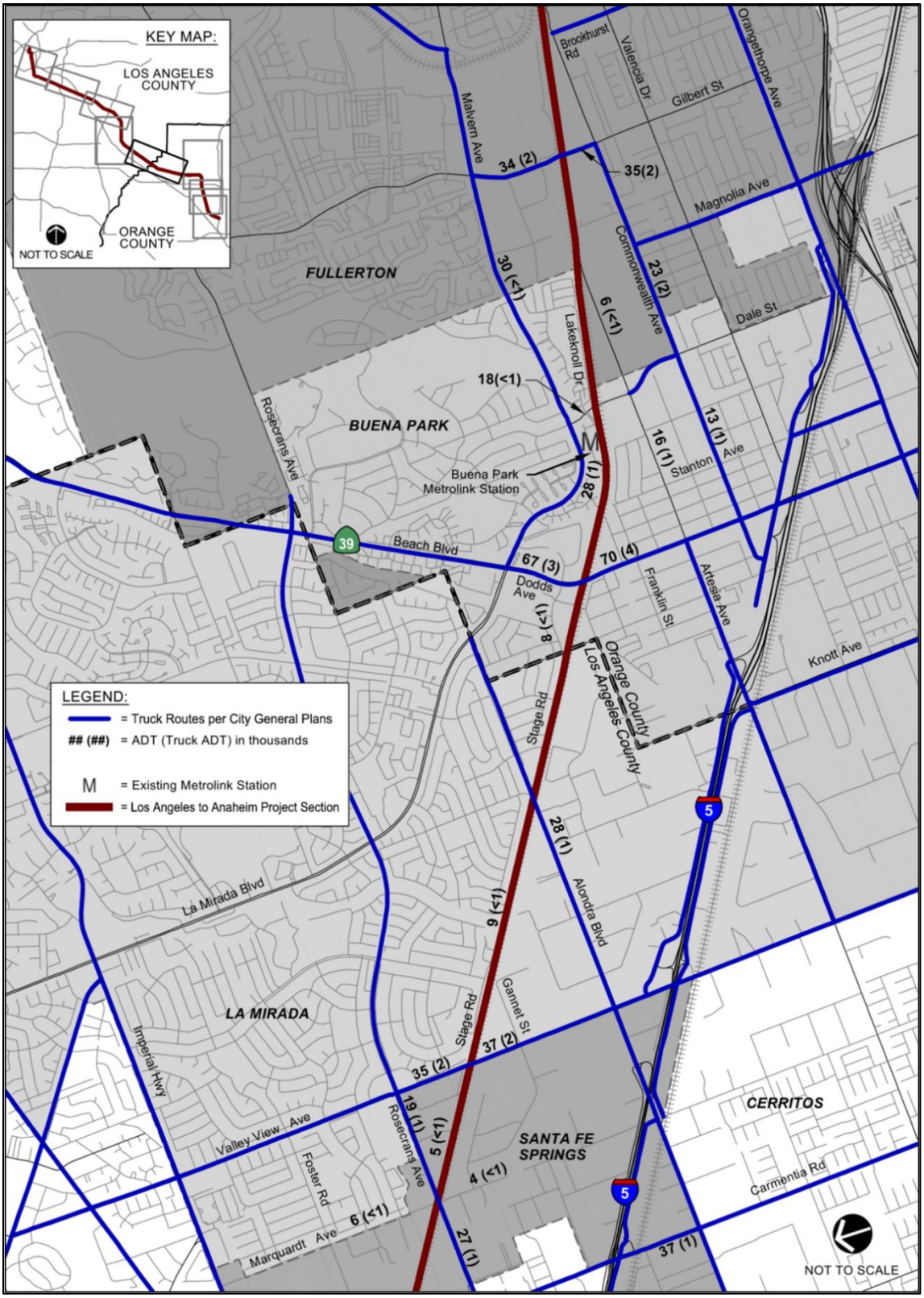


Figure 5-4 Alignment: Existing Average Daily Traffic and Truck Routes (Sheet 4 of 5)

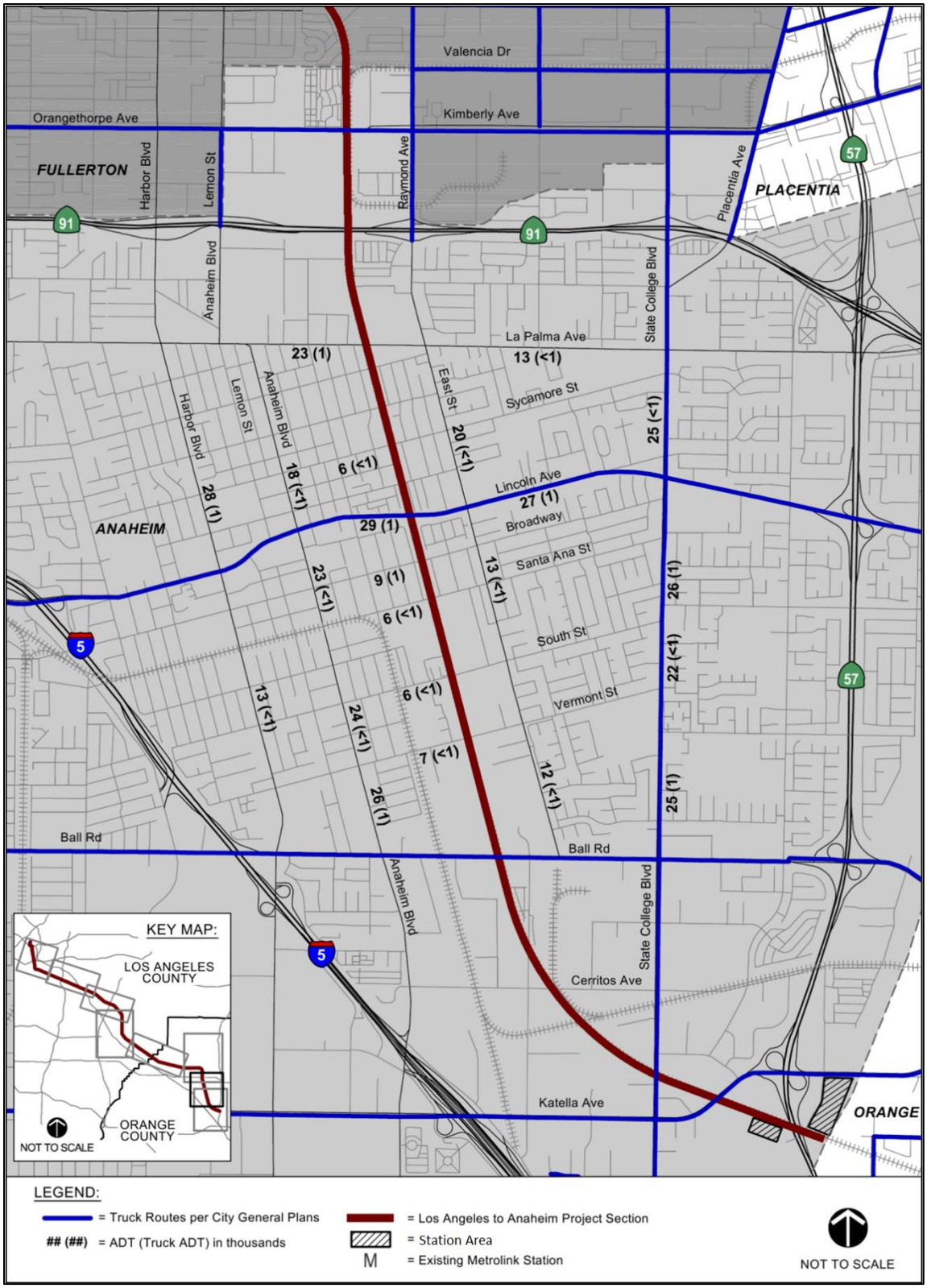


Figure 5-4 Alignment: Existing Average Daily Traffic and Truck Routes (Sheet 5 of 5)

Table 5-6 Major Roadway Traffic Volumes: Alignment, Existing Conditions

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Vermont Ave	west of East St	---	2D	35	7,400	< 1,000
South St	west of East St	---	2U	35	6,100	< 1,000
Santa Ana St	west of East St	---	2U	35	6,300	< 1,000
Broadway	west of East St	---	4D	35	9,000	< 1,000
Sycamore St	west of East St	---	2U	30	6,400	< 1,000
Harbor Blvd	La Palma Ave	Lincoln Ave	4D	35	27,600	1,200
Harbor Blvd	Lincoln Ave	Ball Rd	4D	35	13,400	< 1,000
La Palma Ave	Harbor Blvd	East St	4D	35	23,000	1,000
La Palma Ave	East St	State College Blvd	4D	40	13,400	< 1,000
Lincoln Ave	Anaheim Blvd	East St	6D	35	29,000	< 1,000
Lincoln Ave	East St	State College Blvd	4D	40	26,700	1,200
Soto St	E 26th St	Washington Blvd	4D	35	37,700	3,600
Downey Rd	Bandini Blvd	Washington Blvd	4D	40	34,400	3,200
E 26th St	Downey Rd	Bandini Blvd	2D	35	12,800	1,200
Atlantic Blvd	Bandini Blvd	Washington Blvd	4D	40	24,600	2,300
Eastern Ave	Bandini Blvd	Commerce Way	4D	40	25,000	2,400
Telegraph Rd	Garfield Ave	Washington Blvd	4D	45	17,800	1,700
Garfield Ave	Telegraph Rd	Washington Blvd	4D	40	31,400	2,600
Greenwood Ave	Union St	Washington Blvd	4D	40	20,900	1,900
Paramount Blvd	Slauson Ave	Washington Blvd	4D	45	25,400	2,100
Rosemead Blvd (SR 19)	Slauson Ave	Washington Blvd	4D	40	31,600	2,300
Serapis Ave	north of Slauson Ave	---	2U	25	2,900	< 1,000
Serapis Ave	Rivera Rd	Rex Rd	2U	25	700	< 1,000
Rex Rd	Rosemead Blvd (SR 19)	Serapis Ave	2U	35	4,700	< 1,000
Rex Rd	Serapis Ave	Passons Blvd	2U	25	3,400	< 1,000
Passons Blvd	Slauson Ave	Washington Blvd	2U	25	7,200	< 1,000
Slauson Ave	Passons Blvd	I-605 SB on-ramp	4D	40	37,800	3,100
Pioneer Blvd	Los Nietos Rd	Rivera Rd	4D	35	19,200	2,200
Pioneer Blvd	Rivera Rd	Slauson Ave	4D	25	19,100	2,200
Rivera Rd	west of Pioneer Blvd	---	2U	25	500	< 1,000
Rivera Rd	Pioneer Blvd	Norwalk Blvd	2U	25	1,600	< 1,000
Norwalk Blvd	Telegraph Rd	Los Nietos Rd	4D	30	21,100	2,500
Norwalk Blvd	Los Nietos Rd	Slauson Ave	4U	40	24,000	2,900
Los Nietos Rd	Pioneer Blvd	Norwalk Blvd	2U	40	9,400	1,100

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Los Nietos Rd	Norwalk Blvd	Santa Fe Springs Rd	2D	40	14,600	1,700
Santa Fe Springs Rd	Telegraph Rd	Los Nietos Rd	4D	45	18,900	2,300
Rosecrans Ave	Carmenita Rd	Marquardt Ave	4D	45	27,000	1,400
Rosecrans Ave	Marquardt Ave	Valley View Ave	4D	45	19,100	1,000
Marquardt Ave	Rosecrans Ave	Foster Ave	2D	40	6,000	< 1,000
Marquardt Ave	south of Rosecrans Ave	---	2U	40	4,000	< 1,000
Valley View Ave	Gannet St	Stage Rd	4D	45	36,700	1,900
Valley View Ave	Stage Rd	Rosecrans Ave	4D	45	35,000	1,800
Stage Rd	Rosecrans Ave	Valley View Ave	2U	45	5,200	< 1,000
Stage Rd	Valley View Ave	Alondra Blvd	4U	45	9,000	< 1,000
Alondra Blvd	Valley View Ave	La Mirada Blvd	4D	45	27,600	1,400
Stage Rd	Alondra Blvd	Beach Blvd (SR 39)	4U	45	7,800	< 1,000
Beach Blvd (SR 39)	Franklin St	Stage Rd	6D	35	69,800	3,500
Artesia Blvd	Beach Blvd (SR 39)	Dale St	4D	40	15,500	< 1,000
Commonwealth Ave	Beach Blvd (SR 39)	Dale St	4D	40	12,800	< 1,000
Malvern Ave	Beach Blvd (SR 39)	Dale St	4D	45	27,700	1,400
Dale St	Artesia Blvd	Malvern Ave	4D	40	18,400	< 1,000
Artesia Blvd	Dale St	Gilbert St	2U	40	6,000	< 1,000
Commonwealth Ave	Dale St	Gilbert St	4D	40	22,900	1,700
Malvern Ave	Dale St	Gilbert St	4D	45	29,900	< 1,000
Gilbert St	Commonwealth Ave	Artesia Blvd	4D	40	35,400	1,800
Gilbert St	Artesia Blvd	Malvern Ave	5D	40	33,900	1,700
Commonwealth Ave	Brookhurst Rd	Euclid St	4D	40	9,800	< 1,000
State College Blvd	La Palma Ave	Lincoln Ave	6D	40	25,000	< 1,000
State College Blvd	Lincoln Ave	South St	6D	40	26,000	1,000
State College Blvd	South St	Wagner Ave	6D	40	22,000	< 1,000
State College Blvd	Wagner Ave	Ball Rd	6D	40	24,000	< 1,000
East St	La Palma Ave	Lincoln Ave	4D	35	20,000	< 1,000
East St	Lincoln Ave	South St	4D	35	13,000	< 1,000
East St	South St	Vermont St	4D	35	13,000	< 1,000
East St	Vermont St	Ball Rd	4D	40	12,000	< 1,000
Anaheim Blvd	La Palma Ave	Lincoln Ave	4D	35	18,000	< 1,000
Anaheim Blvd	Lincoln Ave	South St	4D	30	23,000	< 1,000
Anaheim Blvd	South St	Vermont St	4D	35	24,000	< 1,000
Anaheim Blvd	Vermont St	Ball Rd	4D	35	26,000	1,000

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Carmenita Rd	north of Alondra Blvd	---	4D	40	36,600	1,400
Beach Blvd	Malvern Ave	Stage Rd	6D	40	67,000	2,500
Santa Fe Springs Rd	north of Los Nietos Rd	---	4D	40	34,700	1,300
Washington Blvd	west of Indiana St	---	4D	45	10,600	< 1,000
Washington Blvd	Ayers Ave	I-710	4D	40	15,700	1,500
Washington Blvd	I-710	Atlantic Blvd	4D	40	23,500	2,200
Bandini Blvd	Downey Rd	Atlantic Blvd	4U	40	26,000	3,200
Seville Ave	Vernon Ave	Leonis Blvd	2U	25	3,000	< 1,000
E 46th St	Seville Ave	Soto St	2U	25	1,700	< 1,000
Soto St	Vernon Ave	Leonis Blvd	5U	35	28,000	3,400
Boyle Ave	Vernon Ave	Leonis Blvd	2U	25	7,300	< 1,000
Alcoa Ave	Vernon Ave	Leonis Blvd	2U	25	2,900	< 1,000
Downey Rd	Vernon Ave	Leonis Blvd	4U	40	27,000	3,300
Atlantic Blvd	Bandini Blvd	Slauson Ave	6U	45	49,000	5,900
Eastern Ave	Bandini Blvd	Slauson Ave	4D	40	32,000	3,800
Bandini Blvd	Eastern Ave	Garfield Ave	4U	40	19,000	2,300
E 26th St	west of Commerce Station	---	2U	25	500	< 1,000
E 26th St	east of Commerce Station	---	2U	25	800	< 1,000

ADT = average daily trip; D = divided roadway; I = Interstate; mph = miles per hour; SR = State Route; U = undivided roadway; veh = vehicle

5.2.2 Roadway Operations

An analysis of existing peak hour operating conditions was conducted for intersections along the track alignment not within station study areas. Existing intersection turning movement count data were obtained through manual counts collected from September 2015 to November 2015. Supplemental manual counts were collected in November 2016. The counts were collected from 6:00 to 9:00 a.m. and 4:00 to 7:00 p.m., and the highest hourly volumes in each peak period at each intersection were selected for analysis.

Traffic counts for the LAUS area were conducted in early December 2015 while schools were still in session. A comparison with traffic counts also conducted in December 2015 for the LAUS Master Plan project indicated that the counts for that project were generally higher (based on higher area traffic activity on the day the counts were collected) and therefore those counts were replaced for intersections overlapping between the HSR and LAUS count data.

Major roadway segment analysis was conducted to determine the current adequacy of the roadways. The results of the analysis for the grade-separated intersections are presented in Table 5-7. This table also presents roadway segment LOS for AM and PM Peak hours for each location. Existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. The existing conditions LOS analysis for these study intersections is presented in Table 5-8. Of the 81 roadway segments analyzed, 9 are LOS E or F in the AM peak hour and 15 are LOS E or F in the PM peak hour. Of the 122 intersections analyzed, 13 are LOS E or F in the AM peak hour and 14 are LOS E or F in the PM peak hour.

Table 5-7 Major Roadway Segment Level of Service: Project Corridor, Existing (Year 2015) Conditions

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Vermont Ave	west of East St	---	998	700	700	0.67	0.63	B	B
South St	west of East St	---	950	500	600	0.50	0.62	A	B
Santa Ana St	west of East St	---	950	600	600	0.56	0.54	A	A
Broadway	west of East St	---	3,045	1,000	1,100	0.31	0.33	A	A
Sycamore St	west of East St	---	950	600	500	0.55	0.46	A	A
Harbor Blvd	La Palma Ave	Lincoln Ave	3,045	2,300	2,300	0.74	0.73	C	C
Harbor Blvd	Lincoln Ave	Ball Rd	2,520	2,200	2,200	0.86	0.84	D	D
La Palma Ave	Harbor Blvd	East St	3,045	1,900	2,100	0.62	0.68	B	B
La Palma Ave	East St	State College Blvd	2,520	1,700	2,300	0.64	0.89	B	D
Lincoln Ave	Anaheim Blvd	East St	5,198	2,300	2,500	0.42	0.47	A	A
Lincoln Ave	East St	State College Blvd	2,520	2,300	2,600	0.91	1.01	**E***	**F***
Soto St	E 26th St	Washington Blvd	2,835	2,500	2,700	0.88	0.95	D	**E***
Downey Rd	Bandini Blvd	Washington Blvd	3,045	2,300	2,900	0.76	0.95	C	**E***
E 26th St	Downey Rd	Bandini Blvd	998	900	1,200	0.90	1.20	D	**F***
Atlantic Blvd	Bandini Blvd	Washington Blvd	2,835	1,900	2,300	0.67	0.81	B	C
Eastern Ave	Bandini Blvd	Commerce Way	2,835	1,800	1,900	0.63	0.67	B	B
Telegraph Rd	Garfield Ave	Washington Blvd	2,835	1,200	1,400	0.42	0.49	A	A
Garfield Ave	Telegraph Rd	Washington Blvd	2,415	2,800	2,400	1.16	0.99	**F***	**E***
Greenwood Ave	Union St	Washington Blvd	2,415	1,300	1,900	0.52	0.77	A	C
Paramount Blvd	Slauson Ave	Washington Blvd	2,520	1,900	2,600	0.74	1.03	C	**F***
Rosemead Blvd (SR 19)	Slauson Ave	Washington Blvd	2,520	2,500	2,600	0.96	1.00	**E***	**E***
Serapis Ave	north of Slauson Ave	---	850	300	300	0.33	0.31	A	A
Serapis Ave	Rivera Rd	Rex Rd	1,100	100	100	0.07	0.05	A	A
Rex Rd	Rosemead Blvd (SR 19)	Serapis Ave	950	500	400	0.45	0.42	A	A
Rex Rd	Serapis Ave	Passons Blvd	1,100	500	300	0.38	0.25	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Passons Blvd	Slauson Ave	Washington Blvd	850	900	900	1.03	1.04	**F***	**F***
Slauson Ave	Passons Blvd	I-605 SB on-ramp	3,045	3,000	3,000	0.96	0.95	**E***	**E***
Pioneer Blvd	Los Nietos Rd	Rivera Rd	3,360	1,700	2,000	0.49	0.58	A	A
Pioneer Blvd	Rivera Rd	Slauson Ave	2,520	1,700	2,000	0.65	0.78	B	C
Rivera Rd	west of Pioneer Blvd	---	950	100	100	0.07	0.08	A	A
Rivera Rd	Pioneer Blvd	Norwalk Blvd	950	300	200	0.30	0.15	A	A
Norwalk Blvd	Telegraph Rd	Los Nietos Rd	2,520	1,600	1,900	0.62	0.74	B	C
Norwalk Blvd	Los Nietos Rd	Slauson Ave	2,400	1,700	2,000	0.68	0.83	B	D
Los Nietos Rd	Pioneer Blvd	Norwalk Blvd	1,100	900	900	0.80	0.80	C	C
Los Nietos Rd	Norwalk Blvd	Santa Fe Springs Rd	1,103	1,100	1,200	0.91	1.01	**E***	**F***
Santa Fe Springs Rd	Telegraph Rd	Los Nietos Rd	2,415	1,800	1,800	0.72	0.71	C	C
Rosecrans Ave	Carmenita Rd	Marquardt Ave	3,045	2,200	2,300	0.70	0.72	B	C
Rosecrans Ave	Marquardt Ave	Valley View Ave	3,045	2,100	2,100	0.69	0.68	B	B
Marquardt Ave	Rosecrans Ave	Foster Ave	1,155	400	400	0.32	0.33	A	A
Marquardt Ave	south of Rosecrans Ave	---	1,050	300	200	0.22	0.18	A	A
Valley View Ave	Gannet St	Stage Rd	3,360	2,700	2,800	0.78	0.82	C	D
Valley View Ave	Stage Rd	Rosecrans Ave	3,045	2,700	2,600	0.86	0.84	D	D
Stage Rd	Rosecrans Ave	Valley View Ave	1,100	400	600	0.36	0.46	A	A
Stage Rd	Valley View Ave	Alondra Blvd	2,400	800	800	0.30	0.33	A	A
Alondra Blvd	Valley View Ave	La Mirada Blvd	3,045	2,100	2,300	0.67	0.72	B	C
Stage Rd	Alondra Blvd	Beach Blvd (SR 39)	2,400	700	900	0.27	0.35	A	A
Beach Blvd (SR 39)	Franklin St	Stage Rd	5,198	4,600	5,100	0.87	0.97	D	**E***
Artesia Blvd	Beach Blvd (SR 39)	Dale St	2,520	1,500	1,600	0.59	0.60	A	A
Commonwealth Ave	Beach Blvd (SR 39)	Dale St	2,520	1,100	1,100	0.41	0.42	A	A
Malvern Ave	Beach Blvd (SR 39)	Dale St	2,625	2,200	2,200	0.83	0.83	D	D
Dale St	Artesia Blvd	Malvern Ave	3,150	1,800	1,800	0.56	0.56	A	A
Artesia Blvd	Dale St	Gilbert St	1,000	700	700	0.65	0.62	B	B
Commonwealth Ave	Dale St	Gilbert St	3,045	1,500	1,700	0.48	0.53	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Malvern Ave	Dale St	Gilbert St	3,150	2,500	2,600	0.77	0.81	C	D
Gilbert St	Commonwealth Ave	Artesia Blvd	3,045	2,500	2,500	0.81	0.80	D	C
Gilbert St	Artesia Blvd	Malvern Ave	4,332	2,900	2,700	0.65	0.61	B	B
Commonwealth Ave	Brookhurst Rd	Euclid St	3,045	1,700	1,600	0.54	0.50	A	A
State College Blvd	La Palma Ave	Lincoln Ave	4,410	2,000	2,600	0.45	0.58	A	A
State College Blvd	Lincoln Ave	South St	4,410	2,200	2,600	0.48	0.59	A	A
State College Blvd	South St	Wagner Ave	5,198	2,400	2,300	0.45	0.42	A	A
State College Blvd	Wagner Ave	Ball Rd	4,410	2,400	2,400	0.52	0.53	A	A
East St	La Palma Ave	Lincoln Ave	2,520	1,600	1,800	0.62	0.71	B	C
East St	Lincoln Ave	South St	2,520	1,300	1,400	0.51	0.52	A	A
East St	South St	Vermont St	3,360	1,200	1,100	0.34	0.33	A	A
East St	Vermont St	Ball Rd	2,520	1,200	1,200	0.44	0.46	A	A
Anaheim Blvd	La Palma Ave	Lincoln Ave	2,520	1,400	1,600	0.55	0.63	A	B
Anaheim Blvd	Lincoln Ave	South St	2,520	1,700	2,000	0.67	0.76	B	C
Anaheim Blvd	South St	Vermont St	3,360	1,900	2,100	0.56	0.62	A	B
Anaheim Blvd	Vermont St	Ball Rd	2,520	2,100	2,400	0.80	0.95	C	**E***
Carmenita Rd	north of Alondra Blvd	---	3,045	2,300	2,600	0.73	0.84	C	D
Beach Blvd (SR 39)	Malvern Ave	Stage Rd	4,410	4,400	4,800	0.98	1.07	**E***	**F***
Santa Fe Springs Rd	north of Los Nietos Rd	---	3,150	1,500	1,800	0.48	0.54	A	A
Washington Blvd	west of Indiana St	---	3,360	900	1,000	0.27	0.30	A	A
Washington Blvd	Ayers Ave	I-710	3,045	1,000	1,100	0.33	0.36	A	A
Washington Blvd	I-710	Atlantic Blvd	2,835	1,500	1,800	0.53	0.63	A	B
Telegraph Rd	Garfield Ave	Maple Ave	2,700	1,600	1,900	0.59	0.70	A	B
Bandini Blvd	Soto St	Downey Rd	2,700	1,500	1,400	0.56	0.52	A	A
Bandini Blvd	Downey Rd	Atlantic Blvd	2,400	1,900	2,000	0.79	0.83	C	D
Bandini Blvd	Atlantic Blvd	Eastern Ave	2,300	2,000	2,300	0.87	1.00	D	**E***
Soto 8St	E 26th St	Bandini Blvd	2,700	2,500	2,400	0.93	0.89	**E***	D

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
E 26th St	Sierra Pine Ave	Downey Rd	900	900	1,200	1.00	1.33	**E***	**F***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I = Interstate; LOS = level of service; SB = southbound; SR = State Route; V/C = volume to capacity; veh/hr = vehicles per hour

Table 5-8 Intersection Level of Service: Project Corridor, Existing (Year 2015) Conditions

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G35	Anaheim Blvd & La Palma Ave[1]	33	C	35.4	D
G36	Anaheim Blvd & Sycamore St[1]	10.6	B	8.1	A
G37	Anaheim Blvd & Lincoln Ave	29	C	31.6	C
G38	Anaheim Blvd & Santa Ana St	15.7	B	12.6	B
G39	Anaheim Blvd & South St	13.9	B	12.2	B
G40	Anaheim Blvd & Vermont Ave	18.4	B	14.8	B
G42	East St & La Palma Ave	31.4	C	45.4	D
G43	East St & Sycamore St	16	B	14	B
G44	East St & Lincoln Ave	33.2	C	40.7	D
G45	East St & Santa Ana St	16.4	B	14.5	B
G46	East St & South St	19.7	B	16.2	B
G47	East St & Vermont Ave	17.2	B	18.5	B
G49	Anaheim Blvd & Broadway	24.9	C	25.2	C
G50	East St & Broadway	23.2	C	17.7	B
G67	Harbor Blvd & La Palma Ave	33.5	C	37.1	D
G68	Harbor Blvd & Lincoln Ave	34.4	C	36.4	D
G73	State College Blvd & La Palma Ave	30.5	C	54.2	D
G74	State College Blvd & Lincoln Ave	33.7	C	37.7	D
G75	State College Blvd & Vermont Ave	162.5	**F***	105.2	**F***
G78	Harbor Blvd & Vermont Ave	13.3	B	12.2	B
G83	Soto St & Washington Blvd	46.7	D	33.4	C
G84	Downey Rd & Washington Blvd	39.5	D	53.1	D
G85	Atlantic Blvd & Washington Blvd	27.2	C	31.4	C
G86	Eastern Ave & Washington Blvd	25.3	C	25.8	C
G87	I-5 SB ramps & Washington Blvd[1]	20.7	C	64.8	**E***
G88	Telegraph Rd & Washington Blvd	37.6	D	36.1	D
G89	Garfield Ave & Washington Blvd	51.2	D	45.9	D
G90	Greenwood Ave & Washington Blvd	30.5	C	34.2	C
G91	Passons Blvd & Washington Blvd	39.6	D	35.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G92	Pioneer Blvd & Washington Blvd	49.7	D	52.6	D
G93	Sierra Pine Ave & Bandini Blvd	16.9	B	14.8	B
G94	Downey Rd & Bandini Blvd	41.2	D	39.6	D
G95	Indiana St & Bandini Blvd[2]	33.3	D	30.1	D
G96	Bonnie Beach Pl & Bandini Blvd	13.4	B	17	B
G97	Ayers Ave & Bandini Blvd[2]	15.7	C	17.8	C
G98	Atlantic Blvd/I-710 NB ramps & Bandini Blvd[1]	87.8	**F***	87.9	**F***
G99	Eastern Ave & Bandini Blvd	34.4	C	35.2	D
G100	Garfield Ave & Bandini Blvd	25.6	C	42.5	D
G101	I-5 SB ramps & Bandini Blvd[2]	>180	**F***	>180	**F***
G102	Soto St & E 26th St	25.1	C	32.5	C
G103	Sierra Pine Ave & E 26th St[2]	16.8	C	19.6	C
G104	Indiana St & E 26th St[2]	16.1	C	21.5	C
G105	Bonnie Beach Pl & E 26th St	12	B	12.1	B
G106	Ayers Ave & E 26th St[2]	21.6	C	25.2	D
G107	Soto St & E 37th St/Bandini Blvd	34.2	C	30.8	C
G108	Eastern Ave & Commerce Way	6.9	A	7.8	A
G109	Telegraph Rd (Washington Blvd) & I-5 NB ramps	35.4	D	38.7	D
G110	Garfield Ave & Telegraph Rd	32.3	C	31.3	C
G111	Telegraph Rd (Garfield Ave) & I-5 NB ramps[1]	27.5	C	28.3	C
G112	Greenwood Ave & Telegraph Rd	12.1	B	16.4	B
G113	Telegraph Rd (Slauson Ave) & I-5 NB off-ramp[2]	>180	**F***	>180	**F***
G114	Gage Rd & Telegraph Rd[2]	46.1	**E***	135.3	**F***
G115	Telegraph Rd & Slauson Ave	43.4	D	52.1	D
G116	Greenwood Ave & Driveway[2]	18.5	C	25.5	D
G117	Greenwood Ave & Union St	6.1	A	7.3	A
G118	Chapin Rd & Union St[3]	9.5	A	16	C
G119	I-5 SB ramps/Gage Ave & Slauson Ave[1]	49	D	55.8	**E***
G120	Chapin Rd & Slauson Ave	7.1	A	20.6	C
G121	Paramount Blvd & Slauson Ave	37.7	D	51.6	D
G122	Rosemead Blvd (SR 19) & Slauson Ave	56.6	**E***	53.1	D
G123	Passons Blvd & Slauson Ave	30.1	C	32.4	C
G124	I-605 SB off-ramp & Slauson Ave	27.7	C	23.1	C
G125	Pioneer Blvd & Slauson Ave	47.9	D	46.7	D
G126	Norwalk Blvd & Slauson Ave	36.6	D	36.9	D
G127	Sorensen Ave & Slauson Ave	32.5	C	36	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G128	Santa Fe Springs Rd & Slauson Ave/Mulberry Dr[1]	29.7	C	23.6	C
G130	Pioneer Blvd & I-605 NB off-ramp[2]	100.9	**F***	98.8	**F***
G131	Pioneer Blvd & Los Nietos Rd	17.3	B	17.4	B
G132	Pioneer Blvd & Orr and Day Rd[2]	121.6	**F**	171	**F**
G133	Pioneer Blvd & Telegraph Rd	30.1	C	29.6	C
G134	Norwalk Blvd & Los Nietos Rd	22.6	C	24.1	C
G135	Los Nietos Rd & Santa Fe Springs Rd	23.8	C	24.4	C
G136	Santa Fe Springs Rd & Sorensen Ave[2]	24.5	C	37.4	**E***
G137	Valley View Ave & Imperial Hwy	42.5	D	45.9	D
G138	Valley View Ave & Foster Rd	98.2	**F***	35.5	D
G139	Valley View Ave & Rosecrans Ave	54.7	D	48.4	D
G140	Valley View Ave & Stage Rd	20.5	C	23.6	C
G141	Valley View Ave & Gannet St	10.4	B	12.6	B
G142	Marquardt Ave & Imperial Hwy	17.6	B	19.8	B
G143	Marquardt Ave & Foster Rd[3]	15.1	C	13.6	B
G144	Marquardt Ave & Rosecrans Ave/Stage Rd	23.2	C	27.9	C
G146	Stage Rd/Escalona Rd & Alondra Blvd[1]	17.1	B	21.8	C
G147	Dodds Ave (East) & Stage Rd[2]	12.8	B	13.2	B
G148	Beach Blvd (SR 39) & Stage Rd[1]	18.7	B	21.8	C
G149	La Mirada Blvd & Alondra Blvd	38.9	D	29	C
G150	Beach Blvd (SR 39) & La Mirada Blvd/Malvern Ave	46.2	D	44.9	D
G151	Beach Blvd (SR 39) & Franklin St	24.5	C	37.6	D
G152	Beach Blvd (SR 39) & Artesia Ave	35.8	D	42.2	D
G153	Dale St & Malvern Ave[1]	29.8	C	30.6	C
G154	Dale St & Lakeknoll Dr	11.9	B	12.3	B
G155	Dale St & Artesia Ave	21.6	C	19.9	B
G156	Stanton Ave & Artesia Ave	22.2	C	25.4	C
G157	Dale St & Commonwealth Ave	30.5	C	29.7	C
G158	Gilbert St & Commonwealth Ave[1]	36.7	D	33.9	C
G159	Brookhurst Rd & Commonwealth Ave[1]	29.8	C	26.5	C
G160	Brookhurst Rd & Valencia Dr	24.6	C	20.1	C
G162	Gilbert St & Malvern Ave	65.2	**E***	35.8	D
G163	Gilbert St & Artesia Ave	16.9	B	14	B
G164	Anaheim Blvd/Lemon St & La Palma Ave	14.4	B	13.9	B
G165	Paramount Blvd & Washington Blvd	54.6	D	45.7	D
G166	Rosemead Blvd (SR 19) & Washington Blvd	44	D	45.6	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G167	E 26th St & Bandini Blvd[1]	12.1	B	22.2	C
G168	Garfield Ave & E 26th St[2]	108.8	**F***	>180	**F***
G169	Serapis Ave & Slauson Ave	12.9	B	11.2	B
G170	Pioneer Blvd & Wheelock Cir[2]	23.5	C	17.2	C
G171	Pioneer Blvd & Rivera Rd[2]	136.4	**F***	112.1	**F***
G173	Passons Blvd & Rivera Rd	9.7	A	10.4	B
G174	Rosemead Blvd (SR 19) & Rex Rd	22.5	C	21.3	C
G175	Passons Blvd & Rex Rd[3]	20.6	C	14.7	B
G176	La Mirada Blvd & Rosecrans Ave	29.7	C	33.6	C
G177	Valley View Ave & Alondra Blvd	47.8	D	44.8	D
G178	Beach Blvd (SR 39) & Commonwealth Ave	20.6	C	25	C
G197	Indiana St & Washington Blvd	17.5	B	19.2	B
G198	Oak St & Washington Blvd	14.3	B	14.7	B
G199	Arrowmill Ave & Washington Blvd	22.1	C	16.2	B
G200	Ayers Ave & Washington Blvd	14.7	B	17.8	B
G201	I-710 SB ramps & Washington Blvd[1]	26.2	C	23.1	C
G202	I-710 NB ramps & Washington Blvd[1]	22.6	C	19.1	B
G203	Atlantic Blvd & Sheila St	102.8	**F***	>180	**F***
G208	Downey Rd & E 26th St[2]	33	D	26.4	D
G210	Eastern Ave & Driveway[2]	21.1	C	32.6	D
G211	Telegraph Rd & Maple Ave[2]	25.9	D	54.9	**F***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay
[3] 4-way unsignalized intersection
G intersection number prefix indicates intersections outside of station areas.
HCM = Highway Capacity Manual; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route

5.3 Existing Transit Conditions

5.3.1 Regional Transit Service

Regional bus services are provided by Metro and OCTA. The routes serving the RSA are summarized in Table 5-9.

Table 5-9 Regional Bus Service

Operator	Route	Description	Headway (min)	Weekday Ridership (person)
Metro Bus	62	Los Angeles Downtown to Hawaiian Gardens	20–30	3,204
OCTA	26	Fullerton to Placentia	20–30	1,116
	43	Fullerton to Costa Mesa	17–30	6,305

Operator	Route	Description	Headway (min)	Weekday Ridership (person)
	47	Fullerton to Balboa	12–20	6,382
	143	La Habra to Brea	60	550
	543	Fullerton Transportation Center to Santa Ana	12	3,234

Sources: Metro 2024; OCTA 2023
Metro = Los Angeles County Metropolitan Transportation Authority; min = minutes; OCTA = Orange County Transportation Authority

5.3.2 Local Transit

Local transit is covered in Section 5.8, Existing Conditions around High-Speed Rail Stations.

5.4 Aviation

In the study vicinity, there are five airports. All of these airports serve commercial airlines except for Fullerton Municipal Airport, which is a general aviation airport. The basic passenger and air cargo information of each airport is listed in Table 5-10.

Table 5-10 Airport Ridership and Cargo Summary

Airport	Passengers Carried (person)	Cargo Carried (ton)	Note
Los Angeles International Airport	75,000,000	2,400,000	2023 fiscal year data
Long Beach Airport	4,000,000	22,000	2018 fiscal year data
John Wayne Airport	11,300,000	17,300	2022 fiscal year data
Fullerton Municipal Airport	N/A	N/A	General aviation airport

Sources: Los Angeles World Airports 2023; SCAG n.d. ; John Wayne Airport 2023
N/A = not available

5.5 Passenger Rail Service

Conventional passenger rail service in the RSA is provided by Amtrak and Metrolink, and is operated through a series of owned track and use agreements with BNSF. Figure 5-5 depicts existing and planned passenger rail service lines. Ridership by service route is listed in Table 5-11.



Sources: Caltrans 2023; Metro n.d.; U.S. DOT 2022

Figure 5-5 Existing and Planned Passenger Rail Service in the Project Section

Table 5-11 Passenger Rail Service Summary

Operator	Route	Description	Headway (min)	Ridership (person)
Amtrak	Pacific Surfliner	San Luis Obispo to Los Angeles to San Diego	60	1,517,425/year (2023)
	Southwest Chief	Chicago to Los Angeles	Daily	253,838/year (2023)
Metrolink	Orange County Line	LAUS to Oceanside	30	4,175/weekday (2023)
	91 Line	LAUS to Riverside Downtown	40	1,865/weekday (2023)

Sources: National Association of Railroad Passengers 2024; SCRRA 2023
Amtrak = National Railroad Passenger Corporation; LAUS = Los Angeles Union Station; min = minutes

5.6 Freight Rail Service

The RSA includes part of the Metro-owned West Bank between LAUS and Redondo Junction, the BNSF San Bernardino Subdivision between Redondo Junction and Fullerton Junction, as well as

the commuter rail corridor owned by OCTA south of Fullerton Junction to ARTIC. BNSF has track usage rights along the OCTA commuter rail corridor. The BNSF San Bernardino Subdivision is used to connect freight rail with the regional and national rail network. BNSF also operates an intermodal terminal for containers and trailers at Hobart Yard (Los Angeles Intermodal Facility), and a smaller intermodal facility (Commerce Intermodal Facility); both facilities are in Commerce.

According to the 2018 *California State Rail Plan*, the average daily freight train volume within the LOSSAN Corridor from Los Angeles to Anaheim in 2013 was 32 freight trains (Caltrans 2018). In 2013, 62.1 million and 98.6 million tons of goods were moved in carload and intermodal services, respectively, per the 2018 *California State Rail Plan*.

5.7 Railroad Accident History

Within the RSA, 79 roadway-railroad grade crossing incidents occurred in the LOSSAN Corridor between January 2018 and December 2023. These incidents resulted in 8 fatalities and 13 injuries (FRA 2024). Table 5-12 presents the findings of train accident frequency.

Table 5-12 Number of Train Accidents and Incidents with Casualties and Property Damage by County, 2018–2023

County	Accidents/Incidents				Casualties	
	Total	Type of Accident/Incident				
		Fatal	Injury	Property Damage Only	Killed	Injured
Los Angeles County	979	164	607	208	164	607
Orange County	163	41	104	18	41	104

Source: FRA 2024

5.8 Existing Conditions around High-Speed Rail Stations

5.8.1 LAUS

The LAUS area existing conditions are evaluated and provided in the Burbank to Los Angeles Project Section EIR/EIS but provided below for reference.

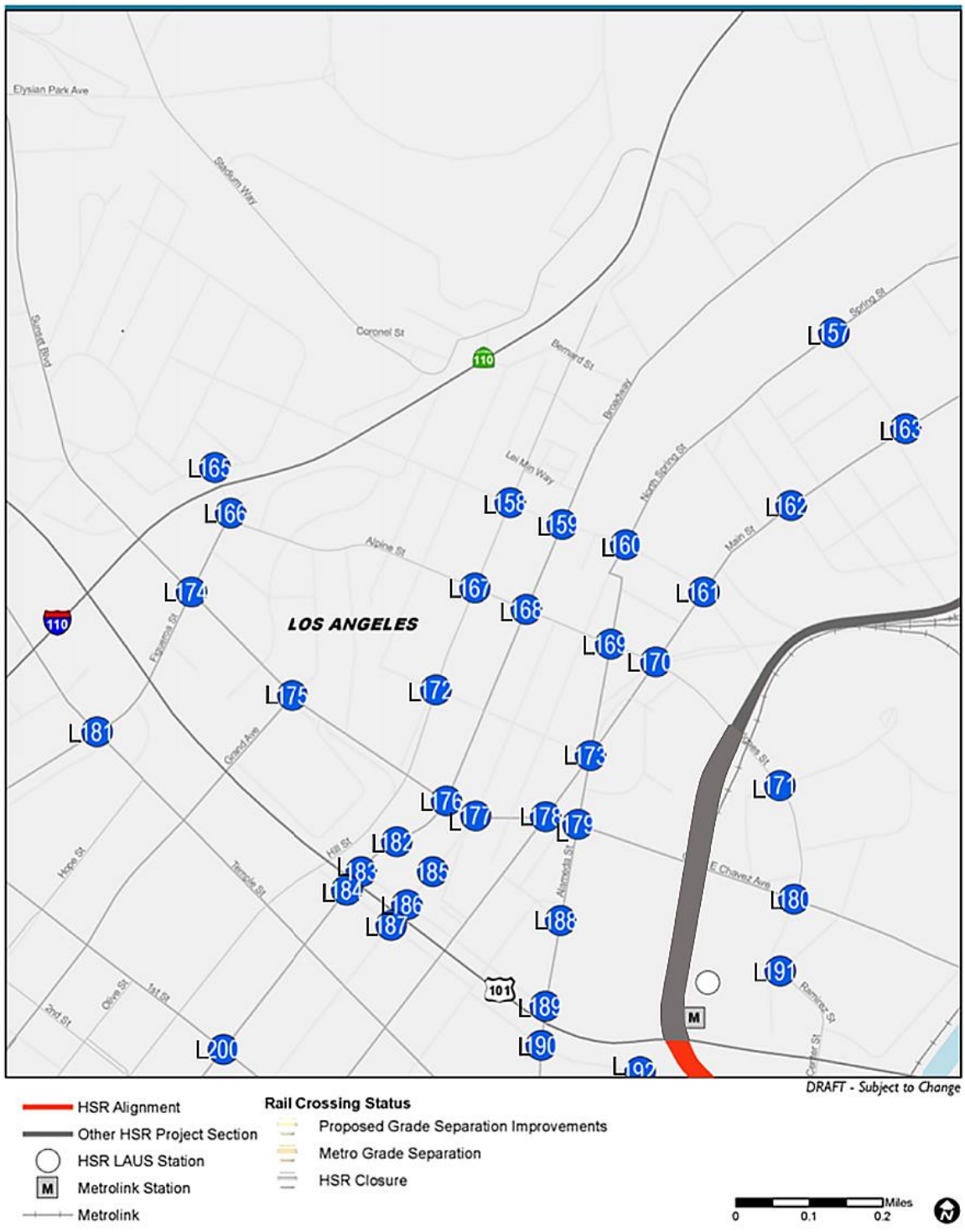
5.8.1.1 Station Area

The LAUS area includes the neighboring areas of the historic Los Angeles Pueblo on the west side of Alameda Street, Chinatown farther to the west and north, institutional uses to the north and northeast, US 101 to the south, and a portion of the core of the downtown area of Los Angeles to the south.

5.8.1.2 Station Traffic Study Area

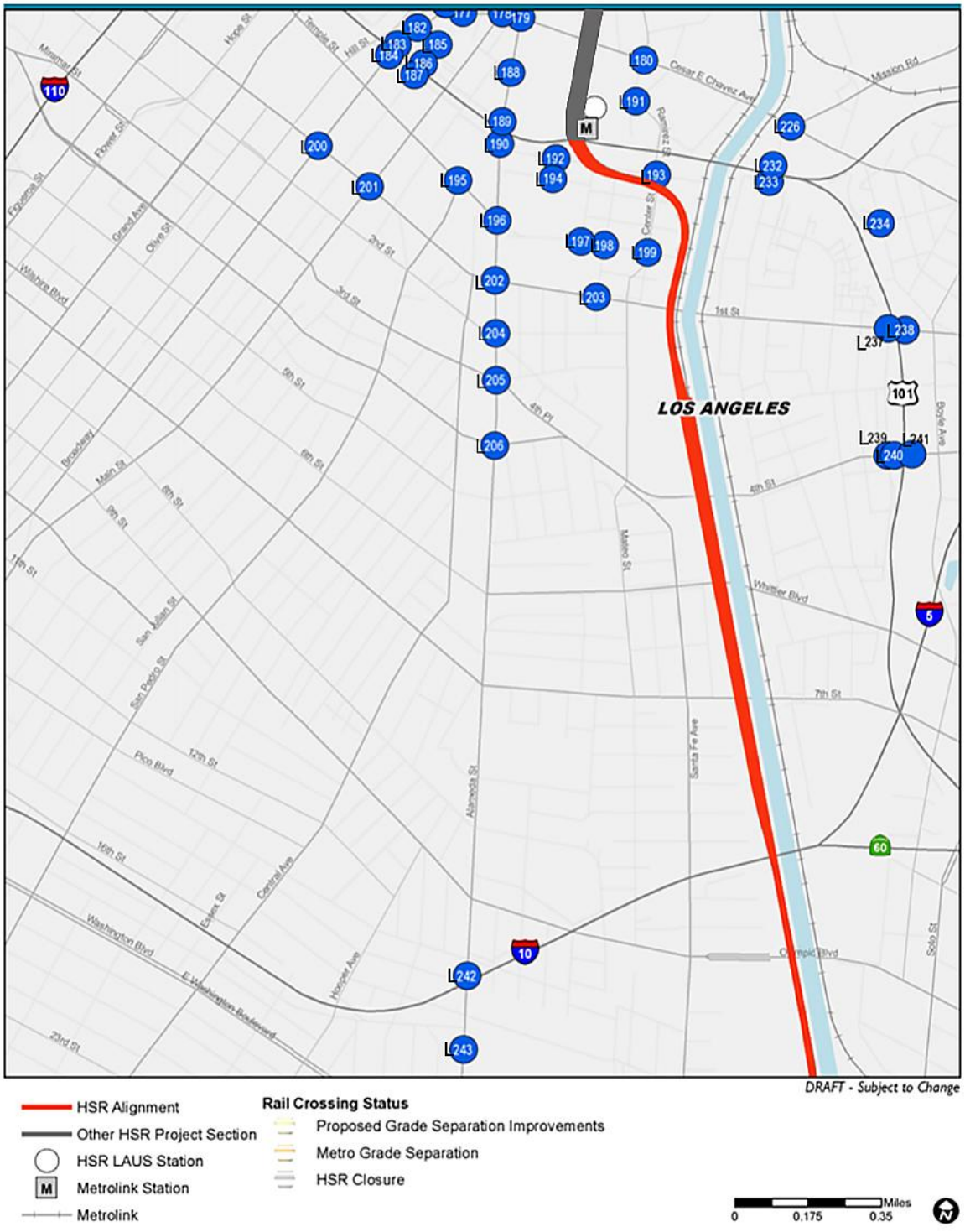
The LAUS operations analysis area is defined as that area within the RSA for which operations related to trips generated to and from the proposed facility, ingress and egress at the proposed station, or parking, can be meaningfully detected.

The RSA for the proposed LAUS was developed based on transportation characteristics of the proposed station including trip generation totals and trip distribution characteristics as discussed in Section 4.2.1, Study Approach and Baselines. Figure 5-6, sheets 1 to 4, depicts the study intersection locations.



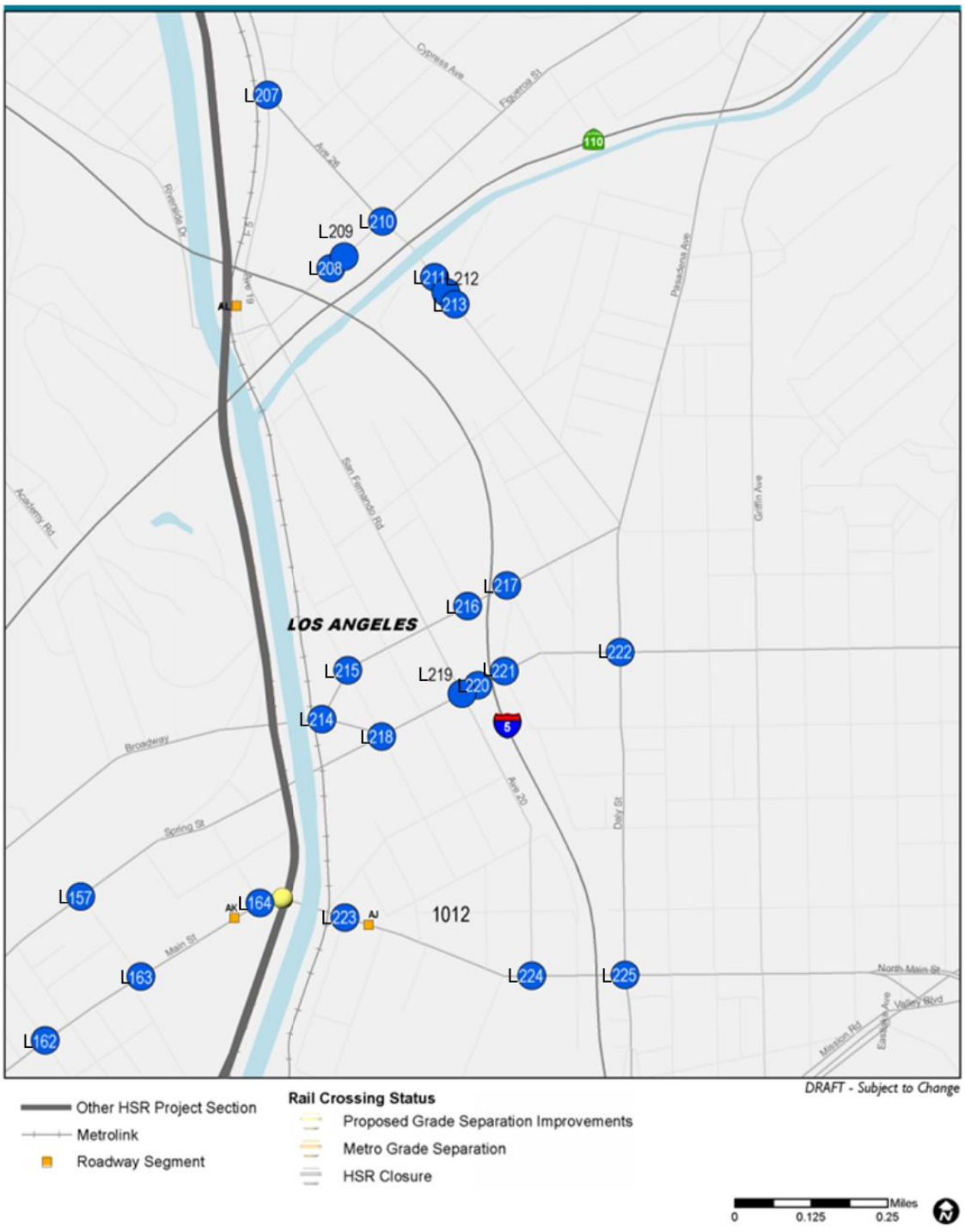
L intersection number prefix indicates intersections within Los Angeles Union Station area.

Figure 5-6 LAUS: Study Intersections (Sheet 1 of 4)



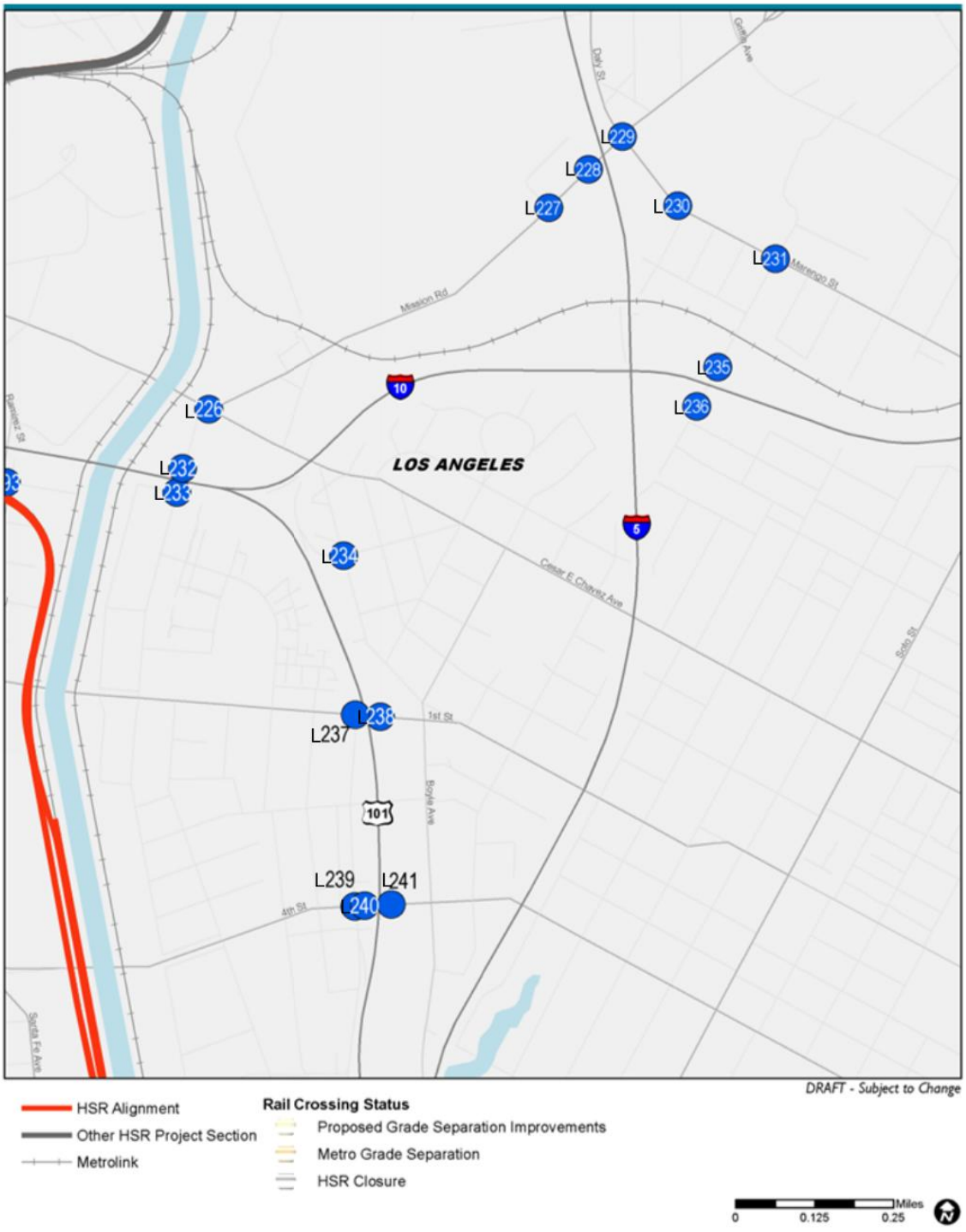
L intersection number prefix indicates intersections within Los Angeles Union Station area.

Figure 5-6 LAUS: Study Intersections (Sheet 2 of 4)



L intersection number prefix indicates intersections within Los Angeles Union Station area.

Figure 5-6 LAUS: Study Intersections (Sheet 3 of 4)

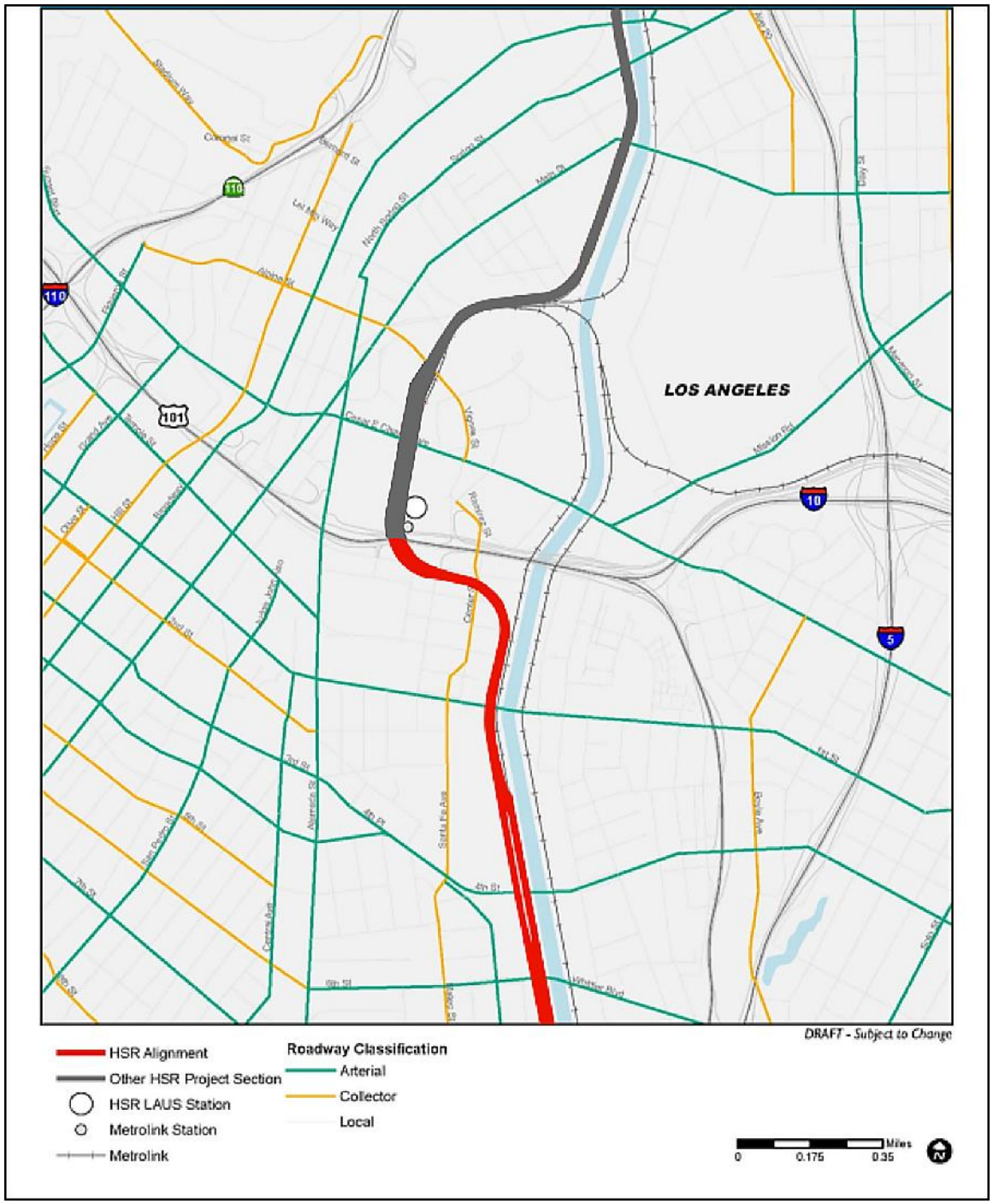


L intersection number prefix indicates intersections within Los Angeles Union Station area.

Figure 5-6 LAUS: Study Intersections (Sheet 4 of 4)

5.8.1.3 Roadways and Intersections

A total of 2 roadway segments and 59 intersections were identified for analysis. Roadway classifications for roadway segments are depicted on Figure 5-7.



L intersection number prefix indicates intersections within Los Angeles Union Station area.

Figure 5-7 LAUS: Existing Roadway Classifications

5.8.1.4 Existing Traffic Volumes

The roadway segment volume and LOS analysis was conducted using the traffic counts, and roadway segment capacity values defined by the SCAG Regional Model. The analyzed roadway segment volumes for the analyzed roadway segments in the LAUS area are provided in Table 5-13.

Existing conditions volume counts were conducted at all of the analyzed RSA intersections and roadway segments. The related volumes for the LAUS area of the RSA are referenced and analyzed below. Existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B.

Table 5-13 LAUS Area: Existing Roadway Segment Volumes

Roadway	From	To	No. of Lanes	ADT (veh)
Main St	Los Angeles River	E Victoria Street	4U	15,398
Main St	Los Angeles River	E Del Amo Blvd	4U	16,356
Ave 19	north of Figueroa St (bridge)	Toberman St	2U	12,430

ADT = average daily trips; LAUS = Los Angeles Union Station; U = undivided roadway; veh = vehicle

5.8.1.5 Existing Level of Service

Table 5-14 presents roadways segment LOS for AM and PM peak hours and the LOS identified for each location. The AM and PM intersection LOS are presented in Table 5-15. Of the 3 roadway segments analyzed, 1 is LOS E or F in the AM peak hour, and 1 is LOS E or F in the PM peak hour. Of the 86 intersections analyzed, 10 are LOS E or F in the AM peak hour, and 7 are LOS E or F in the PM peak hour.

Table 5-14 Roadway Segment Level of Service: LAUS Area, Existing (Year 2015) Conditions

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Main St	Los Angeles River	E Victoria Street	3,000	1,736	1,485	0.58	0.50	A	A
Main St	Los Angeles River	E Del Amo Blvd	3,000	1,735	1,415	0.58	0.47	A	A
Ave 19	North of Figueroa St (bridge)	Toberman St	1,250	1,837	1,368	1.47	1.09	**F***	**F***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LAUS = Los Angeles Union Station; LOS = Level of Service; veh/hr = vehicle per hour; V/C = volume to capacity ratio

Table 5-15 Intersection Level of Service: LAUS Area, Existing (Year 2015) Conditions

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L157	Sotello St & Spring St[2]	12.1	B	19.8	C
L158	Hill St & College St	14.7	B	12.3	B
L159	Broadway & College St	17.6	B	20.7	C
L160	Spring St/Alameda St & College St	20.7	C	11.9	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L161	Main St & College St[2]	> 180	**F***	> 180	**F***
L162	Elmyra St & Main St[2]	30.7	D	47.3	**E***
L163	Sotello St & Main St[2]	24.7	C	26.8	D
L164	Wilhardt St & Main St[2]	22.7	C	16.5	C
L165	Figueroa St & Figueroa Ter[3]	16.8	C	12.9	B
L166	Figueroa St & Alpine St[1]	16.7	B	15.3	B
L167	Hill St & Alpine St	8.0	A	7.4	A
L168	Broadway & Alpine St	12.6	B	10.2	B
L169	Alameda St & Alpine St	12.7	B	17.3	B
L170	Main St & Alpine St	19.9	B	36.8	D
L171	Vignes St & Bauchet St	4.8	A	8.5	A
L172	Hill St & Ord St	> 180	**F***	6.5	A
L173	Alameda St & Main St/Ord St[2]	22.7	C	13.6	B
L174	Figueroa St & Sunset Blvd/Cesar E Chavez Ave	36.4	D	29.9	C
L175	Grand Ave & Cesar E Chavez Ave	26.1	C	26.1	C
L176	Broadway & Cesar E Chavez Ave	36.3	D	36.9	D
L177	New High St/Spring St & Cesar E Chavez Ave	21.8	C	17.8	B
L178	Main St & Cesar E Chavez Ave	5.3	A	10.0	A
L179	Alameda St & Cesar E Chavez Ave	23.4	C	23.1	C
L180	Vignes St & Cesar E Chavez Ave	28.5	C	30.6	C
L181	Figueroa St & Temple St	81.3	**F***	> 180	**F***
L182	Broadway & US 101 NB on-ramp[1]	2.3	A	1.3	A
L183	Broadway & Arcadia St	17.9	B	13.0	B
L184	Broadway & Aliso St	11.4	B	10.2	B
L185	Spring St & US 101 NB off-ramp[2]	0.8	A	1.7	A
L186	Spring St & Arcadia St	25.0	C	> 180	**F***
L187	Spring St & Aliso St[1]	6.9	A	0.1	A
L188	Alameda St & Paseo de la Plaza[1]	8.3	A	12.3	B
L189	Alameda St & Arcadia St/US 101 NB off-ramp	18.0	B	11.1	B
L190	Alameda St & Aliso St/Commercial St[1]	20.2	C	11.8	B
L191	Vignes St & Gateway Plaza/Ramirez St	97.0	**F***	> 180	**F***
L192	Garey St/US 101 SB ramps & Commercial St	34.5	C	40.8	D
L193	Center St & Commercial St[3]	16.2	C	38.0	**E***
L194	Garey St & Ducommun St[2]	9.8	A	11.3	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L195	Judge John Aiso St & Temple St	26.1	C	24.1	C
L196	Alameda St & Temple St	21.7	C	22.7	C
L197	Garey St & Temple St[3]	11.0	B	12.5	B
L198	Vignes St & Temple St	11.0	B	9.4	A
L199	Center St & Temple St[2]	12.8	B	13.3	B
L200	Broadway & 1st St	14.8	B	14.5	B
L201	Main St & 1st St	9.8	A	13.3	B
L202	Alameda St & 1st St	18.9	B	24.3	C
L203	Vignes St & 1st St	32.6	C	27.7	C
L204	Alameda St & 2nd St	13.7	B	18.1	B
L205	Alameda St & 3rd St/4th Pl	25.4	C	22.9	C
L206	Alameda St & 4th St	11.6	B	27.8	C
L207	San Fernando Rd & Ave 26	18.2	B	28.3	C
L208	CA-110 SB on-ramp & Figueroa St	12.1	B	16.5	B
L209	CA-110 NB off-ramp & Figueroa St	10.3	B	12.0	B
L210	Ave 26 & Figueroa St	33.6	C	31.7	C
L211	Ave 26 & I-5 SB on-ramp	0.4	A	0.2	A
L212	Ave 26 & CA-110 NB on-ramp	0.7	A	0.8	A
L213	Ave 26 & I-5 NB off-ramp	8.9	A	8.9	A
L214	Pasadena Ave & Broadway	32.9	C	15.6	B
L215	Avenue 18 & Pasadena Ave	19.4	B	21.6	C
L216	I-5 SB ramps/Ave 21 & Pasadena Ave	24.8	C	19.7	B
L217	I-5 NB ramps & Pasadena Ave	13.4	B	18.9	B
L218	Ave 18 & Spring St/Broadway	> 180	**F***	20.5	C
L219	Ave 20 & Broadway	18.5	B	23.8	C
L220	Ave 21 & I-5 SB ramps/Broadway	17.0	B	15.2	B
L221	I-5 NB ramps/Ave 21 & Broadway	22.4	C	16.1	B
L222	Daly St & Broadway	28.3	C	31.4	C
L223	Gibbons St & Main St	15.9	C	19.5	C
L224	Ave 20 & Main St	20.6	C	11.8	B
L225	Daly St & Main St	21.4	C	25.2	C
L226	Mission Rd & Cesar E Chavez Ave	93.3	**F***	33.9	D
L227	Richmond St & Mission Rd[2]	28.7	C	16.4	B
L228	I-5 SB ramps & Mission Rd	20.6	C	20.4	C

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L229	Marengo St & Mission Rd	28.9	C	22.8	C
L230	I-5 NB on-ramp & Marengo St	6.0	A	2.5	A
L231	State St & Marengo St	28.2	C	22.7	C
L232	Mission Rd & US 101 NB ramps	9.2	A	5.9	A
L233	Mission Rd & Aliso St/US 101 SB ramps	14.6	B	9.1	A
L234	Pleasant Ave & I-10 EB ramps/Kearney St[2]	44.0	**E***	45.8	**E***
L235	State St & I-10 WB off-ramp	12.1	B	7.3	A
L236	State St & I-10 EB ramps	10.5	B	18.4	B
L237	US 101 SB on-ramp/Pecan St & 1st St[2]	13.5	B	14.4	B
L238	US 101 NB ramps & 1st St	20.3	C	22.2	C
L239	US 101 SB on-ramp/Pecan St & 4th St[1]	> 180	**F***	18.1	B
L240	US 101 SB off-ramp & 4th St[1]	> 180	**F***	6.4	A
L241	US 101 NB off-ramp & 4th St[1]	> 180	**F***	16.9	B
L242	Alameda St & Newton St (I-10 WB on-ramp)	13.8	B	32.1	D
L243	Alameda St & I-10 EB On-/off-ramps	19.3	B	19.9	B

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay
[3] 4-way unsignalized intersection
L intersection number prefix indicates intersections within LAUS area.
CA 110 = State Route 110; EB = eastbound; HCM = Highway Capacity Manual; I = Interstate; LAUS = Los Angeles Union Station; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; US 101 = U.S. Highway 101; WB = westbound

5.8.1.6 Existing Transit

LAUS is the hub for an existing, robust transit network that includes rail and bus. These existing transit connections are important to the HSR project, as they would interface with HSR service and provide many transfer opportunities for HSR passengers.

Regional bus service at LAUS is provided by Metro and other municipal operators, including Foothill Transit, City of Los Angeles Department of Transportation Commuter Express and City of Los Angeles Department of Transportation Dash shuttle services, Montebello Bus Lines, Torrance Transit, the Santa Monica Big Blue Bus, the Antelope Valley Transit Authority, and Santa Clarita Transit.

Bus services primarily serve LAUS via the Patsaouras Transit Plaza at the east side of the site, or via the direct I-10 Busway stops on Arcadia Street at the south side of the site and adjacent to US 101.

Commuter rail transit at LAUS is provided by Metrolink, and urban rail is provided by Metro via the Metro Rail system. Intercity rail service is provided by Amtrak. These trains serve LAUS via numbered tracks and platforms, with the A Line serving a dedicated adjacent platform. The B Line and D Line Metro Rail services are accessed via portals in the main passenger lobby and the eastern station main level lobby/portal.

The list of transit services provided at LAUS under existing conditions is summarized by Table 5-16. The transit network in the area near the LAUS site is illustrated on Figure 5-8.

Table 5-16 LAUS Area: Existing Transit

Operator	Route	Weekday Peak Frequency (min)	Weekday Ridership (person)
Rail Lines On Site			
Metrolink	Antelope Valley Line	60	4,125
	Ventura County Line	45–60	1,990
	San Bernardino Line	25–40	6,162
	Riverside Line	45–60	1,201
	91 Line	30	1,865
	Orange County Line	45–60	4,175
Amtrak	Coast Starlight	Daily[1]	N/A
	Southwest Chief	Daily[1]	223,654/year
	Pacific Surfliner	60	1,517,425/year
	Sunset Limited	Daily[1]	77,288/year
Metro Rail	B Line	12	59,202
	D Line	12	
	A Line	8	57,660
	E Line	8	36,446
Bus Service Off Site			
Antelope Valley Transportation Authority	785	30	N/A
Big Blue Bus Rapid	Freeway Express 10	15–30	N/A
CA Shuttle	California Shuttle Bus	N/A	N/A
City of Commerce	Transit Citadel Express	45	N/A
FlyAway	Union Station	30	N/A
Foothill Transit	699	7–15	358
City of Los Angeles Department of Transportation	Dash Downtown B	8	N/A
	DASH Downtown D	5–15	N/A
	DASH Lincoln Heights/Chinatown	30	N/A
	Commuter Express Union Station/Bunker Hill Shuttle	Buses wait for each Metrolink train	N/A
	Commuter Express 431	25	N/A
	Commuter Express 534	25–30	N/A
OCTA	701	20–30	N/A
Santa Clarita	794	25–60	N/A
Torrance Transit	4X	30–35	N/A

Operator	Route	Weekday Peak Frequency (min)	Weekday Ridership (person)
University of Southern California	Intercampus Route	N/A	N/A
Megabus	Bay	N/A	N/A
	Los Angeles	N/A	N/A
Metro	Dodger Stadium Express	10	N/A
	33 Overnight	10–20	14,972
	40	15–20	13,292
	70	11–15	14,327
	76	14–27	8,762
	78/378	10–15	6,416
Bus Service On Site			
Burbank Bus	Empire/Downtown	18	N/A
	NoHo/Airport	15–20	N/A
Foothill Transit	Silver Streak	8–60	4,785
	493	10–15	714
	498	10–20	581
	499	10–15	4,785
Metro	94	15–20	6,724
	169	60	1,689
	222	26–45	988
	Express 487	20–30	1,168
	Silver Line 910/950	5–11	14,030

Sources: Amtrak 2022; Antelope Valley Transit Authority 2024; Big Blue Bus 2024; Burbankbus.org 2024; City of Commerce 2024; Foothill Transit 2024; GotoBus.com. 2024; LADOT 2024a, 2024b; Metro 2024; National Association of Railroad Passengers 2024; OCTA 2024; Santa Clarita Transit 2024; SCRRA 2024; Stagecoach Group PLC 2024; Torrance Transit 2024; USC Transportation 2011

[1] The departures vary by day of week.

Amtrak = National Railroad Passenger Corporation; CA = California; LAUS = Los Angeles Union Station; Metro = Los Angeles County Metropolitan Transportation Authority; min = minutes; N/A = ridership information not available; NoHo = North Hollywood; OCTA = Orange County Transportation Authority

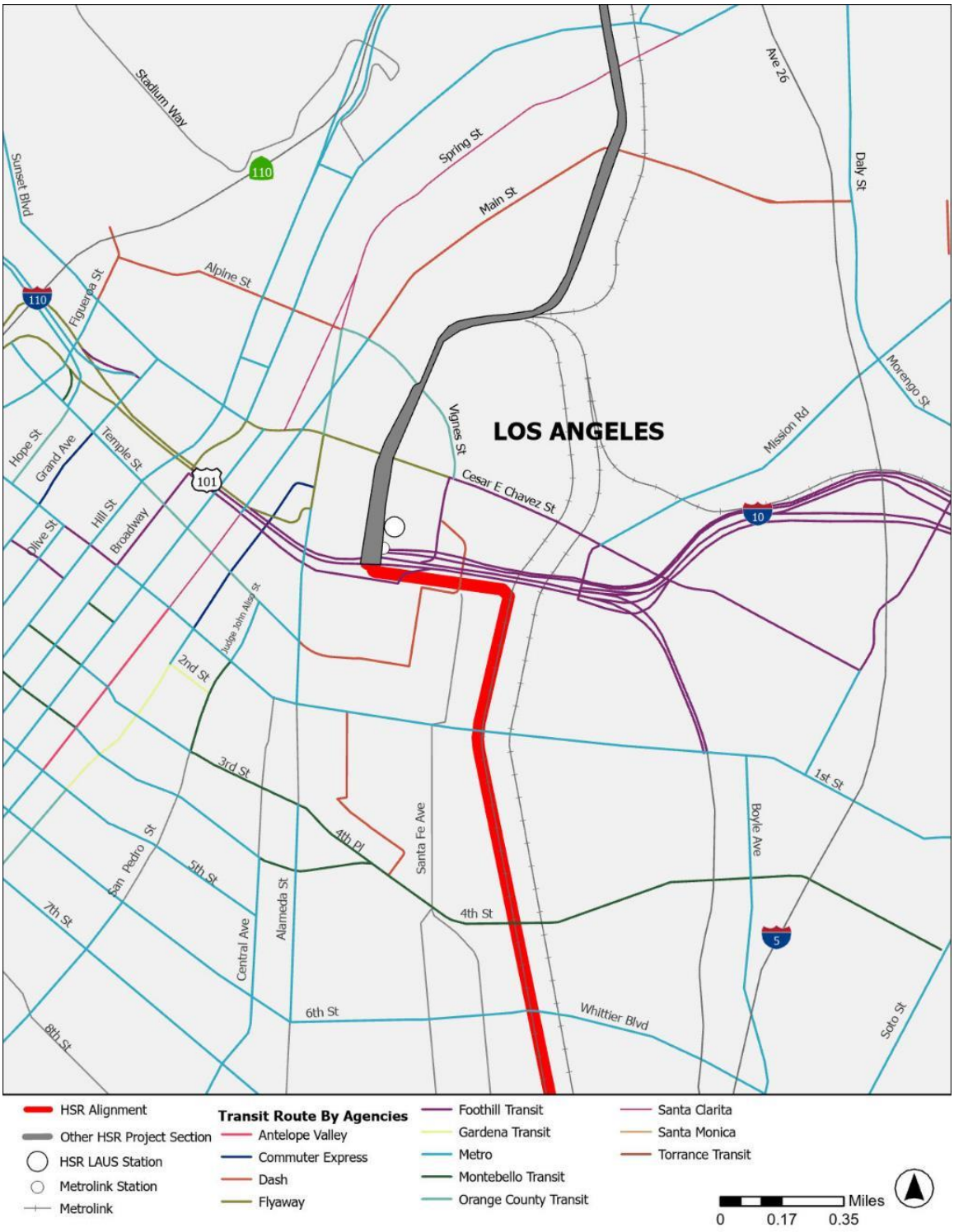


Figure 5-8 LAUS: Existing Transit

5.8.1.7 Existing Pedestrian Facilities

The area around LAUS has a built-out pedestrian network that provides access to the many destinations and transit facilities surrounding the station. Below is an inventory of crosswalks and signalized intersections that provide safe pedestrian connections.

Pedestrian access to and from the Civic Center and the remainder of the Los Angeles downtown core area is provided over US 101 via bridge structures with sidewalks. The closest of these bridge structure links to LAUS are provided at:

- Alameda Street via on-site pedestrian connections within the LAUS site linking with the southwest corner of the site near the Alameda Street/Aliso Avenue intersection
- Los Angeles Street via access routes either through the Pueblo area or via the roadways that front US 101, Arcadia Street on the north and Aliso Street on the south

Alameda Street/Interstate 10 Westbound Off-Ramps: Arcadia Street

Located on the southwest corner of the LAUS site, the intersection provides protected pedestrian phasing and access to government facilities south of I-10 along Alameda Street. This intersection also provides a bus stop for regional express buses such as the Metro Silver Line and Foothill Transit Silver Streak that operate along the El Monte Busway. The pedestrian facilities provide safe movement for transit users of these bus lines.

Alameda Street/Los Angeles Street

Located to the west of LAUS, the intersection provides protected pedestrian phasing that provides safe access between LAUS and the historic El Pueblo de Los Angeles Historical Monument and shops and restaurants in Olvera Street. The intersection also has bus stops that service Metro and City of Los Angeles Department of Transportation bus lines.

Alameda Street/Cesar Chavez Avenue

Located on the northwest corner of the LAUS site, the intersection also provides protected pedestrian phasing and safe access between LAUS and the multifamily housing development on the southeast corner of that intersection to the southern end of Chinatown and Olvera Street to the north and west.

Vignes Street/Cesar Chavez Avenue

Located on the northeast corner of the LAUS site, the intersection also provides protected pedestrian phasing and safe access between LAUS, Metro headquarters, and the newly built Metro bus maintenance yard on the northwest corner of the intersection. Bus stops on the west side of the intersection also provide access to Metro buses.

Vignes Street/Gateway Plaza: Ramirez Street

Located to the east of the LAUS site, the intersection also provides protected pedestrian phasing and safe access between the Patsaouras Bus Plaza in LAUS, which provides access to numerous Metro and municipal bus lines and also to government facilities to the east.

5.8.1.8 Existing Bicycle Facilities

The City of Los Angeles Department of Transportation bike program features seven types of bike lanes/routes:

- Bike Path: a bike path is a paved pathway separated from motorized vehicular traffic by an open space or barrier and either within the highway rights-of-way or within an independent alignment.
- Cycle Track (or Protected Bikeway): a cycle track, or protected bikeway, is an exclusive facility for bicycles that has the protection features of a separate path but is on a street.

- Buffered Bike Lane: A buffered bike lane is a bike lane paired with a painted buffer, which directs people driving cars to travel away from the bike lane and provides room for people riding bicycles to pass another person on a bicycle without entering the adjacent motor vehicle travel lane.
- Bike Lane: a bike lane is a striped lane for one-way bicycle travel on a street or highway. Caltrans refers to this facility as a Class II bikeway.
- Sharrow Route: a sharrow route is a roadway where people riding bicycles and driving cars share the same space with no striped bike lane. Although sharrow routes are usually demarcated by “sharrows,” or a bicycle symbol and painted arrows on the roadway, in conjunction with the “Bikes May Use Full Lane” sign, any roadway where bicycles are not prohibited by law (i.e., interstate highways or freeways) is a shared roadway.
- Neighborhood Enhanced Street: The Neighborhood Enhanced Street is a roadway that provides comfortable and safe localized travel for slower-moving modes such as walking, bicycling, or other slow speed motorized means of travel.

Around the LAUS area, three roadways currently include buffered bike lanes:

- Spring Street between Cesar Chavez E. Avenue and Ninth Street
- Main Street between Cesar Chavez E. Avenue and Ninth Street
- Los Angeles Street between Alameda Street and First Street

All of these facilities are buffered from traffic in some segments. In others, they are built as typical striped bicycle lanes depending on the roadway configuration. These facilities all provide connections between the south and north sides of US 101. The Los Angeles Street segment provides a link directly to the LAUS site.

Two roadways in the vicinity of LAUS provide bicycle lanes:

- First Street, between Beauty Avenue and Aliso Street
- Third Street, between San Pedro Street and Santa Fe Avenue

Two roadways are classified as sharrow routes in the vicinity of LAUS:

- First Street, between Aliso Street and Boyle Avenue
- Second Street, between Spring Street and Santa Fe Avenue

Alameda Street, Vignes Street, and other roadways surrounding LAUS do not currently have dedicated bicycle facilities.

The Metro Bike Share program currently has a station at LAUS on the Alameda Street side for the rental of bicycles. The bike station has 18 docks available to users. The system provides internet-based tracking of available bicycle and return bays for users. Figure 5-9 illustrates the locations of existing and planned bicycle facilities within the vicinity of the LAUS site.

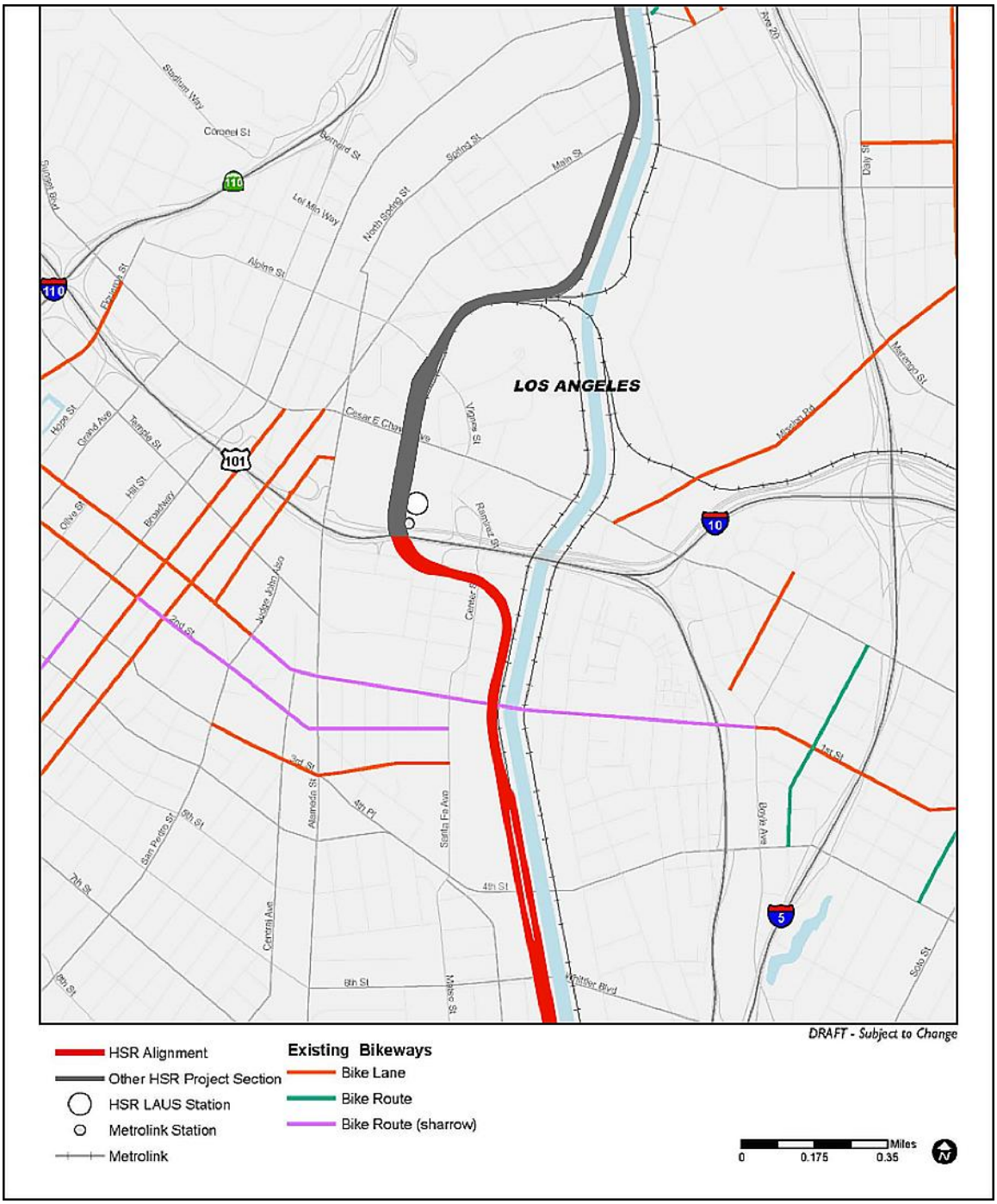


Figure 5-9 LAUS: Existing Bicycle Facilities

5.8.1.9 Existing Parking Facilities

The LAUS site provides short-term parking at the west-end parking lot that is accessed to and from Alameda Street. Long-term parking is provided within the public subterranean parking structure at the Metro headquarters building, which has primary access from Vignes Street.

Public parking exists at some privately operated surface parking lots in the area. These primarily exist in the vicinity of the Pueblo and the Chinatown neighborhood. To the northeast and east of

LAUS, most land uses are institutional and public parking is not available. Public parking options exist as well to the south of US 101.

5.8.2 Norwalk/Santa Fe Springs High-Speed Rail Station Option

5.8.2.1 Station Area

The existing Norwalk/Santa Fe Spring Transportation Center is at 12700 Imperial Highway, on the border of the Cities of Norwalk and Santa Fe Springs. The station currently serves Metrolink commuter rail rider with park-and-ride lots and limited local bus connections. Vehicle access to the station and its parking area are available via two driveways just east and west of the LOSSAN Corridor along Imperial Highway. Pedestrian access to the station is available via sidewalks to Imperial Highway.

The existing Norwalk/Santa Fe Springs Transportation Center is currently served by Metrolink's Orange County and 91 lines. The station consists of two 500-foot-long platforms and a pedestrian that connects Los Angeles bound and Oceanside bound platforms. Pedestrian access to the platforms is available via multiple sidewalk paths from the adjacent parking lots, and a pedestrian overpass is provided to cross between the platforms. Vehicular access to the station and its parking areas available via two driveways just east and west of the Metrolink railroad tracks along Imperial Highway.

The proposed station design option plan, including ingress and egress and nonmotorized access, would be confirmed based on local jurisdiction coordination and review of the PEPD. Section 2.2.1.3 discusses the station area in further detail.

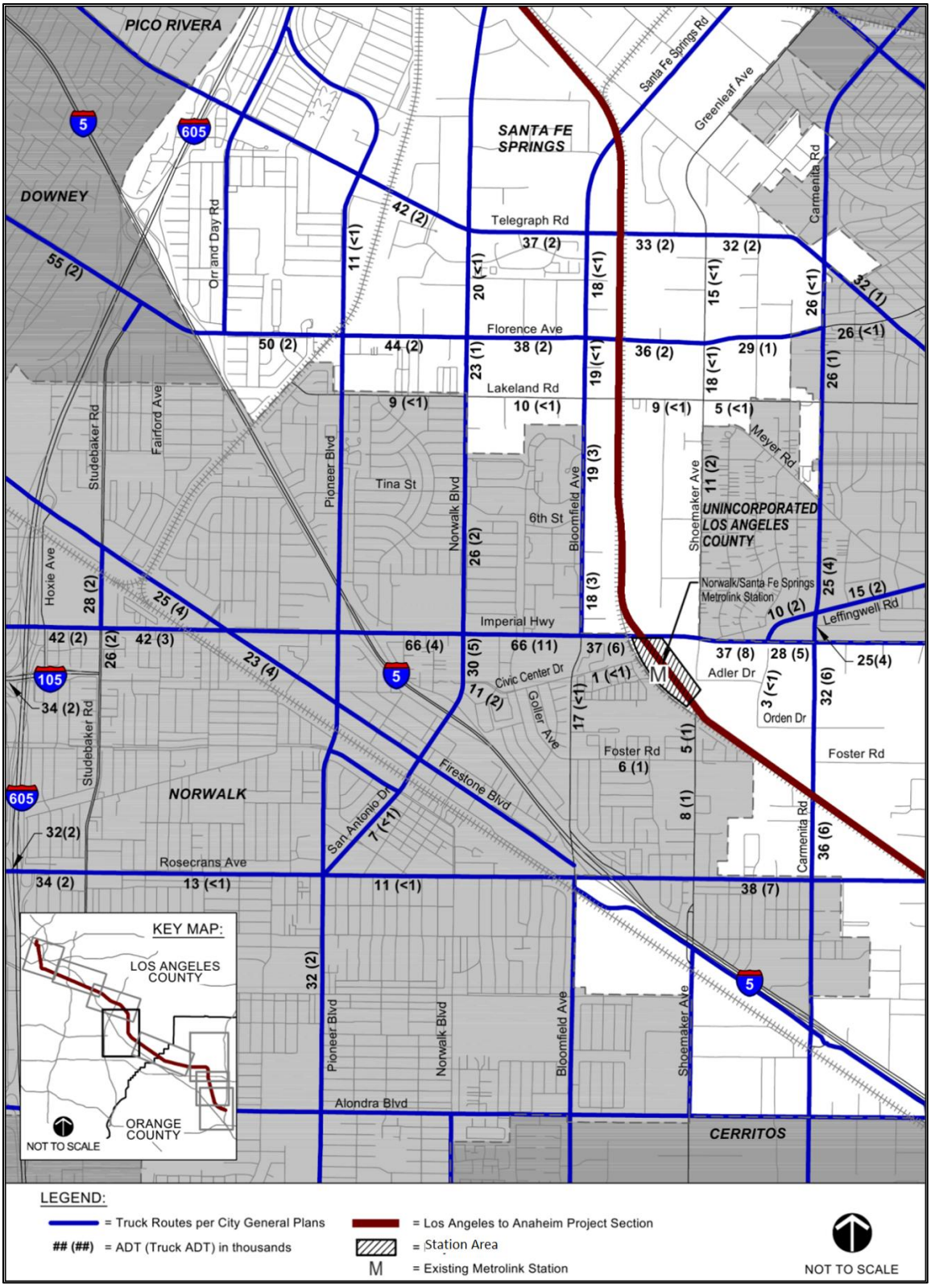
5.8.2.2 Station Traffic Study Area

The Norwalk/Santa Fe Springs HSR Station Option operations analysis area is defined as that area within the RSA for which operations related to trips generated to and from the proposed facility, ingress and egress at the proposed station, or parking, can be meaningfully detected.

The RSA for the proposed Norwalk/Santa Fe Springs HSR Station Option area was developed based on transportation characteristics of the proposed station including trip generation totals and trip distribution characteristics as discussed in Section 4.2.1, Study Approach and Baselines. Figure 5-3 depicts the study intersection locations, including those in the Norwalk/Santa Fe Springs HSR Station Option area.

5.8.2.3 Roadways and Intersections

A total of 62 roadway segments and 61 intersections were identified for analysis. The average daily traffic (ADT) for major roadway segments is depicted on Figure 5-10.



Source: County of Los Angeles 2025; City of Santa Fe Springs 1994

Figure 5-10 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Existing Average Daily Traffic and Truck Routes

5.8.2.4 Existing Traffic Volumes

Existing roadway segment ADT and intersection turning movement traffic count data were obtained through manual traffic counts collected from September 2015 to November 2016. The traffic counts were collected from 6:00 to 9:00 a.m. and 4:00 to 7:00 p.m. with the highest hourly volumes in each peak period at each intersection selected for analysis.

Existing roadway segment volumes are presented in Table 5-17. Existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B.

Table 5-17 Norwalk/Santa Fe Springs High-Speed Rail Station Option Area: Existing Roadway Segment Volumes

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Firestone Blvd	Studebaker Rd	Imperial Hwy	5D	40	24,600	4,200
Firestone Blvd	Imperial Hwy	Pioneer Blvd	4D	40	22,900	3,900
Pioneer Blvd	Telegraph Rd	Florence Ave	4D	40	10,600	< 1,000
Norwalk Blvd	Telegraph Rd	Florence Ave	4D	45	20,100	< 1,000
Norwalk Blvd	Florence Ave	Lakeland Rd	4D	40	23,400	1,100
Norwalk Blvd	Tina St	Imperial Hwy	4D	40	25,500	2,000
Bloomfield Ave	Telegraph Rd	Florence Ave	4D	45	17,600	< 1,000
Bloomfield Ave	Florence Ave	Lakeland Rd	4D	45	18,600	< 1,000
Bloomfield Ave	Lakeland Rd	6th St	4D	45	18,500	3,300
Bloomfield Ave	6th St	Imperial Hwy	4D	45	18,400	3,300
Bloomfield Ave	Imperial Hwy	Foster Rd	4D	40	17,400	< 1,000
Leffingwell Rd	Meyer Rd	Carmenita Rd	4D	40	15,200	4,900
Leffingwell Rd	Carmenita Rd	Imperial Hwy	4D	40	10,400	1,800
Leffingwell Rd	Imperial Hwy	Adler Dr	2U	30	3,100	< 1,000
Carmenita Rd	Telegraph Rd	Florence Ave	4D	35	25,500	< 1,000
Carmenita Rd	Florence Ave	Lakeland Ave	4D	35	26,100	1,100
Carmenita Rd	Meyer Rd	Leffingwell Rd	4D	35	24,600	4,200
Carmenita Rd	Leffingwell Rd	Imperial Hwy	4D	35	25,000	7,900
Carmenita Rd	Imperial Hwy	Orden Dr	4D	45	32,000	5,600
Telegraph Rd	Pioneer Blvd	Norwalk Blvd	6D	45	41,600	1,900
Telegraph Rd	Norwalk Blvd	Santa Fe Springs Rd	6D	45	36,600	1,700
Telegraph Rd	Shoemaker Ave	Carmenita Rd	6D	40	32,100	1,500
Telegraph Rd	Carmenita Rd	Florence Ave	6D	40	32,000	1,100
Florence Ave	Orr and Day Rd	Pioneer Blvd	4D	40	49,600	2,300
Florence Ave	Pioneer Blvd	Norwalk Blvd	4D	40	43,500	2,000
Florence Ave	Norwalk Blvd	Bloomfield Ave	4D	45	38,000	1,700
Florence Ave	Bloomfield Ave	Shoemaker Ave	4D	45	36,300	1,600

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Florence Ave	Shoemaker Ave	Carmenita Rd	4D	45	29,400	1,000
Florence Ave	Carmenita Rd	Telegraph Rd	4D	40	26,000	< 1,000
Imperial Hwy	Studebaker Rd	Firestone Blvd	6D	40	42,000	2,700
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	6D	40	66,300	11,200
Imperial Hwy	Bloomfield Ave	Shoemaker Ave	6D	40	37,400	6,200
Imperial Hwy	Shoemaker Ave	Leffingwell Rd	6D	40	37,000	16,500
Imperial Hwy	Leffingwell Rd	Carmenita Rd	6D	40	27,900	10,300
Telegraph Rd	Santa Fe Springs Rd	Shoemaker Ave	6D	45	32,800	1,500
Lakeland Rd	Pioneer Blvd	Norwalk Blvd	2U	35	8,800	< 1,000
Lakeland Rd	Norwalk Blvd	Bloomfield Ave	2U	40	9,600	< 1,000
Lakeland Rd	Bloomfield Ave	Shoemaker Ave	2D	40	9,000	< 1,000
Shoemaker Ave	Telegraph Rd	Florence Ave	4D	40	14,600	< 1,000
Shoemaker Ave	Florence Ave	Lakeland Rd	4D	40	18,200	< 1,000
Shoemaker Ave	Lakeland Rd	Imperial Hwy	4U	40	10,700	1,900
Florence Ave	west of I-605	---	4D	40	54,800	2,300
Imperial Hwy	west of I-605	---	6D	40	33,900	2,200
Imperial Hwy	I-605	Studebaker Rd	6D	40	42,300	1,800
Studebaker Rd	Imperial Hwy	I-105	4D	40	26,200	1,700
Carmenita Rd	Orden Dr	Rosecrans Ave	4D	45	36,400	6,300
Shoemaker Ave	Imperial Hwy	Foster Rd	2U	30	5,200	1,000
Shoemaker Ave	Foster Rd	Rosecrans Ave	4U	35	7,600	1,300
Norwalk Blvd	Imperial Hwy	Civic Center Dr	6D	35	29,600	5,100
Civic Center Dr	Norwalk Blvd	Bloomfield Ave	4U	25	11,300	1,900
Civic Center Dr	east of Bloomfield Ave	---	2U	25	1,400	< 1,000
Foster Rd	Bloomfield Ave	Shoemaker Ave	2U	25	5,800	1,000
Rosecrans Ave	Shoemaker Ave	Carmenita Rd	5D	40	37,900	6,600
San Antonio Dr	Firestone Blvd	Pioneer Blvd/Rosecrans Ave	4D	40	7,200	< 1,000
Rosecrans Ave	Pioneer Blvd	Norwalk Blvd	4D	40	10,500	< 1,000
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	4D	40	13,100	< 1,000
Rosecrans Ave	I-605 NB ramps	Studebaker Rd	5D	40	34,400	2,300
Rosecrans Ave	I-605 SB ramps	I-605 NB ramps	5D	40	31,700	2,100
Lakeland Rd	Shoemaker Ave	Carmenita Rd	2U	40	4,700	< 1,000

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Studebaker Rd	north of Imperial Hwy	---	4D	40	28,000	1,800
Pioneer Blvd	north of South St	---	4D	25	32,000	2,000
Imperial Hwy	west of Norwalk Blvd	---	6D	55	66,000	4,100

ADT = average daily trips; D = divided roadway; I = Interstate; mph = miles per hour; NB = northbound; SB = southbound; U = undivided roadway; veh = vehicle

5.8.2.5 Existing Level of Service

Table 5-18 presents roadways segment LOS for AM and PM peak hours and the LOS identified for each location. The AM and PM intersection LOS are presented in Table 5-19. Of the 62 roadway segments analyzed, 3 are LOS E or F in the AM peak hour, and 3 are LOS E or F in the PM peak hour. Of the 61 intersections analyzed, 5 are LOS E or F in the AM peak hour, and 8 are LOS E or F in the PM peak hour.

Table 5-18 Roadway Segment Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option Area, Existing (Year 2015) Conditions

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Firestone Blvd	Studebaker Rd	Imperial Hwy	3,675	1,900	2,000	0.50	0.54	A	A
Firestone Blvd	Imperial Hwy	Pioneer Blvd	2,520	1,800	2,000	0.69	0.79	B	C
Pioneer Blvd	Telegraph Rd	Florence Ave	2,520	1,600	1,100	0.63	0.44	B	A
Norwalk Blvd	Telegraph Rd	Florence Ave	2,520	1,600	1,700	0.63	0.65	B	B
Norwalk Blvd	Florence Ave	Lakeland Rd	3,045	1,600	1,600	0.52	0.49	A	A
Norwalk Blvd	Tina St	Imperial Hwy	2,520	2,200	2,100	0.86	0.82	D	D
Bloomfield Ave	Telegraph Rd	Florence Ave	2,415	1,600	1,600	0.65	0.64	B	B
Bloomfield Ave	Florence Ave	Lakeland Rd	2,835	1,800	1,700	0.61	0.59	B	A
Bloomfield Ave	Lakeland Rd	6th St	3,150	1,800	1,700	0.55	0.54	A	A
Bloomfield Ave	6th St	Imperial Hwy	2,625	1,800	1,800	0.66	0.66	B	B
Bloomfield Ave	Imperial Hwy	Foster Rd	2,520	1,600	1,900	0.63	0.73	B	C
Leffingwell Rd	Meyer Rd	Carmenita Rd	3,045	1,400	1,500	0.43	0.48	A	A
Leffingwell Rd	Carmenita Rd	Imperial Hwy	2,520	900	1,000	0.34	0.37	A	A
Leffingwell Rd	Imperial Hwy	Adler Dr	1,000	400	500	0.36	0.42	A	A
Carmenita Rd	Telegraph Rd	Florence Ave	2,520	1,700	1,800	0.64	0.71	B	C
Carmenita Rd	Florence Ave	Lakeland Ave	3,045	1,900	2,100	0.61	0.68	B	B
Carmenita Rd	Meyer Rd	Leffingwell Rd	3,045	1,600	2,000	0.51	0.65	A	B
Carmenita Rd	Leffingwell Rd	Imperial Hwy	2,520	1,800	2,300	0.70	0.90	B	D
Carmenita Rd	Imperial Hwy	Orden Dr	2,520	2,100	2,500	0.82	0.97	D	**E***
Telegraph Rd	Pioneer Blvd	Norwalk Blvd	5,198	3,300	3,100	0.63	0.58	B	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Telegraph Rd	Norwalk Blvd	Santa Fe Springs Rd	4,883	2,800	2,700	0.56	0.53	A	A
Telegraph Rd	Shoemaker Ave	Carmenita Rd	4,883	2,300	2,300	0.47	0.46	A	A
Telegraph Rd	Carmenita Rd	Florence Ave	5,198	2,200	2,600	0.42	0.48	A	A
Florence Ave	Orr and Day Rd	Pioneer Blvd	3,045	3,200	3,200	1.02	1.04	**F***	**F***
Florence Ave	Pioneer Blvd	Norwalk Blvd	3,045	2,600	2,800	0.83	0.90	D	D
Florence Ave	Norwalk Blvd	Bloomfield Ave	2,835	2,400	2,600	0.82	0.89	D	D
Florence Ave	Bloomfield Ave	Shoemaker Ave	2,835	2,400	2,500	0.81	0.88	D	D
Florence Ave	Shoemaker Ave	Carmenita Rd	2,835	2,200	2,200	0.76	0.76	C	C
Florence Ave	Carmenita Rd	Telegraph Rd	2,520	2,100	2,200	0.81	0.86	D	D
Imperial Hwy	Studebaker Rd	Firestone Blvd	5,198	2,700	2,900	0.50	0.54	A	A
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	4,410	2,600	2,700	0.59	0.60	A	A
Imperial Hwy	Bloomfield Ave	Shoemaker Ave	5,198	2,900	3,000	0.55	0.58	A	A
Imperial Hwy	Shoemaker Ave	Leffingwell Rd	5,198	3,000	3,000	0.56	0.57	A	A
Imperial Hwy	Leffingwell Rd	Carmenita Rd	5,198	2,200	2,100	0.41	0.40	A	A
Telegraph Rd	Santa Fe Springs Rd	Shoemaker Ave	4,883	2,000	2,300	0.39	0.47	A	A
Lakeland Rd	Pioneer Blvd	Norwalk Blvd	1,100	700	700	0.63	0.59	B	A
Lakeland Rd	Norwalk Blvd	Bloomfield Ave	1,050	900	900	0.85	0.84	D	D
Lakeland Rd	Bloomfield Ave	Shoemaker Ave	1,103	800	800	0.68	0.72	B	C
Shoemaker Ave	Telegraph Rd	Florence Ave	2,415	1,300	1,100	0.50	0.45	A	A
Shoemaker Ave	Florence Ave	Lakeland Rd	2,835	1,400	1,300	0.48	0.45	A	A
Shoemaker Ave	Lakeland Rd	Imperial Hwy	2,400	1,200	1,100	0.47	0.43	A	A
Florence Ave	west of I-605	---	3,360	2,300	2,200	0.68	0.65	B	B
Imperial Hwy	west of I-605	---	5,198	2,900	3,100	0.54	0.59	A	A
Imperial Hwy	I-605	Studebaker Rd	5,198	3,000	3,300	0.57	0.63	A	B
Studebaker Rd	Imperial Hwy	I-105	2,520	2,300	2,200	0.90	0.86	D	D
Carmenita Rd	Orden Dr	Rosecrans Ave	2,520	2,400	2,200	0.94	0.86	**E***	D
Shoemaker Ave	Imperial Hwy	Foster Rd	1,000	400	500	0.40	0.42	A	A
Shoemaker Ave	Foster Rd	Rosecrans Ave	2,400	800	600	0.30	0.23	A	A
Norwalk Blvd	Imperial Hwy	Civic Center Dr	4,410	2,200	2,400	0.50	0.53	A	A
Civic Center Dr	Norwalk Blvd	Bloomfield Ave	2,200	1,200	1,300	0.50	0.56	A	A
Civic Center Dr	east of Bloomfield Ave	---	950	200	100	0.14	0.09	A	A
Foster Rd	Bloomfield Ave	Shoemaker Ave	900	600	700	0.64	0.75	B	C
Rosecrans Ave	Shoemaker Ave	Carmenita Rd	4,332	2,700	3,000	0.62	0.69	B	B

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
San Antonio Dr	Firestone Blvd	Pioneer Blvd/ Rosecrans Ave	2,520	1,400	1,500	0.52	0.58	A	A
Rosecrans Ave	Pioneer Blvd	Norwalk Blvd	2,520	1,900	1,800	0.73	0.70	C	B
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	2,520	2,400	2,400	0.91	0.94	**E***	**E***
Rosecrans Ave	I-605 NB ramps	Studebaker Rd	4,332	3,400	3,400	0.77	0.76	C	C
Rosecrans Ave	I-605 SB ramps	I-605 NB ramps	4,332	2,700	2,600	0.61	0.59	B	A
Lakeland Rd	Shoemaker Ave	Carmenita Rd	1,050	500	600	0.45	0.50	A	A
Studebaker Rd	north of Imperial Hwy	---	2,520	1,500	1,600	0.57	0.60	A	A
Pioneer Blvd	north of South St	---	3,045	1,400	1,500	0.45	0.48	A	A
Imperial Hwy	west of Norwalk Blvd	---	5,198	2,900	3,000	0.54	0.57	A	A

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I = Interstate; LOS = level of service; NB = northbound; SB = southbound; veh/hr = vehicle per hour; V/C = volume to capacity ratio

Table 5-19 Intersection Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option Area, Existing (Year 2015) Conditions

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N1	Firestone Blvd & Imperial Hwy[1]	61.2	**E***	58.4	**E***
N2	Pioneer Blvd & Florence Ave	36.9	D	31.6	C
N3	Pioneer Blvd & Imperial Hwy	35.5	D	41.5	D
N5	Norwalk Blvd & Telegraph Rd	43.1	D	38.3	D
N6	Norwalk Blvd & Florence Ave	35.3	D	33.5	C
N7	Norwalk Blvd & Imperial Hwy	42.1	D	48.2	D
N10	Bloomfield Ave/Santa Fe Springs Rd & Telegraph Rd	31.2	C	27.1	C
N11	Bloomfield Ave & Florence Ave	35.5	D	32	C
N12	Bloomfield Ave & Lakeland Rd	21.2	C	19.3	B
N15	Bloomfield Ave & Imperial Hwy	46.2	D	43.7	D
N17	Transportation Center West & Imperial Hwy[1]	13	B	12.3	B
N18	Transportation Center East & Imperial Hwy[1]	12.6	B	13.2	B
N19	Shoemaker Ave & Florence Ave	27.4	C	23	C
N20	Shoemaker Ave/Adler Dr & Imperial Hwy	28.6	C	29.1	C
N21	Leffingwell Rd & Imperial Hwy	29.7	C	37	D
N22	Carmenita Rd & Telegraph Rd	44	D	46	D
N23	Carmenita Rd & Florence Ave	43	D	41.4	D
N24	Carmenita Rd & Leffingwell Rd	21.3	C	23.4	C
N25	Carmenita Rd & Imperial Hwy	40	D	39.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N26	Telegraph Rd & Florence Ave/Mills Ave	42.5	D	47.5	D
N27	I-5 NB on-ramp & Imperial Hwy	38.7	D	15	B
N30	I-5 SB off-ramp & Imperial Hwy[1]	14.2	B	17.1	B
N31	Norwalk Blvd & I-5 NB ramps	29.7	C	20	B
N32	San Antonio Dr & I-5 SB on-ramp[1]	19.7	B	21.4	C
N33	Shoemaker Ave & Telegraph Rd	22.3	C	20.4	C
N34	Pioneer Blvd & Lakeland Rd	24.5	C	26.2	C
N35	Norwalk Blvd & Lakeland Rd	18.4	B	19.3	B
N36	I-605 SB ramps & Florence	112.9	**F***	97.4	**F***
N37	Studebaker Rd & Florence Ave[1]	30.3	C	29	C
N38	Studebaker Rd & I-605 NB ramps/Dollison Dr[1]	37.5	D	11.6	B
N40	Fairford Ave & Florence Ave	23.2	C	30.6	C
N41	I-5 NB off-ramp & Florence Ave	14.6	B	6	A
N42	Orr and Day Rd & Florence Ave[1]	22.8	C	24.4	C
N45	I-605 SB ramps/Flatbush Ave & Imperial Hwy[1]	25.9	C	25	C
N46	Hoxie Ave & Imperial Hwy[1]	41.7	D	52.5	D
N47	I-605 NB ramps & Hoxie Ave	25.7	C	29.2	C
N48	Studebaker Rd & I-105 ramps	29.4	C	26.7	C
N49	Studebaker Rd & Imperial Hwy	57	**E***	50.6	D
N50	Bloomfield Ave & Firestone Blvd (north)	7.7	A	11.1	B
N51	Bloomfield Ave & Firestone Blvd (south)	68.5	**E***	57.4	**E***
N52	Bloomfield Ave & Rosecrans Ave	48.5	D	58.1	**E***
N53	I-5 NB off-ramp & Rosecrans Ave[1]	19	B	28.6	C
N54	I-5 SB on-ramp & Rosecrans Ave[1]	14.6	B	13.9	B
N55	Shoemaker Ave & Rosecrans Ave	42.8	D	45.6	D
N56	Shoemaker Ave & Overcrossing (south)[2]	15.2	C	40.1	**E***
N57	Shoemaker Ave & Firestone Blvd (south)[2]	10.2	B	10	A
N58	Carmenita Rd & Rosecrans Ave	42.5	D	49.8	D
N61	Carmenita Rd & I-5 NB ramps[1]	8.9	A	9.7	A
N62	Carmenita Rd & I-5 SB ramps[1]	8.7	A	7.9	A
N63	Norwalk Blvd & Civic Center Dr[1]	21.3	C	24.5	C
N64	Bloomfield Ave & Civic Center Dr	25.3	C	31.2	C
N65	Bloomfield Ave & Goller Ave/Foster Rd	26	C	21.2	C
N66	Shoemaker Ave & Foster Rd[3]	14.6	B	13.2	B
N67	Carmenita Rd & Orden Dr	14.1	B	20.7	C
N68	I-605 NB ramps & Rosecrans Ave	28.6	C	31.5	C

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N69	I-605 SB ramps & Rosecrans Ave[1]	27.5	C	27.3	C
N70	Studebaker Rd & Rosecrans Ave	53.5	D	56.8	**E***
N71	Pioneer Blvd/San Antonio Dr & Rosecrans Ave[1]	60	**E***	75.4	**E***
N72	Shoemaker Ave & Lakeland Rd	18.3	B	24.1	C
N73	Carmenita Rd & Lakeland Rd	41.5	D	129.4	**F***
N145	Carmenita Rd & Foster Rd	15.9	B	12.5	B

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
N intersection number prefix indicates intersections within Norwalk/Santa Fe Springs High-Speed Rail Station Option area.
HCM = Highway Capacity Manual; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle

5.8.2.6 Existing Transit

The proposed Norwalk/Santa Fe Springs HSR Station Option area is served by Metrolink, Metro, Norwalk Transit, Long Beach Transit, and Los Angeles County Department of Public Works Sunshine Shuttle. Specific routes and approximate headways are provided in Table 5-20 and depicted on Figure 5-11.

Access Services Incorporated is the federally required Americans with Disabilities Act (ADA) paratransit service provider for Los Angeles County. This service is offered to individuals whose disabilities prevent them from independently using regular bus or rail service. It is comparable to fixed-route service and offers curb-to-curb service during hours when local bus service is provided.

Table 5-20 Norwalk/Santa Fe Springs High-Speed Rail Station Option Area: Existing Transit

Operator	Route	Description	Headway (min)	Weekday Ridership (person)
Long Beach Transit	172	PCH to Palo Verde	30	N/A
	173	PCH to Studebaker	30	N/A
Metrolink	Orange County Line	LAUS to Oceanside	45–60	4,175
	91 Line	LAUS to Riverside Downtown	30	1,865
Metro Rail	Green Line	Redondo Beach to Norwalk	7–8	39,508
Metro Bus	62	Los Angeles Downtown–Hawaiian Gardens	20–30	3,204
	111	LAX–Norwalk	15–20	13,523
	115	Playa Del Rey–Norwalk	10–20	10,770
	120	El Segundo–Whittier	30	2,864
	128	Martin Luther King, Jr. Transit Center/ Compton Station–Cerritos Towne Center	50	951
	460	Disneyland–6th & Los Angeles	20	3,753
	577	V.A. Medical Center–El Monte Station	Varies	862

Operator	Route	Description	Headway (min)	Weekday Ridership (person)
Norwalk Transit	1	Flower & Bellflower to Rio Hondo College	30	N/A
	2	Norwalk Square to Norwalk & Imperial	40	N/A
	3	Whittier Depot to Norwalk & 166th	60	N/A
	4	Imperial & Idaho to Metro Green Line Station	20	N/A
	5	Rosecrans Ave to Green Line Station	45	N/A
	7	Green Line Station to El Monte Station	60	N/A
Sunshine Shuttle Bus	A	Sorensen Park to Whittwood Town Center	50–55	N/A
	B	Various	45	N/A

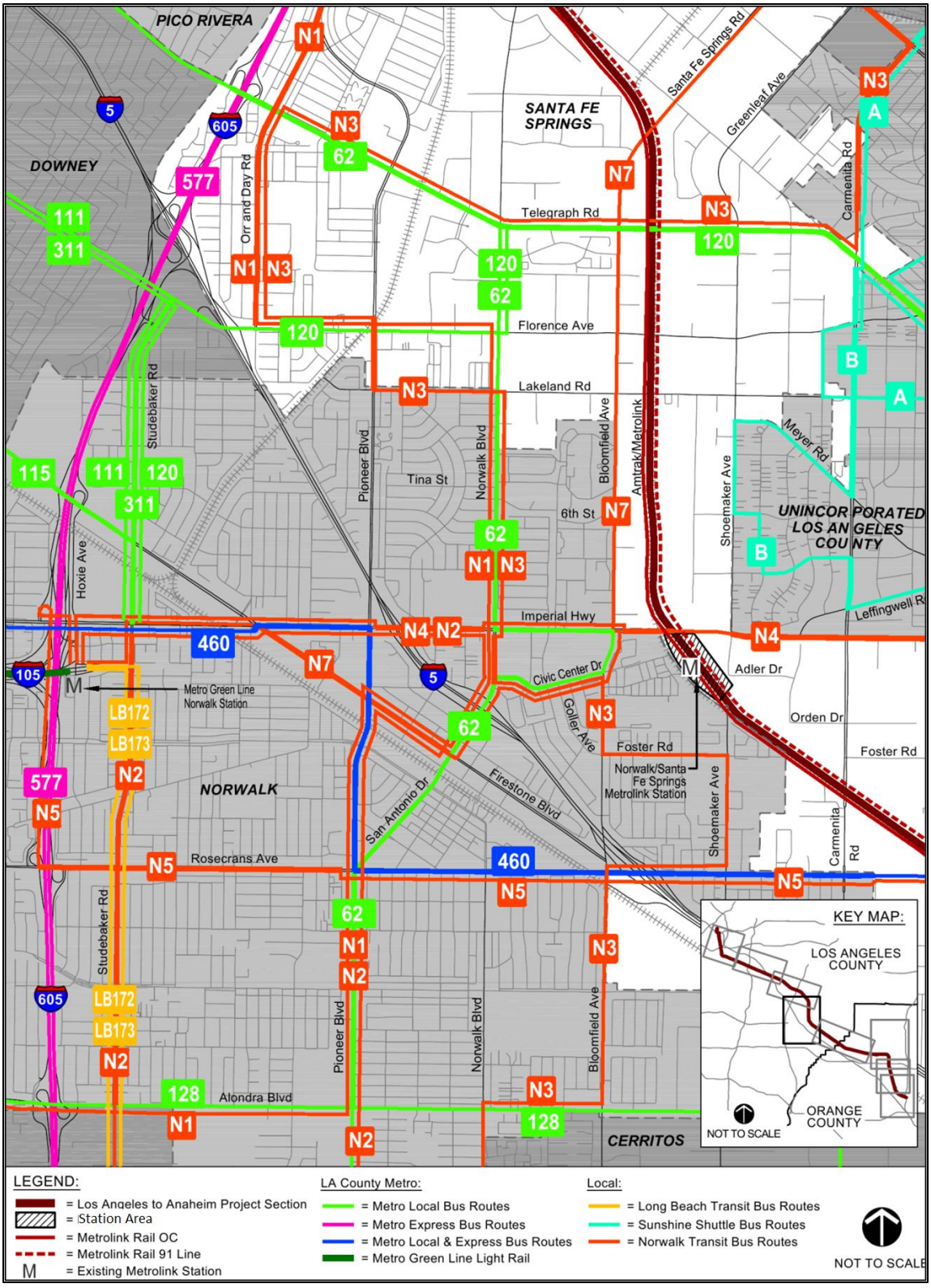
Sources: Metro 2023a, 2023b; SCRRA 2023; Long Beach Transit 2024; City of Norwalk 2024; Los Angeles County Department of Public Works 2024
LAUS = Los Angeles Union Station; LAX = Los Angeles Intersnational Airport; Metro = Los Angeles County Metropolitan Transportation Authority; min = minutes; N/A = not available; PCH = Pacific Coast Highway; V.A. = Veterans' Administration

5.8.2.7 Existing Pedestrian Facilities

The pedestrian facilities around the proposed station include the sidewalk system on the nearby streets. There are no separate pedestrian paths or trails from the nearby neighborhoods. The station area is generally well connected with the sidewalk system as depicted on Figure 5-12. Sidewalks are available on both sides along the streets within the station vicinity and crosswalks are provided for pedestrian movements at most of the intersections. A pedestrian walkway is provided across the existing corridor railroad tracks at the existing station site, for access to the far side of the existing station.

5.8.2.8 Existing Bicycle Facilities

There is a comprehensive bikeway system consisting of Class I, Class II, and Class III bicycle facilities, as defined in Section 3.2.9, California Streets and Highways Code Section 890. Existing bicycle facilities around the station are depicted on Figure 5-13. Existing Class II bikeways provide direct access to and from the station via Bloomfield Avenue from the north and Imperial Highway, Orden Drive, and Foster Road from the southeast. Proposed Class II and Class III bikeways would provide even greater connectivity to the station from the east and north via Leffingwell Road and Carmenita Road, respectively.



Sources: Metro 2016; Norwalk Transit 2016; Long Beach Transit 2024; Los Angeles County Department of Public Works 2024

Figure 5-11 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Existing Transit

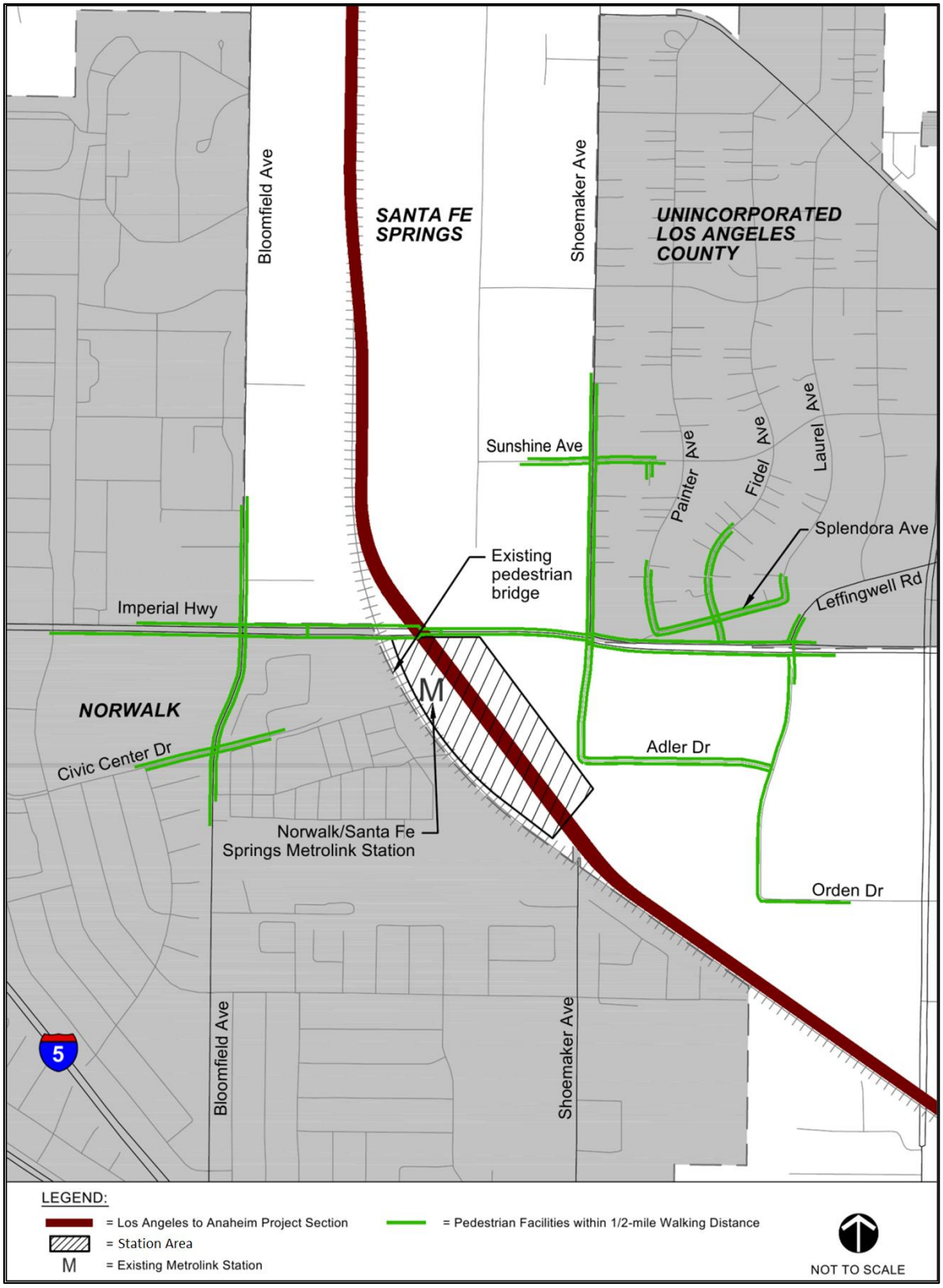
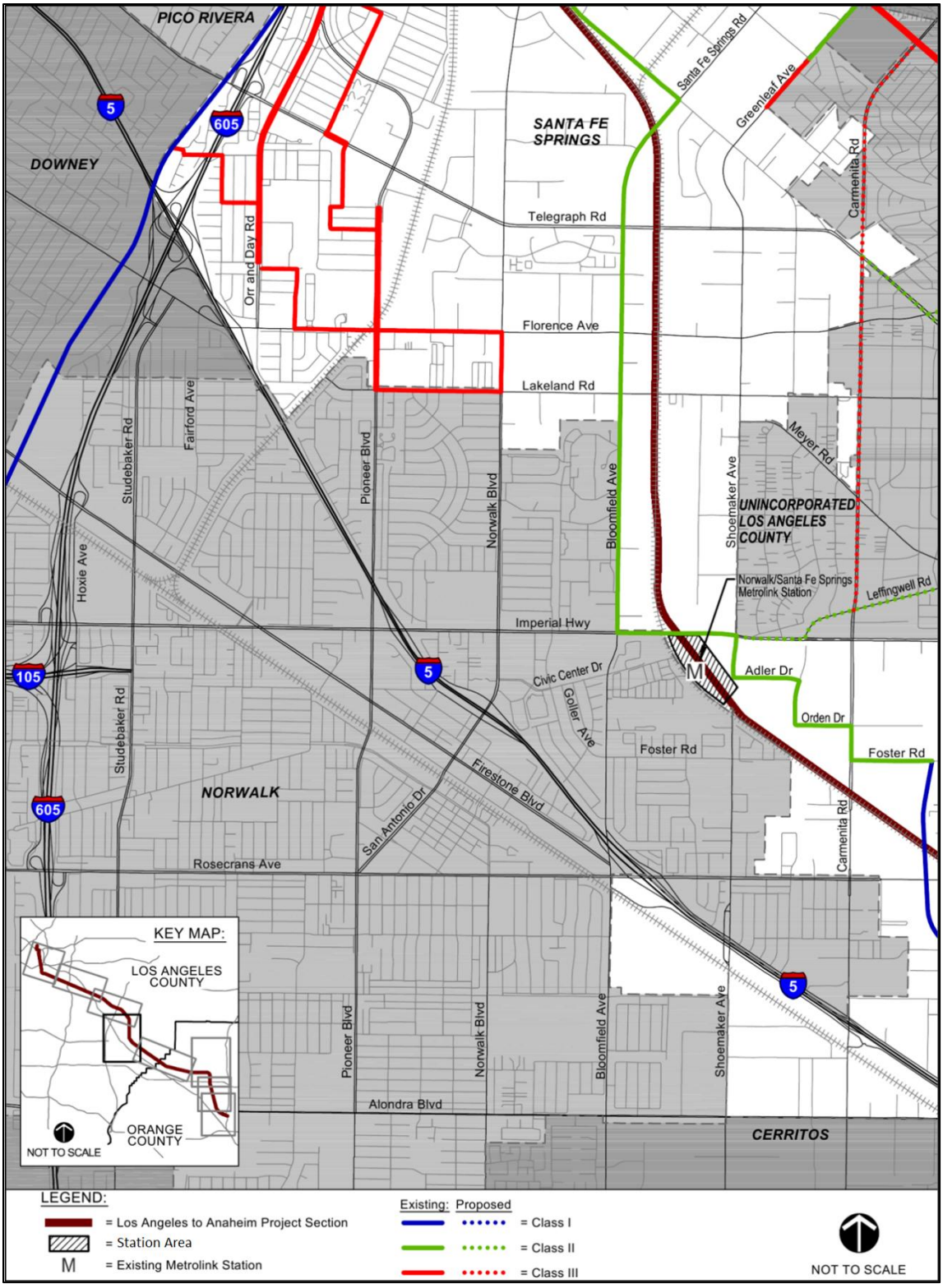


Figure 5-12 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Existing Pedestrian Facilities



Source: County of Los Angeles 2025

Figure 5-13 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Existing Bicycle Facilities

5.8.2.9 Existing Parking Facilities

Per Section 5.8.2.1, Station Area, the station area includes 1,248 parking spaces by 2040, compared to the 497 existing Metrolink station parking spaces.

5.8.3 Fullerton High-Speed Rail Station Option

5.8.3.1 Station Area

The existing Fullerton Transportation Center is immediately east of the proposed station at 120 E Santa Fe Avenue. It is bounded by Santa Fe Avenue in the north, Lemon Street in the east, Walnut Avenue in the south, and Malden Avenue in the west and is serviced by both Amtrak and Metrolink rail and OCTA transit. The existing Fullerton Transportation Center consists of two platforms, a pedestrian overpass that connects Los Angeles-bound and Oceanside–bound platforms, and an Amtrak station adjacent to the Los Angeles bound platform.

The proposed station design option plan, including ingress and egress and nonmotorized access, would be confirmed based on local jurisdiction coordination and review of the PEPD. Section 2.2.1 discusses the Fullerton HSR Station Option area in further detail.

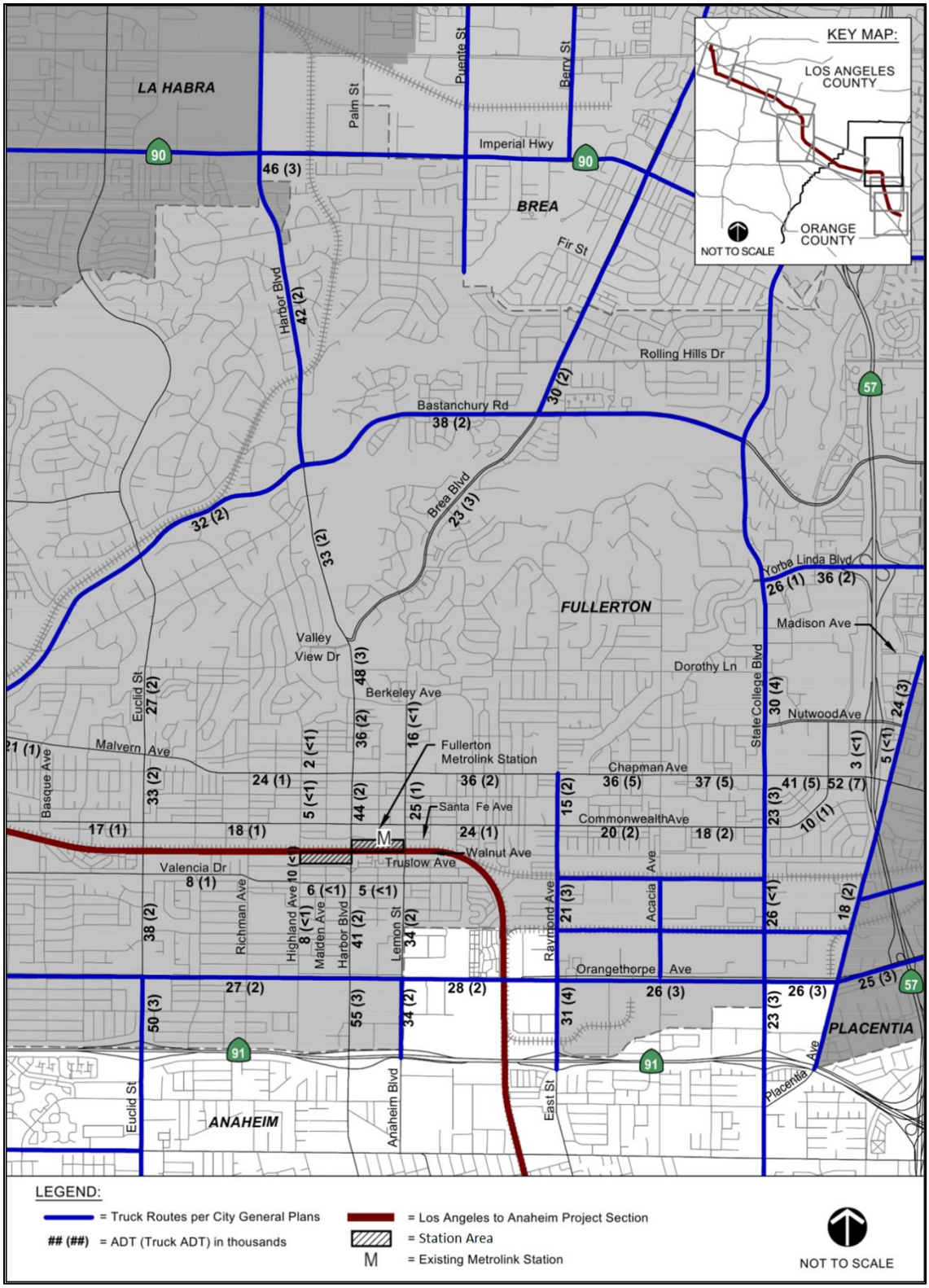
5.8.3.2 Station Traffic Study Area

The Fullerton HSR Station Option operations analysis area is defined as that area within the RSA for which operations related to trips generated to and from the proposed facility, ingress and egress at the proposed station, or parking, can be meaningfully detected.

The RSA for the proposed Fullerton HSR Station Option area was developed based on transportation characteristics of the proposed station including trip generation totals and trip distribution characteristics as discussed in Section 4.2.1, Study Approach and Baselines. Figure 5-3 depicts the study intersection locations, including those in the Fullerton HSR Station Option area.

5.8.3.3 Roadways and Intersections

A total of 60 roadway segments and 62 intersections were identified for analysis. The ADT for major roadway segments is depicted on Figure 5-14.



Source: City of Anaheim 2025; City of Brea 2022; City of Fullerton 2025

Figure 5-14 Fullerton High-Speed Rail Station Option: Existing Average Daily Traffic and Truck Routes

5.8.3.4 Existing Traffic Volumes

Existing roadway segment ADT and intersection turning movement traffic count data were obtained through manual traffic counts collected from September 2015 to November 2016. The traffic counts were collected from 6:00 to 9:00 a.m. and 4:00 to 7:00 p.m. with the highest hourly volumes in each peak period at each intersection selected for analysis.

Existing roadway segment volumes are presented in Table 5-21. Existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B.

Table 5-21 Fullerton High-Speed Rail Station Option Area: Existing Roadway Segment Volumes

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Euclid St	Bastanchury Rd	Malvern Ave	4D	35	27,000	1,500
Euclid St	Malvern Ave	Commonwealth Ave	4D	35	33,000	1,800
Euclid St	Commonwealth Ave	Orangethorpe Ave	4D	35	38,000	2,100
Highland Ave	Malvern Ave	Chapman Ave	2U	25	2,100	< 1,000
Highland Ave	Chapman Ave	Commonwealth Ave	2U	25	5,100	< 1,000
Highland Ave	Commonwealth Ave	Valencia Dr	2U	30	10,000	< 1,000
Highland Ave	Valencia Dr	Orangethorpe Ave	2U	30	8,000	< 1,000
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	4D	50	42,000	2,300
Harbor Blvd	Bastanchury Rd	Brea Blvd	6D	50	33,000	1,800
Harbor Blvd	Brea Blvd	Berkeley Ave	5D	35	48,000	2,600
Harbor Blvd	Berkeley Ave	Chapman Ave	4D	35	36,000	2,000
Harbor Blvd	Chapman Ave	Commonwealth Ave	4D	25	44,000	2,400
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	4D	35	41,000	2,200
Harbor Blvd	south of Orangethorpe Ave	---	6D	40	55,000	3,000
Lemon St	Berkeley Ave	Chapman Ave	4D	30	16,000	< 1,000
Lemon St	Chapman Ave	Commonwealth Ave	4D	35	25,000	1,400
Lemon St	Commonwealth Ave	Orangethorpe Ave	4D	40	34,000	1,900
Lemon St	south of Orangethorpe Ave	---	4D	40	34,000	1,900
Raymond Ave	Chapman Ave	Commonwealth Ave	4D	35	15,000	1,900
Raymond Ave	Commonwealth Ave	Orangethorpe Ave	4D	40	21,000	2,700
Raymond Ave	south of Orangethorpe Ave	---	4D	40	31,000	3,900
State College Blvd	Dorothy Ln	Chapman Ave	6D	40	30,000	3,800
State College Blvd	Chapman Ave	Commonwealth Ave	4D	40	23,000	2,900
State College Blvd	Commonwealth Ave	Orangethorpe Ave	4D	40	26,000	< 1,000
State College Blvd	south of Orangethorpe Ave	---	4D	40	23,300	2,900
Placentia Ave	Chapman Ave	Madison Ave	6D	40	24,000	3,000
Malvern Ave	Bastanchury Rd	Basque Ave	4U	45	21,000	1,200

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Chapman Ave	Richman Ave	Highland Ave	4D	40	24,000	1,300
Chapman Ave	Harbor Blvd	Raymond Ave	4D	30	36,000	2,000
Chapman Ave	Raymond Ave	Acacia Ave	4D	40	36,000	4,500
Chapman Ave	Acacia Ave	State College Blvd	4D	40	37,000	4,600
Chapman Ave	State College Blvd	Commonwealth Ave	4D	40	41,000	5,100
Commonwealth Ave	Brookhurst St	Euclid St	4D	40	17,000	1,000
Commonwealth Ave	Euclid St	Harbor Blvd	4U	35	18,000	1,000
Commonwealth Ave	Harbor Blvd	Raymond Ave	4U	40	24,000	1,300
Commonwealth Ave	Raymond Ave	Acacia Ave	4U	40	20,000	2,500
Commonwealth Ave	Acacia Ave	State College Blvd	4U	40	18,000	2,300
Commonwealth Ave	State College Blvd	Chapman Ave	4U	40	10,000	1,300
Valencia Dr	Highland Ave	Harbor Blvd	2U	30	6,000	< 1,000
Valencia Dr	Harbor Blvd	Lemon St	2U	30	5,000	< 1,000
Orangethorpe Ave	Euclid St	Highland Ave	4D	45	27,000	1,500
Orangethorpe Ave	Harbor Blvd	Raymond Ave	6D	40	28,000	1,500
Orangethorpe Ave	Raymond Ave	State College Blvd	6D	45	26,000	3,300
Orangethorpe Ave	State College Blvd	Placentia Ave	6D	45	26,000	3,300
SR 57 SB Frontage Rd	Nutwood Ave	Chapman Ave	2U	50	3,300	< 1,000
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	1U	45	4,500	< 1,000
Chapman Ave	Commonwealth Ave	SR 57	4D	40	52,000	6,500
Placentia Ave	Chapman Ave	Orangethorpe Ave	4D	40	18,300	2,300
Valencia Dr	Euclid St	Highland Ave	2D	35	8,000	1,000
Orangethorpe Ave	Placentia Ave	SR 57	6D	40	25,200	3,100
Imperial Hwy (SR 90)	Harbor Blvd	Puente St	4D	45	46,000	2,300
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	4D	40	30,000	1,500
Bastanchury Rd	Euclid St	Harbor Blvd	4D	50	32,000	1,600
Bastanchury Rd	Harbor Blvd	Brea Blvd	6D	50	38,000	1,900
Yorba Linda Blvd	State College Blvd	Associated Rd/Campus Dr	6D	40	25,000	1,300
Yorba Linda Blvd	Associated Rd/Campus Dr	SR 57	4D	40	36,000	1,800
Euclid St	Orangethorpe Ave	SR 91	4D	35	50,000	2,500
Brea Blvd	Harbor Blvd	Bastanchury Rd	4D	45	23,000	2,800

ADT = average daily trips; D = divided roadway; mph = miles per hour; NB = northbound; SB = southbound; SR = State Route; U = undivided roadway; veh = vehicle

5.8.3.5 *Existing Level of Service*

Table 5-22 presents roadways segment LOS for AM and PM peak hours. The AM and PM intersection LOS are presented in Table 5-23. Of the 60 roadway segments analyzed, 14 are LOS E or F in the AM peak hour, and 15 are LOS E or F in the PM peak hour. Of the 62 intersections analyzed, 5 are LOS E or F in the AM peak hour, and 3 are LOS E or F in the PM peak hour.

Table 5-22 Roadway Segment Level of Service: Fullerton High-Speed Rail Station Option Area, Existing (Year 2015) Conditions

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Euclid St	Bastanchury Rd	Malvern Ave	2,625	2,800	2,700	1.04	1.00	**F***	**E***
Euclid St	Malvern Ave	Commonwealth Ave	3,045	3,000	2,900	0.95	0.95	**E***	**E***
Euclid St	Commonwealth Ave	Orangethorpe Ave	2,520	2,500	2,500	0.95	0.99	**E***	**E***
Highland Ave	Malvern Ave	Chapman Ave	1,100	300	300	0.22	0.20	A	A
Highland Ave	Chapman Ave	Commonwealth Ave	1,100	600	700	0.47	0.57	A	A
Highland Ave	Commonwealth Ave	Valencia Dr	1,155	800	1,000	0.61	0.78	B	C
Highland Ave	Valencia Dr	Orangethorpe Ave	1,050	400	900	0.32	0.81	A	D
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	2,520	3,100	3,100	1.20	1.23	**F***	**F***
Harbor Blvd	Bastanchury Rd	Brea Blvd	5,198	2,700	2,700	0.50	0.52	A	A
Harbor Blvd	Brea Blvd	Berkeley Ave	4,332	3,500	3,200	0.79	0.73	C	C
Harbor Blvd	Berkeley Ave	Chapman Ave	3,045	2,700	2,500	0.86	0.82	D	D
Harbor Blvd	Chapman Ave	Commonwealth Ave	3,045	2,600	2,300	0.82	0.75	D	C
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	2,900	2,800	1.11	1.09	**F***	**F***
Harbor Blvd	south of Orangethorpe Ave	---	4,410	3,300	3,900	0.74	0.87	C	D
Lemon St	Berkeley Ave	Chapman Ave	3,045	1,600	1,800	0.52	0.58	A	A
Lemon St	Chapman Ave	Commonwealth Ave	3,045	1,800	2,000	0.58	0.64	A	B
Lemon St	Commonwealth Ave	Orangethorpe Ave	2,415	2,500	2,800	1.03	1.14	**F***	**F***
Lemon St	south of Orangethorpe Ave	---	2,415	2,400	3,000	0.97	1.20	**E***	**F***
Raymond Ave	Chapman Ave	Commonwealth Ave	3,045	800	700	0.24	0.22	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Raymond Ave	Commonwealth Ave	Orangethorpe Ave	2,415	500	600	0.20	0.23	A	A
Raymond Ave	south of Orangethorpe Ave	---	2,415	1,600	1,700	0.63	0.70	B	B
State College Blvd	Dorothy Ln	Chapman Ave	5,198	2,200	2,000	0.41	0.38	A	A
State College Blvd	Chapman Ave	Commonwealth Ave	3,045	1,700	1,800	0.54	0.57	A	A
State College Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	1,400	1,500	0.53	0.57	A	A
State College Blvd	south of Orangethorpe Ave	---	2,415	1,600	1,900	0.63	0.75	B	C
Malvern Ave	Bastanchury Rd	Basque Ave	2,900	1,600	1,900	0.54	0.65	A	B
Chapman Ave	Richman Ave	Highland Ave	3,360	1,900	2,100	0.56	0.62	A	B
Chapman Ave	Harbor Blvd	Raymond Ave	3,045	2,400	2,400	0.78	0.79	C	C
Chapman Ave	Raymond Ave	Acacia Ave	3,045	2,700	3,000	0.88	0.97	D	**E***
Chapman Ave	Acacia Ave	State College Blvd	2,520	2,600	3,100	1.02	1.21	**F***	**F***
Chapman Ave	State College Blvd	Commonwealth Ave	2,520	2,400	2,900	0.95	1.11	**E***	**F***
Commonwealth Ave	Brookhurst St	Euclid St	3,045	1,500	1,500	0.46	0.49	A	A
Commonwealth Ave	Euclid St	Harbor Blvd	2,900	1,600	1,300	0.53	0.42	A	A
Commonwealth Ave	Harbor Blvd	Raymond Ave	2,900	1,900	1,800	0.63	0.61	B	B
Commonwealth Ave	Raymond Ave	Acacia Ave	2,900	1,700	1,700	0.57	0.56	A	A
Commonwealth Ave	Acacia Ave	State College Blvd	2,400	1,100	1,300	0.43	0.52	A	A
Commonwealth Ave	State College Blvd	Chapman Ave	2,400	800	900	0.30	0.36	A	A
Valencia Dr	Highland Ave	Harbor Blvd	1,100	500	500	0.44	0.39	A	A
Valencia Dr	Harbor Blvd	Lemon St	1,050	400	500	0.35	0.39	A	A
Orangethorpe Ave	Euclid St	Highland Ave	3,045	1,800	2,500	0.58	0.79	A	C
Orangethorpe Ave	Harbor Blvd	Raymond Ave	4,253	2,100	2,500	0.48	0.57	A	A
Orangethorpe Ave	Raymond Ave	State College Blvd	4,253	2,000	2,500	0.46	0.57	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Orangethorpe Ave	State College Blvd	Placentia Ave	4,253	1,900	2,000	0.43	0.47	A	A
SR 57 SB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	500	800	0.42	0.66	A	B
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	900	900	0.83	0.75	D	C
Chapman Ave	Commonwealth Ave	SR 57	3,045	3,000	3,400	0.97	1.09	**E***	**F***
Placentia Ave	Chapman Ave	Orangethorpe Ave	2,520	1,800	1,900	0.68	0.72	B	C
Valencia Dr	Euclid St	Highland Ave	1,155	700	700	0.57	0.54	A	A
Orangethorpe Ave	Placentia Ave	SR 57	5,198	1,800	1,900	0.33	0.36	A	A
Imperial Hwy (SR 90)	Harbor Blvd	Puente St	4,410	3,900	4,000	0.87	0.90	D	D
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	2,520	2,600	2,700	1.00	1.03	**E***	**F***
Bastanchury Rd	Euclid St	Harbor Blvd	2,625	3,400	3,400	1.26	1.28	**F***	**F***
Bastanchury Rd	Harbor Blvd	Brea Blvd	2,520	3,400	3,400	1.32	1.33	**F***	**F***
Yorba Linda Blvd	State College Blvd	Associated Rd/Campus Dr	4,725	2,000	2,200	0.42	0.46	A	A
Yorba Linda Blvd	Associated Rd/Campus Dr	SR 57	5,198	2,300	2,600	0.43	0.48	A	A
Euclid St	Orangethorpe Ave	SR 91	2,520	2,900	3,100	1.15	1.21	**F***	**F***
Brea Blvd	Harbor Blvd	Bastanchury Rd	2,520	1,900	1,900	0.75	0.75	C	C
Santa Fe Ave	Highland Ave	Malden Ave	1,150	100	200	0.06	0.09	A	A
Santa Fe Ave	Malden Ave	Harbor Blvd	1,000	200	200	0.15	0.16	A	A
Santa Fe Ave	Harbor Blvd	Lemon St	1,000	200	300	0.14	0.20	A	A

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LOS = level of service; NB = northbound; SB = southbound; SR = State Route; veh/hr = vehicle per hour; V/C = volume to capacity ratio

Table 5-23 Intersection Level of Service: Fullerton High-Speed Rail Station Option Area, Existing (Year 2015) Conditions

No.	Intersection	Signalized or Unsignalized Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F1	Euclid St & Malvern Ave	Signalized	42.3	D	51.6	D
F2	Euclid St & Commonwealth Ave	Signalized	36.9	D	33.9	C
F3	Highland Ave & Chapman Ave	Signalized	11.3	B	15.2	B
F4	Highland Ave & Commonwealth Ave	Signalized	17.7	B	19	B
F5	Highland Ave & Santa Fe Ave[2]	Unsignalized	15.5	C	17.4	C

No.	Intersection	Signalized or Unsignalized Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F6	Highland Ave & Truslow Ave[2]	Unsignalized	15.7	C	16.8	C
F7	Highland Ave & Valencia Dr	Signalized	16.2	B	16.4	B
F8	Highland Ave & Orangethorpe Ave	Signalized	17.7	B	21.1	C
F9	Malden Ave & Chapman Ave[2]	Unsignalized	40.6	**E***	111.1	**F***
F10	Malden Ave & Commonwealth Ave	Signalized	14.5	B	18.7	B
F11	Harbor Blvd & Imperial Hwy (SR 90)	Signalized	51.1	D	46.6	D
F12	Harbor Blvd & Bastanchury Rd	Signalized	48.9	D	43.1	D
F13	Harbor Blvd & Valley View Dr/Brea Blvd[1]	Signalized	30.6	C	31.5	C
F14	Harbor Blvd & Berkeley Ave	Signalized	29.1	C	26.3	C
F15	Harbor Blvd & Chapman Ave	Signalized	42.7	D	38.3	D
F16	Harbor Blvd & Commonwealth Ave	Signalized	38.9	D	29.6	C
F17	Harbor Blvd & Santa Fe Ave	Signalized	11.1	B	13.5	B
F18	Harbor Blvd & Truslow Ave[2]	Unsignalized	18.7	C	15.7	C
F19	Harbor Blvd & Orangethorpe Ave	Signalized	34.6	C	40.9	D
F20	Harbor Blvd & SR 91 WB ramps	Signalized	14.5	B	15.2	B
F21	Harbor Blvd & SR 91 EB ramps	Signalized	19.5	B	23.1	C
F22	Brea Blvd & Bastanchury Rd	Signalized	50.5	D	37.7	D
F23	Lemon St & Chapman Ave	Signalized	32.7	C	37.2	D
F24	Lemon St & Commonwealth Ave	Signalized	33.7	C	33	C
F25	Lemon St & Santa Fe Ave[2]	Unsignalized	79	**F***	>180	**F***
F26	Lemon St & Orangethorpe Ave	Signalized	35.5	D	48.9	D
F27	Lemon St & SR 91 WB ramps	Signalized	23.7	C	26.9	C
F28	Anaheim Blvd/Lemon St & SR 91 EB ramps	Signalized	29.4	C	29.5	C
F29	Raymond Ave & Chapman Ave	Signalized	27.3	C	23.2	C
F30	Raymond Ave & Commonwealth Ave	Signalized	22.5	C	20.2	C
F31	Raymond Ave & Orangethorpe Ave	Signalized	30.8	C	31.8	C
F32	State College Blvd & Chapman Ave	Signalized	31.6	C	37.9	D
F33	State College Blvd & Commonwealth Ave	Signalized	34	C	28.4	C
F34	State College Blvd & Orangethorpe Ave	Signalized	29.7	C	34.2	C
F35	Commonwealth Ave & Chapman Ave	Signalized	17.7	B	23.9	C
F36	SR 57 SB ramps & Chapman Ave	Signalized	19.2	B	21.1	C
F37	SR 57 NB ramps & Chapman Ave[1]	Signalized	34.6	C	33.5	C
F38	Placentia Ave & Chapman Ave	Signalized	37.3	D	38.5	D
F39	Euclid St & Valencia Dr	Signalized	26.6	C	22.6	C
F40	Highland Ave & Walnut Ave	Signalized	10.9	B	10.1	B
F41	Malden Ave & Santa Fe Ave[3]	Unsignalized	8.6	A	8.8	A

No.	Intersection	Signalized or Unsignalized Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F42	Malden Ave & Truslow Ave[2]	Unsignalized	8.8	A	8.9	A
F43	Malden Ave & Valencia Dr[2]	Unsignalized	13.2	B	11.9	B
F44	Harbor Blvd & Valencia Dr	Signalized	17.1	B	13.1	B
F45	Lemon St & Walnut Ave[2]	Unsignalized	84.9	**F***	53.5	**F***
F46	Lemon St & Valencia Dr	Signalized	68.8	**E***	53.2	D
F47	Placentia Ave & Orangethorpe Ave	Signalized	32.6	C	32.1	C
F48	SR 57 SB ramps & Nutwood Ave[1]	Signalized	26.6	C	26.1	C
F49	SR 57 SB ramps & Orangethorpe Ave[1]	Signalized	29.1	C	25.9	C
F50	SR 57 NB ramps & Nutwood Ave[1]	Signalized	31.1	C	26.7	C
F51	SR 57 NB ramps & Orangethorpe Ave	Signalized	29.7	C	30.2	C
F52	Brea Blvd & Imperial Hwy (SR 90)	Signalized	49.8	D	44.8	D
F53	State College Blvd & Yorba Linda Blvd[1]	Signalized	39.7	D	32	C
F54	SR 57 SB off-ramp & Yorba Linda Blvd	Signalized	20.3	C	24.5	C
F55	SR 57 NB off-ramp & Yorba Linda Blvd[1]	Signalized	29.4	C	33.3	C
F56	Raymond Ave/East St & SR 91 EB ramps[1]	Signalized	26.2	C	17.7	B
F57	Raymond Ave & SR 91 WB ramps[1]	Signalized	21.5	C	12.3	B
F58	Euclid St & SR 91 WB ramps	Signalized	>180	**F***	22.6	C
F59	Euclid St & SR 91 EB ramps[1]	Signalized	14.5	B	20.7	C
F60	State College Blvd & SR 91 EB ramps[1]	Signalized	21.1	C	21.9	C
F61	State College Blvd & SR 91 WB ramps[1]	Signalized	19.4	B	21.7	C
F161	Euclid St & Orangethorpe Ave	Signalized	42.2	D	39.3	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
F intersection number prefix indicates intersections within Fullerton HSR Station Option area.
EB = eastbound; HCM = Highway Capacity Manual; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route; WB = westbound

5.8.3.6 Existing Transit

The proposed Fullerton HSR Station Option area is served by Amtrak, Metrolink and OCTA. The detailed information is provided in Table 5-24 and the bus lines are depicted on Figure 5-15.

ACCESS is OCTA's shared-ride service for people who are unable to use regular, fixed-route bus service because of functional limitations caused by a disability. Passengers must meet ADA eligibility criteria. Standard curb-to-curb service is provided, as well as subscription service for regular riders, and same-day taxi service for an extra fee.

Table 5-24 Fullerton High-Speed Rail Station Option Area: Existing Transit

Operator	Route	Description	Headway (min)	Weekday Ridership (person)
Amtrak	Pacific Surfliner	San Luis Obispo to Los Angeles to San Diego	60	1,517,425/year

Operator	Route	Description	Headway (min)	Weekday Ridership (person)
	Southwest Chief	Chicago to Los Angeles	Daily	253,838/year
Metrolink	Orange County Line	LAUS to Oceanside	30	4,175
	91 Line	LAUS to Riverside Downtown	40	1,865
	26	Fullerton to Placentia	20–30	1,116
	30	Cerritos to Anaheim	25–30	1,691
	37	La Habra to Fountain Valley	30	2,474
	38	Lakewood to Anaheim Hills	20	3,498
	43	Fullerton to Costa Mesa	17–30	6,305
	47	Fullerton to Balboa	12–20	6,382
	57	Brea to Newport Beach	20	9,323
	129	La Habra to Anaheim	60	663
	143	La Habra to Brea	60	550
	150/A	Santa Ana to Costa Mesa	40	424
	543	Fullerton Transportation Center to Santa Ana	12	3,234

Sources: National Association of Railroad Passengers 2024; Metro 2023a; SCRRA 2023; OCTA 2023
Amtrak = National Railroad Passenger Corporation; LAUS = Los Angeles Union Station; min = minutes

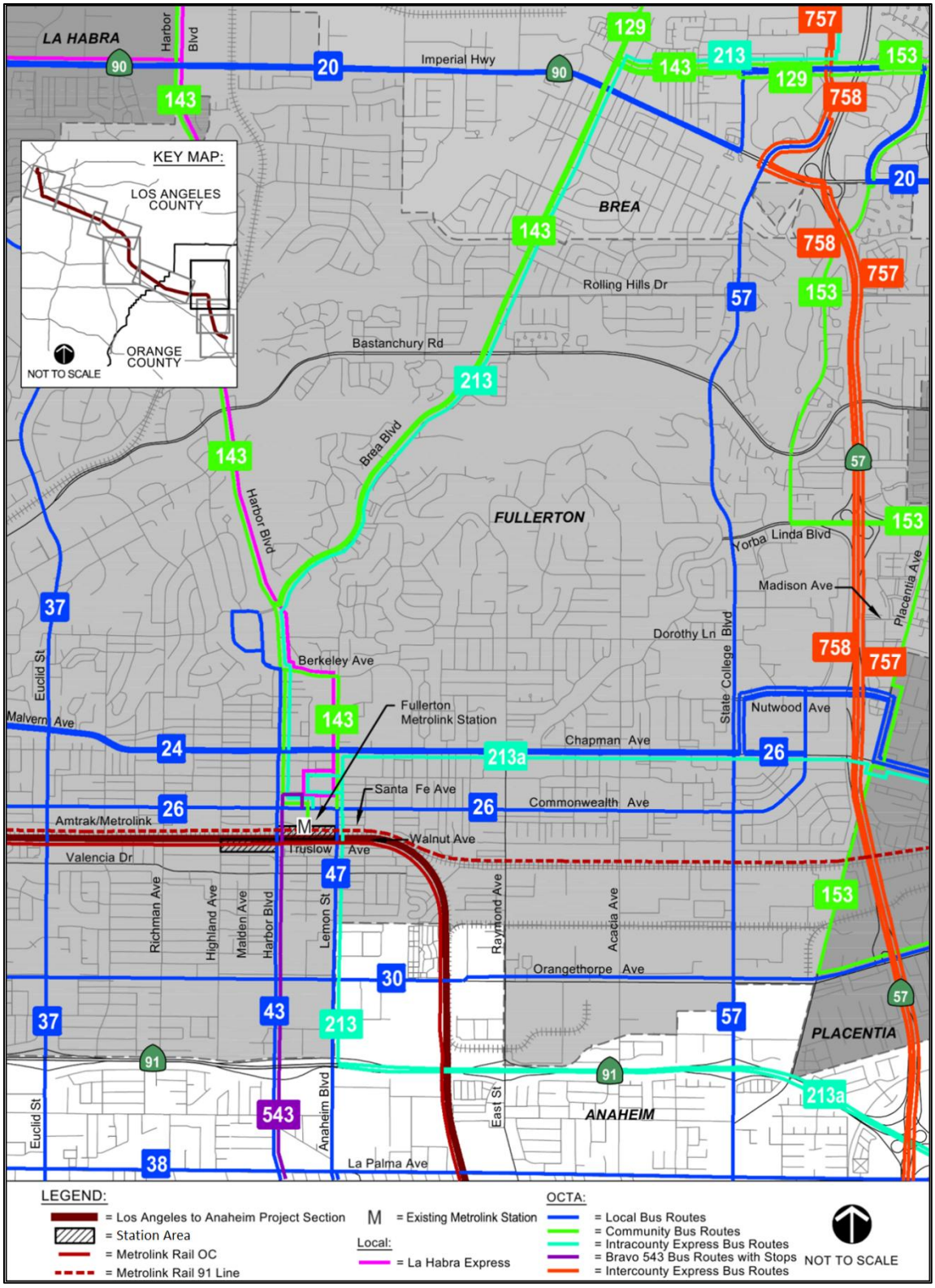
5.8.3.7 Existing Pedestrian Facilities

The pedestrian facilities around the proposed station include the sidewalk system on the nearby streets. There are no separate pedestrian paths or trails from the nearby neighborhoods. The station area is generally well connected with the sidewalk system as on Figure 5-16. Sidewalks are available on both sides along the streets within the station vicinity and crosswalks are provided for pedestrian movements at most of the intersections.

5.8.3.8 Existing Bicycle Facilities

There is a comprehensive bikeway system consisting of Class I, Class II, and Class III bicycle facilities, as defined in Section 3.2.9, California Streets and Highways Code Section 890. Existing bicycle facilities around the station are depicted on Figure 5-17. Currently, few existing bikeway facilities provide access to the station design option area (Class II via Valencia Drive from the west, Highland Avenue from the south, and Orangethorpe Avenue from the west; Class III via Richmond Avenue north of SR 91). Proposed bikeways would lend access to the proposed Fullerton HSR Station Option via an elaborate network of future Class I, II, and III bikeway facilities all throughout Fullerton.

Bike lockers are at the existing Fullerton Metrolink/Amtrak Station and are available for reservation or at a first come first serve basis. Bike lockers remove the need for additional locks or cables and are usually prereserved and key-operated. The existing Fullerton Metrolink/Amtrak Station is equipped with 44 regular sized and 4 extra-large sized bike lockers (OCTA 2017).



Sources: OCTA 2015, 2025; Amtrak 2016; SCRRA 2023; City of La Habra 2016

Figure 5-15 Fullerton High-Speed Rail Station Option: Existing Transit Facilities

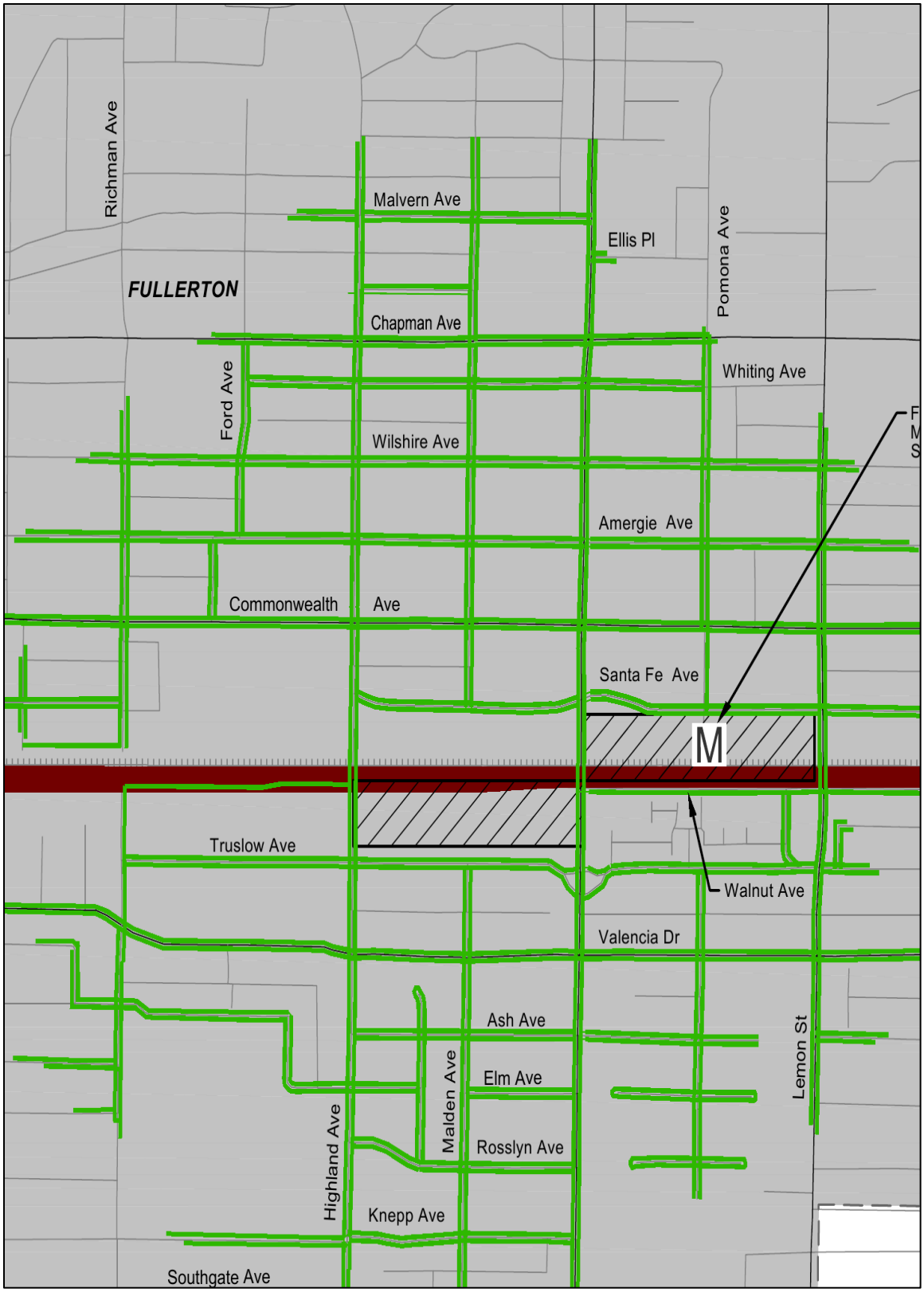
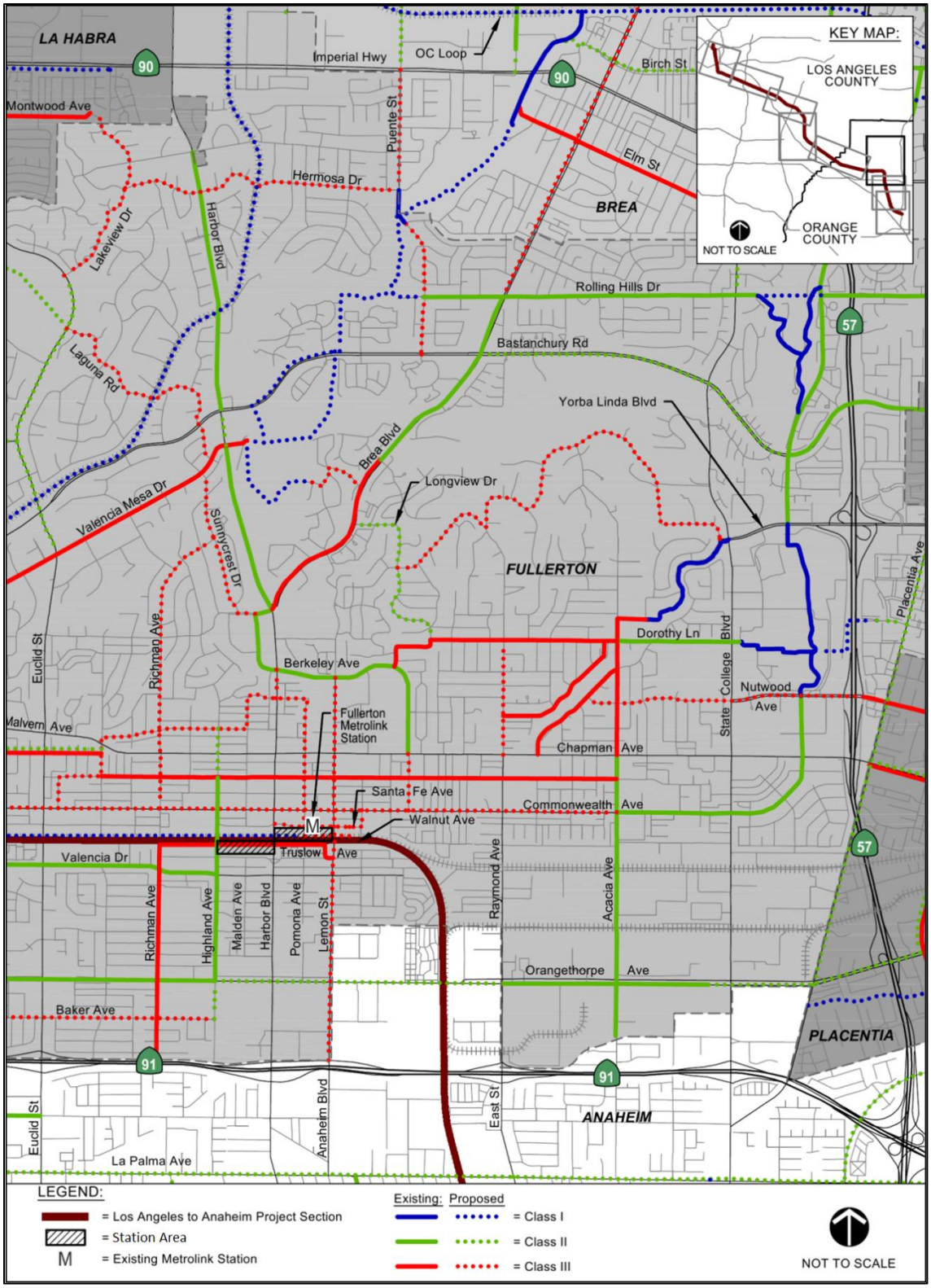


Figure 5-16 Fullerton High-Speed Rail Station Option: Existing Pedestrian Facilities



Source: City of Fullerton 2025

Figure 5-17 Fullerton High-Speed Rail Station Option: Existing Bicycle Facilities

5.8.3.9 Existing Parking Facilities

Per Section 5.8.3.1, Station Area, the station area includes a new parking structure west of Lemon Street and south of Santa Fe Street and provides up to 1,342 parking spaces by 2040, adding additional parking spaces to the current Fullerton Metrolink/Amtrak Station.

5.8.4 ARTIC

5.8.4.1 Station Area

At present, ARTIC is east of the current Anaheim Metrolink and Amtrak station and serves as Orange County's main focal point for transportation. ARTIC is bounded by Katella Avenue in the north, the Santa Ana River in the east, SR 57 in the south, and Douglass Road in the west. ARTIC is also directly adjacent to the Honda Center and Angel Stadium of Anaheim. Primary access to ARTIC is provided by Douglass Road whereas regional access to ARTIC is provided via SR 57, and I-5 and SR 55 via Katella Avenue.

The proposed station plan, including ingress and egress and nonmotorized access, would be confirmed based on local jurisdiction coordination and review of the PEPD. Section 2.2.1.3, ARTIC, discusses the ARTIC station area in further detail.

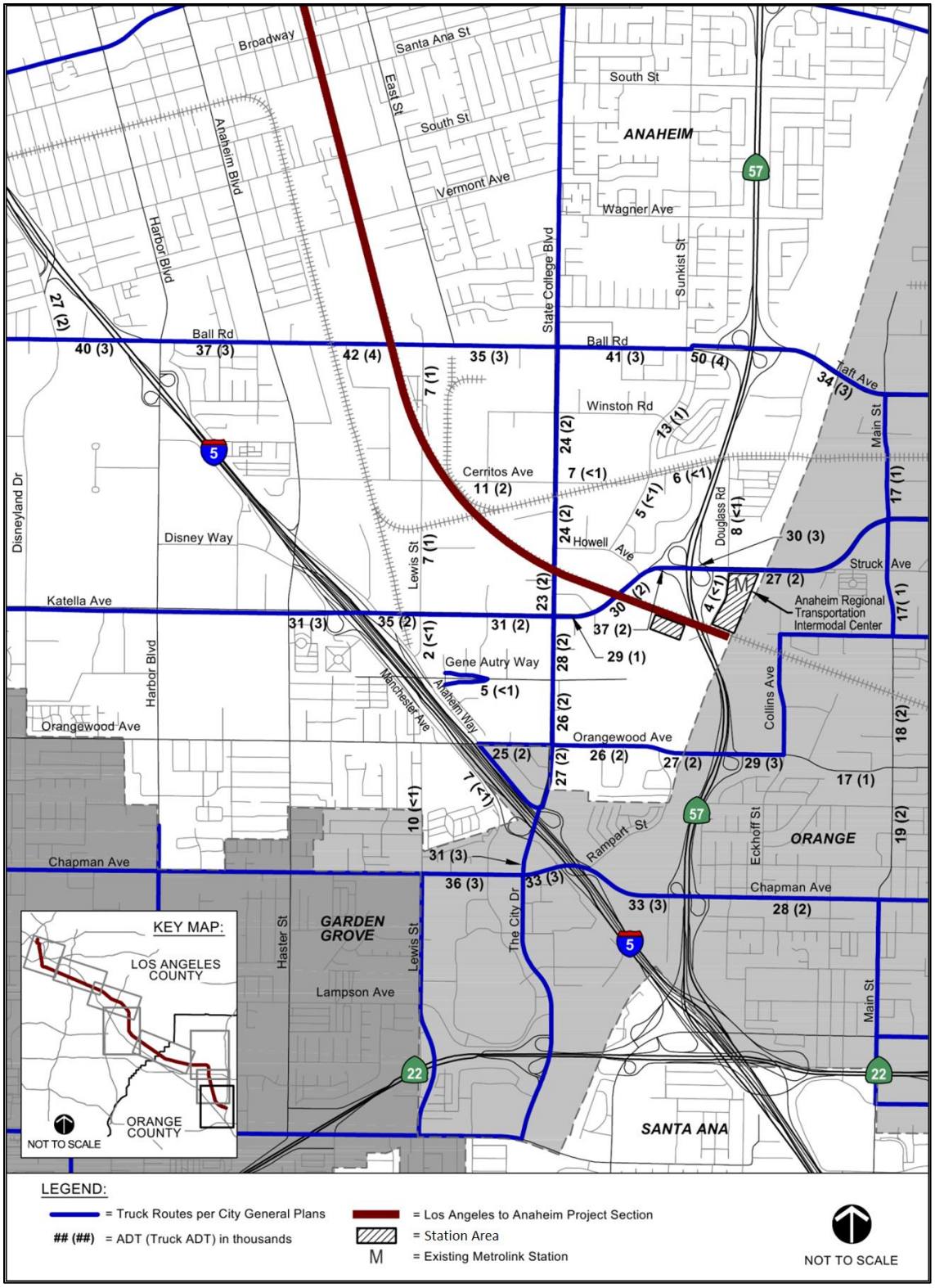
5.8.4.2 Station Traffic Study Area

The ARTIC operations analysis area is defined as that area within the RSA for which operations related to trips generated to and from the proposed facility, ingress and egress at the proposed station, or parking, can be meaningfully detected.

The RSA for the proposed ARTIC station area was developed based on transportation characteristics of the proposed station including trip generation totals and trip distribution characteristics as discussed in Section 4.2.1, Study Approach and Baselines. Figure 5-3 depicts the study intersection locations, including those in the ARTIC station area.

5.8.4.3 Roadways and Intersections

A total of 49 roadway segments and 57 intersections were identified for analysis. The ADT for major roadway segments is depicted on Figure 5-18.



Source: City of Anaheim 2025; City of Orange 2023

Figure 5-18 ARTIC: Existing Average Daily Traffic and Truck Routes

5.8.4.4 Existing Traffic Volumes

Existing roadway segment ADT and intersection turning movement traffic count data were obtained through manual traffic counts collected from September 2015 to November 2016. The traffic counts were collected from 6:00 to 9:00 a.m. and 4:00 to 7:00 p.m. with the highest hourly volumes in each peak period at each intersection selected for analysis.

Existing roadway segment volumes are presented in Table 5-25. Existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B.

Table 5-25 ARTIC Station Area: Existing Roadway Segment Volumes

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Lewis St	Ball Rd	Cerritos Ave	4D	45	7,400	1,000
Lewis St	Cerritos Ave	Katella Ave	4D	45	7,000	1,000
Lewis St	Katella Ave	Anaheim Way	2U	35	2,400	< 1,000
State College Blvd	Ball Rd	Cerritos Ave	6D	40	24,000	2,000
State College Blvd	Cerritos Ave	Howell Ave	6D	40	24,400	1,900
State College Blvd	Howell Ave	Katella Ave	6D	40	22,600	1,600
State College Blvd	Katella Ave	Gene Autry Way	6D	40	28,100	1,800
State College Blvd	Gene Autry Way	Orangewood Ave	6D	40	25,700	1,700
State College Blvd	Orangewood Ave	I-5	8D	40	26,700	2,300
Sunkist St	Ball Rd	Cerritos Ave	4D	40	13,000	1,100
Sunkist St	Cerritos Ave	Howell Ave	4D	40	4,700	< 1,000
Douglass Rd	Cerritos Ave	Katella Ave	4D	35	7,600	< 1,000
Main St	Taft Ave	Katella Ave	4D	40	17,000	1,400
Main St	Katella Ave	Collins Ave	4D	40	17,000	1,400
Main St	Collins Ave	Orangewood Ave	4D	40	18,000	1,500
Main St	Orangewood Ave	Chapman Ave	4D	35	19,000	1,600
Ball Rd	Harbor Blvd	Anaheim Blvd	6D	40	37,000	3,100
Ball Rd	Anaheim Blvd	Lewis St	6D	40	42,000	3,500
Ball Rd	Lewis St	State College Blvd	6D	40	35,000	2,900
Ball Rd	State College Blvd	Sunkist St	4D	40	41,000	3,400
Ball Rd	Sunkist St	SR 57	6D	40	50,000	4,100
Ball Rd	SR 57	Main St	4D	40	34,000	2,800
Cerritos Ave	Lewis St	State College Blvd	4D	40	10,800	1,600
Cerritos Ave	State College Blvd	Sunkist St	4U	40	6,900	< 1,000
Cerritos Ave	Sunkist St	Douglass Rd	4D	40	5,600	< 1,000
Katella Ave	Anaheim Blvd/Haster St	I-5	6D	40	31,400	2,600
Katella Ave	I-5	Lewis St	6D	40	34,970	2,100
Katella Ave	Lewis St	State College Blvd	6D	40	30,600	1,600

Roadway	From	To	No. of Lanes	Speed Limit (mph)	ADT (veh)	Truck ADT (veh)
Katella Ave	State College Blvd	Sportstown	6D	40	29,100	1,400
Katella Ave	Sportstown	Howell Ave	6D	40	30,300	1,600
Katella Ave	Howell Ave	SR 57	6D	40	36,600	2,100
Gene Autry Way	I-5	State College Blvd	4D	40	4,500	< 1,000
Orangewood Ave	Manchester Ave	State College Blvd	6D	40	25,200	2,200
Orangewood Ave	State College Blvd	Rampart St	4D	45	25,700	2,300
Orangewood Ave	Rampart St	SR 57	4U	45	26,500	2,300
Orangewood Ave	SR 57	Eckhoff St	4D	40	29,100	2,600
Orangewood Ave	Eckhoff St	Main St	4D	35	17,000	1,400
Chapman Ave	I-5 SB on-ramp/NB off-ramp	SR 57	6D	40	33,000	2,700
Chapman Ave	SR 57	Main St	6D	40	28,000	2,300
Douglass Rd	Katella Ave	ARTIC entrance	4U	30	3,800	< 1,000
Katella Ave	Douglass Rd	Main St	6D	40	27,000	2,200
Katella Ave	SR 57	Douglass Rd	6D	40	30,400	2,800
Chapman Ave	Lewis St	The City Dr	6D	35	36,000	3,000
Chapman Ave	The City Dr	I-5 SB on-ramp/NB off-ramp	6D	40	33,000	2,700
Disneyland Dr	Ball Rd	I-5 SB off-ramp	5U	35	26,700	2,300
State College Blvd	Manchester Ave	Chapman Ave	6D	35	31,000	2,600
Manchester Ave	Orangewood Ave	Chapman Ave	3U	55	7,000	< 1,000
Lewis St	Orangewood Ave	Chapman Ave	2U	45	10,000	< 1,000
Ball Rd	I-5 NB ramps	Disneyland Dr	6U	55	40,000	3,300

ADT = average daily trips; ARTIC = Anaheim Regional Transportation Intermodal Center; D = divided roadway; I = Interstate; mph = miles per hour; NB = northbound; SB = southbound; SR = State Route; U = undivided roadway; veh = vehicle

5.8.4.5 Existing Level of Service

Table 5-26 presents roadways segment LOS for AM and PM peak hours. The AM and PM intersection LOS are presented in Table 5-27. Of the 49 roadway segments analyzed, 3 are LOS E or F in the AM peak hour, and 4 are LOS E or F in the PM peak hour. Of the 57 intersections analyzed, 1 is LOS E or F in the AM peak hour, and none are LOS E or F in the PM peak hour.

Table 5-26 Roadway Segment Level of Service: ARTIC Station Area, Existing (Year 2015) Conditions

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Lewis St	Ball Rd	Cerritos Ave	2,415	700	700	0.27	0.28	A	A
Lewis St	Cerritos Ave	Katella Ave	2,415	700	700	0.26	0.27	A	A
Lewis St	Katella Ave	Anaheim Way	950	200	300	0.17	0.24	A	A
State College Blvd	Ball Rd	Cerritos Ave	4,253	2,100	2,400	0.49	0.56	A	A
State College Blvd	Cerritos Ave	Howell Ave	4,883	2,000	2,300	0.41	0.47	A	A
State College Blvd	Howell Ave	Katella Ave	3,938	2,100	2,300	0.53	0.56	A	A
State College Blvd	Katella Ave	Gene Autry Way	3,938	2,700	2,500	0.67	0.62	B	B
State College Blvd	Gene Autry Way	Orangewood Ave	4,253	2,500	2,500	0.58	0.57	A	A
State College Blvd	Orangewood Ave	I-5	6,090	2,600	2,800	0.42	0.45	A	A
Sunkist St	Ball Rd	Cerritos Ave	2,415	1,100	1,200	0.45	0.48	A	A
Sunkist St	Cerritos Ave	Howell Ave	2,835	600	600	0.20	0.19	A	A
Douglass Rd	Cerritos Ave	Katella Ave	2,415	700	900	0.27	0.35	A	A
Main St	Taft Ave	Katella Ave	2,415	1,300	1,100	0.51	0.43	A	A
Main St	Katella Ave	Collins Ave	2,415	1,600	1,600	0.63	0.64	B	B
Main St	Collins Ave	Orangewood Ave	2,835	1,600	1,700	0.54	0.59	A	A
Main St	Orangewood Ave	Chapman Ave	2,415	1,900	2,000	0.76	0.83	C	D
Ball Rd	Harbor Blvd	Anaheim Blvd	3,938	2,600	3,000	0.65	0.75	B	C
Ball Rd	Anaheim Blvd	Lewis St	4,253	2,500	2,800	0.57	0.65	A	B
Ball Rd	Lewis St	State College Blvd	4,253	2,700	2,900	0.63	0.68	B	B
Ball Rd	State College Blvd	Sunkist St	2,415	2,500	2,900	1.01	1.18	**F***	**F***
Ball Rd	Sunkist St	SR 57	4,883	2,700	3,200	0.55	0.64	A	B
Ball Rd	SR 57	Main St	2,835	2,500	2,800	0.88	0.95	D	**E***
Cerritos Ave	Lewis St	State College Blvd	2,415	900	1,000	0.33	0.40	A	A
Cerritos Ave	State College Blvd	Sunkist St	2,300	600	800	0.24	0.32	A	A
Cerritos Ave	Sunkist St	Douglass Rd	2,835	600	700	0.19	0.23	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Katella Ave	Anaheim Blvd/ Haster St	I-5	4,253	2,000	3,000	0.45	0.71	A	C
Katella Ave	I-5	Lewis St	4,883	2,000	2,700	0.40	0.54	A	A
Katella Ave	Lewis St	State College Blvd	4,253	1,600	2,300	0.37	0.52	A	A
Katella Ave	State College Blvd	Sportstown	4,253	1,900	2,100	0.43	0.49	A	A
Katella Ave	Sportstown	Howell Ave	4,883	2,100	2,400	0.43	0.48	A	A
Katella Ave	Howell Ave	SR 57	4,883	2,100	2,400	0.42	0.48	A	A
Gene Autry Way	I-5	State College Blvd	2,415	500	500	0.18	0.17	A	A
Orangewood Ave	Manchester Ave	State College Blvd	4,253	2,400	2,400	0.56	0.55	A	A
Orangewood Ave	State College Blvd	Rampart St	2,415	2,500	2,500	1.00	1.03	**E***	**F***
Orangewood Ave	Rampart St	SR 57	3,000	2,300	2,600	0.74	0.84	C	D
Orangewood Ave	SR 57	Eckhoff St	3,150	2,500	2,600	0.79	0.81	C	D
Orangewood Ave	Eckhoff St	Main St	2,835	1,300	1,400	0.43	0.47	A	A
Chapman Ave	I-5 SB on-ramp/ NB off-ramp	SR 57	4,253	2,500	2,900	0.58	0.67	A	B
Chapman Ave	SR 57	Main St	4,883	2,200	2,700	0.43	0.54	A	A
Douglass Rd	Katella Ave	ARTIC entrance	2,300	300	300	0.10	0.12	A	A
Katella Ave	Douglass Rd	Main St	4,883	1,700	2,000	0.34	0.40	A	A
Katella Ave	SR 57	Douglass Rd	4,883	2,000	2,100	0.39	0.43	A	A
Chapman Ave	Lewis St	The City Dr	3,938	2,500	3,200	0.63	0.79	B	C
Chapman Ave	The City Dr	I-5 SB on-ramp/ NB off-ramp	3,938	2,900	3,600	0.72	0.89	C	D
Disneyland Dr	Ball Rd	I-5 SB off-ramp	3,375	1,400	1,600	0.39	0.45	A	A
State College Blvd	Manchester Ave	Chapman Ave	4,253	2,900	3,300	0.67	0.76	B	C
Manchester Ave	Orangewood Ave	Chapman Ave	2,520	1,400	600	0.52	0.24	A	A
Lewis St	Orangewood Ave	Chapman Ave	800	1,200	1,300	1.40	1.59	**F***	**F***
Ball Rd	I-5 NB ramps	Disneyland Dr	4,650	3,300	3,800	0.69	0.80	B	C

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; SR = State Route; veh/hr = vehicle per hour; V/C = volume to capacity ratio

Table 5-27 Intersection Level of Service: ARTIC Station Area, Existing (Year 2015) Conditions

No.	Intersection	Signalized or Unsignalized	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A1	Manchester Ave/I-5 SB ramps & Katella Ave	Signalized	19	B	17.1	B
A2	Anaheim Way/I-5 NB ramps & Katella Ave[1]	Signalized	23.2	C	26.9	C
A3	Lewis St & Katella Ave[1]	Signalized	22.3	C	23.9	C
A4	I-5 HOV & Gene Autry Way[1]	Signalized	25.8	C	23.4	C
A6	State College Blvd & Ball Rd	Signalized	40.4	D	39.7	D
A7	State College Blvd & Winston Rd	Signalized	6.8	A	8.9	A
A8	State College Blvd & Cerritos Ave	Signalized	17.7	B	19.6	B
A9	State College Blvd & Howell Ave	Signalized	38.6	D	23.5	C
A10	State College Blvd & Katella Ave[1]	Signalized	32	C	33.3	C
A12	State College Blvd & Gene Autry Way	Signalized	10.5	B	8.3	A
A14	State College Blvd & Orangewood Ave	Signalized	35.4	D	34.9	C
A15	Stadium Crossing & Katella Ave[1]	Signalized	25.6	C	23.8	C
A16	Sunkist St & Ball Rd	Signalized	36.1	D	41.5	D
A17	Sunkist St & Cerritos Ave	Signalized	16.5	B	16.5	B
A18	Howell Ave & Katella Ave[1]	Signalized	26.1	C	30.5	C
A19	Rampart St & Orangewood Ave[1]	Signalized	15.4	B	12.9	B
A20	SR 57 SB ramps & Ball Rd[1]	Signalized	28.5	C	29.1	C
A21	SR 57 SB ramps & Katella Ave[1]	Signalized	21.2	C	24.1	C
A22	SR 57 SB ramps & Orangewood Ave	Signalized	34.5	C	30.6	C
A23	SR 57 SB ramps & Chapman Ave	Signalized	22.1	C	33	C
A24	SR 57 NB ramps & Ball Rd	Signalized	26.4	C	29.9	C
A25	SR 57 NB ramps & Katella Ave[1]	Signalized	24.4	C	20.2	C
A26	SR 57 NB ramps & Orangewood Ave[1]	Signalized	19.1	B	13.2	B
A27	SR 57 NB ramps & Chapman Ave[1]	Signalized	12.3	B	12.3	B
A28	Douglass Rd & Katella Ave[1]	Signalized	26.8	C	26.3	C
A29	Struck Ave & Katella Ave[1]	Signalized	4.2	A	4.2	A
A30	Main St & Ball Rd/Taft Ave[1]	Signalized	37	D	31.9	C
A31	Main St & Katella Ave	Signalized	28.6	C	28.1	C
A32	Main St & Struck Ave	Signalized	11	B	12.9	B
A33	Main St & Collins Ave	Signalized	21.5	C	26.2	C
A34	Main St & Orangewood Ave/Walnut Ave	Signalized	38.1	D	36.2	D
A41	Anaheim Blvd & Ball Rd	Signalized	32	C	44	D
A48	East St & Ball Rd	Signalized	24.4	C	25.5	C
A51	Lewis St & Ball Rd	Signalized	20.9	C	24.7	C

No.	Intersection	Signalized or Unsignalized	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A52	Lewis St & Cerritos Ave	Signalized	20.3	C	19.5	B
A53	Lewis St & Orangewood Ave	Signalized	55.4	**E***	12.6	B
A54	Lewis St & Chapman Ave	Signalized	44.8	D	44.8	D
A55	Manchester Ave & Orangewood Ave	Signalized	25.6	C	17.7	B
A56	The City Dr/State College Blvd & Chapman Ave	Signalized	39.1	D	36.3	D
A57	Anaheim Way & Orangewood Ave	Signalized	6.5	A	31	C
A58	Manchester Ave & Chapman Ave	Signalized	42.5	D	27.9	C
A59	State College Blvd & I-5 SB off-ramp[1]	Signalized	13.5	B	7.7	A
A60	I-5 SB on-ramp/NB off-ramp & Chapman Ave[1]	Signalized	24.1	C	20.1	C
A61	State College Blvd & I-5 NB ramps[1]	Signalized	14.7	B	32.3	C
A62	I-5 NB on-ramp/Rampart St & Chapman Ave	Signalized	18.4	B	16.2	B
A63	Douglass Rd & ARTIC	Signalized	21.7	C	23.1	C
A64	Douglass Rd & Bus Entrance	Signalized	11.4	B	10.3	B
A65	Douglass Rd & Parking Lot B[2]	Unsignalized	8.7	A	8.9	A
A66	ARTIC Driveway & Katella Ave[2]	Unsignalized	13.6	B	13.4	B
A69	Harbor Blvd & Ball Rd	Signalized	48.6	D	52.3	D
A70	Harbor Blvd & I-5 NB ramps[1]	Signalized	14.2	B	14.3	B
A71	Harbor Blvd & I-5 SB ramps	Signalized	17.7	B	15.5	B
A72	Harbor Blvd & Katella Ave	Signalized	26.8	C	32.4	C
A79	Anaheim Blvd & Cerritos Ave	Signalized	18.7	B	29.8	C
A80	Disneyland Dr & I-5 SB off-ramp	Signalized	19.2	B	16.8	B
A81	Disneyland Dr & Ball Rd[1]	Signalized	39.9	D	43.8	D
A82	Main St & Chapman Ave	Signalized	37.6	D	40.3	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
A intersection number prefix indicates intersections within ARTIC station area.
ARTIC = Anaheim Regional Transportation Intermodal Center; EB = eastbound; HCM = Highway Capacity Manual; HOV = high-occupancy vehicle; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route

5.8.4.6 Existing Transit

The proposed ARTIC station area is served by Amtrak, Metrolink, OCTA, Anaheim Resort Transit, Megabus, and Greyhound. The detailed information is provided in Table 5-28 and the bus lines are depicted on Figure 5-19.

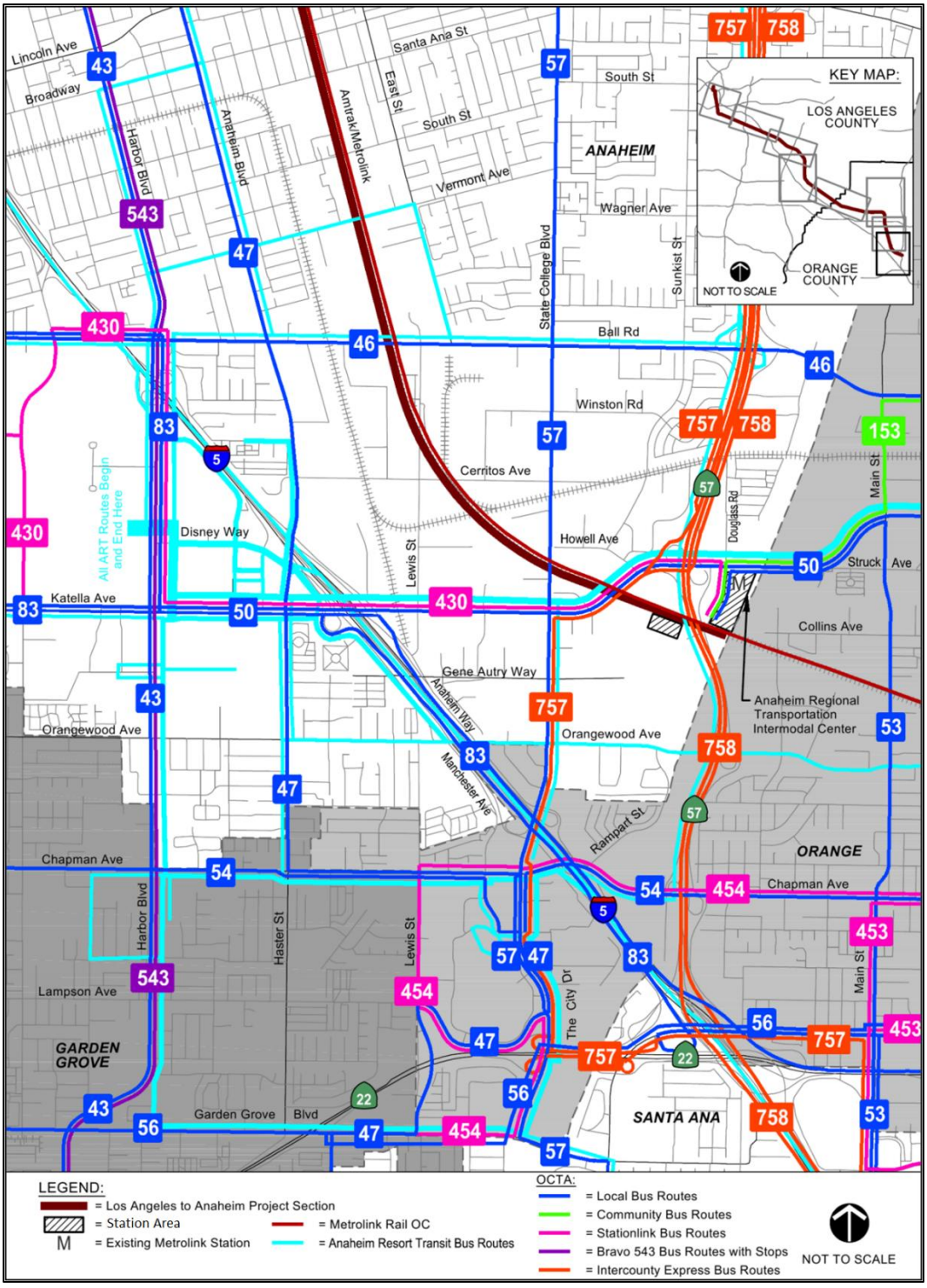
ACCESS is OCTA's shared-ride service for people who are unable to use regular, fixed-route bus service because of functional limitations caused by a disability. Passengers must meet ADA eligibility criteria. Standard curb-to-curb service is provided, as well as subscription service for regular riders, and same-day taxi service for an extra fee.

Table 5-28 Existing Transit: ARTIC Station Area

Operator	Route	Description	Weekday Peak Frequency (min)	Weekday Ridership (person)
Amtrak	Pacific Surfliner	San Luis Obispo–Los Angeles–San Diego	60	1,517,425/ year
Metrolink	Orange County Line	Los Angeles Union Station–Oceanside	45–60	4,175
OCTA	43	Fullerton–Costa Mesa	17–30	6,305
	46	Los Alamitos–Orange	30	1,897
	47	Fullerton–Newport Beach	12–20	6,382
	50	Long Beach–Orange	24–40	3,396
	53	Anaheim–Irvine	11–13	5,986
	54	Garden Grove–Orange	15	3,304
	56	Garden Grove–Orange	40	1,173
	57	Brea–Newport Beach	20	9,323
	83	Anaheim–Laguna Hills	20	1,931
	430	ARTIC–Anaheim Resort area	30	18
	453	Orange Transportation Center–St. Joseph's Hospital	20–30	101
	543	Fullerton Transportation Center–Santa Ana	12	3,234
Anaheim Resort Transit	3	Grove Line	20	N/A
	4	Harbor Boulevard Line	20	N/A
	5	Grand Plaza Line	20	N/A
	6	Disney Way Line	20	N/A
	7	Clementine Street Line	20	N/A
	8	Hotel Circle Line	20	N/A
	9	Katella Line	20	N/A
	10	Center City Line	30	N/A
	11	Ball Road Line	20	N/A
	12	Manchester Line	20	N/A
	14	Orange Line	20	N/A
	15	ARTIC Sports Complex Line	60	N/A
	17	Canyon Metrolink Line	Various	N/A
	18	Buena Park Line	On-demand	N/A
Megabus	---	Los Angeles, Las Vegas, Oakland, San Francisco, San Jose	Various	N/A

Operator	Route	Description	Weekday Peak Frequency (min)	Weekday Ridership (person)
Greyhound	---	Various	Various	N/A

Sources: Anaheim Transportation Network 2024; Greyhound 2024; Metro 2023a, 2023b; National Association of Railroad Passengers 2024; OCTA 2023; SCRRA 2023; Stagecoach Group PLC 2023
Amtrak = National Railroad Passenger Corporation; ARTIC = Anaheim Regional Transportation Intermodal Center; Metro = Los Angeles County Metropolitan Transportation Authority; min = minutes; N/A = ridership information not available; OCTA = Orange County Transportation Authority



Sources: Amtrak 2016; SCRRA 2023; Metro 2016; OCTA 2025; Anaheim Transportation Network 2024

Figure 5-19 ARTIC: Existing Transit Facilities

5.8.4.7 Existing Pedestrian Facilities

The pedestrian facilities around the proposed station include the sidewalk system on the nearby streets. There are no separate pedestrian paths or trails from the nearby neighborhoods. The

station area is generally well connected with the sidewalk system as on Figure 5-20. Sidewalks are available on both sides along the streets within the station vicinity and crosswalks are provided for pedestrian movements at most of the intersections.

5.8.4.8 Existing Bicycle Facilities

There is a comprehensive bikeway system consisting of Class I, Class II, and Class III bicycle facilities, as defined in Section 3.2.9, California Streets and Highways Code Section 890. Existing bicycle facilities around the station are depicted on Figure 5-21. At present, ARTIC is not well connected to the surrounding area by way of bikeway facilities (aside from a Class I bikeway along the Santa Ana River Trail/OC Loop. Future improvements would afford greater connectivity by introducing multiple Class I and Class II bikeways connecting both existing bikeways and areas previously deficient of bike paths/routes/lanes.

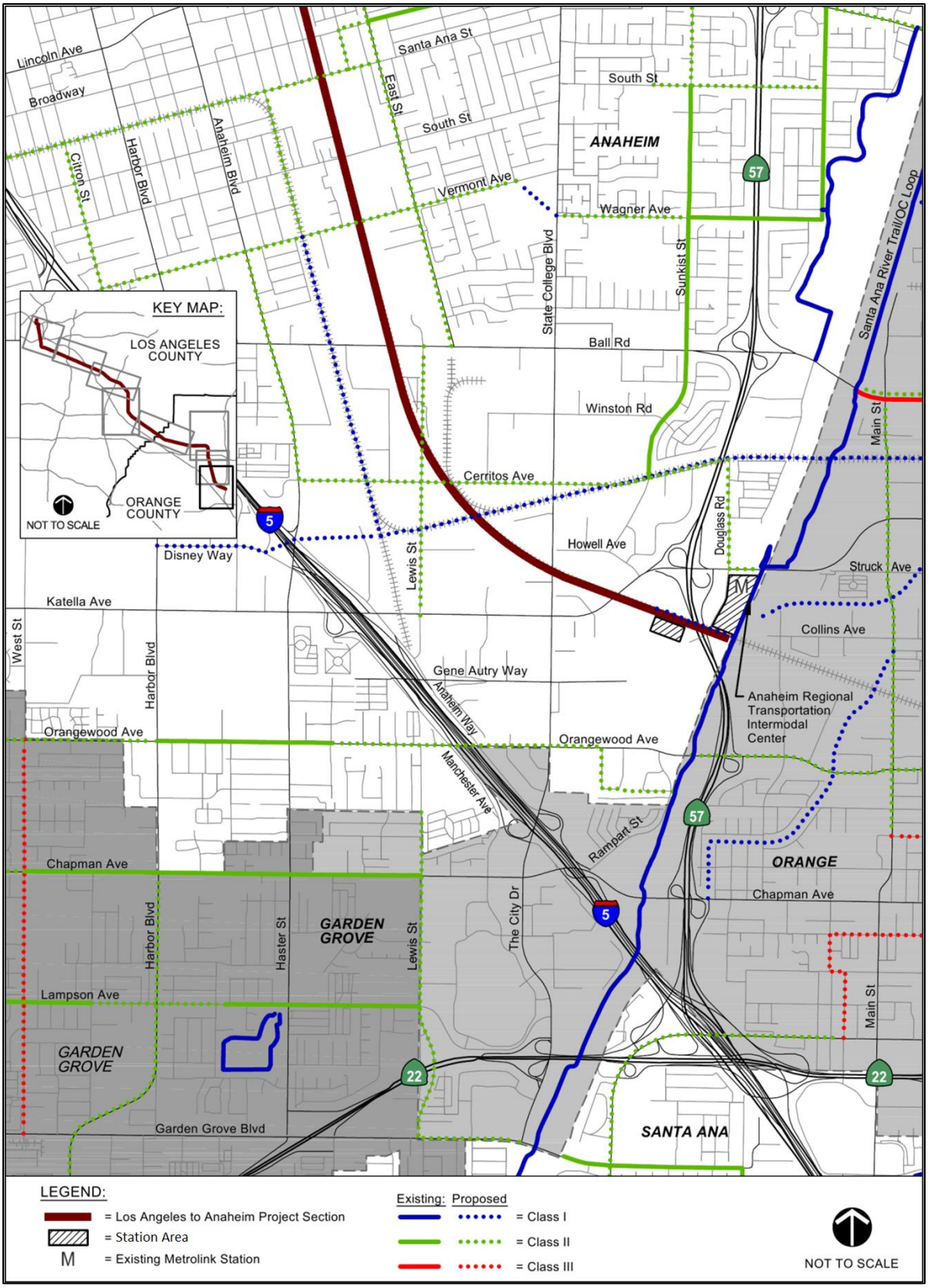
Bike lockers are at the existing ARTIC and are available for reservation or at a first come first serve basis. Bike lockers are usually prereserved and key-operated. The existing ARTIC is equipped with 12 regular sized bike lockers (OCTA 2017).

5.8.4.9 Existing Parking Facilities

Per Section 5.8.4.1, Station Area, the station area includes a new parking structure and PUDO adjacent to ARTIC between Douglass Road and SR 57, and would provide up to 1,976 parking spaces by 2040.



Figure 5-20 ARTIC: Existing Pedestrian Facilities



Source: City of Anaheim 2025

Figure 5-21 ARTIC: Existing Bicycle Facilities

5.9 Existing Freeway Conditions Analysis

5.9.1 Existing Traffic Volumes

Year 2010 and year 2040 freeway projections were obtained from the Authority from the Statewide Demand Model for freeway facilities near the project section. The Authority's year 2010 and 2040 freeway projections are provided in Table 5-29.

Table 5-29 Major Highway Volumes from Statewide Travel Demand Model

Major Highways	Average Daily Volume 2010	Average Daily Volume 2040	Change (percent)
I-5 between San Diego and Los Angeles (Orange County–Los Angeles County line)	229,000	284,000	24
I-5 between Santa Clarita and Orange County Line	294,000	309,000	5
US 101 from Ventura County Line to Pasadena	296,000	319,000	8

I = Interstate; US 101 = U.S. Highway 101

Daily traffic counts for freeway on-ramps and off-ramps within the project vicinity were obtained and are summarized in Table 5-30.

Table 5-30 Existing Freeway Service Ramp Daily Volumes

Fwy	Direction	On-Ramp/ Off-Ramp	Interchange	Daily Volume (veh)
SR 57	NB	On-ramp	Yorba Linda Blvd	6,200
	NB	On-ramp	Yorba Linda Blvd	2,400
	NB	Off-ramp	Yorba Linda Blvd	15,200
	SB	On-ramp	Yorba Linda Blvd	9,600
	SB	On-ramp	Yorba Linda Blvd	8,900
	SB	Off-ramp	Yorba Linda Blvd	7,400
	NB	Off-ramp	Nutwood Ave	13,200
	NB	On-ramp	Nutwood Ave	9,500
	SB	On-ramp	Nutwood Ave	11,400
	NB	On-ramp	Orangethorpe Ave	7,500
	SB	Off-ramp	Orangethorpe Ave	7,300
	SB	On-ramp	Orangethorpe Ave	7,600
	NB	On-ramp	Ball Rd	12,100
	NB	Off-ramp	Ball Rd	11,400
	NB	On-ramp	Ball Rd	6,700
SR 57	SB	On-ramp	Ball Rd	4,600
	SB	On-ramp	Ball Rd	7,600
	NB	On-ramp	Katella Ave	10,600
	NB	On-ramp	Katella Ave	4,400

Fwy	Direction	On-Ramp/ Off-Ramp	Interchange	Daily Volume (veh)
	SB	On-ramp	Katella Ave	5,200
	SB	Off-ramp	Katella Ave	8,100
	SB	On-ramp	Katella Ave	5,300
	NB	Off-ramp	Orangewood Ave	6,500
	NB	On-ramp	Orangewood Ave	3,200
	NB	On-ramp	Orangewood Ave	3,900
	SB	On-ramp	Orangewood Ave	5,800
	SB	Off-ramp	Orangewood Ave	7,300
	NB	Off-ramp	W Chapman Ave	2,300
	NB	On-ramp	W Chapman Ave	4,700
	NB	On-ramp	W Chapman Ave	4,300
	SB	Off-ramp	W Chapman Ave	7,700
	SB	On-ramp	W Chapman Ave	2,700
I-5	NB	Off-ramp	Chapman Ave	7,500
	NB	On-ramp	Chapman Ave	4,200
	SB	Off-ramp	Chapman Ave	7,200
	SB	On-ramp	Chapman Ave	12,700
	NB	Off-ramp	State College Blvd	12,500
	NB	On-ramp	State College Blvd	4,900
	NB	On-ramp	Katella Ave	5,300
	SB	Off-ramp	Katella Ave	6,900
	SB	Off-ramp	Katella Ave	5,300
	SB	On-ramp	Katella Ave	8,200
	NB	Off-ramp	Orangewood Ave	15,500
	NB	On-ramp	Orangewood Ave	5,600
	SB	On-ramp	Orangewood Ave	6,900
	NB	On-ramp	Anaheim Blvd	7,300
	NB	Off-ramp	Harbor Blvd	18,900
	NB	On-ramp	Harbor Blvd	14,000
	SB	Off-ramp	Harbor Blvd	8,300
I-5	SB	On-ramp	Harbor Blvd	11,600
	NB	On-ramp	Ball Rd	6,900
	NB	On-ramp	South 2	8,200
	NB	On-ramp	Lincoln Ave	4,900

Fwy	Direction	On-Ramp/ Off-Ramp	Interchange	Daily Volume (veh)
	NB	Off-ramp	Lincoln Ave	9,000
	NB	Off-ramp	Euclid St	13,100
	NB	On-ramp	Euclid St	9,200
	NB	Off-ramp	Brookhurst Ave	1,300
	NB	Off-ramp	Brookhurst Ave	13,100
	NB	On-ramp	Brookhurst Ave	8,600
	NB	Off-ramp	Paramount Blvd	3,300
	NB	On-ramp	Paramount Blvd	6,000
	NB	On-ramp	Garfield Ave	400
	NB	On-ramp	Washington Blvd	10,800
	NB	Off-ramp	Washington Blvd	6,400
	SB	Off-ramp	Washington Blvd	9,700
	SB	On-ramp	Florence Ave	5,400
	SB	Off-ramp	Slauson Ave	5,400
	SB	On-ramp	Slauson Ave	9,900
I-605	NB	Off-ramp	Alondra Blvd	15,000
	NB	On-ramp	Alondra Blvd	3,600
	NB	On-ramp	Alondra Blvd	15,200
	SB	On-ramp	Alondra Blvd	5,800
	SB	On-ramp	Alondra Blvd	5,600
	SB	Off-ramp	Alondra Blvd	13,600
	NB	Off-ramp	Rosecrans Ave	9,800
	NB	On-ramp	Rosecrans Ave	4,900
	NB	On-ramp	Rosecrans Ave	7,400
	SB	Off-ramp	Rosecrans Ave	16,800
	SB	On-ramp	Rosecrans Ave	4,500
	SB	On-ramp	Rosecrans Ave	3,300
	NB	Off-ramp	Imperial Hwy	9,900
	NB	On-ramp	Imperial Hwy	5,200
	SB	Off-ramp	Imperial Hwy	5,700
I-605	SB	On-ramp	Imperial Hwy	10,500
	NB	Off-ramp	Firestone Blvd	10,000
	NB	On-ramp	Firestone Blvd	4,000
	SB	On-ramp	Firestone Blvd	4,500

Fwy	Direction	On-Ramp/ Off-Ramp	Interchange	Daily Volume (veh)
	NB	Off-ramp	Florence Ave	9,000
	NB	On-ramp	Florence Ave	8,700
	SB	On-ramp	Florence Ave	15,100
	NB	Off-ramp	Telegraph Rd	3,400
	NB	On-ramp	Telegraph Rd	7,100
	NB	On-ramp	Telegraph Rd	7,100
	SB	On-ramp	Telegraph Rd	16,300
	NB	On-ramp	Washington Blvd	10,100
	SB	Off-ramp	Washington Blvd	4,300
	SB	On-ramp	Washington Blvd	9,100
	SB	On-ramp	Washington Blvd	3,300
	SB	On-ramp	Slauson Ave	1,900
SR 91	EB	On-ramp	Brookhurst St/Euclid Ave	11,900
	WB	On-ramp	Brookhurst St	4,600
	WB	Off-ramp	Brookhurst St	10,700
	EB	Off-ramp	State College Blvd	10,300
	EB	On-ramp	State College Blvd	11,300
	WB	On-ramp	State College Blvd	12,900

Sources: Caltrans n.d.
EB = eastbound; Fwy = freeway; I = Interstate; NB = northbound; SB = southbound; SR = State Route; veh = vehicle; WB = westbound

Table 5-31 and Table 5-32 summarize the number of trucks entering and exiting Hobart Yard and Commerce Yard using I-10 and SR 60 in the peak hour for Existing Year 2015, respectively.

Table 5-31 Peak Hour Trips from/to Hobart Yard using Interstate 10 and State Route 60: Existing Year 2015

	Eastbound (number of trucks)		Westbound (number of trucks)	
Fwy	AM	PM	AM	PM
I-10	15	16	15	15
SR 60	27	30	28	28

fwy = freeway; I = Interstate; SR = State Route

Table 5-32 Peak Hour Trips from/to Commerce Yard using Interstate 10 and State Route 60: Existing Year 2015

Fwy	Eastbound (number of trucks)		Westbound (number of trucks)	
	AM	PM	AM	PM
I-10	3	4	3	3
SR 60	5	6	5	5

fwy = freeway; I = Interstate; SR = State Route

5.9.2 Existing Level of Service

The transportation RSA includes the evaluation of freeway mainline segments of I-5, I-90, I-105, I-605, SR 22, SR 57, and SR 91. The following freeway mainline segments are expected to experience 100 or more directional peak hour vehicular trips as a result of the proposed project.

5.9.2.1 Freeway Mainline Segments

The freeway mainline segment Existing Year 2015 analysis results for AM and PM peak hours are presented in Table 5-33, Table 5-34, and Table 5-35.

Table 5-33 Freeway Mainline Segment Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option Area, Existing Year 2015

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
I-105	West of I-605	Eastbound	995	0.423	B	1,024	0.436	B
		Westbound	1,171	0.498	C	1,064	0.453	B

fwy = freeway; I = Interstate; LOS = level of service; pce/ln = passenger car equivalents per lane; V/C = volume-to-capacity ratio

Table 5-34 Freeway Mainline Segment Level of Service: Fullerton High-Speed Rail Station Option Area, Existing Year 2015

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
SR 91	East of State College Blvd	Eastbound	1,401	0.596	C	1,561	0.664	C
		Westbound	1,286	0.547	C	1,229	0.523	C
SR 57	North of Yorba Linda Blvd	Northbound	1,401	0.596	C	1,473	0.627	C
		Southbound	1,613	0.686	C	1,557	0.663	C

fwy = freeway; LOS = level of service; pce/ln = passenger car equivalents per lane; SR = State Route; V/C = volume-to-capacity ratio

Table 5-35 Freeway Mainline Segment Level of Service: ARTIC Station Area, Existing Year 2015

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
I-5	South of SR 22	Northbound	1,848	0.787	D	1,733	0.737	D
		Southbound	1,339	0.570	C	1,372	0.584	C

ARTIC = Anaheim Regional Transportation Intermodal Center; fwy = freeway; LOS = level of service; pce/ln = passenger car equivalents per lane; SR = State Route; V/C = volume-to-capacity ratio

5.9.2.2 *Freeway Ramps*

Volumes entering and exiting interchange intersections were used to conduct an analysis of queued vehicles at off-ramps and on-ramps. The calculated queue lengths for on-ramps with at least 100 project-related trips are presented in Table 5-36. The calculated queue lengths for off-ramps with at least 100 project-related trips are presented in Table 5-37.

Table 5-36 Freeway Service On-Ramp Queue Lengths: Existing Year 2015

Fwy	Direction	Interchange	Available Queue Storage (ft)	AM Peak Volume (veh/hr)	AM Peak Queue Length (ft)	PM Peak Volume (veh/hr)	PM Peak Queue Length (ft)
SR 57	SB	WB Katella	1,430	154	310	369	750
SR 91	EB	Lemon St	1,500	1,328	2,700	1,153	2,340
I-5	SB	State College Blvd	1,660	256	520	308	630

EB = eastbound; ft = feet; fwy = freeway; I = Interstate; SB = southbound; SR = State Route; veh/hr = vehicles per hour

Table 5-37 Freeway Service Off-Ramp Queue Lengths: Existing Year 2015

Fwy	Direction	Interchange	Available Queue Storage (ft)	AM Peak Volume (veh/hr)	AM Peak Queue Length (ft)	PM Peak Volume (veh/hr)	PM Peak Queue Length (ft)
SR 57	NB	Katella Ave	2,500	910	193	525	90
SR 91	WB	Lemon St	1,720	903	501	972	629
I-5	NB	State College Blvd	2,200	600	248	1,276	552

ft = feet; fwy = freeway; I = Interstate; NB = northbound; SR = State Route; veh/hr = vehicles per hour; WB = westbound

Queue length exceeds available storage at these on-ramp locations:

- SR 91 eastbound Lemon Street on-ramp

Queue length does not exceed available storage length for any of the studied off-ramps.

6 EFFECT ANALYSIS

6.1 Introduction

The project section, which traverses approximately 30 miles through densely populated urban and suburban built environments, is anticipated to result in changes to roadway configurations, as well as roadway and intersection volumes. Forecasted traffic volumes that would result from station operations were calculated based on data generated by the Authority as used in the economic analysis in the *California High-Speed Rail 2023 Project Update Report*. Because of proposed permanent roadway closures, new overcrossings and rail viaducts, and other geometric constraints imposed on the roadway network, traffic would necessarily be rerouted to parallel routes. An already stressed roadway network, which operates under saturated conditions during several hours of the day, will be expected to absorb the additional and displaced traffic caused by the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B.

The following sections quantify these effects using the procedures presented in Section 4.2, Methodology for Effect Analysis. These effects, which may be negative or positive, will be used to determine intensity and significance in the EIR/EIS.

6.2 No Project Alternative

The No Project Alternative represents future conditions analysis without the project section. This Alternative was also used to provide future year base conditions for the affected environment.

Future condition traffic analyses were conducted using the Existing Year 2015 traffic analysis calculated in Section 5, Affected Environment, as the basis for projecting future volumes in each base condition scenario.

Future projects were used to determine the future conditions lane geometries (for intersection analyses), and number of lanes (for roadway segment analyses). Table 6-1 presents the future cumulative conditions projects listed in the fiscally constrained SCAG 2020 RTP/SCS, 2014 FTIP, and 2014 STIP.

Table 6-1 Future Conditions Project List

Project #[3]	Project Type	Lead Agency	Cities	Location	Project Description	Estimated Completion Date
1NL04-LAF1535	Bicycle improvement	City	Los Angeles	Citywide	Bicycle wayfinding signage program. Wayfinding signs to direct bicyclists, and educate motorists, to the locations of dedicated bike paths, lanes and routes, destinations, and transit hubs throughout Los Angeles.	2024
LA9919160	Street Improvement	City	Commerce	Slauson Avenue	Add dedicated right turn lane; upgrade signal, traffic signs, lighting, pavement markings and striping	N/A[1]

Project #[3]	Project Type	Lead Agency	Cities	Location	Project Description	Estimated Completion Date
LA0G807	Street Improvement	City	Commerce	Garfield Avenue: Telegraph Rd to Gage Ave	Pavement rehabilitation and ADA improvements	N/A[1]
LAF5108	Street Improvement	City	Commerce	Garfield Avenue/ Washington Blvd Multimodal Intersection	Add dedicated turn lanes, sidewalks, crosswalks, curb ramps and pedestrian traffic signals	N/A[1]
LA0G349	Street Improvement	City	Commerce	Commerce Way: Eastern Ave to Washington Blvd	Raised median modifications, landscaping, irrigation	N/A[1]
LA9919091	Street Improvement	City	Bell City	Atlantic Ave & I-5	Curb/gutter improvements, directional signage, median upgrades, pedestrian facilities, landscaping, street lights	N/A[1]
LA9919223	Pedestrian Improvement	City	Pico Rivera	Citywide	Updating signage along major corridors	N/A[1]
LA0G945	Pedestrian Improvement	City	Pico Rivera	Rosemead Blvd at Beverly Blvd	New turn lanes; restricted parking	N/A[1]
LA0G1105	Bridge Improvement	City	Pico Rivera	Telegraph Rd over San Gabriel Bridge	Demolish 4-lane existing bridge; construct 3-lane bridge	N/A[1]
LA0G1106	Bridge Improvement	City	Pico Rivera	Washington Boulevard over Rio Hondo Bridge	Replacing existing 6-lane bridge with an 8-lane bridge increasing capacity	N/A[1]
LAF7519	Pedestrian Improvement	City	Whittier	UPRR Corridor: Mills Ave to Leffingwell Road	Implement a 2-mile Class I bike/pedestrian path on a city-controlled easement along the UPRR railroad corridor	N/A[1]
LA0G1688	Street Improvement	City	Whittier	Whittier Blvd: La Curata St to Pacific Pl	Reconstruction of curb ramps, passage ways and sidewalks	N/A[1]

Project #[3]	Project Type	Lead Agency	Cities	Location	Project Description	Estimated Completion Date
LAF7311	Traffic Signal Upgrade	City	Downey	Citywide	Synchronizes traffic signals along existing transit routes. Installs new fiber optic communication along 5.5 miles of arterial streets to connect signals to the central traffic management center; install and integrate transit priority system with the traffic signal system.	N/A[1]
LA0G1518	Street Improvements	City	Downey	Paramount Blvd at Imperial Hwy	Addition of turn lanes; widening of intersection; striping, signage and pavement markings	N/A[1]
LA0G1517	Street Improvements	City	Downey	Lakewood Blvd at Imperial Hwy	Addition of turn lanes, modification to traffic signals; striping and signage	N/A[1]
LA0G1516	Street Improvements	City	Downey	Lakewood Blvd at Firestone Blvd	Addition of turn lanes, modification to traffic signals; striping and signage	N/A[1]
LA0G1515	Street Improvements	City	Downey	Lakewood Blvd at Florence Ave	Addition of turn lanes; relocation of overhead utilities; striping, signage and pavement	N/A[1]
LAF7118	Bridge Improvements	City	Downey	Florence Ave Bridge over San Gabriel River	Rehabilitate existing bridge; improve approaches; new shoulder, and landscaping	N/A[1]
LA0F063	Grade Separation	Metro	Santa Fe Springs	Rosecrans Ave	---	2025
1HO707	Freeway Improvement	Caltrans	La Mirada/ Norwalk/ Santa Fe Springs	I-5 from SR 19 to I-710	I-5 high-occupancy vehicle lanes from SR 19 to I-710—one lane in each direction	N/A[1]
LAF1219	Bridge Widening	City	Norwalk	Firestone Blvd at San Gabriel River	Widen existing bridge	N/A[1]

Project #[3]	Project Type	Lead Agency	Cities	Location	Project Description	Estimated Completion Date
LA0G1509A	Street Improvement	City	Norwalk	Firestone Blvd: Studebaker Rd to Imperial Hwy	Street widening, narrowing of median, installation of bike lane	N/A[1]
LA0G1064	Street Improvement	City	Norwalk	Bloomfield Ave at Imperial Hwy	Additional turn lanes, modify existing median and traffic signal	N/A[1]
LA0G1342	Traffic Signal Upgrade	City	Norwalk	Imperial Hwy: San Gabriel River to Shoemaker Rd	Traffic signal synchronization	N/A[1]
LA0G1066	Street Improvement	City	Norwalk	Studebaker Rd at Alondra Rd	Additional turn lane; modify existing median, traffic signals and relocation streetlights	N/A[1]
LA0G1065	Street Improvement	City	Norwalk	Pioneer Blvd at Imperial Hwy	Additional turn lane; modify existing median and traffic signal	N/A[1]
LA0G1063	Street Improvement	City	Norwalk	Studebaker Rd at Rosecrans Ave	Additional turn lanes; modify existing median and traffic signal	N/A[1]
LA0G1442	Traffic Signal Upgrade	City	Norwalk	Alondra Blvd: Puma Ave to Shoemaker Ave	Traffic signal upgrade	N/A[1]
LA0G1439	Traffic Signal Upgrade	City	Norwalk	Studebaker Rd: Rosecrans Ave to Cecilia St	Traffic signal upgrade	N/A[1]
LA0G1438	Traffic Signal Upgrade	City	Norwalk	Firestone Blvd and Rosecrans Ave	Traffic signal upgrade	N/A[1]
LA0G1437	Traffic Signal Upgrade	City	Norwalk	San Antonio Dr/Norwalk Blvd: Rosecrans Ave to Civic Center Dr	Traffic signal upgrade	N/A[1]

Project #[3]	Project Type	Lead Agency	Cities	Location	Project Description	Estimated Completion Date
LA0G1435	Traffic Signal Upgrade	City	Norwalk	Studebaker Rd: Alondra Blvd to Rosecrans Ave	Traffic signal upgrade	N/A[1]
LA0G1433	Traffic Signal Upgrade	City	Norwalk	Rosecrans Ave: Studebaker Rd to Carmenita Rd	Traffic signal upgrade	N/A[1]
ORA000809	Grade Separation	OCTA	Fullerton	Raymond Ave	New bridge for BNSF Metrolink Rail	N/A[1]
ORA000115	Street Improvement	City	Fullerton	SR 90 Imperial Hwy	Imperial Hwy, Los Angeles County to Harbor Blvd—restripe 4 to 6 lanes	N/A[1]
ORA020113	Parking Expansion	Metro	Fullerton	Fullerton Train Station	New parking structure—500 spaces	N/A[1]
ORA120526	Street Improvement	OCTA	Fullerton	State College Blvd: Orangethorpe to Kimberly	Widen from 4 to 6 lanes	N/A[1]
ORA120531	Fixed Bus Route	Metro	Fullerton/ Anaheim/ Orange/ Costa Mesa	Harbor Blvd: between Fullerton and Costa Mesa	Structures and added buses	N/A[1]
2M0735B	Freeway Improvement	Caltrans	Anaheim/ Placentia	SR 57 NB: Lincoln Ave to Orangethorpe Ave	Add 1 mixed-flow lane and interchange improvements at SR 91	N/A[1]
ORA120531	Fixed bus route	Metro	Fullerton/ Anaheim/ Orange/ Costa Mesa	Harbor Blvd: between Fullerton and Costa Mesa	Structures and added buses	N/A[1]
2M0735B	Freeway improvement	Caltrans	Anaheim/ Placentia	SR 57 NB: Lincoln Ave to Orangethorpe Ave	Add 1 mixed-flow lane and interchange improvements at SR 91	N/A[1]
ORA040602	Grade Separation	OCTA	Anaheim	State College Blvd	New bridge for BNSF Metrolink Rail	N/A[1]
ORA120332	Freeway Improvement	Caltrans	Anaheim	SR 91 WB: I-5 to SR 57	1 mixed-flow lane addition	N/A[1]

Project #[3]	Project Type	Lead Agency	Cities	Location	Project Description	Estimated Completion Date
ORA02925	Grade Separation	OCTA	Anaheim	N Tustin Ave Overpass	Add bridge for rail	N/A[1]
ORA02925	Grade Separation	OCTA	Anaheim	Lakeview Ave	New bridge for BNSF Metrolink Rail	N/A[1]
ORA151509	Pedestrian Improvement	City	Anaheim	West St and Citron St	Construction of sidewalk gap closures	N/A[1]
ORA190902	Pedestrian Improvement	City	Anaheim	Citywide	Construct ADA accessible sidewalk gaps located with one-half mile of school entrances	N/A[1]

Sources: Caltrans 2017a, 2017b; SCAG 2020 (as amended)
[1] Project is programmed in SCAG 2020 Regional Transportation Plan/Sustainable Communities Strategy but funding is not programmed
[3] The project number comes from the relevant CIPs.
ADA = Americans with Disabilities Act; ATP = Active Transportation Plan; BNSF = BNSF Railway; Caltrans = California Department of Transportation; EB = eastbound; FMIS = Fiscal Management Information System; FTIP = Federal Transportation Improvement Program; HSIP = Highway Safety Improvement Program; I = Interstate; LF = Linear Feet; Metro = Los Angeles County Metropolitan Transportation Authority; N/A = not available or unable to be determined; NB = northbound; OC = Orange County; OCTA = Orange County Transportation Authority; RRFB = rectangular rapid flashing beacon; RTP = Regional Transportation Plan; SCAG = Southern California Association of Governments; SR = State Route; UPRR = Union Pacific Railroad; WB = westbound

6.2.1 Highway Element

6.2.1.1 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040)

Roadway segment base analysis and intersection base analysis were performed along the corridor alignment for the Phase 1 Full Operation Horizon Year 2040 condition. Roadway segment base analysis along the project section alignment between LAUS and ARTIC is provided in Table 6-2. Intersection base analysis along the project section alignment is provided in Table 6-3. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. It should be noted that base analysis of roadway segments and intersections within station areas for the Phase 1 Full Operation Horizon Year 2040 are provided in Section 6.2.7.1.

Of the 81 roadway segments analyzed, 12 are LOS E or F in the AM peak hour and 19 are LOS E or F in the PM peak hour. Of the 122 intersections analyzed, 26 are LOS E or F in the AM peak hour and 28 are LOS E or F in the PM peak hour.

Table 6-2 Major Roadway Segment Level of Service: Project Corridor, Horizon Year 2040 No Project

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Vermont Ave	west of East St	---	998	800	800	0.8	0.8	C	C
South St	west of East St	---	950	600	700	0.63	0.74	B	C
Santa Ana St	west of East St	---	950	800	800	0.84	0.84	D	D
Broadway	west of East St	---	3,045	1,400	1,400	0.46	0.46	A	A
Sycamore St	west of East St	---	950	700	600	0.74	0.63	C	B

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Harbor Blvd	La Palma Ave	Lincoln Ave	3,045	2,900	2,900	0.95	0.95	**E***	**E***
Harbor Blvd	Lincoln Ave	Ball Rd	2,520	2,600	2,800	1.03	1.11	**F***	**F***
La Palma Ave	Harbor Blvd	East St	3,045	2,000	2,200	0.66	0.72	B	C
La Palma Ave	East St	State College Blvd	2,520	1,900	2,600	0.75	1.03	C	**F***
Lincoln Ave	Anaheim Blvd	East St	5,198	2,500	2,700	0.48	0.52	A	A
Lincoln Ave	East St	State College Blvd	2,520	2,900	3,500	1.15	1.39	**F***	**F***
Soto St	E 26th St	Washington Blvd	2,835	2,500	2,700	0.88	0.95	D	**E***
Downey Rd	Bandini Blvd	Washington Blvd	3,045	2,700	3,400	0.89	1.12	D	**F***
E 26th St	Downey Rd	Bandini Blvd	998	900	1300	0.9	1.3	D	**F***
Atlantic Blvd	Bandini Blvd	Washington Blvd	2,835	2,300	2,500	0.81	0.88	D	D
Eastern Ave	Bandini Blvd	Commerce Way	2,835	1,800	1,900	0.63	0.67	B	B
Telegraph Rd	Garfield Ave	Washington Blvd	2,835	1,200	1,400	0.42	0.49	A	A
Garfield Ave	Telegraph Rd	Washington Blvd	2,415	2,800	2,400	1.16	0.99	**F***	**E***
Greenwood Ave	Union St	Washington Blvd	2,415	1,300	1,900	0.54	0.79	A	C
Paramount Blvd	Slauson Ave	Washington Blvd	2,520	1,900	2,600	0.75	1.03	C	**F***
Rosemead Blvd (SR 19)	Slauson Ave	Washington Blvd	2,520	2,500	2,600	0.99	1.03	**E***	**F***
Serapis Ave	north of Slauson Ave	---	850	300	300	0.35	0.35	A	A
Serapis Ave	Rivera Rd	Rex Rd	1,100	100	100	0.09	0.09	A	A
Rex Rd	Rosemead Blvd (SR 19)	Serapis Ave	950	500	400	0.53	0.42	A	A
Rex Rd	Serapis Ave	Passons Blvd	1,100	500	300	0.45	0.27	A	A
Passons Blvd	Slauson Ave	Washington Blvd	850	900	900	1.06	1.06	**F***	**F***
Slauson Ave	Passons Blvd	I-605 SB on-ramp	3,045	3,000	3,000	0.99	0.99	**E***	**E***
Pioneer Blvd	Los Nietos Rd	Rivera Rd	3,360	1,700	2,000	0.51	0.6	A	A
Pioneer Blvd	Rivera Rd	Slauson Ave	2,520	1,700	2,000	0.67	0.79	B	C
Rivera Rd	west of Pioneer Blvd	---	950	100	100	0.11	0.11	A	A
Rivera Rd	Pioneer Blvd	Norwalk Blvd	950	300	200	0.32	0.21	A	A
Norwalk Blvd	Telegraph Rd	Los Nietos Rd	2,520	1,600	1,900	0.63	0.75	B	C
Norwalk Blvd	Los Nietos Rd	Slauson Ave	2,400	1,800	2,100	0.75	0.88	C	D
Los Nietos Rd	Pioneer Blvd	Norwalk Blvd	1,100	900	900	0.82	0.82	D	D
Los Nietos Rd	Norwalk Blvd	Santa Fe Springs Rd	1,103	1,100	1,200	1	1.09	**E***	**F***

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Santa Fe Springs Rd	Telegraph Rd	Los Nietos Rd	2,415	1,800	1,800	0.75	0.75	C	C
Rosecrans Ave	Carmenita Rd	Marquardt Ave	3,045	2,200	2,300	0.72	0.76	C	C
Rosecrans Ave	Marquardt Ave	Valley View Ave	3,045	2,100	2,100	0.69	0.69	B	B
Marquardt Ave	Rosecrans Ave	Foster Ave	1,155	400	400	0.35	0.35	A	A
Marquardt Ave	south of Rosecrans Ave	---	1,050	300	200	0.29	0.19	A	A
Valley View Ave	Gannet St	Stage Rd	3,360	2,700	2,800	0.8	0.83	C	D
Valley View Ave	Stage Rd	Rosecrans Ave	3,045	2,700	2,600	0.89	0.85	D	D
Stage Rd	Rosecrans Ave	Valley View Ave	1,100	400	600	0.36	0.55	A	A
Stage Rd	Valley View Ave	Alondra Blvd	2,400	800	800	0.33	0.33	A	A
Alondra Blvd	Valley View Ave	La Mirada Blvd	3,045	2,100	2,300	0.69	0.76	B	C
Stage Rd	Alondra Blvd	Beach Blvd (SR 39)	2,400	700	900	0.29	0.38	A	A
Beach Blvd (SR 39)	Franklin St	Stage Rd	5,198	4,600	5,100	0.88	0.98	D	**E***
Artesia Blvd	Beach Blvd (SR 39)	Dale St	2,520	1,500	1,800	0.6	0.71	A	C
Commonwealth Ave	Beach Blvd (SR 39)	Dale St	2,520	1,100	1,100	0.44	0.44	A	A
Malvern Ave	Beach Blvd (SR 39)	Dale St	2,625	2,200	2,200	0.84	0.84	D	D
Dale St	Artesia Blvd	Malvern Ave	3,150	1,800	2,000	0.57	0.63	A	B
Artesia Blvd	Dale St	Gilbert St	1,000	700	800	0.7	0.8	B	C
Commonwealth Ave	Dale St	Gilbert St	3,045	1,600	1,800	0.53	0.59	A	A
Malvern Ave	Dale St	Gilbert St	3,150	2,700	2,800	0.86	0.89	D	D
Gilbert St	Commonwealth Ave	Artesia Blvd	3,045	2,500	2,500	0.82	0.82	D	D
Gilbert St	Artesia Blvd	Malvern Ave	4,332	3,200	3,000	0.74	0.69	C	B
Commonwealth Ave	Brookhurst Rd	Euclid St	3,045	1,700	1,600	0.56	0.53	A	A
State College Blvd	La Palma Ave	Lincoln Ave	4,410	2,000	2,700	0.45	0.61	A	B
State College Blvd	Lincoln Ave	South St	4,410	2,200	2,800	0.5	0.63	A	B
State College Blvd	South St	Wagner Ave	5,198	2,700	2,600	0.52	0.5	A	A
State College Blvd	Wagner Ave	Ball Rd	4,410	2,900	2,600	0.66	0.59	B	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
East St	La Palma Ave	Lincoln Ave	2,520	1,800	2,000	0.71	0.79	C	C
East St	Lincoln Ave	South St	2,520	1,600	1,500	0.63	0.6	B	A
East St	South St	Vermont St	3,360	1,300	1,300	0.39	0.39	A	A
East St	Vermont St	Ball Rd	2,520	1,600	1,500	0.63	0.6	B	A
Anaheim Blvd	La Palma Ave	Lincoln Ave	2,520	1,500	1,700	0.6	0.67	A	B
Anaheim Blvd	Lincoln Ave	South St	2,520	1,700	2,000	0.67	0.79	B	C
Anaheim Blvd	South St	Vermont St	3,360	2,000	2,200	0.6	0.65	A	B
Anaheim Blvd	Vermont St	Ball Rd	2,520	2,300	2,800	0.91	1.11	**E***	**F***
Carmenita Rd	north of Alondra Blvd	---	3,045	2,300	2,600	0.76	0.85	C	D
Beach Blvd (SR 39)	Malvern Ave	Stage Rd	4,410	4,400	4,800	1	1.09	**E***	**F***
Santa Fe Springs Rd	north of Los Nietos Rd	---	3,150	1,800	2,100	0.57	0.67	A	B
Washington Blvd	west of Indiana St	---	3,360	1,000	1,200	0.3	0.36	A	A
Washington Blvd	Ayers Ave	I-710	3,045	1,100	1,500	0.36	0.49	A	A
Washington Blvd	I-710	Atlantic Blvd	2,835	2,000	2,400	0.71	0.85	C	D
Telegraph Rd	Garfield Ave	Maple Ave	2,700	1,700	2,000	0.63	0.74	B	C
Bandini Blvd	Soto St	Downey Rd	2,700	1,500	1,500	0.56	0.56	A	A
Bandini Blvd	Downey Rd	Atlantic Blvd	2,400	1,900	2,000	0.79	0.83	C	D
Bandini Blvd	Atlantic Blvd	Eastern Ave	2,300	2,000	2,400	0.87	1.04	D	**F***
Soto St	E 26th St	Bandini Blvd	2,700	3,300	3,100	1.22	1.15	**F***	**F***
E 26th St	Sierra Pine Ave	Downey Rd	900	900	1,200	1	1.33	**E***	**F***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I = Interstate; LOS = level of service; SB = southbound; SR = State Route; V/C = volume to capacity; veh/hr = vehicles per hour

Table 6-3 Intersection Level of Service: Project Corridor, Horizon Year 2040 No Project

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G35	Anaheim Blvd & La Palma Ave[1]	33	C	38.1	D
G36	Anaheim Blvd & Sycamore St[1]	12.5	B	10	B
G37	Anaheim Blvd & Lincoln Ave	30.9	C	38.5	D
G38	Anaheim Blvd & Santa Ana St	17	B	14.1	B
G39	Anaheim Blvd & South St	16.3	B	13	B
G40	Anaheim Blvd & Vermont Ave	21.9	C	15.9	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G42	East St & La Palma Ave	33.9	C	57	**E***
G43	East St & Sycamore St	18.8	B	16.5	B
G44	East St & Lincoln Ave	41.6	D	70.1	**E***
G45	East St & Santa Ana St	20.2	C	18.8	B
G46	East St & South St	25	C	>180	**F***
G47	East St & Vermont Ave	20.2	C	19	B
G49	Anaheim Blvd & Broadway	26.3	C	28.3	C
G50	East St & Broadway	27.6	C	24.9	C
G67	Harbor Blvd & La Palma Ave	42.5	D	113.4	**F***
G68	Harbor Blvd & Lincoln Ave	66.8	**E***	78.5	**E***
G73	State College Blvd & La Palma Ave	33.2	C	59.9	**E***
G74	State College Blvd & Lincoln Ave	39.3	D	51.1	D
G75	State College Blvd & Vermont Ave	>180	**F***	>180	**F***
G78	Harbor Blvd & Vermont Ave	15.8	B	14.5	B
G83	Soto St & Washington Blvd	53.7	D	40.6	D
G84	Downey Rd & Washington Blvd	43.4	D	55.5	**E***
G85	Atlantic Blvd & Washington Blvd	31.9	C	40.3	D
G86	Eastern Ave & Washington Blvd	29	C	33.8	C
G87	I-5 SB ramps & Washington Blvd[1]	21	C	21	C
G88	Telegraph Rd & Washington Blvd	37.7	D	37.7	D
G89	Garfield Ave & Washington Blvd	60.3	**E***	49.1	D
G90	Greenwood Ave & Washington Blvd	29.1	C	29.1	C
G91	Passons Blvd & Washington Blvd	44.3	D	35.9	D
G92	Pioneer Blvd & Washington Blvd	115.5	**F***	62.8	**E***
G93	Sierra Pine Ave & Bandini Blvd	16.9	B	14.7	B
G94	Downey Rd & Bandini Blvd	42.7	D	41	D
G95	Indiana St & Bandini Blvd[2]	39.6	**E***	31.7	D
G96	Bonnie Beach Pl & Bandini Blvd	16.4	B	18.4	B
G97	Ayers Ave & Bandini Blvd[2]	16	C	18.5	C
G98	Atlantic Blvd/I-710 NB ramps & Bandini Blvd[1]	112.4	**F***	102.1	**F***
G99	Eastern Ave & Bandini Blvd	34.7	C	35.3	D
G100	Garfield Ave & Bandini Blvd	26	C	44.6	D
G101	I-5 SB ramps & Bandini Blvd[2]	>180	**F***	>180	**F***
G102	Soto St & E 26th St	26.5	C	42.3	D
G103	Sierra Pine Ave & E 26th St[2]	18	C	22.8	C
G104	Indiana St & E 26th St[2]	15.5	C	28.6	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G105	Bonnie Beach Pl & E 26th St	13	B	11.9	B
G106	Ayers Ave & E 26th St[2]	23.4	C	145.1	**F***
G107	Soto St & E 37th St/Bandini Blvd	40.7	D	34.2	C
G108	Eastern Ave & Commerce Way	7.2	A	7.8	A
G109	Telegraph Rd (Washington Blvd) & I-5 NB ramps[1]	35.4	D	35.4	D
G110	Garfield Ave & Telegraph Rd	34.9	C	33	C
G111	Telegraph Rd (Garfield Ave) & I-5 NB ramps[1]	27.8	C	31.1	C
G112	Greenwood Ave & Telegraph Rd	12.4	B	16.3	B
G113	Telegraph Rd (Slauson Ave) & I-5 NB off-ramp[2]	>180	**F***	>180	**F***
G114	Gage Rd & Telegraph Rd[2]	53.9	**F***	94.8	**F***
G115	Telegraph Rd & Slauson Ave	47	D	54.3	D
G116	Greenwood Ave & Driveway[2]	19.2	C	25.9	D
G117	Greenwood Ave & Union St	6.7	A	8.4	A
G118	Chapin Rd & Union St[3]	10	A	16.7	C
G119	I-5 SB ramps/Gage Ave & Slauson Ave[1]	51.8	D	80.9	**F***
G120	Chapin Rd & Slauson Ave	7.2	A	20.7	C
G121	Paramount Blvd & Slauson Ave	43.7	D	53.6	D
G122	Rosemead Blvd (SR 19) & Slauson Ave	59	**E***	56.1	**E***
G123	Passons Blvd & Slauson Ave	58.5	**E***	135.9	**F***
G124	I-605 SB off-ramp & Slauson Ave	35.9	D	23.2	C
G125	Pioneer Blvd & Slauson Ave	66.1	**E***	63.8	**E***
G126	Norwalk Blvd & Slauson Ave	43.5	D	38.6	D
G127	Sorensen Ave & Slauson Ave	36.6	D	39.7	D
G128	Santa Fe Springs Rd & Slauson Ave/Mulberry Dr[1]	31.2	C	24.4	C
G130	Pioneer Blvd & I-605 NB off-ramp[2]	118.2	**F***	>180	**F***
G131	Pioneer Blvd & Los Nietos Rd	18.2	B	17.4	B
G132	Pioneer Blvd & Orr and Day Rd[2]	133	**F***	>180	**F***
G133	Pioneer Blvd & Telegraph Rd	31	C	30	C
G134	Norwalk Blvd & Los Nietos Rd	23.7	C	28.2	C
G135	Los Nietos Rd & Santa Fe Springs Rd	24.6	C	24.8	C
G136	Santa Fe Springs Rd & Sorensen Ave[2]	26.3	D	60.9	**F***
G137	Valley View Ave & Imperial Hwy	43.6	D	47.1	D
G138	Valley View Ave & Foster Rd	128.8	**F***	>180	**F***
G139	Valley View Ave & Rosecrans Ave	59.4	**E***	49.7	D
G140	Valley View Ave & Stage Rd	21.2	C	24.6	C
G141	Valley View Ave & Gannet St	11.4	B	13.3	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G142	Marquardt Ave & Imperial Hwy	18.6	B	19.6	B
G143	Marquardt Ave & Foster Rd[3]	23.1	C	19.6	C
G144	Marquardt Ave & Rosecrans Ave/Stage Rd	24.7	C	31.1	C
G146	Stage Rd/Escalona Rd & Alondra Blvd[1]	20.7	C	21.6	C
G147	Dodds Ave (East) & Stage Rd[2]	16	C	15.1	C
G148	Beach Blvd (SR 39) & Stage Rd	20	C	22.3	C
G149	La Mirada Blvd & Alondra Blvd	39.9	D	30.2	C
G150	Beach Blvd (SR 39) & La Mirada Blvd/Malvern Ave	49.3	D	46.4	D
G151	Beach Blvd (SR 39) & Franklin St	33.1	C	45.2	D
G152	Beach Blvd (SR 39) & Artesia Ave	39	D	44.5	D
G153	Dale St & Malvern Ave[1]	31.5	C	32.3	C
G154	Dale St & Lakeknoll Dr	13.8	B	15	B
G155	Dale St & Artesia Ave	22.7	C	20.5	C
G156	Stanton Ave & Artesia Ave	23.9	C	26.5	C
G157	Dale St & Commonwealth Ave	30.9	C	30	C
G158	Gilbert St & Commonwealth Ave[1]	39.4	D	35	C
G159	Brookhurst Rd & Commonwealth Ave[1]	33.5	C	28.5	C
G160	Brookhurst Rd & Valencia Dr	68.9	**E***	30.1	C
G162	Gilbert St & Malvern Ave	90.1	**F***	45.8	D
G163	Gilbert St & Artesia Ave	18.8	B	14.8	B
G164	Anaheim Blvd/Lemon St & La Palma Ave	13.7	B	31.3	C
G165	Paramount Blvd & Washington Blvd	56.5	**E***	48	D
G166	Rosemead Blvd (SR 19) & Washington Blvd	45.7	D	47.7	D
G167	E 26th St & Bandini Blvd[1]	10.9	B	17	B
G168	Garfield Ave & E 26th St[2]	>180	**F***	>180	**F***
G169	Serapis Ave & Slauson Ave	14.2	B	12.4	B
G170	Pioneer Blvd & Wheelock Cir[2]	4.7	A	4.5	A
G171	Pioneer Blvd & Rivera Rd[2]	>180	**F***	>180	**F***
G173	Passons Blvd & Rivera Rd	21.9	C	13.4	B
G174	Rosemead Blvd (SR 19) & Rex Rd	25.6	C	22.6	C
G175	Passons Blvd & Rex Rd[3]	24.2	C	16.1	C
G176	La Mirada Blvd & Rosecrans Ave	31.1	C	34.2	C
G177	Valley View Ave & Alondra Blvd	50.4	D	47.6	D
G178	Beach Blvd (SR 39) & Commonwealth Ave	25.8	C	30.8	C
G197	Indiana St & Washington Blvd	16.6	B	16.7	B
G198	Oak St & Washington Blvd	13.3	B	13.3	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G199	Arrowmill Ave & Washington Blvd	19.4	B	19.4	B
G200	Ayers Ave & Washington Blvd	14.3	B	14.3	B
G201	I-710 SB ramps & Washington Blvd[1]	34.1	C	33.8	C
G202	I-710 NB ramps & Washington Blvd[1]	22.4	C	22.5	C
G203	Atlantic Blvd & Sheila St	>180	**F***	>180	**F***
G208	Downey Rd & E 26th St[2]	77.6	**F***	77.6	**F***
G210	Eastern Ave & Driveway[2]	84.9	**F***	>180	**F***
G211	Telegraph Rd & Maple Ave[2]	50.1	**F***	58.1	**F***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
G intersection number prefix indicates intersections outside of station areas.
HCM = Highway Capacity Manual; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route

6.2.2 Regional Bus Service

Several bus service projects are being studied or are in the process of design. Only one of these projects within the RSA was reflected in the SCAG 2020 RTP/SCS. Additionally, projects discussed in Section 6.2.3, Local Fixed Guideway Element, may result in improvements to regional bus service as a possible preferred alternative.

6.2.3 Local Fixed Guideway Element

There are several local transit projects under evaluation and expected to operate in the near future and were included in the SCAG 2020 RTP/SCS.

6.2.3.1 Metro Green Line (C) Extension

Metro is studying an extension of the C Line into the South Bay, connecting the existing Redondo Beach (Marine) Station and the Torrance Transit Center (Metro 2024). This extension's purpose is to provide congestion relief along the busy I-405 corridor. It will also improve mobility in southwestern Los Angeles County by providing access to the regional rail network through connections to the Metro A and E Lines. Metro released the Draft EIR in January 2023, and a locally preferred alternative was selected in May 2024. Metro is preparing the Final EIR to be released in spring 2025.

6.2.3.2 Metro Purple (D) Line Extension

The Metro Purple (D) Line Extension Project will expand the existing Metro Purple Line subway from its current western terminus at Wilshire/Western westward approximately 9 miles to the Veterans Affairs Medical Center in Westwood, Los Angeles. The extension will provide seven new stations. In April and May 2012, the Metro Board of Directors certified its Final EIS/EIR. Construction began in 2019 and is proceeding in three phases. Sections 1 and 2 are expected to open in 2025, and Section 3 is expected to open in 2027.

The expanded service area of the Metro public transit system and resulting transit-oriented development efforts around new stations, would improve mobility options and regional accessibility for potential HSR passengers. The Metro Purple (D) Line would particularly improve regional accessibility for potential HSR passengers as it connects to LAUS, a major proposed HSR station.

6.2.3.3 Southeast Gateway Line (formerly known as West Santa Ana Transit Corridor)

Metro is evaluating a new light rail transit system connecting southeast Los Angeles County to downtown Los Angeles via the abandoned Pacific Electric right-of-way/West Santa Ana Branch Transit Corridor, and a combination of local streets and Metro-owned rail right-of-way. The study area stretches approximately 12 miles from LAUS to the Pacific Electric right-of-way/West Santa Ana Branch Corridor in Paramount and 8 miles south along the corridor to Artesia. The Metro Board of Directors approved the LPA in January 2022, and certified the Final EIS/EIR in April 2024. The project is expected to open in 2035.

6.2.3.4 Santa Ana-Garden Grove Fixed Guideway Project (formerly known as OC Streetcar)

In 2008, the cities of Santa Ana and Garden Grove began a partnership to develop a streetcar connection from the Santa Ana Regional Transportation Center to Garden Grove, providing greater mobility and transportation choices to the residents of both cities. It is currently under construction, and it is expected to operate in 2025.

6.2.4 Aviation Element

6.2.4.1 Los Angeles International Airport

LAX currently has seven listed, active projects that are planned or under construction. These projects are presented in Table 6-4.

Table 6-4 Los Angeles International Airport Projects

Project Name	Description
Airfield & Terminal Modernization Project	This project would add two new terminals, called Concourse 0 and Terminal 9, for a total of 23 new gates. The project would also include an infill station for the under-construction LAX Automated People Mover at the proposed Terminal 9. The project would include airfield and roadway improvements, with the goals of reducing tarmac wait times, enhancing passenger experience, and reducing congestion on roadways that access LAX terminals.
Landside Access Modernization Program	The program includes the LAX Train (Automated People Mover), Intermodal Transportation Facilities, a Consolidated Rent-A-Car Center, improvements to the Central Terminal area, and a connection to Metro Green Line. Together, these projects will relieve traffic congestion, and improve the travel experience. These projects seek to accomplish the following: ▪ Relieve traffic congestion within the Central Terminal area and the surrounding street network ▪ Create new convenient locations for passenger pick-up, drop-off, and parking outside of the Central Terminal area ▪ Give passengers a fast and reliable way to get to their flights ▪ Reduce vehicle emissions and improve air quality
Midfield Satellite Concourse: North/ Baggage Optimization Project	A new $1.6 billion concourse addition to LAX's Tom Bradley International Terminal will feature 12 aircraft gates as well as a Baggage Optimization Project that will expand capacity for the Tom Bradley International Terminal and the new facility.
Receiving Station X	In cooperation with the Los Angeles Department of Water and Power (LADWP), Los Angeles World Airports (LAWA) is constructing a new $157.8 million power receiving station, Receiving Station X (RS-X) that will address persistent power reliability, redundancy and capacity issues at Los Angeles International Airport (LAX).

Project Name	Description
Terminals 2 & 3	Terminals 2 and 3, home to Delta Air Lines, Aeromexico, and WestJet, is currently undergoing a $2.3 billion modernization that broke ground in April 2019. The project includes a new headhouse for Terminals 2 and 3, the complete replacement of the Terminal 3 concourse and original 1961 satellite, a connection behind security between Terminal 3 and Tom Bradley International Terminal and connection to the Automated People Mover (APM) train system.
Terminals 4 & 5	Terminals 4 and 5, home to American Airlines, JetBlue and Spirit Airlines, is undergoing a $1.6 billion modernization slated to complete in 2027 that will create a centralized location for ticketing, screening and baggage claim with enhanced amenities for guests, as well as provide direct connection to the Automated People Mover (APM) train system.
Northside Development	The Northside Development, also known as the bow tie, is an approximately 70-acre section of land located north of Westchester Parkway in which Los Angeles World Airports (LAWA) will be developing commercial and open space in the coming years. The commercial area includes 901,000 square feet of allowable development for a variety of commercial applications. Nearly 13 acres of land designated for recreational areas will also be built as part of the community benefits of the project.

Source: Los Angeles World Airports 2023
LAX = Los Angeles International Airport

6.2.4.2 Long Beach Airport

As part of Long Beach Airport's Modernization Program, the airport launched the second phase of terminal improvements following the completion of Phase 1 in 2012, which included a new passenger concourse, parking structure, and other improvements. Phase 2 focuses on presecurity improvements to enhance the overall experience for visitors and passengers, which include renovating facilities and spaces and improving overall functional flow. Construction of Phase 2 began in 2020, with most elements completed in 2024. Other elements designed as a part of Phase II were delayed as a result of budget constraints; the terminal roadway improvements project is anticipated to be completed by end of 2024, with other improvements continuing into early 2025 (LGB Road Improvements 2024).

6.2.4.3 John Wayne Airport

John Wayne Airport currently has no active projects.

6.2.5 Freight Rail

Whether carrying imported goods from the San Pedro Bay Ports to regional distribution centers, supplying materials for local manufacturers, or delivering consumer goods to residents, the movement of freight provides the goods needed to sustain regional industries and consumer needs on a daily basis. In the year 2040, under the No Project Alternative, freight train volume along the San Bernardino Subdivision between LAUS and Fullerton Junction is estimated to be 165 freight trains each weekday (Authority 2019).[19]

[19] For LAUS to Fullerton, existing conditions are provided by BNSF, based on data from August 2016; 2040 Horizon Year projections are based on 2 percent annual growth. This is consistent with the 2018 California State Rail Plan (page 28), which anticipated growth to compound annually at a rate of 1.7 percent and 2.9 percent for carload and intermodal services, respectively.

6.2.5.1 High Desert Operational Efficiency Project

The High Desert Operational Efficiency Project is a Caltrans-sponsored project that will improve the efficiency of freight operations on the BNSF Cajon Subdivision and within the LOSSAN Corridor. The project, originally proposed in Lenwood (also potentially referred to as Barstow), is now proposed in Hesperia and unincorporated areas of San Bernardino County within BNSF right-of-way, extending for approximately 11.2 miles between railroad milepost 41.8 at the north to milepost 53.0 to the south. The project includes the construction of two 22,500-foot-long staging tracks and an 11-mile extension of the existing Main Track 1, matching the lengths of Main Tracks 2 and 3 between control point Martinez and control point Thorn.

These improvements will allow freight trains to be staged or held outside and east of the LOSSAN Corridor to alleviate freight rail congestion during routine maintenance in the LOSSAN Corridor and during periods of construction in the LOSSAN Corridor. The High Desert Operational Efficiency Project will allow freight to move more efficiently between the Los Angeles Basin and the High Desert Freight Corridor. In addition, the third main track will allow freight and passenger trains to more easily pass one another, alleviating delays and improving operations.

A CEQA Notice of Exemption (State Clearinghouse No. 2024040820) was filed for the High Desert Operational Efficiency Project on April 18, 2024, with the project determined to qualify for a Statutory Exemption related to specified mass transit projects, pursuant to CEQA Guidelines Section 15275. The project was awarded $100,467,000 in funding through the State of California's Port and Freight Infrastructure Program (California State Transportation Agency 2023) and $30,770,000 in funding through the state's Trade Corridor Enhancement Program (California Transportation Commission 2025). The Port and Freight Infrastructure Program is overseen by the California State Transportation Agency, with assistance provided by Caltrans. The Trade Corridor Enhancement Program is a state program overseen by the California Transportation Commission. The High Desert Operational Efficiency Project is expected to complete construction by July 2027 (California State Transportation Agency 2023).

6.2.6 Conventional Passenger Rail Element

In the existing condition, a Shared Use Agreement outlines the operating rights of freight and passenger rail within the Los Angeles to Fullerton corridor, including train volume caps based on completion of capital improvement projects that had been identified during preparation of the agreement (ATSF and RCTC 1992). In the No Project Alternative, passenger rail trains would continue to operate within the project section consistent with relevant contractual operating agreements between BNSF and other operators. Passenger train volumes would be determined, in part, through coordination between BNSF and other operators. Such coordination would include, but not be limited to, taking account of how proposed increases in passenger rail volumes would affect BNSF's timetables and be consistent with BNSF's operating rules and other applicable freight standards related to operation, maintenance, inspection, and safety. A shared use agreement would continue to govern freight and passenger rail operating rights and include consideration of any proposed improvements to corridor capacity.

6.2.7 Roadway and Intersection Operations

6.2.7.1 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040)

Norwalk/Santa Fe Springs High-Speed Rail Station Option Area

Roadway segment base analysis and intersection base analysis were performed in the Norwalk/Santa Fe Springs HSR Station Option area for the Phase 1 Full Operation Horizon Year 2040 condition. Roadway segment base analysis is provided in Table 6-5. Intersection base analysis is provided in Table 6-6. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. Of the 62 roadway segments analyzed, 5 are LOS E or F in the AM peak hour, and 7 are LOS E or F in the PM peak hour. Of the 61 intersections analyzed, 9 are LOS E or F in the AM peak hour, and 9 are LOS E or F in the PM peak hour.

Table 6-5 Roadway Segment Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option Area, Horizon Year 2040 No Project

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Firestone Blvd	Studebaker Rd	Imperial Hwy	3,675	1,900	2,000	0.52	0.54	A	A
Firestone Blvd	Imperial Hwy	Pioneer Blvd	2,520	1,800	2,000	0.71	0.79	C	C
Pioneer Blvd	Telegraph Rd	Florence Ave	2,520	1,800	1,200	0.71	0.48	C	A
Norwalk Blvd	Telegraph Rd	Florence Ave	2,520	1,600	1,700	0.63	0.67	B	B
Norwalk Blvd	Florence Ave	Lakeland Rd	3,045	1,700	1,700	0.56	0.56	A	A
Norwalk Blvd	Tina St	Imperial Hwy	2,520	2,200	2,100	0.87	0.83	D	D
Bloomfield Ave	Telegraph Rd	Florence Ave	2,415	1,600	1,600	0.66	0.66	B	B
Bloomfield Ave	Florence Ave	Lakeland Rd	2,835	1,900	1,800	0.67	0.63	B	B
Bloomfield Ave	Lakeland Rd	6th St	3,150	1,800	1,700	0.57	0.54	A	A
Bloomfield Ave	6th St	Imperial Hwy	2,625	1,800	1,800	0.69	0.69	B	B
Bloomfield Ave	Imperial Hwy	Foster Rd	2,520	1,600	1,900	0.63	0.75	B	C
Leffingwell Rd	Meyer Rd	Carmenita Rd	3,045	1,500	1,600	0.49	0.53	A	A
Leffingwell Rd	Carmenita Rd	Imperial Hwy	2,520	900	1,000	0.36	0.4	A	A
Leffingwell Rd	Imperial Hwy	Adler Dr	1,000	400	500	0.4	0.5	A	A
Carmenita Rd	Telegraph Rd	Florence Ave	2,520	1,800	1,800	0.71	0.71	C	C
Carmenita Rd	Florence Ave	Lakeland Ave	3,045	1,900	2,100	0.62	0.69	B	B
Carmenita Rd	Meyer Rd	Leffingwell Rd	3,045	1,600	2,000	0.53	0.66	A	B
Carmenita Rd	Leffingwell Rd	Imperial Hwy	2,520	1,800	2,300	0.71	0.91	C	**E***
Carmenita Rd	Imperial Hwy	Orden Dr	2,520	2,100	2,500	0.83	0.99	D	**E***
Telegraph Rd	Pioneer Blvd	Norwalk Blvd	5,198	3,300	3,100	0.63	0.6	B	A
Telegraph Rd	Norwalk Blvd	Santa Fe Springs Rd	4,883	2,800	2,700	0.57	0.55	A	A
Telegraph Rd	Shoemaker Ave	Carmenita Rd	4,883	2,300	2,300	0.47	0.47	A	A
Telegraph Rd	Carmenita Rd	Florence Ave	5,198	2,200	2,600	0.42	0.5	A	A
Florence Ave	Orr and Day Rd	Pioneer Blvd	3,045	3,600	3,500	1.18	1.15	**F***	**F***
Florence Ave	Pioneer Blvd	Norwalk Blvd	3,045	2,600	2,800	0.85	0.92	D	**E***
Florence Ave	Norwalk Blvd	Bloomfield Ave	2,835	2,400	2,600	0.85	0.92	D	**E***
Florence Ave	Bloomfield Ave	Shoemaker Ave	2,835	2,400	2,500	0.85	0.88	D	D
Florence Ave	Shoemaker Ave	Carmenita Rd	2,835	2,400	2,400	0.85	0.85	D	D
Florence Ave	Carmenita Rd	Telegraph Rd	2,520	2,300	2,500	0.91	0.99	**E***	**E***
Imperial Hwy	Studebaker Rd	Firestone Blvd	5,198	2,700	2,900	0.52	0.56	A	A
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	4,410	2,600	2,700	0.59	0.61	A	B
Imperial Hwy	Bloomfield Ave	Shoemaker Ave	5,198	2,900	3,000	0.56	0.58	A	A
Imperial Hwy	Shoemaker Ave	Leffingwell Rd	5,198	3,100	3,200	0.6	0.62	A	B

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Imperial Hwy	Leffingwell Rd	Carmenita Rd	5,198	2,200	2,100	0.42	0.4	A	A
Telegraph Rd	Santa Fe Springs Rd	Shoemaker Ave	4,883	2,000	2,300	0.41	0.47	A	A
Lakeland Rd	Pioneer Blvd	Norwalk Blvd	1,100	700	800	0.64	0.73	B	C
Lakeland Rd	Norwalk Blvd	Bloomfield Ave	1,050	900	900	0.86	0.86	D	D
Lakeland Rd	Bloomfield Ave	Shoemaker Ave	1,103	800	900	0.73	0.82	C	D
Shoemaker Ave	Telegraph Rd	Florence Ave	2,415	1,300	1,100	0.54	0.46	A	A
Shoemaker Ave	Florence Ave	Lakeland Rd	2,835	1,600	1,400	0.56	0.49	A	A
Shoemaker Ave	Lakeland Rd	Imperial Hwy	2,400	1,200	1,100	0.5	0.46	A	A
Florence Ave	west of I-605	---	3,360	2,800	2,700	0.83	0.8	D	C
Imperial Hwy	west of I-605	---	5,198	2,900	3,100	0.56	0.6	A	A
Imperial Hwy	I-605	Studebaker Rd	5,198	3,200	3,500	0.62	0.67	B	B
Studebaker Rd	Imperial Hwy	I-105	2,520	2,300	2,200	0.91	0.87	**E***	D
Carmenita Rd	Orden Dr	Rosecrans Ave	2,520	2,400	2,200	0.95	0.87	**E***	D
Shoemaker Ave	Imperial Hwy	Foster Rd	1,000	400	500	0.4	0.5	A	A
Shoemaker Ave	Foster Rd	Rosecrans Ave	2,400	800	600	0.33	0.25	A	A
Norwalk Blvd	Imperial Hwy	Civic Center Dr	4,410	2,200	2,400	0.5	0.54	A	A
Civic Center Dr	Norwalk Blvd	Bloomfield Ave	2,200	1,200	1,400	0.55	0.64	A	B
Civic Center Dr	east of Bloomfield Ave	---	950	200	100	0.21	0.11	A	A
Foster Rd	Bloomfield Ave	Shoemaker Ave	900	600	700	0.67	0.78	B	C
Rosecrans Ave	Shoemaker Ave	Carmenita Rd	4,332	2,700	3,000	0.62	0.69	B	B
San Antonio Dr	Firestone Blvd	Pioneer Blvd /Rosecrans Ave	2,520	1,400	1,500	0.56	0.6	A	A
Rosecrans Ave	Pioneer Blvd	Norwalk Blvd	2,520	1,900	1,800	0.75	0.71	C	C
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	2,520	2,400	2,400	0.95	0.95	**E***	**E***
Rosecrans Ave	I-605 NB ramps	Studebaker Rd	4,332	3,400	3,400	0.78	0.78	C	C
Rosecrans Ave	I-605 SB ramps	I-605 NB ramps	4,332	2,700	2,600	0.62	0.6	B	A
Lakeland Rd	Shoemaker Ave	Carmenita Rd	1,050	500	600	0.48	0.57	A	A
Studebaker Rd	north of Imperial Hwy	---	2,520	1,500	1,600	0.6	0.63	A	B
Pioneer Blvd	north of South St	---	3,045	1,500	1,600	0.49	0.53	A	A
Imperial Hwy	west of Norwalk Blvd	---	5,198	2,900	3,000	0.56	0.58	A	A

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I = Interstate; LOS = level of service; NB = northbound; SB = southbound; veh/hr = vehicle per hour; V/C = volume to capacity ratio

Table 6-6 Intersection Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option Area, Horizon Year 2040 No Project

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N1	Firestone Blvd & Imperial Hwy[1]	62.5	**E***	62.8	**E***
N2	Pioneer Blvd & Florence Ave	42.2	D	34.4	C
N3	Pioneer Blvd & Imperial Hwy	37.2	D	39	D
N5	Norwalk Blvd & Telegraph Rd	44.9	D	42	D
N6	Norwalk Blvd & Florence Ave	42.5	D	41.9	D
N7	Norwalk Blvd & Imperial Hwy	55.3	**E***	173.1	**F***
N10	Bloomfield Ave/Santa Fe Springs Rd & Telegraph Rd	32.7	C	31.4	C
N11	Bloomfield Ave & Florence Ave	40.2	D	37	D
N12	Bloomfield Ave & Lakeland Rd	24.5	C	21.9	C
N15	Bloomfield Ave & Imperial Hwy	47	D	49.2	D
N17	Transportation Center West & Imperial Hwy[1]	14.5	B	14.7	B
N18	Transportation Center East & Imperial Hwy[1]	12.9	B	14.5	B
N19	Shoemaker Ave & Florence Ave	29.2	C	27.6	C
N20	Shoemaker Ave/Adler Dr & Imperial Hwy	29.7	C	29.2	C
N21	Leffingwell Rd & Imperial Hwy	30.1	C	28.5	C
N22	Carmenita Rd & Telegraph Rd	47	D	47.3	D
N23	Carmenita Rd & Florence Ave	45.2	D	41.3	D
N24	Carmenita Rd & Leffingwell Rd	22	C	27	C
N25	Carmenita Rd & Imperial Hwy	40.8	D	42.3	D
N26	Telegraph Rd & Florence Ave/Mills Ave	45.4	D	49.6	D
N27	I-5 NB on-ramp & Imperial Hwy	44.2	D	25	C
N30	I-5 SB off-ramp & Imperial Hwy[1]	20.4	C	25.8	C
N31	Norwalk Blvd & I-5 NB ramps	33.5	C	30.4	C
N32	San Antonio Dr & I-5 SB on-ramp[1]	22.8	C	25.4	C
N33	Shoemaker Ave & Telegraph Rd	73.5	**E***	50.1	D
N34	Pioneer Blvd & Lakeland Rd	28	C	22.3	C
N35	Norwalk Blvd & Lakeland Rd	20.8	C	20.1	C
N36	I-605 SB ramps & Florence Ave	72	**E***	50.5	D
N37	Studebaker Rd & Florence Ave[1]	34.7	C	41.6	D
N38	Studebaker Rd & I-605 NB ramps/Dollison Dr[1]	40.1	D	17.6	B
N40	Fairford Ave & Florence Ave	30	C	28.7	C
N41	I-5 NB off-ramp & Florence Ave	15.8	B	7.1	A
N42	Orr and Day Rd & Florence Ave[1]	29.7	C	26.2	C
N45	I-605 SB ramps/Flatbush Ave & Imperial Hwy[1]	27.4	C	53.6	D
N46	Hoxie Ave & Imperial Hwy[1]	45.2	D	69	**E***

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N47	I-605 NB ramps & Hoxie Ave	27.7	C	39	D
N48	Studebaker Rd & I-105 ramps	35.7	D	29.8	C
N49	Studebaker Rd & Imperial Hwy	66.2	**E***	74.1	**E***
N50	Bloomfield Ave & Firestone Blvd (North)	6.4	A	11.1	B
N51	Bloomfield Ave & Firestone Blvd (South)	72.9	**E**	104.6	**F**
N52	Bloomfield Ave & Rosecrans Ave	47.8	D	49.8	D
N53	I-5 NB off-ramp & Rosecrans Ave[1]	18.3	B	21.6	C
N54	I-5 SB on-ramp & Rosecrans Ave[1]	15.3	B	14.4	B
N55	Shoemaker Ave & Rosecrans Ave	45.2	D	52.6	D
N56	Shoemaker Ave & Overcrossing (south)[2]	20.2	C	154.3	**F***
N57	Shoemaker Ave & Firestone Blvd (south)[2]	10.7	B	12.4	B
N58	Carmenita Rd & Rosecrans Ave	46	D	50.3	D
N61	Carmenita Rd & I-5 NB ramps[1]	9.5	A	11.1	B
N62	Carmenita Rd & I-5 SB ramps[1]	9.1	A	12	B
N63	Norwalk Blvd & Civic Center Dr[1]	25	C	26.9	C
N64	Bloomfield Ave & Civic Center Dr	26.3	C	34.5	C
N65	Bloomfield Ave & Goller Ave/Foster Rd	27.8	C	38.5	D
N66	Shoemaker Ave & Foster Rd[3]	20.5	C	28.3	C
N67	Carmenita Rd & Orden Dr	15.1	B	22.1	C
N68	I-605 NB ramps & Rosecrans Ave	41.8	D	49.3	D
N69	I-605 SB ramps & Rosecrans Ave[1]	34.9	C	37.2	D
N70	Studebaker Rd & Rosecrans Ave	59.8	**E***	73.1	**E***
N71	Pioneer Blvd/San Antonio Dr & Rosecrans Ave[1]	101.6	**F***	94.6	**F***
N72	Shoemaker Ave & Lakeland Rd	20.1	C	21.9	C
N73	Carmenita Rd & Lakeland Rd	67.4	**E***	148.1	**F***
N145	Carmenita Rd & Foster Rd	17.9	B	15.9	B

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
N intersection number prefix indicates intersections within Norwalk/Santa Fe Springs HSR Station Option area.
HCM = Highway Capacity Manual; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle

Fullerton High-Speed Rail Station Option Area

Roadway segment base analysis and intersection base analysis were performed in the Fullerton HSR Station Option area for the Phase 1 Full Operation Horizon Year 2040 condition. Roadway segment base analysis is provided in Table 6-7. Intersection base analysis is provided in Table 6-8. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. Of the 60 roadway segments analyzed, 17 are LOS E or F in the AM peak hour, and 22 are LOS E or F in the PM peak hour. Of the 62 intersections analyzed, 13 are LOS E or F in the AM peak hour, and 12 are LOS E or F in the PM peak hour.

Table 6-7 Roadway Segment Level of Service: Fullerton High-Speed Rail Station Option Area, Horizon Year 2040 No Project

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/ hr)	PM Peak (veh/ hr)	AM V/C	PM V/C	AM LOS	PM LOS
Euclid St	Bastanchury Rd	Malvern Ave	2,625	2,800	2,700	1.07	1.03	**F***	**F***
Euclid St	Malvern Ave	Commonwealth Ave	3,045	3,000	2,900	0.99	0.95	**E***	**E***
Euclid St	Commonwealth Ave	Orangethorpe Ave	2,520	2,500	2,500	0.99	0.99	**E***	**E***
Highland Ave	Malvern Ave	Chapman Ave	1,100	800	1000	0.73	0.91	C	**E***
Highland Ave	Chapman Ave	Commonwealth Ave	1,100	700	900	0.64	0.82	B	D
Highland Ave	Commonwealth Ave	Valencia Dr	1,155	1000	1,300	0.87	1.13	D	**F***
Highland Ave	Valencia Dr	Orangethorpe Ave	1,050	500	1,000	0.48	0.95	A	**E***
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	2,520	3,900	4,200	1.55	1.67	**F***	**F***
Harbor Blvd	Bastanchury Rd	Brea Blvd	5,198	3,400	3,700	0.65	0.71	B	C
Harbor Blvd	Brea Blvd	Berkeley Ave	4,332	3,900	3,500	0.9	0.81	D	D
Harbor Blvd	Berkeley Ave	Chapman Ave	3,045	2,700	2,500	0.89	0.82	D	D
Harbor Blvd	Chapman Ave	Commonwealth Ave	3,045	2,700	2,500	0.89	0.82	D	D
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	3,000	3,100	1.19	1.23	**F***	**F***
Harbor Blvd	south of Orangethorpe Ave	---	4,410	3,300	3,900	0.75	0.88	C	D
Lemon St	Berkeley Ave	Chapman Ave	3,045	1,700	2,100	0.56	0.69	A	B
Lemon St	Chapman Ave	Commonwealth Ave	3,045	2,100	2,300	0.69	0.76	B	C
Lemon St	Commonwealth Ave	Orangethorpe Ave	2,415	3,000	3,400	1.24	1.41	**F***	**F***
Lemon St	south of Orangethorpe Ave	---	2,415	2,800	3,500	1.16	1.45	**F***	**F***
Raymond Ave	Chapman Ave	Commonwealth Ave	3,045	1100	900	0.36	0.3	A	A
Raymond Ave	Commonwealth Ave	Orangethorpe Ave	2,415	500	700	0.21	0.29	A	A
Raymond Ave	south of Orangethorpe Ave	---	2,415	1,700	1,900	0.7	0.79	B	C
State College Blvd	Dorothy Ln	Chapman Ave	5,198	2,200	2,000	0.42	0.38	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
State College Blvd	Chapman Ave	Commonwealth Ave	3,045	1,700	1,800	0.56	0.59	A	A
State College Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	1,400	1,500	0.56	0.6	A	A
State College Blvd	south of Orangethorpe Ave	---	2,415	1,700	2,200	0.7	0.91	B	**E***
Malvern Ave	Bastanchury Rd	Basque Ave	2,900	1,700	2,000	0.59	0.69	A	B
Chapman Ave	Richman Ave	Highland Ave	3,360	1,900	2,100	0.57	0.63	A	B
Chapman Ave	Harbor Blvd	Raymond Ave	3,045	2,700	2,800	0.89	0.92	D	**E***
Chapman Ave	Raymond Ave	Acacia Ave	3,045	2,900	3,400	0.95	1.12	**E***	**F***
Chapman Ave	Acacia Ave	State College Blvd	2,520	3,500	4,400	1.39	1.75	**F***	**F***
Chapman Ave	State College Blvd	Commonwealth Ave	2,520	3,500	4,400	1.39	1.75	**F***	**F***
Commonwealth Ave	Brookhurst St	Euclid St	3,045	1,700	1,700	0.56	0.56	A	A
Commonwealth Ave	Euclid St	Harbor Blvd	2,900	1,800	1,600	0.62	0.55	B	A
Commonwealth Ave	Harbor Blvd	Raymond Ave	2,900	2,500	2,400	0.86	0.83	D	D
Commonwealth Ave	Raymond Ave	Acacia Ave	2,900	2,300	2,100	0.79	0.72	C	C
Commonwealth Ave	Acacia Ave	State College Blvd	2,400	1,300	1,500	0.54	0.63	A	B
Commonwealth Ave	State College Blvd	Chapman Ave	2,400	800	900	0.33	0.38	A	A
Valencia Dr	Highland Ave	Harbor Blvd	1,100	900	900	0.82	0.82	D	D
Valencia Dr	Harbor Blvd	Lemon St	1,050	900	900	0.86	0.86	D	D
Orangethorpe Ave	Euclid St	Highland Ave	3,045	1,900	2,700	0.62	0.89	B	D
Orangethorpe Ave	Harbor Blvd	Raymond Ave	4,253	2,500	3,000	0.59	0.71	A	C
Orangethorpe Ave	Raymond Ave	State College Blvd	4,253	2,100	2,800	0.49	0.66	A	B
Orangethorpe Ave	State College Blvd	Placentia Ave	4,253	2,300	2,600	0.54	0.61	A	B
SR 57 SB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	500	900	0.46	0.83	A	D
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	900	900	0.83	0.83	D	D

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Chapman Ave	Commonwealth Ave	SR 57	3,045	3,900	4,800	1.28	1.58	**F***	**F***
Placentia Ave	Chapman Ave	Orangethorpe Ave	2,520	1,800	1,900	0.71	0.75	C	C
Valencia Dr	Euclid St	Highland Ave	1,155	800	900	0.69	0.78	B	C
Orangethorpe Ave	Placentia Ave	SR 57	5,198	2,300	2,500	0.44	0.48	A	A
Imperial Hwy (SR 90)	Harbor Blvd	Puente St	4,410	4,200	4,300	0.95	0.98	**E***	**E***
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	2,520	2,600	3,000	1.03	1.19	**F***	**F***
Bastanchury Rd	Euclid St	Harbor Blvd	2,625	3,400	3,400	1.3	1.3	**F***	**F***
Bastanchury Rd	Harbor Blvd	Brea Blvd	2,520	3,600	3,600	1.43	1.43	**F***	**F***
Yorba Linda Blvd	State College Blvd	Associated Rd/Campus Dr	4,725	2,200	2,200	0.47	0.47	A	A
Yorba Linda Blvd	Associated Rd/Campus Dr	SR 57	5,198	2,400	2,600	0.46	0.5	A	A
Euclid St	Orangethorpe Ave	SR 91	2,520	3,000	3,200	1.19	1.27	**F***	**F***
Brea Blvd	Harbor Blvd	Bastanchury Rd	2,520	2,300	2,500	0.91	0.99	**E***	**E***
Santa Fe Ave	Highland Ave	Malden Ave	1,150	200	300	0.17	0.26	A	A
Santa Fe Ave	Malden Ave	Harbor Blvd	1,000	200	200	0.2	0.2	A	A
Santa Fe Ave	Harbor Blvd	Lemon St	1,000	200	300	0.2	0.3	A	A

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LOS = level of service; NB = northbound; SB = southbound; SR = State Route; veh/hr = vehicle per hour; V/C = volume to capacity ratio

Table 6-8 Intersection Level of Service: Modified Fullerton Metrolink/Amtrak Station Design Option Area, Horizon Year 2040 No Project

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F1	Euclid St & Malvern Ave	42.9	D	54.9	D
F2	Euclid St & Commonwealth Ave	41	D	43.7	D
F3	Highland Ave & Chapman Ave	14.5	B	18.7	B
F4	Highland Ave & Commonwealth Ave	20.5	C	24.1	C
F5	Highland Ave & Santa Fe Ave[2]	20.4	C	30.1	D
F6	Highland Ave & Truslow Ave[2]	22.7	C	24.7	C
F7	Highland Ave & Valencia Dr	17.1	B	15.8	B
F8	Highland Ave & Orangethorpe Ave	18.2	B	22	C
F9	Malden Ave & Chapman Ave[2]	162.3	**F***	>180	**F***
F10	Malden Ave & Commonwealth Ave	15.6	B	48.3	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F11	Harbor Blvd & Imperial Hwy (SR 90)	101.9	**F***	83.9	**F***
F12	Harbor Blvd & Bastanchury Rd	85.4	**F***	87	**F***
F13	Harbor Blvd & Valley View Dr/Brea Blvd[1]	37.2	D	48.5	D
F14	Harbor Blvd & Berkeley Ave	35	C	32	C
F15	Harbor Blvd & Chapman Ave	71.2	**E***	63.4	**E***
F16	Harbor Blvd & Commonwealth Ave	71.7	**E***	41.8	D
F17	Harbor Blvd & Santa Fe Ave	19.1	B	23.6	C
F18	Harbor Blvd & Truslow Ave[2]	19.6	C	17	C
F19	Harbor Blvd & Orangethorpe Ave	37.9	D	47.8	D
F20	Harbor Blvd & SR 91 WB ramps	16.9	B	16.4	B
F21	Harbor Blvd & SR 91 EB ramps	21.5	C	26.9	C
F22	Brea Blvd & Bastanchury Rd	88.6	**F***	53.7	D
F23	Lemon St & Chapman Ave	42.3	D	49.7	D
F24	Lemon St & Commonwealth Ave	62.2	**E***	70.6	**E***
F25	Lemon St & Santa Fe Ave[2]	>180	**F***	>180	**F***
F26	Lemon St & Orangethorpe Ave	49	D	76.8	**E***
F27	Lemon St & SR 91 WB ramps	27.8	C	31.6	C
F28	Anaheim Blvd/Lemon St & SR 91 EB ramps	51.7	D	35.2	D
F29	Raymond Ave & Chapman Ave	32.6	C	52	D
F30	Raymond Ave & Commonwealth Ave	24.9	C	25.6	C
F31	Raymond Ave & Orangethorpe Ave	31.4	C	35.5	D
F32	State College Blvd & Chapman Ave	40.9	D	70.2	**E***
F33	State College Blvd & Commonwealth Ave	104	**F***	75.9	**E***
F34	State College Blvd & Orangethorpe Ave	33.6	C	54.6	D
F35	Commonwealth Ave & Chapman Ave	23.4	C	40.1	D
F36	SR 57 SB ramps & Chapman Ave	17.7	B	26.8	C
F37	SR 57 NB ramps & Chapman Ave[1]	37.7	D	53.9	D
F38	Placentia Ave & Chapman Ave	49	D	67.6	**E***
F39	Euclid St & Valencia Dr	151.6	**F***	45.3	D
F40	Highland Ave & Walnut Ave	11.6	B	10.9	B
F41	Malden Ave & Santa Fe Ave[3]	8.9	A	9.5	A
F42	Malden Ave & Truslow Ave[2]	9.1	A	9.1	A
F43	Malden Ave & Valencia Dr[2]	15.7	C	12.8	B
F44	Harbor Blvd & Valencia Dr	25.3	C	15.1	B
F45	Lemon St & Walnut Ave[2]	>180	**F***	>180	**F***
F46	Lemon St & Valencia Dr	>180	**F***	>180	**F***

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F47	Placentia Ave & Orangethorpe Ave	37.5	D	42.7	D
F48	SR 57 SB ramps & Nutwood Ave[1]	53.6	D	34.5	C
F49	SR 57 SB ramps & Orangethorpe Ave[1]	30.8	C	28.4	C
F50	SR 57 NB ramps & Nutwood Ave[1]	47.1	D	27.3	C
F51	SR 57 NB ramps & Orangethorpe Ave	41.3	D	30	C
F52	Brea Blvd & Imperial Hwy (SR 90)	57.6	**E***	49.3	D
F53	State College Blvd & Yorba Linda Blvd[1]	47	D	33.8	C
F54	SR 57 SB off-ramp & Yorba Linda Blvd	25.1	C	24.5	C
F55	SR 57 NB off-ramp & Yorba Linda Blvd[1]	49.4	D	39.8	D
F56	Raymond Ave/East St & SR 91 EB ramps[1]	29.2	C	25	C
F57	Raymond Ave & SR 91 WB ramps[1]	26.9	C	14.1	B
F58	Euclid St & SR 91 WB ramps	20.8	C	23.6	C
F59	Euclid St & SR 91 EB ramps[1]	15.1	B	25	C
F60	State College Blvd & SR 91 EB ramps[1]	21.1	C	23.1	C
F61	State College Blvd & SR 91 WB ramps[1]	19.5	B	21.3	C
F161	Euclid St & Orangethorpe Ave	44.8	D	44.3	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
F intersection number prefix indicates intersections within Fullerton Metrolink/Amtrak Station area.
Amtrak = National Railroad Passenger Corporation; EB = eastbound; HCM = Highway Capacity Manual; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route; WB = westbound

ARTIC Station Area

Roadway segment base analysis and intersection base analysis were performed in the ARTIC station area for the Phase 1 Full Operation Horizon Year 2040 condition. Roadway segment base analysis performed in the ARTIC station area is provided in Table 6-9. Intersection base analysis performed in the ARTIC station area is provided in Table 6-10. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. Of the 49 roadway segments analyzed, 6 are LOS E or F in the AM peak hour, and 9 are LOS E or F in the PM peak hour. Of the 57 intersections analyzed, 11 are LOS E or F in the AM peak hour, and 16 are LOS E or F in the PM peak hour.

Table 6-9 Roadway Segment Level of Service: ARTIC Station Area, Horizon Year 2040 No Project

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Lewis St	Ball Rd	Cerritos Ave	2,415	1000	1200	0.41	0.5	A	A
Lewis St	Cerritos Ave	Katella Ave	2,415	800	1000	0.33	0.41	A	A
Lewis St	Katella Ave	Anaheim Way	950	200	300	0.21	0.32	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
State College Blvd	Ball Rd	Cerritos Ave	4,253	2,700	3,100	0.63	0.73	B	C
State College Blvd	Cerritos Ave	Howell Ave	4,883	2,000	2,300	0.41	0.47	A	A
State College Blvd	Howell Ave	Katella Ave	3,938	2,500	2,800	0.63	0.71	B	C
State College Blvd	Katella Ave	Gene Autry Way	3,938	2,800	2,600	0.71	0.66	C	B
State College Blvd	Gene Autry Way	Orangewood Ave	4,253	2,500	2,500	0.59	0.59	A	A
State College Blvd	Orangewood Ave	I-5	6,090	3,400	4,000	0.56	0.66	A	B
Sunkist St	Ball Rd	Cerritos Ave	2,415	1,300	1,600	0.54	0.66	A	B
Sunkist St	Cerritos Ave	Howell Ave	2,835	700	600	0.25	0.21	A	A
Douglass Rd	Cerritos Ave	Katella Ave	2,415	900	1,200	0.37	0.5	A	A
Main St	Taft Ave	Katella Ave	2,415	1,400	1,100	0.58	0.46	A	A
Main St	Katella Ave	Collins Ave	2,415	1,800	2,000	0.75	0.83	C	D
Main St	Collins Ave	Orangewood Ave	2,835	2,000	2,300	0.71	0.81	C	D
Main St	Orangewood Ave	Chapman Ave	2,415	2,000	2,000	0.83	0.83	D	D
Ball Rd	Harbor Blvd	Anaheim Blvd	3,938	3,000	3,700	0.76	0.94	C	**E***
Ball Rd	Anaheim Blvd	Lewis St	4,253	2,500	3,300	0.59	0.78	A	C
Ball Rd	Lewis St	State College Blvd	4,253	3,000	3,400	0.71	0.8	C	C
Ball Rd	State College Blvd	Sunkist St	2,415	3,000	3,100	1.24	1.28	**F***	**F***
Ball Rd	Sunkist St	SR 57	4,883	3,400	3,300	0.7	0.68	B	B
Ball Rd	SR 57	Main St	2,835	2,600	3,400	0.92	1.2	**E***	**F***
Cerritos Ave	Lewis St	State College Blvd	2,415	900	1,000	0.37	0.41	A	A
Cerritos Ave	State College Blvd	Sunkist St	2,300	1200	1,900	0.52	0.83	A	D
Cerritos Ave	Sunkist St	Douglass Rd	2,835	700	1,000	0.25	0.35	A	A
Katella Ave	Anaheim Blvd/Haster St	I-5	4,253	2,500	3,500	0.59	0.82	A	D
Katella Ave	I-5	Lewis St	4,883	3,100	4,300	0.63	0.88	B	D
Katella Ave	Lewis St	State College Blvd	4,253	2,100	2,900	0.49	0.68	A	B
Katella Ave	State College Blvd	Sportstown	4,253	2,300	2,500	0.54	0.59	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Katella Ave	Sportstown	Howell Ave	4,883	2,500	2,900	0.51	0.59	A	A
Katella Ave	Howell Ave	SR 57	4,883	2,600	2,900	0.53	0.59	A	A
Gene Autry Way	I-5	State College Blvd	2,415	1700	1800	0.7	0.75	B	C
Orangewood Ave	Manchester Ave	State College Blvd	4,253	3,300	3,500	0.78	0.82	C	D
Orangewood Ave	State College Blvd	Rampart St	2,415	3,300	3,400	1.37	1.41	**F***	**F***
Orangewood Ave	Rampart St	SR 57	3,000	2,800	3,200	0.93	1.07	**E***	**F***
Orangewood Ave	SR 57	Eckhoff St	3,150	2,900	3,100	0.92	0.98	**E***	**E***
Orangewood Ave	Eckhoff St	Main St	2,835	2,200	2,400	0.78	0.85	C	D
Chapman Ave	I-5 SB on-ramp/ NB off-ramp	SR 57	4,253	2,700	3,300	0.63	0.78	B	C
Chapman Ave	SR 57	Main St	4,883	2,200	2,700	0.45	0.55	A	A
Douglass Rd	Katella Ave	ARTIC entrance	2,300	300	300	0.13	0.13	A	A
Katella Ave	Douglass Rd	Main St	4,883	2,300	2,500	0.47	0.51	A	A
Katella Ave	SR 57	Douglass Rd	4,883	2,400	2,700	0.49	0.55	A	A
Chapman Ave	Lewis St	The City Dr	3,938	2,700	3,300	0.69	0.84	B	D
Chapman Ave	The City Dr	I-5 SB on-ramp/ NB off-ramp	3,938	3,100	3,800	0.79	0.96	C	**E***
Disneyland Dr	Ball Rd	I-5 SB off-ramp	3,375	1,600	1,800	0.47	0.53	A	A
State College Blvd	Manchester Ave	Chapman Ave	4,253	3,400	4,000	0.8	0.94	C	**E***
Manchester Ave	Orangewood Ave	Chapman Ave	2,520	1,500	700	0.6	0.28	A	A
Lewis St	Orangewood Ave	Chapman Ave	800	1,300	1,400	1.63	1.75	**F***	**F***
Ball Rd	I-5 NB ramps	Disneyland Dr	4,650	3,400	3,800	0.73	0.82	C	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; SR = State Route; veh/hr = vehicle per hour; V/C = volume to capacity ratio

Table 6-10 Intersection Level of Service: ARTIC Station Area, Horizon Year 2040 No Project

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A1	Manchester Ave/I-5 SB ramps & Katella Ave	24.6	C	22.1	C
A2	Anaheim Way/I-5 NB ramps & Katella Ave[1]	24.1	C	33.1	C
A3	Lewis St & Katella Ave[1]	28.2	C	46.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A4	I-5 HOV & Gene Autry Way[1]	22.8	C	25.7	C
A6	State College Blvd & Ball Rd	63.3	**E***	51.1	D
A7	State College Blvd & Winston Rd	11.9	B	21.1	C
A8	State College Blvd & Cerritos Ave	27.9	C	115.4	**F***
A9	State College Blvd & Howell Ave	67.3	**E***	158.5	**F***
A10	State College Blvd & Katella Ave[1]	35	C	39	D
A12	State College Blvd & Gene Autry Way	24.6	C	64.6	**E***
A14	State College Blvd & Orangewood Ave	60.5	**E***	61.2	**E***
A15	Stadium Crossing & Katella Ave[1]	27.1	C	24.6	C
A16	Sunkist St & Ball Rd	95.8	**F***	114.5	**F***
A17	Sunkist St & Cerritos Ave	25.2	C	140.6	**F***
A18	Howell Ave & Katella Ave[1]	42.6	D	>180	**F***
A19	Rampart St & Orangewood Ave[1]	23.3	C	16.2	B
A20	SR 57 SB ramps & Ball Rd[1]	46.1	D	50.3	D
A21	SR 57 SB ramps & Katella Ave[1]	19.8	B	24	C
A22	SR 57 SB ramps & Orangewood Ave[1]	75.6	**E***	101.7	**F***
A23	SR 57 SB ramps & Chapman Ave	22.5	C	33.6	C
A24	SR 57 NB ramps & Ball Rd	32.5	C	38	D
A25	SR 57 NB ramps & Katella Ave[1]	24	C	25.5	C
A26	SR 57 NB ramps & Orangewood Ave[1]	20.8	C	18.1	B
A27	SR 57 NB ramps & Chapman Ave[1]	13.1	B	11.6	B
A28	Douglass Rd & Katella Ave[1]	40.1	D	>180	**F***
A29	Struck Ave & Katella Ave[1]	4	A	54.7	D
A30	Main St & Ball Rd/Taft Ave[1]	57.1	**E***	36.3	D
A31	Main St & Katella Ave	33.7	C	30.3	C
A32	Main St & Struck Ave	13.4	B	20.6	C
A33	Main St & Collins Ave	23.3	C	29.1	C
A34	Main St & Orangewood Ave/Walnut Ave	96.4	**F***	74.6	**E***
A41	Anaheim Blvd & Ball Rd	34.3	C	60	**E***
A48	East St & Ball Rd	27.9	C	28.2	C
A51	Lewis St & Ball Rd	24.6	C	46	D
A52	Lewis St & Cerritos Ave	21.4	C	31.9	C
A53	Lewis St & Orangewood Ave	>180	**F***	82.9	**F***
A54	Lewis St & Chapman Ave	55.2	**E***	68	**E***
A55	Manchester Ave & Orangewood Ave	28.6	C	20.4	C
A56	The City Dr/State College Blvd & Chapman Ave	45.9	D	44	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A57	Anaheim Way & Orangewood Ave	7.5	A	39.8	D
A58	Manchester Ave & Chapman Ave	170	**F***	28.8	C
A59	State College Blvd & I-5 SB off-ramp[1]	18.9	B	12.6	B
A60	I-5 SB on-ramp/NB off-ramp & Chapman Ave[1]	24.5	C	20.8	C
A61	State College Blvd & I-5 NB ramps[1]	18.2	B	37.5	D
A62	I-5 NB on-ramp/Rampart St & Chapman Ave	19.7	B	16.6	B
A63	Douglass Rd & ARTIC[1]	22.8	C	23.5	C
A64	Douglass Rd & Bus Entrance	15.3	B	13.5	B
A65	Douglass Rd & Parking Lot B[2]	9	A	9.1	A
A66	ARTIC Driveway & Katella Ave[2]	17.7	C	14.7	B
A69	Harbor Blvd & Ball Rd	54.3	D	71.1	**E***
A70	Harbor Blvd & I-5 NB ramps[1]	23.2	C	16.8	B
A71	Harbor Blvd & I-5 SB ramps	67.9	**E***	15.9	B
A72	Harbor Blvd & Katella Ave	30.4	C	40.7	D
A79	Anaheim Blvd & Cerritos Ave	29.8	C	156.8	**F***
A80	Disneyland Dr & I-5 SB off-ramp	18.9	B	16.7	B
A81	Disneyland Dr & Ball Rd[1]	39.6	D	49.1	D
A82	Main St & Chapman Ave	44.6	D	55.9	**E***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
A intersection number prefix indicates intersections within ARTIC station area.
ARTIC = Anaheim Regional Transportation Intermodal Center; EB = eastbound; HCM = Highway Capacity Manual; HOV = high-occupancy vehicle; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route

6.2.8 Freeway Analysis

6.2.8.1 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040)

Table 6-11 and Table 6-12 summarize the number of trucks entering and exiting Hobart Yard and Commerce Yard using I-10 and SR 60 in the peak hour for Horizon Year 2040, respectively.

Table 6-11 Peak Hour Trips from/to Hobart Yard using Interstate 10 and State Route 60: Horizon Year 2040

Fwy	Eastbound (number of trucks)		Westbound (number of trucks)	
	AM	PM	AM	PM
I-10	31	33	31	32
SR 60	60	65	60	61

fwy = freeway; I = Interstate; SR = State Route

Table 6-12 Peak Hour Trips from/to Commerce Yard using Interstate 10 and State Route 60: Horizon Year 2040

Fwy	Eastbound (number of trucks)		Westbound (number of trucks)	
	AM	PM	AM	PM
I-10	6	6	6	6
SR 60	10	11	11	11

fwy = freeway; I = Interstate; SR = State Route

The results of the freeway mainline segment LOS analysis along the transportation RSA freeway mainline segments for Horizon Year 2040 without the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B are listed below.

Freeway Mainline Segments

The freeway mainline segment Horizon Year 2040 analysis results for AM and PM peak hours are presented in Table 6-13, Table 6-14, and Table 6-15.

Table 6-13 Freeway Mainline Segment Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option Area, Horizon Year 2040 No Project

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
I-105	West of I-605	Eastbound	995	0.498	B	1,041	0.520	B
		Westbound	1,171	0.586	C	1,064	0.532	B

fwy = freeway; I = Interstate; LOS = level of service; pce/ln = passenger car equivalents per lane; V/C = volume to capacity ratio

Table 6-14 Freeway Mainline Segment Level of Service: Fullerton High-Speed Rail Station Option Area, Horizon Year 2040 No Project

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
SR 91	East of State College Blvd	Eastbound	1,401	0.701	C	1,620	0.810	D
		Westbound	1,333	0.667	C	1,229	0.615	C
SR 57	North of Yorba Linda Blvd	Northbound	1,401	0.701	C	1,473	0.737	C
		Southbound	1,613	0.807	D	1,557	0.779	D

fwy = freeway; LOS = level of service; pce/ln = passenger car equivalents per lane; SR = State Route; V/C = volume to capacity ratio

Table 6-15 Freeway Mainline Segment Level of Service: ARTIC Station Area, Horizon Year 2040 No Project

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
I-5	South of SR 22	Northbound	1,848	0.924	D	1,733	0.867	D
		Southbound	1,339	0.670	C	1,372	0.686	C

fwy = freeway; I = Interstate; LOS = level of service; pce/ln = passenger car equivalents per lane; SR = State Route; V/C = volume to capacity ratio

Freeway Ramps

Forecasted volumes entering and exiting interchange intersections were used to conduct an analysis of queued vehicles at off-ramps and on-ramps for Phase 1 Horizon Year 2040 without the proposed Shared Passenger Track Alternative A and Shared Passenger Track Alternative B. The calculated queue lengths for on-ramps with at least 100 project-related trips are presented in Table 6-16. The calculated queue lengths for off-ramps with at least 100 project-related trips are presented in Table 6-17.

Table 6-16 Freeway Service On-Ramp Queue Lengths: Horizon Year 2040 No Project

Fwy	Direction	Interchange	Available Queue Storage (ft)	AM Peak Volume (veh/hr)	AM Peak Queue Length (ft)	PM Peak Volume (veh/hr)	PM Peak Queue Length (ft)
SR 57	SB	WB Katella	1,430	400	810	800	1,620
SR 91	EB	Lemon St	1,500	1,600	3,250	1,200	2,440
I-5	SB	State College Blvd	1,660	400	810	400	810

fwy = freeway; EB = eastbound; ft = feet; I = Interstate; LOS = level of service; SB = southbound; SR = State Route; veh/hr = vehicles per hour; WB = westbound

Table 6-17 Freeway Service Off-Ramp Queue Lengths: Horizon Year 2040 No Project

Fwy	Direction	Interchange	Available Queue Storage (ft)	AM Peak Volume (veh/hr)	AM Peak Queue Length (ft)	PM Peak Volume (veh/hr)	PM Peak Queue Length (ft)
SR 57	NB	Katella Ave	2,500	1,740	574	1,750	719
SR 91	WB	Lemon St	1,720	1,060	628	1,100	799
I-5	NB	State College Blvd	2,200	950	405	1,580	852

fwy = freeway; ft = feet; I = Interstate; LOS = level of service; NB = northbound; SR = State Route; veh/hr = vehicles per hour; WB = westbound

Queue length exceeds available storage at these on-ramp locations:

- SR 91 eastbound Lemon Street on-ramp
- SR 57 southbound westbound Katella Avenue on-ramp

Queue length does not exceed available storage length for any of the studied off-ramps.

6.2.9 Statewide Model Long Distance Trips and Annual Vehicle Miles Traveled

Long distance trips in the No Project condition were generated by the Authority from the *California High-Speed Rail 2020 Business Plan, Ridership, and Revenue Forecasting Model*. Trips by analysis year and mode within California are provided in Table 6-18.

Table 6-18 Annual Statewide Model Trips: No Project

Trip Mode	Statewide Model Output	
	Year 2010 (number of trips)	Year 2040 (number of trips)
Auto	532,005,000	799,306,000
Air	9,440,000	15,882,000
Conventional Rail	7,041,000	13,419,000

Source: Authority 2020

Annual roadway VMT was calculated from the *California High-Speed Rail 2024 Business Plan, Ridership, and Revenue Forecasting Model* in the No Project condition for each baseline year, by county. The outputs are presented in Table 6-19.

Table 6-19 Annual Vehicle Miles Traveled: No Project

Statewide	Annual VMT
	Horizon Year 2040
Statewide Total	97,525,790,530

Source: Authority 2024a
VMT = vehicle mile traveled

6.3 Shared Passenger Track Alternatives: Project Trip Generation and Distribution

6.3.1 Shared Passenger Track Alternative A

Trips to and from each HSR station and HSR station option were calculated during the peak traffic hour from ridership data generated by the Authority.

6.3.1.1 LAUS

Table 6-20 presents the forecasted daily passenger trip data used for the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B trip distribution at LAUS. Table 6-21 presents daily forecasted vehicle trip data used for LAUS. Table 6-22 presents the daily forecasted unconstrained parking and daily parking supply needed at LAUS.

Table 6-20 LAUS Daily Forecasted Passenger Trips

Trip Type	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Arriving/departing by drop-off/pick-up	2,280	1,230	3,680	1,950
Arriving/departing by parked car	2,520	0	4,300	0
Arriving/departing by rental car	0	1,100	0	1,770
Arriving/departing by taxi	210	630	340	1,120
Arriving/departing by transit	1,800	6,440	4,410	14,620
by dedicated HSR bus	0	0	0	0
by local/regional bus	860	2,540	2,050	5,210
by local/regional/intercity rail	940	3,900	2,360	9,410
Arriving/departing by bike/walk	2,760	1,150	6,290	2,470
Total	**9,570**	**10,550**	**19,020**	**21,930**

HSR = High Speed Rail; LAUS = Los Angeles Union Station

Table 6-21 LAUS Daily Forecasted Vehicle Trips

Trip Type	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Drop-off/pick-up	1,610	870	2,590	1,380

Trip Type	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Parking arrivals/departures	1,950	0	3,330	0
Rental car arrivals/departures	0	770	0	1,230
Taxi arrivals/departures	150	510	250	900
Local/regional transit buses	43	126	103	260
Total	**3,753**	**2,276**	**6,273**	**3,770**

LAUS = Los Angeles Union Station

Table 6-22 LAUS Daily Forecasted Parking Demand

Parking Demand	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Unconstrained parking	1,180	0	2,010	0
Parking supply needed	1,180	0	2,010	0

LAUS = Los Angeles Union Station

Trip Generation, Distribution, and Assignment

Peak hour trips were calculated as described in Section 4.2.1, Study Approach and Baselines. Based on the Statewide Model travel forecasting results, 31 percent of the daily trips are made during the six-hour peak period at LAUS for both Phase 1 Opening Year 2029 and Horizon Year 2040. It is assumed that the AM peak hour and PM peak hour would have the same share of the peak period trips. Therefore, the peak hour trips are calculated by dividing the daily trips by 6 peak hours, which is 5.17 percent for Phase 1 Opening Year 2029 and Horizon Year 2040.

Peak hour ridership was then converted to peak hour vehicle trips. These trips were assigned to network perimeter locations for the station area based on proximity to each TAZ in the Statewide Model. Park-and-ride and PUDO trips were distributed to each lot or loading zone based on site layout and assumed percentages.

Table 6-23 and Table 6-25 present the park-and-ride trips by network perimeter locations calculated in the peak hour, for Opening Year 2029 and Horizon Year 2040, respectively. Table 6-24 and Table 6-26 present the PUDO trips by network perimeter locations calculated in the peak hour for auto trips, for Opening Year 2029 and Horizon Year 2040, respectively.

Table 6-23 LAUS: Peak Hour Park-and-Ride Trips, Opening Year 2029

To/From	Originating Trips		Destination Trips		Total Trips		Patsaouras Plaza Trips (PUDO)		Parking Cluster Trips (Park-and-Ride)	
	In	Out	In	Out	In	Out	In	Out	In	Out
I-10 west/I-110 south	45	45	0	0	45	45	0	0	45	45
US 101 North	8	8	0	0	8	8	0	0	8	8
I-5 south/SR 60 east	41	41	0	0	41	41	0	0	41	41
I-10 east	14	14	0	0	14	14	0	0	14	14
I-5 north/I-110 north	18	18	0	0	18	18	0	0	18	18
Total	**127**	**127**	**0**	**0**	**127**	**127**	**0**	**0**	**127**	**127**

I = Interstate; LAUS = Los Angeles Union Station; PUDO = Pick-Up Drop-Off; SR = State Route; US 101 = U.S. Highway 101

Table 6-24 LAUS: Peak Hour Pick-Up/Drop-Off Trips, Opening Year 2029

To/From	Originating Trips		Destination Trips		Total Trips		Patsaouras Plaza Trips (PUDO)		Parking Cluster Trips (Park-and-Ride)	
	In	Out	In	Out	In	Out	In	Out	In	Out
I-10 west/I-110 south	41	41	26	26	67	67	67	67	0	0
US 101 north	7	7	2	2	9	9	9	9	0	0
I-5 south/SR 60 east	37	37	26	26	63	63	63	63	0	0
I-10 east	13	13	5	5	17	17	17	17	0	0
I-5 north/I-110 north	17	17	5	5	22	22	22	22	0	0
Total	**115**	**115**	**64**	**64**	**178**	**178**	**178**	**178**	**0**	**0**

I = Interstate; LAUS = Los Angeles Union Station; PUDO = Pick-Up Drop-Off; SR = State Route; US 101 = U.S. Highway 101

Table 6-25 LAUS: Peak Hour Park-and-Ride Trips, Horizon Year 2040

To/From	Originating Trips		Destination Trips		Total Trips		Patsaouras Plaza Trips (PUDO)		Parking Cluster Trips (Park-and-Ride)	
	In	Out	In	Out	In	Out	In	Out	In	Out
I-10 west/I-110 south	82	82	0	0	82	82	0	0	82	82
US 101 north	15	15	0	0	15	15	0	0	15	15
I-5 south/SR 60 east	75	75	0	0	75	75	0	0	75	75
I-10 east	25	25	0	0	25	25	0	0	25	25
I-5 north/I-110 north	34	34	0	0	34	34	0	0	34	34
Total	**232**	**232**	**0**	**0**	**232**	**232**	**0**	**0**	**232**	**232**

I = Interstate; LAUS = Los Angeles Union Station; PUDO = Pick-Up Drop-Off; SR = State Route; US 101 = U.S. Highway 101

Table 6-26 LAUS: Peak Hour Pick-Up/Drop-Off Trips, Horizon Year 2040

To/From	Originating Trips		Destination Trips		Total Trips		Patsaouras Plaza Trips (PUDO)		Parking Cluster Trips (Park-and-Ride)	
	In	Out	In	Out	In	Out	In	Out	In	Out
I-10 west/I-110 south	70	70	28	28	98	98	98	98	0	0
US 101 north	13	13	2	2	15	15	15	15	0	0
I-5 south/SR 60 east	64	64	30	30	94	94	94	94	0	0
I-10 east	21	21	5	5	26	26	26	26	0	0
I-5 north/I-110 north	29	29	5	5	33	33	33	33	0	0
Total	**198**	**198**	**69**	**69**	**267**	**267**	**267**	**267**	**0**	**0**

I = Interstate; LAUS = Los Angeles Union Station; PUDO = Pick-Up Drop-Off; SR = State Route; US 101 = U.S. Highway 101

All PUDO trips were distributed to the current PUDO location at the Patsaouras Transit Plaza, west of Vignes Street, as depicted on Figure 6-1. The park-and-ride trips were distributed to potential parking locations to the northeast (Chinatown Parking Cluster), to the west (Pueblo Parking Cluster, and to the south (South of US 101 Parking Cluster). These general locations are illustrated on Figure 6-1.

The number of parking spaces at each parking location is listed in Table 6-27. The estimated parking supply that would be available in these areas is a total of 2,250 vehicle spaces. Total parking demand at LAUS generated by the HSR station is estimated to be 1,180 spaces in Phase 1 Opening Year 2029, and 2,010 spaces in Horizon Year 2040. The park-and-ride trips were distributed to these parking locations based on the estimated available supply.

Table 6-27 LAUS Trip Assignment: Parking Spaces by Location

Parking Cluster	Chinatown (33%)	Pueblo (33%)	South of US 101 (33%)	Total
Parking spaces	750	750	750	2,250

LAUS = Los Angeles Union Station

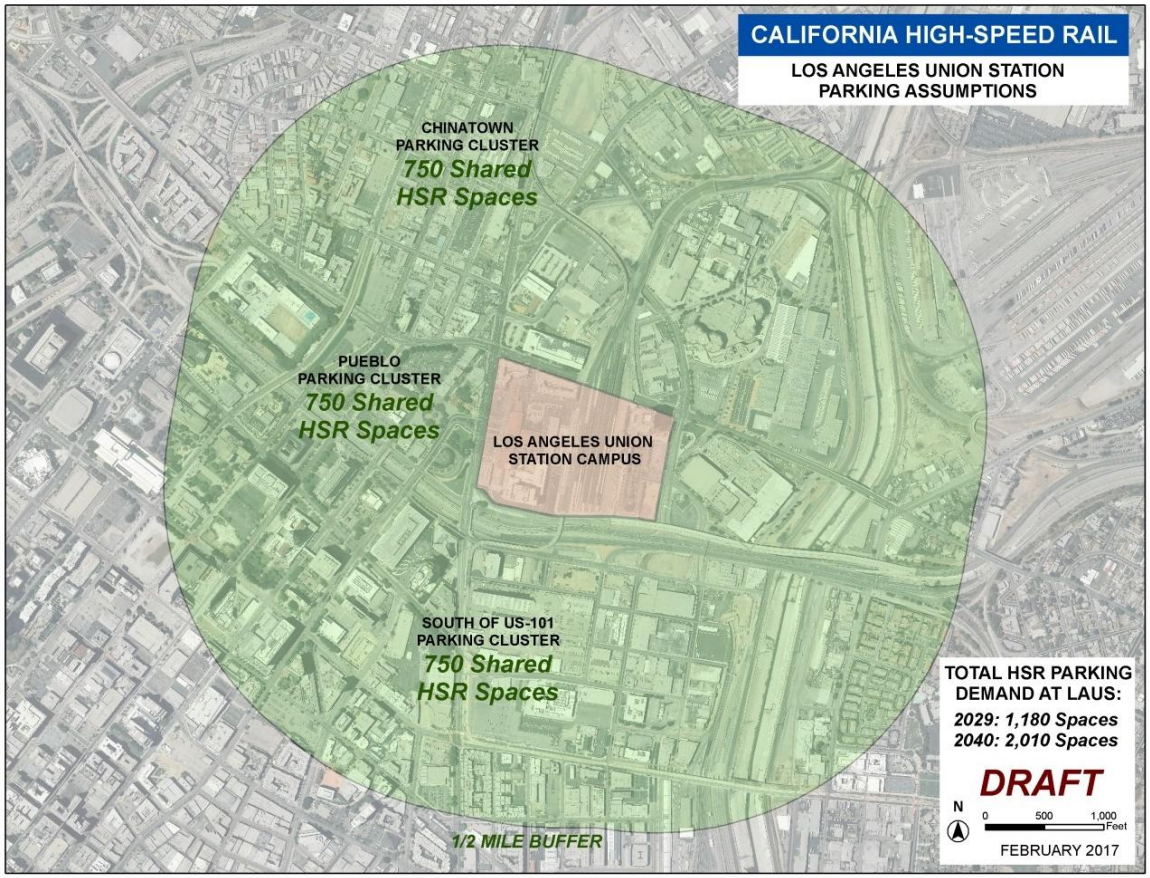


Figure 6-1 Parking Locations in Vicinity of LAUS

The trip generation and distribution were coded into a geographic analysis network that represents the downtown Los Angeles area and the area surrounding LAUS. The project trips were assigned to the study intersections. Using the trip distribution and trip assignment information, the HSR-generated vehicles were manually assigned to the local and regional roadway network between the HSR station and the final origin/destination of the trip. The routing

of vehicles to the roadway network accounted for the driveway locations for the park-and-ride and PUDO areas, the surrounding roadway network, and the accessibility to the nearest on- and off-ramps to the freeway network. These project trips were then added to the background traffic to produce Plus Project forecasts through study roadways and intersections.

6.3.1.2 Norwalk/Santa Fe Springs High-Speed Rail Station Option

Table 6-28 presents the forecasted daily passenger trip data used for the project trip distribution at Norwalk/Santa Fe Springs HSR Station Option. Table 6-29 presents daily forecasted vehicle trip data used for calculating vehicle occupancy, and Table 6-30 presents the daily forecasted unconstrained parking and daily parking supply needed at Norwalk/Santa Fe Springs HSR Station Option.

Table 6-28 Norwalk/Santa Fe Springs High-Speed Rail Station Option Daily Forecasted Passenger Trips

	Phase 1 Opening Year 2029		Horizon Year 2040	
Trip Type	Origin	Destination	Origin	Destination
Arriving/departing by drop-off/pick-up	470	340	860	530
Arriving/departing by parked car	750	0	1,410	0
Arriving/departing by rental car	0	300	0	480
Arriving/departing by taxi	30	100	60	170
Arriving/departing by transit	300	980	890	2,420
by dedicated HSR bus	0	0	0	0
by local/regional bus	20	50	60	120
by local/regional/intercity rail	290	920	830	2,300
Arriving/departing by bike/walk	270	270	580	580
Total	**1,820**	**1,990**	**3,800**	**4,180**

HSR = high-speed rail

Table 6-29 Norwalk/Santa Fe Springs High-Speed Rail Station Option Daily Forecasted Vehicle Trips

	Phase 1 Opening Year 2029		Horizon Year 2040	
Trip Type	Origin	Destination	Origin	Destination
Drop-off/pick-up	330	240	600	370
Parking arrivals/departures	570	0	1,070	0
Rental car arrivals/departures	0	210	0	330
Taxi arrivals/departures	20	80	40	140
Local/regional transit buses	1	2	3	6
Total	**921**	**532**	**1,713**	**846**

Table 6-30 Norwalk/Santa Fe Springs High-Speed Rail Station Option Daily Forecasted Parking Demand

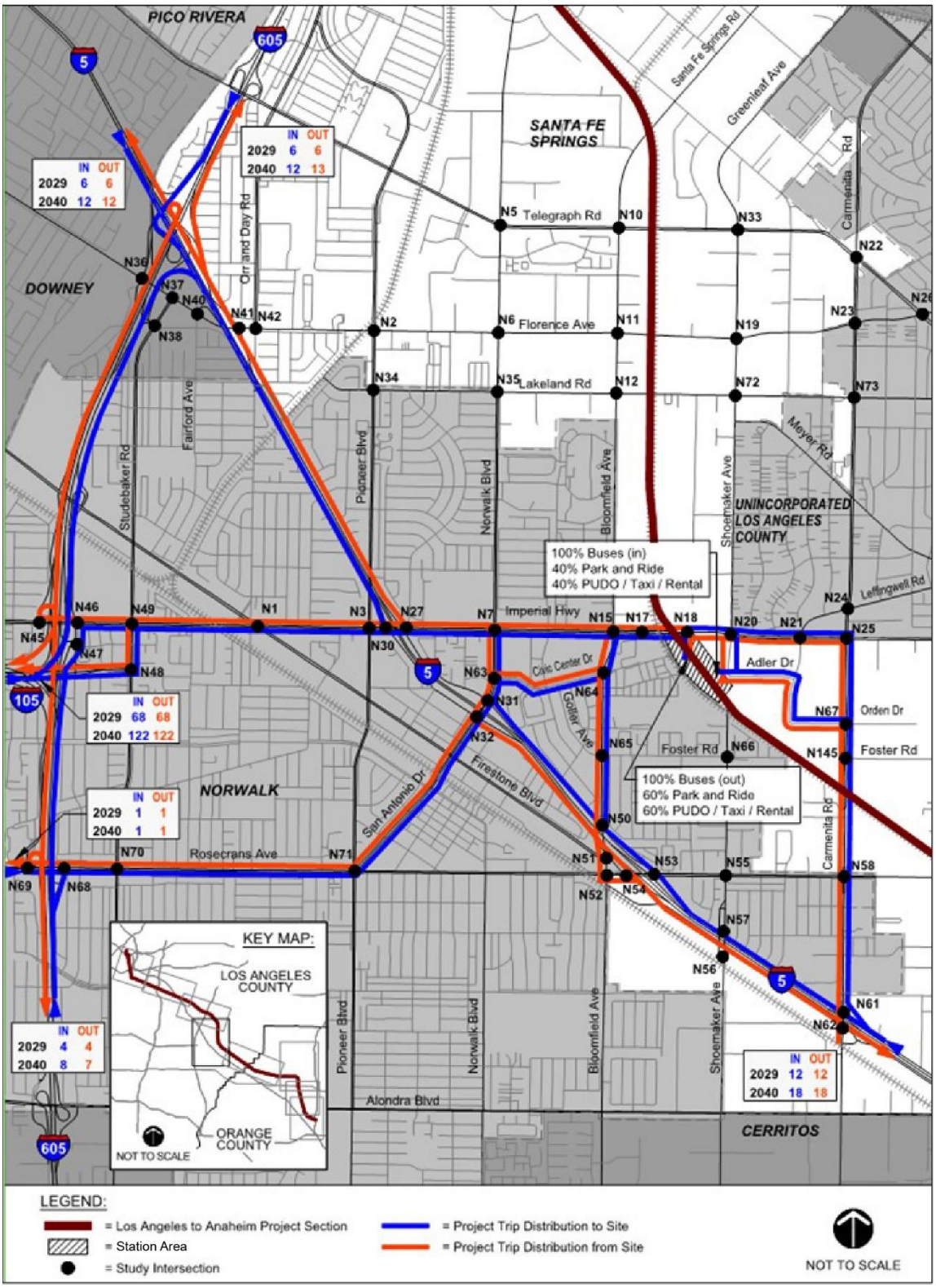
Parking Demand	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Unconstrained parking	350	0	640	0
Parking supply needed	350	0	640	0

Trip Generation, Distribution, and Assignment

Peak hour trips were calculated as described in Section 4.2.1, Study Approach and Baselines. According to the data generated by the Authority for Norwalk/Santa Fe Springs HSR Station Option, 42 percent of ridership would occur during the peak 6-hour period in Phase 1 Opening Year 2029, and 41 percent of ridership would occur during the peak 6-hour period in Horizon Year 2040. This results in a peak hour percentage of daily ridership of 7.00 percent and 6.83 percent, respectively.

Peak hour ridership was then converted to peak hour vehicle trips. These trips were assigned to network perimeter locations for the station area based on proximity to each TAZ in the Statewide Model. Park-and-ride, PUDO, and bus trips were distributed to each lot or loading zone based on site layout and assumed percentages.

Figure 6-2 depicts the network perimeter locations and paths that trips were distributed along in the station area. Table 6-31 and Table 6-34 present the park-and-ride trips by network perimeter locations calculated in the peak hour for auto trips, for Opening Year 2029 and Horizon Year 2040, respectively. Table 6-32 and Table 6-35 present the PUDO trips by network perimeter locations calculated in the peak hour for auto trips, for Opening Year 2029 and Horizon Year 2040, respectively. Table 6-33 and Table 6-36 present the trips by network perimeter locations calculated in the peak hour for bus trips, for Opening Year 2029 and Horizon Year 2040, respectively.



N intersection number prefix indicates intersections within the Norwalk/Santa Fe Springs High-Speed Rail Station Option area.

Figure 6-2 Norwalk/Santa Fe Springs High-Speed Rail Station Option Trip Assignment

Table 6-31 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Peak Hour Park-and-Ride Auto Trips, Opening Year 2029

	Originating Trips		Destination Trips		Total Trips		East Entrance Trips (40%)		West Entrance Trips (60%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
I-5 north	3	3	0	0	3	3	1	1	2	2
Rosecrans west	0	0	0	0	0	0	0	0	0	0
I-605 north	3	3	0	0	3	3	1	1	2	2
I-605 south	2	2	0	0	2	2	1	1	1	1
I-5 south	5	5	0	0	5	5	2	2	3	3
I-105 west	28	28	0	0	28	28	13	13	15	15
Total	**41**	**41**	**0**	**0**	**41**	**41**	**18**	**18**	**23**	**23**

I = Interstate

Table 6-32 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Peak Hour Pick-Up/Drop-Off Auto Trips, Opening Year 2029

	Originating Trips		Destination Trips		Total Trips		East Entrance Trips (40%)		West Entrance Trips (60%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
I-5 north	2	2	1	1	3	3	1	1	2	2
Rosecrans west	0	0	1	1	1	1	0	0	1	1
I-605 north	2	2	1	1	3	3	1	1	2	2
I-605 south	1	1	1	1	2	2	1	1	1	1
I-5 south	3	3	4	4	7	7	3	3	4	4
I-105 west	17	17	23	23	40	40	16	16	24	24
Total	**25**	**25**	**31**	**31**	**56**	**56**	**22**	**22**	**34**	**34**

I = Interstate

Table 6-33 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Peak Hour Bus Trips, Opening Year 2029

	Originating Trips		Destination Trips		Total Trips		East Entrance Trips (Out)		West Entrance Trips (In)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
I-5 north	0	0	0	0	0	0	0	0	0	0
Rosecrans west	0	0	0	0	0	0	0	0	0	0
I-605 north	0	0	0	0	0	0	0	0	0	0
I-605 south	0	0	0	0	0	0	0	0	0	0
I-5 south	0	0	0	0	0	0	0	0	0	0
I-105 west	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

I = Interstate

Table 6-34 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Peak Hour Park-and-Ride Auto Trips, Horizon Year 2040

	Originating Trips		Destination Trips		Total Trips		East Entrance Trips (40%)		West Entrance Trips (60%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
I-5 north	6	6	0	0	6	6	2	2	4	4
Rosecrans west	1	1	0	0	1	1	0	0	1	1
I-605 north	6	6	0	0	6	6	2	2	4	4
I-605 south	3	3	0	0	3	3	1	1	2	2
I-5 south	8	8	0	0	8	8	3	3	5	5
I-105 west	57	57	0	0	57	57	23	23	34	34
Total	**81**	**81**	**0**	**0**	**81**	**81**	**31**	**31**	**50**	**50**

I = Interstate

Table 6-35 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Peak Hour Pick-Up/Drop-Off Auto Trips, Horizon Year 2040

	Originating Trips		Destination Trips		Total Trips		East Entrance Trips (40%)		West Entrance Trips (60%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
I-5 north	4	4	2	2	6	6	2	2	4	4
Rosecrans west	0	0	0	0	0	0	0	0	0	0
I-605 north	4	4	2	2	6	6	2	2	4	4
I-605 south	2	2	2	2	4	4	2	2	2	2
I-5 south	5	5	5	5	10	10	4	4	6	6
I-105 west	34	34	31	31	65	65	26	26	39	39
Total	**49**	**49**	**42**	**42**	**91**	**91**	**36**	**36**	**55**	**55**

I = Interstate

Table 6-36 Norwalk/Santa Fe Springs High-Speed Rail Station Option: Peak Hour Bus Trips, Horizon Year 2040

	Originating Trips		Destination Trips		Total Trips		East Entrance Trips (In)		West Entrance Trips (Out)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
I-5 north	0	0	0	0	0	0	0	0	0	0
Rosecrans west	0	0	0	0	0	0	0	0	0	0
I-605 north	0	0	0	1	0	1	0	0	0	1
I-605 south	0	0	1	0	1	0	1	0	0	0
I-5 south	0	0	0	0	0	0	0	0	0	0
I-105 west	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**1**

I = Interstate

6.3.1.3 Fullerton High-Speed Rail Station Option

Table 6-37 presents the daily forecasted passenger trip data used for the project trip distribution at the Fullerton HSR Station Option. Table 6-38 presents the daily forecasted vehicle trip data used for calculating vehicle occupancy, and Table 6-39 presents the daily forecasted unconstrained parking and daily parking supply needed at the Fullerton HSR Station Option.

Table 6-37 Fullerton High-Speed Rail Station Option: Daily Forecasted Passenger Trips

Trip Type	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Arriving/departing by drop-off/pick-up	1,120	790	2,950	1,790
Arriving/departing by parked car	1,750	0	2,050	0
Arriving/departing by rental car	0	710	0	1,150
Arriving/departing by taxi	70	220	150	430
Arriving/departing by transit	520	1,660	1,500	4,080
by dedicated HSR bus	0	0	0	0
by local/regional bus	30	90	90	210
by local/regional/intercity rail	490	1,570	1,410	3,870
Arriving/Departing by bike/walk	470	480	1,040	1,040
Total	**3,390**	**3,860**	**7,690**	**8,490**

HSR = high-speed rail

Table 6-38 Fullerton High-Speed Rail Station Option: Daily Forecasted Vehicle Trips

Trip Type	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Drop-off/pick-up	780	560	2,060	1,260
Parking arrivals/departures	1,330	0	1,560	0
Rental car arrivals/departures	0	490	0	800
Taxi arrivals/departures	50	180	110	340
Local/regional transit buses	1	5	5	10
Total	**2,161**	**1,235**	**3,735**	**2,410**

Table 6-39 Fullerton High-Speed Rail Station Option: Daily Forecasted Parking Demand

Parking Demand	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Unconstrained parking	800	0	1,560	0
Parking supply needed	940	0	940	0

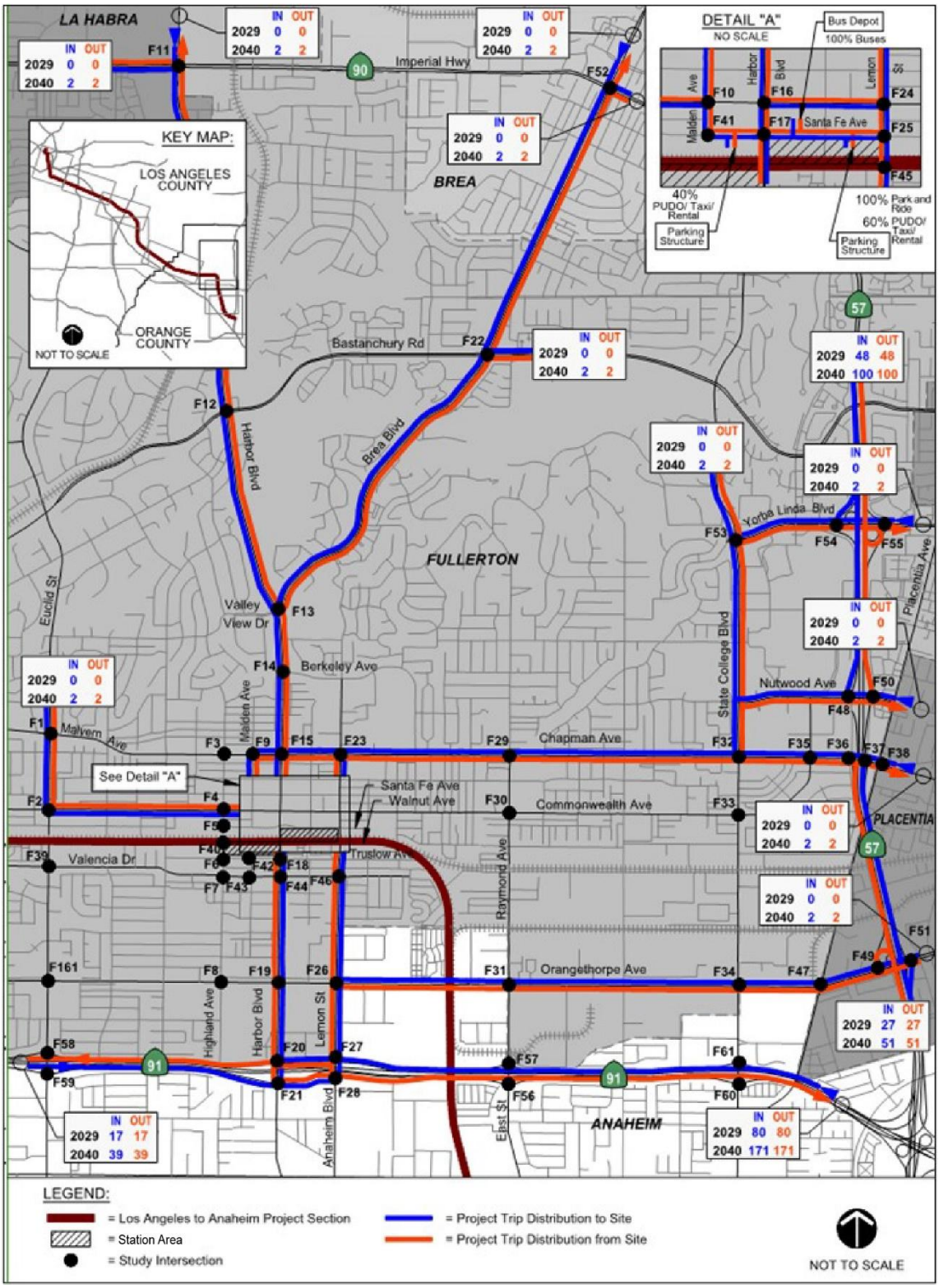
Trip Generation, Distribution, and Assignment

Peak hour trips were calculated as described in Section 4.2.1, Study Approach and Baselines. According to the data generated by the Authority for the Fullerton HSR Station Option, 31 percent of ridership would occur during the peak 6-hour period in Phase 1 Opening Year 2029, and 37

percent of ridership would occur during the peak 6-hour period in Horizon Year 2040. This results in a peak hour percentage of daily ridership of 5.17 percent and 6.17 percent, respectively.

Peak hour ridership was then converted to peak hour vehicle trips. These trips were assigned to network perimeter locations for the station area based on proximity to each TAZ in the Statewide Model. Park-and-ride, PUDO, and bus trips were distributed to each lot or loading zone based on site layout and assumed percentages.

Figure 6-3 depicts the network perimeter locations and paths that trips were distributed along in the station area. Table 6-40 and Table 6-43 present the Park-and-ride trips by network perimeter locations calculated in the peak hour for auto trips, for Opening Year 2029 and Horizon Year 2040, respectively. Table 6-41 and Table 6-44 present the PUDO trips by network perimeter locations calculated in the peak hour for auto trips, for Opening Year 2029 and Horizon Year 2040, respectively. Table 6-42 and Table 6-45 present the trips by network perimeter locations calculated in the peak hour for bus trips, for Opening Year 2029 and Horizon Year 2040, respectively.



F intersection number prefix indicates intersections within the Fullerton High-Speed Rail Station Option area.

Figure 6-3 Fullerton High-Speed Rail Station Option Trip Assignment

Table 6-40 Fullerton High-Speed Rail Station Option: Peak Hour Park-and-Ride Auto Trips, Opening Year 2029

	Originating Trips		Destination Trips		Total Trips		SOCO West Parking Structure Trips (0%)		Metrolink Depot Trips (0%)		New Parking Structure Trips (100%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Chapman east	0	0	0	0	0	0	0	0	0	0	0	0
Orangethorpe east	0	0	0	0	0	0	0	0	0	0	0	0
SR 91 west	9	9	0	0	9	9	0	0	0	0	9	9
SR 91 east	30	30	0	0	30	30	0	0	0	0	30	30
SR 57 north	21	21	0	0	21	21	0	0	0	0	21	21
SR 57 south	8	8	0	0	8	8	0	0	0	0	8	8
State College north	0	0	0	0	0	0	0	0	0	0	0	0
Harbor north	0	0	0	0	0	0	0	0	0	0	0	0
Euclid north	0	0	0	0	0	0	0	0	0	0	0	0
Brea north	0	0	0	0	0	0	0	0	0	0	0	0
Bastanchury east	0	0	0	0	0	0	0	0	0	0	0	0
Imperial west	0	0	0	0	0	0	0	0	0	0	0	0
Imperial east	0	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda east	0	0	0	0	0	0	0	0	0	0	0	0
Nutwood east	0	0	0	0	0	0	0	0	0	0	0	0
Total	68	68	0	0	68	68	0	0	0	0	68	68

SR = State Route

Table 6-41 Fullerton High-Speed Rail Station Option: Peak Hour Pick-Up/Drop-Off Auto Trips, Opening Year 2029

	Originating Trips		Destination Trips		Total Trips		SOCO West Parking Structure Trips (40%)		Metrolink Depot Trips (10%)		New Parking Structure Trips (50%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Chapman east	0	0	0	0	0	0	0	0	0	0	0	0
Orangethorpe east	0	0	0	0	0	0	0	0	0	0	0	0
SR 91 west	5	5	3	3	8	8	3	3	1	1	4	4
SR 91 east	18	18	32	32	50	50	20	20	5	5	25	25
SR 57 north	13	13	14	14	27	27	12	12	1	1	14	14
SR 57 south	5	5	14	14	19	19	8	8	1	1	10	10
State College north	0	0	0	0	0	0	0	0	0	0	0	0

To/From	Originating Trips		Destination Trips		Total Trips		SOCO West Parking Structure Trips (40%)		Metrolink Depot Trips (10%)		New Parking Structure Trips (50%)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Harbor north	0	0	0	0	0	0	0	0	0	0	0	0
Euclid north	0	0	0	0	0	0	0	0	0	0	0	0
Brea north	0	0	0	0	0	0	0	0	0	0	0	0
Bastanchury east	0	0	0	0	0	0	0	0	0	0	0	0
Imperial west	0	0	0	0	0	0	0	0	0	0	0	0
Imperial east	0	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda east	0	0	0	0	0	0	0	0	0	0	0	0
Nutwood east	0	0	0	0	0	0	0	0	0	0	0	0
Total	**41**	**41**	**63**	**63**	**104**	**104**	**43**	**43**	**8**	**8**	**53**	**53**

SR = State Route

Table 6-42 Fullerton High-Speed Rail Station Option: Peak Hour Bus Trips, Opening Year 2029

To/From	Originating Trips		Destination Trips		Total Trips		SOCO West Parking Structure Trips (0%)		Metrolink Depot Trips (100%)		New Parking Structure Trips (0%)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Chapman east	0	0	0	0	0	0	0	0	0	0	0	0
Orangethorpe east	0	0	0	0	0	0	0	0	0	0	0	0
SR 91 west	0	0	0	0	0	0	0	0	0	0	0	0
SR 91 east	0	0	0	0	0	0	0	0	0	0	0	0
SR 57 north	0	0	0	0	0	0	0	0	0	0	0	0
SR 57 south	0	0	0	0	0	0	0	0	0	0	0	0
State College north	0	0	0	0	0	0	0	0	0	0	0	0
Harbor north	0	0	0	0	0	0	0	0	0	0	0	0
Euclid north	0	0	0	0	0	0	0	0	0	0	0	0
Brea north	0	0	0	0	0	0	0	0	0	0	0	0
Bastanchury east	0	0	0	0	0	0	0	0	0	0	0	0
Imperial west	0	0	0	0	0	0	0	0	0	0	0	0
Imperial east	0	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda east	0	0	0	0	0	0	0	0	0	0	0	0
Nutwood east	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SR = State Route

Table 6-43 Fullerton High-Speed Rail Station Option: Peak Hour Park-and-Ride Auto Trips, Horizon Year 2040

To/From	Originating Trips		Destination Trips		Total Trips		SOCO West Parking Structure Trips (0%)		Metrolink Depot Trips (0%)		New Parking Structure Trips (100%)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Chapman east	1	1	0	0	1	1	0	0	0	0	1	1
Orangethorpe east	1	1	0	0	1	1	0	0	0	0	1	1
SR 91 west	14	14	0	0	14	14	0	0	0	0	14	14
SR 91 east	45	45	0	0	45	45	0	0	0	0	45	45
SR 57 north	31	31	0	0	31	31	0	0	0	0	31	31
SR 57 south	11	11	0	0	11	11	0	0	0	0	11	11
State College north	1	1	0	0	1	1	0	0	0	0	1	1
Harbor north	1	1	0	0	1	1	0	0	0	0	1	1
Euclid north	1	1	0	0	1	1	0	0	0	0	1	1
Brea north	1	1	0	0	1	1	0	0	0	0	1	1
Bastanchury east	1	1	0	0	1	1	0	0	0	0	1	1
Imperial west	1	1	0	0	1	1	0	0	0	0	1	1
Imperial east	1	1	0	0	1	1	0	0	0	0	1	1
Yorba Linda east	1	1	0	0	1	1	0	0	0	0	1	1
Nutwood east	1	1	0	0	1	1	0	0	0	0	1	1
Total	**112**	**112**	**0**	**0**	**112**	**112**	**0**	**0**	**0**	**0**	**112**	**112**

SR = State Route

Table 6-44 Fullerton High-Speed Rail Station Option: Peak Hour Pick-Up/Drop-Off Auto Trips, Horizon Year 2040

To/From	Originating Trips		Destination Trips		Total Trips		SOCO West Parking Structure Trips (40%)		Metrolink Depot Trips (10%)		New Parking Structure Trips (50%)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Chapman east	1	1	0	0	1	1	0	0	0	0	1	1
Orangethorpe east	1	1	0	0	1	1	0	0	0	0	1	1
SR 91 west	19	19	6	6	25	25	10	10	2	2	13	13
SR 91 east	63	63	62	62	125	125	50	50	12	12	63	63
SR 57 north	43	43	26	26	69	69	28	28	6	6	35	35
SR 57 south	15	15	25	25	40	40	16	16	4	4	20	20
State College north	1	1	0	0	1	1	0	0	0	0	1	1

To/From	Originating Trips		Destination Trips		Total Trips		SOCO West Parking Structure Trips (40%)		Metrolink Depot Trips (10%)		New Parking Structure Trips (50%)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Harbor north	1	1	0	0	1	1	0	0	0	0	1	1
Euclid north	1	1	0	0	1	1	0	0	0	0	1	1
Brea north	1	1	0	0	1	1	0	0	0	0	1	1
Bastanchury east	1	1	0	0	1	1	0	0	0	0	1	1
Imperial west	1	1	0	0	1	1	0	0	0	0	1	1
Imperial east	1	1	0	0	1	1	0	0	0	0	1	1
Yorba Linda east	1	1	0	0	1	1	0	0	0	0	1	1
Nutwood east	1	1	0	0	1	1	0	0	0	0	1	1
Total	**151**	**151**	**119**	**119**	**270**	**270**	**104**	**104**	**24**	**24**	**142**	**142**

SR = State Route

Table 6-45 Fullerton High-Speed Rail Station Option: Peak Hour Bus Trips, Horizon Year 2040

To/From	Originating Trips		Destination Trips		Total Trips		SOCO West Parking Structure Trips (0%)		Metrolink Depot Trips (100%)		New Parking Structure Trips (0%)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Chapman east	0	0	0	0	0	0	0	0	0	0	0	0
Orangethorpe east	0	0	0	0	0	0	0	0	0	0	0	0
SR 91 west	0	0	0	0	0	0	0	0	0	0	0	0
SR 91 east	0	0	1	1	1	1	0	0	1	1	0	0
SR 57 north	0	0	0	0	0	0	0	0	0	0	0	0
SR 57 south	0	0	0	0	0	0	0	0	0	0	0	0
State College north	0	0	0	0	0	0	0	0	0	0	0	0
Harbor north	0	0	0	0	0	0	0	0	0	0	0	0
Euclid north	0	0	0	0	0	0	0	0	0	0	0	0
Brea north	0	0	0	0	0	0	0	0	0	0	0	0
Bastanchury east	0	0	0	0	0	0	0	0	0	0	0	0
Imperial west	0	0	0	0	0	0	0	0	0	0	0	0
Imperial east	0	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda east	0	0	0	0	0	0	0	0	0	0	0	0
Nutwood East	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**0**

SR = State Route

6.3.1.4 ARTIC

Table 6-46 presents the daily forecasted passenger trip data used for the project trip distribution at ARTIC. Table 6-47 presents the daily forecasted vehicle trip data used for calculating vehicle occupancy at ARTIC. Table 6-48 presents the daily forecasted unconstrained parking and daily parking supply needed at ARTIC.

Table 6-46 ARTIC: Daily Forecasted Passenger Trips

Trip Type	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Arriving/departing by drop-off/pick-up	1,760	1,760	4,290	4,090
Arriving/departing by parked car	2,620	0	2,940	0
Arriving/departing by rental car	0	1,590	0	2,800
Arriving/departing by taxi	110	550	210	1,040
Arriving/departing by transit	790	4,310	2,030	10,470
by dedicated HSR bus	0	0	0	0
by local/regional bus	130	180	290	390
by local/regional/intercity rail	660	4,130	1,740	10,080
Arriving/departing by bike/walk	560	580	1,320	1,280
Total	**5,840**	**8,790**	**10,790**	**19,680**

ARTIC = Anaheim Regional Transportation Intermodal Center; HSR = high-speed rail

Table 6-47 ARTIC: Daily Forecasted Vehicle Trips

Trip Type	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Drop-off/pick-up	1,230	1,230	3,000	2,880
Parking arrivals/departures	1,990	0	2,240	0
Rental car arrivals/departures	0	1,100	0	1,950
Taxi arrivals/departures	80	440	150	830
Local/regional transit buses	6	9	14	20
Total	**3,306**	**2,779**	**5,404**	**5,680**

ARTIC = Anaheim Regional Transportation Intermodal Center

Table 6-48 ARTIC: Daily Forecasted Parking Demand

Parking Demand	Phase 1 Opening Year 2029		Horizon Year 2040	
	Origin	Destination	Origin	Destination
Unconstrained parking	1,210	0	2,280	0
Parking supply needed	1,350	0	1,350	0

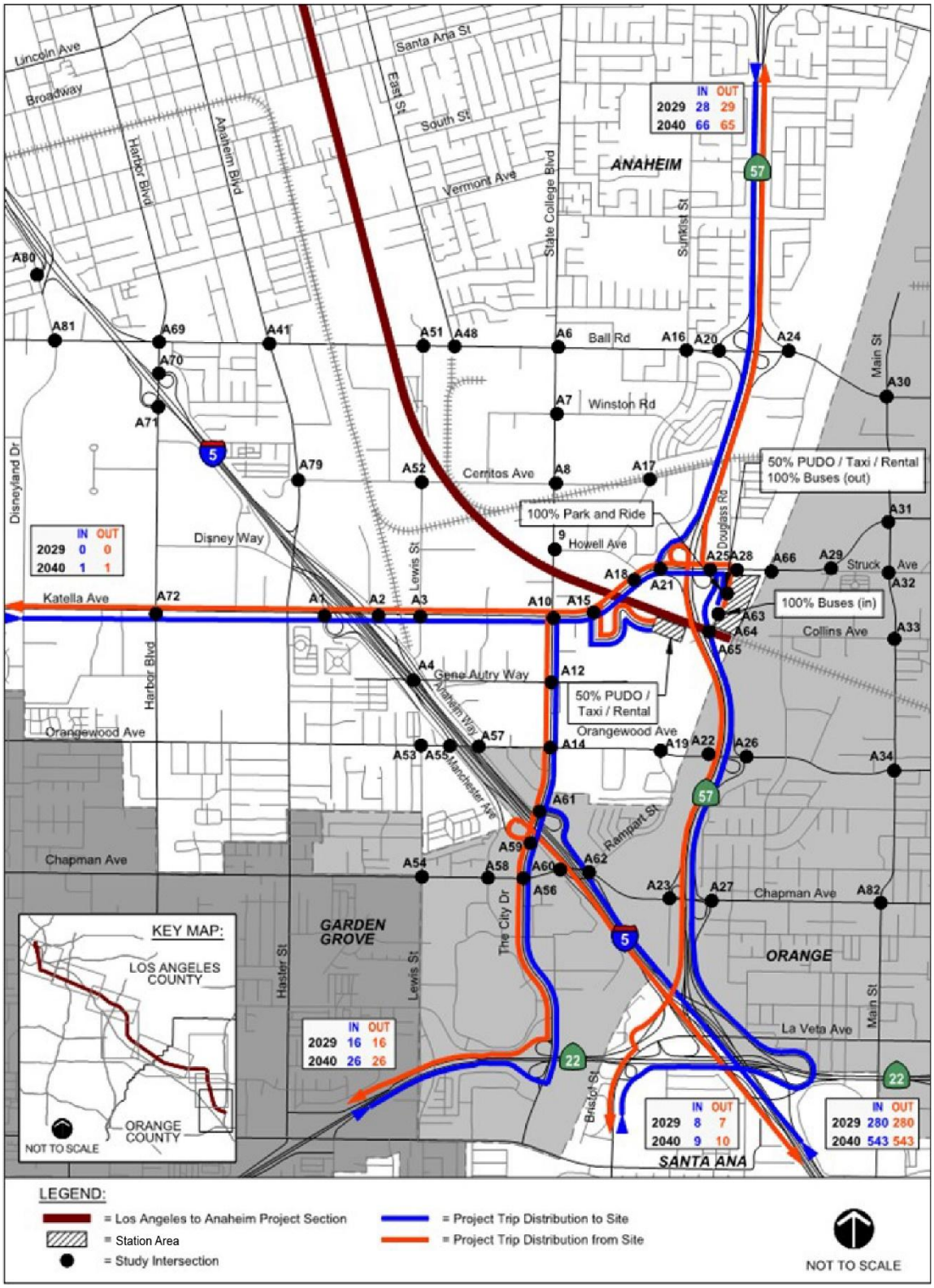
ARTIC = Anaheim Regional Transportation Intermodal Center

Trip Generation, Distribution, and Assignment

Peak hour trips were calculated as described in Section 4.2.1, Study Approach and Baselines. According to the data generated by the Authority for ARTIC, 33 percent of ridership would occur during the peak 6-hour period in Phase 1 Opening Year 2029, and 35 percent of ridership would occur during the peak 6-hour period in Horizon Year 2040. This results in a peak hour percentage of daily ridership of 5.50 percent and 5.83 percent, respectively.

Peak hour ridership was then converted to peak hour vehicle trips. These trips were assigned to network perimeter locations for the station area based on proximity to each TAZ in the Statewide Model. Park-and-ride, PUDO, and bus trips were distributed to each lot or loading zone based on site layout and assumed percentages.

Figure 6-4 depicts the network perimeter locations and paths that trips were distributed along in the station area. Table 6-49 and Table 6-52 present the Park-and-ride trips by network perimeter locations calculated in the peak hour for auto trips, for Opening Year 2029 and Horizon Year 2040, respectively. Table 6-50 and Table 6-53 present the PUDO trips by network perimeter locations calculated in the peak hour for auto trips, for Opening Year 2029 and Horizon Year 2040, respectively. Table 6-51 and Table 6-54 present the trips by network perimeter locations calculated in the peak hour for bus trips, for Opening Year 2029 and Horizon Year 2040, respectively.



A intersection number prefix indicates intersections within Anaheim Regional Transportation Intermodal Center station area.

Figure 6-4 ARTIC Trip Assignment

Table 6-49 ARTIC: Peak Hour Park-and-Ride Auto Trips, Opening Year 2029

	Originating Trips		Destination Trips		Total Trips		Westside Facility Trips (50%)		Main Facility Trips (50%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
Katella west	0	0	0	0	0	0	0	0	0	0
I-5 south	87	87	0	0	87	87	0	0	87	87
SR 57 north	8	8	0	0	8	8	0	0	8	8
SR 57 south	4	4	0	0	4	4	0	0	4	4
SR 22 west	7	7	0	0	7	7	0	0	7	7
Total	**106**	**106**	**0**	**0**	**106**	**106**	**0**	**0**	**106**	**106**

ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; SR = State Route

Table 6-50 ARTIC: Peak Hour Pick-Up/Drop-Off Auto Trips, Opening Year 2029

	Originating Trips		Destination Trips		Total Trips		Westside Facility Trips (50%)		Main Facility Trips (50%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
Katella west	0	0	0	0	0	0	0	0	0	0
I-5 south	58	58	135	135	193	193	97	97	96	96
SR 57 north	5	5	15	15	20	20	9	9	11	11
SR 57 south	3	3	0	0	3	3	2	2	1	1
SR 22 west	5	5	4	4	9	9	5	5	4	4
Total	**71**	**71**	**154**	**154**	**225**	**225**	**113**	**113**	**112**	**112**

ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; SR = State Route

Table 6-51 ARTIC: Peak Hour Bus Trips, Opening Year 2029

	Originating Trips		Destination Trips		Total Trips		Westside Facility Trips (50%)		Main Facility Trips (50%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
Katella west	0	0	0	0	0	0	0	0	0	0
I-5 south	0	0	0	0	0	0	0	0	0	0
SR 57 north	0	0	0	1	0	1	0	0	0	1
SR 57 south	0	0	1	0	1	0	0	0	1	0
SR 22 west	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**1**	**1**

ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; SR = State Route

Table 6-52 ARTIC: Peak Hour Park-and-Ride Auto Trips, Horizon Year 2040

	Originating Trips		Destination Trips		Total Trips		Westside Facility Trips (50%)		Main Facility Trips (50%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
Katella west	0	0	0	0	0	0	0	0	0	0
I-5 south	121	121	0	0	121	121	0	0	121	121
SR 57 north	16	16	0	0	16	16	0	0	16	16
SR 57 south	3	3	0	0	3	3	0	0	3	3
SR 22 west	9	9	0	0	9	9	0	0	9	9
Total	**149**	**149**	**0**	**0**	**149**	**149**	**0**	**0**	**149**	**149**

ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; SR = State Route

Table 6-53 ARTIC: Peak Hour Pick-Up/Drop-Off Auto Trips, Horizon Year 2040

	Originating Trips		Destination Trips		Total Trips		Westside Facility Trips (50%)		Main Facility Trips (50%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
Katella west	0	0	0	0	0	0	0	0	0	0
I-5 south	167	167	255	255	422	422	211	211	211	211
SR 57 north	22	22	27	27	49	49	24	24	25	25
SR 57 south	4	4	2	2	6	6	3	3	3	3
SR 22 west	12	12	5	5	17	17	9	9	8	8
Total	**205**	**205**	**289**	**289**	**494**	**494**	**247**	**247**	**247**	**247**

ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; SR = State Route

Table 6-54 ARTIC: Peak Hour Bus Trips, Horizon Year 2040

	Originating Trips		Destination Trips		Total Trips		Westside Facility Trips (0%)		Main Facility Trips (100%)	
To/From	In	Out	In	Out	In	Out	In	Out	In	Out
Katella west	1	1	0	0	1	1	0	0	1	1
I-5 south	0	0	0	0	0	0	0	0	0	0
SR 57 north	0	0	1	0	1	0	0	0	1	0
SR 57 south	0	0	0	1	0	1	0	0	0	1
SR 22 west	0	0	0	0	0	0	0	0	0	0
Total	**1**	**1**	**1**	**1**	**2**	**2**	**0**	**0**	**2**	**2**

ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; SR = State Route

The ARTIC HSR operation would receive about half of its ridership from park-and-ride or kiss-and-ride trips to and from I-5 from the south (central and southern Orange County, and San Diego County). This would amount to 280 peak hour trips each way in 2029 and 543 each way in 2040.

In the No Project condition, many of these trips would be on I-5 and simply continue northward rather than switching to HSR in the Plus Project conditions. These volumes should therefore not be directly used to assess the impacts of HSR on I-5.

Given this special circumstance, a refined analysis of ARTIC trips to and from I-5 was conducted. The statewide model was used to determine the likely freeway path between TAZs in San Diego County and southern Orange County (southern end of trip) and locations in Los Angeles County (northern end of trip).

The HSR ARTIC trips were assigned using an origin-destination table to the freeway paths from the previous step, concentrating on I-5, I-15, and I-215. The resulting volumes were the No-Project volumes for these freeways.

These passenger vehicle trips would result in the addition of 365 net inbound (northbound) and 214 outbound (southbound) vehicles per day along the I-5 corridor south of Anaheim in Opening Year 2029. In Horizon Year 2040, these passenger vehicle trips would result in the addition of 486 net inbound (northbound) and 275 outbound (southbound) vehicles per day along the I-5 corridor south of Anaheim.

6.3.1.5 Maintenance Facility

Based on the project footprint at the time of this report, there are two locations for the Shared Passenger Track Alternative with the maintenance facility (i.e., LMF) to be in one of two locations in the city of Los Angeles. The LMF for the Shared Passenger Track Alternative A would be a Level III facility along the West Bank of the Los Angeles River. This LMF would hold 20 single trainsets, with four shop tracks, and would be built to the west of Amtrak's current Eighth Street Yard. The LMF for the Shared Passenger Track Alternative B would be a 41-acre Level III facility at Hobart Yard. This LMF would hold 24 single trainsets, with six shop tracks, and would require the restriping of BNSF Lot 11 to maintain operations. Only one LMF will ultimately be needed; however, both alternatives are evaluated below.

As discussed in Section 5.2, Corridor Traffic Volumes, Level III LMFs have been determined to not have meaningfully detectable trips during peak hours.[20]

6.3.1.6 Electric Power Utility Improvements

The Authority has determined that because maintenance activities associated with TPSS, switching stations, and paralleling stations would generally be performed during nonpeak hours, these facilities do not have meaningfully detectable trips during peak hours.

6.3.2 Shared Passenger Track Alternative B

6.3.2.1 Maintenance Facility

As discussed in Section 5.2, Corridor Traffic Volumes, Level 1 LMFs have been determined to not have meaningfully detectable trips during peak hours.

6.4 Plus Project Roadway and Intersection Level of Service

The Plus Project Alternative represents future conditions analysis with the project. This alternative is built from the respective base condition (No Project) analyses and includes project trips caused by station activity for comparison to the affected environment.

[20] As explained in the *Summary of Requirements for Maintenance Facilities* (March 2016), and *Information Provided from Operations and Maintenance Team (Network Rail) for Purposes of EIS/EIR Clearance* (April 2016), Level 1 LMFs are primarily for storage, and minor operations undertaken during daytime hours are "primarily the movement of trains into and out of the storage tracks," with more intense use during off-peak hours. Staffing at LMFs higher than Level 1 is expected to be approximately 40 persons per shift with shifts staggered to avoid traffic peak hours, which would result in the peak hour number of trips to and from the Level 1 LMF being below the threshold for study.

Permanent future traffic effect analyses were conducted using the Existing year Plus Project traffic analysis calculated in Section 6.7.1.1, Permanent Conditions (Existing Year 2015 Plus Project) as the basis for projecting future volumes and effects analysis.

6.4.1 Effects on Regional Transportation System and Local Roadway Network

Several streets would be permanently closed as a result of the project and existing at-grade crossings would be improved to grade-separated conditions. Most of these instances would be the result of track work built as part of the HSR alignment and would indirectly result from the expansion of BNSF-owned yards, rather than construction at the stations. Future capital improvement projects and street closures/grade separations were included as a cumulative effect from track construction. Station trips were also distributed throughout the Plus Project roadway network. Rerouting of diverted traffic was prepared, and the effect analysis was conducted for the intersections and roadway segments affected by street closures and station area traffic.

6.4.1.1 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040), Shared Passenger Track Alternatives

Roadway segment effect analysis and intersection effect analysis were performed along the corridor alignment and at each station area for the Phase 1 Horizon Year 2040 Plus Project condition. The roadway segment effect analyses along the project section alignment and at the station areas for Shared Passenger Track Alternatives A and B is provided in Table 6-55.

Intersection effect analyses along the project section alignment and at station areas for Shared Passenger Track Alternatives A and B is provided in Table 6-56. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B.

Table 6-55 Horizon Year 2040 Plus Project Major Roadway Segment Level of Service for Shared Passenger Track Alternatives A and B

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Vermont Ave	East St	State College Blvd	998	800	800	0.80	0.80	C	C
South St	East St	State College Blvd	950	100	100	0.11	0.11	A	A
Santa Ana St	East St	State College Blvd	950	800	800	0.84	0.84	D	D
Broadway	East St	State College Blvd	3,045	1,400	1,400	0.46	0.46	A	A
Sycamore St	East St	State College Blvd	950	100	100	0.11	0.11	A	A
Harbor Blvd	La Palma Ave	Lincoln Ave	3,045	2,900	2,900	0.95	0.95	**E***	**E***
Harbor Blvd	Lincoln Ave	Ball Rd	2,520	2,600	2,800	1.03	1.11	**F***	**F***
La Palma Ave	Harbor Blvd	East St	3,045	2,000	2,200	0.66	0.72	B	C
La Palma Ave	East St	State College Blvd	2,520	1,900	2,600	0.75	1.03	C	**F***
Lincoln Ave	Anaheim Blvd	East St	5,198	2,500	2,700	0.48	0.52	A	A
Lincoln Ave	East St	State College Blvd	2,520	2,900	3,500	1.15	1.39	**F***	**F***
Soto St	E 26th St	Washington Blvd	2,835	2,300	2,500	0.81	0.88	D	D
Downey Rd	Bandini Blvd	Washington Blvd	3,045	2,700	3,400	0.89	1.12	D	**F***
E 26th St	Downey Rd	Bandini Blvd	998	900	1,300	0.9	1.30	D	**F***
Atlantic Blvd	Bandini Blvd	Washington Blvd	2,835	2,100	2,400	0.74	0.85	C	D
Eastern Ave	Bandini Blvd	Commerce Way	2,835	1,700	1,800	0.6.0	0.63	A	B
Telegraph Rd	Garfield Ave	Washington Blvd	2,835	1,200	1,400	0.42	0.49	A	A
Garfield Ave	Telegraph Rd	Washington Blvd	2,415	2,800	2,400	1.16	0.99	**F***	**E***
Greenwood Ave	Union St	Washington Blvd	2,415	1,300	1,900	0.54	0.79	A	C
Paramount Blvd	Slauson Ave	Washington Blvd	2,520	1,900	2,600	0.75	1.03	C	**F***
Rosemead Blvd (SR 19)	Slauson Ave	Washington Blvd	2,520	2,500	2,600	0.99	1.03	**E***	**F***

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Serapis Ave	Slauson Ave	Bequette Ave	850	300	300	0.35	0.35	A	A
Serapis Ave	Rivera Rd	Rex Rd	1,100	100	100	0.09	0.09	A	A
Rex Rd	Rosemead Blvd (SR 19)	Serapis Ave	950	500	400	0.53	0.42	A	A
Rex Rd	Serapis Ave	Passons Blvd	1,100	500	300	0.45	0.27	A	A
Passons Blvd	Slauson Ave	Washington Blvd	850	900	900	1.06	1.06	**F***	**F***
Slauson Ave	Passons Blvd	I-605 SB on-ramp	3,045	3,000	3,000	0.99	0.99	**E***	**E***
Pioneer Blvd	Los Nietos Rd	Rivera Rd	3,360	1,700	2,000	0.51	0.60	A	A
Pioneer Blvd	Rivera Rd	Slauson Ave	2,520	1,700	2,000	0.67	0.79	B	C
Rivera Rd	Pioneer Blvd	Bradwell Ave	950	100	100	0.11	0.11	A	A
Rivera Rd	Pioneer Blvd	Norwalk Blvd	950	300	200	0.32	0.21	A	A
Norwalk Blvd	Telegraph Rd	Los Nietos Rd	2,520	1,600	1,900	0.63	0.75	B	C
Norwalk Blvd	Los Nietos Rd	Slauson Ave	2,400	1,800	2,100	0.75	0.88	C	D
Los Nietos Rd	Pioneer Blvd	Norwalk Blvd	1,100	900	900	0.82	0.82	D	D
Los Nietos Rd	Norwalk Blvd	Santa Fe Springs Rd	1,103	1,100	1,200	1.00	1.09	**F***	**F***
Santa Fe Springs Rd	Telegraph Rd	Los Nietos Rd	2,415	1,800	1,800	0.75	0.75	C	C
Rosecrans Ave	Carmenita Rd	Marquardt Ave	3,045	2,200	2,300	0.72	0.76	C	C
Rosecrans Ave	Marquardt Ave	Valley View Ave	3,045	2,100	2,100	0.69	0.69	B	B
Marquardt Ave	Rosecrans Ave	Foster Ave	1,155	400	400	0.35	0.35	A	A
Marquardt Ave	Rosecrans Ave	Borate St	1,050	300	200	0.29	0.19	A	A
Valley View Ave	Gannet St	Stage Rd	3,360	2,700	2,800	0.80	0.83	C	D
Valley View Ave	Stage Rd	Rosecrans Ave	3,045	2,700	2,600	0.89	0.85	D	D
Stage Rd	Rosecrans Ave	Valley View Ave	1,100	400	600	0.36	0.55	A	A
Stage Rd	Valley View Ave	Alondra Blvd	2,400	800	800	0.33	0.33	A	A
Alondra Blvd	Valley View Ave	La Mirada Blvd	3,045	2,100	2,300	0.69	0.76	B	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Stage Rd	Alondra Blvd	Beach Blvd (SR 39)	2,400	700	900	0.29	0.38	A	A
Beach Blvd (SR 39)	Franklin St	Stage Rd	5,198	4,600	5,100	0.88	0.98	D	**E***
Artesia Blvd	Beach Blvd (SR 39)	Dale St	2,520	1,500	1,800	0.60	0.71	A	C
Commonwealth Ave	Beach Blvd (SR 39)	Dale St	2,520	1,100	1,100	0.44	0.44	A	A
Malvern Ave	Beach Blvd (SR 39)	Dale St	2,625	2,200	2,200	0.84	0.84	D	D
Dale St	Artesia Blvd	Malvern Ave	3,150	1,800	2,000	0.57	0.63	A	B
Artesia Blvd	Dale St	Gilbert St	1,000	700	800	0.70	0.80	B	C
Commonwealth Ave	Dale St	Gilbert St	3,045	1,600	1,800	0.53	0.59	A	A
Malvern Ave	Dale St	Gilbert St	3,150	2,700	2,800	0.86	0.89	D	D
Gilbert St	Commonwealth Ave	Artesia Blvd	3,045	2,500	2,500	0.82	0.82	D	D
Gilbert St	Artesia Blvd	Malvern Ave	4,332	3,200	3,000	0.74	0.69	C	B
Commonwealth Ave	Brookhurst Rd	Euclid St	3,045	1,700	1,600	0.56	0.53	A	A
State College Blvd	La Palma Ave	Lincoln Ave	4,410	2,000	2,700	0.45	0.61	A	B
State College Blvd	Lincoln Ave	South St	4,410	2,200	2,800	0.50	0.63	A	B
State College Blvd	South St	Wagner Ave	5,198	2,700	2,600	0.52	0.50	A	A
State College Blvd	Wagner Ave	Ball Rd	4,410	2,900	2,600	0.66	0.59	B	A
East St	La Palma Ave	Lincoln Ave	2,520	1,800	2,000	0.71	0.79	C	C
East St	Lincoln Ave	South St	2,520	1,600	1,500	0.63	0.60	B	A
East St	South St	Vermont St	3,360	1,300	1,300	0.39	0.39	A	A
East St	Vermont St	Ball Rd	2,520	1,600	1,500	0.63	0.6	B	A
Anaheim Blvd	La Palma Ave	Lincoln Ave	2,520	1,500	1,700	0.60	0.67	A	B
Anaheim Blvd	Lincoln Ave	South St	2,520	1,800	2,100	0.71	0.83	C	D
Anaheim Blvd	South St	Vermont St	3,360	2,000	2,200	0.6	0.65	A	B
Anaheim Blvd	Vermont St	Ball Rd	2,520	2,300	2,800	0.91	1.11	**E***	**F***

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Carmenita Rd	Alondra Blvd	Excelsior Dr	3,045	2,300	2,600	0.76	0.85	C	D
Beach Blvd (SR 39)	Malvern Ave	Stage Rd	4,410	4,400	4,800	1.00	1.09	**F***	**F***
Santa Fe Springs Rd	Los Nietos Rd	John St	3,150	1,800	2,100	0.57	0.67	A	B
Washington Blvd	Indiana St	Downey Rd	3,360	700	900	0.21	0.27	A	A
Washington Blvd	Ayers Ave	I-710	3,045	800	1100	0.26	0.36	A	A
Washington Blvd	I-710	Atlantic Blvd	2,835	1,600	2,100	0.56	0.74	A	C
Telegraph Rd	Garfield Ave	Maple Ave	2,700	1,800	2,000	0.67	0.74	B	C
Bandini Blvd	Soto St	Downey Rd	2,700	1,500	1,500	0.56	0.56	A	A
Bandini Blvd	Downey Rd	Atlantic Blvd	2,400	2,100	2,400	0.88	1.00	D	**F***
Bandini Blvd	Atlantic Blvd	Eastern Ave	2,300	1,900	2,300	0.83	1.00	D	**F***
Soto St	E 26th St	Bandini Blvd	2,700	3,300	3,100	1.22	1.15	**F***	**F***
E 26th St	Sierra Pine Ave	Downey Rd	2500	1,100	1,600	0.44	0.64	A	B
Firestone Blvd	Studebaker Rd	Imperial Hwy	3,675	1,900	2,000	0.52	0.54	A	A
Firestone Blvd	Imperial Hwy	Pioneer Blvd	2,520	1,800	2,000	0.71	0.79	C	C
Pioneer Blvd	Telegraph Rd	Florence Ave	2,520	1,800	1,200	0.71	0.48	C	A
Norwalk Blvd	Telegraph Rd	Florence Ave	2,520	1,600	1,700	0.63	0.67	B	B
Norwalk Blvd	Florence Ave	Lakeland Rd	3,045	1,700	1,700	0.56	0.56	A	A
Norwalk Blvd	Tina St	Imperial Hwy	2,520	2,200	2,100	0.87	0.83	D	D
Bloomfield Ave	Telegraph Rd	Florence Ave	2,415	1,600	1,600	0.66	0.66	B	B
Bloomfield Ave	Florence Ave	Lakeland Rd	2,835	1,900	1,800	0.67	0.63	B	B
Bloomfield Ave	Lakeland Rd	6th St	3,150	1,800	1,700	0.57	0.54	A	A
Bloomfield Ave	6th St	Imperial Hwy	2,625	1,800	1,800	0.69	0.69	B	B
Bloomfield Ave	Imperial Hwy	Foster Rd	2,520	1,700	2,000	0.67	0.79	B	C
Leffingwell Rd	Meyer Rd	Carmenita Rd	3,045	1,500	1,600	0.49	0.53	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Leffingwell Rd	Carmenita Rd	Imperial Hwy	2,520	900	1,000	0.36	0.4	A	A
Leffingwell Rd	Imperial Hwy	Adler Dr	1,000	400	500	0.4	0.5	A	A
Carmenita Rd	Telegraph Rd	Florence Ave	2,520	1,800	1,800	0.71	0.71	C	C
Carmenita Rd	Florence Ave	Lakeland Ave	3,045	1,900	2,100	0.62	0.69	B	B
Carmenita Rd	Meyer Rd	Leffingwell Rd	3,045	1,600	2,000	0.53	0.66	A	B
Carmenita Rd	Leffingwell Rd	Imperial Hwy	2,520	1,800	2,300	0.71	0.91	C	**E***
Carmenita Rd	Imperial Hwy	Orden Dr	2,520	2,200	2,600	0.87	1.03	D	**F***
Telegraph Rd	Pioneer Blvd	Norwalk Blvd	5,198	3,300	3,100	0.63	0.6	B	B
Telegraph Rd	Norwalk Blvd	Santa Fe Springs Rd	4,883	2,800	2,700	0.57	0.55	A	A
Telegraph Rd	Shoemaker Ave	Carmenita Rd	4,883	2,300	2,300	0.47	0.47	A	A
Telegraph Rd	Carmenita Rd	Florence Ave	5,198	2,200	2,600	0.42	0.5	A	A
Florence Ave	Orr and Day Rd	Pioneer Blvd	3,045	3,600	3,500	1.18	1.15	**F***	**F***
Florence Ave	Pioneer Blvd	Norwalk Blvd	3,045	2,600	2,800	0.85	0.92	D	**E***
Florence Ave	Norwalk Blvd	Bloomfield Ave	2,835	2,400	2,600	0.85	0.92	D	**E***
Florence Ave	Bloomfield Ave	Shoemaker Ave	2,835	2,400	2,500	0.85	0.88	D	D
Florence Ave	Shoemaker Ave	Carmenita Rd	2,835	2,400	2,400	0.85	0.85	D	D
Florence Ave	Carmenita Rd	Telegraph Rd	2,520	2,300	2,500	0.91	0.99	**E***	**E***
Imperial Hwy	Studebaker Rd	Firestone Blvd	5,198	3,500	3,700	0.56	0.6	A	B
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	4,410	4,000	4,100	0.68	0.7	B	C
Imperial Hwy	Bloomfield Ave	Shoemaker Ave	5,198	3,300	3,400	0.63	0.65	B	B
Imperial Hwy	Shoemaker Ave	Leffingwell Rd	5,198	3,200	3,300	0.62	0.63	B	B
Imperial Hwy	Leffingwell Rd	Carmenita Rd	5,198	2,300	2,200	0.44	0.42	A	A
Telegraph Rd	Santa Fe Springs Rd	Shoemaker Ave	4,883	2,000	2,300	0.41	0.47	A	A
Lakeland Rd	Pioneer Blvd	Norwalk Blvd	1,100	700	800	0.64	0.73	B	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Lakeland Rd	Norwalk Blvd	Bloomfield Ave	1,050	900	900	0.86	0.86	D	D
Lakeland Rd	Bloomfield Ave	Shoemaker Ave	1,103	800	900	0.73	0.82	C	D
Shoemaker Ave	Telegraph Rd	Florence Ave	2,415	1,300	1,100	0.54	0.46	A	A
Shoemaker Ave	Florence Ave	Lakeland Rd	2,835	1,600	1,400	0.56	0.49	A	A
Shoemaker Ave	Lakeland Rd	Imperial Hwy	2,400	1,200	1,100	0.5	0.46	A	A
Florence Ave	I-605	Woodruff Ave	3,360	2,800	2,700	0.83	0.8	D	D
Imperial Hwy	I-605	Woodruff Ave	5,198	2,900	3,100	0.56	0.6	A	B
Imperial Hwy	I-605	Studebaker Rd	5,198	3,300	3,600	0.63	0.69	B	B
Studebaker Rd	Imperial Hwy	I-105	2,520	2,500	2,400	0.99	0.95	**E***	**E***
Carmenita Rd	Orden Dr	Rosecrans Ave	2,520	2,500	2,300	0.99	0.91	**E***	**E***
Shoemaker Ave	Imperial Hwy	Foster Rd	1,000	900	1,000	0.6	0.7	B	C
Shoemaker Ave	Foster Rd	Rosecrans Ave	2,400	800	600	0.33	0.25	A	A
Norwalk Blvd	Imperial Hwy	Civic Center Dr	4,410	2,300	2,500	0.52	0.57	A	A
Civic Center Dr	Norwalk Blvd	Bloomfield Ave	2,200	1,300	1,500	0.59	0.68	A	B
Civic Center Dr	Bloomfield Ave	Volunteer Ave	950	200	100	0.21	0.11	A	A
Foster Rd	Bloomfield Ave	Shoemaker Ave	900	600	700	0.67	0.78	B	C
Rosecrans Ave	Shoemaker Ave	Carmenita Rd	4,332	2,700	3,000	0.62	0.69	B	B
San Antonio Dr	Firestone Blvd	Pioneer Blvd/Rosecrans Ave	2,520	1,500	1,600	0.6	0.63	B	B
Rosecrans Ave	Pioneer Blvd	Norwalk Blvd	2,520	1,900	1,800	0.75	0.71	C	C
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	2,520	2,500	2,500	0.99	0.99	**E***	**E***
Rosecrans Ave	I-605 NB ramps	Studebaker Rd	4,332	3,500	3,500	0.81	0.81	D	D
Rosecrans Ave	I-605 SB ramps	I-605 NB ramps	4,332	2,800	2,700	0.65	0.62	B	B
Lakeland Rd	Shoemaker Ave	Carmenita Rd	1,050	500	600	0.48	0.57	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Studebaker Rd	Imperial Hwy	Firestone Blvd	2,520	1,500	1,600	0.6	0.63	B	B
Pioneer Blvd	South St	187th St	3,045	1,500	1,600	0.49	0.53	A	A
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	5,198	4,300	4,400	0.62	0.63	B	B
Euclid St	Bastanchury Rd	Malvern Ave	2,625	2,900	2,800	1.1	1.07	**F***	**F***
Euclid St	Malvern Ave	Commonwealth Ave	3,045	3,100	3,000	1.02	0.99	**F***	**E***
Euclid St	Commonwealth Ave	Orangethorpe Ave	2,520	2,500	2,500	0.99	0.99	**E***	**E***
Highland Ave	Malvern Ave	Chapman Ave	1,100	800	1,000	0.73	0.91	C	**E***
Highland Ave	Chapman Ave	Commonwealth Ave	1,100	700	900	0.64	0.82	B	D
Highland Ave	Commonwealth Ave	Valencia Dr	1,155	1,000	1,300	0.87	1.13	D	**F***
Highland Ave	Valencia Dr	Orangethorpe Ave	1,050	500	1,000	0.48	0.95	A	**E***
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	2,520	4,000	4,300	1.59	1.71	**F***	**F***
Harbor Blvd	Bastanchury Rd	Brea Blvd	5,198	3,500	3,800	0.67	0.73	B	C
Harbor Blvd	Brea Blvd	Berkeley Ave	4,332	4,000	3,600	0.92	0.83	**E***	D
Harbor Blvd	Berkeley Ave	Chapman Ave	3,045	2,800	2,600	0.92	0.85	**E***	D
Harbor Blvd	Chapman Ave	Commonwealth Ave	3,045	2,900	2,700	0.95	0.89	**E***	D
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	3,100	3,200	1.23	1.27	**F***	**F***
Harbor Blvd	Orangethorpe Ave	Orangefair Ave	4,410	3,400	4,000	0.77	0.91	C	**E***
Lemon St	Berkeley Ave	Chapman Ave	3,045	1,700	2,100	0.56	0.69	A	B
Lemon St	Chapman Ave	Commonwealth Ave	3,045	2,300	2,500	0.76	0.82	C	D
Lemon St	Commonwealth Ave	Orangethorpe Ave	2,415	3,500	3,900	1.45	1.61	**F***	**F***
Lemon St	Orangethorpe Ave	Orangefair Ave	2,415	3,200	3,900	1.33	1.61	**F***	**F***
Raymond Ave	Chapman Ave	Commonwealth Ave	3,045	1,100	900	0.36	0.3	A	A
Raymond Ave	Commonwealth Ave	Orangethorpe Ave	2,415	500	700	0.21	0.29	A	A
Raymond Ave	Orangethorpe Ave	E Burton St	2,415	1,700	1,900	0.7	0.79	B	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
State College Blvd	Dorothy Ln	Chapman Ave	5,198	2,500	2,300	0.48	0.44	A	A
State College Blvd	Chapman Ave	Commonwealth Ave	3,045	1,700	1,800	0.56	0.59	A	A
State College Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	1,400	1,500	0.56	0.6	A	B
State College Blvd	Orangethorpe Ave	Via Burton St	2,415	1,700	2,200	0.7	0.91	B	**E***
Malvern Ave	Bastanchury Rd	Basque Ave	2,900	1,700	2,000	0.59	0.69	A	B
Chapman Ave	Richman Ave	Highland Ave	3,360	1,900	2,100	0.57	0.63	A	B
Chapman Ave	Harbor Blvd	Raymond Ave	3,045	3,000	3,100	0.99	1.02	**E***	**F***
Chapman Ave	Raymond Ave	Acacia Ave	3,045	3,200	3,700	1.05	1.22	**F***	**F***
Chapman Ave	Acacia Ave	State College Blvd	2,520	3,800	4,700	1.51	1.87	**F***	**F***
Chapman Ave	State College Blvd	Commonwealth Ave	2,520	3,600	4,500	1.43	1.79	**F***	**F***
Commonwealth Ave	Brookhurst St	Euclid St	3,045	1,700	1,700	0.56	0.56	A	A
Commonwealth Ave	Euclid St	Harbor Blvd	2,900	1,900	1,700	0.66	0.59	B	A
Commonwealth Ave	Harbor Blvd	Raymond Ave	2,900	2,600	2,500	0.9	0.86	D	D
Commonwealth Ave	Raymond Ave	Acacia Ave	2,900	2,300	2,100	0.79	0.72	C	C
Commonwealth Ave	Acacia Ave	State College Blvd	2,400	1,300	1,500	0.54	0.63	A	B
Commonwealth Ave	State College Blvd	Chapman Ave	2,400	800	900	0.33	0.38	A	A
Valencia Dr	Highland Ave	Harbor Blvd	1,100	900	900	0.82	0.82	D	D
Valencia Dr	Harbor Blvd	Lemon St	1,050	900	900	0.86	0.86	D	D
Orangethorpe Ave	Euclid St	Highland Ave	3,045	1,900	2,700	0.62	0.89	B	D
Orangethorpe Ave	Harbor Blvd	Raymond Ave	4,253	2,600	3,100	0.61	0.73	B	C
Orangethorpe Ave	Raymond Ave	State College Blvd	4,253	2,200	2,900	0.52	0.68	A	B
Orangethorpe Ave	State College Blvd	Placentia Ave	4,253	2,400	2,700	0.56	0.63	A	B
SR 57 SB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	500	900	0.46	0.83	A	D

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	1,000	1,000	0.93	0.93	**E***	**E***
Chapman Ave	Commonwealth Ave	SR 57	3,045	4,000	4,900	1.31	1.61	**F***	**F***
Placentia Ave	Chapman Ave	Orangethorpe Ave	2,520	1,800	1,900	0.71	0.75	C	C
Valencia Dr	Euclid St	Highland Ave	1,155	800	900	0.69	0.78	B	C
Orangethorpe Ave	Placentia Ave	SR 57	5,198	2,400	2,600	0.46	0.5	A	A
Imperial Hwy (SR 90)	Harbor Blvd	Puente St	4,410	4,200	4,300	0.95	0.98	**E***	**E***
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	2,520	2,700	3,100	1.07	1.23	**F***	**F***
Bastanchury Rd	Euclid St	Harbor Blvd	2,625	3,400	3,400	1.3	1.3	**F***	**F***
Bastanchury Rd	Harbor Blvd	Brea Blvd	2,520	3,600	3,600	1.43	1.43	**F***	**F***
Yorba Linda Blvd	State College Blvd	Associated Rd/Campus Dr	4,725	2,400	2,400	0.51	0.51	A	A
Yorba Linda Blvd	Associated Rd/Campus Dr	SR 57	5,198	2,600	2,800	0.5	0.54	A	A
Euclid St	Orangethorpe Ave	SR 91	2,520	3,000	3,200	1.19	1.27	**F***	**F***
Brea Blvd	Harbor Blvd	Bastanchury Rd	2,520	2,400	2,600	0.95	1.03	**E***	**F***
Santa Fe Ave	Highland Ave	Malden Ave	1,150	200	300	0.17	0.26	A	A
Santa Fe Ave	Malden Ave	Harbor Blvd	1,000	700	700	0.7	0.7	B	C
Santa Fe Ave	Harbor Blvd	Lemon St	1,000	900	1,000	0.9	1	D	**F***
Lewis St	Ball Rd	Cerritos Ave	2,415	1,000	1,200	0.41	0.5	A	A
Lewis St	Cerritos Ave	Katella Ave	2,415	800	1,000	0.33	0.41	A	A
Lewis St	Katella Ave	Anaheim Way	950	200	300	0.21	0.32	A	A
State College Blvd	Ball Rd	Cerritos Ave	4,253	2,700	3,100	0.63	0.73	B	C
State College Blvd	Cerritos Ave	Howell Ave	4,883	2,000	2,300	0.41	0.47	A	A
State College Blvd	Howell Ave	Katella Ave	3,938	2,500	2,800	0.63	0.71	B	C
State College Blvd	Katella Ave	Gene Autry Way	3,938	3,300	3,100	0.84	0.79	D	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
State College Blvd	Gene Autry Way	Orangewood Ave	4,253	3,000	3,000	0.71	0.71	C	C
State College Blvd	Orangewood Ave	I-5	6,090	3,900	4,500	0.64	0.74	B	C
Sunkist St	Ball Rd	Cerritos Ave	2,415	1,300	1,600	0.54	0.66	A	B
Sunkist St	Cerritos Ave	Howell Ave	2,835	700	600	0.25	0.21	A	A
Douglass Rd	Cerritos Ave	Katella Ave	2,415	900	1,200	0.37	0.5	A	A
Main St	Taft Ave	Katella Ave	2,415	1,400	1,100	0.58	0.46	A	A
Main St	Katella Ave	Collins Ave	2,415	1,800	2,000	0.75	0.83	C	D
Main St	Collins Ave	Orangewood Ave	2,835	2,000	2,300	0.71	0.81	C	D
Main St	Orangewood Ave	Chapman Ave	2,415	2,000	2,000	0.83	0.83	D	D
Ball Rd	Harbor Blvd	Anaheim Blvd	3,938	3,000	3,700	0.76	0.94	C	**E***
Ball Rd	Anaheim Blvd	Lewis St	4,253	2,500	3,300	0.59	0.78	A	C
Ball Rd	Lewis St	State College Blvd	4,253	3,000	3,400	0.71	0.8	C	C
Ball Rd	State College Blvd	Sunkist St	2,415	3,000	3,100	1.24	1.28	**F***	**F***
Ball Rd	Sunkist St	SR 57	4,883	3,400	3,300	0.7	0.68	B	B
Ball Rd	SR 57	Main St	2,835	2,600	3,400	0.92	1.2	**E***	**F***
Cerritos Ave	Lewis St	State College Blvd	2,415	900	1,000	0.37	0.41	A	A
Cerritos Ave	State College Blvd	Sunkist St	2,300	1,200	1,900	0.52	0.83	A	D
Cerritos Ave	Sunkist St	Douglass Rd	2,835	700	1,000	0.25	0.35	A	A
Katella Ave	Anaheim Blvd/Haster St	I-5	4,253	2,600	3,600	0.61	0.85	B	D
Katella Ave	I-5	Lewis St	4,883	3,200	4,400	0.66	0.9	B	D
Katella Ave	Lewis St	State College Blvd	4,253	2,200	3,000	0.52	0.71	A	C
Katella Ave	State College Blvd	Sportstown	4,253	2,800	3,000	0.66	0.71	B	C
Katella Ave	Sportstown	Howell Ave	4,883	2,600	3,000	0.53	0.61	A	B
Katella Ave	Howell Ave	SR 57	4,883	2,700	3,000	0.55	0.61	A	B

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Gene Autry Way	I-5	State College Blvd	2,415	1,700	1,800	0.7	0.75	B	C
Orangewood Ave	Manchester Ave	State College Blvd	4,253	3,300	3,500	0.78	0.82	C	D
Orangewood Ave	State College Blvd	Rampart St	2,415	3,300	3,400	1.37	1.41	**F***	**F***
Orangewood Ave	Rampart St	SR 57	3,000	2,800	3,200	0.93	1.07	**E***	**F***
Orangewood Ave	SR 57	Eckhoff St	3,150	2,900	3,100	0.92	0.98	**E***	**E***
Orangewood Ave	Eckhoff St.	Main St	2,835	2,200	2,400	0.78	0.85	C	D
Chapman Ave	I-5 SB on-ramp/NB off-ramp	SR 57	4,253	2,700	3,300	0.63	0.78	B	C
Chapman Ave	SR 57	Main St	4,883	2,200	2,700	0.45	0.55	A	A
Douglass Rd	Katella Ave	ARTIC entrance	2,300	1,100	1,100	0.48	0.48	A	A
Katella Ave	Douglass Rd	Main St	4,883	2,400	2,600	0.49	0.53	A	A
Katella Ave	SR 57	Douglass Rd	4,883	3,300	3,600	0.68	0.74	B	C
Chapman Ave	Lewis St	The City Dr	3,938	2,700	3,300	0.69	0.84	B	D
Chapman Ave	The City Dr	I-5 SB on-ramp/NB off-ramp	3,938	3,100	3,800	0.79	0.96	C	**E***
Disneyland Dr	Ball Rd	I-5 SB off-ramp	3,375	1,600	1,800	0.47	0.53	A	A
State College Blvd	Manchester Ave	Chapman Ave	4,253	3,500	4,100	0.82	0.96	D	**E***
Manchester Ave	Orangewood Ave	Chapman Ave	2,520	1,500	700	0.6	0.28	A	A
Lewis St	Orangewood Ave	Chapman Ave	800	1,300	1,400	1.63	1.75	**F***	**F***
Ball Rd	I-5 NB ramps	Disneyland Dr	4,650	3,500	3,900	0.75	0.84	C	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; SR = State Route; V/C = volume to capacity; veh/hr = vehicles per hour

Table 6-56 Intersection Level of Service: Alignment, Horizon Year 2040 Plus Project Intersection Level of Service for Shared Passenger Track Alternatives A and B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G35	Anaheim Blvd and La Palma Ave[1]	33	C	38.1	D
G36	Anaheim Blvd and Sycamore St[1]	7.1	A	6.7	A
G37	Anaheim Blvd and Lincoln Ave	34.9	C	45.5	D
G38	Anaheim Blvd and Santa Ana St	29.4	C	19.8	B
G39	Anaheim Blvd and South St	9.6	A	7.6	A
G40	Anaheim Blvd and Vermont Ave	21.9	C	15.9	B
G42	East St and La Palma Ave	33.9	C	57	**E***
G43	East St and Sycamore St	17.7	B	10.4	B
G44	East St and Lincoln Ave	71.3	**E***	79.7	**E***
G45	East St and Santa Ana St	32.5	C	24.2	C
G46	East St and South St	18.3	B	>180	**F***
G47	East St and Vermont Ave	20.2	C	19	B
G49	Anaheim Blvd and Broadway	26.3	C	28.3	C
G50	East St and Broadway	27.6	C	24.9	C
G67	Harbor Blvd and La Palma Ave	42.5	D	113.4	**F***
G68	Harbor Blvd and Lincoln Ave	66.8	**E***	78.5	**E***
G73	State College Blvd and La Palma Ave	33.2	C	59.9	**E***
G74	State College Blvd and Lincoln Ave	39.3	D	51.1	D
G75	State College Blvd and Vermont Ave	>180	**F***	>180	**F***
G78	Harbor Blvd and Vermont Ave	15.8	B	14.5	B
G83	Soto St and Washington Blvd	53.7	D	40.6	D
G84	Downey Rd and Washington Blvd	43.4	D	55.5	**E***
G85	Atlantic Blvd and Washington Blvd	39.9	D	33.5	C
G86	Eastern Ave and Washington Blvd	30	C	33.8	C
G87	I-5 SB ramps and Washington Blvd[1]	20.9	C	33.6	C
G88	Telegraph Rd and Washington Blvd	35.2	D	47.2	D
G89	Garfield Ave and Washington Blvd	67.8	**E***	55	D
G90	Greenwood Ave and Washington Blvd	35	C	35.9	D
G91	Passons Blvd and Washington Blvd	44.3	D	35.9	D
G92	Pioneer Blvd and Washington Blvd	115.5	**F***	62.8	**E***
G93	Sierra Pine Ave and Bandini Blvd	16.9	B	14.7	B
G94	Downey Rd and Bandini Blvd	42.7	D	40.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G95	Indiana St and Bandini Blvd[2]	39.6	**E***	31.7	D
G96	Bonnie Beach Pl and Bandini Blvd	16.4	B	18.4	B
G97	Ayers Ave and Bandini Blvd[2]	16	C	18.4	C
G98	Atlantic Blvd/I-710 NB ramps and Bandini Blvd[1]	113.9	**F***	102.1	**F***
G99	Eastern Ave and Bandini Blvd	34.7	C	35.3	D
G100	Garfield Ave and Bandini Blvd	26	C	44.6	D
G101	I-5 SB ramps and Bandini Blvd[2]	>180	**F***	>180	**F***
G102	Soto St and E 26th St	26.5	C	42.3	D
G103	Sierra Pine Ave and E 26th St[2]	18	C	22.8	C
G104	Indiana St and E 26th St[2]	15.5	C	28.6	D
G105	Bonnie Beach Pl and E 26th St	13	B	11.9	B
G106	Ayers Ave and E 26th St[2]	23.4	C	144.8	**F***
G107	Soto St and E 37th St/Bandini Blvd	40.7	D	34.2	C
G108	Eastern Ave and Commerce Way	7.2	A	7.8	A
G109	Telegraph Rd (Washington Blvd) and I-5 NB ramps	36.9	D	40.5	D
G110	Garfield Ave and Telegraph Rd	34.9	C	32.9	C
G111	Telegraph Rd (Garfield Ave) and I-5 NB ramps[1]	27.8	C	31.1	C
G112	Greenwood Ave and Telegraph Rd	12.4	B	16.3	B
G113	Telegraph Rd (Slauson Ave) and I-5 NB off-ramp[2]	>180	**F***	>180	**F***
G114	Gage Rd and Telegraph Rd[2]	53.9	**F***	94.8	**F***
G115	Telegraph Rd and Slauson Ave	47	D	54.3	D
G116	Greenwood Ave and Driveway[2]	19.2	C	25.9	D
G117	Greenwood Ave and Union St	6.7	A	8.4	A
G118	Chapin Rd and Union St[3]	10	A	16.7	C
G119	I-5 SB ramps/Gage Ave and Slauson Ave[1]	51.8	D	80.9	**F***
G120	Chapin Rd and Slauson Ave	7.2	A	20.7	C
G121	Paramount Blvd and Slauson Ave	43.7	D	53.6	D
G122	Rosemead Blvd (SR 19) and Slauson Ave	59	**E***	56.1	**E***
G123	Passons Blvd and Slauson Ave	58.5	**E***	135.9	**F***
G124	I-605 SB off-ramp and Slauson Ave	35.9	D	23.2	C
G125	Pioneer Blvd and Slauson Ave	66.1	**E***	63.8	**E***
G126	Norwalk Blvd and Slauson Ave	43.5	D	38.6	D
G127	Sorensen Ave and Slauson Ave	36.6	D	39.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G128	Santa Fe Springs Rd and Slauson Ave/Mulberry Dr[1]	31.2	C	24.4	C
G130	Pioneer Blvd and I-605 NB off-ramp[2]	118.2	**F***	>180	**F***
G131	Pioneer Blvd and Los Nietos Rd	18.2	B	17.4	B
G132	Pioneer Blvd and Orr and Day Rd[2]	133	**F***	>180	**F***
G133	Pioneer Blvd and Telegraph Rd	31	C	30	C
G134	Norwalk Blvd and Los Nietos Rd	22.6	C	28.1	C
G135	Los Nietos Rd and Santa Fe Springs Rd	24.6	C	24.8	C
G136	Santa Fe Springs Rd and Sorensen Ave[2]	26.3	D	60.9	**E***
G137	Valley View Ave and Imperial Hwy	43.6	D	47.1	D
G138	Valley View Ave and Foster Rd	128.8	**F***	>180	**F***
G139	Valley View Ave and Rosecrans Ave	59.4	**E***	49.7	D
G140	Valley View Ave and Stage Rd	21.2	C	24.6	C
G141	Valley View Ave and Gannet St	11.4	B	13.3	B
G142	Marquardt Ave and Imperial Hwy	18.6	B	19.6	B
G143	Marquardt Ave and Foster Rd[3]	23.1	C	19.6	C
G144	Marquardt Ave and Rosecrans Ave/Stage Rd	24.7	C	31.1	C
G146	Stage Rd/Escalona Rd and Alondra Blvd[1]	22.6	C	28.3	C
G147	Dodds Ave (East) and Stage Rd[2]	24.8	C	29.8	D
G148	Beach Blvd (SR 39) and Stage Rd[1]	43.4	D	42.9	D
G149	La Mirada Blvd and Alondra Blvd	38	D	29.5	C
G150	Beach Blvd (SR 39) and La Mirada Blvd/Malvern Ave	56.2	**E***	45.4	D
G151	Beach Blvd (SR 39) and Franklin St	33.6	C	43.9	D
G152	Beach Blvd (SR 39) and Artesia Ave	39.1	D	50.5	D
G153	Dale St and Malvern Ave[1]	29	C	28.1	C
G154	Dale St and Lakeknoll Dr	14.2	B	6.9	A
G155	Dale St and Artesia Ave	22.2	C	19.7	B
G156	Stanton Ave and Artesia Ave	23.9	C	26.3	C
G157	Dale St and Commonwealth Ave	29.5	C	27.4	C
G158	Gilbert St and Commonwealth Ave[1]	39.4	D	35	C
G159	Brookhurst Rd and Commonwealth Ave[1]	33.5	C	28.5	C
G160	Brookhurst Rd and Valencia Dr	68.9	**E***	30.1	C
G162	Gilbert St and Malvern Ave	90.1	**F***	45.8	D
G163	Gilbert St and Artesia Ave	18.8	B	14.8	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G164	Anaheim Blvd/Lemon St and La Palma Ave	13.7	B	31.3	C
G165	Paramount Blvd and Washington Blvd	56.5	**E***	48	D
G166	Rosemead Blvd (SR 19) and Washington Blvd	45.7	D	47.7	D
G167	E 26th St and Bandini Blvd[1]	10.9	B	21.1	C
G168	Garfield Ave and E 26th St[2]	>180	**F***	>180	**F***
G169	Serapis Ave and Slauson Ave	14.2	B	12.4	B
G170	Pioneer Blvd and Wheelock Cir[2]	11	B	18.3	B
G171	Pioneer Blvd and Rivera Rd[2]	--	--	--	--
G173	Passons Blvd and Rivera Rd	21.9	C	13.4	B
G174	Rosemead Blvd (SR 19) and Rex Rd	25.6	C	22.6	C
G175	Passons Blvd and Rex Rd[3]	24.2	C	16.1	C
G176	La Mirada Blvd and Rosecrans Ave	31.4	C	34.2	C
G177	Valley View Ave and Alondra Blvd	53.9	D	50	D
G178	Beach Blvd (SR 39) and Commonwealth Ave	25.8	C	30.8	C
G179	Wheelock Cir and Rivera Rd[2]	21.3	C	16.3	B
G180	Dodds Ave (West) and Stage Rd[2]	17.5	B	16.3	B
G197	Indiana St and Washington Blvd	21.3	C	16.3	B
G198	Oak St and Washington Blvd	17.5	B	16.3	B
G199	Arrowmill Ave and Washington Blvd	24.6	C	15.9	B
G200	Ayers Ave and Washington Blvd	19	B	17.6	B
G201	I-710 SB ramps and Washington Blvd[1]	20	C	24.1	C
G202	I-710 NB ramps and Washington Blvd[1]	35.1	D	41.9	D
G203	Atlantic Blvd and Sheila St	121.2	**F***	>180	**F***
G208	Downey Rd and E 26th St[2]	38.3	**E***	25.7	D
G210	Eastern Ave and Driveway[2]	98.5	**F***	145.1	**F***
G211	Telegraph Rd and Maple Ave[2]	25.5	D	46.5	**E***
N1	Firestone Blvd and Imperial Hwy[1]	64.4	**E***	61.9	**E***
N2	Pioneer Blvd and Florence Ave	42.2	D	34.4	C
N3	Pioneer Blvd and Imperial Hwy	37.7	D	40	D
N5	Norwalk Blvd and Telegraph Rd	44.9	D	42	D
N6	Norwalk Blvd and Florence Ave	42.5	D	41.9	D
N7	Norwalk Blvd and Imperial Hwy	57.8	**E***	174.7	**F***
N10	Bloomfield Ave/Santa Fe Springs Rd and Telegraph Rd	32.7	C	31.4	C

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N11	Bloomfield Ave and Florence Ave	40.2	D	37	D
N12	Bloomfield Ave and Lakeland Rd	24.5	C	21.9	C
N15	Bloomfield Ave and Imperial Hwy	49.8	D	54.3	D
N17	Transportation Center West and Imperial Hwy[1]	0	0	0	0
N18	Transportation Center East and Imperial Hwy[1]	25.6	C	26.2	C
N19	Shoemaker Ave and Florence Ave	29.2	C	27.6	C
N20	Shoemaker Ave/Adler Dr and Imperial Hwy	27.9	C	27.8	C
N21	Leffingwell Rd and Imperial Hwy	30.2	C	28.1	C
N22	Carmenita Rd and Telegraph Rd	47	D	47.3	D
N23	Carmenita Rd and Florence Ave	45.2	D	41.3	D
N24	Carmenita Rd and Leffingwell Rd	22	C	27	C
N25	Carmenita Rd and Imperial Hwy	42.2	D	42.6	D
N26	Telegraph Rd and Florence Ave/Mills Ave	45.4	D	49.6	D
N27	I-5 NB on-ramp and Imperial Hwy	49.8	D	25.5	C
N30	I-5 SB off-ramp and Imperial Hwy[1]	22.6	C	27.8	C
N31	Norwalk Blvd and I-5 NB ramps	34.1	C	31.1	C
N32	San Antonio Dr and I-5 SB on-ramp[1]	23.3	C	25.7	C
N33	Shoemaker Ave and Telegraph Rd	73.5	**E***	50.1	D
N34	Pioneer Blvd and Lakeland Rd	28	C	22.3	C
N35	Norwalk Blvd and Lakeland Rd	20.8	C	20.1	C
N36	I-605 SB ramps and Florence	72	**E***	50.5	D
N37	Studebaker Rd and Florence Ave[1]	34.7	C	41.6	D
N38	Studebaker Rd and I-605 NB ramps/Dollison Dr[1]	40.1	D	17.6	B
N40	Fairford Ave and Florence Ave	30	C	28.7	C
N41	I-5 NB off-ramp and Florence Ave	15.8	B	7.1	A
N42	Orr and Day Rd and Florence Ave[1]	29.7	C	26.2	C
N45	I-605 SB ramps/Flatbush Ave and Imperial Hwy[1]	27.5	C	53.8	D
N46	Hoxie Ave and Imperial Hwy[1]	45.2	D	69.2	**E***
N47	I-605 NB ramps and Hoxie Ave	28	C	39.5	D
N48	Studebaker Rd and I-105 ramps	39.7	D	31.5	C
N49	Studebaker Rd and Imperial Hwy	70.5	**E***	77.1	**E***
N50	Bloomfield Ave and Firestone Blvd (north)	6.9	A	11.5	B
N51	Bloomfield Ave and Firestone Blvd (south)	77.8	**E***	104.7	**F***
N52	Bloomfield Ave and Rosecrans Ave	47.7	D	50.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N53	I-5 NB off-ramp and Rosecrans Ave[1]	18.5	B	21.9	C
N54	I-5 SB on-ramp and Rosecrans Ave[1]	15.3	B	14.4	B
N55	Shoemaker Ave and Rosecrans Ave	45.2	D	50.3	D
N56	Shoemaker Ave and Overcrossing (south)[2]	20.2	C	154.3	**F***
N57	Shoemaker Ave and Firestone Blvd (south)[2]	10.7	B	12.4	B
N58	Carmenita Rd and Rosecrans Ave	46	D	55.9	**E***
N61	Carmenita Rd and I-5 NB ramps[1]	9.9	A	11.6	B
N62	Carmenita Rd and I-5 SB ramps[1]	9.1	A	12.1	B
N63	Norwalk Blvd and Civic Center Dr[1]	25.3	C	27.2	C
N64	Bloomfield Ave and Civic Center Dr	27	C	35.4	D
N65	Bloomfield Ave and Goller Ave/Foster Rd	27.7	C	38.3	D
N66	Shoemaker Ave and Foster Rd[3]	17.3	C	20.8	C
N67	Carmenita Rd and Orden Dr	16	B	23	C
N68	I-605 NB ramps and Rosecrans Ave	43.3	D	50.9	D
N69	I-605 SB ramps and Rosecrans Ave[1]	34.9	C	37.1	D
N70	Studebaker Rd and Rosecrans Ave	60.2	**E***	73.6	**E***
N71	Pioneer Blvd/San Antonio Dr and Rosecrans Ave[1]	102.3	**F***	86.4	**F***
N72	Shoemaker Ave and Lakeland Rd	20.1	C	21.9	C
N73	Carmenita Rd and Lakeland Rd	67.4	**E***	148.1	**F***
N74	Shoemaker Ave and Entrance/Adler Dr[2]	--	--	--	--
N145	Carmenita Rd and Foster Rd	18.1	B	13.9	B
F1	Euclid St and Malvern Ave	43.5	D	55.5	**E***
F2	Euclid St and Commonwealth Ave	41.1	D	44.4	D
F3	Highland Ave and Chapman Ave	14.5	B	18.7	B
F4	Highland Ave and Commonwealth Ave	20.6	C	24.2	C
F5	Highland Ave and Santa Fe Ave[2]	20.4	C	30.1	D
F6	Highland Ave and Truslow Ave[2]	22.7	C	24.7	C
F7	Highland Ave and Valencia Dr	17.1	B	15.8	B
F8	Highland Ave and Orangethorpe Ave	18.2	B	22	C
F9	Malden Ave and Chapman Ave[2]	>180	**F***	>180	**F***
F10	Malden Ave and Commonwealth Ave	19.5	B	99.4	**F***
F11	Harbor Blvd and Imperial Hwy (SR 90)	105.2	**F***	88.3	**F***
F12	Harbor Blvd and Bastanchury Rd	86.4	**F***	87.7	**F***
F13	Harbor Blvd and Valley View Dr/Brea Blvd[1]	39.7	D	50.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F14	Harbor Blvd and Berkeley Ave	35.6	D	32.1	C
F15	Harbor Blvd and Chapman Ave	80.3	**F***	74	**E***
F16	Harbor Blvd and Commonwealth Ave	74.7	**E***	44.8	D
F17	Harbor Blvd and Santa Fe Ave	151.2	**F***	161.3	**F***
F18	Harbor Blvd and Truslow Ave[2]	19.9	C	17.2	C
F19	Harbor Blvd and Orangethorpe Ave	38.2	D	48.6	D
F20	Harbor Blvd and SR 91 WB ramps	18.4	B	17.1	B
F21	Harbor Blvd and SR 91 EB ramps	22.7	C	28.1	C
F22	Brea Blvd and Bastanchury Rd	90	**F***	54.2	D
F23	Lemon St and Chapman Ave	46.6	D	55	**E***
F24	Lemon St and Commonwealth Ave	69.4	**E***	75.8	**E***
F25	Lemon St and Santa Fe Ave[2]	>180	**F***	11.7	B
F26	Lemon St and Orangethorpe Ave	62.8	**E***	96.2	**F***
F27	Lemon St and SR 91 WB ramps	43.8	D	52.3	D
F28	Anaheim Blvd/Lemon St and SR 91 EB ramps	65.8	**E***	40.6	D
F29	Raymond Ave and Chapman Ave	36.8	D	63.5	**E***
F30	Raymond Ave and Commonwealth Ave	24.9	C	25.6	C
F31	Raymond Ave and Orangethorpe Ave	31.9	C	35	C
F32	State College Blvd and Chapman Ave	46.2	D	90	**F***
F33	State College Blvd and Commonwealth Ave	104	**F***	75.9	**E***
F34	State College Blvd and Orangethorpe Ave	35.4	D	54.9	D
F35	Commonwealth Ave and Chapman Ave	23.6	C	41.7	D
F36	SR 57 SB ramps and Chapman Ave	17.9	B	27.2	C
F37	SR 57 NB ramps and Chapman Ave[1]	38.1	D	55	**E***
F38	Placentia Ave and Chapman Ave	49.1	D	66.7	**E***
F39	Euclid St and Valencia Dr	151.6	**F***	45.3	D
F40	Highland Ave and Walnut Ave	11.6	B	10.9	B
F41	Malden Ave and Santa Fe Ave[3]	13.4	B	12.1	B
F42	Malden Ave and Truslow Ave[2]	9.1	A	9.1	A
F43	Malden Ave and Valencia Dr[2]	15.7	C	12.8	B
F44	Harbor Blvd and Valencia Dr	25.5	C	15.2	B
F45	Lemon St and Walnut Ave[2]	>180	**F***	>180	**F***
F46	Lemon St and Valencia Dr	>180	**F***	>180	**F***
F47	Placentia Ave and Orangethorpe Ave	37.7	D	43.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F48	SR 57 SB ramps and Nutwood Ave[1]	59.6	**E***	39.4	D
F49	SR 57 SB ramps and Orangethorpe Ave[1]	31.1	C	28.1	C
F50	SR 57 NB ramps and Nutwood Ave[1]	52.7	D	28.5	C
F51	SR 57 NB ramps and Orangethorpe Ave	41.4	D	30	C
F52	Brea Blvd and Imperial Hwy (SR 90)	57	**E***	51	D
F53	State College Blvd and Yorba Linda Blvd[1]	48.2	D	34.6	C
F54	SR 57 SB off-ramp and Yorba Linda Blvd	26.9	C	24.6	C
F55	SR 57 NB off-ramp and Yorba Linda Blvd[1]	48.9	D	40.3	D
F56	Raymond Ave/East St and SR 91 EB ramps[1]	29.2	C	25	C
F57	Raymond Ave and SR 91 WB ramps[1]	26.9	C	14.1	B
F58	Euclid St and SR 91 WB ramps	20.8	C	23.6	C
F59	Euclid St and SR 91 EB ramps[1]	15.1	B	25	C
F60	State College Blvd and SR 91 EB ramps[1]	21.1	C	23.1	C
F61	State College Blvd and SR 91 WB ramps[1]	19.5	B	21.3	C
F161	Euclid St and Orangethorpe Ave	44.8	D	44.3	D
A1	Manchester Ave/I-5 SB ramps and Katella Ave	24.6	C	22	C
A2	Anaheim Way/I-5 NB ramps and Katella Ave[1]	24.2	C	32.3	C
A3	Lewis St and Katella Ave[1]	27.7	C	47.3	D
A4	I-5 HOV and Gene Autry Way[1]	22.8	C	25.7	C
A6	State College Blvd and Ball Rd	63.3	**E***	51.1	D
A7	State College Blvd and Winston Rd	11.9	B	21.1	C
A8	State College Blvd and Cerritos Ave	27.9	C	112.7	**F***
A9	State College Blvd and Howell Ave	67.3	**E***	158.5	**F***
A10	State College Blvd and Katella Ave[1]	37.2	D	39.6	D
A12	State College Blvd and Gene Autry Way	27	C	57.9	**E***
A14	State College Blvd and Orangewood Ave	58.5	**E***	69	**E***
A15	Stadium Crossing and Katella Ave[1]	31.1	C	33.2	C
A16	Sunkist St and Ball Rd	95.8	**F***	114.5	**F***
A17	Sunkist St and Cerritos Ave	25.2	C	148.4	**F***
A18	Howell Ave and Katella Ave[1]	34.7	C	110.4	**F***
A19	Rampart St and Orangewood Ave[1]	23.3	C	16.2	B
A20	SR 57 SB ramps and Ball Rd[1]	46.1	D	50.3	D
A21	SR 57 SB ramps and Katella Ave[1]	20.6	C	23.9	C
A22	SR 57 SB ramps and Orangewood Ave[1]	75.6	**E***	101.7	**F***

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A23	SR 57 SB ramps and Chapman Ave	22.5	C	33.6	C
A24	SR 57 NB ramps and Ball Rd	32.5	C	38	D
A25	SR 57 NB ramps and Katella Ave[1]	27.5	C	29.7	C
A26	SR 57 NB ramps and Orangewood Ave[1]	20.8	C	18.1	B
A27	SR 57 NB ramps and Chapman Ave[1]	13.1	B	11.6	B
A28	Douglass Rd and Katella Ave[1]	50.5	D	>180	**F***
A29	Struck Ave and Katella Ave[1]	4	A	54.7	D
A30	Main St and Ball Rd/Taft Ave[1]	57.1	**E***	36.3	D
A31	Main St and Katella Ave	33.7	C	30.3	C
A32	Main St and Struck Ave	13.4	B	20.6	C
A33	Main St and Collins Ave	23.3	C	29.1	C
A34	Main St and Orangewood Ave/Walnut Ave	96.4	**F***	74.6	**E***
A41	Anaheim Blvd and Ball Rd	34.3	C	60	**E***
A48	East St and Ball Rd	27.9	C	28.2	C
A51	Lewis St and Ball Rd	21	C	33.9	C
A52	Lewis St and Cerritos Ave	20.9	C	24.6	C
A53	Lewis St and Orangewood Ave	>180	**F***	82.9	**F***
A54	Lewis St and Chapman Ave	55.2	**E***	68	**E***
A55	Manchester Ave and Orangewood Ave	28.6	C	20.4	C
A56	The City Dr/State College Blvd and Chapman Ave	46.1	D	45.1	D
A57	Anaheim Way and Orangewood Ave	7.5	A	39.8	D
A58	Manchester Ave and Chapman Ave	170	**F***	28.8	C
A59	State College Blvd and I-5 SB off-ramp[1]	18.9	B	12.7	B
A60	I-5 SB on-ramp/NB off-ramp and Chapman Ave[1]	24.5	C	20.8	C
A61	State College Blvd and I-5 NB ramps[1]	23.3	C	41.9	D
A62	I-5 NB on-ramp/Rampart St and Chapman Ave	19.7	B	16.6	B
A63	Douglass Rd and ARTIC[1]	27.9	C	32.3	C
A64	Douglass Rd and Bus Entrance	26.3	C	16	B
A65	Douglass Rd and Parking Lot B[2]	8.6	A	8.7	A
A66	ARTIC Driveway and Katella Ave[2]	17.7	C	14.7	B
A69	Harbor Blvd and Ball Rd	55.3	**E***	72.1	**E***
A70	Harbor Blvd and I-5 NB ramps[1]	23.7	C	17	B
A71	Harbor Blvd and I-5 SB ramps	67.5	**E***	15.8	B
A72	Harbor Blvd and Katella Ave	30.4	C	40.8	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A79	Anaheim Blvd and Cerritos Ave	29.8	C	161.2	**F***
A80	Disneyland Dr and I-5 SB off-ramp	18.9	B	16.7	B
A81	Disneyland Dr and Ball Rd[1]	41.2	D	49.2	D
A82	Main St and Chapman Ave	44.6	D	55.9	**E***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "N" intersection number prefix indicates Norwalk/Santa Fe Springs Metrolink Station area; "F" intersection number prefix indicates Fullerton Metrolink/Amtrak Station area; "A" intersection number prefix indicates ARTIC station area.
[1] Delay is based on Highway Capacity Manual 2000 signalized intersection analysis because of Highway Capacity Manual 2010 analysis limitations.
[2] Two-way unsignalized intersection. The delay presented is for the worst minor approach delay.
[3] Four-way unsignalized intersection.
Amtrak = National Railroad Passenger Corporation; ARTIC = Anaheim Regional Transportation Intermodal Center; EB = eastbound; HOV = high-occupancy vehicle; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route; WB = westbound

Side-by-side LOS effect comparisons for the Horizon Year 2040 No Project condition and Horizon Year 2040 Plus Project condition with implementation of Shared Passenger Track Alternatives A and B are contained in Appendix E of this report. Roadway segment LOS effects are presented in Table E1-1 of Appendix E. Signalized intersection LOS effects are presented in Table E2-1 of Appendix E, and unsignalized intersection LOS effects are presented in Table E3-1 of Appendix E. These tables present the differences in V/C ratio (roadway segments) and control delay (intersections) and identify the roadway segments and intersections that meet the thresholds discussed in Section 4.4.3, High-Speed Rail Recommended Criteria. As detailed in Table 6-57, Table 6-58, and Table 6-59, respectively, Horizon Year 2040 Plus Project creates LOS effects through build out of either Shared Passenger Track Alternative A or B that meet the applicable thresholds at the following 20 roadway segments, 20 signalized intersections, and two unsignalized intersections.

Table 6-57 Major Roadway Segments: Horizon Year 2040 Impacts for Shared Passenger Track Alternatives A and B

Roadway	Segment Limits		Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		V/C Increase
	From	To		V/C	LOS	V/C	LOS	
Bandini Blvd	Downey Rd	Atlantic Blvd	AM	0.79	C	0.88	D	0.09
			PM	0.83	D	1	**F***	0.17
Carmenita Rd	Imperial Hwy	Orden Dr	AM	0.83	D	0.87	D	0.04
			PM	0.99	**E***	1.03	**F***	0.04
Studebaker Rd	Imperial Hwy	I-105	AM	0.91	**E***	0.99	**E***	0.08
			PM	0.87	D	0.95	**E***	0.08
Carmenita Rd	Orden Dr	Rosecrans Ave	AM	0.95	**E***	0.99	**E***	0.04
			PM	0.87	D	0.91	**E***	0.04
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	AM	0.95	**E***	0.99	**E***	0.04
			PM	0.95	**E***	0.99	**E***	0.04
Euclid St	Bastanchury Rd	Malvern Ave	AM	1.07	**F***	1.1	**F***	0.03
			PM	1.03	**F***	1.07	**F***	0.04

Roadway	Segment Limits		Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		V/C Increase
	From	To		V/C	LOS	V/C	LOS	
Euclid St	Malvern Ave	Commonwealth Ave	AM	0.99	**E***	1.02	**F***	0.03
			PM	0.95	**E***	0.99	**E***	0.04
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	AM	1.55	**F***	1.59	**F***	0.04
			PM	1.67	**F***	1.71	**F***	0.04
Harbor Blvd	Chapman Ave	Commonwealth Ave	AM	0.89	D	0.95	**E***	0.06
			PM	0.82	D	0.89	D	0.07
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	AM	1.19	**F***	1.23	**F***	0.04
			PM	1.23	**F***	1.27	**F***	0.04
Lemon St	Commonwealth Ave	Orangethorpe Ave	AM	1.24	**F***	1.45	**F***	0.21
			PM	1.41	**F***	1.61	**F***	0.20
Lemon St	Orangethorpe Ave	Orangefair Ave	AM	1.16	**F***	1.33	**F***	0.17
			PM	1.45	**F***	1.61	**F***	0.16
Chapman Ave	Harbor Blvd	Raymond Ave	AM	0.89	D	0.99	**E***	0.10
			PM	0.92	**E***	1.02	**F***	0.10
Chapman Ave	Raymond Ave	Acacia Ave	AM	0.95	**E***	1.05	**F***	0.10
			PM	1.12	**F***	1.22	**F***	0.10
Chapman Ave	Acacia Ave	State College Blvd	AM	1.39	**F***	1.51	**F***	0.12
			PM	1.75	**F***	1.87	**F***	0.12
Chapman Ave	State College Blvd	Commonwealth Ave	AM	1.39	**F***	1.43	**F***	0.04
			PM	1.75	**F***	1.79	**F***	0.04
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	AM	0.83	D	0.93	**E***	0.10
			PM	0.83	D	0.93	**E***	0.10
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	AM	1.03	**F***	1.07	**F***	0.04
			PM	1.19	**F***	1.23	**F***	0.04
Brea Blvd	Harbor Blvd	Bastanchury Rd	AM	0.91	**E***	0.95	**E***	0.04
			PM	0.99	**E***	1.03	**F***	0.04
Santa Fe Ave	Harbor Blvd	Lemon St	AM	0.2	A	0.9	D	0.70
			PM	0.3	A	1	**F***	0.70

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I- = Interstate; LOS = level of service; NB = northbound; SR = State Route; V/C = volume to capacity ratio

Table 6-58 Signalized Intersections: Horizon Year 2040 Impacts for Shared Passenger Track Alternatives A and B

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
G44	East St and Lincoln Ave	AM	41.6	D	71.3	**E***	29.7
		PM	70.1	**E***	79.7	**E***	9.6
G89	Garfield Ave and Washington Blvd	AM	60.3	**E***	67.8	**E***	7.5
		PM	49.1	D	55	D	5.9
G150	Beach Blvd (SR 39) and La Mirada Blvd/Malvern Ave	AM	49.3	D	56.1	**E***	6.8
		PM	46.4	D	46.9	D	0.5
N49	Studebaker Rd and Imperial Hwy	AM	66.2	**E***	70.5	**E***	4.3
		PM	74.1	**E***	77.1	**E***	3
N51	Bloomfield Ave and Firestone Blvd (south)	AM	72.9	**E***	77.8	**E***	4.9
		PM	104.6	**F***	104.7	**F***	0.1
N58	Carmenita Rd and Rosecrans Ave	AM	46	D	46	D	0
		PM	50.3	D	55.9	**E***	5.6
F10	Malden Ave and Commonwealth Ave	AM	15.6	B	19.5	B	3.9
		PM	48.3	D	99.4	**F***	>35
F11	Harbor Blvd and Imperial Hwy (SR 90)	AM	101.9	**F***	105.2	**F***	3.3
		PM	83.9	**F***	88.3	**F***	4.4
F15	Harbor Blvd and Chapman Ave	AM	71.2	**E***	80.3	**F***	9.1
		PM	63.4	**E***	74	**E***	10.6
F17	Harbor Blvd and Santa Fe Ave	AM	19.1	B	151.2	**F***	>35
		PM	23.6	C	161.3	**F***	>35
F23	Lemon St and Chapman Ave	AM	42.3	D	46.6	D	4.3
		PM	49.7	D	55	**E***	5.3
F24	Lemon St and Commonwealth Ave	AM	62.2	**E***	69.4	**E***	7.2
		PM	70.6	**E***	75.8	**E***	5.2
F26	Lemon St and Orangethorpe Ave	AM	49	D	62.8	**E***	13.8
		PM	76.8	**E***	96.2	**F***	19.4
F28	Anaheim Blvd/Lemon St and SR 91 EB ramps	AM	51.7	D	65.8	**E***	14.1
		PM	35.2	D	40.6	D	5.4
F29	Raymond Ave and Chapman Ave	AM	32.6	C	36.8	D	4.2
		PM	52	D	63.5	**E***	11.5
F32		AM	40.9	D	46.2	D	5.3

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
	State College Blvd and Chapman Ave	PM	70.2	**E***	90	**F***	19.8
F48	SR 57 SB ramps and Nutwood Ave[1]	AM	53.6	D	59.6	**E***	6
		PM	34.5	C	39.4	D	4.9
A14	State College Blvd and Orangewood Ave	AM	60.5	**E***	58.5	**E***	-2
		PM	61.2	**E***	69	**E***	7.8
A17	Sunkist St and Cerritos Ave	AM	25.2	C	25.2	C	0
		PM	140.6	**F***	148.4	**F***	7.8
A79	Anaheim Blvd and Cerritos Ave	AM	29.8	C	29.8	C	0
		PM	156.8	**F***	161.2	**F***	4.4

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "N" intersection number prefix indicates Norwalk/Santa Fe Springs Metrolink Station area; "F" intersection number prefix indicates Fullerton Metrolink/Amtrak Station area; "A" intersection number prefix indicates Anaheim Regional Transportation Intermodal Center station area.
[1] Delay is based on Highway Capacity Manual 2000 signalized intersection analysis, because of Highway Capacity Manual 2010 analysis limitations.
Amtrak = National Railroad Passenger Corporation; EB = eastbound; LOS = level of service; SB = southbound; sec = seconds; SR = State Route

Table 6-59 Unsignalized Intersections: Horizon Year 2040 Impacts for Shared Passenger Track Alternatives A and B

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
G210	Eastern Ave and Driveway[1]	AM	84.9	**F***	98.5	**F***	13.6
		PM	>180	**F***	145.1	**F***	-34.9
F9	Malden Ave and Chapman Ave[1]	AM	162.3	**F***	>180	**F***	17.7
		PM	>180	**F***	>180	**F***	0

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "F" intersection number prefix indicates intersections within the Fullerton Metrolink/Amtrak Station area.
[1] Two-way unsignalized intersection. The delay presented is for the worst minor approach delay.
Amtrak = National Railroad Passenger Corporation; LOS = level of service; sec = seconds

Of the 252 roadway segments, 265 signalized intersections, and 37 unsignalized intersections evaluated along the project section alignment and at station areas, the following one roadway segment and three unsignalized intersections would improve from either LOS E to LOS D (or higher) or LOS F to LOS E (or higher) in the Plus Project scenario for Shared Passenger Track Alternatives A and B:

- Soto Street, from East 26th Street to Washington Boulevard
- G208, Downey Road and East 26th Street
- G211, Telegraph Road and Maple Avenue
- F25, Lemon Street and Santa Fe Avenue

Two intersections (G170, Pioneer Boulevard and Wheelock Circle and G211, Telegraph Road and Maple Avenue) would be upgraded to a signalized intersection in the Plus Project condition, which would result in improved overall LOS.

In addition, in Horizon Year 2040, there would be an increase in passenger trains passing through the eight at-grade crossings in Anaheim, with the addition of up to four HSR trains per hour. These eight at-grade-crossing locations are Orangethorpe Avenue, La Palma Avenue, Sycamore Street, Broadway, Santa Ana Street, South Street, Vermont Avenue, and Ball Road. The Authority studied the potential effect to gate down time at these locations that would result from introducing HSR service (STV 2025) and determined that each HSR train crossing would be similar in duration to current Metrolink or Amtrak crossings at the foregoing locations. Future HSR crossings would primarily occur as isolated events (as opposed to multi-train gate-down-time events), due to the anticipated clockface schedule with which the passenger trains would operate. The clockface schedule is expected to result in 15-minute peak headways to account for the two HSR trains, one Metrolink train, and one Amtrak train per hour per direction. Additionally, the at-grade crossings are far enough from adjacent traffic signals to prevent queues from backing up to the traffic signals. Furthermore, in the rare instance that a multi-train gate-down-time event occurs through an HSR train and BNSF train passing in immediate succession, such instances would not exacerbate existing gate down times from multi-train events involving BNSF and passenger rail trains that already occur. Overall, the addition of HSR train operations would not lead to additional traffic delays at adjacent intersections.

6.4.1.2 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040), LAUS Area

Permanent future traffic analyses were conducted at the LAUS area using the Horizon year Plus Project traffic analysis calculated in Section 6.7.1.1 as the basis for projecting future volumes, with the added trips calculated in Section 6.3, Shared Passenger Track Alternatives: Project Trip Generation and Distribution.

The LAUS area Plus Project analysis was performed and provided in Burbank to Los Angeles Project Section EIS/EIR but provided below for reference. Roadway segment Plus Project analysis and intersection Plus Project analysis was performed in the LAUS area for the Phase 1 Horizon Year 2040 condition. Roadway segment Plus Project analysis performed in the LAUS area is provided in Table 6-60. Intersection Plus Project analysis performed in the LAUS area is provided in Table 6-61. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. Of the 3 roadway segments analyzed, none are LOS E or F in the AM peak hour, and none are LOS E or F in the PM peak hour. Of the 86 intersections and 1 new intersection analyzed, 13 are LOS E or F in the AM peak hour, and 15 are LOS E or F in the PM peak hour.

Table 6-60 Major Roadway Segment Level of Service: LAUS, Horizon Year 2040 Plus Project

Roadway	From	To	Change in Geometry or Volume from No Project Scenario (Y/N)	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Main St	Los Angeles River	E Victoria Street	Y	3,000	1,743	1,492	0.58	0.50	A	A
Main St	Los Angeles River	E DelAmo Blvd	Y	3,000	1,742	1,422	0.58	0.47	A	A

Roadway	From	To	Change in Geometry or Volume from No Project Scenario (Y/N)	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Ave 19	North of Figueroa St (bridge)	---	Y	1,250	1,840	1,371	1.47	1.10	**F***	**F***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LAUS = Los Angeles Union Station; LOS = level of service; veh/hr = vehicle per hour; V/C = volume to capacity ratio; Y/N = yes or no

Table 6-61 Intersection Level of Service: LAUS, Horizon Year 2040 Plus Project

No.	Intersection	Change in Geometry or Volume from No Project Scenario (Y/N)	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L157	Sotello St & Spring St[2]	Y	13.6	B	21.8	C
L158	Hill St & College St	Y	16.6	B	26.4	C
L159	Broadway & College St	Y	17.7	B	57.8	**E***
L160	Spring St/Alameda St & College St	Y	21.2	C	15.6	B
L161	Main St & College St[2]	Y	> 180	**F***	> 180	**F***
L162	Elmyra St & Main St[2]	Y	> 180	**F***	155.2	**F***
L163	Sotello St & Main St[2]	Y	55.0	**F***	> 180	**F***
L164	Wilhardt St & Main St[4]	Y	---	---	---	---
L165	Figueroa St & Figueroa Ter[3]	Y	20.8	C	16.1	C
L166	Figueroa St & Alpine St[1]	Y	18.1	B	23.8	C
L167	Hill St & Alpine St	Y	8.6	A	8.3	A
L168	Broadway & Alpine St	Y	14.6	B	11.3	B
L169	Alameda St & Alpine St	Y	11.1	B	25.2	C
L170	Main St & Alpine St	Y	27.2	C	78.2	**E***
L171	Vignes St & Bauchet St	Y	4.8	A	7.4	A
L172	Hill St & Ord St	Y	56.3	**E***	10.5	B
L173	Alameda St & Main St/Ord St[2]	Y	148.6	**F***	22.5	C
L174	Figueroa St & Sunset Blvd/Cesar E Chavez Ave	Y	40.3	D	33.6	C
L175	Grand Ave & Cesar E Chavez Ave	Y	99.4	**F***	48.5	D
L176	Broadway & Cesar E Chavez Ave	Y	> 180	**F***	74.4	**E***
L177	New High St/Spring St & Cesar E Chavez Ave	Y	18.9	B	12.2	B
L178	Main St & Cesar E Chavez Ave	Y	3.2	A	9.0	A
L179	Alameda St & Cesar E Chavez Ave	Y	24.5	C	27.2	C
L180	Vignes St & Cesar E Chavez Ave	Y	35.0	C	52.4	D

No.	Intersection	Change in Geometry or Volume from No Project Scenario (Y/N)	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L181	Figueroa St & Temple St	Y	> 180	**F***	> 180	**F***
L182	Broadway & US 101 NB on-ramp[1]	Y	5.4	A	8.4	A
L183	Broadway & Arcadia St	Y	20.9	C	14.6	B
L184	Broadway & Aliso St	Y	12.1	B	10.3	B
L185	Spring St & US 101 NB off-ramp[2]	Y	12.0	B	9.9	A
L186	Spring St & Arcadia St	Y	25.4	C	> 180	**F***
L187	Spring St & Aliso St[1]	Y	0.1	A	0.1	A
L188	Alameda St & Paseo de la Plaza[1]	Y	10.9	B	14.4	B
L189	Alameda St & Arcadia St/US 101 NB off-ramp	Y	39.6	D	10.6	B
L190	Alameda St & Aliso St/Commercial St[1]	Y	20.7	C	55.5	**E***
L191	Vignes St & Gateway Plaza/Ramirez St	Y	167.5	**F***	122.5	**F***
L192	Garey St/US 101 SB ramps & Commercial St	Y	39.3	D	117.7	**F***
L193	Center St & Commercial St[3]	Y	21.4	C	80.6	**F***
L194	Garey St & Ducommun St[2]	Y	10.3	B	12.8	B
L195	Judge John Aiso St & Temple St	Y	26.6	C	24.2	C
L196	Alameda St & Temple St	Y	28.3	C	26.5	C
L197	Garey St & Temple St[3]	Y	12.4	B	12.6	B
L198	Vignes St & Temple St[3]	Y	12.1	B	9.6	A
L199	Center St & Temple St[2]	Y	17.1	C	17.7	C
L200	Broadway & 1st St	Y	14.9	B	14.6	B
L201	Main St & 1st St	Y	9.7	A	13.7	B
L202	Alameda St & 1st St	Y	29.1	C	30.4	C
L203	Vignes St & 1st St	Y	38.1	D	32.3	C
L204	Alameda St & 2nd St	Y	26.5	C	21.6	C
L205	Alameda St & 3rd St/4th Pl	Y	34.2	C	25.4	C
L206	Alameda St & 4th St	Y	12.6	B	30.1	C
L207	San Fernando Rd & Ave 26	Y	19.5	B	23.9	C
L208	CA-110 SB on-ramp & Figueroa St	Y	12.9	B	19.9	B
L209	CA-110 NB off-ramp & Figueroa St	Y	10.7	B	15.3	B
L210	Ave 26 & Figueroa St	Y	45.2	D	37.2	D
L211	Ave 26 & I-5 SB on-ramp	Y	1.3	A	0.4	A
L212	Ave 26 & CA-110 NB on-ramp	Y	1.8	A	2.6	A
L213	Ave 26 & I-5 NB off-ramp	Y	9.3	A	10.3	B

No.	Intersection	Change in Geometry or Volume from No Project Scenario (Y/N)	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L214	Pasadena Ave & Broadway	Y	>180	**F***	15.0	B
L215	Ave 18 & Pasadena Ave	Y	29.7	C	13.5	B
L216	I-5 SB ramps/Ave 21 & Pasadena Ave	Y	12.8	B	13.6	B
L217	I-5 NB ramps & Pasadena Ave	Y	18.9	B	12.4	B
L218	Ave 18 & Spring St/Broadway	Y	163.4	**F***	22.6	C
L219	Ave 20 & Broadway	Y	11.8	B	14.3	B
L220	Ave 21 & I-5 SB ramps/Broadway	Y	18.9	B	17.4	B
L221	I-5 NB ramps/Ave 21 & Broadway	Y	23.8	C	16.8	B
L222	Daly St & Broadway	Y	32.8	C	26.2	C
L223	Gibbons St & Main St	Y	8.5	A	8.6	A
L224	Ave 20 & Main St	Y	9.7	A	11.0	B
L225	Daly St & Main St	Y	83.7	**F***	48.6	D
L226	Mission Rd & Cesar E Chavez Ave	Y	>180	**F***	88.2	**F***
L227	Richmond St & Mission Rd[2]	Y	38.3	D	17.9	B
L228	I-5 SB ramps & Mission Rd	Y	31.7	C	22.7	C
L229	Marengo St & Mission Rd	Y	41.3	D	25.4	C
L230	I-5 NB on-ramp & Marengo St	Y	16.4	C	7.8	A
L231	State St & Marengo St	Y	72.4	**E***	23.4	C
L232	Mission Rd & US 101 NB ramps	Y	14.8	B	8.0	A
L233	Mission Rd & Aliso St/US 101 SB ramps	Y	18.4	B	20.4	C
L234	Pleasant Ave & I-10 EB ramps/Kearney St[2]	Y	> 180	**F***	> 180	**F***
L235	State St & I-10 WB off-ramp	Y	12.0	B	7.8	A
L236	State St & I-10 EB ramps	Y	11.0	B	18.7	B
L237	US 101 SB on-ramp/Pecan St & 1st St[2]	Y	14.0	B	20.0	C
L238	US 101 NB ramps & 1st St	Y	20.5	C	21.7	C
L239	US 101 SB on-ramp/Pecan St & 4th St[1]	Y	> 180	**F***	120.5	**F***
L240	US 101 SB off-ramp & 4th St[1]	Y	> 180	**F***	8.4	A
L241	US 101 NB off-ramp & 4th St[1]	Y	> 180	**F***	56.0	**E***
L242	Alameda St & Newton St (I-10 WB on-ramp)	Y	16.7	C	> 180	**F***
L243	Alameda St & I-10 EB On-/off-ramps	Y	20.2	C	20.8	C
L1013	Main St & Clover St/Avenue 17	Y	43.9	D	26.8	C

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection

[4] Intersection closed in Plus Project scenario.
L intersection number prefix indicates intersections within LAUS area.
CA 110 = State Route 110; EB = eastbound; HCM = Highway Capacity Manual; I = Interstate; LAUS = Los Angeles Union Station; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; US 101 = U.S. Highway 101; WB = westbound; Y/N = yes or no

Table 6-62, Table 6-63, and Table 6-64 contain side-by-side comparisons of effects for roadway segments, signalized intersections, and unsignalized intersections, respectively. These tables present locations at which there was a change on geometry or volumes between the No Project and Plus Project scenarios for the Phase 1 Horizon Year 2040 baseline, as well as the difference in V/C ratio (roadway segments) or control delay (intersections), and whether these conditions meet the thresholds discussed in Section 4.4.3.

Table 6-62 Major Roadway Segments: LAUS, Horizon Year 2040 Effects

Roadway	Segment Limits		Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
	From	To		V/C	LOS	V/C	LOS	V/C Increase	Y/N
Main St	east of Los Angeles River	---	AM	0.58	A	0.58	A	0.00	N
			PM	0.50	A	0.50	A	0.00	
Main St	west of Los Angeles River	---	AM	0.58	A	0.58	A	0.00	N
			PM	0.47	A	0.47	A	0.00	
Ave 19	north of Figueroa St (bridge)	---	AM	1.47	**F***	1.47	**F***	0.00	N
			PM	1.10	**F***	1.10	**F***	0.00	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LAUS = Los Angeles Union Station; LOS = level of service; V/C = volume to capacity ratio; Y/N = yes or no

Table 6-63 Signalized Intersections: LAUS, Horizon Year 2040 Effects

No.	Intersection	Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L158	Hill St & College St	AM	15.8	B	16.6	B	0.8	N
		PM	25.7	C	26.4	C	0.7	
L159	Broadway & College St	AM	18.1	B	17.7	B	-0.4	N
		PM	58.2	**E***	57.8	**E***	-0.4	
L159	Spring St/Alameda St & College St	AM	21.6	C	21.2	C	-0.4	N
		PM	15.5	B	15.6	B	0.1	
L166	Figueroa St & Alpine St[1]	AM	18.1	B	18.1	B	0.0	N
		PM	23.4	C	23.8	C	0.4	
L167	Hill St & Alpine St	AM	8.7	A	8.6	A	-0.1	N
		PM	8.3	A	8.3	A	0.0	
L168	Broadway & Alpine St	AM	13.9	B	14.6	B	0.7	N
		PM	12.0	B	11.3	B	-0.7	

No.	Intersection	Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L169	Alameda St & Alpine St	AM	11.4	B	11.1	B	-0.3	N
		PM	23.2	C	25.2	C	2.0	
L170	Main St & Alpine St	AM	26.6	C	27.2	C	0.6	N
		PM	76.4	**E***	78.2	**E***	1.8	
L171	Vignes St & Bauchet St	AM	4.8	A	4.8	A	0.0	N
		PM	7.4	A	7.4	A	0.0	
L172	Hill St & Ord St	AM	59.8	**E***	56.3	**E***	-3.5	N
		PM	9.1	A	10.5	B	1.4	
L174	Figueroa St & Sunset Blvd/Cesar E Chavez Ave	AM	39.5	D	40.3	D	0.8	N
		PM	34.3	C	33.6	C	-0.7	
L175	Grand Ave & Cesar E Chavez Ave	AM	85.9	**F***	99.4	**F***	13.5	Y
		PM	39.9	D	48.5	D	8.6	
L176	Broadway & Cesar E Chavez Ave	AM	> 180	**F***	> 180	**F***	> 55[2,3]	Y
		PM	51.2	D	74.4	**E***	23.2	
L177	New High St/Spring St & Cesar E Chavez Ave	AM	18.7	B	18.9	B	0.2	N
		PM	11.7	B	12.2	B	0.5	
L178	Main St & Cesar E Chavez Ave	AM	3.6	A	3.2	A	-0.4	N
		PM	13.0	B	9.0	A	-4.0	
L179	Alameda St & Cesar E Chavez Ave	AM	20.0	B	24.5	C	4.5	N
		PM	26.5	C	27.2	C	0.7	
L180	Vignes St & Cesar E Chavez Ave	AM	37.7	D	35.0	C	-2.7	N
		PM	38.4	D	52.4	D	14.0	
L181	Figueroa St & Temple St	AM	> 180	**F***	> 180	**F***	9.7 [2]	Y
		PM	> 180	**F***	> 180	**F***	4.3 [2]	
L182	Broadway & US 101 NB on-ramp	AM	5.1	A	5.4	A	0.3	N
		PM	7.8	A	8.4	A	0.6	
L183	Broadway & Arcadia St	AM	18.4	B	20.9	C	2.5	N
		PM	14.7	B	14.6	B	-0.1	
L184	Broadway & Aliso St	AM	11.9	B	12.1	B	0.2	N
		PM	15.5	B	10.3	B	-5.2	
L186	Spring St & Arcadia St	AM	25.4	C	25.4	C	0.0	N
		PM	> 180	**F***	> 180	**F***	-18.0 [2]	
L187	Spring St & Aliso St	AM	0.1	A	0.1	A	0.0	N
		PM	0.1	A	0.1	A	0.0	

No.	Intersection	Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L188	Alameda St & Paseo de la Plaza	AM	10.8	B	10.9	B	0.1	N
		PM	14.1	B	14.4	B	0.3	
L189	Alameda St & Arcadia St/US 101 NB off-ramp	AM	35.1	D	39.6	D	4.5	N
		PM	10.6	B	10.6	B	0.0	
L190	Alameda St & Aliso St/Commercial St	AM	20.1	C	20.7	C	0.6	Y
		PM	43.1	D	55.5	**E***	12.4	
L191	Vignes St & Gateway Plaza/Ramirez St	AM	> 180	**F***	167.5	**F***	-25.1[2]	Y
		PM	113.5	**F***	122.5	**F***	9.0	
L192	Garey St/US 101 SB ramps & Commercial St	AM	38.9	D	39.3	D	0.4	Y
		PM	58.9	**E***	117.7	**F***	> 55 [3]	
L195	Judge John Aiso St & Temple St	AM	26.0	C	26.6	C	0.6	N
		PM	24.3	C	24.2	C	-0.1	
L196	Alameda St & Temple St	AM	27.9	C	28.3	C	0.4	N
		PM	27.6	C	26.5	C	-1.1	
L200	Broadway & 1st St	AM	14.9	B	14.9	B	0.0	N
		PM	14.6	B	14.6	B	0.0	
L201	Main St & 1st St	AM	12.5	B	9.7	A	-2.8	N
		PM	13.7	B	13.7	B	0.0	
L202	Alameda St & 1st St	AM	26.2	C	29.1	C	2.9	N
		PM	30.4	C	30.4	C	0.0	
L203	Vignes St & 1st St	AM	37.0	D	38.1	D	1.1	N
		PM	32.0	C	32.3	C	0.3	
L204	Alameda St & 2nd St	AM	26.0	C	26.5	C	0.5	N
		PM	19.1	B	21.6	C	2.5	
L205	Alameda St & 3rd St/4th Pl	AM	33.9	C	34.2	C	0.3	N
		PM	25.3	C	25.4	C	0.1	
L206	Alameda St & 4th St	AM	12.5	B	12.6	B	0.1	N
		PM	30.1	C	30.1	C	0.0	
L207	San Fernando Rd & Ave 26	AM	19.4	B	19.5	B	0.1	N
		PM	30.7	C	23.9	C	-6.8	
L208	CA-110 SB on-ramp & Figueroa St	AM	12.9	B	12.9	B	0.0	N
		PM	19.3	B	19.9	B	0.6	
L209	CA-110 SB on-ramp & Figueroa St	AM	10.6	B	10.7	B	0.1	N
		PM	15.3	B	15.3	B	0.0	

No.	Intersection	Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L210	Ave 26 & Figueroa St	AM	41.1	D	45.2	D	4.1	N
		PM	36.9	D	37.2	D	0.3	
L213	Ave 26 & I-5 NB off-ramp	AM	9.3	A	9.3	A	0.0	N
		PM	10.4	B	10.3	B	-1.0	
L214	Pasadena & Broadway	AM	161.3	**F***	>180	**F***	350	Y
		PM	16.0	B	15.0	B	-1.0	
L215	Ave 18 & Pasadena Ave	AM	29.9	C	29.7	C	-0.2	N
		PM	13.7	B	13.5	B	-0.2	
L216	I-5 SB ramps/Ave 21 & Pasadena Ave	AM	12.8	B	12.8	B	0.0	N
		PM	17.4	B	13.6	B	-3.8	
L217	I-5 NB ramps & Pasadena Ave	AM	15.2	B	18.9	B	3.7	N
		PM	11.3	B	12.4	B	1.1	
L218	Ave 18 & Spring St/Broadway	AM	167.8	**F***	163.4	**F***	-4.4	N
		PM	21.1	C	22.6	C	1.5	
L219	Ave 20 & Broadway	AM	11.8	B	11.8	B	0.0	N
		PM	9.9	A	14.3	B	4.4	
L220	Ave 21 & I-5 SB ramps/Broadway	AM	19.3	B	18.9	B	-0.4	N
		PM	22.5	C	17.4	B	-5.1	
L221	I-5 NB ramps/Ave 21 & Broadway	AM	23.8	C	23.8	C	0.0	N
		PM	16.7	B	16.8	B	0.1	
L222	Daly St & Broadway	AM	33.6	C	32.8	C	-0.8	N
		PM	27.4	C	26.2	C	-1.2	
L223	Ave 20 & Main St	AM	10.0	A	9.7	A	-0.3	N
		PM	11.0	B	11.0	B	0.0	
L225	Daly St & Main St	AM	81.6	**F***	83.7	**F***	2.1	N
		PM	48.0	D	48.6	D	0.6	
L226	Mission Rd & Cesar E Chavez Ave	AM	>180	**F***	>180	**F***	62.2	Y
		PM	63.0	**F***	88.2	**F***	32.2	
L228	I-5 SB ramps & Mission Rd	AM	31.7	C	31.7	C	0.0	N
		PM	22.6	C	22.7	C	0.1	
L229	Marengo St & Mission Rd	AM	40.9	D	41.3	D	0.4	N
		PM	25.0	C	25.4	C	0.4	
L231	State St & Marengo	AM	49.8	D	72.4	**E***	22.6	Y
		PM	23.0	C	23.4	C	0.4	

No.	Intersection	Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L232	Mission Rd & US 101 NB ramps	AM	12.3	B	14.8	B	2.5	N
		PM	7.1	A	8.0	A	0.9	
L233	Mission Rd & Aliso St/US 101 SB ramps	AM	16.3	B	18.4	B	2.1	N
		PM	14.3	B	20.4	C	6.1	
L235	State St & I-10 WB off-ramp	AM	12.0	B	12.0	B	0.0	N
		PM	7.7	A	7.8	A	0.1	
L236	State St & I-10 EB ramps	AM	11.0	B	11.0	B	0.0	N
		PM	18.7	B	18.7	B	0.0	
L238	US 101 NB ramps & 1st St	AM	22.9	C	20.5	C	-2.4	N
		PM	21.7	C	21.7	C	0.0	
L239	US 101 SB on-ramp/Pecan St & 4th St	AM	> 180	**F***	> 180	**F***	6.3 [2]	Y
		PM	79.9	**E***	120.5	**F***	40.6	
L240	US 101 SB off-ramp & 4th St	AM	> 180	**F**	> 180	**F***	7.0 [2]	Y
		PM	7.9	A	8.4	A	0.5	
L241	US 101 NB off-ramp & 4th St	AM	> 180	**F***	> 180	**F***	7.3 [2]	Y
		PM	70.3	**E***	56.0	**E***	-14.3	
L243	Alameda St & I-10 EB On-/off-ramps	AM	19.9	B	20.2	C	0.3	N
		PM	20.6	C	20.8	C	0.2	
L1013	Main St & Clover St/Avenue 17[1]	AM	---	---	43.9	D	---	---
		PM	---	---	26.8	C	---	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] New intersection in Plus Project scenario.
[2] Control delay in No Project or Plus Project scenario is greater than 180 seconds.
[3] Control delay increase exceeds 55 seconds.
L intersection number prefix indicates intersections within LAUS area.
CA 110 = State Route 110; EB = eastbound; I = Interstate; LAUS = Los Angeles Union Station; LOS = level of service; NB = northbound; SB = southbound; sec = second; US 101 = U.S. Highway 101; WB = westbound; Y/N = yes or no

Table 6-64 Unsignalized Intersections: LAUS, Horizon Year 2040 Effects

No.	Intersection	Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L157	Sotello St & Spring St	AM	13.5	B	13.6	B	0.1	N
		PM	21.7	C	21.8	C	0.1	
L161	Main St & College St	AM	> 180	**F***	> 180	**F***	> 35[2,3]	Y
		PM	> 180	**F***	> 180	**F***	0.0[2]	

No.	Intersection	Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L162	Elmyra St & Main St	AM	> 180	**F***	> 180	**F***	23.0[2]	Y
		PM	146.1	**F***	155.2	**F***	9.1	
L163	Sotello St & Main St	AM	45.8	**E***	55.0	**F****	9.2	Y
		PM	91.7	**F***	> 180	**F**	> 35[2,3]	
L164	Wilhardt St & Main St[1]	AM	48.2	**E***	---	---	---	---
		PM	50.1	**F***	---	---	---	
L165	Figueroa St & Figueroa Ter	AM	19.8	C	20.8	C	1.0	N
		PM	15.8	C	16.1	C	0.3	
L173	Alameda St & Main St/Ord St	AM	141.9	**F***	148.6	**F***	6.7	Y
		PM	22.4	C	22.5	C	0.1	
L185	Spring St & US 101 NB off-ramp	AM	11.9	B	12.0	B	0.1	N
		PM	9.9	A	9.9	A	0.0	
L193	Center St & Commercial St	AM	18.5	C	21.4	C	2.9	Y
		PM	48.4	**E***	80.6	**F***	32.2	
L194	Garey St & Ducommun St	AM	10.3	B	10.3	B	0.0	N
		PM	12.7	B	12.8	B	0.1	
L197	Garey St & Temple St	AM	12.4	B	12.4	B	0.0	N
		PM	12.3	B	12.6	B	0.3	
L198	Vignes St & Temple St	AM	11.8	B	12.1	B	0.3	N
		PM	9.5	A	9.6	A	0.1	
L199	Center St & Temple St	AM	13.0	B	17.1	C	4.1	N
		PM	14.2	B	17.7	C	3.5	
L211	Ave 26 & I-5 SB on-ramp	AM	1.3	A	1.3	A	0.0	N
		PM	0.4	A	0.4	A	0.0	
L212	Ave 26 & CA-110 NB on-ramp	AM	1.8	A	1.8	A	0.0	N
		PM	2.6	A	2.6	A	0.0	
L223	Gibbons St & Main St	AM	24.1	C	8.5	A	-15.6	N
		PM	32.6	D	8.6	A	-24.0	
L227	Richmond St & Mission Rd	AM	38.0	D	38.3	D	0.3	N
		PM	17.9	B	17.9	B	0.0	
L230	I-5 NB on-ramp & Marengo St	AM	16.4	C	16.4	C	0.0	N
		PM	7.8	A	7.8	A	0.0	
L234	Pleasant Ave & I-10 EB ramps/Kearney St	AM	> 180	**F***	> 180	**F***	34.1[2]	Y
		PM	> 180	**F***	> 180	**F***	> 35[2,3]	

No.	Intersection	Peak Hour	Horizon Year 2040 No Project		Horizon Year 2040 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L237	US 101 SB on-ramp/Pecan St & 1st St	AM	13.8	B	14.0	B	0.2	N
		PM	20.0	C	20.0	C	0.0	
L242	Alameda St & Newton St (I-10 WB on-ramp)	AM	15.5	C	16.7	C	1.2	N
		PM	>180	**F***	>180	**F***	0.0	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Intersection closed in Plus Project scenario.
[2] Control delay in No Project or Plus Project scenario is greater than 180 seconds.
[3] Control delay increase exceeds 35 seconds.
L intersection number prefix indicates intersections within LAUS area.
CA 110 = State Route 110; EB = eastbound; I = Interstate; LAUS = Los Angeles Union Station; LOS = level of service; NB = northbound; SB = southbound; sec = second; US 101 = U.S. Highway 101; WB = westbound; Y/N = yes or no

Horizon Year 2040 Plus Project creates effects that meet thresholds at 12 signalized intersections and 6 unsignalized intersections at the following study locations:

- L175, Grand Avenue and Cesar E Chavez Avenue
- L176, Broadway and Cesar E Chavez Avenue
- L181, Figueroa Street and Temple Street
- L190, Alameda Street and Aliso Street/Commercial Street
- L191, Vignes Street and Gateway Plaza/Ramirez Street
- L192, Garey Street/US 101 southbound ramps and Commercial Street
- L214, Pasadena Avenue and Broadway
- L226, Mission Road and Cesar E Chavez Avenue
- L231, State Street and Marengo Street
- L239, US 101 southbound on-ramp/Pecan Street and Fourth Street
- L240, US 101 southbound off-ramp and Fourth Street
- L241, US 101 northbound off-ramp and Fourth Street
- L161, Main Street and College Street
- L162, Elmyra Street and Main Street
- L163, Sotello Street and Main Street
- L173, Alameda Street and Main Street/Ord Street
- L193, Center Street and Commercial Street
- L234, Pleasant Avenue and I-10 eastbound ramps/Kearney Street

Of the three roadway segments and 86 intersections compared, none of the study locations improved from LOS E or F in the Plus Project scenario.

6.4.1.3 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040), Norwalk/Santa Fe Springs High-Speed Rail Station Option

Permanent future traffic analyses were conducted using the Horizon year Plus Project traffic analysis calculated in Section 6.7.1.1 as the basis for projecting future volumes, with the added trips calculated in Section 6.3Shared Passenger Track Alternatives: Project Trip Generation and Distribution. Roadway segment Plus Project analysis and intersection Plus Project analysis were performed for the Phase 1 Horizon Year 2040 condition with inclusion of the Norwalk/Santa Fe Springs HSR Station Option. The roadway segment effect analyses along the project section alignment and at the station areas is provided in Table 6-65. Intersection effect analyses along the project section alignment and at station areas is provided in Table 6-66. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B.

Table 6-65 Horizon Year 2040 Plus Project Major Roadway Segment Level of Service for Norwalk/Santa Fe Springs High-Speed Rail Station Option

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Vermont Ave	East St	State College Blvd	998	800	800	0.8	0.8	C	C
South St	East St	State College Blvd	950	100	100	0.11	0.11	A	A
Santa Ana St	East St	State College Blvd	950	800	800	0.84	0.84	D	D
Broadway	East St	State College Blvd	3,045	1,400	1,400	0.46	0.46	A	A
Sycamore St	East St	State College Blvd	950	100	100	0.11	0.11	A	A
Harbor Blvd	La Palma Ave	Lincoln Ave	3,045	2,900	2,900	0.95	0.95	**E***	**E***
Harbor Blvd	Lincoln Ave	Ball Rd	2,520	2,600	2,800	1.03	1.11	**F***	**F***
La Palma Ave	Harbor Blvd	East St	3,045	2,000	2,200	0.66	0.72	B	C
La Palma Ave	East St	State College Blvd	2,520	1,900	2,600	0.75	1.03	C	**F***
Lincoln Ave	Anaheim Blvd	East St	5,198	2,500	2,700	0.48	0.52	A	A
Lincoln Ave	East St	State College Blvd	2,520	2,900	3,500	1.15	1.39	**F***	**F***
Soto St	E 26th St	Washington Blvd	2,835	2,300	2,500	0.81	0.88	D	D
Downey Rd	Bandini Blvd	Washington Blvd	3,045	2,700	3,400	0.89	1.12	D	**F***
E 26th St	Downey Rd	Bandini Blvd	998	900	1,300	0.9	1.3	D	**F***
Atlantic Blvd	Bandini Blvd	Washington Blvd	2,835	2,100	2,400	0.74	0.85	C	D
Eastern Ave	Bandini Blvd	Commerce Way	2,835	1,700	1,800	0.6	0.63	A	B
Telegraph Rd	Garfield Ave	Washington Blvd	2,835	1,200	1,400	0.42	0.49	A	A
Garfield Ave	Telegraph Rd	Washington Blvd	2,415	2,800	2,400	1.16	0.99	**F***	**E***
Greenwood Ave	Union St	Washington Blvd	2,415	1,300	1,900	0.54	0.79	A	C
Paramount Blvd	Slauson Ave	Washington Blvd	2,520	1,900	2,600	0.75	1.03	C	**F***
Rosemead Blvd (SR 19)	Slauson Ave	Washington Blvd	2,520	2,500	2,600	0.99	1.03	**E***	**F***

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Serapis Ave	Slauson Ave	Bequette Ave	850	300	300	0.35	0.35	A	A
Serapis Ave	Rivera Rd	Rex Rd	1,100	100	100	0.09	0.09	A	A
Rex Rd	Rosemead Blvd (SR 19)	Serapis Ave	950	500	400	0.53	0.42	A	A
Rex Rd	Serapis Ave	Passons Blvd	1,100	500	300	0.45	0.27	A	A
Passons Blvd	Slauson Ave	Washington Blvd	850	900	900	1.06	1.06	**F***	**F***
Slauson Ave	Passons Blvd	I-605 SB on-ramp	3,045	3,000	3,000	0.99	0.99	**E***	**E***
Pioneer Blvd	Los Nietos Rd	Rivera Rd	3,360	1,700	2,000	0.51	0.6	A	A
Pioneer Blvd	Rivera Rd	Slauson Ave	2,520	1,700	2,000	0.67	0.79	B	C
Rivera Rd	Pioneer Blvd	Bradwell Ave	950	100	100	0.11	0.11	A	A
Rivera Rd	Pioneer Blvd	Norwalk Blvd	950	300	200	0.32	0.21	A	A
Norwalk Blvd	Telegraph Rd	Los Nietos Rd	2,520	1,600	1,900	0.63	0.75	B	C
Norwalk Blvd	Los Nietos Rd	Slauson Ave	2,400	1,800	2,100	0.75	0.88	C	D
Los Nietos Rd	Pioneer Blvd	Norwalk Blvd	1,100	900	900	0.82	0.82	D	D
Los Nietos Rd	Norwalk Blvd	Santa Fe Springs Rd	1,103	1,100	1,200	1.00	1.09	**F***	**F***
Santa Fe Springs Rd	Telegraph Rd	Los Nietos Rd	2,415	1,800	1,800	0.75	0.75	C	C
Rosecrans Ave	Carmenita Rd	Marquardt Ave	3,045	2,200	2,300	0.72	0.76	C	C
Rosecrans Ave	Marquardt Ave	Valley View Ave	3,045	2,100	2,100	0.69	0.69	B	B
Marquardt Ave	Rosecrans Ave	Foster Ave	1,155	400	400	0.35	0.35	A	A
Marquardt Ave	Rosecrans Ave	Borate St	1,050	300	200	0.29	0.19	A	A
Valley View Ave	Gannet St	Stage Rd	3,360	2,700	2,800	0.80	0.83	C	D
Valley View Ave	Stage Rd	Rosecrans Ave	3,045	2,700	2,600	0.89	0.85	D	D
Stage Rd	Rosecrans Ave	Valley View Ave	1,100	400	600	0.36	0.55	A	A
Stage Rd	Valley View Ave	Alondra Blvd	2,400	800	800	0.33	0.33	A	A
Alondra Blvd	Valley View Ave	La Mirada Blvd	3,045	2,100	2,300	0.69	0.76	B	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Stage Rd	Alondra Blvd	Beach Blvd (SR 39)	2,400	700	900	0.29	0.38	A	A
Beach Blvd (SR 39)	Franklin St	Stage Rd	5,198	4,600	5,100	0.88	0.98	D	**E***
Artesia Blvd	Beach Blvd (SR 39)	Dale St	2,520	1,500	1,800	0.60	0.71	A	C
Commonwealth Ave	Beach Blvd (SR 39)	Dale St	2,520	1,100	1,100	0.44	0.44	A	A
Malvern Ave	Beach Blvd (SR 39)	Dale St	2,625	2,200	2,200	0.84	0.84	D	D
Dale St	Artesia Blvd	Malvern Ave	3,150	1,800	2,000	0.57	0.63	A	B
Artesia Blvd	Dale St	Gilbert St	1,000	700	800	0.70	0.80	B	C
Commonwealth Ave	Dale St	Gilbert St	3,045	1,600	1,800	0.53	0.59	A	A
Malvern Ave	Dale St	Gilbert St	3,150	2,700	2,800	0.86	0.89	D	D
Gilbert St	Commonwealth Ave	Artesia Blvd	3,045	2,500	2,500	0.82	0.82	D	D
Gilbert St	Artesia Blvd	Malvern Ave	4,332	3,200	3,000	0.74	0.69	C	B
Commonwealth Ave	Brookhurst Rd	Euclid St	3,045	1,700	1,600	0.56	0.53	A	A
State College Blvd	La Palma Ave	Lincoln Ave	4,410	2,000	2,700	0.45	0.61	A	B
State College Blvd	Lincoln Ave	South St	4,410	2,200	2,800	0.50	0.63	A	B
State College Blvd	South St	Wagner Ave	5,198	2,700	2,600	0.52	0.5	A	A
State College Blvd	Wagner Ave	Ball Rd	4,410	2,900	2,600	0.66	0.59	B	A
East St	La Palma Ave	Lincoln Ave	2,520	1,800	2,000	0.71	0.79	C	C
East St	Lincoln Ave	South St	2,520	1,600	1,500	0.63	0.6	B	A
East St	South St	Vermont St	3,360	1,300	1,300	0.39	0.39	A	A
East St	Vermont St	Ball Rd	2,520	1,600	1,500	0.63	0.6	B	A
Anaheim Blvd	La Palma Ave	Lincoln Ave	2,520	1,500	1,700	0.60	0.67	A	B
Anaheim Blvd	Lincoln Ave	South St	2,520	1,800	2,100	0.71	0.83	C	D
Anaheim Blvd	South St	Vermont St	3,360	2,000	2,200	0.60	0.65	A	B
Anaheim Blvd	Vermont St	Ball Rd	2,520	2,300	2,800	0.91	1.11	**E***	**F***

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Carmenita Rd	Alondra Blvd	Excelsior Dr	3,045	2,300	2,600	0.76	0.85	C	D
Beach Blvd (SR 39)	Malvern Ave	Stage Rd	4,410	4,400	4,800	1.00	1.09	**F***	**F***
Santa Fe Springs Rd	Los Nietos Rd	John St	3,150	1,800	2,100	0.57	0.67	A	B
Washington Blvd	Indiana St	Downey Rd	3,360	700	900	0.21	0.27	A	A
Washington Blvd	Ayers Ave	I-710	3,045	800	1,100	0.26	0.36	A	A
Washington Blvd	I-710	Atlantic Blvd	2,835	1,600	2,100	0.56	0.74	A	C
Telegraph Rd	Garfield Ave	Maple Ave	2,700	1,900	2,000	0.70	0.74	B	C
Bandini Blvd	Soto St	Downey Rd	2,700	1,500	1,500	0.56	0.56	A	A
Bandini Blvd	Downey Rd	Atlantic Blvd	2,400	2,200	2,600	0.92	1.08	**E***	**F***
Bandini Blvd	Atlantic Blvd	Eastern Ave	2,300	1,900	2,300	0.83	1.00	D	**F***
Soto St	E 26th St	Bandini Blvd	2,700	3,300	3,100	1.22	1.15	**F***	**F***
E 26th St	Sierra Pine Ave	Downey Rd	2,500	1,200	1,800	0.48	0.72	A	C
Firestone Blvd	Studebaker Rd	Imperial Hwy	3,675	1,900	2,000	0.52	0.54	A	A
Firestone Blvd	Imperial Hwy	Pioneer Blvd	2,520	1,800	2,000	0.71	0.79	C	C
Pioneer Blvd	Telegraph Rd	Florence Ave	2,520	1,800	1,200	0.71	0.48	C	A
Norwalk Blvd	Telegraph Rd	Florence Ave	2,520	1,600	1,700	0.63	0.67	B	B
Norwalk Blvd	Florence Ave	Lakeland Rd	3,045	1,700	1,700	0.56	0.56	A	A
Norwalk Blvd	Tina St	Imperial Hwy	2,520	2,200	2,100	0.87	0.83	D	D
Bloomfield Ave	Telegraph Rd	Florence Ave	2,415	1,600	1,600	0.66	0.66	B	B
Bloomfield Ave	Florence Ave	Lakeland Rd	2,835	1,900	1,800	0.67	0.63	B	B
Bloomfield Ave	Lakeland Rd	6th St	3,150	1,800	1,700	0.57	0.54	A	A
Bloomfield Ave	6th St	Imperial Hwy	2,625	1,800	1,800	0.69	0.69	B	B
Bloomfield Ave	Imperial Hwy	Foster Rd	2,520	1,700	2,000	0.67	0.79	B	C
Leffingwell Rd	Meyer Rd	Carmenita Rd	3,045	1,500	1,600	0.49	0.53	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Leffingwell Rd	Carmenita Rd	Imperial Hwy	2,520	900	1,000	0.36	0.4	A	A
Leffingwell Rd	Imperial Hwy	Adler Dr	1,000	400	500	0.4	0.5	A	A
Carmenita Rd	Telegraph Rd	Florence Ave	2,520	1,800	1,800	0.71	0.71	C	C
Carmenita Rd	Florence Ave	Lakeland Ave	3,045	1,900	2,100	0.62	0.69	B	B
Carmenita Rd	Meyer Rd	Leffingwell Rd	3,045	1,600	2,000	0.53	0.66	A	B
Carmenita Rd	Leffingwell Rd	Imperial Hwy	2,520	1,800	2,300	0.71	0.91	C	**E***
Carmenita Rd	Imperial Hwy	Orden Dr	2,520	2,200	2,600	0.87	1.03	D	**F***
Telegraph Rd	Pioneer Blvd	Norwalk Blvd	5,198	3,300	3,100	0.63	0.6	B	B
Telegraph Rd	Norwalk Blvd	Santa Fe Springs Rd	4,883	2,800	2,700	0.57	0.55	A	A
Telegraph Rd	Shoemaker Ave	Carmenita Rd	4,883	2,300	2,300	0.47	0.47	A	A
Telegraph Rd	Carmenita Rd	Florence Ave	5,198	2,200	2,600	0.42	0.5	A	A
Florence Ave	Orr and Day Rd	Pioneer Blvd	3,045	3,600	3,500	1.18	1.15	**F***	**F***
Florence Ave	Pioneer Blvd	Norwalk Blvd	3,045	2,600	2,800	0.85	0.92	D	**E***
Florence Ave	Norwalk Blvd	Bloomfield Ave	2,835	2,400	2,600	0.85	0.92	D	**E***
Florence Ave	Bloomfield Ave	Shoemaker Ave	2,835	2,400	2,500	0.85	0.88	D	D
Florence Ave	Shoemaker Ave	Carmenita Rd	2,835	2,400	2,400	0.85	0.85	D	D
Florence Ave	Carmenita Rd	Telegraph Rd	2,520	2,300	2,500	0.91	0.99	**E***	**E***
Imperial Hwy	Studebaker Rd	Firestone Blvd	5,198	3,500	3,700	0.67	0.71	B	C
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	4,410	4,000	4,100	0.91	0.93	**E***	**E***
Imperial Hwy	Bloomfield Ave	Shoemaker Ave	5,198	3,300	3,400	0.63	0.65	B	B
Imperial Hwy	Shoemaker Ave	Leffingwell Rd	5,198	3,200	3,300	0.62	0.63	B	B
Imperial Hwy	Leffingwell Rd	Carmenita Rd	5,198	2,300	2,200	0.44	0.42	A	A
Telegraph Rd	Santa Fe Springs Rd	Shoemaker Ave	4,883	2,000	2,300	0.41	0.47	A	A
Lakeland Rd	Pioneer Blvd	Norwalk Blvd	1,100	700	800	0.64	0.73	B	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Lakeland Rd	Norwalk Blvd	Bloomfield Ave	1,050	900	900	0.86	0.86	D	D
Lakeland Rd	Bloomfield Ave	Shoemaker Ave	1,103	800	900	0.73	0.82	C	D
Shoemaker Ave	Telegraph Rd	Florence Ave	2,415	1,300	1,100	0.54	0.46	A	A
Shoemaker Ave	Florence Ave	Lakeland Rd	2,835	1,600	1,400	0.56	0.49	A	A
Shoemaker Ave	Lakeland Rd	Imperial Hwy	2,400	1,200	1,100	0.5	0.46	A	A
Florence Ave	I-605	Woodruff Ave	3,360	2,800	2,700	0.83	0.8	D	D
Imperial Hwy	I-605	Woodruff Ave	5,198	2,900	3,100	0.56	0.6	A	B
Imperial Hwy	I-605	Studebaker Rd	5,198	3,300	3,600	0.63	0.69	B	B
Studebaker Rd	Imperial Hwy	I-105	2,520	2,500	2,400	0.99	0.95	**E***	**E***
Carmenita Rd	Orden Dr	Rosecrans Ave	2,520	2,500	2,300	0.99	0.91	**E***	**E***
Shoemaker Ave	Imperial Hwy	Foster Rd	1,000	900	1,000	0.90	1	D	**F***
Shoemaker Ave	Foster Rd	Rosecrans Ave	2,400	800	600	0.33	0.25	A	A
Norwalk Blvd	Imperial Hwy	Civic Center Dr	4,410	2,300	2,500	0.52	0.57	A	A
Civic Center Dr	Norwalk Blvd	Bloomfield Ave	2,200	1,300	1,500	0.59	0.68	A	B
Civic Center Dr	Bloomfield Ave	Volunteer Ave	950	200	100	0.21	0.11	A	A
Foster Rd	Bloomfield Ave	Shoemaker Ave	900	600	700	0.67	0.78	B	C
Rosecrans Ave	Shoemaker Ave	Carmenita Rd	4,332	2,700	3,000	0.62	0.69	B	B
San Antonio Dr	Firestone Blvd	Pioneer Blvd/Rosecrans Ave	2,520	1,500	1,600	0.6	0.63	B	B
Rosecrans Ave	Pioneer Blvd	Norwalk Blvd	2,520	1,900	1,800	0.75	0.71	C	C
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	2,520	2,500	2,500	0.99	0.99	**E***	**E***
Rosecrans Ave	I-605 NB ramps	Studebaker Rd	4,332	3,500	3,500	0.81	0.81	D	D
Rosecrans Ave	I-605 SB ramps	I-605 NB ramps	4,332	2,800	2,700	0.65	0.62	B	B
Lakeland Rd	Shoemaker Ave	Carmenita Rd	1,050	500	600	0.48	0.57	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Studebaker Rd	Imperial Hwy	Firestone Blvd	2,520	1,500	1,600	0.6	0.63	B	B
Pioneer Blvd	South St	187th St	3,045	1,500	1,600	0.49	0.53	A	A
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	5,198	4,300	4,400	0.83	0.85	D	D
Euclid St	Bastanchury Rd	Malvern Ave	2,625	2,900	2,800	1.1	1.07	**F***	**F***
Euclid St	Malvern Ave	Commonwealth Ave	3,045	3,100	3,000	1.02	0.99	**F***	**E***
Euclid St	Commonwealth Ave	Orangethorpe Ave	2,520	2,500	2,500	0.99	0.99	**E***	**E***
Highland Ave	Malvern Ave	Chapman Ave	1,100	800	1,000	0.73	0.91	C	**E***
Highland Ave	Chapman Ave	Commonwealth Ave	1,100	700	900	0.64	0.82	B	D
Highland Ave	Commonwealth Ave	Valencia Dr	1,155	1,000	1,300	0.87	1.13	D	**F***
Highland Ave	Valencia Dr	Orangethorpe Ave	1,050	500	1000	0.48	0.95	A	**E***
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	2,520	4,000	4,300	1.59	1.71	**F***	**F***
Harbor Blvd	Bastanchury Rd	Brea Blvd	5,198	3,500	3,800	0.67	0.73	B	C
Harbor Blvd	Brea Blvd	Berkeley Ave	4,332	4,100	3,700	0.95	0.85	**E***	D
Harbor Blvd	Berkeley Ave	Chapman Ave	3,045	2,900	2,700	0.95	0.89	**E***	D
Harbor Blvd	Chapman Ave	Commonwealth Ave	3,045	2,900	2,700	0.95	0.89	**E***	D
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	3,200	3,300	1.27	1.31	**F***	**F***
Harbor Blvd	Orangethorpe Ave	Orangefair Ave	4,410	3,500	4,100	0.79	0.93	C	**E***
Lemon St	Berkeley Ave	Chapman Ave	3,045	1,700	2,100	0.56	0.69	A	B
Lemon St	Chapman Ave	Commonwealth Ave	3,045	2,300	2,500	0.76	0.82	C	D
Lemon St	Commonwealth Ave	Orangethorpe Ave	2,415	3,500	3,900	1.45	1.61	**F***	**F***
Lemon St	Orangethorpe Ave	Orangefair Ave	2,415	3,200	3,900	1.33	1.61	**F***	**F***
Raymond Ave	Chapman Ave	Commonwealth Ave	3,045	1,100	900	0.36	0.3	A	A
Raymond Ave	Commonwealth Ave	Orangethorpe Ave	2,415	500	700	0.21	0.29	A	A
Raymond Ave	Orangethorpe Ave	E Burton St	2,415	1,700	1,900	0.7	0.79	B	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
State College Blvd	Dorothy Ln	Chapman Ave	5,198	2,500	2,300	0.48	0.44	A	A
State College Blvd	Chapman Ave	Commonwealth Ave	3,045	1,700	1,800	0.56	0.59	A	A
State College Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	1,400	1,500	0.56	0.6	A	B
State College Blvd	Orangethorpe Ave	Via Burton St	2,415	1,700	2,200	0.7	0.91	B	**E***
Malvern Ave	Bastanchury Rd	Basque Ave	2,900	1,700	2,000	0.59	0.69	A	B
Chapman Ave	Richman Ave	Highland Ave	3,360	1,900	2,100	0.57	0.63	A	B
Chapman Ave	Harbor Blvd	Raymond Ave	3,045	3,000	3,100	0.99	1.02	**E***	**F***
Chapman Ave	Raymond Ave	Acacia Ave	3,045	3,200	3,700	1.05	1.22	**F***	**F***
Chapman Ave	Acacia Ave	State College Blvd	2,520	3,800	4,700	1.51	1.87	**F***	**F***
Chapman Ave	State College Blvd	Commonwealth Ave	2,520	3,600	4,500	1.43	1.79	**F***	**F***
Commonwealth Ave	Brookhurst St	Euclid St	3,045	1,700	1,700	0.56	0.56	A	A
Commonwealth Ave	Euclid St	Harbor Blvd	2,900	1,900	1,700	0.66	0.59	B	A
Commonwealth Ave	Harbor Blvd	Raymond Ave	2,900	2,600	2,500	0.9	0.86	D	D
Commonwealth Ave	Raymond Ave	Acacia Ave	2,900	2,300	2,100	0.79	0.72	C	C
Commonwealth Ave	Acacia Ave	State College Blvd	2,400	1,300	1,500	0.54	0.63	A	B
Commonwealth Ave	State College Blvd	Chapman Ave	2,400	800	900	0.33	0.38	A	A
Valencia Dr	Highland Ave	Harbor Blvd	1,100	900	900	0.82	0.82	D	D
Valencia Dr	Harbor Blvd	Lemon St	1,050	900	900	0.86	0.86	D	D
Orangethorpe Ave	Euclid St	Highland Ave	3,045	1,900	2,700	0.62	0.89	B	D
Orangethorpe Ave	Harbor Blvd	Raymond Ave	4,253	2,600	3,100	0.61	0.73	B	C
Orangethorpe Ave	Raymond Ave	State College Blvd	4,253	2,200	2,900	0.52	0.68	A	B
Orangethorpe Ave	State College Blvd	Placentia Ave	4,253	2,400	2,700	0.56	0.63	A	B
SR 57 SB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	500	900	0.46	0.83	A	D
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	1,000	1,000	0.93	0.93	**E***	**E***

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Chapman Ave	Commonwealth Ave	SR 57	3,045	4,000	4,900	1.31	1.61	**F***	**F***
Placentia Ave	Chapman Ave	Orangethorpe Ave	2,520	1,800	1,900	0.71	0.75	C	C
Valencia Dr	Euclid St	Highland Ave	1,155	800	900	0.69	0.78	B	C
Orangethorpe Ave	Placentia Ave	SR 57	5,198	2,400	2,600	0.46	0.5	A	A
Imperial Hwy (SR 90)	Harbor Blvd	Puente St	4,410	4,200	4,300	0.95	0.98	**E***	**E***
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	2,520	2,700	3,100	1.07	1.23	**F***	**F***
Bastanchury Rd	Euclid St	Harbor Blvd	2,625	3,400	3,400	1.3	1.3	**F***	**F***
Bastanchury Rd	Harbor Blvd	Brea Blvd	2,520	3,600	3,600	1.43	1.43	**F***	**F***
Yorba Linda Blvd	State College Blvd	Associated Rd/Campus Dr	4,725	2,400	2,400	0.51	0.51	A	A
Yorba Linda Blvd	Associated Rd/Campus Dr	SR 57	5,198	2,600	2,800	0.5	0.54	A	A
Euclid St	Orangethorpe Ave	SR 91	2,520	3,000	3,200	1.19	1.27	**F***	**F***
Brea Blvd	Harbor Blvd	Bastanchury Rd	2,520	2,400	2,600	0.95	1.03	**E***	**F***
Santa Fe Ave	Highland Ave	Malden Ave	1,150	200	300	0.17	0.26	A	A
Santa Fe Ave	Malden Ave	Harbor Blvd	1,000	1,000	1,000	1	1	**F***	**F***
Santa Fe Ave	Harbor Blvd	Lemon St	1,000	900	1,000	0.9	1	D	**F***
Lewis St	Ball Rd	Cerritos Ave	2,415	1,000	1,200	0.41	0.5	A	A
Lewis St	Cerritos Ave	Katella Ave	2,415	800	1,000	0.33	0.41	A	A
Lewis St	Katella Ave	Anaheim Way	950	200	300	0.21	0.32	A	A
State College Blvd	Ball Rd	Cerritos Ave	4,253	2,700	3,100	0.63	0.73	B	C
State College Blvd	Cerritos Ave	Howell Ave	4,883	2,000	2,300	0.41	0.47	A	A
State College Blvd	Howell Ave	Katella Ave	3,938	2,500	2,800	0.63	0.71	B	C
State College Blvd	Katella Ave	Gene Autry Way	3,938	3,300	3,100	0.84	0.79	D	C
State College Blvd	Gene Autry Way	Orangewood Ave	4,253	3,000	3,000	0.71	0.71	C	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
State College Blvd	Orangewood Ave	I-5	6,090	3,900	4,500	0.64	0.74	B	C
Sunkist St	Ball Rd	Cerritos Ave	2,415	1,300	1,600	0.54	0.66	A	B
Sunkist St	Cerritos Ave	Howell Ave	2,835	700	600	0.25	0.21	A	A
Douglass Rd	Cerritos Ave	Katella Ave	2,415	900	1,200	0.37	0.5	A	A
Main St	Taft Ave	Katella Ave	2,415	1,400	1,100	0.58	0.46	A	A
Main St	Katella Ave	Collins Ave	2,415	1,800	2,000	0.75	0.83	C	D
Main St	Collins Ave	Orangewood Ave	2,835	2,000	2,300	0.71	0.81	C	D
Main St	Orangewood Ave	Chapman Ave	2,415	2,000	2,000	0.83	0.83	D	D
Ball Rd	Harbor Blvd	Anaheim Blvd	3,938	3,000	3,700	0.76	0.94	C	**E***
Ball Rd	Anaheim Blvd	Lewis St	4,253	2,500	3,300	0.59	0.78	A	C
Ball Rd	Lewis St	State College Blvd	4,253	3,000	3,400	0.71	0.8	C	C
Ball Rd	State College Blvd	Sunkist St	2,415	3,000	3,100	1.24	1.28	**F***	**F***
Ball Rd	Sunkist St	SR 57	4,883	3,400	3,300	0.7	0.68	B	B
Ball Rd	SR 57	Main St	2,835	2,600	3,400	0.92	1.2	**E***	**F***
Cerritos Ave	Lewis St	State College Blvd	2,415	900	1,000	0.37	0.41	A	A
Cerritos Ave	State College Blvd	Sunkist St	2,300	1,200	1,900	0.52	0.83	A	D
Cerritos Ave	Sunkist St	Douglass Rd	2,835	700	1,000	0.25	0.35	A	A
Katella Ave	Anaheim Blvd/Haster St	I-5	4,253	2,600	3,600	0.61	0.85	B	D
Katella Ave	I-5	Lewis St	4,883	3,200	4,400	0.66	0.9	B	D
Katella Ave	Lewis St	State College Blvd	4,253	2,200	3,000	0.52	0.71	A	C
Katella Ave	State College Blvd	Sportstown	4,253	2,800	3,000	0.66	0.71	B	C
Katella Ave	Sportstown	Howell Ave	4,883	2,600	3,000	0.53	0.61	A	B
Katella Ave	Howell Ave	SR 57	4,883	2,700	3,000	0.55	0.61	A	B
Gene Autry Way	I-5	State College Blvd	2,415	1,700	1,800	0.7	0.75	B	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Orangewood Ave	Manchester Ave	State College Blvd	4,253	3,300	3,500	0.78	0.82	C	D
Orangewood Ave	State College Blvd	Rampart St	2,415	3,300	3,400	1.37	1.41	**F***	**F***
Orangewood Ave	Rampart St	SR 57	3,000	2,800	3,200	0.93	1.07	**E***	**F***
Orangewood Ave	SR 57	Eckhoff St	3,150	2,900	3,100	0.92	0.98	**E***	**E***
Orangewood Ave	Eckhoff St	Main St	2,835	2,200	2,400	0.78	0.85	C	D
Chapman Ave	I-5 SB on-ramp/NB off-ramp	SR 57	4,253	2,700	3,300	0.63	0.78	B	C
Chapman Ave	SR 57	Main St	4,883	2,200	2,700	0.45	0.55	A	A
Douglass Rd	Katella Ave	ARTIC entrance	2,300	1,100	1,100	0.48	0.48	A	A
Katella Ave	Douglass Rd	Main St	4,883	2,400	2,600	0.49	0.53	A	A
Katella Ave	SR 57	Douglass Rd	4,883	3,300	3,600	0.68	0.74	B	C
Chapman Ave	Lewis St	The City Dr	3,938	2,700	3,300	0.69	0.84	B	D
Chapman Ave	The City Dr	I-5 SB on-ramp/NB off-ramp	3,938	3,100	3,800	0.79	0.96	C	**E***
Disneyland Dr	Ball Rd	I-5 SB off-ramp	3,375	1,600	1,800	0.47	0.53	A	A
State College Blvd	Manchester Ave	Chapman Ave	4,253	3,500	4,100	0.82	0.96	D	**E***
Manchester Ave	Orangewood Ave	Chapman Ave	2,520	1,500	700	0.6	0.28	A	A
Lewis St	Orangewood Ave	Chapman Ave	800	1,300	1,400	1.63	1.75	**F***	**F***
Ball Rd	I-5 NB ramps	Disneyland Dr	4,650	3,500	3,900	0.75	0.84	C	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; SR = State Route; V/C = volume to capacity; veh/hr = vehicles per hour

Table 6-66 Horizon Year 2040 Plus Project Intersection Level of Service for Norwalk/Santa Fe Springs High-Speed Rail Station Option

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G35	Anaheim Blvd and La Palma Ave[1]	33	C	38.1	D
G36	Anaheim Blvd and Sycamore St[1]	7.1	A	6.7	A
G37	Anaheim Blvd and Lincoln Ave	34.9	C	45.5	D
G38	Anaheim Blvd and Santa Ana St	29.4	C	19.8	B
G39	Anaheim Blvd and South St	9.6	A	7.6	A
G40	Anaheim Blvd and Vermont Ave	21.9	C	15.9	B
G42	East St and La Palma Ave	33.9	C	57	**E***
G43	East St and Sycamore St	17.7	B	10.4	B
G44	East St and Lincoln Ave	71.3	**E***	79.7	**E***
G45	East St and Santa Ana St	32.5	C	24.2	C
G46	East St and South St	18.3	B	20.2	C
G47	East St and Vermont Ave	20.2	C	19	B
G49	Anaheim Blvd and Broadway	26.3	C	28.3	C
G50	East St and Broadway	27.6	C	24.9	C
G67	Harbor Blvd and La Palma Ave	42.5	D	113.4	**F***
G68	Harbor Blvd and Lincoln Ave	66.8	**E***	78.5	**E***
G73	State College Blvd and La Palma Ave	33.2	C	59.9	**E**
G74	State College Blvd and Lincoln Ave	39.3	D	51.1	D
G75	State College Blvd and Vermont Ave	>180	**F***	>180	**F***
G78	Harbor Blvd and Vermont Ave	15.8	B	14.5	B
G83	Soto St and Washington Blvd	53.7	D	41.3	D
G84	Downey Rd and Washington Blvd	43.4	D	101.4	**F***
G85	Atlantic Blvd and Washington Blvd	39.2	D	33.3	C
G86	Eastern Ave and Washington Blvd	29	C	26.7	C
G87	I-5 SB ramps and Washington Blvd[1]	20.9	C	33.6	C
G88	Telegraph Rd and Washington Blvd	37.7	D	37.7	D
G89	Garfield Ave and Washington Blvd	60.3	**E***	>180	**F***
G90	Greenwood Ave and Washington Blvd	29.1	C	29.1	C
G91	Passons Blvd and Washington Blvd	44.3	D	35.9	D
G92	Pioneer Blvd and Washington Blvd	115.5	**F***	62.8	**E***
G93	Sierra Pine Ave and Bandini Blvd	16.9	B	12.1	B
G94	Downey Rd and Bandini Blvd	42.7	D	>180	**F***

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G95	Indiana St and Bandini Blvd[2]	64.2	**F***	>180	**F***
G96	Bonnie Beach Pl and Bandini Blvd	25.3	C	134.8	**F***
G97	Ayers Ave and Bandini Blvd[2]	16.1	C	50.3	**F***
G98	Atlantic Blvd/I-710 NB ramps and Bandini Blvd[1]	>180	**F***	124.3	**F***
G99	Eastern Ave and Bandini Blvd	34.7	C	31.2	C
G100	Garfield Ave and Bandini Blvd	26	C	45.8	D
G101	I-5 SB ramps and Bandini Blvd[2]	>180	**F***	>180	**F***
G102	Soto St and E 26th St	26.5	C	46.3	D
G103	Sierra Pine Ave and E 26th St[2]	26.5	C	33	C
G104	Indiana St and E 26th St[2]	8.9	A	8.9	A
G105	Bonnie Beach Pl and E 26th St	8.9	A	9.3	A
G106	Ayers Ave and E 26th St[2]	9	A	10.7	A
G107	Soto St and E 37th St/Bandini Blvd	40.7	D	40.5	D
G108	Eastern Ave and Commerce Way	7.2	A	7.8	A
G109	Telegraph Rd (Washington Blvd) and I-5 NB ramps	35.4	D	35.4	D
G110	Garfield Ave and Telegraph Rd	34.8	C	34	C
G111	Telegraph Rd (Garfield Ave) and I-5 NB ramps [1]	27.5	C	28.4	C
G112	Greenwood Ave and Telegraph Rd	12.4	B	16.3	B
G113	Telegraph Rd (Slauson Ave) and I-5 NB off-ramp[2]	>180	**F***	>180	**F***
G114	Gage Rd and Telegraph Rd[2]	53.9	**F***	164.8	**F***
G115	Telegraph Rd and Slauson Ave	47	D	54.3	D
G116	Greenwood Ave and Driveway[2]	19.2	C	31.4	D
G117	Greenwood Ave and Union St	6.7	A	8.4	A
G118	Chapin Rd and Union St[3]	10	A	54.7	**F***
G119	I-5 SB ramps/Gage Ave and Slauson Ave[1]	51.8	D	80.9	**F***
G120	Chapin Rd and Slauson Ave	7.2	A	20.7	C
G121	Paramount Blvd and Slauson Ave	43.7	D	53.6	D
G122	Rosemead Blvd (SR 19) and Slauson Ave	59	**E***	56.1	**E***
G123	Passons Blvd and Slauson Ave	58.5	**E***	135.9	**F***
G124	I-605 SB off-ramp and Slauson Ave	35.9	D	23.2	C
G125	Pioneer Blvd and Slauson Ave	66.1	**E***	63.8	**E***
G126	Norwalk Blvd and Slauson Ave	43.5	D	38.6	D
G127	Sorensen Ave and Slauson Ave	36.6	D	39.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G128	Santa Fe Springs Rd and Slauson Ave/Mulberry Dr[1]	31.2	C	24.4	C
G130	Pioneer Blvd and I-605 NB off-ramp[2]	118.2	**F***	123.4	**F***
G131	Pioneer Blvd and Los Nietos Rd	18.2	B	17.4	B
G132	Pioneer Blvd and Orr and Day Rd[2]	133	**F***	>180	**F***
G133	Pioneer Blvd and Telegraph Rd	31	C	30	C
G134	Norwalk Blvd and Los Nietos Rd	22.6	C	28.1	C
G135	Los Nietos Rd and Santa Fe Springs Rd	24.6	C	24.8	C
G136	Santa Fe Springs Rd and Sorensen Ave[2]	26.3	D	60.9	**F***
G137	Valley View Ave and Imperial Hwy	43.6	D	47.1	D
G138	Valley View Ave and Foster Rd	128.8	**F***	>180	**F***
G139	Valley View Ave and Rosecrans Ave	59.4	**E***	49.7	D
G140	Valley View Ave and Stage Rd	21.2	C	24.6	C
G141	Valley View Ave and Gannet St	11.4	B	13.3	B
G142	Marquardt Ave and Imperial Hwy	18.6	B	19.6	B
G143	Marquardt Ave and Foster Rd[3]	23.1	C	19.6	C
G144	Marquardt Ave and Rosecrans Ave/Stage Rd	24.7	C	31.1	C
G146	Stage Rd/Escalona Rd and Alondra Blvd[1]	31.8	C	44.4	D
G147	Dodds Ave (East) and Stage Rd[2]	92.3	**F***	>180	**F***
G148	Beach Blvd (SR 39) and Stage Rd[1]	78.5	**E***	73.7	**E***
G149	La Mirada Blvd and Alondra Blvd	39.1	D	30.1	C
G150	Beach Blvd (SR 39) and La Mirada Blvd/Malvern Ave	63.1	**E***	49.6	D
G151	Beach Blvd (SR 39) and Franklin St	33.6	C	43.5	D
G152	Beach Blvd (SR 39) and Artesia Ave	40.5	D	52.7	D
G153	Dale St and Malvern Ave [1]	37.8	D	32.9	C
G154	Dale St and Lakeknoll Dr	17.7	B	6.9	A
G155	Dale St and Artesia Ave	22.2	C	20.3	C
G156	Stanton Ave and Artesia Ave	24.2	C	26.4	C
G157	Dale St and Commonwealth Ave	30.4	C	29	C
G158	Gilbert St and Commonwealth Ave[1]	39.4	D	35	C
G159	Brookhurst Rd and Commonwealth Ave[1]	33.5	C	28.5	C
G160	Brookhurst Rd and Valencia Dr	68.9	**E***	30.1	C
G162	Gilbert St and Malvern Ave	90.1	**F***	45.8	D
G163	Gilbert St and Artesia Ave	18.8	B	14.8	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G164	Anaheim Blvd/Lemon St and La Palma Ave	13.7	B	31.3	C
G165	Paramount Blvd and Washington Blvd	56.5	**E***	48	D
G166	Rosemead Blvd (SR 19) and Washington Blvd	45.7	D	47.7	D
G167	E 26th St and Bandini Blvd[1]	33.3	C	21.8	C
G168	Garfield Ave and E 26th St[2]	>180	**F***	>180	**F***
G169	Serapis Ave and Slauson Ave	14.2	B	12.4	B
G170	Pioneer Blvd and Wheelock Cir[2]	31.5	C	35.3	D
G171	Pioneer Blvd and Rivera Rd[2]	--	--	--	--
G173	Passons Blvd and Rivera Rd	21.9	C	13.4	B
G174	Rosemead Blvd (SR 19) and Rex Rd	25.6	C	22.6	C
G175	Passons Blvd and Rex Rd[3]	31.5	D	19	C
G176	La Mirada Blvd and Rosecrans Ave	32	C	34.2	C
G177	Valley View Ave and Alondra Blvd	58.7	**E***	51.7	D
G178	Beach Blvd (SR 39) and Commonwealth Ave	25.8	C	30.8	C
G179	Wheelock Cir and Rivera Rd[2]	4.7	A	9.2	A
G180	Dodds Ave (west) and Stage Rd[2]	8.5	A	9	A
G197	Indiana St and Washington Blvd	20.2	C	16.3	B
G198	Oak St and Washington Blvd	17.1	B	15.9	B
G199	Arrowmill Ave and Washington Blvd	24.7	C	19.8	B
G200	Ayers Ave and Washington Blvd	18.6	B	17.1	B
G201	I-710 SB ramps and Washington Blvd[1]	24.6	C	24.1	C
G202	I-710 NB ramps and Washington Blvd[1]	35.9	D	41.9	D
G203	Atlantic Blvd and Sheila St	119.3	**F***	>180	**F***
G208	Downey Rd and E 26th St[2]	38.3	**E***	25.7	D
G210	Eastern Ave and Driveway[2]	98.5	**F***	145.1	**F***
G211	Telegraph Rd and Maple Ave[2]	25.2	D	45.6	**E***
N1	Firestone Blvd and Imperial Hwy[1]	128.9	**F***	58.9	**E***
N2	Pioneer Blvd and Florence Ave	42.2	D	34.4	C
N3	Pioneer Blvd and Imperial Hwy	39	D	42.4	D
N5	Norwalk Blvd and Telegraph Rd	44.9	D	42	D
N6	Norwalk Blvd and Florence Ave	42.5	D	41.9	D
N7	Norwalk Blvd and Imperial Hwy	71	**E***	>180	**F***
N10	Bloomfield Ave/Santa Fe Springs Rd and Telegraph Rd	32.7	C	31.4	C

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N11	Bloomfield Ave and Florence Ave	40.2	D	37	D
N12	Bloomfield Ave and Lakeland Rd	24.5	C	21.9	C
N15	Bloomfield Ave and Imperial Hwy	61.5	**E***	76.5	**E***
N17	Transportation Center West and Imperial Hwy[1]	---	---	---	---
N18	Transportation Center East and Imperial Hwy[1]	25.6	C	26.2	C
N19	Shoemaker Ave and Florence Ave	29.2	C	27.6	C
N20	Shoemaker Ave/Adler Dr and Imperial Hwy	27.9	C	27.8	C
N21	Leffingwell Rd and Imperial Hwy	30.2	C	28.1	C
N22	Carmenita Rd and Telegraph Rd	47	D	47.3	D
N23	Carmenita Rd and Florence Ave	45.2	D	41.3	D
N24	Carmenita Rd and Leffingwell Rd	22	C	27	C
N25	Carmenita Rd and Imperial Hwy	42.2	D	42.6	D
N26	Telegraph Rd and Florence Ave/Mills Ave	45.4	D	49.6	D
N27	I-5 NB on-ramp and Imperial Hwy	70.1	**E***	29.4	C
N30	I-5 SB off-ramp and Imperial Hwy[1]	29.7	C	34.3	C
N31	Norwalk Blvd and I-5 NB ramps	34.2	C	31	C
N32	San Antonio Dr and I-5 SB on-ramp[1]	23.3	C	25.7	C
N33	Shoemaker Ave and Telegraph Rd	73.5	**E***	50.1	D
N34	Pioneer Blvd and Lakeland Rd	28	C	22.3	C
N35	Norwalk Blvd and Lakeland Rd	20.8	C	20.1	C
N36	I-605 SB ramps and Florence	72	**E***	50.5	D
N37	Studebaker Rd and Florence Ave[1]	34.7	C	41.6	D
N38	Studebaker Rd and I-605 NB ramps/Dollison Dr[1]	40.1	D	17.6	B
N40	Fairford Ave and Florence Ave	30	C	28.7	C
N41	I-5 NB off-ramp and Florence Ave	15.8	B	7.1	A
N42	Orr and Day Rd and Florence Ave[1]	29.7	C	26.2	C
N45	I-605 SB ramps/Flatbush Ave and Imperial Hwy[1]	27.5	C	52.2	D
N46	Hoxie Ave and Imperial Hwy[1]	45.3	D	69.6	**E***
N47	I-605 NB ramps and Hoxie Ave	28	C	39.5	D
N48	Studebaker Rd and I-105 ramps	39.7	D	31.5	C
N49	Studebaker Rd and Imperial Hwy	130.2	**F***	143.3	**F***
N50	Bloomfield Ave and Firestone Blvd (north)	6.9	A	11.5	B
N51	Bloomfield Ave and Firestone Blvd (south)	77.8	**E***	104.7	**F***
N52	Bloomfield Ave and Rosecrans Ave	47.7	D	50.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N53	I-5 NB off-ramp and Rosecrans Ave[1]	18.5	B	21.9	C
N54	I-5 SB on-ramp and Rosecrans Ave[1]	15.3	B	14.4	B
N55	Shoemaker Ave and Rosecrans Ave	45.2	D	50.3	D
N56	Shoemaker Ave and Overcrossing (south)[2]	20.2	C	154.3	**F***
N57	Shoemaker Ave and Firestone Blvd (south)[2]	10.7	B	12.4	B
N58	Carmenita Rd and Rosecrans Ave	46	D	56	**E***
N61	Carmenita Rd and I-5 NB ramps[1]	10.1	B	11.7	B
N62	Carmenita Rd and I-5 SB ramps[1]	9.2	A	12.2	B
N63	Norwalk Blvd and Civic Center Dr[1]	25.3	C	27.2	C
N64	Bloomfield Ave and Civic Center Dr	27	C	35.4	D
N65	Bloomfield Ave and Goller Ave/Foster Rd	27.7	C	38.3	D
N66	Shoemaker Ave and Foster Rd[3]	20.5	C	28.3	D
N67	Carmenita Rd and Orden Dr	17.1	B	23.9	C
N68	I-605 NB ramps and Rosecrans Ave	43.3	D	50.9	D
N69	I-605 SB ramps and Rosecrans Ave[1]	34.9	C	37.1	D
N70	Studebaker Rd and Rosecrans Ave	60.2	**E***	73.6	**E***
N71	Pioneer Blvd/San Antonio Dr and Rosecrans Ave[1]	102.3	**F***	96.1	**F***
N72	Shoemaker Ave and Lakeland Rd	20.1	C	21.9	C
N73	Carmenita Rd and Lakeland Rd	67.4	**E***	148.1	**F***
N74	Shoemaker Ave and Entrance/Adler Dr[2]	10.6	B	10.2	B
N145	Carmenita Rd and Foster Rd	18.1	B	13.9	B
F1	Euclid St and Malvern Ave	43.5	D	55.5	**E***
F2	Euclid St and Commonwealth Ave	41.1	D	44.4	D
F3	Highland Ave and Chapman Ave	14.5	B	18.7	B
F4	Highland Ave and Commonwealth Ave	20.6	C	24.2	C
F5	Highland Ave and Santa Fe Ave[2]	20.4	C	30.1	D
F6	Highland Ave and Truslow Ave[2]	22.7	C	24.7	C
F7	Highland Ave and Valencia Dr	17.1	B	15.8	B
F8	Highland Ave and Orangethorpe Ave	18.2	B	22	C
F9	Malden Ave and Chapman Ave[1]	>180	**F***	>180	**F***
F10	Malden Ave and Commonwealth Ave	30.4	C	144.3	**F***
F11	Harbor Blvd and Imperial Hwy (SR 90)	105.2	**F***	88.3	**F***
F12	Harbor Blvd and Bastanchury Rd	86.9	**F***	88.1	**F***
F13	Harbor Blvd and Valley View Dr/Brea Blvd[1]	39.7	D	50.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F14	Harbor Blvd and Berkeley Ave	35.5	D	32.5	C
F15	Harbor Blvd and Chapman Ave	88.9	**F***	83.7	**F***
F16	Harbor Blvd and Commonwealth Ave	76.9	**E***	45.3	D
F17	Harbor Blvd and Santa Fe Ave	>180	**F***	>180	**F***
F18	Harbor Blvd and Truslow Ave[2]	20.2	C	17.4	C
F19	Harbor Blvd and Orangethorpe Ave	38.4	D	49.7	D
F20	Harbor Blvd and SR 91 WB ramps	19	B	17.4	B
F21	Harbor Blvd and SR 91 EB ramps	22.8	C	28.3	C
F22	Brea Blvd and Bastanchury Rd	90	**F***	54.2	D
F23	Lemon St and Chapman Ave	46.6	D	55	**E***
F24	Lemon St and Commonwealth Ave	69.4	**E***	75.8	**E***
F25	Lemon St and Santa Fe Ave[2]	>180	**F***	42.5	D
F26	Lemon St and Orangethorpe Ave	62.8	**E***	96.2	**F***
F27	Lemon St and SR 91 WB ramps	43.8	D	52.3	D
F28	Anaheim Blvd/Lemon St and SR 91 EB ramps	65.8	**E***	40.6	D
F29	Raymond Ave and Chapman Ave	36.8	D	63.5	**E***
F30	Raymond Ave and Commonwealth Ave	24.9	C	25.6	C
F31	Raymond Ave and Orangethorpe Ave	31.9	C	35	C
F32	State College Blvd and Chapman Ave	46.2	D	90	**F***
F33	State College Blvd and Commonwealth Ave	104	**F***	75.9	**E***
F34	State College Blvd and Orangethorpe Ave	35.4	D	54.9	D
F35	Commonwealth Ave and Chapman Ave	23.6	C	41.7	D
F36	SR 57 SB ramps and Chapman Ave	17.9	B	27.2	C
F37	SR 57 NB ramps and Chapman Ave[1]	38.1	D	55	**E***
F38	Placentia Ave and Chapman Ave	49.1	D	66.7	**E***
F39	Euclid St and Valencia Dr	151.6	**F***	45.3	D
F40	Highland Ave and Walnut Ave	11.6	B	10.9	B
F41	Malden Ave and Santa Fe Ave[3]	13.4	B	11.3	B
F42	Malden Ave and Truslow Ave[2]	9.1	A	9.1	A
F43	Malden Ave and Valencia Dr[2]	15.7	C	12.8	B
F44	Harbor Blvd and Valencia Dr	25.8	C	15.3	B
F45	Lemon St and Walnut Ave[2]	>180	**F***	>180	**F***
F46	Lemon St and Valencia Dr	116	**F***	98	**F***
F47	Placentia Ave and Orangethorpe Ave	37.7	D	43.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F48	SR 57 SB ramps and Nutwood Ave	59.6	**E***	39.4	D
F49	SR 57 SB ramps and Orangethorpe Ave[1]	31.1	C	28.1	C
F50	SR 57 NB ramps and Nutwood Ave[1]	52.7	D	28.5	C
F51	SR 57 NB ramps and Orangethorpe Ave	41.4	D	30	C
F52	Brea Blvd and Imperial Hwy (SR 90)	57	**E***	51	D
F53	State College Blvd and Yorba Linda Blvd[1]	48.2	D	34.6	C
F54	SR 57 SB off-ramp and Yorba Linda Blvd	26.9	C	24.6	C
F55	SR 57 NB off-ramp and Yorba Linda Blvd[1]	48.9	D	40.3	D
F56	Raymond Ave/East St and SR 91 EB ramps[1]	29.2	C	25	C
F57	Raymond Ave and SR 91 WB ramps[1]	26.9	C	14.1	B
F58	Euclid St and SR 91 WB ramps	20.8	C	23.6	C
F59	Euclid St and SR 91 EB ramps[1]	15.1	B	25	C
F60	State College Blvd and SR 91 EB ramps[1]	21.1	C	23.1	C
F61	State College Blvd and SR 91 WB ramps[1]	19.5	B	21.3	C
F161	Euclid St and Orangethorpe Ave	44.8	D	44.3	D
A1	Manchester Ave/I-5 SB ramps and Katella Ave	24.1	C	21.4	C
A2	Anaheim Way/I-5 NB ramps and Katella Ave[1]	24.2	C	32.3	C
A3	Lewis St and Katella Ave[1]	27.7	C	47.3	D
A4	I-5 HOV and Gene Autry Way[1]	22.8	C	25.7	C
A6	State College Blvd and Ball Rd	63.3	**E***	51.1	D
A7	State College Blvd and Winston Rd	11.9	B	21.1	C
A8	State College Blvd and Cerritos Ave	27.9	C	112.7	**F***
A9	State College Blvd and Howell Ave	67.3	**E***	158.5	**F***
A10	State College Blvd and Katella Ave[1]	37.2	D	39.6	D
A12	State College Blvd and Gene Autry Way	27	C	57.9	**E***
A14	State College Blvd and Orangewood Ave	58.5	**E***	69	**E***
A15	Stadium Crossing and Katella Ave[1]	31.7	C	33.2	C
A16	Sunkist St and Ball Rd	95.8	**F***	114.5	**F***
A17	Sunkist St and Cerritos Ave	25.2	C	148.4	**F***
A18	Howell Ave and Katella Ave[1]	43.1	D	110.4	**F***
A19	Rampart St and Orangewood Ave[1]	23.3	C	16.2	B
A20	SR 57 SB ramps and Ball Rd[1]	46.1	D	50.3	D
A21	SR 57 SB ramps and Katella Ave[1]	20.6	C	23.9	C
A22	SR 57 SB ramps and Orangewood Ave[1]	75.6	**E***	101.7	**F***

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A23	SR 57 SB ramps and Chapman Ave	22.5	C	33.6	C
A24	SR 57 NB ramps and Ball Rd	32.5	C	38	D
A25	SR 57 NB ramps and Katella Ave[1]	27.5	C	29.7	C
A26	SR 57 NB ramps and Orangewood Ave[1]	20.8	C	18.1	B
A27	SR 57 NB ramps and Chapman Ave[1]	13.1	B	11.6	B
A28	Douglass Rd and Katella Ave[1]	50.5	D	>180	**F***
A29	Struck Ave and Katella Ave[1]	4	A	54.7	D
A30	Main St and Ball Rd/Taft Ave[1]	57.1	**E***	36.3	D
A31	Main St and Katella Ave	33.7	C	30.3	C
A32	Main St and Struck Ave	13.4	B	20.6	C
A33	Main St and Collins Ave	23.3	C	29.1	C
A34	Main St and Orangewood Ave/Walnut Ave	96.4	**F***	74.6	**E***
A41	Anaheim Blvd and Ball Rd	34.3	C	60	**E***
A48	East St and Ball Rd	27.9	C	28.2	C
A51	Lewis St and Ball Rd	24.6	C	33.9	C
A52	Lewis St and Cerritos Ave	21.4	C	24.6	C
A53	Lewis St and Orangewood Ave	>180	**F***	82.9	**F***
A54	Lewis St and Chapman Ave	55.2	**E***	68	**E***
A55	Manchester Ave and Orangewood Ave	28.6	C	20.4	C
A56	The City Dr/State College Blvd and Chapman Ave	46.1	D	45.1	D
A57	Anaheim Way and Orangewood Ave	7.5	A	39.8	D
A58	Manchester Ave and Chapman Ave	170	**F***	28.8	C
A59	State College Blvd and I-5 SB off-ramp[1]	18.9	B	12.7	B
A60	I-5 SB on-ramp/NB off-ramp and Chapman Ave[1]	24.5	C	20.8	C
A61	State College Blvd and I-5 NB ramps[1]	23.3	C	41.9	D
A62	I-5 NB on-ramp/Rampart St and Chapman Ave	19.7	B	16.6	B
A63	Douglass Rd and ARTIC[1]	27.9	C	32.3	C
A64	Douglass Rd and Bus Entrance	26.3	C	16	B
A65	Douglass Rd and Parking Lot B	8.6	A	8.7	A
A66	ARTIC Driveway and Katella Ave	17.7	C	14.7	B
A69	Harbor Blvd and Ball Rd	55.3	**E***	72.1	**E***
A70	Harbor Blvd and I-5 NB ramps[1]	23.7	C	17	B
A71	Harbor Blvd and I-5 SB ramps	67.5	**E***	15.8	B
A72	Harbor Blvd and Katella Ave	30.4	C	40.8	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A79	Anaheim Blvd and Cerritos Ave	29.8	C	161.2	**F***
A80	Disneyland Dr and I-5 SB off-ramp	18.9	B	16.7	B
A81	Disneyland Dr and Ball Rd[1]	41.2	D	49.2	D
A82	Main St and Chapman Ave	44.6	D	55.9	**E***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "N" intersection number prefix indicates Norwalk/Santa Fe Springs Metrolink Station area; "F" intersection number prefix indicates Fullerton Metrolink/Amtrak Station area; "A" intersection number prefix indicates ARTIC station area.
[1] Delay is based on Highway Capacity Manual 2000 signalized intersection analysis because of Highway Capacity Manual 2010 analysis limitations.
[2] Two-way unsignalized intersection. The delay presented is for the worst minor approach delay.
[3] Four-way unsignalized intersection.
Amtrak = National Railroad Passenger Corporation; ARTIC = Anaheim Regional Transportation Intermodal Center; EB = eastbound; HOV = high-occupancy vehicle; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route; WB = westbound

Side-by-side LOS effect comparisons for the Horizon Year 2040 No Project condition and Horizon Year 2040 Plus Project condition with inclusion of the Norwalk/Santa Fe Springs HSR Station Option are contained in Appendix E of this report. Roadway segment LOS effects are presented in Table E1-2 of Appendix E. Signalized intersection LOS effects are presented in Table E2-2 of Appendix E, and unsignalized intersection LOS effects are presented in Table E3-2 of Appendix E. These tables present the differences in V/C ratio (roadway segments) and control delay (intersections) and identify the roadway segments and intersections that meet the thresholds discussed in Section 4.4.3. As detailed in Table 6-67, Table 6-68, and Table 6-69, respectively, Horizon Year 2040 Plus Project with inclusion of the Norwalk/Santa Fe Springs HSR Station Option creates LOS effects that meet the applicable thresholds at the following 26 roadway segments, 31 signalized intersections, and eight unsignalized intersections.

Table 6-67 Major Roadway Segments: Horizon Year 2040 Impacts with Inclusion of Norwalk/Santa Fe Springs High-Speed Rail Station Option

Roadway	Segment Limits		Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		V/C Increase
	From	To		V/C	LOS	V/C	LOS	
Bandini Blvd	Downey Rd	Atlantic Blvd	AM	0.79	C	0.92	**E***	0.13
			PM	0.83	D	1.08	**F***	0.25
Carmenita Rd	Imperial Hwy	Orden Dr	AM	0.83	D	0.87	D	0.04
			PM	0.99	**E***	1.03	**F***	0.04
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	AM	0.59	A	0.91	**E***	0.32
			PM	0.61	B	0.93	**E***	0.32
Studebaker Rd	Imperial Hwy	I-105	AM	0.91	**E***	0.99	**E***	0.08
			PM	0.87	D	0.95	**E***	0.08
Carmenita Rd	Orden Dr	Rosecrans Ave	AM	0.95	**E***	0.99	**E***	0.04
			PM	0.87	D	0.91	**E***	0.04
Shoemaker Ave	Imperial Hwy	Foster Rd	AM	0.4	A	0.9	D	0.50
			PM	0.5	A	1.00	**F***	0.50

Roadway	Segment Limits		Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		V/C Increase
	From	To		V/C	LOS	V/C	LOS	
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	AM	0.95	**E***	0.99	**E***	0.04
			PM	0.95	**E***	0.99	**E***	0.04
Euclid St	Bastanchury Rd	Malvern Ave	AM	1.07	**F***	1.1	**F***	0.03
			PM	1.03	**F***	1.07	**F***	0.04
Euclid St	Malvern Ave	Commonwealth Ave	AM	0.99	**E***	1.02	**F***	0.03
			PM	0.95	**E***	0.99	**E***	0.04
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	AM	1.55	**F***	1.59	**F***	0.04
			PM	1.67	**F***	1.71	**F***	0.04
Harbor Blvd	Brea Blvd	Berkeley Ave	AM	0.9	D	0.95	**E***	0.05
			PM	0.81	D	0.85	D	0.04
Harbor Blvd	Berkeley Ave	Chapman Ave	AM	0.89	D	0.95	**E***	0.06
			PM	0.82	D	0.89	D	0.07
Harbor Blvd	Chapman Ave	Commonwealth Ave	AM	0.89	D	0.95	**E***	0.06
			PM	0.82	D	0.89	D	0.07
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	AM	1.19	**F***	1.27	**F***	0.08
			PM	1.23	**F***	1.31	**F***	0.08
Harbor Blvd	Orangethorpe Ave	Orangefair Ave	AM	0.75	C	0.79	C	0.04
			PM	0.88	D	0.93	**E***	0.05
Lemon St	Commonwealth Ave	Orangethorpe Ave	AM	1.24	**F***	1.45	**F***	0.21
			PM	1.41	**F***	1.61	**F***	0.2
Lemon St	Orangethorpe Ave	Orangefair Ave	AM	1.16	**F***	1.33	**F***	0.17
			PM	1.45	**F***	1.61	**F***	0.16
Chapman Ave	Harbor Blvd	Raymond Ave	AM	0.89	D	0.99	**E***	0.1
			PM	0.92	**E***	1.02	**F***	0.1
Chapman Ave	Raymond Ave	Acacia Ave	AM	0.95	**E***	1.05	**F***	0.1
			PM	1.12	**F***	1.22	**F***	0.1
Chapman Ave	Acacia Ave	State College Blvd	AM	1.39	**F***	1.51	**F***	0.12
			PM	1.75	**F***	1.87	**F***	0.12
Chapman Ave	State College Blvd	Commonwealth Ave	AM	1.39	**F***	1.43	**F***	0.04
			PM	1.75	**F***	1.79	**F***	0.04
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	AM	0.83	D	0.93	**E***	0.1
			PM	0.83	D	0.93	**E***	0.1
Brea Blvd	Rolling Hills Dr		AM	1.03	**F***	1.07	**F***	0.04

Roadway	Segment Limits		Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		V/C Increase
	From	To		V/C	LOS	V/C	LOS	
		Bastanchury Rd	PM	1.19	**F***	1.23	**F***	0.04
Brea Blvd	Harbor Blvd	Bastanchury Rd	AM	0.91	**E***	0.95	**E***	0.04
			PM	0.99	**E***	1.03	**F***	0.04
Santa Fe Ave	Malden Ave	Harbor Blvd	AM	0.2	A	1	**E***	0.8
			PM	0.2	A	1	**E***	0.8
Santa Fe Ave	Harbor Blvd	Lemon St	AM	0.2	A	0.9	D	0.7
			PM	0.3	A	1	**E***	0.7

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I- = Interstate; LOS = level of service; NB = northbound; SR = State Route; V/C = volume to capacity ratio

Table 6-68 Signalized Intersections: Horizon Year 2040 Impacts with Inclusion of Norwalk/Santa Fe Springs High-Speed Rail Station Option

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
G44	East St and Lincoln Ave	AM	41.6	D	71.3	**E***	29.7
		PM	70.1	**E***	79.7	**E***	9.6
G84	Downey Rd and Washington Blvd	AM	43.4	D	43.4	D	0
		PM	55.5	**E***	101.4	**F***	45.5
G89	Garfield Ave and Washington Blvd	AM	60.3	**E***	60.3	**E***	0
		PM	49.1	D	>180	**F***	>55[1]
G94	Downey Rd and Bandini Blvd	AM	42.7	D	42.7	D	0
		PM	41	D	>180	**F***	>55[1]
G96	Bonnie Beach Pl and Bandini Blvd	AM	16.4	B	25.3	C	8.9
		PM	18.4	B	134.8	**F***	>55[1]
G98	Atlantic Blvd/I-710 NB ramps and Bandini Blvd[1]	AM	112.4	**F***	>180	**F***	>55[1]
		PM	102.1	**F***	124.3	**F***	22.2
G148	Beach Blvd (SR 39) and Stage Rd[1]	AM	20	C	78.5	**E***	>55[1]
		PM	22.3	C	73.7	**E***	51.4
G150	Beach Blvd (SR 39) and La Mirada Blvd/Malvern Ave	AM	49.3	D	63.1	**E***	13.8
		PM	46.4	D	49.6	D	3.2
G177	Valley View Ave and Alondra Blvd	AM	50.4	D	58.7	**E***	8.3
		PM	47.6	D	51.7	D	4.1
N1	Firestone Blvd and Imperial Hwy[1]	AM	62.5	**E***	128.9	**F***	>55[1]

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
		PM	62.8	**E***	58.9	**E***	-3.9
N7	Norwalk Blvd and Imperial Hwy	AM	55.3	**E***	71	**E***	15.7
		PM	173.1	**F***	>180	**F***	25.5
N15	Bloomfield Ave and Imperial Hwy	AM	47	D	61.5	**E***	14.5
		PM	49.2	D	76.5	**E***	27.3
N27	I-5 NB on-ramp and Imperial Hwy	AM	44.2	D	70.1	**E***	25.9
		PM	25	C	29.4	C	4.4
N49	Studebaker Rd and Imperial Hwy	AM	66.2	**E***	130.2	**F***	>55[1]
		PM	74.1	**E***	143.3	**F***	>55[1]
N51	Bloomfield Ave and Firestone Blvd (south)	AM	72.9	**E***	77.8	**E***	4.9
		PM	104.6	**F***	104.7	**F***	0.1
N58	Carmenita Rd and Rosecrans Ave	AM	46	D	46	D	0
		PM	50.3	D	56	**E***	5.7
F10	Malden Ave and Commonwealth Ave	AM	15.6	B	30.4	C	14.8
		PM	48.3	D	144.3	**F***	>55[1]
F11	Harbor Blvd & Imperial Hwy (SR 90)	AM	101.9	**F***	105.2	**F***	3.3
		PM	83.9	**F***	88.3	**F***	4.4
F15	Harbor Blvd and Chapman Ave	AM	71.2	**E***	88.9	**F***	17.7
		PM	63.4	**E***	83.7	**F***	20.3
F16	Harbor Blvd and Commonwealth Ave	AM	71.7	**E***	76.9	**E***	5.2
		PM	41.8	D	45.3	D	3.5
F17	Harbor Blvd and Santa Fe Ave	AM	19.1	B	>180	**F***	>55[1]
		PM	23.6	C	>180	**F***	>55[1]
F23	Lemon St and Chapman Ave	AM	42.3	D	46.6	D	4.3
		PM	49.7	D	55	**E***	5.3
F24	Lemon St and Commonwealth Ave	AM	62.2	**E***	69.4	**E***	7.2
		PM	70.6	**E***	75.8	**E***	5.2
F26	Lemon St and Orangethorpe Ave	AM	49	D	62.8	**E***	13.8
		PM	76.8	**E***	96.2	**F***	19.4
F28	Anaheim Blvd/Lemon St and SR 91 EB ramps	AM	51.7	D	65.8	**E***	14.1
		PM	35.2	D	40.6	D	5.4
F29	Raymond Ave and Chapman Ave	AM	32.6	C	36.8	D	4.2

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
		PM	52	D	63.5	**E***	11.5
F32	State College Blvd and Chapman Ave	AM	40.9	D	46.2	D	5.3
		PM	70.2	**E***	90	**F***	19.8
F48	SR 57 SB ramps and Nutwood Ave[1]	AM	53.6	D	59.6	**E***	6
		PM	34.5	C	39.4	D	4.9
A14	State College Blvd and Orangewood Ave	AM	60.5	**E***	58.5	**E***	-2
		PM	61.2	**E***	69	**E***	7.8
A17	Sunkist St and Cerritos Ave	AM	25.2	C	25.2	C	0
		PM	140.6	**F***	148.4	**F***	7.8
A79	Anaheim Blvd and Cerritos Ave	AM	29.8	C	29.8	C	0
		PM	156.8	**F***	161.2	**F***	4.4

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "N" intersection number prefix indicates Norwalk/Santa Fe Springs Metrolink Station area; "F" intersection number prefix indicates Fullerton Metrolink/Amtrak Station area; "A" intersection number prefix indicates Anaheim Regional Transportation Intermodal Center station area.
[1] Delay is based on Highway Capacity Manual 2000 signalized intersection analysis, because of Highway Capacity Manual 2010 analysis limitations.
Amtrak = National Railroad Passenger Corporation; I = Interstate; EB = eastbound; LOS = level of service; NB = northbound; SB = southbound; sec = seconds; SR = State Route

Table 6-69 Unsignalized Intersections: Horizon Year 2040 Impacts with Inclusion of Norwalk/Santa Fe Springs High-Speed Rail Station Option

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
G95	Indiana St and Bandini Blvd[1]	AM	39.6	**E***	64.2	**F***	24.6
		PM	31.7	D	>180	**F***	>35[1]
G97	Ayers Ave and Bandini Blvd[1]	AM	16	C	16.1	C	0.1
		PM	18.5	C	50.3	**F***	31.8
G114	Gage Rd and Telegraph Rd[1]	AM	53.9	**F***	53.9	**F***	0
		PM	94.8	**F***	164.8	**F***	>35[1]
G118	Chapin Rd and Union St[2]	AM	10	A	10	A	0
		PM	16.7	C	54.7	**F***	>35[1]
G132	Pioneer Blvd and Orr and Day Rd[1]	AM	133	**F***	133	**F***	0
		PM	>180	**F***	>180	**F***	>35[1]
G147	Dodds Ave (east) and Stage Rd[1]	AM	16	C	92.3	**F***	>35[1]
		PM	15.1	C	>180	**F***	>35[1]

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
G210	Eastern Ave and Driveway[1]	AM	84.9	**F***	98.5	**F***	13.6
		PM	>180[1]	**F***	145.1	**F***	-34.9
F9	Malden Ave and Chapman Ave[1]	AM	162.3	**F***	>180	**F***	>35[1]
		PM	>180	**F***	>180	**F***	>35[1]

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "F" intersection number prefix indicates intersections within the Fullerton Metrolink/Amtrak Station area.
[1] Two-way unsignalized intersection. The delay presented is for the worst minor approach delay.
[2] Four-way unsignalized intersection.
Amtrak = National Railroad Passenger Corporation; LOS = level of service; sec = seconds

Of the 252 roadway segments, 265 signalized intersections, and 37 unsignalized intersections evaluated along the project section alignment and at station areas, the following one roadway segment, one signalized intersection, and four unsignalized intersections would improve from either LOS E to LOS D (or higher) or LOS F to LOS E (or higher) in the Plus Project scenario with inclusion of the Norwalk/Santa Fe Springs HSR Station Option:

- Soto Street, from East 26th Street to Washington Boulevard
- G46, East Street and South Street
- G106, Ayers Avenue and East 26th Street
- G208, Downey Road and East 26th Street
- G211, Telegraph Road and Maple Avenue
- F25, Lemon Street and Santa Fe Avenue

Two intersections (G170, Pioneer Boulevard and Wheelock Circle and G211, Telegraph Road and Maple Avenue) would be upgraded to a signalized intersection in the Plus Project condition, which would result in improved overall LOS. Additionally, as discussed further in Section 6.4.1.1, the addition of HSR train operations would not lead to additional traffic delays at adjacent intersections, due to the anticipated use of a clockface schedule, which would result in 15-minute peak headways to account for the two HSR trains, one Metrolink train, and one Amtrak train per hour per direction. In the rare instance that a multi-train gate-down-time event occurs through an HSR train and BNSF train passing in immediate succession, such instances would not exacerbate existing gate down times from multi-train events involving BNSF and passenger rail trains that already occur.

6.4.1.4 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040), Fullerton High-Speed Rail Station Option

Permanent future traffic analyses were conducted using the Horizon year Plus Project traffic analysis calculated in Section 6.7.1.1 as the basis for projecting future volumes, with the added trips calculated in Section 6.3, Shared Passenger Track Alternatives: Project Trip Generation and Distribution. Roadway segment Plus Project analysis and intersection Plus Project analysis were performed for the Phase 1 Horizon Year 2040 condition with inclusion of the Fullerton HSR Station Option. The roadway segment effect analyses along the project section alignment and at the station areas is provided in Table 6-70. Intersection effect analyses along the project section alignment and at station areas is provided in Table 6-71. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B.

Table 6-70 Horizon Year 2040 Plus Project Major Roadway Segment Level of Service for Fullerton High-Speed Rail Station Option

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Vermont Ave	East St	State College Blvd	998	800	800	0.80	0.80	C	C
South St	East St	State College Blvd	950	100	100	0.11	0.11	A	A
Santa Ana St	East St	State College Blvd	950	800	800	0.84	0.84	D	D
Broadway	East St	State College Blvd	3,045	1,400	1,400	0.46	0.46	A	A
Sycamore St	East St	State College Blvd	950	100	100	0.11	0.11	A	A
Harbor Blvd	La Palma Ave	Lincoln Ave	3,045	2,900	2,900	0.95	0.95	**E***	**E***
Harbor Blvd	Lincoln Ave	Ball Rd	2,520	2,600	2,800	1.03	1.11	**F***	**F***
La Palma Ave	Harbor Blvd	East St	3,045	2,000	2,200	0.66	0.72	B	C
La Palma Ave	East St	State College Blvd	2,520	1,900	2,600	0.75	1.03	C	**F***
Lincoln Ave	Anaheim Blvd	East St	5,198	2,500	2,700	0.48	0.52	A	A
Lincoln Ave	East St	State College Blvd	2,520	2,900	3,500	1.15	1.39	**F***	**F***
Soto St	E 26th St	Washington Blvd	2,835	2,300	2,500	0.81	0.88	D	D
Downey Rd	Bandini Blvd	Washington Blvd	3,045	2,700	3,400	0.89	1.12	D	**F***
E 26th St	Downey Rd	Bandini Blvd	998	900	1,300	0.90	1.30	D	**F***
Atlantic Blvd	Bandini Blvd	Washington Blvd	2,835	2,100	2,400	0.74	0.85	C	D
Eastern Ave	Bandini Blvd	Commerce Way	2,835	1,700	1,800	0.60	0.63	A	B
Telegraph Rd	Garfield Ave	Washington Blvd	2,835	1,200	1,400	0.42	0.49	A	A
Garfield Ave	Telegraph Rd	Washington Blvd	2,415	2,800	2,400	1.16	0.99	**F***	**E***
Greenwood Ave	Union St	Washington Blvd	2,415	1,300	1,900	0.54	0.79	A	C
Paramount Blvd	Slauson Ave	Washington Blvd	2,520	1,900	2,600	0.75	1.03	C	**F***
Rosemead Blvd (SR 19)	Slauson Ave	Washington Blvd	2,520	2,500	2,600	0.99	1.03	**E***	**F***
Serapis Ave	Slauson Ave	Bequette Ave	850	300	300	0.35	0.35	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Serapis Ave	Rivera Rd	Rex Rd	1,100	100	100	0.09	0.09	A	A
Rex Rd	Rosemead Blvd (SR 19)	Serapis Ave	950	500	400	0.53	0.42	A	A
Rex Rd	Serapis Ave	Passons Blvd	1,100	500	300	0.45	0.27	A	A
Passons Blvd	Slauson Ave	Washington Blvd	850	900	900	1.06	1.06	**F***	**F***
Slauson Ave	Passons Blvd	I-605 SB on-ramp	3,045	3,000	3,000	0.99	0.99	**E***	**E***
Pioneer Blvd	Los Nietos Rd	Rivera Rd	3,360	1,700	2,000	0.51	0.6	A	A
Pioneer Blvd	Rivera Rd	Slauson Ave	2,520	1,700	2,000	0.67	0.79	B	C
Rivera Rd	Pioneer Blvd	Bradwell Ave	950	100	100	0.11	0.11	A	A
Rivera Rd	Pioneer Blvd	Norwalk Blvd	950	300	200	0.32	0.21	A	A
Norwalk Blvd	Telegraph Rd	Los Nietos Rd	2,520	1,600	1,900	0.63	0.75	B	C
Norwalk Blvd	Los Nietos Rd	Slauson Ave	2,400	1,800	2,100	0.75	0.88	C	D
Los Nietos Rd	Pioneer Blvd	Norwalk Blvd	1,100	900	900	0.82	0.82	D	D
Los Nietos Rd	Norwalk Blvd	Santa Fe Springs Rd	1,103	1,100	1,200	1.00	1.09	**F***	**F***
Santa Fe Springs Rd	Telegraph Rd	Los Nietos Rd	2,415	1,800	1,800	0.75	0.75	C	C
Rosecrans Ave	Carmenita Rd	Marquardt Ave	3,045	2,200	2,300	0.72	0.76	C	C
Rosecrans Ave	Marquardt Ave	Valley View Ave	3,045	2,100	2,100	0.69	0.69	B	B
Marquardt Ave	Rosecrans Ave	Foster Ave	1,155	400	400	0.35	0.35	A	A
Marquardt Ave	Rosecrans Ave	Borate St	1,050	300	200	0.29	0.19	A	A
Valley View Ave	Gannet St	Stage Rd	3,360	2,700	2,800	0.80	0.83	C	D
Valley View Ave	Stage Rd	Rosecrans Ave	3,045	2,700	2,600	0.89	0.85	D	D
Stage Rd	Rosecrans Ave	Valley View Ave	1,100	400	600	0.36	0.55	A	A
Stage Rd	Valley View Ave	Alondra Blvd	2,400	800	800	0.33	0.33	A	A
Alondra Blvd	Valley View Ave	La Mirada Blvd	3,045	2,100	2,300	0.69	0.76	B	C
Stage Rd	Alondra Blvd	Beach Blvd (SR 39)	2,400	700	900	0.29	0.38	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Beach Blvd (SR 39)	Franklin St	Stage Rd	5,198	4,600	5,100	0.88	0.98	D	**E***
Artesia Blvd	Beach Blvd (SR 39)	Dale St	2,520	1,500	1,800	0.60	0.71	A	C
Commonwealth Ave	Beach Blvd (SR 39)	Dale St	2,520	1,100	1,100	0.44	0.44	A	A
Malvern Ave	Beach Blvd (SR 39)	Dale St	2,625	2,200	2,200	0.84	0.84	D	D
Dale St	Artesia Blvd	Malvern Ave	3,150	1,800	2,000	0.57	0.63	A	B
Artesia Blvd	Dale St	Gilbert St	1,000	700	800	0.70	0.80	B	C
Commonwealth Ave	Dale St	Gilbert St	3,045	1,600	1,800	0.53	0.59	A	A
Malvern Ave	Dale St	Gilbert St	3,150	2,700	2,800	0.86	0.89	D	D
Gilbert St	Commonwealth Ave	Artesia Blvd	3,045	2,500	2,500	0.82	0.82	D	D
Gilbert St	Artesia Blvd	Malvern Ave	4,332	3,200	3,000	0.74	0.69	C	B
Commonwealth Ave	Brookhurst Rd	Euclid St	3,045	1,700	1,600	0.56	0.53	A	A
State College Blvd	La Palma Ave	Lincoln Ave	4,410	2,000	2,700	0.45	0.61	A	B
State College Blvd	Lincoln Ave	South St	4,410	2,200	2,800	0.50	0.63	A	B
State College Blvd	South St	Wagner Ave	5,198	2,700	2,600	0.52	0.5	A	A
State College Blvd	Wagner Ave	Ball Rd	4,410	2,900	2,600	0.66	0.59	B	A
East St	La Palma Ave	Lincoln Ave	2,520	1,800	2,000	0.71	0.79	C	C
East St	Lincoln Ave	South St	2,520	1,600	1,500	0.63	0.60	B	A
East St	South St	Vermont St	3,360	1,300	1,300	0.39	0.39	A	A
East St	Vermont St	Ball Rd	2,520	1,600	1,500	0.63	0.60	B	A
Anaheim Blvd	La Palma Ave	Lincoln Ave	2,520	1,500	1,700	0.60	0.67	A	B
Anaheim Blvd	Lincoln Ave	South St	2,520	1,900	2,200	0.75	0.87	C	D
Anaheim Blvd	South St	Vermont St	3,360	2,000	2,200	0.6	0.65	A	B
Anaheim Blvd	Vermont St	Ball Rd	2,520	2,300	2,800	0.91	1.11	**E***	**F***
Carmenita Rd	Alondra Blvd	Excelsior Dr	3,045	2,300	2,600	0.76	0.85	C	D

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Beach Blvd (SR 39)	Malvern Ave	Stage Rd	4,410	4,400	4,800	1.00	1.09	**F***	**F***
Santa Fe Springs Rd	Los Nietos Rd	John St	3,150	1,800	2,100	0.57	0.67	A	B
Washington Blvd	Indiana St	Downey Rd	3,360	700	900	0.21	0.27	A	A
Washington Blvd	Ayers Ave	I-710	3,045	800	1,100	0.26	0.36	A	A
Washington Blvd	I-710	Atlantic Blvd	2,835	1,600	2,100	0.56	0.74	A	C
Telegraph Rd	Garfield Ave	Maple Ave	2,700	1,800	2,000	0.67	0.74	B	C
Bandini Blvd	Soto St	Downey Rd	2,700	1,500	1,500	0.56	0.56	A	A
Bandini Blvd	Downey Rd	Atlantic Blvd	2,400	2,100	2,400	0.88	1.00	D	**F***
Bandini Blvd	Atlantic Blvd	Eastern Ave	2,300	1,900	2,300	0.83	1.00	D	**F***
Soto St	E 26th St	Bandini Blvd	2,700	3,300	3,100	1.22	1.15	**F***	**F***
E 26th St	Sierra Pine Ave	Downey Rd	2,500	1,100	1,600	0.44	0.64	A	B
Firestone Blvd	Studebaker Rd	Imperial Hwy	3,675	1,900	2,000	0.52	0.54	A	A
Firestone Blvd	Imperial Hwy	Pioneer Blvd	2,520	1,800	2,000	0.71	0.79	C	C
Pioneer Blvd	Telegraph Rd	Florence Ave	2,520	1,800	1,200	0.71	0.48	C	A
Norwalk Blvd	Telegraph Rd	Florence Ave	2,520	1,600	1,700	0.63	0.67	B	B
Norwalk Blvd	Florence Ave	Lakeland Rd	3,045	1,700	1,700	0.56	0.56	A	A
Norwalk Blvd	Tina St	Imperial Hwy	2,520	2,200	2,100	0.87	0.83	D	D
Bloomfield Ave	Telegraph Rd	Florence Ave	2,415	1,600	1,600	0.66	0.66	B	B
Bloomfield Ave	Florence Ave	Lakeland Rd	2,835	1,900	1,800	0.67	0.63	B	B
Bloomfield Ave	Lakeland Rd	6th St	3,150	1,800	1,700	0.57	0.54	A	A
Bloomfield Ave	6th St	Imperial Hwy	2,625	1,800	1,800	0.69	0.69	B	B
Bloomfield Ave	Imperial Hwy	Foster Rd	2,520	1,700	2,000	0.67	0.79	B	C
Leffingwell Rd	Meyer Rd	Carmenita Rd	3,045	1,500	1,600	0.49	0.53	A	A
Leffingwell Rd	Carmenita Rd	Imperial Hwy	2,520	900	1,000	0.36	0.4	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Leffingwell Rd	Imperial Hwy	Adler Dr	1,000	400	500	0.4	0.5	A	A
Carmenita Rd	Telegraph Rd	Florence Ave	2,520	1,800	1,800	0.71	0.71	C	C
Carmenita Rd	Florence Ave	Lakeland Ave	3,045	1,900	2,100	0.62	0.69	B	B
Carmenita Rd	Meyer Rd	Leffingwell Rd	3,045	1,600	2,000	0.53	0.66	A	B
Carmenita Rd	Leffingwell Rd	Imperial Hwy	2,520	1,800	2,300	0.71	0.91	C	**E***
Carmenita Rd	Imperial Hwy	Orden Dr	2,520	2,200	2,600	0.87	1.03	D	**F***
Telegraph Rd	Pioneer Blvd	Norwalk Blvd	5,198	3,300	3,100	0.63	0.6	B	B
Telegraph Rd	Norwalk Blvd	Santa Fe Springs Rd	4,883	2,800	2,700	0.57	0.55	A	A
Telegraph Rd	Shoemaker Ave	Carmenita Rd	4,883	2,300	2,300	0.47	0.47	A	A
Telegraph Rd	Carmenita Rd	Florence Ave	5,198	2,200	2,600	0.42	0.5	A	A
Florence Ave	Orr and Day Rd	Pioneer Blvd	3,045	3,600	3,500	1.18	1.15	**F***	**F***
Florence Ave	Pioneer Blvd	Norwalk Blvd	3,045	2,600	2,800	0.85	0.92	D	**E***
Florence Ave	Norwalk Blvd	Bloomfield Ave	2,835	2,400	2,600	0.85	0.92	D	**E***
Florence Ave	Bloomfield Ave	Shoemaker Ave	2,835	2,400	2,500	0.85	0.88	D	D
Florence Ave	Shoemaker Ave	Carmenita Rd	2,835	2,400	2,400	0.85	0.85	D	D
Florence Ave	Carmenita Rd	Telegraph Rd	2,520	2,300	2,500	0.91	0.99	**E***	**E***
Imperial Hwy	Studebaker Rd	Firestone Blvd	5,198	3,500	3,700	0.56	0.6	A	B
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	4,410	4,000	4,100	0.68	0.7	B	C
Imperial Hwy	Bloomfield Ave	Shoemaker Ave	5,198	3,300	3,400	0.63	0.65	B	B
Imperial Hwy	Shoemaker Ave	Leffingwell Rd	5,198	3,200	3,300	0.62	0.63	B	B
Imperial Hwy	Leffingwell Rd	Carmenita Rd	5,198	2,300	2,200	0.44	0.42	A	A
Telegraph Rd	Santa Fe Springs Rd	Shoemaker Ave	4,883	2,000	2,300	0.41	0.47	A	A
Lakeland Rd	Pioneer Blvd	Norwalk Blvd	1,100	700	800	0.64	0.73	B	C
Lakeland Rd	Norwalk Blvd	Bloomfield Ave	1,050	900	900	0.86	0.86	D	D

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Lakeland Rd	Bloomfield Ave	Shoemaker Ave	1,103	800	900	0.73	0.82	C	D
Shoemaker Ave	Telegraph Rd	Florence Ave	2,415	1,300	1,100	0.54	0.46	A	A
Shoemaker Ave	Florence Ave	Lakeland Rd	2,835	1,600	1,400	0.56	0.49	A	A
Shoemaker Ave	Lakeland Rd	Imperial Hwy	2,400	1,200	1,100	0.5	0.46	A	A
Florence Ave	I-605	Woodruff Ave	3,360	2,800	2,700	0.83	0.8	D	D
Imperial Hwy	I-605	Woodruff Ave	5,198	2,900	3,100	0.56	0.6	A	B
Imperial Hwy	I-605	Studebaker Rd	5,198	3,300	3,600	0.63	0.69	B	B
Studebaker Rd	Imperial Hwy	I-105	2,520	2,500	2,400	0.99	0.95	**E***	**E***
Carmenita Rd	Orden Dr	Rosecrans Ave	2,520	2,500	2,300	0.99	0.91	**E***	**E***
Shoemaker Ave	Imperial Hwy	Foster Rd	1,000	900	1,000	0.6	0.7	B	C
Shoemaker Ave	Foster Rd	Rosecrans Ave	2,400	800	600	0.33	0.25	A	A
Norwalk Blvd	Imperial Hwy	Civic Center Dr	4,410	2,300	2,500	0.52	0.57	A	A
Civic Center Dr	Norwalk Blvd	Bloomfield Ave	2,200	1,300	1,500	0.59	0.68	A	B
Civic Center Dr	Bloomfield Ave	Volunteer Ave	950	200	100	0.21	0.11	A	A
Foster Rd	Bloomfield Ave	Shoemaker Ave	900	600	700	0.67	0.78	B	C
Rosecrans Ave	Shoemaker Ave	Carmenita Rd	4,332	2,700	3,000	0.62	0.69	B	B
San Antonio Dr	Firestone Blvd	Pioneer Blvd/Rosecrans Ave	2,520	1,500	1,600	0.6	0.63	B	B
Rosecrans Ave	Pioneer Blvd	Norwalk Blvd	2,520	1,900	1,800	0.75	0.71	C	C
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	2,520	2,500	2,500	0.99	0.99	**E***	**E***
Rosecrans Ave	I-605 NB ramps	Studebaker Rd	4,332	3,500	3,500	0.81	0.81	D	D
Rosecrans Ave	I-605 SB ramps	I-605 NB ramps	4,332	2,800	2,700	0.65	0.62	B	B
Lakeland Rd	Shoemaker Ave	Carmenita Rd	1,050	500	600	0.48	0.57	A	A
Studebaker Rd	Imperial Hwy	Firestone Blvd	2,520	1,500	1,600	0.6	0.63	B	B

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Pioneer Blvd	South St	187th St	3,045	1,500	1,600	0.49	0.53	A	A
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	5,198	4,300	4,400	0.62	0.63	B	B
Euclid St	Bastanchury Rd	Malvern Ave	2,625	2,900	2,800	1.1	1.07	**F***	**F***
Euclid St	Malvern Ave	Commonwealth Ave	3,045	3,100	3,000	1.02	0.99	**F***	**E***
Euclid St	Commonwealth Ave	Orangethorpe Ave	2,520	2,500	2,500	0.99	0.99	**E***	**E***
Highland Ave	Malvern Ave	Chapman Ave	1,100	800	1,000	0.73	0.91	C	**E***
Highland Ave	Chapman Ave	Commonwealth Ave	1,100	700	900	0.64	0.82	B	D
Highland Ave	Commonwealth Ave	Valencia Dr	1,155	1,000	1,300	0.87	1.13	D	**F***
Highland Ave	Valencia Dr	Orangethorpe Ave	1,050	500	1,000	0.48	0.95	A	**E***
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	2,520	4,000	4,300	1.59	1.71	**F***	**F***
Harbor Blvd	Bastanchury Rd	Brea Blvd	5,198	3,500	3,800	0.67	0.73	B	C
Harbor Blvd	Brea Blvd	Berkeley Ave	4,332	4,000	3,600	0.92	0.83	**E***	D
Harbor Blvd	Berkeley Ave	Chapman Ave	3,045	2,800	2,600	0.92	0.85	**E***	D
Harbor Blvd	Chapman Ave	Commonwealth Ave	3,045	2,900	2,700	0.95	0.89	**E***	D
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	3,100	3,200	1.23	1.27	**F***	**F***
Harbor Blvd	Orangethorpe Ave	Orangefair Ave	4,410	3,500	4,100	0.79	0.93	C	**E***
Lemon St	Berkeley Ave	Chapman Ave	3,045	1,700	2,100	0.56	0.69	A	B
Lemon St	Chapman Ave	Commonwealth Ave	3,045	2,300	2,500	0.76	0.82	C	D
Lemon St	Commonwealth Ave	Orangethorpe Ave	2,415	3,500	3,900	1.45	1.61	**F***	**F***
Lemon St	Orangethorpe Ave	Orangefair Ave	2,415	3,200	3,900	1.33	1.61	**F***	**F***
Raymond Ave	Chapman Ave	Commonwealth Ave	3,045	1,100	900	0.36	0.3	A	A
Raymond Ave	Commonwealth Ave	Orangethorpe Ave	2,415	500	700	0.21	0.29	A	A
Raymond Ave	Orangethorpe Ave	E Burton St	2,415	1,700	1,900	0.7	0.79	B	C
State College Blvd	Dorothy Ln	Chapman Ave	5,198	2,500	2,300	0.48	0.44	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
State College Blvd	Chapman Ave	Commonwealth Ave	3,045	1,700	1,800	0.56	0.59	A	A
State College Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	1,400	1,500	0.56	0.6	A	B
State College Blvd	Orangethorpe Ave	Via Burton St	2,415	1,700	2,200	0.7	0.91	B	**E***
Malvern Ave	Bastanchury Rd	Basque Ave	2,900	1,700	2,000	0.59	0.69	A	B
Chapman Ave	Richman Ave	Highland Ave	3,360	1,900	2,100	0.57	0.63	A	B
Chapman Ave	Harbor Blvd	Raymond Ave	3,045	3,000	3,100	0.99	1.02	**E***	**F***
Chapman Ave	Raymond Ave	Acacia Ave	3,045	3,200	3,700	1.05	1.22	**F***	**F***
Chapman Ave	Acacia Ave	State College Blvd	2,520	3,800	4,700	1.51	1.87	**F***	**F***
Chapman Ave	State College Blvd	Commonwealth Ave	2,520	3,600	4,500	1.43	1.79	**F***	**F***
Commonwealth Ave	Brookhurst St	Euclid St	3,045	1,700	1,700	0.56	0.56	A	A
Commonwealth Ave	Euclid St	Harbor Blvd	2,900	1,900	1,700	0.66	0.59	B	A
Commonwealth Ave	Harbor Blvd	Raymond Ave	2,900	2,600	2,500	0.9	0.86	D	D
Commonwealth Ave	Raymond Ave	Acacia Ave	2,900	2,300	2,100	0.79	0.72	C	C
Commonwealth Ave	Acacia Ave	State College Blvd	2,400	1,300	1,500	0.54	0.63	A	B
Commonwealth Ave	State College Blvd	Chapman Ave	2,400	800	900	0.33	0.38	A	A
Valencia Dr	Highland Ave	Harbor Blvd	1,100	900	900	0.82	0.82	D	D
Valencia Dr	Harbor Blvd	Lemon St	1,050	900	900	0.86	0.86	D	D
Orangethorpe Ave	Euclid St	Highland Ave	3,045	1,900	2,700	0.62	0.89	B	D
Orangethorpe Ave	Harbor Blvd	Raymond Ave	4,253	2,600	3,100	0.61	0.73	B	C
Orangethorpe Ave	Raymond Ave	State College Blvd	4,253	2,200	2,900	0.52	0.68	A	B
Orangethorpe Ave	State College Blvd	Placentia Ave	4,253	2,400	2,700	0.56	0.63	A	B
SR 57 SB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	500	900	0.46	0.83	A	D
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	1,080	1,000	1,000	0.93	0.93	**E***	**E***
Chapman Ave	Commonwealth Ave	SR 57	3,045	4,000	4,900	1.31	1.61	**F***	**F***

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Placentia Ave	Chapman Ave	Orangethorpe Ave	2,520	1,800	1,900	0.71	0.75	C	C
Valencia Dr	Euclid St	Highland Ave	1,155	800	900	0.69	0.78	B	C
Orangethorpe Ave	Placentia Ave	SR 57	5,198	2,400	2,600	0.46	0.5	A	A
Imperial Hwy (SR 90)	Harbor Blvd	Puente St	4,410	4,200	4,300	0.95	0.98	**E***	**E***
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	2,520	2,700	3,100	1.07	1.23	**F***	**F***
Bastanchury Rd	Euclid St	Harbor Blvd	2,625	3,400	3,400	1.3	1.3	**F***	**F***
Bastanchury Rd	Harbor Blvd	Brea Blvd	2,520	3,600	3,600	1.43	1.43	**F***	**F***
Yorba Linda Blvd	State College Blvd	Associated Rd/Campus Dr	4,725	2,400	2,400	0.51	0.51	A	A
Yorba Linda Blvd	Associated Rd/Campus Dr	SR 57	5,198	2,600	2,800	0.5	0.54	A	A
Euclid St	Orangethorpe Ave	SR 91	2,520	3,000	3,200	1.19	1.27	**F***	**F***
Brea Blvd	Harbor Blvd	Bastanchury Rd	2,520	2,400	2,600	0.95	1.03	**E***	**F***
Santa Fe Ave	Highland Ave	Malden Ave	1,150	200	300	0.17	0.26	A	A
Santa Fe Ave	Malden Ave	Harbor Blvd	1,000	800	800	0.8	0.8	C	D
Santa Fe Ave	Harbor Blvd	Lemon St	1,000	900	1,000	0.9	1	D	**F***
Lewis St	Ball Rd	Cerritos Ave	2,415	1,000	1,200	0.41	0.5	A	A
Lewis St	Cerritos Ave	Katella Ave	2,415	800	1,000	0.33	0.41	A	A
Lewis St	Katella Ave	Anaheim Way	950	200	300	0.21	0.32	A	A
State College Blvd	Ball Rd	Cerritos Ave	4,253	2,700	3,100	0.63	0.73	B	C
State College Blvd	Cerritos Ave	Howell Ave	4,883	2,000	2,300	0.41	0.47	A	A
State College Blvd	Howell Ave	Katella Ave	3,938	2,500	2,800	0.63	0.71	B	C
State College Blvd	Katella Ave	Gene Autry Way	3,938	3,300	3,100	0.84	0.79	D	C
State College Blvd	Gene Autry Way	Orangewood Ave	4,253	3,000	3,000	0.71	0.71	C	C
State College Blvd	Orangewood Ave	I-5	6,090	3,900	4,500	0.64	0.74	B	C

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Sunkist St	Ball Rd	Cerritos Ave	2,415	1,300	1,600	0.54	0.66	A	B
Sunkist St	Cerritos Ave	Howell Ave	2,835	700	600	0.25	0.21	A	A
Douglass Rd	Cerritos Ave	Katella Ave	2,415	900	1,200	0.37	0.5	A	A
Main St	Taft Ave	Katella Ave	2,415	1,400	1,100	0.58	0.46	A	A
Main St	Katella Ave	Collins Ave	2,415	1,800	2,000	0.75	0.83	C	D
Main St	Collins Ave	Orangewood Ave	2,835	2,000	2,300	0.71	0.81	C	D
Main St	Orangewood Ave	Chapman Ave	2,415	2,000	2,000	0.83	0.83	D	D
Ball Rd	Harbor Blvd	Anaheim Blvd	3,938	3,000	3,700	0.76	0.94	C	**E***
Ball Rd	Anaheim Blvd	Lewis St	4,253	2,500	3,300	0.59	0.78	A	C
Ball Rd	Lewis St	State College Blvd	4,253	3,000	3,400	0.71	0.8	C	C
Ball Rd	State College Blvd	Sunkist St	2,415	3,000	3,100	1.24	1.28	**F***	**F***
Ball Rd	Sunkist St	SR 57	4,883	3,400	3,300	0.7	0.68	B	B
Ball Rd	SR 57	Main St	2,835	2,600	3,400	0.92	1.2	**E***	**F***
Cerritos Ave	Lewis St	State College Blvd	2,415	900	1,000	0.37	0.41	A	A
Cerritos Ave	State College Blvd	Sunkist St	2,300	1,200	1,900	0.52	0.83	A	D
Cerritos Ave	Sunkist St	Douglass Rd	2,835	700	1,000	0.25	0.35	A	A
Katella Ave	Anaheim Blvd/Haster St	I-5	4,253	2,600	3,600	0.61	0.85	B	D
Katella Ave	I-5	Lewis St	4,883	3,200	4,400	0.66	0.9	B	D
Katella Ave	Lewis St	State College Blvd	4,253	2,200	3,000	0.52	0.71	A	C
Katella Ave	State College Blvd	Sportstown	4,253	2,900	3,100	0.68	0.73	B	C
Katella Ave	Sportstown	Howell Ave	4,883	2,600	3,000	0.53	0.61	A	B
Katella Ave	Howell Ave	SR 57	4,883	2,700	3,000	0.55	0.61	A	B
Gene Autry Way	I-5	State College Blvd	2,415	1,700	1,800	0.7	0.75	B	C
Orangewood Ave	Manchester Ave	State College Blvd	4,253	3,300	3,500	0.78	0.82	C	D

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Orangewood Ave	State College Blvd	Rampart St	2,415	3,300	3,400	1.37	1.41	**F***	**F***
Orangewood Ave	Rampart St	SR 57	3,000	2,800	3,200	0.93	1.07	**E***	**F***
Orangewood Ave	SR 57	Eckhoff St	3,150	2,900	3,100	0.92	0.98	**E***	**E***
Orangewood Ave	Eckhoff St.	Main St	2,835	2,200	2,400	0.78	0.85	C	D
Chapman Ave	I-5 SB on-ramp/NB off-ramp	SR 57	4,253	2,700	3,300	0.63	0.78	B	C
Chapman Ave	SR 57	Main St	4,883	2,200	2,700	0.45	0.55	A	A
Douglass Rd	Katella Ave	ARTIC entrance	2,300	1,100	1,100	0.48	0.48	A	A
Katella Ave	Douglass Rd	Main St	4,883	2,400	2,600	0.49	0.53	A	A
Katella Ave	SR 57	Douglass Rd	4,883	3,300	3,600	0.68	0.74	B	C
Chapman Ave	Lewis St	The City Dr	3,938	2,700	3,300	0.69	0.84	B	D
Chapman Ave	The City Dr	I-5 SB on-ramp/NB off-ramp	3,938	3,100	3,800	0.79	0.96	C	**E***
Disneyland Dr	Ball Rd	I-5 SB off-ramp	3,375	1,600	1,800	0.47	0.53	A	A
State College Blvd	Manchester Ave	Chapman Ave	4,253	3,500	4,100	0.82	0.96	D	**E***
Manchester Ave	Orangewood Ave	Chapman Ave	2,520	1,500	700	0.6	0.28	A	A
Lewis St	Orangewood Ave	Chapman Ave	800	1,300	1,400	1.63	1.75	**F***	**F***
Ball Rd	I-5 NB ramps	Disneyland Dr	4,650	3,500	3,900	0.75	0.84	C	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; SR = State Route; V/C = volume to capacity; veh/hr = vehicles per hour

Table 6-71 Horizon Year 2040 Plus Project Intersection Level of Service for Fullerton High-Speed Rail Station Option

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G35	Anaheim Blvd and La Palma Ave[1]	33	C	38.1	D
G36	Anaheim Blvd and Sycamore St[1]	7.1	A	6.6	A
G37	Anaheim Blvd and Lincoln Ave	36.1	D	46.9	D
G38	Anaheim Blvd and Santa Ana St	32.3	C	21.4	C
G39	Anaheim Blvd and South St	9.9	A	8.2	A
G40	Anaheim Blvd and Vermont Ave	21.9	C	15.9	B
G42	East St and La Palma Ave	33.9	C	57	**E***
G43	East St and Sycamore St	19.4	B	13.2	B
G44	East St and Lincoln Ave	76.3	**E***	84.2	**F***
G45	East St and Santa Ana St	39.2	D	25.7	C
G46	East St and South St	18.9	B	136.7	**F***
G47	East St and Vermont Ave	20.2	C	19	B
G49	Anaheim Blvd and Broadway	26.3	C	28.3	C
G50	East St and Broadway	27.6	C	24.9	C
G67	Harbor Blvd and La Palma Ave	42.5	D	113.4	**F***
G68	Harbor Blvd and Lincoln Ave	66.8	**E***	78.5	**E***
G73	State College Blvd and La Palma Ave	33.2	C	59.9	**E***
G74	State College Blvd and Lincoln Ave	39.3	D	51.1	D
G75	State College Blvd and Vermont Ave	>180	**F***	>180	**F***
G78	Harbor Blvd and Vermont Ave	15.8	B	14.5	B
G83	Soto St and Washington Blvd	53.7	D	40.6	D
G84	Downey Rd and Washington Blvd	43.4	D	55.5	**E***
G85	Atlantic Blvd and Washington Blvd	39.2	D	33.3	C
G86	Eastern Ave and Washington Blvd	30	C	33.8	C
G87	I-5 SB ramps and Washington Blvd[1]	20.9	C	33.6	C
G88	Telegraph Rd and Washington Blvd	35.2	D	47.2	D
G89	Garfield Ave and Washington Blvd	67.8	**E***	55	D
G90	Greenwood Ave and Washington Blvd	35	C	35.9	D
G91	Passons Blvd and Washington Blvd	44.3	D	35.9	D
G92	Pioneer Blvd and Washington Blvd	115.5	**F***	62.8	**E***
G93	Sierra Pine Ave and Bandini Blvd	16.9	B	14.7	B
G94	Downey Rd and Bandini Blvd	42.7	D	40.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G95	Indiana St and Bandini Blvd[2]	39.6	**E***	31.7	D
G96	Bonnie Beach Pl and Bandini Blvd	16.4	B	18.4	B
G97	Ayers Ave and Bandini Blvd[2]	16	C	18.4	C
G98	Atlantic Blvd/I-710 NB ramps and Bandini Blvd[1]	113.9	**F***	102.1	**F***
G99	Eastern Ave and Bandini Blvd	34.7	C	35.3	D
G100	Garfield Ave and Bandini Blvd	26	C	44.6	D
G101	I-5 SB ramps and Bandini Blvd[2]	>180	**F***	>180	**F***
G102	Soto St and E 26th St	26.5	C	42.3	D
G103	Sierra Pine Ave and E 26th St[2]	18	C	22.8	C
G104	Indiana St and E 26th St[2]	15.5	C	28.6	D
G105	Bonnie Beach Pl and E 26th St	13	B	11.9	B
G106	Ayers Ave and E 26th St[2]	23.4	C	144.8	**F***
G107	Soto St and E 37th St/Bandini Blvd	40.7	D	34.2	C
G108	Eastern Ave and Commerce Way	7.2	A	7.8	A
G109	Telegraph Rd (Washington Blvd) and I-5 NB ramps	36.9	D	40.5	D
G110	Garfield Ave and Telegraph Rd	34.9	C	32.9	C
G111	Telegraph Rd (Garfield Ave) and I-5 NB ramps[1]	27.8	C	31.1	C
G112	Greenwood Ave and Telegraph Rd	12.4	B	16.3	B
G113	Telegraph Rd (Slauson Ave) and I-5 NB off-ramp[2]	>180	**F***	>180	**F***
G114	Gage Rd and Telegraph Rd[2]	53.9	**F***	94.8	**F***
G115	Telegraph Rd and Slauson Ave	47	D	54.3	D
G116	Greenwood Ave and Driveway[2]	19.2	C	25.9	D
G117	Greenwood Ave and Union St	6.7	A	8.4	A
G118	Chapin Rd and Union St[3]	10	A	16.7	C
G119	I-5 SB ramps/Gage Ave and Slauson Ave[1]	51.8	D	80.9	**F***
G120	Chapin Rd and Slauson Ave	7.2	A	20.7	C
G121	Paramount Blvd and Slauson Ave	43.7	D	53.6	D
G122	Rosemead Blvd (SR 19) and Slauson Ave	59	**E***	56.1	**E***
G123	Passons Blvd and Slauson Ave	58.5	**E***	135.9	**F***
G124	I-605 SB off-ramp and Slauson Ave	35.9	D	23.2	C
G125	Pioneer Blvd and Slauson Ave	66.1	**E***	63.8	**E***
G126	Norwalk Blvd and Slauson Ave	43.5	D	38.6	D
G127	Sorensen Ave and Slauson Ave	36.6	D	39.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G128	Santa Fe Springs Rd and Slauson Ave/Mulberry Dr[1]	31.2	C	24.4	C
G130	Pioneer Blvd and I-605 NB off-ramp[2]	118.2	**F***	>180	**F***
G131	Pioneer Blvd and Los Nietos Rd	18.2	B	17.4	B
G132	Pioneer Blvd and Orr and Day Rd[2]	133	**F***	>180	**F***
G133	Pioneer Blvd and Telegraph Rd	31	C	30	C
G134	Norwalk Blvd and Los Nietos Rd	22.6	C	28.1	C
G135	Los Nietos Rd and Santa Fe Springs Rd	24.6	C	24.8	C
G136	Santa Fe Springs Rd and Sorensen Ave[2]	26.3	D	60.9	**F***
G137	Valley View Ave and Imperial Hwy	43.6	D	47.1	D
G138	Valley View Ave and Foster Rd	128.8	**F***	>180	**F***
G139	Valley View Ave and Rosecrans Ave	59.4	**E***	49.7	D
G140	Valley View Ave and Stage Rd	21.2	C	24.6	C
G141	Valley View Ave and Gannet St	11.4	B	13.3	B
G142	Marquardt Ave and Imperial Hwy	18.6	B	19.6	B
G143	Marquardt Ave and Foster Rd[3]	23.1	C	19.6	C
G144	Marquardt Ave and Rosecrans Ave/Stage Rd	24.7	C	31.1	C
G146	Stage Rd/Escalona Rd and Alondra Blvd[1]	21.7	C	25.2	C
G147	Dodds Ave (East) and Stage Rd[2]	24.8	C	29.8	D
G148	Beach Blvd (SR 39) and Stage Rd[1]	55.1	**E***	48	D
G149	La Mirada Blvd and Alondra Blvd	37.4	D	29.1	C
G150	Beach Blvd (SR 39) and La Mirada Blvd/Malvern Ave	55.5	**E***	43.9	D
G151	Beach Blvd (SR 39) and Franklin St	33.2	C	44.5	D
G152	Beach Blvd (SR 39) and Artesia Ave	39.1	D	49.4	D
G153	Dale St and Malvern Ave[1]	31.2	C	29.9	C
G154	Dale St and Lakeknoll Dr	16	B	6.9	A
G155	Dale St and Artesia Ave	21.5	C	19.9	B
G156	Stanton Ave and Artesia Ave	23.2	C	26.1	C
G157	Dale St and Commonwealth Ave	30.3	C	28.4	C
G158	Gilbert St and Commonwealth Ave[1]	39.4	D	35	C
G159	Brookhurst Rd and Commonwealth Ave[1]	33.5	C	28.5	C
G160	Brookhurst Rd and Valencia Dr	68.9	**E***	30.1	C
G162	Gilbert St and Malvern Ave	90.1	**F***	45.8	D
G163	Gilbert St and Artesia Ave	18.8	B	14.8	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G164	Anaheim Blvd/Lemon St and La Palma Ave	13.7	B	31.3	C
G165	Paramount Blvd and Washington Blvd	56.5	**E***	48	D
G166	Rosemead Blvd (SR 19) and Washington Blvd	45.7	D	47.7	D
G167	E 26th St and Bandini Blvd[1]	10.9	B	21.1	C
G168	Garfield Ave and E 26th St[2]	>180	**F***	>180	**F***
G169	Serapis Ave and Slauson Ave	14.2	B	12.4	B
G170	Pioneer Blvd and Wheelock Cir[2]	11.6	B	16.2	B
G171	Pioneer Blvd and Rivera Rd[2]	--	--	--	--
G173	Passons Blvd and Rivera Rd	21.9	C	13.4	B
G174	Rosemead Blvd (SR 19) and Rex Rd	25.6	C	22.6	C
G175	Passons Blvd and Rex Rd[3]	24.2	C	16.1	C
G176	La Mirada Blvd and Rosecrans Ave	31.6	C	34.2	C
G177	Valley View Ave and Alondra Blvd	55.3	**E***	50.8	D
G178	Beach Blvd (SR 39) and Commonwealth Ave	25.8	C	30.8	C
G179	Wheelock Cir and Rivera Rd[2]	4.7	A	9.2	A
G180	Dodds Ave (West) and Stage Rd[2]	8.5	A	9	A
G197	Indiana St and Washington Blvd	21.3	C	16.3	B
G198	Oak St and Washington Blvd	17.5	B	16.3	B
G199	Arrowmill Ave and Washington Blvd	24.6	C	15.9	B
G200	Ayers Ave and Washington Blvd	19	B	17.6	B
G201	I-710 SB ramps and Washington Blvd[1]	20	C	24.1	C
G202	I-710 NB ramps and Washington Blvd[1]	35.1	D	41.9	D
G203	Atlantic Blvd and Sheila St	121.2	**F***	>180	**F***
G208	Downey Rd and E 26th St[2]	38.3	**E***	25.7	D
G210	Eastern Ave and Driveway[2]	98.5	**F***	145.1	**F***
G211	Telegraph Rd and Maple Ave[2]	25.2	D	45.6	**E***
N1	Firestone Blvd and Imperial Hwy[1]	136.3	**F***	61.9	**E***
N2	Pioneer Blvd and Florence Ave	42.2	D	34.4	C
N3	Pioneer Blvd and Imperial Hwy	37.7	D	40	D
N5	Norwalk Blvd and Telegraph Rd	44.9	D	42	D
N6	Norwalk Blvd and Florence Ave	42.5	D	41.9	D
N7	Norwalk Blvd and Imperial Hwy	57.8	**E***	174.7	**F***
N10	Bloomfield Ave/Santa Fe Springs Rd and Telegraph Rd	32.7	C	31.4	C

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N11	Bloomfield Ave and Florence Ave	40.2	D	37	D
N12	Bloomfield Ave and Lakeland Rd	24.5	C	21.9	C
N15	Bloomfield Ave and Imperial Hwy	49.8	D	54.3	D
N17	Transportation Center West and Imperial Hwy[1]	0	0	0	0
N18	Transportation Center East and Imperial Hwy[1]	25.6	C	26.2	C
N19	Shoemaker Ave and Florence Ave	29.2	C	27.6	C
N20	Shoemaker Ave/Adler Dr and Imperial Hwy	27.9	C	27.8	C
N21	Leffingwell Rd and Imperial Hwy	30.2	C	28.1	C
N22	Carmenita Rd and Telegraph Rd	47	D	47.3	D
N23	Carmenita Rd and Florence Ave	45.2	D	41.3	D
N24	Carmenita Rd and Leffingwell Rd	22	C	27	C
N25	Carmenita Rd and Imperial Hwy	42.2	D	42.6	D
N26	Telegraph Rd and Florence Ave/Mills Ave	45.4	D	49.6	D
N27	I-5 NB on-ramp and Imperial Hwy	49.8	D	25.5	C
N30	I-5 SB off-ramp and Imperial Hwy[1]	22.6	C	27.8	C
N31	Norwalk Blvd and I-5 NB ramps	34.1	C	31.1	C
N32	San Antonio Dr and I-5 SB on-ramp[1]	23.3	C	25.7	C
N33	Shoemaker Ave and Telegraph Rd	73.5	**E***	50.1	D
N34	Pioneer Blvd and Lakeland Rd	28	C	22.3	C
N35	Norwalk Blvd and Lakeland Rd	20.8	C	20.1	C
N36	I-605 SB ramps and Florence	72	**E***	50.5	D
N37	Studebaker Rd and Florence Ave[1]	34.7	C	41.6	D
N38	Studebaker Rd and I-605 NB ramps/Dollison Dr[1]	40.1	D	17.6	B
N40	Fairford Ave and Florence Ave	30	C	28.7	C
N41	I-5 NB off-ramp and Florence Ave	15.8	B	7.1	A
N42	Orr and Day Rd and Florence Ave[1]	29.7	C	26.2	C
N45	I-605 SB ramps/Flatbush Ave and Imperial Hwy[1]	27.5	C	53.8	D
N46	Hoxie Ave and Imperial Hwy[1]	45.2	D	69.2	**E***
N47	I-605 NB ramps and Hoxie Ave	28	C	39.5	D
N48	Studebaker Rd and I-105 ramps	39.7	D	31.5	C
N49	Studebaker Rd and Imperial Hwy	70.5	**E***	77.1	**E***
N50	Bloomfield Ave and Firestone Blvd (North)	6.9	A	11.5	B
N51	Bloomfield Ave and Firestone Blvd (South)	77.8	**E***	104.7	**F***
N52	Bloomfield Ave and Rosecrans Ave	47.7	D	50.7	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N53	I-5 NB off-ramp and Rosecrans Ave[1]	18.5	B	21.9	C
N54	I-5 SB on-ramp and Rosecrans Ave[1]	15.3	B	14.4	B
N55	Shoemaker Ave and Rosecrans Ave	45.2	D	50.3	D
N56	Shoemaker Ave and Overcrossing (South)[2]	20.2	C	154.3	**F***
N57	Shoemaker Ave and Firestone Blvd (South)[2]	10.7	B	12.4	B
N58	Carmenita Rd and Rosecrans Ave	46	D	56	**E***
N61	Carmenita Rd and I-5 NB ramps[1]	10	B	11.6	B
N62	Carmenita Rd and I-5 SB ramps[1]	9.1	A	12.1	B
N63	Norwalk Blvd and Civic Center Dr[1]	25.3	C	27.2	C
N64	Bloomfield Ave and Civic Center Dr	27	C	35.4	D
N65	Bloomfield Ave and Goller Ave/Foster Rd	27.7	C	38.3	D
N66	Shoemaker Ave and Foster Rd[3]	17.3	C	20.8	C
N67	Carmenita Rd and Orden Dr	16	B	23	C
N68	I-605 NB ramps and Rosecrans Ave	43.3	D	50.9	D
N69	I-605 SB ramps and Rosecrans Ave[1]	34.9	C	37.1	D
N70	Studebaker Rd and Rosecrans Ave	60.2	**E***	73.6	**E***
N71	Pioneer Blvd/San Antonio Dr and Rosecrans Ave[1]	98.7	**F***	96.1	**F***
N72	Shoemaker Ave and Lakeland Rd	20.1	C	21.9	C
N73	Carmenita Rd and Lakeland Rd	67.4	**E***	148.1	**F***
N74	Shoemaker Ave and Entrance/Adler Dr[2]	--	--	--	--
N145	Carmenita Rd and Foster Rd	18	B	15.9	B
F1	Euclid St and Malvern Ave	38.1	D	55.5	**E***
F2	Euclid St and Commonwealth Ave	41.1	D	44.4	D
F3	Highland Ave and Chapman Ave	14.5	B	18.7	B
F4	Highland Ave and Commonwealth Ave	20.6	C	24.2	C
F5	Highland Ave and Santa Fe Ave[2]	20.4	C	30.1	D
F6	Highland Ave and Truslow Ave[2]	22.7	C	24.7	C
F7	Highland Ave and Valencia Dr	17.1	B	15.8	B
F8	Highland Ave and Orangethorpe Ave	18.2	B	22	C
F9	Malden Ave and Chapman Ave[2]	304	**F***	>180	**F***
F10	Malden Ave and Commonwealth Ave	24.4	C	126	**F***
F11	Harbor Blvd and Imperial Hwy (SR 90)	105.2	**F***	88.3	**F***
F12	Harbor Blvd and Bastanchury Rd	86.9	**F***	88.1	**F***
F13	Harbor Blvd and Valley View Dr/Brea Blvd[1]	39.7	D	50.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F14	Harbor Blvd and Berkeley Ave	35.3	D	32.4	C
F15	Harbor Blvd and Chapman Ave	85.4	**F***	78.6	**E***
F16	Harbor Blvd and Commonwealth Ave	75.5	**E***	45.1	D
F17	Harbor Blvd and Santa Fe Ave	>180	**F***	>180	**F***
F18	Harbor Blvd and Truslow Ave[2]	20.1	C	17.3	C
F19	Harbor Blvd and Orangethorpe Ave	38.3	D	49.4	D
F20	Harbor Blvd and SR 91 WB ramps	18.8	B	17.3	B
F21	Harbor Blvd and SR 91 EB ramps	22.6	C	28.2	C
F22	Brea Blvd and Bastanchury Rd	90	**F***	54.2	D
F23	Lemon St and Chapman Ave	46.6	D	55	**E***
F24	Lemon St and Commonwealth Ave	69.4	**E***	75.8	**E***
F25	Lemon St and Santa Fe Ave[2]	>180	**F***	11.7	B
F26	Lemon St and Orangethorpe Ave	62.8	**E***	96.2	**F***
F27	Lemon St and SR 91 WB ramps	43.8	D	52.3	D
F28	Anaheim Blvd/Lemon St and SR 91 EB ramps	65.8	**E***	40.6	D
F29	Raymond Ave and Chapman Ave	36.8	D	63.5	**E***
F30	Raymond Ave and Commonwealth Ave	24.9	C	25.6	C
F31	Raymond Ave and Orangethorpe Ave	31.9	C	35	C
F32	State College Blvd and Chapman Ave	46.2	D	90	**F***
F33	State College Blvd and Commonwealth Ave	104	**F***	75.9	**E***
F34	State College Blvd and Orangethorpe Ave	35.4	D	54.9	D
F35	Commonwealth Ave and Chapman Ave	23.6	C	41.7	D
F36	SR 57 SB ramps and Chapman Ave	17.9	B	27.2	C
F37	SR 57 NB ramps and Chapman Ave[1]	38.1	D	55	**E***
F38	Placentia Ave and Chapman Ave	49.1	D	66.7	**E***
F39	Euclid St and Valencia Dr	151.6	**F***	45.3	D
F40	Highland Ave and Walnut Ave	11.6	B	10.9	B
F41	Malden Ave and Santa Fe Ave[3]	13.4	B	12.1	B
F42	Malden Ave and Truslow Ave[2]	9.1	A	9.1	A
F43	Malden Ave and Valencia Dr[2]	15.7	C	12.8	B
F44	Harbor Blvd and Valencia Dr	25.7	C	15.2	B
F45	Lemon St and Walnut Ave[2]	125.9	**F***	>180	**F***
F46	Lemon St and Valencia Dr	125.9	**F***	>180	**F***
F47	Placentia Ave and Orangethorpe Ave	37.4	D	43.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F48	SR 57 SB ramps and Nutwood Ave[1]	59.6	**E***	39.4	D
F49	SR 57 SB ramps and Orangethorpe Ave[1]	31.1	C	28.1	C
F50	SR 57 NB ramps and Nutwood Ave[1]	52.7	D	28.5	C
F51	SR 57 NB ramps and Orangethorpe Ave	41.4	D	30	C
F52	Brea Blvd and Imperial Hwy (SR 90)	57	**E***	51	D
F53	State College Blvd and Yorba Linda Blvd[1]	48.2	D	34.6	C
F54	SR 57 SB off-ramp and Yorba Linda Blvd	26.9	C	24.6	C
F55	SR 57 NB off-ramp and Yorba Linda Blvd[1]	48.9	D	40.3	D
F56	Raymond Ave/East St and SR 91 EB ramps[1]	29.2	C	25	C
F57	Raymond Ave and SR 91 WB ramps[1]	26.9	C	14.1	B
F58	Euclid St and SR 91 WB ramps	20.8	C	23.6	C
F59	Euclid St and SR 91 EB ramps[1]	15.1	B	25	C
F60	State College Blvd and SR 91 EB ramps[1]	21.1	C	23.1	C
F61	State College Blvd and SR 91 WB ramps[1]	19.5	B	21.3	C
F161	Euclid St and Orangethorpe Ave	44.8	D	44.3	D
A1	Manchester Ave/I-5 SB ramps and Katella Ave	24.6	C	22	C
A2	Anaheim Way/I-5 NB ramps and Katella Ave[1]	24.2	C	32.3	C
A3	Lewis St and Katella Ave[1]	27.7	C	47.3	D
A4	I-5 HOV and Gene Autry Way[1]	22.8	C	25.7	C
A6	State College Blvd and Ball Rd	63.3	**E***	51.1	D
A7	State College Blvd and Winston Rd	11.9	B	21.1	C
A8	State College Blvd and Cerritos Ave	27.9	C	112.7	**F***
A9	State College Blvd and Howell Ave	67.3	**E***	158.5	**F***
A10	State College Blvd and Katella Ave[1]	37.4	D	39.5	D
A12	State College Blvd and Gene Autry Way	27	C	57.9	**E***
A14	State College Blvd and Orangewood Ave	58.5	**E***	69	**E***
A15	Stadium Crossing and Katella Ave[1]	31.1	C	34	C
A16	Sunkist St and Ball Rd	95.8	**F***	114.5	**F***
A17	Sunkist St and Cerritos Ave	25.2	C	148.4	**F***
A18	Howell Ave and Katella Ave[1]	34.7	C	110.4	**F***
A19	Rampart St and Orangewood Ave[1]	23.3	C	16.2	B
A20	SR 57 SB ramps and Ball Rd[1]	46.1	D	50.3	D
A21	SR 57 SB ramps and Katella Ave[1]	20.7	C	24	C
A22	SR 57 SB ramps and Orangewood Ave[1]	75.6	**E***	101.7	**F***

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A23	SR 57 SB ramps and Chapman Ave	22.5	C	33.6	C
A24	SR 57 NB ramps and Ball Rd	32.5	C	38	D
A25	SR 57 NB ramps and Katella Ave[1]	27.7	C	30.6	C
A26	SR 57 NB ramps and Orangewood Ave[1]	20.8	C	18.1	B
A27	SR 57 NB ramps and Chapman Ave[1]	13.1	B	11.6	B
A28	Douglass Rd and Katella Ave[1]	50.5	D	>180	**F***
A29	Struck Ave and Katella Ave[1]	4	A	54.7	D
A30	Main St and Ball Rd/Taft Ave[1]	57.1	**E***	36.3	D
A31	Main St and Katella Ave	33.7	C	30.3	C
A32	Main St and Struck Ave	13.4	B	20.6	C
A33	Main St and Collins Ave	23.3	C	29.1	C
A34	Main St and Orangewood Ave/Walnut Ave	96.4	**F***	74.6	**E***
A41	Anaheim Blvd and Ball Rd	34.3	C	60	**E***
A48	East St and Ball Rd	27.9	C	28.2	C
A51	Lewis St and Ball Rd	21	C	33.9	C
A52	Lewis St and Cerritos Ave	20.9	C	24.6	C
A53	Lewis St and Orangewood Ave	>180	**F***	82.9	**F***
A54	Lewis St and Chapman Ave	55.2	**E***	68	**E***
A55	Manchester Ave and Orangewood Ave	28.6	C	20.4	C
A56	The City Dr/State College Blvd and Chapman Ave	46.1	D	45.1	D
A57	Anaheim Way and Orangewood Ave	7.5	A	39.8	D
A58	Manchester Ave and Chapman Ave	170	**F***	28.8	C
A59	State College Blvd and I-5 SB off-ramp[1]	18.9	B	12.7	B
A60	I-5 SB on-ramp/NB off-ramp and Chapman Ave[1]	24.5	C	20.8	C
A61	State College Blvd and I-5 NB ramps[1]	23.3	C	41.9	D
A62	I-5 NB on-ramp/Rampart St and Chapman Ave	19.7	B	16.6	B
A63	Douglass Rd and ARTIC[1]	27.9	C	32.3	C
A64	Douglass Rd and Bus Entrance	26.3	C	16	B
A65	Douglass Rd and Parking Lot B[2]	8.6	A	8.7	A
A66	ARTIC Driveway and Katella Ave[2]	17.7	C	14.7	B
A69	Harbor Blvd and Ball Rd	55.3	**E***	72.1	**E***
A70	Harbor Blvd and I-5 NB ramps[1]	23.7	C	17	B
A71	Harbor Blvd and I-5 SB ramps	67.5	**E***	15.8	B
A72	Harbor Blvd and Katella Ave	30.4	C	40.8	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A79	Anaheim Blvd and Cerritos Ave	29.8	C	161.2	**F***
A80	Disneyland Dr and I-5 SB off-ramp	18.9	B	16.7	B
A81	Disneyland Dr and Ball Rd[1]	41.2	D	49.2	D
A82	Main St and Chapman Ave	44.6	D	55.9	**E***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "N" intersection number prefix indicates Norwalk/Santa Fe Springs Metrolink Station area; "F" intersection number prefix indicates Fullerton Metrolink/Amtrak Station area; "A" intersection number prefix indicates ARTIC station area.
[1] Delay is based on Highway Capacity Manual 2000 signalized intersection analysis because of Highway Capacity Manual 2010 analysis limitations.
[2] Two-way unsignalized intersection. The delay presented is for the worst minor approach delay.
[3] Four-way unsignalized intersection.
Amtrak = National Railroad Passenger Corporation; ARTIC = Anaheim Regional Transportation Intermodal Center; EB = eastbound; HOV = high-occupancy vehicle; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route; WB = westbound

Side-by-side LOS effect comparisons for the Horizon Year 2040 No Project condition and Horizon Year 2040 Plus Project condition with inclusion of the Fullerton HSR Station Option are contained in Appendix E of this report. Roadway segment LOS effects are presented in Table E1-3 of Appendix E. Signalized intersection LOS effects are presented in Table E2-3 of Appendix E, and unsignalized intersection LOS effects are presented in Table E3-3 of Appendix E. These tables present the differences in V/C ratio (roadway segments) and control delay (intersections) and identify the roadway segments and intersections that meet the thresholds discussed in Section 4.4.3. As detailed in Table 6-72, Table 6-73, and Table 6-74, respectively, Horizon Year 2040 Plus Project with inclusion of the Fullerton HSR Station Option creates LOS effects that meet the applicable thresholds at the following 21 roadway segments, 23 signalized intersections, and two unsignalized intersections.

Table 6-72 Major Roadway Segments: Horizon Year 2040 Impacts with Inclusion of Fullerton High-Speed Rail Station Option

Roadway	Segment Limits		Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		V/C Increase
	From	To		V/C	LOS	V/C	LOS	
Bandini Blvd	Downey Rd	Atlantic Blvd	AM	0.79	C	0.88	D	0.09
			PM	0.83	D	1	**F***	0.17
Carmenita Rd	Imperial Hwy	Orden Dr	AM	0.83	D	0.87	D	0.04
			PM	0.99	**E***	1.03	**F***	0.04
Studebaker Rd	Imperial Hwy	I-105	AM	0.91	**E***	0.99	**E***	0.08
			PM	0.87	D	0.95	**E***	0.08
Carmenita Rd	Orden Dr	Rosecrans Ave	AM	0.95	**E***	0.99	**E***	0.04
			PM	0.87	D	0.91	**E***	0.04
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	AM	0.95	**E***	0.99	**E***	0.04
			PM	0.95	**E***	0.99	**E***	0.04
Euclid St	Bastanchury Rd	Malvern Ave	AM	1.07	**F***	1.1	**F***	0.03
			PM	1.03	**F***	1.07	**F***	0.04

Roadway	Segment Limits		Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		V/C Increase
	From	To		V/C	LOS	V/C	LOS	
Euclid St	Malvern Ave	Commonwealth Ave	AM	0.99	**E***	1.02	**F***	0.03
			PM	0.95	**E***	0.99	**E***	0.04
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	AM	1.55	**F***	1.59	**F***	0.04
			PM	1.67	**F***	1.71	**F***	0.04
Harbor Blvd	Chapman Ave	Commonwealth Ave	AM	0.89	D	0.95	**E***	0.06
			PM	0.82	D	0.89	D	0.07
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	AM	1.19	**F***	1.23	**F***	0.04
			PM	1.23	**F***	1.27	**F***	0.04
Harbor Blvd	Orangethorpe Ave	Orangefair Ave	AM	0.75	C	0.79	C	0.04
			PM	0.88	D	0.93	**E***	0.05
Lemon St	Commonwealth Ave	Orangethorpe Ave	AM	1.24	**F***	1.45	**F***	0.21
			PM	1.41	**F***	1.61	**F***	0.20
Lemon St	Orangethorpe Ave	Orangefair Ave	AM	1.16	**F***	1.33	**F***	0.17
			PM	1.45	**F***	1.61	**F***	0.16
Chapman Ave	Harbor Blvd	Raymond Ave	AM	0.89	D	0.99	**E***	0.10
			PM	0.92	**E***	1.02	**F***	0.10
Chapman Ave	Raymond Ave	Acacia Ave	AM	0.95	**E***	1.05	**F***	0.10
			PM	1.12	**F***	1.22	**F***	0.10
Chapman Ave	Acacia Ave	State College Blvd	AM	1.39	**F***	1.51	**F***	0.12
			PM	1.75	**F***	1.87	**F***	0.12
Chapman Ave	State College Blvd	Commonwealth Ave	AM	1.39	**F***	1.43	**F***	0.04
			PM	1.75	**F***	1.79	**F***	0.04
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	AM	0.83	D	0.93	**E***	0.10
			PM	0.83	D	0.93	**E***	0.10
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	AM	1.03	**F***	1.07	**F***	0.04
			PM	1.19	**F***	1.23	**F***	0.04
Brea Blvd	Harbor Blvd	Bastanchury Rd	AM	0.91	**E***	0.95	**E***	0.04
			PM	0.99	**E***	1.03	**F***	0.04
Santa Fe Ave	Harbor Blvd	Lemon St	AM	0.2	A	0.9	D	0.70
			PM	0.3	A	1	**F***	0.70

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I- = Interstate; LOS = level of service; NB = northbound; SR = State Route; V/C = volume to capacity ratio

Table 6-73 Signalized Intersections: Horizon Year 2040 Impacts with Inclusion of Fullerton High-Speed Rail Station Option

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
G44	East St and Lincoln Ave	AM	41.6	D	76.3	**E***	34.7
		PM	70.1	**E***	84.2	**F***	14.1
G89	Garfield Ave and Washington Blvd	AM	60.3	**E***	67.8	**E***	7.5
		PM	49.1	D	55	D	5.9
G148	Beach Blvd (SR 39) and Stage Rd[1]	AM	20	C	55.1	**E***	35.1
		PM	22.3	C	53.6	D	31.3
G150	Beach Blvd (SR 39) and La Mirada Blvd/Malvern Ave	AM	49.3	D	57.8	**E***	8.5
		PM	46.4	D	50	D	3.6
G177	Valley View Ave and Alondra Blvd	AM	50.4	D	55.3	**E***	4.9
		PM	47.6	D	50.8	D	3.2
N1	Firestone Blvd and Imperial Hwy[1]	AM	62.5	**E***	136.3	**F***	>35
		PM	62.8	**E***	61.9	**E***	-0.9
N49	Studebaker Rd and Imperial Hwy	AM	66.2	**E***	70.5	**E***	4.3
		PM	74.1	**E***	77.1	**E***	3
N51	Bloomfield Ave and Firestone Blvd (south)	AM	72.9	**E***	77.8	**E***	4.9
		PM	104.6	**F***	104.7	**F***	0.1
N58	Carmenita Rd and Rosecrans Ave	AM	46	D	46	D	0
		PM	50.3	D	56	**E***	5.7
F10	Malden Ave and Commonwealth Ave	AM	15.6	B	24.4	C	8.8
		PM	48.3	D	126	**F***	>35
F11	Harbor Blvd and Imperial Hwy (SR 90)	AM	101.9	**F***	105.2	**F***	3.3
		PM	83.9	**F***	88.3	**F***	4.4
F15	Harbor Blvd and Chapman Ave	AM	71.2	**E***	85.4	**F***	14.2
		PM	63.4	**E***	78.6	**E***	15.2
F17	Harbor Blvd and Santa Fe Ave	AM	19.1	B	>180	**F***	>35
		PM	23.6	C	>180	**F***	>35
F23	Lemon St and Chapman Ave	AM	42.3	D	46.6	D	4.3
		PM	49.7	D	55	**E***	5.3
F24	Lemon St and Commonwealth Ave	AM	62.2	**E***	69.4	**E***	7.2
		PM	70.6	**E***	75.8	**E***	5.2
F26	Lemon St and Orangethorpe Ave	AM	49	D	62.8	**E***	13.8

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
		PM	76.8	**E***	96.2	**F***	19.4
F28	Anaheim Blvd/Lemon St and SR 91 EB ramps	AM	51.7	D	65.8	**E***	14.1
		PM	35.2	D	40.6	D	5.4
F29	Raymond Ave and Chapman Ave	AM	32.6	C	36.8	D	4.2
		PM	52	D	63.5	**E***	11.5
F32	State College Blvd and Chapman Ave	AM	40.9	D	46.2	D	5.3
		PM	70.2	**E***	90	**F***	19.8
F48	SR 57 SB ramps and Nutwood Ave[1]	AM	53.6	D	59.6	**E***	6
		PM	34.5	C	39.4	D	4.9
A14	State College Blvd and Orangewood Ave	AM	60.5	**E***	58.5	**E***	-2
		PM	61.2	**E***	69	**E***	7.8
A17	Sunkist St and Cerritos Ave	AM	25.2	C	25.2	C	0
		PM	140.6	**F***	148.4	**F***	7.8
A79	Anaheim Blvd and Cerritos Ave	AM	29.8	C	29.8	C	0
		PM	156.8	**F***	161.2	**F***	4.4

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "N" intersection number prefix indicates Norwalk/Santa Fe Springs Metrolink Station area; "F" intersection number prefix indicates Fullerton Metrolink/Amtrak Station area; "A" intersection number prefix indicates Anaheim Regional Transportation Intermodal Center station area.
[1] Delay is based on Highway Capacity Manual 2000 signalized intersection analysis, because of Highway Capacity Manual 2010 analysis limitations.
Amtrak = National Railroad Passenger Corporation; EB = eastbound; LOS = level of service; SB = southbound; sec = seconds; SR = State Route

Table 6-74 Unsignalized Intersections: Horizon Year 2040 Impacts with Inclusion of Fullerton High-Speed Rail Station Option

No.	Intersection	Peak Hour	Horizon Year 2040		Horizon Year 2040 Plus Project		Delay Increase (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
G210	Eastern Ave and Driveway[1]	AM	84.9	**F***	98.5	**F***	13.6
		PM	>180	**F***	145.1	**F***	-34.9
F9	Malden Ave and Chapman Ave[1]	AM	162.3	**F***	>180	**F***	17.7
		PM	>180	**F***	>180	**F***	0

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
"G" intersection number prefix indicates intersections outside of station areas; "F" intersection number prefix indicates intersections within the Fullerton Metrolink/Amtrak Station area.
[1] Two-way unsignalized intersection. The delay presented is for the worst minor approach delay.
Amtrak = National Railroad Passenger Corporation; LOS = level of service; sec = seconds

Of the 252 roadway segments, 265 signalized intersections, and 37 unsignalized intersections evaluated along the project section alignment and at station areas, the following one roadway segment and three unsignalized intersections would improve from either LOS E to LOS D (or

higher) or LOS F to LOS E (or higher) in the Plus Project scenario with inclusion of the Fullerton HSR Station Option:

- Soto Street, from East 26th Street to Washington Boulevard
- G208, Downey Road and East 26th Street
- G211, Telegraph Road and Maple Avenue
- F25, Lemon Street and Santa Fe Avenue

Two intersections (G170, Pioneer Boulevard and Wheelock Circle and G211, Telegraph Road and Maple Avenue) would be upgraded to a signalized intersection in the Plus Project condition, which would result in improved overall LOS. Additionally, as discussed further in Section 6.4.1.1, the addition of HSR train operations would not lead to additional traffic delays at adjacent intersections, due to the anticipated use of a clockface schedule, which would result in 15-minute peak headways to account for the two HSR trains, one Metrolink train, and one Amtrak train per hour per direction. In the rare instance that a multi-train gate-down-time event occurs through an HSR train and BNSF train passing in immediate succession, such instances would not exacerbate existing gate down times from multi-train events involving BNSF and passenger rail trains that already occur.

6.5 Effect on Transit Services

6.5.1 Shared Passenger Track Alternative A

Mode split analysis was conducted by TAZ in the Statewide Model as discussed in Section 4.2.1.3, Approach for Transit Effect Analysis. Passenger originating and destination trips were assigned to TAZs based on buffer zones created from major transit lines, such as express bus, light rail or commuter rail facilities. These buffer zones were intended to model typical ridership capture envelopes for rail and bus.

Resulting passenger ridership for bus and rail transit modes for Phase 1 Horizon Year 2040 are presented in Table 6-75. Based on these calculations, ridership for both rail and bus transit modes would increase as a result of the Shared Passenger Track Alternative A. Travel times and service times for transit lines that directly connect to each proposed HSR station would not increase as a result of this increased ridership.

Table 6-75 Daily Forecasted Transit Ridership Analysis from Statewide Model

HSR Station	Trip Type	Phase 1 Horizon Year 2040	
		Bus	Rail
LAUS	Originating	2,058	2,366
	Destination	5,209	9,430
Norwalk/Santa Fe Springs	Originating	53	840
	Destination	111	2,312
Fullerton	Originating	85	1,450
	Destination	205	3,898
ARTIC	Originating	279	1,761
	Destination	389	10,428

ARTIC = Anaheim Regional Transportation Intermodal Center; LAUS = Los Angeles Union Station

The operation of the Shared Passenger Track Alternative A would result in increased trains using shared tracks through the LOSSAN Corridor. Table 6-76 contains an analysis of future Plus Project daily HSR train volumes along the project section.

Table 6-76 Future High-Speed Rail Trains per Day in the Los Angeles – San Diego – San Luis Obispo Rail Corridor between Los Angeles and Anaheim

Operator	Existing Conditions		Phase 1 Opening Year 2029		Phase 1 Horizon Year 2040	
	LAUS to Fullerton Junction	Fullerton Junction to ARTIC	LAUS to Fullerton Junction	Fullerton Junction to ARTIC	LAUS to Fullerton Junction	Fullerton Junction to ARTIC
California High-Speed Rail [1]	N/A	N/A	76	76	76	76

[1] 2029 Opening Day and 2040 Horizon Year projections from the California High Speed Rail Authority's "Year 2029 and Year 2040 Concept Timetable for EIR/EIS Analysis"
ARTIC = Anaheim Regional Transportation Intermodal Center; LAUS = Los Angeles Union Station; N/A = not applicable

Additionally, as discussed further in Section 6.4.1.1, the addition of HSR train operations would not lead to additional traffic delays at adjacent intersections, due to the anticipated use of a clockface schedule, which would result in 15-minute peak headways to account for the two HSR trains, one Metrolink train, and one Amtrak train per hour per direction. In the rare instance that a multi-train gate-down-time event occurs through an HSR train and BNSF train passing in immediate succession, such instances would not exacerbate existing gate down times from multi-train events involving BNSF and passenger rail trains that already occur. Thus, HSR service is not anticipated to affect bus services at adjacent intersections in Anaheim.

6.5.2 Shared Passenger Track Alternative B

The difference between the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B is the location of the LMF. The 15th Street LMF associated with Shared Passenger Track Alternative B would have approximately 100 employees during its peak day shift. As such, the effect on transit service is anticipated to be minimal.

6.6 Effect on Nonmotorized Modes of Travel

6.6.1 Shared Passenger Track Alternative A

Mode split analysis was conducted by TAZ in the Statewide Model as discussed in Section 4.2.1.4, Approach for Bicycle and Pedestrian Analysis. Passenger originating and destination trips were assigned to TAZs based on buffer zones created from each proposed HSR station. These buffer zones were intended to model typical walking and bicycling trip capture envelopes.

Resulting passenger ridership for nonmotorized modes (pedestrian and bicycle) for Phase 1 Horizon Year 2040 are presented in Table 6-77. Based on these calculations, nonmotorized transportation modes would increase because of project operations. The inclusion of bicycle and pedestrian facilities at each station site would likely induce mode shifts within the station area.

Table 6-77 Daily Forecasted Nonmotorized Ridership Analysis from Statewide Model

HSR Station	Trip Type	Phase 1 Horizon Year 2040
		Pedestrian/Bicycle
LAUS	Originating	6,292
	Destination	2,469
Norwalk/Santa Fe Springs HSR Station Option	Originating	577
	Destination	586
Fullerton HSR Station Option	Originating	1,042
	Destination	1,036
ARTIC	Originating	1,319

HSR Station	Trip Type	Phase 1 Horizon Year 2040
		Pedestrian/Bicycle
	Destination	1,282

ARTIC = Anaheim Regional Transportation Intermodal Center; LAUS = Los Angeles Union Station

6.6.2 Shared Passenger Track Alternative B

The difference between the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B is the location of the LMF. The 15th Street LMF would have approximately 100 employees during its peak day shift. Mode split for these employees was not prepared; however, nonmotorized ridership is not anticipated to be affected.

6.7 Project Construction Period Effects

6.7.1 Urban Area Construction Effects on Circulation and Emergency Access

6.7.1.1 Permanent Conditions (Existing Year 2015 Plus Project)

The HSR track alignment construction analysis area contains all improvements required along the project section, including the actual HSR track facility, and public civil roadway improvements for station area construction. This work also includes possible effects from shifting of traffic from the existing Norwalk/Santa Fe Springs Metrolink Station to the modified Norwalk/Santa Fe Springs Metrolink Station (with or without the HSR station option), and relocation of the Commerce and Buena Park Metrolink Stations, because the track alignment would not be physically possible to build without these improvements. Additionally, the proposed changes to BNSF Hobart and Commerce Yards are a part of the project footprint.

Permanent Conditions Along the Corridor

The existing trip generation at the Commerce Metrolink station was obtained by reviewing the 24-hour traffic counts east and west of the station. Trips were re-assigned from northbound and southbound Garfield Avenue. Because this reassignment would result regardless of any station operations, and because the relocation did not alter the generation of trips or directional redistribution of trips, it was assumed that these trips were part of the corridor analysis, and not the result of any particular station area construction effect.

The existing trip generation at the Buena Park Metrolink station was obtained by reviewing the station driveway traffic counts. The future trip generation for the relocated station was estimated based on the existing trip generations and future parking spaces. Then, the trip distribution and the access/departure paths were assigned through the network. Because this reassignment would result regardless of any station operations, these trips would be assumed to be part of the corridor analysis, and not related to any particular station area construction effect. It was assumed, however, that the relocation of Buena Park Metrolink Station would result in a larger-scale redistribution of volumes because of the distance of the relocation. The Existing Year 2015 and Plus Project station trip distributions for the existing and relocated Buena Park Metrolink Station are given on Figure 6-5 and Figure 6-6, respectively.

Effects also include the permanent road closures (E 26th Street, Sheila Street, E Forty-Ninth Street, South Street and Sycamore Street), roadway reconfigurations (such as the proposed Pioneer Boulevard grade separation at Rivera Road), and other signalized intersections and lane reconfigurations that would be implemented. These could be permanent effects associated with construction affecting traffic movement through the altered roadway network independent of HSR station area construction. The lane configurations incorporating both the permanent street and lane reconfigurations outside of station areas are presented in Appendix B. The traffic turning volumes under the Existing (Year 2015) Plus Project condition outside of HSR station areas are presented in Appendix B. These rerouted volumes also formed the basis for volume projections used in the Plus Project scenario calculations presented in Section 6.4, Plus Project Roadway and Intersection Level of Service.

Permanent street and lane reconfigurations around proposed HSR station option areas related to the construction of these stations are provided subsequently for each respective station area.

The roadway segment LOS analysis for roadway segments along the project section alignment under the Existing (Year 2015) Plus Project condition (outside of station areas) is presented in Table 6-78. The intersection LOS analysis for intersections along the project section alignment under the Existing (Year 2015) Plus Project condition (outside of station areas) is presented in Table 6-79. Of the 81 roadway segments analyzed, 9 are LOS E or F in the AM peak hour and 16 are LOS E or F in the PM peak hour. Of the 122 intersections and 2 new intersections analyzed, 12 are LOS E or F in the AM peak hour and 13 are LOS E or F in the PM peak hour.



G intersection number prefix indicates intersections outside of station areas.

Figure 6-5 Buena Park Metrolink Station Relocation: Existing Year 2015 Traffic Distribution



G intersection number prefix indicates intersections outside of station areas.

Figure 6-6 Buena Park Metrolink Station Relocation: Plus Project Traffic Redistribution

Table 6-78 Major Roadway Segment Level of Service: Project Corridor, Existing (Year 2015) Plus Project

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Vermont Ave	west of East St	---	998	700	700	0.67	0.63	B	B
South St	west of East St	---	950	100	100	0.07	0.05	A	A
Santa Ana St	west of East St	---	950	1,000	1,100	1	1.06	**E***	**F***
Broadway	west of East St	---	3,045	1,000	1,100	0.31	0.33	A	A
Sycamore St	west of East St	---	950	100	100	0.06	0.07	A	A
Harbor Blvd	La Palma Ave	Lincoln Ave	3,045	2,300	2,300	0.74	0.73	C	C
Harbor Blvd	Lincoln Ave	Ball Rd	2,520	2,200	2,200	0.86	0.84	D	D
La Palma Ave	Harbor Blvd	East St	3,045	1,900	2,100	0.62	0.68	B	B
La Palma Ave	East St	State College Blvd	2,520	1,700	2,300	0.64	0.89	B	D
Lincoln Ave	Anaheim Blvd	East St	5,198	2,700	2,600	0.51	0.5	A	A
Lincoln Ave	East St	State College Blvd	2,520	2,300	2,600	0.91	1.01	**E***	**F***
Soto St	E 26th St	Washington Blvd	2,835	2,300	2,600	0.81	0.92	C	**E***
Downey Rd	Bandini Blvd	Washington Blvd	3,045	2,300	2,900	0.76	0.95	C	**E***
Atlantic Blvd	Bandini Blvd	Washington Blvd	2,835	1,900	2,200	0.67	0.78	B	C
Eastern Ave	Bandini Blvd	Commerce Way	2,835	1,800	1,900	0.63	0.67	B	B
Telegraph Rd	Garfield Ave	Washington Blvd	2,835	1,200	1,400	0.42	0.49	A	A
Garfield Ave	Telegraph Rd	Washington Blvd	2,415	2,800	2,400	1.16	0.99	**F***	**E***
Greenwood Ave	Union St	Washington Blvd	2,415	1,300	1,900	0.52	0.77	A	C
Paramount Blvd	Slauson Ave	Washington Blvd	2,520	1,900	2,600	0.74	1.03	C	**F***
Rosemead Blvd (SR 19)	Slauson Ave	Washington Blvd	2,520	2,500	2,600	0.96	1	**E***	**E***
Serapis Ave	north of Slauson Ave	---	850	300	300	0.33	0.31	A	A
Serapis Ave	Rivera Rd	Rex Rd	1,100	100	100	0.07	0.05	A	A
Rex Rd	Rosemead Blvd (SR 19)	Serapis Ave	950	500	400	0.45	0.42	A	A
Rex Rd	Serapis Ave	Passons Blvd	1,100	500	300	0.38	0.25	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Passons Blvd	Slauson Ave	Washington Blvd	850	900	900	1.03	1.04	**F***	**F***
Slauson Ave	Passons Blvd	I-605 SB on-ramp	3,045	3,000	3,000	0.96	0.95	**E***	**E***
Pioneer Blvd	Los Nietos Rd	Rivera Rd	3,360	1,700	2,000	0.49	0.58	A	A
Pioneer Blvd	Rivera Rd	Slauson Ave	2,520	1,700	2,000	0.65	0.78	B	C
Rivera Rd	west of Pioneer Blvd	---	950	100	200	0.1	0.12	A	A
Rivera Rd	Pioneer Blvd	Norwalk Blvd	950	300	200	0.3	0.15	A	A
Norwalk Blvd	Telegraph Rd	Los Nietos Rd	2,520	1,600	1,900	0.62	0.74	B	C
Norwalk Blvd	Los Nietos Rd	Slauson Ave	2,400	1,700	2,000	0.68	0.83	B	D
Los Nietos Rd	Pioneer Blvd	Norwalk Blvd	1,100	900	900	0.8	0.8	C	C
Los Nietos Rd	Norwalk Blvd	Santa Fe Springs Rd	1,103	1,100	1,200	0.91	1.01	**E***	**F***
Santa Fe Springs Rd	Telegraph Rd	Los Nietos Rd	2,415	1,800	1,800	0.72	0.71	C	C
Rosecrans Ave	Carmenita Rd	Marquardt Ave	3,045	2,200	2,300	0.7	0.72	B	C
Rosecrans Ave	Marquardt Ave	Valley View Ave	3,045	2,100	2,100	0.69	0.68	B	B
Marquardt Ave	Rosecrans Ave	Foster Ave	1,155	400	400	0.32	0.33	A	A
Marquardt Ave	south of Rosecrans Ave	---	1,050	300	200	0.22	0.18	A	A
Valley View Ave	Gannet St	Stage Rd	3,360	2,700	2,800	0.78	0.82	C	D
Valley View Ave	Stage Rd	Rosecrans Ave	3,045	2,700	2,600	0.86	0.84	D	D
Stage Rd	Rosecrans Ave	Valley View Ave	1,100	400	600	0.36	0.46	A	A
Stage Rd	Valley View Ave	Alondra Blvd	2,400	800	800	0.3	0.33	A	A
Alondra Blvd	Valley View Ave	La Mirada Blvd	3,045	2,100	2,200	0.67	0.72	B	C
Stage Rd	Alondra Blvd	Beach Blvd (SR 39)	2,400	800	1,100	0.33	0.42	A	A
Beach Blvd (SR 39)	Franklin St	Stage Rd	5,198	4,700	5,200	0.89	0.99	D	**E***
Artesia Blvd	Beach Blvd (SR 39)	Dale St	2,520	1,500	1,500	0.58	0.58	A	A
Commonwealth Ave	Beach Blvd (SR 39)	Dale St	2,520	1,100	1,100	0.41	0.43	A	A
Malvern Ave	Beach Blvd (SR 39)	Dale St	2,625	2,200	2,200	0.83	0.83	D	D

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Dale St	Artesia Blvd	Malvern Ave	3,150	1,700	1,700	0.53	0.52	A	A
Artesia Blvd	Dale St	Gilbert St	1,000	700	700	0.65	0.62	B	B
Commonwealth Ave	Dale St	Gilbert St	3,045	1,500	1,700	0.48	0.53	A	A
Malvern Ave	Dale St	Gilbert St	3,150	2,500	2,600	0.77	0.81	C	D
Gilbert St	Commonwealth Ave	Artesia Blvd	3,045	2,500	2,500	0.81	0.8	D	C
Gilbert St	Artesia Blvd	Malvern Ave	4,332	2,900	2,700	0.65	0.61	B	B
Commonwealth Ave	Brookhurst Rd	Euclid St	3,045	1,700	1,600	0.54	0.5	A	A
State College Blvd	La Palma Ave	Lincoln Ave	4,410	2,000	2,600	0.45	0.58	A	A
State College Blvd	Lincoln Ave	South St	4,410	2,200	2,600	0.48	0.59	A	A
State College Blvd	South St	Wagner Ave	5,198	2,400	2,300	0.45	0.42	A	A
State College Blvd	Wagner Ave	Ball Rd	4,410	2,400	2,400	0.52	0.53	A	A
East St	La Palma Ave	Lincoln Ave	2,520	1,800	1,900	0.69	0.73	B	C
East St	Lincoln Ave	South St	2,520	1,400	1,500	0.54	0.56	A	A
East St	South St	Vermont St	3,360	1,200	1,100	0.34	0.33	A	A
East St	Vermont St	Ball Rd	2,520	1,200	1,200	0.44	0.46	A	A
Anaheim Blvd	La Palma Ave	Lincoln Ave	2,520	1,500	1,500	0.56	0.59	A	A
Anaheim Blvd	Lincoln Ave	South St	2,520	1,800	2,100	0.7	0.8	B	C
Anaheim Blvd	South St	Vermont St	3,360	1,900	2,100	0.56	0.62	A	B
Anaheim Blvd	Vermont St	Ball Rd	2,520	2,100	2,400	0.8	0.95	C	**E***
Carmenita Rd	north of Alondra Blvd	---	3,045	2,300	2,600	0.73	0.84	C	D
Beach Blvd (SR 39)	Malvern Ave	Stage Rd	4,410	4,400	4,900	1	1.1	**E***	**F***
Santa Fe Springs Rd	north of Los Nietos Rd	---	3,150	1,500	1,800	0.48	0.54	A	A
Washington Blvd	west of Indiana St	---	3,360	700	800	0.21	0.24	A	A
Washington Blvd	Ayers Ave	I-710	3,045	700	900	0.23	0.3	A	A
Washington Blvd	I-710	Atlantic Blvd	2,835	1,400	1,700	0.49	0.6	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Telegraph Rd	Garfield Ave	Maple Ave	2,700	1,600	1,900	0.59	0.7	A	B
Bandini Blvd	Soto St	Downey Rd	2,700	1,500	1,300	0.56	0.48	A	A
Bandini Blvd	Downey Rd	Atlantic Blvd	2,400	2,200	2,400	0.92	1	**E***	**E***
Bandini Blvd	Atlantic Blvd	Eastern Ave	2,300	1,900	2,200	0.83	0.96	D	**E***
Soto St	E 26th St	Bandini Blvd	2,700	2,500	2,400	0.93	0.89	**E***	D
E 26th St	Sierra Pine Ave	Downey Rd	900	600	1,000	0.67	1.11	B	**F***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I = Interstate; LOS = level of service; SB = southbound; SR = State Route; V/C = volume to capacity; veh/hr = vehicles per hour
The dashes (---) are defined as "not applicable."

Table 6-79 Intersection Level of Service: Project Corridor, Existing (Year 2015) Plus Project

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G35	Anaheim Blvd & La Palma Ave [1]	33	C	35.4	D
G36	Anaheim Blvd & Sycamore St[1]	3.8	A	3.8	A
G37	Anaheim Blvd & Lincoln Ave	35.9	D	36	D
G38	Anaheim Blvd & Santa Ana St	32	C	16.6	B
G39	Anaheim Blvd & South St	7.6	A	7.2	A
G40	Anaheim Blvd & Vermont Ave	18.4	B	14.8	B
G42	East St & La Palma Ave	31.4	C	45.4	D
G43	East St & Sycamore St	14.2	B	10.2	B
G44	East St & Lincoln Ave	53.7	D	68.7	**E***
G45	East St & Santa Ana St	23.1	C	20.1	C
G46	East St & South St	13	B	15.6	B
G47	East St & Vermont Ave	17.2	B	18.5	B
G49	Anaheim Blvd & Broadway	24.9	C	25.2	C
G50	East St & Broadway	23.2	C	17.7	B
G67	Harbor Blvd & La Palma Ave	33.5	C	37.1	D
G68	Harbor Blvd & Lincoln Ave	34.4	C	36.4	D
G73	State College Blvd & La Palma Ave	30.5	C	54.2	D
G74	State College Blvd & Lincoln Ave	33.7	C	37.7	D
G75	State College Blvd & Vermont Ave	162.5	**F***	105.2	**F***
G78	Harbor Blvd & Vermont Ave	13.3	B	12.2	B
G83	Soto St & Washington Blvd	41.8	D	30.8	C
G84	Downey Rd & Washington Blvd	39	D	51.3	D
G85	Atlantic Blvd & Washington Blvd	30.2	C	33.2	C
G86	Eastern Ave & Washington Blvd	22.2	C	25.8	C
G87	I-5 SB ramps & Washington Blvd [1]	22.4	C	21.7	C
G88	Telegraph Rd & Washington Blvd	40.4	D	32.6	C
G89	Garfield Ave & Washington Blvd	46.2	D	42	D
G90	Greenwood Ave & Washington Blvd	30.5	C	34.2	C
G91	Passons Blvd & Washington Blvd	39.6	D	35.7	D
G92	Pioneer Blvd & Washington Blvd	49.7	D	52.6	D
G93	Sierra Pine Ave & Bandini Blvd	16.9	B	14.8	B
G94	Downey Rd & Bandini Blvd	41.5	D	39.7	D
G95	Indiana St & Bandini Blvd [2]	41.8	**E***	>180	**F***
G96	Bonnie Beach Pl & Bandini Blvd	11.5	B	43.5	D
G97	Ayers Ave & Bandini Blvd [2]	19.6	C	28.9	D

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G98	Atlantic Blvd/I-710 NB ramps & Bandini Blvd[1]	109.3	**F***	103.6	**F***
G99	Eastern Ave & Bandini Blvd	32.8	C	33.4	C
G100	Garfield Ave & Bandini Blvd	23	C	35.2	D
G101	I-5 SB ramps & Bandini Blvd [2]	66.4	**F***	599.2	**F***
G102	Soto St & E 26th St	21.1	C	29.2	C
G103	Sierra Pine Ave & E 26th St [2]	13.8	B	17	C
G104	Indiana St & E 26th St[2,4]	14.8	B	19.5	C
G105	Bonnie Beach Pl & E 26th St[2,4]	12.3	B	9.4	A
G106	Ayers Ave & E 26th St[2,4]	9.5	A	8.7	A
G107	Soto St & E 37th St/Bandini Blvd	33.8	C	30.6	C
G108	Eastern Ave & Commerce Way	6.9	A	8	A
G109	Telegraph Rd (Washington Blvd) & I-5 NB ramps	25.1	C	30.8	C
G110	Garfield Ave & Telegraph Rd	27.6	C	27.9	C
G111	Telegraph Rd (Garfield Ave) & I-5 NB ramps[1]	24.2	C	26	C
G112	Greenwood Ave & Telegraph Rd	12.1	B	16.4	B
G113	Telegraph Rd (Slauson Ave) & I-5 NB off-ramp [2]	179.8	**F***	>180	**F***
G114	Gage Rd & Telegraph Rd[2]	46.1	**E***	135.3	**F***
G115	Telegraph Rd & Slauson Ave	43.4	D	52.1	D
G116	Greenwood Ave & Driveway[2]	18.5	C	25.5	D
G117	Greenwood Ave & Union St	6.1	A	7.3	A
G118	Chapin Rd & Union St [3]	9.5	A	16	C
G119	I-5 SB ramps/Gage Ave & Slauson Ave [1]	49	D	55.8	**E***
G120	Chapin Rd & Slauson Ave	7.1	A	20.6	C
G121	Paramount Blvd & Slauson Ave	37.7	D	51.6	D
G122	Rosemead Blvd (SR 19) & Slauson Ave	56.6	**E***	53.1	D
G123	Passons Blvd & Slauson Ave	30.1	C	32.4	C
G124	I-605 SB off-ramp & Slauson Ave	27.7	C	23.1	C
G125	Pioneer Blvd & Slauson Ave	47.9	D	46.7	D
G126	Norwalk Blvd & Slauson Ave	36.6	D	36.9	D
G127	Sorensen Ave & Slauson Ave	32.5	C	36	D
G128	Santa Fe Springs Rd & Slauson Ave/Mulberry Dr [1]	29.7	C	23.6	C
G130	Pioneer Blvd & I-605 NB off-ramp [2]	100.9	**F***	98.8	**F***
G131	Pioneer Blvd & Los Nietos Rd	17.3	B	17.4	B
G132	Pioneer Blvd & Orr and Day Rd[2]	121.6	**F***	171	**F***
G133	Pioneer Blvd & Telegraph Rd	30.1	C	29.6	C
G134	Norwalk Blvd & Los Nietos Rd	22.5	C	24	C

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G135	Los Nietos Rd & Santa Fe Springs Rd	23.8	C	24.4	C
G136	Santa Fe Springs Rd & Sorensen Ave [2]	24.5	C	37.4	**E***
G137	Valley View Ave & Imperial Hwy	42.5	D	45.9	D
G138	Valley View Ave & Foster Rd	98.2	**F***	35.5	D
G139	Valley View Ave & Rosecrans Ave	54.7	D	48.4	D
G140	Valley View Ave & Stage Rd	20.5	C	23.6	C
G141	Valley View Ave & Gannet St	10.4	B	12.6	B
G142	Marquardt Ave & Imperial Hwy	17.6	B	19.8	B
G143	Marquardt Ave & Foster Rd [3]	15.1	C	13.6	B
G144	Marquardt Ave & Rosecrans Ave/Stage Rd	23.2	C	27.9	C
G146	Stage Rd/Escalona Rd & Alondra Blvd [1]	17.1	B	21.8	C
G147	Dodds Ave (East) & Stage Rd [2]	10.1	B	10.4	B
G148	Beach Blvd (SR 39) & Stage Rd [1]	19.8	B	27.7	C
G149	La Mirada Blvd & Alondra Blvd	38.2	D	28.4	C
G150	Beach Blvd (SR 39) & La Mirada Blvd/Malvern Ave	46.5	D	44.6	D
G151	Beach Blvd (SR 39) & Franklin St	24.5	C	37.4	D
G152	Beach Blvd (SR 39) & Artesia Ave	36	D	42.9	D
G153	Dale St & Malvern Ave [1]	29.3	C	29.7	C
G154	Dale St & Lakeknoll Dr	8	A	6.1	A
G155	Dale St & Artesia Ave	21.3	C	20	B
G156	Stanton Ave & Artesia Ave	22.1	C	25.2	C
G157	Dale St & Commonwealth Ave	30.6	C	28.9	C
G158	Gilbert St & Commonwealth Ave [1]	36.7	D	33.9	C
G159	Brookhurst Rd & Commonwealth Ave [1]	29.8	C	26.5	C
G160	Brookhurst Rd & Valencia Dr	24.6	C	20.1	C
G162	Gilbert St & Malvern Ave	65.2	**E***	35.8	D
G163	Gilbert St & Artesia Ave	16.9	B	14	B
G164	Anaheim Blvd/Lemon St & La Palma Ave	14.4	B	13.9	B
G165	Paramount Blvd & Washington Blvd	54.6	D	45.7	D
G166	Rosemead Blvd (SR 19) & Washington Blvd	44	D	45.6	D
G167	E 26th St & Bandini Blvd [1]	12.1	B	22.2	C
G168	Garfield Ave & E 26th St [2]	108.8	**F***	248.2	**F***
G169	Serapis Ave & Slauson Ave	12.9	B	11.2	B
G170	Pioneer Blvd & Wheelock Cir	16	B	9.3	A
G171	Pioneer Blvd & Rivera Rd [4]	---	---	---	---
G173	Passons Blvd & Rivera Rd	9.7	A	10.4	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
G174	Rosemead Blvd (SR 19) & Rex Rd	22.5	C	21.3	C
G175	Passons Blvd & Rex Rd [3]	20.6	C	14.7	B
G176	La Mirada Blvd & Rosecrans Ave	29.7	C	33.6	C
G177	Valley View Ave & Alondra Blvd	47.9	D	44.7	D
G178	Beach Blvd (SR 39) & Commonwealth Ave	21.3	C	26.3	C
G179	Wheelock Cir & Rivera Rd [2]	9.4	A	8.9	A
G180	Dodds Ave (West) & Stage Rd [2]	21.2	C	25.5	D
G197	Indiana St & Washington Blvd	21.9	C	20.4	C
G198	Oak St & Washington Blvd	17.9	B	15.5	B
G199	Arrowmill Ave & Washington Blvd	13.6	B	15.5	B
G200	Ayers Ave & Washington Blvd	17.6	B	16.4	B
G201	I-710 SB ramps & Washington Blvd[1]	25.6	C	22.3	C
G202	I-710 NB ramps & Washington Blvd [1]	21.3	C	18.8	B
G203	Atlantic Blvd & Sheila St	6.4	A	112.1	**F***
G208	Downey Rd & E 26th St [2]	18.6	C	21.9	C
G210	Eastern Ave & Driveway [2]	21.3	C	32.2	D
G211	Telegraph Rd & Maple Ave	7.9	A	8.5	A

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] Two-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] Four-way unsignalized intersection
[4] Intersection relocated in Plus Project scenario.
G intersection number prefix indicates intersections outside of station areas.
I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route

Table 6-80, Table 6-81, and Table 6-82 contain side-by-side comparisons of effects for roadway segments, signalized intersections, and unsignalized intersections, respectively. These tables present locations at which there was a change on geometry or volumes between the No Project and Plus Project scenarios for the Existing Year 2015 baseline, as well as the difference in V/C ratio (roadway segments) or control delay (intersections), and whether these conditions meet the thresholds discussed in Section 4.4.3.

Table 6-80 Major Roadway Segments: Project Corridor, Existing Year 2015 Effects

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Vermont Ave	East St	State College Blvd	AM	0.67	B	0.67	B	0	N
			PM	0.63	B	0.63	B	0	N
South St	East St	State College Blvd	AM	0.5	A	0.07	A	-0.43	N
			PM	0.62	B	0.05	A	-0.57	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Santa Ana St	East St	State College Blvd	AM	0.56	A	1	**E***	0.44	Y
			PM	0.54	A	1.06	**F***	0.52	Y
Broadway	East St	State College Blvd	AM	0.31	A	0.31	A	0	N
			PM	0.33	A	0.33	A	0	N
Sycamore St	East St	State College Blvd	AM	0.55	A	0.06	A	-0.49	N
			PM	0.46	A	0.07	A	-0.39	N
Harbor Blvd	La Palma Ave	Lincoln Ave	AM	0.74	C	0.74	C	0	N
			PM	0.73	C	0.73	C	0	N
Harbor Blvd	Lincoln Ave	Ball Rd	AM	0.86	D	0.86	D	0	N
			PM	0.84	D	0.84	D	0	N
La Palma Ave	Harbor Blvd	East St	AM	0.62	B	0.62	B	0	N
			PM	0.68	B	0.68	B	0	N
La Palma Ave	East St	State College Blvd	AM	0.64	B	0.64	B	0	N
			PM	0.89	D	0.89	D	0	N
Lincoln Ave	Anaheim Blvd	East St	AM	0.42	A	0.51	A	0.09	N
			PM	0.47	A	0.5	A	0.03	N
Lincoln Ave	East St	State College Blvd	AM	0.91	**E***	0.91	**E***	0	N
			PM	1.01	**F***	1.01	**F***	0	N
Soto St	E 26th St	Washington Blvd	AM	0.88	D	0.81	C	-0.07	N
			PM	0.95	**E**	0.92	**E***	-0.03	N
Downey Rd	Bandini Blvd	Washington Blvd	AM	0.76	C	0.76	C	0	N
			PM	0.95	**E***	0.95	**E***	0	N
E 26th St	Downey Rd	Bandini Blvd	AM	0.9	D	---	---	---	---
			PM	1.2	**F***	---	---	---	---
Atlantic Blvd	Bandini Blvd	Washington Blvd	AM	0.67	B	0.67	B	0	N
			PM	0.81	C	0.78	C	-0.03	N
Eastern Ave	Bandini Blvd	Commerce Way	AM	0.63	B	0.63	B	0	N
			PM	0.67	B	0.67	B	0	N
Telegraph Rd	Garfield Ave	Washington Blvd	AM	0.42	A	0.42	A	0	N
			PM	0.49	A	0.49	A	0	N
Garfield Ave	Telegraph Rd	Washington Blvd	AM	1.16	**F***	1.16	**F***	0	N
			PM	0.99	**E***	0.99	**E***	0	N
Greenwood Ave	Union St	Washington Blvd	AM	0.52	A	0.52	A	0	N
			PM	0.77	C	0.77	C	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Paramount Blvd	Slauson Ave	Washington Blvd	AM	0.74	C	0.74	C	0	N
			PM	1.03	**F***	1.03	**F***	0	N
Rosemead Blvd (SR 19)	Slauson Ave	Washington Blvd	AM	0.96	**E***	0.96	**E***	0	N
			PM	1	**E***	1	**E***	0	N
Serapis Ave	Slauson Ave	Bequette Ave	AM	0.33	A	0.33	A	0	N
			PM	0.31	A	0.31	A	0	N
Serapis Ave	Rivera Rd	Rex Rd	AM	0.07	A	0.07	A	0	N
			PM	0.05	A	0.05	A	0	N
Rex Rd	Rosemead Blvd (SR 19)	Serapis Ave	AM	0.45	A	0.45	A	0	N
			PM	0.42	A	0.42	A	0	N
Rex Rd	Serapis Ave	Passons Blvd	AM	0.38	A	0.38	A	0	N
			PM	0.25	A	0.25	A	0	N
Passons Blvd	Slauson Ave	Washington Blvd	AM	1.03	**F**	1.03	**F****	0	N
			PM	1.04	**F***	1.04	**F***	0	N
Slauson Ave	Passons Blvd	I-605 SB on-ramp	AM	0.96	**E***	0.96	**E***	0	N
			PM	0.95	**E***	0.95	**E***	0	N
Pioneer Blvd	Los Nietos Rd	Rivera Rd	AM	0.49	A	0.49	A	0	N
			PM	0.58	A	0.58	A	0	N
Pioneer Blvd	Rivera Rd	Slauson Ave	AM	0.65	B	0.65	B	0	N
			PM	0.78	C	0.78	C	0	N
Rivera Rd	Pioneer Blvd	Bradwell Ave	AM	0.07	A	0.1	A	0.03	N
			PM	0.08	A	0.12	A	0.04	N
Rivera Rd	Pioneer Blvd	Norwalk Blvd	AM	0.3	A	0.3	A	0	N
			PM	0.15	A	0.15	A	0	N
Norwalk Blvd	Telegraph Rd	Los Nietos Rd	AM	0.62	B	0.62	B	0	N
			PM	0.74	C	0.74	C	0	N
Norwalk Blvd	Los Nietos Rd	Slauson Ave	AM	0.68	B	0.68	B	0	N
			PM	0.83	D	0.83	D	0	N
Los Nietos Rd	Pioneer Blvd	Norwalk Blvd	AM	0.8	C	0.8	C	0	N
			PM	0.8	C	0.8	C	0	N
Los Nietos Rd	Norwalk Blvd	Santa Fe Springs Rd	AM	0.91	**E***	0.91	**E***	0	N
			PM	1.01	**F***	1.01	**F***	0	N
Santa Fe Springs Rd	Telegraph Rd	Los Nietos Rd	AM	0.72	C	0.72	C	0	N
			PM	0.71	C	0.71	C	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Rosecrans Ave	Carmenita Rd	Marquardt Ave	AM	0.7	B	0.7	B	0	N
			PM	0.72	C	0.72	C	0	N
Rosecrans Ave	Marquardt Ave	Valley View Ave	AM	0.69	B	0.69	B	0	N
			PM	0.68	B	0.68	B	0	N
Marquardt Ave	Rosecrans Ave	Foster Ave	AM	0.32	A	0.32	A	0	N
			PM	0.33	A	0.33	A	0	N
Marquardt Ave	Rosecrans Ave	Borate St	AM	0.22	A	0.22	A	0	N
			PM	0.18	A	0.18	A	0	N
Valley View Ave	Gannet St	Stage Rd	AM	0.78	C	0.78	C	0	N
			PM	0.82	D	0.82	D	0	N
Valley View Ave	Stage Rd	Rosecrans Ave	AM	0.86	D	0.86	D	0	N
			PM	0.84	D	0.84	D	0	N
Stage Rd	Rosecrans Ave	Valley View Ave	AM	0.36	A	0.36	A	0	N
			PM	0.46	A	0.46	A	0	N
Stage Rd	Valley View Ave	Alondra Blvd	AM	0.3	A	0.3	A	0	N
			PM	0.33	A	0.33	A	0	N
Alondra Blvd	Valley View Ave	La Mirada Blvd	AM	0.67	B	0.67	B	0	N
			PM	0.72	C	0.72	C	0	N
Stage Rd	Alondra Blvd	Beach Blvd (SR 39)	AM	0.27	A	0.33	A	0.06	N
			PM	0.35	A	0.42	A	0.07	N
Beach Blvd (SR 39)	Franklin St	Stage Rd	AM	0.87	D	0.89	D	0.02	N
			PM	0.97	**E***	0.99	**E***	0.02	N
Artesia Blvd	Beach Blvd (SR 39)	Dale St	AM	0.59	A	0.58	A	-0.01	N
			PM	0.6	A	0.58	A	-0.02	N
Commonwealth Ave	Beach Blvd (SR 39)	Dale St	AM	0.41	A	0.41	A	0	N
			PM	0.42	A	0.43	A	0.01	N
Malvern Ave	Beach Blvd (SR 39)	Dale St	AM	0.83	D	0.83	D	0	N
			PM	0.83	D	0.83	D	0	N
Dale St	Artesia Blvd	Malvern Ave	AM	0.56	A	0.53	A	-0.03	N
			PM	0.56	A	0.52	A	-0.04	N
Artesia Blvd	Dale St	Gilbert St	AM	0.65	B	0.65	B	0	N
			PM	0.62	B	0.62	B	0	N
Commonwealth Ave	Dale St	Gilbert St	AM	0.48	A	0.48	A	0	N
			PM	0.53	A	0.53	A	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Malvern Ave	Dale St	Gilbert St	AM	0.77	C	0.77	C	0	N
			PM	0.81	D	0.81	D	0	N
Gilbert St	Commonwealth Ave	Artesia Blvd	AM	0.81	D	0.81	D	0	N
			PM	0.8	C	0.8	C	0	N
Gilbert St	Artesia Blvd	Malvern Ave	AM	0.65	B	0.65	B	0	N
			PM	0.61	B	0.61	B	0	N
Commonwealth Ave	Brookhurst Rd	Euclid St	AM	0.54	A	0.54	A	0	N
			PM	0.5	A	0.5	A	0	N
State College Blvd	La Palma Ave	Lincoln Ave	AM	0.45	A	0.45	A	0	N
			PM	0.58	A	0.58	A	0	N
State College Blvd	Lincoln Ave	South St	AM	0.48	A	0.48	A	0	N
			PM	0.59	A	0.59	A	0	N
State College Blvd	South St	Wagner Ave	AM	0.45	A	0.45	A	0	N
			PM	0.42	A	0.42	A	0	N
State College Blvd	Wagner Ave	Ball Rd	AM	0.52	A	0.52	A	0	N
			PM	0.53	A	0.53	A	0	N
East St	La Palma Ave	Lincoln Ave	AM	0.62	B	0.69	B	0.07	N
			PM	0.71	C	0.73	C	0.02	N
East St	Lincoln Ave	South St	AM	0.51	A	0.54	A	0.03	N
			PM	0.52	A	0.56	A	0.04	N
East St	South St	Vermont St	AM	0.34	A	0.34	A	0	N
			PM	0.33	A	0.33	A	0	N
East St	Vermont St	Ball Rd	AM	0.44	A	0.44	A	0	N
			PM	0.46	A	0.46	A	0	N
Anaheim Blvd	La Palma Ave	Lincoln Ave	AM	0.55	A	0.56	A	0.01	N
			PM	0.63	B	0.59	A	-0.04	N
Anaheim Blvd	Lincoln Ave	South St	AM	0.67	B	0.7	B	0.03	N
			PM	0.76	C	0.8	C	0.04	N
Anaheim Blvd	South St	Vermont St	AM	0.56	A	0.56	A	0	N
			PM	0.62	B	0.62	B	0	N
Anaheim Blvd	Vermont St	Ball Rd	AM	0.8	C	0.8	C	0	N
			PM	0.95	**E***	0.95	**E***	0	N
Carmenita Rd	Alondra Blvd	Excelsior Dr	AM	0.73	C	0.73	C	0	N
			PM	0.84	D	0.84	D	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Beach Blvd (SR 39)	Malvern Ave	Stage Rd	AM	0.98	**E***	1	**E***	0.02	N
			PM	1.07	**F***	1.1	**F***	0.03	N
Santa Fe Springs Rd	Los Nietos Rd	John St	AM	0.48	A	0.48	A	0	N
			PM	0.54	A	0.54	A	0	N
Washington Blvd	Indiana St	Downey Rd	AM	0.27	A	0.21	A	-0.06	N
			PM	0.3	A	0.24	A	-0.06	N
Washington Blvd	Ayers Ave	I-710	AM	0.33	A	0.23	A	-0.1	N
			PM	0.36	A	0.3	A	-0.06	N
Washington Blvd	I-710	Atlantic Blvd	AM	0.53	A	0.49	A	-0.04	N
			PM	0.63	B	0.6	A	-0.03	N
Telegraph Rd	Garfield Ave	Maple Ave	AM	0.59	A	0.59	A	0	N
			PM	0.7	B	0.7	B	0	N
Bandini Blvd	Soto St	Downey Rd	AM	0.56	A	0.56	A	0	N
			PM	0.52	A	0.48	A	-0.04	N
Bandini Blvd	Downey Rd	Atlantic Blvd	AM	0.79	C	0.92	**E***	0.13	Y
			PM	0.83	D	1	**E***	0.17	Y
Bandini Blvd	Atlantic Blvd	Eastern Ave	AM	0.87	D	0.83	D	-0.04	N
			PM	1	**E***	0.96	**E***	-0.04	N
Soto St	E 26th St	Bandini Blvd	AM	0.93	**E***	0.93	**E***	0	N
			PM	0.89	D	0.89	D	0	N
E 26th St	Sierra Pine Ave	Downey Rd	AM	1	**E***	0.67	B	-0.33	N
			PM	1.33	**F***	1.11	**F***	-0.22	N

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I = Interstate; LOS = level of service; SB = southbound; SR = State Route; V/C = volume to capacity; veh/hr = vehicles per hour; Y/N = yes or no
The dashes (---) are defined as "not applicable."

Table 6-81 Signalized Intersections: Project Corridor, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
G35	Anaheim Blvd & La Palma Ave 1	AM	33	C	33	C	0	N
		PM	35.4	D	35.4	D	0	
G36	Anaheim Blvd & Sycamore St 1	AM	10.6	B	3.8	A	-6.8	N
		PM	8.1	A	3.8	A	-4.3	
G37		AM	29	C	35.9	D	6.9	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	Anaheim Blvd & Lincoln Ave	PM	31.6	C	36	D	4.4	
G38	Anaheim Blvd & Santa Ana St	AM	15.7	B	32	C	16.3	N
		PM	12.6	B	16.6	B	4	
G39	Anaheim Blvd & South St	AM	13.9	B	7.6	A	-6.3	N
		PM	12.2	B	7.2	A	-5	
G40	Anaheim Blvd & Vermont Ave	AM	18.4	B	18.4	B	0	N
		PM	14.8	B	14.8	B	0	
G42	East St & La Palma Ave	AM	31.4	C	31.4	C	0	N
		PM	45.4	D	45.4	D	0	
G43	East St & Sycamore St	AM	16	B	14.2	B	-1.8	N
		PM	14	B	10.2	B	-3.8	
G44	East St & Lincoln Ave	AM	33.2	C	53.7	D	20.5	Y
		PM	40.7	D	68.7	**E***	28	
G45	East St & Santa Ana St	AM	16.4	B	23.1	C	6.7	N
		PM	14.5	B	20.1	C	5.6	
G46	East St & South St	AM	19.7	B	13	B	-6.7	N
		PM	16.2	B	15.6	B	-0.6	
G47	East St & Vermont Ave	AM	17.2	B	17.2	B	0	N
		PM	18.5	B	18.5	B	0	
G49	Anaheim Blvd & Broadway	AM	24.9	C	24.9	C	0	N
		PM	25.2	C	25.2	C	0	
G50	East St & Broadway	AM	23.2	C	23.2	C	0	N
		PM	17.7	B	17.7	B	0	
G67	Harbor Blvd & La Palma Ave	AM	33.5	C	33.5	C	0	N
		PM	37.1	D	37.1	D	0	
G68	Harbor Blvd & Lincoln Ave	AM	34.4	C	34.4	C	0	N
		PM	36.4	D	36.4	D	0	
G73	State College Blvd & La Palma Ave	AM	30.5	C	30.5	C	0	N
		PM	54.2	D	54.2	D	0	
G74	State College Blvd & Lincoln Ave	AM	33.7	C	33.7	C	0	N
		PM	37.7	D	37.7	D	0	
G75	State College Blvd & Vermont Ave	AM	162.5	**F***	162.5	**F***	0	N
		PM	105.2	**F***	105.2	**F***	0	
G78		AM	13.3	B	13.3	B	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	Harbor Blvd & Vermont Ave	PM	12.2	B	12.2	B	0	
G83	Soto St & Washington Blvd	AM	46.7	D	41.8	D	-4.9	N
		PM	33.4	C	30.8	C	-2.6	
G84	Downey Rd & Washington Blvd	AM	39.5	D	39	D	-0.5	N
		PM	53.1	D	51.3	D	-1.8	
G85	Atlantic Blvd & Washington Blvd	AM	27.2	C	30.2	C	3	N
		PM	31.4	C	33.2	C	1.8	
G86	Eastern Ave & Washington Blvd	AM	25.3	C	22.2	C	-3.1	N
		PM	25.8	C	25.8	C	0	
G87	I-5 SB ramps & Washington Blvd 1	AM	20.7	C	22.4	C	1.7	N
		PM	64.8	**E***	21.7	C	-43.1	
G88	Telegraph Rd & Washington Blvd	AM	37.6	D	40.4	D	2.8	N
		PM	36.1	D	32.6	C	-3.5	
G89	Garfield Ave & Washington Blvd	AM	51.2	D	46.2	D	-5	N
		PM	45.9	D	42	D	-3.9	
G90	Greenwood Ave & Washington Blvd	AM	30.5	C	30.5	C	0	N
		PM	34.2	C	34.2	C	0	
G91	Passons Blvd & Washington Blvd	AM	39.6	D	39.6	D	0	N
		PM	35.7	D	35.7	D	0	
G92	Pioneer Blvd & Washington Blvd	AM	49.7	D	49.7	D	0	N
		PM	52.6	D	52.6	D	0	
G93	Sierra Pine Ave & Bandini Blvd	AM	16.9	B	16.9	B	0	N
		PM	14.8	B	14.8	B	0	
G94	Downey Rd & Bandini Blvd	AM	41.2	D	41.5	D	0.3	N
		PM	39.6	D	39.7	D	0.1	
G96	Bonnie Beach Pl & Bandini Blvd	AM	13.4	B	11.5	B	-1.9	N
		PM	17	B	43.5	D	26.5	
G98	Atlantic Blvd/I-710 NB ramps & Bandini Blvd 1	AM	87.8	**F***	109.3	**F***	21.5	Y
		PM	87.9	**F***	103.6	**F***	15.7	
G99	Eastern Ave & Bandini Blvd	AM	34.4	C	32.8	C	-1.6	N
		PM	35.2	D	33.4	C	-1.8	
G100	Garfield Ave & Bandini Blvd	AM	25.6	C	23	C	-2.6	N
		PM	42.5	D	35.2	D	-7.3	
G102	Soto St & E 26th St	AM	25.1	C	21.1	C	-4	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
		PM	32.5	C	29.2	C	-3.3	
G105	Bonnie Beach Pl & E 26th St	AM	12	B	12.3	B	0.3	N
		PM	12.1	B	9.4	A	-2.7	
G107	Soto St & E 37th St/Bandini Blvd	AM	34.2	C	33.8	C	-0.4	N
		PM	30.8	C	30.6	C	-0.2	
G108	Eastern Ave & Commerce Way	AM	6.9	A	6.9	A	0	N
		PM	7.8	A	8	A	0.2	
G109	Telegraph Rd (Washington Blvd) & I-5 NB ramps	AM	35.4	D	25.1	C	-10.3	N
		PM	38.7	D	30.8	C	-7.9	
G110	Garfield Ave & Telegraph Rd	AM	32.3	C	27.6	C	-4.7	N
		PM	31.3	C	27.9	C	-3.4	
G111	Telegraph Rd (Garfield Ave) & I-5 NB ramps 1	AM	27.5	C	24.2	C	-3.3	N
		PM	28.3	C	26	C	-2.3	
G112	Greenwood Ave & Telegraph Rd	AM	12.1	B	12.1	B	0	N
		PM	16.4	B	16.4	B	0	
G115	Telegraph Rd & Slauson Ave	AM	43.4	D	43.4	D	0	N
		PM	52.1	D	52.1	D	0	
G117	Greenwood Ave & Union St	AM	6.1	A	6.1	A	0	N
		PM	7.3	A	7.3	A	0	
G119	I-5 SB ramps/Gage Ave & Slauson Ave 1	AM	49	D	49	D	0	N
		PM	55.8	**E***	55.8	**E***	0	
G120	Chapin Rd & Slauson Ave	AM	7.1	A	7.1	A	0	N
		PM	20.6	C	20.6	C	0	
G121	Paramount Blvd & Slauson Ave	AM	37.7	D	37.7	D	0	N
		PM	51.6	D	51.6	D	0	
G122	Rosemead Blvd (SR 19) & Slauson Ave	AM	56.6	**E***	56.6	**E***	0	N
		PM	53.1	D	53.1	D	0	
G123	Passons Blvd & Slauson Ave	AM	30.1	C	30.1	C	0	N
		PM	32.4	C	32.4	C	0	
G124	I-605 SB off-ramp & Slauson Ave	AM	27.7	C	27.7	C	0	N
		PM	23.1	C	23.1	C	0	
G125	Pioneer Blvd & Slauson Ave	AM	47.9	D	47.9	D	0	N
		PM	46.7	D	46.7	D	0	
G126	Norwalk Blvd & Slauson Ave	AM	36.6	D	36.6	D	0	N
		PM	36.9	D	36.9	D	0	

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
G127	Sorensen Ave & Slauson Ave	AM	32.5	C	32.5	C	0	N
		PM	36	D	36	D	0	
G128	Santa Fe Springs Rd & Slauson Ave/Mulberry Dr 1	AM	29.7	C	29.7	C	0	N
		PM	23.6	C	23.6	C	0	
G131	Pioneer Blvd & Los Nietos Rd	AM	17.3	B	17.3	B	0	N
		PM	17.4	B	17.4	B	0	
G133	Pioneer Blvd & Telegraph Rd	AM	30.1	C	30.1	C	0	N
		PM	29.6	C	29.6	C	0	
G134	Norwalk Blvd & Los Nietos Rd	AM	22.6	C	22.5	C	-0.1	N
		PM	24.1	C	24	C	-0.1	
G135	Los Nietos Rd & Santa Fe Springs Rd	AM	23.8	C	23.8	C	0	N
		PM	24.4	C	24.4	C	0	
G137	Valley View Ave & Imperial Hwy	AM	42.5	D	42.5	D	0	N
		PM	45.9	D	45.9	D	0	
G138	Valley View Ave & Foster Rd	AM	98.2	F*	98.2	F*	0	N
		PM	35.5	D	35.5	D	0	
G139	Valley View Ave & Rosecrans Ave	AM	54.7	D	54.7	D	0	N
		PM	48.4	D	48.4	D	0	
G140	Valley View Ave & Stage Rd	AM	20.5	C	20.5	C	0	N
		PM	23.6	C	23.6	C	0	
G141	Valley View Ave & Gannet St	AM	10.4	B	10.4	B	0	N
		PM	12.6	B	12.6	B	0	
G142	Marquardt Ave & Imperial Hwy	AM	17.6	B	17.6	B	0	N
		PM	19.8	B	19.8	B	0	
G144	Marquardt Ave & Rosecrans Ave/Stage Rd	AM	23.2	C	23.2	C	0	N
		PM	27.9	C	27.9	C	0	
G146	Stage Rd/Escalona Rd & Alondra Blvd 1	AM	17.1	B	17.1	B	0	N
		PM	21.8	C	21.8	C	0	
G148	Beach Blvd (SR 39) & Stage Rd 1	AM	18.7	B	19.8	B	1.1	N
		PM	21.8	C	27.7	C	5.9	
G149	La Mirada Blvd & Alondra Blvd	AM	38.9	D	38.2	D	-0.7	N
		PM	29	C	28.4	C	-0.6	
G150	Beach Blvd (SR 39) & La Mirada Blvd/ Malvern Ave	AM	46.2	D	46.5	D	0.3	N
		PM	44.9	D	44.6	D	-0.3	
G151		AM	24.5	C	24.5	C	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	Beach Blvd (SR 39) & Franklin St	PM	37.6	D	37.4	D	-0.2	
G152	Beach Blvd (SR 39) & Artesia Ave	AM	35.8	D	36	D	0.2	N
		PM	42.2	D	42.9	D	0.7	
G153	Dale St & Malvern Ave 1	AM	29.8	C	29.3	C	-0.5	N
		PM	30.6	C	29.7	C	-0.9	
G154	Dale St & Lakeknoll Dr	AM	11.9	B	8	A	-3.9	N
		PM	12.3	B	6.1	A	-6.2	
G155	Dale St & Artesia Ave	AM	21.6	C	21.3	C	-0.3	N
		PM	19.9	B	20	B	0.1	
G156	Stanton Ave & Artesia Ave	AM	22.2	C	22.1	C	-0.1	N
		PM	25.4	C	25.2	C	-0.2	
G157	Dale St & Commonwealth Ave	AM	30.5	C	30.6	C	0.1	N
		PM	29.7	C	28.9	C	-0.8	
G158	Gilbert St & Commonwealth Ave 1	AM	36.7	D	36.7	D	0	N
		PM	33.9	C	33.9	C	0	
G159	Brookhurst Rd & Commonwealth Ave 1	AM	29.8	C	29.8	C	0	N
		PM	26.5	C	26.5	C	0	
G160	Brookhurst Rd & Valencia Dr	AM	24.6	C	24.6	C	0	N
		PM	20.1	C	20.1	C	0	
G162	Gilbert St & Malvern Ave	AM	65.2	**E***	65.2	**E***	0	N
		PM	35.8	D	35.8	D	0	
G163	Gilbert St & Artesia Ave	AM	16.9	B	16.9	B	0	N
		PM	14	B	14	B	0	
G164	Anaheim Blvd/Lemon St & La Palma Ave	AM	14.4	B	14.4	B	0	N
		PM	13.9	B	13.9	B	0	
G165	Paramount Blvd & Washington Blvd	AM	54.6	D	54.6	D	0	N
		PM	45.7	D	45.7	D	0	
G166	Rosemead Blvd (SR 19) & Washington Blvd	AM	44	D	44	D	0	N
		PM	45.6	D	45.6	D	0	
G167	E 26th St & Bandini Blvd 1	AM	12.1	B	12.1	B	0	N
		PM	22.2	C	22.2	C	0	
G169	Serapis Ave & Slauson Ave	AM	12.9	B	12.9	B	0	N
		PM	11.2	B	11.2	B	0	
G173	Passons Blvd & Rivera Rd	AM	9.7	A	9.7	A	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
		PM	10.4	B	10.4	B	0	
G174	Rosemead Blvd (SR 19) & Rex Rd	AM	22.5	C	22.5	C	0	N
		PM	21.3	C	21.3	C	0	
G176	La Mirada Blvd & Rosecrans Ave	AM	29.7	C	29.7	C	0	N
		PM	33.6	C	33.6	C	0	
G177	Valley View Ave & Alondra Blvd	AM	47.8	D	47.9	D	0.1	N
		PM	44.8	D	44.7	D	-0.1	
G178	Beach Blvd (SR 39) & Commonwealth Ave	AM	20.6	C	21.3	C	0.7	N
		PM	25	C	26.3	C	1.3	
G197	Indiana St & Washington Blvd	AM	17.5	B	21.9	C	4.4	N
		PM	19.2	B	20.4	C	1.2	
G198	Oak St & Washington Blvd	AM	14.3	B	17.9	B	3.6	N
		PM	14.7	B	15.5	B	0.8	
G199	Arrowmill Ave & Washington Blvd	AM	22.1	C	13.6	B	-8.5	N
		PM	16.2	B	15.5	B	-0.7	
G200	Ayers Ave & Washington Blvd	AM	14.7	B	17.6	B	2.9	N
		PM	17.8	B	16.4	B	-1.4	
G201	I-710 SB ramps & Washington Blvd 1	AM	26.2	C	25.6	C	-0.6	N
		PM	23.1	C	22.3	C	-0.8	
G202	I-710 NB ramps & Washington Blvd 1	AM	22.6	C	21.3	C	-1.3	N
		PM	19.1	B	18.8	B	-0.3	
G203	Atlantic Blvd & Sheila St	AM	11.4	B	6.4	A	-5	N
		PM	18.5	B	15.5	B	-3	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Unsignalized intersection signalized in Plus Project conditions.
[2] Control delay in No Project or Plus Project scenario is greater than 180 seconds.
G intersection number prefix indicates intersections outside of station areas.
I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec = second; SR = State Route; Y/N = yes or no

Table 6-82 Unsignalized Intersections: Project Corridor, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
G95	Indiana St & Bandini Blvd 2	AM	33.3	D	41.8	**E***	8.5	Y
		PM	30.1	D	>180	**F***	179.1	
G97	Ayers Ave & Bandini Blvd 2	AM	15.7	C	19.6	C	3.9	N
		PM	17.8	C	28.9	D	11.1	

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
G101	I-5 SB ramps & Bandini Blvd 2	AM	>180	**F***	66.4	**F***	-219.2	N
		PM	>180	**F***	>180	**F***	-3312.1	
G103	Sierra Pine Ave & E 26th St 2	AM	16.8	C	13.8	B	-3	N
		PM	19.6	C	17	C	-2.6	
G104	Indiana St & E 26th St 2	AM	16.1	C	14.8	B	-1.3	N
		PM	21.5	C	19.5	C	-2	
G106	Ayers Ave & E 26th St 2	AM	21.6	C	9.5	A	-12.1	N
		PM	25.2	D	8.7	A	-16.5	
G113	Telegraph Rd (Slauson Ave) & I-5 NB off-ramp 2	AM	>180	**F***	179.8	**F***	0.3	N
		PM	>180	**F***	>180	**F***	0.1	
G114	Gage Rd & Telegraph Rd 2	AM	46.1	**E***	46.1	**E***	0	N
		PM	135.3	**F***	135.3	**F***	0	
G116	Greenwood Ave & Driveway 2	AM	18.5	C	18.5	C	0	N
		PM	25.5	D	25.5	D	0	
G118	Chapin Rd & Union St 3	AM	9.5	A	9.5	A	0	N
		PM	16	C	16	C	0	
G130	Pioneer Blvd & I-605 NB off-ramp 2	AM	100.9	**F***	100.9	**F***	0	N
		PM	98.8	**F***	98.8	**F***	0	
G132	Pioneer Blvd & Orr and Day Rd 2	AM	121.6	**F***	121.6	**F***	0	N
		PM	171	**F***	171	**F***	0	
G136	Santa Fe Springs Rd & Sorensen Ave 2	AM	24.5	C	24.5	C	0	N
		PM	37.4	**E***	37.4	**E***	0	
G143	Marquardt Ave & Foster Rd 3	AM	15.1	C	15.1	C	0	N
		PM	13.6	B	13.6	B	0	
G147	Dodds Ave (East) & Stage Rd 2	AM	12.8	B	10.1	B	-2.7	N
		PM	13.2	B	10.4	B	-2.8	
G168	Garfield Ave & E 26th St 2	AM	108.8	**F***	108.8	**F***	0	N
		PM	>180	**F***	>180	**F***	0	
G170	Pioneer Blvd & Wheelock Cir 2	AM	23.5	C	16	B	-7.5	N
		PM	17.2	C	9.3	A	-7.9	
G171	Pioneer Blvd & Rivera Rd 2	AM	136.4	**F***	---	---	---	---
		PM	112.1	**F***	---	---	---	
G175	Passons Blvd & Rex Rd 3	AM	20.6	C	20.6	C	0	N
		PM	14.7	B	14.7	B	0	
G208		AM	33	D	18.6	C	-14.4	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	Downey Rd & E 26th St 2	PM	26.4	D	21.9	C	-4.5	
G210	Eastern Ave & Driveway 2	AM	21.1	C	21.3	C	0.2	N
		PM	32.6	D	32.2	D	-0.4	
G211	Telegraph Rd & Maple Ave 2	AM	25.9	D	7.9	A	-18	N
		PM	54.9	**F***	8.5	A	-46.4	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Intersection closed in Plus Project scenario.
[2] New intersection in Plus Project scenario.
[3] Control delay in No Project or Plus Project scenario is greater than 180 seconds.
G intersection number prefix indicates intersections outside of station areas.
LOS = level of service; sec = second; Y/N = yes or no

Existing Year 2015 Plus Project creates effects that meet thresholds at six roadway segments, three signalized intersections, and one unsignalized intersection at the following study locations:

- Santa Ana Street from west of East Street
- Atlantic Boulevard from Bandini Boulevard to Washington Boulevard
- Serapis Avenue from north of Slauson Avenue
- Serapis Avenue from Rivera Road to Rex Road
- Stage Road from Rosecrans Avenue to Valley View Avenue
- East Street from La Palma Avenue to Lincoln Avenue
- G44, East Street and Lincoln Avenue
- G95, Indiana Street and Bandini Boulevard
- G98, Atlantic Boulevard/I-710 northbound ramps and Bandini Boulevard

Of the 81 roadway segments and 122 intersections compared, the following study locations improved from LOS E or F in the Plus Project scenario:

- G87, I-5 southbound ramps and Washington Boulevard
- G211, Telegraph Road and Maple Avenue

Two intersections (G170, Pioneer Boulevard and Wheelock Circle and G206, Telegraph Road and Maple Avenue) were upgraded to a signalized intersection in the Plus Project condition, which resulted in an improvement in overall LOS.

Permanent Conditions around High-Speed Rail Stations

LAUS Area

Roadway segment Plus Project analysis and intersection Plus Project analysis was performed in the LAUS area for the Existing (Year 2015) Plus Project condition. Roadway segment Plus Project analysis performed in the LAUS area is provided in Table 6-83. Intersection Plus Project analysis performed in the LAUS area is provided in Table 6-84. Future and existing intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. Of the 3 roadway segments analyzed, 1 is LOS E or F in the AM peak hour, and 1 is LOS E or F in the PM peak hour. Of the 86 intersections and 1 new intersection analyzed, 10 are LOS E or F in the AM peak hour, and 8 are LOS E or F in the PM peak hour.

Table 6-83 Major Roadway Segment Level of Service: LAUS, Existing (Year 2015) Plus Project

Roadway	From	To	Change in Geometry or Volume from No Project Scenario (Y/N)	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Main St	Los Angeles River	E Victoria Street	N	3,000	1,736	1,485	0.58	0.50	A	A
Main St	Los Angeles River	E Del Amo Blvd	N	3,000	1,735	1,415	0.58	0.47	A	A
Ave 19	north of Figueroa St (bridge	---	N	1,250	1,837	1,368	1.47	10.9	**F***	**F***

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LAUS = Los Angeles Union Station; LOS = Level of Service; U = undivided roadway; veh/hr = vehicle per hour; V/C = volume to capacity ratio; Y/N = yes or no
The dashes (---) are defined as "not applicable."

Table 6-84 Intersection Level of Service: LAUS, Existing (Year 2015) Plus Project

No.	Intersection	Change in Geometry or Volume from No Project Scenario (Y/N)	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L157	Sotello St & Spring St [2]	N	12.1	B	19.8	C
L158	Hill St & College St	N	14.7	B	12.3	B
L159	Broadway & College St	N	17.6	B	20.7	C
L160	Spring St/Alameda St & College St	N	20.7	C	11.9	B
L161	Main St & College St [2]	N	116.2	**F***	> 180	**F***
L162	Elmyra St & Main St [2]	N	30.7	D	47.3	**E***
L163	Sotello St & Main St [2]	Y	20.1	C	> 180	**F***
L164	Wilhardt St & Main St [4]	Y	---	---	---	---
L165	Figueroa St & Figueroa Ter [3]	N	16.8	C	12.9	B
L166	Figueroa St & Alpine St [1]	N	16.7	B	15.3	B
L167	Hill St & Alpine St	N	8.0	A	7.4	A
L168	Broadway & Alpine St	N	12.6	B	10.2	B
L169	Alameda St & Alpine St	N	12.7	B	17.3	B
L170	Main St & Alpine St	N	19.9	B	36.8	D
L171	Vignes St & Bauchet St	N	4.8	A	8.5	A
L172	Hill St & Ord St	N	107.1	**F**	6.5	A
L173	Alameda St & Main St/Ord St [2]	N	22.7	C	13.6	B
L174	Figueroa St & Sunset Blvd/Cesar E Chavez Ave	N	36.4	D	29.9	C

No.	Intersection	Change in Geometry or Volume from No Project Scenario (Y/N)	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L175	Grand Ave & Cesar E Chavez Ave	N	26.1	C	26.1	C
L176	Broadway & Cesar E Chavez Ave	N	36.3	D	36.9	D
L177	New High St/Spring St & Cesar E Chavez Ave	N	21.8	C	17.8	B
L178	Main St & Cesar E Chavez Ave	N	5.3	A	10.0	A
L179	Alameda St & Cesar E Chavez Ave	N	23.4	C	23.1	C
L180	Vignes St & Cesar E Chavez Ave	N	28.5	C	30.6	C
L181	Figueroa St & Temple St	N	81.3	**F***	> 180	**F***
L182	Broadway & US 101 NB on-ramp [1]	N	2.3	A	1.3	A
L183	Broadway & Arcadia St	N	17.9	B	13.0	B
L184	Broadway & Aliso St	N	11.4	B	10.2	B
L185	Spring St & US 101 NB off-ramp [2]	N	0.8	A	1.7	A
L186	Spring St & Arcadia St	N	25.0	C	> 180	**F***
L187	Spring St & Aliso St [1]	N	6.9	A	0.1	A
L188	Alameda St & Paseo de la Plaza [1]	N	8.3	A	12.3	B
L189	Alameda St & Arcadia St/US 101 NB off-ramp	N	18.0	B	11.1	B
L190	Alameda St & Aliso St/Commercial St [1]	N	20.2	C	11.8	B
L191	Vignes St & Gateway Plaza/Ramirez St	N	97.0	**F***	117.8	**F***
L192	Garey St/US 101 SB ramps & Commercial St	N	34.5	C	40.8	D
L193	Center St & Commercial St [3]	N	16.2	C	38.0	**E***
L194	Garey St & Ducommun St [2]	N	9.8	A	11.3	B
L195	Judge John Aiso St & Temple St	N	26.1	C	24.1	C
L196	Alameda St & Temple St	N	21.7	C	22.7	C
L197	Garey St & Temple St [3]	N	11.0	B	12.5	B
L198	Vignes St & Temple St [3]	N	11.0	B	9.4	A
L199	Center St & Temple St [2]	N	12.8	B	13.3	B
L200	Broadway & 1st St	N	14.8	B	14.5	B
L201	Main St & 1st St	N	9.8	A	13.3	B
L202	Alameda St & 1st St	N	18.9	B	24.3	C
L203	Vignes St & 1st St	N	32.6	C	27.7	C
L204	Alameda St & 2nd St	N	13.7	B	18.1	B
L205	Alameda St & 3rd St/4th Pl	N	25.4	C	22.9	C
L206	Alameda St & 4th St	N	11.6	B	27.8	C
L207	San Fernando Rd & Ave 26	N	18.2	B	28.3	C
L208	CA-110 SB on-ramp & Figueroa St	N	12.1	B	16.5	B
L209	CA-110 NB off-ramp & Figueroa St	N	10.3	B	12.0	B

No.	Intersection	Change in Geometry or Volume from No Project Scenario (Y/N)	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
L210	Ave 26 & Figueroa St	N	33.6	C	31.7	C
L211	Ave 26 & I-5 SB on-ramp	N	0.4	A	0.2	A
L212	Ave 26 & CA-110 NB on-ramp	N	0.7	A	0.8	A
L213	Ave 26 & I-5 NB off-ramp	N	8.9	A	8.9	A
L214	Pasadena Ave & Broadway	N	32.9	C	15.6	B
L215	Avenue 18 & Pasadena Ave	N	19.4	B	21.6	C
L216	I-5 SB ramps/Ave 21 & Pasadena Ave	N	24.8	C	19.7	B
L217	I-5 NB ramps & Pasadena Ave	N	13.4	B	18.9	B
L218	Ave 18 & Spring St/Broadway	N	>180	**F***	20.5	C
L219	Ave 20 & Broadway	N	18.5	B	23.8	C
L220	Ave 21 & I-5 SB ramps/Broadway	N	17.0	B	15.2	B
L221	I-5 NB ramps/Ave 21 & Broadway	N	22.4	C	16.1	B
L222	Daly St & Broadway	N	28.3	C	31.4	C
L223	Gibbons St & Main St	Y	8.4	A	8.6	A
L224	Ave 20 & Main St	N	20.6	C	11.8	B
L225	Daly St & Main St	N	21.4	C	25.2	C
L226	Mission Rd & Cesar E Chavez Ave	N	93.3	**F***	33.9	D
L227	Richmond St & Mission Rd [2]	N	28.7	C	16.4	B
L228	I-5 SB ramps & Mission Rd	N	20.6	C	20.4	C
L229	Marengo St & Mission Rd	N	28.9	C	22.8	C
L230	I-5 NB on-ramp & Marengo St	N	6.0	A	2.5	A
L231	State St & Marengo St	N	28.2	C	22.7	C
L232	Mission Rd & US 101 NB ramps	N	9.2	A	5.9	A
L233	Mission Rd & Aliso St/US 101 SB ramps	N	14.6	B	9.1	A
L234	Pleasant Ave & I-10 EB ramps/Kearney St [2]	N	44.0	**E***	45.8	**E***
L235	State St & I-10 WB off-ramp	N	12.1	B	7.3	A
L236	State St & I-10 EB ramps	N	10.5	B	18.4	B
L237	US 101 SB on-ramp/Pecan St & 1st St [2]	N	13.5	B	14.4	B
L238	US 101 NB ramps & 1st St	N	20.3	C	22.2	C
L239	US 101 SB on-ramp/Pecan St & 4th St [1]	N	> 180	**F***	18.1	B
L240	US 101 SB off-ramp & 4th St [1]	N	> 180	**F***	6.4	A
L241	US 101 NB off-ramp & 4th St [1]	N	> 180	**F***	16.9	B
L242	Alameda St & Newton St (I-10 WB on-ramp)	N	13.8	B	32.1	D
L243	Alameda St & I-10 EB On-/off-ramps	N	19.3	B	19.9	B
L1013	Main St & Clover St/Avenue 17	Y	29.5	C	27.0	C

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
[4] Intersection closed in Plus Project scenario.
L intersection number prefix indicates intersections within LAUS area.
CA 110 = State Route 110; EB = eastbound; I = Interstate; LAUS = Los Angeles Union Station; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; US 101 = U.S. Highway 101; WB = westbound; Y/N = yes or no

Table 6-85 and Table 6-86 contain side-by-side comparisons of effects for signalized intersections and unsignalized intersections, respectively. These tables present locations at which there was a change on geometry or volumes between the No Project and Plus Project scenarios for the Existing Year 2015 baseline, as well as the difference in V/C ratio (roadway segments) or control delay (intersections), and whether these conditions meet the thresholds discussed in Section 4.4.3.

Table 6-85 Signalized Intersections: LAUS, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L1013	Main St & Clover St/Avenue 17 [1]	AM	---	---	29.5	C	---	---
		PM	---	---	27.0	C	---	

[1] New intersection in Plus Project scenario.
L intersection number prefix indicates intersections within LAUS area.
LAUS = Los Angeles Union Station; LOS = level of service; sec = second; Y/N = yes or no
The dashes (---) are defined as "not applicable."

Table 6-86 Unsignalized Intersections: LAUS, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
L163	Sotello St & Main St	AM	24.7	C	20.1	C	-4.6	Y
		PM	26.8	D	> 180	**F***	> 35[2,3]	
L164	Wilhardt St & Main St [1]	AM	22.7	C	---	---	---	---
		PM	16.5	C	---	---	---	
L224	Gibbons St & Main St	AM	15.9	C	8.4	A	-7.5	N
		PM	19.5	C	8.6	A	-10.9	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Intersection closed in Plus Project scenario.
[2] Control delay in No Project or Plus Project scenario is greater than 180 seconds.
[3] Control delay increase exceeds 35 seconds.
L intersection number prefix indicates intersections within LAUS area.
LAUS = Los Angeles Union Station; LOS = level of service; sec = second; Y/N = yes or no
The dashes (---) are defined as "not applicable."

Existing Year 2015 Plus Project creates effects that meet thresholds at 1 unsignalized intersection at the following study location:

- L163, Sotello Street and Main Street

Of the 2 intersections compared, none of the study locations improved from LOS E or F in the Plus Project scenario.

Norwalk/Santa Fe Springs High-Speed Rail Station Option Area

Traffic entering and exiting the existing Norwalk/Santa Fe Springs Metrolink Station was added to the relocated east entrance to the facility, which is also the main entrance to the proposed Norwalk/Santa Fe Springs HSR Station Option.

The roadway segment LOS analysis for roadway segments in the Norwalk/Santa Fe Springs HSR Station Option area under the Existing (Year 2015) Plus Project condition is presented in Table 6-87. The intersection LOS analysis for intersections under the Existing (Year 2015) Plus Project condition is presented in Table 6-88. Existing Plus Project intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. Of the 62 roadway segments analyzed, 3 are LOS E or F in the AM peak hour, and 3 are LOS E or F in the PM peak hour. Of the 61 intersections and 1 new intersection analyzed, 5 are LOS E or F in the AM peak hour, and 7 are LOS E or F in the PM peak hour.

Table 6-87 Major Roadway Segment Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option, Existing (Year 2015) Plus Project

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Firestone Blvd	Studebaker Rd	Imperial Hwy	3,675	1,900	2,000	0.5	0.54	A	A
Firestone Blvd	Imperial Hwy	Pioneer Blvd	2,520	1,800	2,000	0.69	0.79	B	C
Pioneer Blvd	Telegraph Rd	Florence Ave	2,520	1,600	1,100	0.63	0.44	B	A
Norwalk Blvd	Telegraph Rd	Florence Ave	2,520	1,600	1,700	0.63	0.65	B	B
Norwalk Blvd	Florence Ave	Lakeland Rd	3,045	1,600	1,600	0.52	0.49	A	A
Norwalk Blvd	Tina St	Imperial Hwy	2,520	2,200	2,100	0.86	0.82	D	D
Bloomfield Ave	Telegraph Rd	Florence Ave	2,415	1,600	1,600	0.65	0.64	B	B
Bloomfield Ave	Florence Ave	Lakeland Rd	2,835	1,800	1,700	0.61	0.59	B	A
Bloomfield Ave	Lakeland Rd	6th St	3,150	1,800	1,700	0.55	0.54	A	A
Bloomfield Ave	6th St	Imperial Hwy	2,625	1,800	1,800	0.66	0.66	B	B
Bloomfield Ave	Imperial Hwy	Foster Rd	2,520	1,600	1,900	0.63	0.73	B	C
Leffingwell Rd	Meyer Rd	Carmenita Rd	3,045	1,400	1,500	0.43	0.48	A	A
Leffingwell Rd	Carmenita Rd	Imperial Hwy	2,520	900	1,000	0.34	0.37	A	A
Leffingwell Rd	Imperial Hwy	Adler Dr	1,000	400	500	0.36	0.42	A	A
Carmenita Rd	Telegraph Rd	Florence Ave	2,520	1,700	1,800	0.64	0.71	B	C
Carmenita Rd	Florence Ave	Lakeland Ave	3,045	1,900	2,100	0.61	0.68	B	B
Carmenita Rd	Meyer Rd	Leffingwell Rd	3,045	1,600	2,000	0.51	0.65	A	B
Carmenita Rd	Leffingwell Rd	Imperial Hwy	2,520	1,800	2,300	0.7	0.9	B	D
Carmenita Rd	Imperial Hwy	Orden Dr	2,520	2,100	2,500	0.82	0.97	D	**E***
Telegraph Rd	Pioneer Blvd	Norwalk Blvd	5,198	3,300	3,100	0.63	0.58	B	A
Telegraph Rd	Norwalk Blvd	Santa Fe Springs Rd	4,883	2,800	2,700	0.56	0.53	A	A
Telegraph Rd	Shoemaker Ave	Carmenita Rd	4,883	2,300	2,300	0.47	0.46	A	A
Telegraph Rd	Carmenita Rd	Florence Ave	5,198	2,200	2,600	0.42	0.48	A	A
Florence Ave	Orr and Day Rd	Pioneer Blvd	3,045	3,200	3,200	1.02	1.04	**F***	**F***
Florence Ave	Pioneer Blvd	Norwalk Blvd	3,045	2,600	2,800	0.83	0.9	D	D
Florence Ave	Norwalk Blvd	Bloomfield Ave	2,835	2,400	2,600	0.82	0.89	D	D
Florence Ave	Bloomfield Ave	Shoemaker Ave	2,835	2,400	2,500	0.81	0.88	D	D
Florence Ave	Shoemaker Ave	Carmenita Rd	2,835	2,200	2,200	0.76	0.76	C	C
Florence Ave	Carmenita Rd	Telegraph Rd	2,520	2,100	2,200	0.81	0.86	D	D

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Imperial Hwy	Studebaker Rd	Firestone Blvd	5,198	2,700	2,900	0.5	0.54	A	A
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	4,410	2,600	2,700	0.59	0.6	A	A
Imperial Hwy	**Bloomfield Ave**	**Shoemaker Ave**	**6,064**	2,900	3,000	0.55	0.58	A	A
Imperial Hwy	Shoemaker Ave	Leffingwell Rd	5,198	3,000	3,000	0.56	0.57	A	A
Imperial Hwy	Leffingwell Rd	Carmenita Rd	5,198	2,200	2,100	0.41	0.4	A	A
Telegraph Rd	Santa Fe Springs Rd	Shoemaker Ave	4,883	2,000	2,300	0.39	0.47	A	A
Lakeland Rd	Pioneer Blvd	Norwalk Blvd	1,100	700	700	0.63	0.59	B	A
Lakeland Rd	Norwalk Blvd	Bloomfield Ave	1,050	900	900	0.85	0.84	D	D
Lakeland Rd	Bloomfield Ave	Shoemaker Ave	1,103	800	800	0.68	0.72	B	C
Shoemaker Ave	Telegraph Rd	Florence Ave	2,415	1,300	1,100	0.5	0.45	A	A
Shoemaker Ave	Florence Ave	Lakeland Rd	2,835	1,400	1,300	0.48	0.45	A	A
Shoemaker Ave	Lakeland Rd	Imperial Hwy	2,400	1,200	1,100	0.47	0.43	A	A
Florence Ave	I-605	Woodruff Ave	3,360	2,300	2,200	0.68	0.65	B	B
Imperial Hwy	I-605	Woodruff Ave	5,198	2,900	3,100	0.54	0.59	A	A
Imperial Hwy	I-605	Studebaker Rd	5,198	3,000	3,300	0.57	0.63	A	B
Studebaker Rd	Imperial Hwy	I-105	2,520	2,300	2,200	0.9	0.86	D	D
Carmenita Rd	Orden Dr	Rosecrans Ave	2,520	2,400	2,200	0.94	0.86	**E***	D
Shoemaker Ave	Imperial Hwy	Foster Rd	1,000	400	500	0.4	0.42	A	A
Shoemaker Ave	Foster Rd	Rosecrans Ave	2,400	800	600	0.3	0.23	A	A
Norwalk Blvd	Imperial Hwy	Civic Center Dr	4,410	2,200	2,400	0.5	0.53	A	A
Civic Center Dr	Norwalk Blvd	Bloomfield Ave	2,200	1,200	1,300	0.5	0.56	A	A
Civic Center Dr	Bloomfield Ave	Volunteer Ave	950	200	100	0.14	0.09	A	A
Foster Rd	Bloomfield Ave	Shoemaker Ave	900	600	700	0.64	0.75	B	C
Rosecrans Ave	Shoemaker Ave	Carmenita Rd	4,332	2,700	3,000	0.62	0.69	B	B
San Antonio Dr	Firestone Blvd	Pioneer Blvd/Rosecrans Ave	2,520	1,400	1,500	0.52	0.58	A	A
Rosecrans Ave	Pioneer Blvd	Norwalk Blvd	2,520	1,900	1,800	0.73	0.7	C	B
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	2,520	2,400	2,400	0.91	0.94	**E***	**E***
Rosecrans Ave	I-605 NB ramps	Studebaker Rd	4,332	3,400	3,400	0.77	0.76	C	C
Rosecrans Ave	I-605 SB ramps	I-605 NB ramps	4,332	2,700	2,600	0.61	0.59	B	A
Lakeland Rd	Shoemaker Ave	Carmenita Rd	1,050	500	600	0.45	0.5	A	A
Studebaker Rd	Imperial Hwy	Fireston Blvd	2,520	1,500	1,600	0.57	0.6	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Pioneer Blvd	South St	187th St	3,045	1,400	1,500	0.45	0.48	A	A
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	5,198	2,900	3,000	0.54	0.57	A	A

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
I = Interstate; LOS = level of service; NB = northbound; SB = southbound; veh/hr = vehicle per hour; V/C = volume to capacity ratio; Y/N = yes or no
The dashes (---) are defined as "not applicable."

Table 6-88 Intersection Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option, Existing (Year 2015) Plus Project

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N1	Firestone Blvd & Imperial Hwy[1]	61.2	**E***	58.4	**E***
N2	Pioneer Blvd & Florence Ave	36.9	D	31.6	C
N3	Pioneer Blvd & Imperial Hwy	35.5	D	41.5	D
N5	Norwalk Blvd & Telegraph Rd	43.1	D	38.3	D
N6	Norwalk Blvd & Florence Ave	35.3	D	33.5	C
N7	Norwalk Blvd & Imperial Hwy	42.1	D	48.2	D
N10	Bloomfield Ave/Santa Fe Springs Rd & Telegraph Rd	31.2	C	27.1	C
N11	Bloomfield Ave & Florence Ave	35.5	D	32	C
N12	Bloomfield Ave & Lakeland Rd	21.2	C	19.3	B
N15	Bloomfield Ave & Imperial Hwy	46.2	D	43.7	D
N17	Transportation Center West & Imperial Hwy [4]	14.5	B	13.4	B
N18	Transportation Center East & Imperial Hwy [1]	27.4	C	23	C
N19	Shoemaker Ave & Florence Ave	28.6	C	29.1	C
N20	Shoemaker Ave/Adler Dr & Imperial Hwy	29.7	C	37	D
N21	Leffingwell Rd & Imperial Hwy	44	D	46	D
N22	Carmenita Rd & Telegraph Rd	43	D	41.4	D
N23	Carmenita Rd & Florence Ave	21.3	C	23.4	C
N24	Carmenita Rd & Leffingwell Rd	40	D	39.9	D
N25	Carmenita Rd & Imperial Hwy	42.5	D	47.5	D
N26	Telegraph Rd & Florence Ave/Mills Ave	38.7	D	15	B
N27	I-5 NB on-ramp & Imperial Hwy	14.2	B	17.1	B
N30	I-5 SB off-ramp & Imperial Hwy[1]	29.7	C	20	B
N31	Norwalk Blvd & I-5 NB ramps	19.7	B	21.4	C
N32	San Antonio Dr & I-5 SB on-ramp [1]	22.3	C	20.4	C
N33	Shoemaker Ave & Telegraph Rd	24.5	C	26.2	C
N34	Pioneer Blvd & Lakeland Rd	18.4	B	19.3	B
N35	Norwalk Blvd & Lakeland Rd	112.9	**F***	97.4	**F***
N36	I-605 SB ramps & Florence	30.3	C	29	C
N37	Studebaker Rd & Florence Ave [1]	37.5	D	11.6	B
N38	Studebaker Rd & I-605 NB ramps/Dollison Dr [1]	23.2	C	30.6	C
N40	Fairford Ave & Florence Ave	61.2	**E***	58.4	**E***
N41	I-5 NB off-ramp & Florence Ave	14.6	B	6	A
N42	Orr and Day Rd & Florence Ave [1]	22.8	C	24.4	C
N45	I-605 SB ramps/Flatbush Ave & Imperial Hwy [1]	25.9	C	25	C

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
N46	Hoxie Ave & Imperial Hwy [1]	41.7	D	52.5	D
N47	I-605 NB ramps & Hoxie Ave	25.7	C	29.2	C
N48	Studebaker Rd & I-105 ramps	29.4	C	26.7	C
N49	Studebaker Rd & Imperial Hwy	57	**E***	50.6	D
N50	Bloomfield Ave & Firestone Blvd (North)	7.7	A	11.1	B
N51	Bloomfield Ave & Firestone Blvd (South)	68.5	**E***	57.4	**E***
N52	Bloomfield Ave & Rosecrans Ave	48.5	D	58.1	**E***
N53	I-5 NB off-ramp & Rosecrans Ave [1]	19	B	28.6	C
N54	I-5 SB on-ramp & Rosecrans Ave [1]	14.6	B	13.9	B
N55	Shoemaker Ave & Rosecrans Ave	42.8	D	45.6	D
N56	Shoemaker Ave & Overcrossing (South)[2]	20.2	C	15.2	C
N57	Shoemaker Ave & Firestone Blvd (South)[2]	10.7	B	10.2	B
N58	Carmenita Rd & Rosecrans Ave	42.5	D	49.8	D
N61	Carmenita Rd & I-5 NB ramps [1]	8.9	A	9.7	A
N62	Carmenita Rd & I-5 SB ramps [1]	8.7	A	7.9	A
N63	Norwalk Blvd & Civic Center Dr [1]	21.3	C	24.5	C
N64	Bloomfield Ave & Civic Center Dr	25.3	C	31.2	C
N65	Bloomfield Ave & Goller Ave/Foster Rd	26	C	21.2	C
N66	Shoemaker Ave & Foster Rd [3]	14.6	B	13.2	B
N67	Carmenita Rd & Orden Dr	14.1	B	20.7	C
N68	I-605 NB ramps & Rosecrans Ave	28.6	C	31.5	C
N69	I-605 SB ramps & Rosecrans Ave[1]	27.5	C	27.3	C
N70	Studebaker Rd & Rosecrans Ave	53.5	D	56.8	**E***
N71	Pioneer Blvd/San Antonio Dr & Rosecrans Ave [1]	60	**E***	75.4	**E***
N72	Shoemaker Ave & Lakeland Rd	18.3	B	24.1	C
N73	Carmenita Rd & Lakeland Rd	41.5	D	129.4	**F***
N74	Shoemaker Ave & Entrance/Adler Dr [2]	0.1	A	0.2	A
N145	Carmenita Rd & Foster Rd	15.9	B	12.5	B

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
[4] Intersection closed in Plus Project scenario.
N intersection number prefix indicates intersections within Norwalk/Santa Fe Springs HSR Station Option area.
HSR = high-speed rail; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; Y/N = yes or no

Table 6-89 and Table 6-90 contain side-by-side comparisons of effects for roadway segments and signalized intersections, respectively. These tables present locations at which there was a change on geometry or volumes between the No Project and Plus Project scenarios for the Existing Year 2015 baseline, as well as the difference in V/C ratio (roadway segments) or control delay (intersections), and whether these conditions meet the thresholds discussed in Section 4.4.3.

Table 6-89 Major Roadway Segments: Norwalk/Santa Fe Springs High-Speed Rail Station Option, Existing Year 2015 Effects

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Firestone Blvd	Studebaker Rd	Imperial Hwy	AM	0.50	A	0.5	A	0.00	N
			PM	0.54	A	0.54	A	0.00	N
Firestone Blvd	Imperial Hwy	Pioneer Blvd	AM	0.69	B	0.69	B	0.00	N
			PM	0.79	C	0.79	C	0.00	N
Pioneer Blvd	Telegraph Rd	Florence Ave	AM	0.63	B	0.63	B	0.00	N
			PM	0.44	A	0.44	A	0.00	N
Norwalk Blvd	Telegraph Rd	Florence Ave	AM	0.63	B	0.63	B	0.00	N
			PM	0.65	B	0.65	B	0.00	N
Norwalk Blvd	Florence Ave	Lakeland Rd	AM	0.52	A	0.52	A	0.00	N
			PM	0.49	A	0.49	A	0.00	N
Norwalk Blvd	Tina St	Imperial Hwy	AM	0.86	D	0.86	D	0.00	N
			PM	0.82	D	0.82	D	0.00	N
Bloomfield Ave	Telegraph Rd	Florence Ave	AM	0.65	B	0.65	B	0.00	N
			PM	0.64	B	0.64	B	0.00	N
Bloomfield Ave	Florence Ave	Lakeland Rd	AM	0.61	B	0.61	B	0.00	N
			PM	0.59	A	0.59	A	0.00	N
Bloomfield Ave	Lakeland Rd	6th St	AM	0.55	A	0.55	A	0.00	N
			PM	0.54	A	0.54	A	0.00	N
Bloomfield Ave	6th St	Imperial Hwy	AM	0.66	B	0.66	B	0.00	N
			PM	0.66	B	0.66	B	0.00	N
Bloomfield Ave	Imperial Hwy	Foster Rd	AM	0.63	B	0.63	B	0.00	N
			PM	0.73	C	0.73	C	0.00	N
Leffingwell Rd	Meyer Rd	Carmenita Rd	AM	0.43	A	0.43	A	0.00	N
			PM	0.48	A	0.48	A	0.00	N
Leffingwell Rd	Carmenita Rd	Imperial Hwy	AM	0.34	A	0.34	A	0.00	N
			PM	0.37	A	0.37	A	0.00	N
Leffingwell Rd	Imperial Hwy	Adler Dr	AM	0.36	A	0.36	A	0.00	N
			PM	0.42	A	0.42	A	0.00	N
Carmenita Rd	Telegraph Rd	Florence Ave	AM	0.64	B	0.64	B	0.00	N
			PM	0.71	C	0.71	C	0.00	N
Carmenita Rd	Florence Ave	Lakeland Ave	AM	0.61	B	0.61	B	0.00	N
			PM	0.68	B	0.68	B	0.00	N
	Meyer Rd	Leffingwell Rd	AM	0.51	A	0.51	A	0.00	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Carmenita Rd			PM	0.65	B	0.65	B	0.00	N
Carmenita Rd	Leffingwell Rd	Imperial Hwy	AM	0.70	B	0.7	B	0.00	N
			PM	0.90	D	0.9	D	0.00	N
Carmenita Rd	Imperial Hwy	Orden Dr	AM	0.82	D	0.82	D	0.00	N
			PM	0.97	**E***	0.97	**E***	0.00	N
Telegraph Rd	Pioneer Blvd	Norwalk Blvd	AM	0.63	B	0.63	B	0.00	N
			PM	0.58	A	0.58	A	0.00	N
Telegraph Rd	Norwalk Blvd	Santa Fe Springs Rd	AM	0.56	A	0.56	A	0.00	N
			PM	0.53	A	0.53	A	0.00	N
Telegraph Rd	Shoemaker Ave	Carmenita Rd	AM	0.47	A	0.47	A	0.00	N
			PM	0.46	A	0.46	A	0.00	N
Telegraph Rd	Carmenita Rd	Florence Ave	AM	0.42	A	0.42	A	0.00	N
			PM	0.48	A	0.48	A	0.00	N
Florence Ave	Orr and Day Rd	Pioneer Blvd	AM	1.02	**F***	1.02	**F***	0.00	N
			PM	1.04	**F***	1.04	**F***	0.00	N
Florence Ave	Pioneer Blvd	Norwalk Blvd	AM	0.83	D	0.83	D	0.00	N
			PM	0.90	D	0.9	D	0.00	N
Florence Ave	Norwalk Blvd	Bloomfield Ave	AM	0.82	D	0.82	D	0.00	N
			PM	0.89	D	0.89	D	0.00	N
Florence Ave	Bloomfield Ave	Shoemaker Ave	AM	0.81	D	0.81	D	0.00	N
			PM	0.88	D	0.88	D	0.00	N
Florence Ave	Shoemaker Ave	Carmenita Rd	AM	0.76	C	0.76	C	0.00	N
			PM	0.76	C	0.76	C	0.00	N
Florence Ave	Carmenita Rd	Telegraph Rd	AM	0.81	D	0.81	D	0.00	N
			PM	0.86	D	0.86	D	0.00	N
Imperial Hwy	Studebaker Rd	Firestone Blvd	AM	0.50	A	0.5	A	0.00	N
			PM	0.54	A	0.54	A	0.00	N
Imperial Hwy	Norwalk Blvd	Bloomfield Ave	AM	0.59	A	0.59	A	0.00	N
			PM	0.60	A	0.6	A	0.00	N
Imperial Hwy	Bloomfield Ave	Shoemaker Ave	AM	0.55	A	0.55	A	0.00	N
			PM	0.58	A	0.58	A	0.00	N
Imperial Hwy	Shoemaker Ave	Leffingwell Rd	AM	0.56	A	0.56	A	0.00	N
			PM	0.57	A	0.57	A	0.00	N
	Leffingwell Rd	Carmenita Rd	AM	0.41	A	0.41	A	0.00	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Imperial Hwy			PM	0.40	A	0.4	A	0.00	N
Telegraph Rd	Santa Fe Springs Rd	Shoemaker Ave	AM	0.39	A	0.39	A	0.00	N
			PM	0.47	A	0.47	A	0.00	N
Lakeland Rd	Pioneer Blvd	Norwalk Blvd	AM	0.63	B	0.63	B	0.00	N
			PM	0.59	A	0.59	A	0.00	N
Lakeland Rd	Norwalk Blvd	Bloomfield Ave	AM	0.85	D	0.85	D	0.00	N
			PM	0.84	D	0.84	D	0.00	N
Lakeland Rd	Bloomfield Ave	Shoemaker Ave	AM	0.68	B	0.68	B	0.00	N
			PM	0.72	C	0.72	C	0.00	N
Shoemaker Ave	Telegraph Rd	Florence Ave	AM	0.50	A	0.5	A	0.00	N
			PM	0.45	A	0.45	A	0.00	N
Shoemaker Ave	Florence Ave	Lakeland Rd	AM	0.48	A	0.48	A	0.00	N
			PM	0.45	A	0.45	A	0.00	N
Shoemaker Ave	Lakeland Rd	Imperial Hwy	AM	0.47	A	0.47	A	0.00	N
			PM	0.43	A	0.43	A	0.00	N
Florence Ave	I-605	Woodruff Ave	AM	0.68	B	0.68	B	0.00	N
			PM	0.65	B	0.65	B	0.00	N
Imperial Hwy	I-605	Woodruff Ave	AM	0.54	A	0.54	A	0.00	N
			PM	0.59	A	0.59	A	0.00	N
Imperial Hwy	I-605	Studebaker Rd	AM	0.57	A	0.57	A	0.00	N
			PM	0.63	B	0.63	B	0.00	N
Studebaker Rd	Imperial Hwy	I-105	AM	0.90	D	0.9	D	0.00	N
			PM	0.86	D	0.86	D	0.00	N
Carmenita Rd	Orden Dr	Rosecrans Ave	AM	0.94	**E***	0.94	**E***	0.00	N
			PM	0.86	D	0.86	D	0.00	N
Shoemaker Ave	Imperial Hwy	Foster Rd	AM	0.40	A	0.4	A	0.00	N
			PM	0.42	A	0.42	A	0.00	N
Shoemaker Ave	Foster Rd	Rosecrans Ave	AM	0.30	A	0.3	A	0.00	N
			PM	0.23	A	0.23	A	0.00	N
Norwalk Blvd	Imperial Hwy	Civic Center Dr	AM	0.50	A	0.5	A	0.00	N
			PM	0.53	A	0.53	A	0.00	N
Civic Center Dr	Norwalk Blvd	Bloomfield Ave	AM	0.50	A	0.5	A	0.00	N
			PM	0.56	A	0.56	A	0.00	N
		Volunteer Ave	AM	0.14	A	0.14	A	0.00	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Civic Center Dr	Bloomfield Ave		PM	0.09	A	0.09	A	0.00	N
Foster Rd	Bloomfield Ave	Shoemaker Ave	AM	0.64	B	0.64	B	0.00	N
			PM	0.75	C	0.75	C	0.00	N
Rosecrans Ave	Shoemaker Ave	Carmenita Rd	AM	0.62	B	0.62	B	0.00	N
			PM	0.69	B	0.69	B	0.00	N
San Antonio Dr	Firestone Blvd	Pioneer Blvd/ Rosecrans Ave	AM	0.52	A	0.52	A	0.00	N
			PM	0.58	A	0.58	A	0.00	N
Rosecrans Ave	Pioneer Blvd	Norwalk Blvd	AM	0.73	C	0.73	C	0.00	N
			PM	0.70	B	0.7	B	0.00	N
Rosecrans Ave	Studebaker Rd	Pioneer Blvd	AM	0.91	**E***	0.91	**E***	0.00	N
			PM	0.94	**E***	0.94	**E***	0.00	N
Rosecrans Ave	I-605 NB ramps	Studebaker Rd	AM	0.77	C	0.77	C	0.00	N
			PM	0.76	C	0.76	C	0.00	N
Rosecrans Ave	I-605 SB ramps	I-605 NB ramps	AM	0.61	B	0.61	B	0.00	N
			PM	0.59	A	0.59	A	0.00	N
Lakeland Rd	Shoemaker Ave	Carmenita Rd	AM	0.45	A	0.45	A	0.00	N
			PM	0.50	A	0.5	A	0.00	N
Studebaker Rd	Imperial Hwy	Fireston Blvd	AM	0.57	A	0.57	A	0.00	N
			PM	0.60	A	0.6	A	0.00	N
Pioneer Blvd	South St	187th St	AM	0.45	A	0.45	A	0.00	N
			PM	0.48	A	0.48	A	0.00	N
Imperial Hwy	Norwalk Blvd	Bloomfiled Ave	AM	0.54	A	0.54	A	0.00	N
			PM	0.57	A	0.57	A	0.00	N

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LOS = level of service; V/C = volume to capacity ratio; Y/N = yes or no
The dashes (---) are defined as "not applicable."

Table 6-90 Signalized Intersections: Norwalk/Santa Fe Springs High-Speed Rail Station Option, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
N1	Firestone Blvd & Imperial Hwy[1]	AM	61.2	**E***	61.2	**E***	0	N
		PM	58.4	**E***	58.4	**E***	0	
N2		AM	36.9	D	36.9	D	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	Pioneer Blvd & Florence Ave	PM	31.6	C	31.6	C	0	
N3	Pioneer Blvd & Imperial Hwy	AM	35.5	D	35.5	D	0	N
		PM	41.5	D	41.5	D	0	
N5	Norwalk Blvd & Telegraph Rd	AM	43.1	D	43.1	D	0	N
		PM	38.3	D	38.3	D	0	
N6	Norwalk Blvd & Florence Ave	AM	35.3	D	35.3	D	0	N
		PM	33.5	C	33.5	C	0	
N7	Norwalk Blvd & Imperial Hwy	AM	42.1	D	42.1	D	0	N
		PM	48.2	D	48.2	D	0	
N10	Bloomfield Ave/Santa Fe Springs Rd & Telegraph Rd	AM	31.2	C	31.2	C	0	N
		PM	27.1	C	27.1	C	0	
N11	Bloomfield Ave & Florence Ave	AM	35.5	D	35.5	D	0	N
		PM	32	C	32	C	0	
N12	Bloomfield Ave & Lakeland Rd	AM	21.2	C	21.2	C	0	N
		PM	19.3	B	19.3	B	0	
N15	Bloomfield Ave & Imperial Hwy	AM	46.2	D	46.2	D	0	N
		PM	43.7	D	43.7	D	0	
N17	Transportation Center West & Imperial Hwy [1]	AM	13	B	---	---	---	---
		PM	12.3	B	---	---	---	
N18	Transportation Center East & Imperial Hwy[1]	AM	12.6	B	14.5	B	1.9	N
		PM	13.2	B	13.4	B	0.2	
N19	Shoemaker Ave & Florence Ave	AM	27.4	C	27.4	C	0	N
		PM	23	C	23	C	0	
N20	Shoemaker Ave/Adler Dr & Imperial Hwy	AM	28.6	C	28.6	C	0	N
		PM	29.1	C	29.1	C	0	
N21	Leffingwell Rd & Imperial Hwy	AM	29.7	C	29.7	C	0	N
		PM	37	D	37	D	0	
N22	Carmenita Rd & Telegraph Rd	AM	44	D	44	D	0	N
		PM	46	D	46	D	0	
N23	Carmenita Rd & Florence Ave	AM	43	D	43	D	0	N
		PM	41.4	D	41.4	D	0	
N24	Carmenita Rd & Leffingwell Rd	AM	21.3	C	21.3	C	0	N
		PM	23.4	C	23.4	C	0	
N25		AM	40	D	40	D	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	Carmenita Rd & Imperial Hwy	PM	39.9	D	39.9	D	0	
N26	Telegraph Rd & Florence Ave/Mills Ave	AM	42.5	D	42.5	D	0	N
		PM	47.5	D	47.5	D	0	
N27	I-5 NB on-ramp & Imperial Hwy	AM	38.7	D	38.7	D	0	N
		PM	15	B	15	B	0	
N30	I-5 SB off-ramp & Imperial Hwy [1]	AM	14.2	B	14.2	B	0	N
		PM	17.1	B	17.1	B	0	
N31	Norwalk Blvd & I-5 NB ramps	AM	29.7	C	29.7	C	0	N
		PM	20	B	20	B	0	
N32	San Antonio Dr & I-5 SB on-ramp [1]	AM	19.7	B	19.7	B	0	N
		PM	21.4	C	21.4	C	0	
N33	Shoemaker Ave & Telegraph Rd	AM	22.3	C	22.3	C	0	N
		PM	20.4	C	20.4	C	0	
N34	Pioneer Blvd & Lakeland Rd	AM	24.5	C	24.5	C	0	N
		PM	26.2	C	26.2	C	0	
N35	Norwalk Blvd & Lakeland Rd	AM	18.4	B	18.4	B	0	N
		PM	19.3	B	19.3	B	0	
N36	I-605 SB ramps & Florence	AM	112.9	**F***	112.9	**F***	0	N
		PM	97.4	**F***	97.4	**F***	0	
N37	Studebaker Rd & Florence Ave [1]	AM	30.3	C	30.3	C	0	N
		PM	29	C	29	C	0	
N38	Studebaker Rd & I-605 NB ramps/Dollison Dr [1]	AM	37.5	D	37.5	D	0	N
		PM	11.6	B	11.6	B	0	
N40	Fairford Ave & Florence Ave	AM	23.2	C	23.2	C	0	N
		PM	30.6	C	30.6	C	0	
N41	I-5 NB off-ramp & Florence Ave	AM	14.6	B	14.6	B	0	N
		PM	6	A	6	A	0	
N42	Orr and Day Rd & Florence Ave[1]	AM	22.8	C	22.8	C	0	N
		PM	24.4	C	24.4	C	0	
N45	I-605 SB ramps/Flatbush Ave & Imperial Hwy[1]	AM	25.9	C	25.9	C	0	N
		PM	25	C	25	C	0	
N46	Hoxie Ave & Imperial Hwy[1]	AM	41.7	D	41.7	D	0	N
		PM	52.5	D	52.5	D	0	
N47		AM	25.7	C	25.7	C	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	I-605 NB ramps & Hoxie Ave	PM	29.2	C	29.2	C	0	
N48	Studebaker Rd & I-105 ramps	AM	29.4	C	29.4	C	0	N
		PM	26.7	C	26.7	C	0	
N49	Studebaker Rd & Imperial Hwy	AM	57	**E***	57	**E***	0	N
		PM	50.6	D	50.6	D	0	
N50	Bloomfield Ave & Firestone Blvd (North)	AM	7.7	A	7.7	A	0	N
		PM	11.1	B	11.1	B	0	
N51	Bloomfield Ave & Firestone Blvd (South)	AM	68.5	**E***	68.5	**E***	0	N
		PM	57.4	**E***	57.4	**E***	0	
N52	Bloomfield Ave & Rosecrans Ave	AM	48.5	D	48.5	D	0	N
		PM	58.1	**E***	58.1	**E***	0	
N53	I-5 NB off-ramp & Rosecrans Ave[1]	AM	19	B	19	B	0	N
		PM	28.6	C	28.6	C	0	
N54	I-5 SB on-ramp & Rosecrans Ave [1]	AM	14.6	B	14.6	B	0	N
		PM	13.9	B	13.9	B	0	
N55	Shoemaker Ave & Rosecrans Ave	AM	42.8	D	42.8	D	0	N
		PM	45.6	D	45.6	D	0	
N58	Carmenita Rd & Rosecrans Ave	AM	42.5	D	42.5	D	0	N
		PM	49.8	D	49.8	D	0	
N61	Carmenita Rd & I-5 NB ramps [1]	AM	8.9	A	8.9	A	0	N
		PM	9.7	A	9.7	A	0	
N62	Carmenita Rd & I-5 SB ramps [1]	AM	8.7	A	8.7	A	0	N
		PM	7.9	A	7.9	A	0	
N63	Norwalk Blvd & Civic Center Dr [1]	AM	21.3	C	21.3	C	0	N
		PM	24.5	C	24.5	C	0	
N64	Bloomfield Ave & Civic Center Dr	AM	25.3	C	25.3	C	0	N
		PM	31.2	C	31.2	C	0	
N65	Bloomfield Ave & Goller Ave/Foster Rd	AM	26	C	26	C	0	N
		PM	21.2	C	21.2	C	0	
N67	Carmenita Rd & Orden Dr	AM	14.1	B	14.1	B	0	N
		PM	20.7	C	20.7	C	0	
N68	I-605 NB ramps & Rosecrans Ave	AM	28.6	C	28.6	C	0	N
		PM	31.5	C	31.5	C	0	
N69		AM	27.5	C	27.5	C	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	I-605 SB ramps & Rosecrans Ave[1]	PM	27.3	C	27.3	C	0	
N70	Studebaker Rd & Rosecrans Ave	AM	53.5	D	53.5	D	0	N
		PM	56.8	**E***	56.8	**E***	0	
N71	Pioneer Blvd/San Antonio Dr & Rosecrans Ave [1]	AM	60	**E***	60	**E***	0	N
		PM	75.4	**E***	75.4	**E***	0	
N72	Shoemaker Ave & Lakeland Rd	AM	18.3	B	18.3	B	0	N
		PM	24.1	C	24.1	C	0	
N73	Carmenita Rd & Lakeland Rd	AM	41.5	D	41.5	D	0	N
		PM	129.4	**F***	129.4	**F***	0	
N74	State College Blvd & Lincoln Ave	AM	33.7	C	33.7	C	0	N
		PM	37.7	D	37.7	D	0	
N145	Carmenita Rd & Foster Rd	AM	15.9	B	15.9	B	0	N
		PM	12.5	B	12.5	B	0	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Intersection closed in Plus Project scenario.
[2] New intersection in Plus Project scenario.
N intersection number prefix indicates intersections within the Norwalk/Santa Fe Springs HSR Station Option area.
HSR = high-speed rail; LOS = level of service; sec = second; Y/N = yes or no

Table 6-91 Unsignalized Intersections: Norwalk/Santa Fe Springs High-Speed Rail Station Option, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
N56	Shoemaker Ave & Overcrossing (South) 2	AM	15.2	C	20.2	C	5	N
		PM	40.1	**E***	15.2	C	-24.9	
N57	Shoemaker Ave & Firestone Blvd (South) 2	AM	10.2	B	10.7	B	0.5	N
		PM	10	A	10.2	B	0.2	
N66	Shoemaker Ave & Foster Rd 3	AM	14.6	B	14.6	B	0	N
		PM	13.2	B	13.2	B	0	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
N intersection number prefix indicates intersections within the Norwalk/Santa Fe Springs HSR Station Option area.
HSR = high-speed rail; LOS = level of service; sec = second; Y/N = yes or no

Existing Year 2015 Plus Project creates no effects that meet thresholds. Of the 62 roadway segments and 60 intersections compared, none of the study locations improved from LOS E or F in the Plus Project scenario.

Fullerton High-Speed Rail Station Option Area

The roadway segment LOS analysis for roadway segments in the Fullerton HSR Station Option area under the Existing (Year 2015) Plus Project condition is presented in Table 6-92. The intersection LOS analysis for intersections under the Existing (Year 2015) Plus Project condition is presented in Table 6-93. Existing Plus Project intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. Of the 60 roadway segments analyzed, 14 are LOS E or F in the AM peak hour, and 15 are LOS E or F in the PM peak hour. Of the 62 intersections analyzed, 4 are LOS E or F in the AM peak hour, and 3 are LOS E or F in the PM peak hour.

Table 6-92 Major Roadway Segment Level of Service: Fullerton High-Speed Rail Station Option, Existing (Year 2015) Plus Project

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Euclid St	Bastanchury Rd	Malvern Ave	2,625	2,800	2,700	1.04	1	**F***	**E***
Euclid St	Malvern Ave	Commonwealth Ave	3,045	3,000	2,900	0.95	0.95	**E***	**E***
Euclid St	Commonwealth Ave	Orangethorpe Ave	2,520	2,500	2,500	0.95	0.99	**E***	**E***
Highland Ave	Malvern Ave	Chapman Ave	1,100	300	300	0.22	0.2	A	A
Highland Ave	Chapman Ave	Commonwealth Ave	1,100	600	700	0.47	0.57	A	A
Highland Ave	Commonwealth Ave	Valencia Dr	1,155	800	1,000	0.61	0.78	B	C
Highland Ave	Valencia Dr	Orangethorpe Ave	1,050	400	900	0.32	0.81	A	D
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	2,520	3,100	3,100	1.2	1.23	**F***	**F***
Harbor Blvd	Bastanchury Rd	Brea Blvd	5,198	2,700	2,700	0.5	0.52	A	A
Harbor Blvd	Brea Blvd	Berkeley Ave	4,332	3,500	3,200	0.79	0.73	C	C
Harbor Blvd	Berkeley Ave	Chapman Ave	3,045	2,700	2,500	0.86	0.82	D	D
Harbor Blvd	Chapman Ave	Commonwealth Ave	3,045	2,600	2,300	0.82	0.75	D	C
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	2,900	2,800	1.11	1.09	**F***	**F***
Harbor Blvd	Orangethorpe Ave	Orangefair Ave	4,410	3,300	3,900	0.74	0.87	C	D
Lemon St	Berkeley Ave	Chapman Ave	3,045	1,600	1,800	0.52	0.58	A	A
Lemon St	Chapman Ave	Commonwealth Ave	3,045	1,800	2,000	0.58	0.64	A	B
Lemon St	Commonwealth Ave	Orangethorpe Ave	2,415	2,500	2,800	1.03	1.14	**F***	**F***
Lemon St	Orangethorpe Ave	Orangefair Ave	2,415	2,400	3,000	0.97	1.2	**E***	**F***
Raymond Ave	Chapman Ave	Commonwealth Ave	3,045	800	700	0.24	0.22	A	A
Raymond Ave	Commonwealth Ave	Orangethorpe Ave	2,415	500	600	0.2	0.23	A	A
Raymond Ave	Orangethorpe Ave	E Burton St	2,415	1,600	1,700	0.63	0.7	B	B
State College Blvd	Dorothy Ln	Chapman Ave	5,198	2,200	2,000	0.41	0.38	A	A
State College Blvd	Chapman Ave	Commonwealth Ave	3,045	1,700	1,800	0.54	0.57	A	A
State College Blvd	Commonwealth Ave	Orangethorpe Ave	2,520	1,400	1,500	0.53	0.57	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
State College Blvd	Orangethorpe Ave	Via Burton St	2,415	1,600	1,900	0.63	0.75	B	C
Malvern Ave	Bastanchury Rd	Basque Ave	2,900	1,600	1,900	0.54	0.65	A	B
Chapman Ave	Richman Ave	Highland Ave	3,360	1,900	2,100	0.56	0.62	A	B
Chapman Ave	Harbor Blvd	Raymond Ave	3,045	2,400	2,400	0.78	0.79	C	C
Chapman Ave	Raymond Ave	Acacia Ave	3,045	2,700	3,000	0.88	0.97	D	**E***
Chapman Ave	Acacia Ave	State College Blvd	2,520	2,600	3,100	1.02	1.21	**F***	**F***
Chapman Ave	State College Blvd	Commonwealth Ave	2,520	2,400	2,900	0.95	1.11	**E***	**F***
Commonwealth Ave	Brookhurst St	Euclid St	3,045	1,500	1,500	0.46	0.49	A	A
Commonwealth Ave	Euclid St	Harbor Blvd	2,900	1,600	1,300	0.53	0.42	A	A
Commonwealth Ave	Harbor Blvd	Raymond Ave	2,900	1,900	1,800	0.63	0.61	B	B
Commonwealth Ave	Raymond Ave	Acacia Ave	2,900	1,700	1,700	0.57	0.56	A	A
Commonwealth Ave	Acacia Ave	State College Blvd	2,400	1,100	1,300	0.43	0.52	A	A
Commonwealth Ave	State College Blvd	Chapman Ave	2,400	800	900	0.3	0.36	A	A
Valencia Dr	Highland Ave	Harbor Blvd	1,100	500	500	0.44	0.39	A	A
Valencia Dr	Harbor Blvd	Lemon St	1,050	400	500	0.35	0.39	A	A
Orangethorpe Ave	Euclid St	Highland Ave	3,045	1,800	2,500	0.58	0.79	A	C
Orangethorpe Ave	Harbor Blvd	Raymond Ave	4,253	2,100	2,500	0.48	0.57	A	A
Orangethorpe Ave	Raymond Ave	State College Blvd	4,253	2,000	2,500	0.46	0.57	A	A
Orangethorpe Ave	State College Blvd	Placentia Ave	4,253	1,900	2,000	0.43	0.47	A	A
SR 57 SB Frontage Rd	Nutwood	Chapman	1,080	500	800	0.42	0.66	A	B
SR 57 NB Frontage Rd	Nutwood	Chapman	1,080	900	900	0.83	0.75	D	C
Chapman Ave	Commonwealth Ave	SR 57	3,045	3,000	3,400	0.97	1.09	**E***	**F***
Placentia Ave	Chapman Ave	Orangethorpe Ave	2,520	1,800	1,900	0.68	0.72	B	C
Valencia Dr	Euclid St	Highland Ave	1,155	700	700	0.57	0.54	A	A
Orangethorpe Ave	Placentia Ave	SR 57	5,198	1,800	1,900	0.33	0.36	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Imperial Hwy (SR 90)	Harbor Blvd	Puente St	4,410	3,900	4,000	0.87	0.9	D	D
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	2,520	2,600	2,700	1	1.03	**E***	**F***
Bastanchury Rd	Euclid St	Harbor Blvd	2,625	3,400	3,400	1.26	1.28	**F***	**F***
Bastanchury Rd	Harbor Blvd	Brea Blvd	2,520	3,400	3,400	1.32	1.33	**F***	**F***
Yorba Linda Blvd	State College Blvd	Associated Rd/Campus Dr	4,725	2,000	2,200	0.42	0.46	A	A
Yorba Linda Blvd	Associated Rd/Campus Dr	SR 57	5,198	2,300	2,600	0.43	0.48	A	A
Euclid St	Orangethorpe Ave	SR 91	2,520	2,900	3,100	1.15	1.21	**F***	**F***
Brea Blvd	Harbor Blvd	Bastanchury Rd	2,520	1,900	1,900	0.75	0.75	C	C
Santa Fe Ave	Highland Ave	Malden Ave	1,150	100	200	0.06	0.09	A	A
Santa Fe Ave	Malden Ave	Harbor Blvd	1,000	200	200	0.15	0.16	A	A
Santa Fe Ave	Harbor Blvd	Lemon St	1,000	200	300	0.14	0.2	A	A

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LOS = level of service; NB = northbound; SB = southbound; SR = State Route; veh/hr = vehicle per hour; V/C = volume to capacity ratio; Y/N = yes or no
The dashes (---) are defined as "not applicable."

Table 6-93 Intersection Level of Service: Fullerton High-Speed Rail Station Option, Existing (Year 2015) Plus Project

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F1	Euclid St & Malvern Ave	42.3	D	51.6	D
F2	Euclid St & Commonwealth Ave	36.9	D	33.9	C
F3	Highland Ave & Chapman Ave	11.3	B	15.2	B
F4	Highland Ave & Commonwealth Ave	17.7	B	19	B
F5	Highland Ave & Santa Fe Ave [2]	15.5	C	17.4	C
F6	Highland Ave & Truslow Ave [2]	15.7	C	16.8	C
F7	Highland Ave & Valencia Dr	16.2	B	16.4	B
F8	Highland Ave & Orangethorpe Ave	17.7	B	21.1	C
F9	Malden Ave & Chapman Ave[2]	40.6	**E***	111.1	**F***
F10	Malden Ave & Commonwealth Ave	14.5	B	18.7	B
F11	Harbor Blvd & Imperial Hwy (SR 90)	51.1	D	46.6	D
F12	Harbor Blvd & Bastanchury Rd	48.9	D	43.1	D
F13	Harbor Blvd & Valley View Dr/Brea Blvd[1]	30.6	C	31.5	C
F14	Harbor Blvd & Berkeley Ave	29.1	C	26.3	C
F15	Harbor Blvd & Chapman Ave	42.7	D	38.3	D
F16	Harbor Blvd & Commonwealth Ave	38.9	D	29.6	C
F17	Harbor Blvd & Santa Fe Ave	11.1	B	13.5	B
F18	Harbor Blvd & Truslow Ave [2]	18.7	C	15.7	C
F19	Harbor Blvd & Orangethorpe Ave	34.6	C	40.9	D
F20	Harbor Blvd & SR 91 WB ramps	14.5	B	15.2	B
F21	Harbor Blvd & SR 91 EB ramps	19.5	B	23.1	C
F22	Brea Blvd & Bastanchury Rd	50.5	D	37.7	D
F23	Lemon St & Chapman Ave	32.7	C	37.2	D
F24	Lemon St & Commonwealth Ave	33.7	C	32.7	C
F25	Lemon St & Santa Fe Ave	4.6	A	7.6	A
F26	Lemon St & Orangethorpe Ave	35.5	D	48.9	D
F27	Lemon St & SR 91 WB ramps	23.7	C	26.9	C
F28	Anaheim Blvd/Lemon St & SR 91 EB ramps	29.4	C	29.5	C
F29	Raymond Ave & Chapman Ave	27.3	C	23.2	C
F30	Raymond Ave & Commonwealth Ave	22.5	C	20.2	C
F31	Raymond Ave & Orangethorpe Ave	30.8	C	31.8	C
F32	State College Blvd & Chapman Ave	31.6	C	37.9	D
F33	State College Blvd & Commonwealth Ave	34	C	28.4	C
F34	State College Blvd & Orangethorpe Ave	29.7	C	34.2	C

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
F35	Commonwealth Ave & Chapman Ave	17.7	B	23.9	C
F36	SR 57 SB ramps & Chapman Ave	19.2	B	21.1	C
F37	SR 57 NB ramps & Chapman Ave [1]	34.6	C	33.5	C
F38	Placentia Ave & Chapman Ave	37.3	D	38.5	D
F39	Euclid St & Valencia Dr	26.6	C	22.6	C
F40	Highland Ave & Walnut Ave	10.9	B	10.1	B
F41	Malden Ave & Santa Fe Ave [3]	8.6	A	8.8	A
F42	Malden Ave & Truslow Ave [2]	8.8	A	8.9	A
F43	Malden Ave & Valencia Dr [2]	13.2	B	11.9	B
F44	Harbor Blvd & Valencia Dr	17.1	B	13.1	B
F45	Lemon St & Walnut Ave[2]	84.9	**F***	53.5	**F***
F46	Lemon St & Valencia Dr	84.9	**F***	53.5	**F***
F47	Placentia Ave & Orangethorpe Ave	32.6	C	32.1	C
F48	SR 57 SB ramps & Nutwood Ave [1]	26.6	C	26.1	C
F49	SR 57 SB ramps & Orangethorpe Ave [1]	29.1	C	25.9	C
F50	SR 57 NB ramps & Nutwood Ave [1]	31.1	C	26.7	C
F51	SR 57 NB ramps & Orangethorpe Ave	29.7	C	30.2	C
F52	Brea Blvd & Imperial Hwy (SR 90)	49.8	D	44.8	D
F53	State College Blvd & Yorba Linda Blvd [1]	39.7	D	32	C
F54	SR 57 SB off-ramp & Yorba Linda Blvd	20.3	C	24.5	C
F55	SR 57 NB off-ramp & Yorba Linda Blvd [1]	29.4	C	33.3	C
F56	Raymond Ave/East St & SR 91 EB ramps[1]	26.2	C	17.7	B
F57	Raymond Ave & SR 91 WB ramps [1]	21.5	C	12.3	B
F58	Euclid St & SR 91 WB ramps	264.9	**F***	22.6	C
F59	Euclid St & SR 91 EB ramps [1]	14.5	B	20.7	C
F60	State College Blvd & SR 91 EB ramps [1]	21.1	C	21.9	C
F61	State College Blvd & SR 91 WB ramps [1]	19.4	B	21.7	C
F161	Euclid St & Orangethorpe Ave	42.2	D	39.3	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
[4] Intersection closed in Plus Project scenario.
F intersection number prefix indicates intersections within the Fullerton Station HSR Station Option area.
EB = eastbound; HSR = high-speed rail; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route; WB = westbound; Y/N =yes or no

Table 6-94, Table 6-95, and Table 6-96 contain side-by-side comparisons of effects for roadway segments, signalized intersections, and unsignalized intersections, respectively. These tables present locations at which there was a change on geometry or volumes between the No Project and Plus Project scenarios for the Existing Year 2015 baseline, as well as the difference in V/C

ratio (roadway segments) or control delay (intersections), and whether these conditions meet the thresholds discussed in Section 4.4.3.

Table 6-94 Major Roadway Segments: Fullerton High-Speed Rail Station Option, Existing Year 2015 Effects

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Euclid St	Bastanchury Rd	Malvern Ave	AM	1.04	**F***	1.04	**F**	0	N
			PM	1	**E***	1	**E**	0	N
Euclid St	Malvern Ave	Commonwealth Ave	AM	0.95	**E***	0.95	**E**	0	N
			PM	0.95	**E***	0.95	**E**	0	N
Euclid St	Commonwealth Ave	Orangethorpe Ave	AM	0.95	**E**	0.95	**E**	0	N
			PM	0.99	**E**	0.99	**E**	0	N
Highland Ave	Malvern Ave	Chapman Ave	AM	0.22	A	0.22	A	0	N
			PM	0.2	A	0.2	A	0	N
Highland Ave	Chapman Ave	Commonwealth Ave	AM	0.47	A	0.47	A	0	N
			PM	0.57	A	0.57	A	0	N
Highland Ave	Commonwealth Ave	Valencia Dr	AM	0.61	B	0.61	B	0	N
			PM	0.78	C	0.78	C	0	N
Highland Ave	Valencia Dr	Orangethorpe Ave	AM	0.32	A	0.32	A	0	N
			PM	0.81	D	0.81	D	0	N
Harbor Blvd	Imperial Hwy (SR 90)	Bastanchury Rd	AM	1.2	**F**	1.2	**F***	0	N
			PM	1.23	**F**	1.23	**F***	0	N
Harbor Blvd	Bastanchury Rd	Brea Blvd	AM	0.5	A	0.5	A	0	N
			PM	0.52	A	0.52	A	0	N
Harbor Blvd	Brea Blvd	Berkeley Ave	AM	0.79	C	0.79	C	0	N
			PM	0.73	C	0.73	C	0	N
Harbor Blvd	Berkeley Ave	Chapman Ave	AM	0.86	D	0.86	D	0	N
			PM	0.82	D	0.82	D	0	N
Harbor Blvd	Chapman Ave	Commonwealth Ave	AM	0.82	D	0.82	D	0	N
			PM	0.75	C	0.75	C	0	N
Harbor Blvd	Commonwealth Ave	Orangethorpe Ave	AM	1.11	**F***	1.11	**F***	0	N
			PM	1.09	**F***	1.09	**F***	0	N
Harbor Blvd	Orangethorpe Ave	Orangefair Ave	AM	0.74	C	0.74	C	0	N
			PM	0.87	D	0.87	D	0	N
Lemon St	Berkeley Ave	Chapman Ave	AM	0.52	A	0.52	A	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
			PM	0.58	A	0.58	A	0	N
Lemon St	Chapman Ave	Commonwealth Ave	AM	0.58	A	0.58	A	0	N
			PM	0.64	B	0.64	B	0	N
Lemon St	Commonwealth Ave	Orangethorpe Ave	AM	1.03	**F***	1.03	**F***	0	N
			PM	1.14	**F***	1.14	**F***	0	N
Lemon St	Orangethorpe Ave	Orangefair Ave	AM	0.97	**E***	0.97	**E***	0	N
			PM	1.2	**F***	1.2	**F***	0	N
Raymond Ave	Chapman Ave	Commonwealth Ave	AM	0.24	A	0.24	A	0	N
			PM	0.22	A	0.22	A	0	N
Raymond Ave	Commonwealth Ave	Orangethorpe Ave	AM	0.2	A	0.2	A	0	N
			PM	0.23	A	0.23	A	0	N
Raymond Ave	Orangethorpe Ave	E Burton St	AM	0.63	B	0.63	B	0	N
			PM	0.7	B	0.7	B	0	N
State College Blvd	Dorothy Ln	Chapman Ave	AM	0.41	A	0.41	A	0	N
			PM	0.38	A	0.38	A	0	N
State College Blvd	Chapman Ave	Commonwealth Ave	AM	0.54	A	0.54	A	0	N
			PM	0.57	A	0.57	A	0	N
State College Blvd	Commonwealth Ave	Orangethorpe Ave	AM	0.53	A	0.53	A	0	N
			PM	0.57	A	0.57	A	0	N
State College Blvd	Orangethorpe Ave	Via Burton St	AM	0.63	B	0.63	B	0	N
			PM	0.75	C	0.75	C	0	N
Malvern Ave	Bastanchury Rd	Basque Ave	AM	0.54	A	0.54	A	0	N
			PM	0.65	B	0.65	B	0	N
Chapman Ave	Richman Ave	Highland Ave	AM	0.56	A	0.56	A	0	N
			PM	0.62	B	0.62	B	0	N
Chapman Ave	Harbor Blvd	Raymond Ave	AM	0.78	C	0.78	C	0	N
			PM	0.79	C	0.79	C	0	N
Chapman Ave	Raymond Ave	Acacia Ave	AM	0.88	D	0.88	D	0	N
			PM	0.97	**E***	0.97	**E***	0	N
Chapman Ave	Acacia Ave	State College Blvd	AM	1.02	**F***	1.02	**F***	0	N
			PM	1.21	**F***	1.21	**F***	0	N
Chapman Ave	State College Blvd	Commonwealth Ave	AM	0.95	**E***	0.95	**E***	0	N
			PM	1.11	**F***	1.11	**F***	0	N
	Brookhurst St	Euclid St	AM	0.46	A	0.46	A	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Commonwealth Ave			PM	0.49	A	0.49	A	0	N
Commonwealth Ave	Euclid St	Harbor Blvd	AM	0.53	A	0.53	A	0	N
			PM	0.42	A	0.42	A	0	N
Commonwealth Ave	Harbor Blvd	Raymond Ave	AM	0.63	B	0.63	B	0	N
			PM	0.61	B	0.61	B	0	N
Commonwealth Ave	Raymond Ave	Acacia Ave	AM	0.57	A	0.57	A	0	N
			PM	0.56	A	0.56	A	0	N
Commonwealth Ave	Acacia Ave	State College Blvd	AM	0.43	A	0.43	A	0	N
			PM	0.52	A	0.52	A	0	N
Commonwealth Ave	State College Blvd	Chapman Ave	AM	0.3	A	0.3	A	0	N
			PM	0.36	A	0.36	A	0	N
Valencia Dr	Highland Ave	Harbor Blvd	AM	0.44	A	0.44	A	0	N
			PM	0.39	A	0.39	A	0	N
Valencia Dr	Harbor Blvd	Lemon St	AM	0.35	A	0.35	A	0	N
			PM	0.39	A	0.39	A	0	N
Orangethorpe Ave	Euclid St	Highland Ave	AM	0.58	A	0.58	A	0	N
			PM	0.79	C	0.79	C	0	N
Orangethorpe Ave	Harbor Blvd	Raymond Ave	AM	0.48	A	0.48	A	0	N
			PM	0.57	A	0.57	A	0	N
Orangethorpe Ave	Raymond Ave	State College Blvd	AM	0.46	A	0.46	A	0	N
			PM	0.57	A	0.57	A	0	N
Orangethorpe Ave	State College Blvd	Placentia Ave	AM	0.43	A	0.43	A	0	N
			PM	0.47	A	0.47	A	0	N
SR 57 SB Frontage Rd	Nutwood Ave	Chapman Ave	AM	0.42	A	0.42	A	0	N
			PM	0.66	B	0.66	B	0	N
SR 57 NB Frontage Rd	Nutwood Ave	Chapman Ave	AM	0.83	D	0.83	D	0	N
			PM	0.75	C	0.75	C	0	N
Chapman Ave	Commonwealth Ave	SR 57	AM	0.97	**E***	0.97	**E***	0	N
			PM	1.09	**F***	1.09	**F***	0	N
Placentia Ave	Chapman Ave	Orangethorpe Ave	AM	0.68	B	0.68	B	0	N
			PM	0.72	C	0.72	C	0	N
Valencia Dr	Euclid St	Highland Ave	AM	0.57	A	0.57	A	0	N
			PM	0.54	A	0.54	A	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Orangethorpe Ave	Placentia Ave	SR 57	AM	0.33	A	0.33	A	0	N
			PM	0.36	A	0.36	A	0	N
Imperial Hwy (SR 90)	Harbor Blvd	Puente St	AM	0.87	D	0.87	D	0	N
			PM	0.9	D	0.9	D	0	N
Brea Blvd	Rolling Hills Dr	Bastanchury Rd	AM	1	**E***	1	**E***	0	N
			PM	1.03	**F***	1.03	**F***	0	N
Bastanchury Rd	Euclid St	Harbor Blvd	AM	1.26	**F***	1.26	**F***	0	N
			PM	1.28	**F***	1.28	**F***	0	N
Bastanchury Rd	Harbor Blvd	Brea Blvd	AM	1.32	**F***	1.32	**F***	0	N
			PM	1.33	**F***	1.33	**F***	0	N
Yorba Linda Blvd	State College Blvd	Associated Rd/Campus Dr	AM	0.42	A	0.42	A	0	N
			PM	0.46	A	0.46	A	0	N
Yorba Linda Blvd	Associated Rd/Campus Dr	SR 57	AM	0.43	A	0.43	A	0	N
			PM	0.48	A	0.48	A	0	N
Euclid St	Orangethorpe Ave	SR 91	AM	1.15	**F***	1.15	**F***	0	N
			PM	1.21	**F***	1.21	**F***	0	N
Brea Blvd	Harbor Blvd	Bastanchury Rd	AM	0.75	C	0.75	C	0	N
			PM	0.75	C	0.75	C	0	N
Santa Fe Ave	Highland Ave	Malden Ave	AM	0.06	A	0.06	A	0	N
			PM	0.09	A	0.09	A	0	N
Santa Fe Ave	Malden Ave	Harbor Blvd	AM	0.15	A	0.15	A	0	N
			PM	0.16	A	0.16	A	0	N
Santa Fe Ave	Harbor Blvd	Lemon St	AM	0.14	A	0.14	A	0	N
			PM	0.2	A	0.2	A	0	N

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
LOS = level of service; SR = State Route; V/C = volume to capacity ratio; Y/N = yes or no
The dashes (---) are defined as "not applicable."

Table 6-95 Signalized Intersections: Fullerton High-Speed Rail Station Option, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
F1	Euclid St & Malvern Ave	AM	42.3	D	42.3	D	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
		PM	51.6	D	51.6	D	0	
F2	Euclid St & Commonwealth Ave	AM	36.9	D	36.9	D	0	N
		PM	33.9	C	33.9	C	0	
F3	Highland Ave & Chapman Ave	AM	11.3	B	11.3	B	0	N
		PM	15.2	B	15.2	B	0	
F4	Highland Ave & Commonwealth Ave	AM	17.7	B	17.7	B	0	N
		PM	19	B	19	B	0	
F7	Highland Ave & Valencia Dr	AM	16.2	B	16.2	B	0	N
		PM	16.4	B	16.4	B	0	
F8	Highland Ave & Orangethorpe Ave	AM	17.7	B	17.7	B	0	N
		PM	21.1	C	21.1	C	0	
F10	Malden Ave & Commonwealth Ave	AM	14.5	B	14.5	B	0	N
		PM	18.7	B	18.7	B	0	
F11	Harbor Blvd & Imperial Hwy (SR 90)	AM	51.1	D	51.1	D	0	N
		PM	46.6	D	46.6	D	0	
F12	Harbor Blvd & Bastanchury Rd	AM	48.9	D	48.9	D	0	N
		PM	43.1	D	43.1	D	0	
F13	Harbor Blvd & Valley View Dr/Brea Blvd[1]	AM	30.6	C	30.6	C	0	N
		PM	31.5	C	31.5	C	0	
F14	Harbor Blvd & Berkeley Ave	AM	29.1	C	29.1	C	0	N
		PM	26.3	C	26.3	C	0	
F15	Harbor Blvd & Chapman Ave	AM	42.7	D	42.7	D	0	N
		PM	38.3	D	38.3	D	0	
F16	Harbor Blvd & Commonwealth Ave	AM	38.9	D	38.9	D	0	N
		PM	29.6	C	29.6	C	0	
F17	Harbor Blvd & Santa Fe Ave	AM	11.1	B	11.1	B	0	N
		PM	13.5	B	13.5	B	0	
F19	Harbor Blvd & Orangethorpe Ave	AM	34.6	C	34.6	C	0	N
		PM	40.9	D	40.9	D	0	
F20	Harbor Blvd & SR 91 WB ramps	AM	14.5	B	14.5	B	0	N
		PM	15.2	B	15.2	B	0	
F21	Harbor Blvd & SR 91 EB ramps	AM	19.5	B	19.5	B	0	N
		PM	23.1	C	23.1	C	0	
F22	Brea Blvd & Bastanchury Rd	AM	50.5	D	50.5	D	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
		PM	37.7	D	37.7	D	0	
F23	Lemon St & Chapman Ave	AM	32.7	C	32.7	C	0	N
		PM	37.2	D	37.2	D	0	
F24	Lemon St & Commonwealth Ave	AM	33.7	C	33.7	C	0	N
		PM	33	C	32.7	C	-0.3	
F26	Lemon St & Orangethorpe Ave	AM	35.5	D	35.5	D	0	N
		PM	48.9	D	48.9	D	0	
F27	Lemon St & SR 91 WB ramps	AM	23.7	C	23.7	C	0	N
		PM	26.9	C	26.9	C	0	
F28	Anaheim Blvd/Lemon St & SR 91 EB ramps	AM	29.4	C	29.4	C	0	N
		PM	29.5	C	29.5	C	0	
F29	Raymond Ave & Chapman Ave	AM	27.3	C	27.3	C	0	N
		PM	23.2	C	23.2	C	0	
F30	Raymond Ave & Commonwealth Ave	AM	22.5	C	22.5	C	0	N
		PM	20.2	C	20.2	C	0	
F31	Raymond Ave & Orangethorpe Ave	AM	30.8	C	30.8	C	0	N
		PM	31.8	C	31.8	C	0	
F32	State College Blvd & Chapman Ave	AM	31.6	C	31.6	C	0	N
		PM	37.9	D	37.9	D	0	
F33	State College Blvd & Commonwealth Ave	AM	34	C	34	C	0	N
		PM	28.4	C	28.4	C	0	
F34	State College Blvd & Orangethorpe Ave	AM	29.7	C	29.7	C	0	N
		PM	34.2	C	34.2	C	0	
F35	Commonwealth Ave & Chapman Ave	AM	17.7	B	17.7	B	0	N
		PM	23.9	C	23.9	C	0	
F36	SR 57 SB ramps & Chapman Ave	AM	19.2	B	19.2	B	0	N
		PM	21.1	C	21.1	C	0	
F37	SR 57 NB ramps & Chapman Ave[1]	AM	34.6	C	34.6	C	0	N
		PM	33.5	C	33.5	C	0	
F38	Placentia Ave & Chapman Ave	AM	37.3	D	37.3	D	0	N
		PM	38.5	D	38.5	D	0	
F39	Euclid St & Valencia Dr	AM	26.6	C	26.6	C	0	N
		PM	22.6	C	22.6	C	0	
F40	Highland Ave & Walnut Ave	AM	10.9	B	10.9	B	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
		PM	10.1	B	10.1	B	0	
F44	Harbor Blvd & Valencia Dr	AM	17.1	B	17.1	B	0	N
		PM	13.1	B	13.1	B	0	
F46	Lemon St & Valencia Dr	AM	68.8	**E***	84.9	**F***	16.1	Y
		PM	53.2	D	53.5	**F***	0.3	
F47	Placentia Ave & Orangethorpe Ave	AM	32.6	C	32.6	C	0	N
		PM	32.1	C	32.1	C	0	
F48	SR 57 SB ramps & Nutwood Ave[1]	AM	26.6	C	26.6	C	0	N
		PM	26.1	C	26.1	C	0	
F49	SR 57 SB ramps & Orangethorpe Ave[1]	AM	29.1	C	29.1	C	0	N
		PM	25.9	C	25.9	C	0	
F50	SR 57 NB ramps & Nutwood Ave[1]	AM	31.1	C	31.1	C	0	N
		PM	26.7	C	26.7	C	0	
F51	SR 57 NB ramps & Orangethorpe Ave	AM	29.7	C	29.7	C	0	N
		PM	30.2	C	30.2	C	0	
F52	Brea Blvd & Imperial Hwy (SR 90)	AM	49.8	D	49.8	D	0	N
		PM	44.8	D	44.8	D	0	
F53	State College Blvd & Yorba Linda Blvd[1]	AM	39.7	D	39.7	D	0	N
		PM	32	C	32	C	0	
F54	SR 57 SB off-ramp & Yorba Linda Blvd	AM	20.3	C	20.3	C	0	N
		PM	24.5	C	24.5	C	0	
F55	SR 57 NB off-ramp & Yorba Linda Blvd[1]	AM	29.4	C	29.4	C	0	N
		PM	33.3	C	33.3	C	0	
F56	Raymond Ave/East St & SR 91 EB ramps[1]	AM	26.2	C	26.2	C	0	N
		PM	17.7	B	17.7	B	0	
F57	Raymond Ave & SR 91 WB ramps[1]	AM	21.5	C	21.5	C	0	N
		PM	12.3	B	12.3	B	0	
F58	Euclid St & SR 91 WB ramps	AM	>180	**F***	>180	**F***	0	N
		PM	22.6	C	22.6	C	0	
F59	Euclid St & SR 91 EB ramps[1]	AM	14.5	B	14.5	B	0	N
		PM	20.7	C	20.7	C	0	
F60	State College Blvd & SR 91 EB ramps[1]	AM	21.1	C	21.1	C	0	N
		PM	21.9	C	21.9	C	0	
F61		AM	19.4	B	19.4	B	0	N

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
	State College Blvd & SR 91 WB ramps[1]	PM	21.7	C	21.7	C	0	
F161	Euclid St & Orangethorpe Ave	AM	42.2	D	42.2	D	0	N
		PM	39.3	D	39.3	D	0	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Unsignalized intersection signalized in Plus Project scenario.
F intersection number prefix indicates intersections within the Fullerton HSR Station Option area.
EB = eastbound; HSR = high-speed rail; LOS = level of service; NB = northbound; sec = second; SB = southbound; SR = State Route; WB = westbound; Y/N = yes or no

Table 6-96 Unsignalized Intersections: Fullerton High-Speed Rail Station Option, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
F5	Highland Ave & Santa Fe Ave[1]	AM	15.5	C	15.5	C	0	N
		PM	17.4	C	17.4	C	0	
F6	Highland Ave & Truslow Ave[1]	AM	15.7	C	15.7	C	0	N
		PM	16.8	C	16.8	C	0	
F9	Malden Ave & Chapman Ave[1]	AM	40.6	**E***	40.6	**E***	0	N
		PM	111.1	**F***	111.1	**F***	0	
F18	Harbor Blvd & Truslow Ave[1]	AM	18.7	C	18.7	C	0	N
		PM	15.7	C	15.7	C	0	
F25	Lemon St & Santa Fe Ave[1]	AM	79	**F***	4.6	A	-74.4	N
		PM	>180	**F***	7.6	A	-173.4	
F41	Malden Ave & Santa Fe Ave[2]	AM	8.6	A	8.6	A	0	N
		PM	8.8	A	8.8	A	0	
F42	Malden Ave & Truslow Ave[1]	AM	8.8	A	8.8	A	0	N
		PM	8.9	A	8.9	A	0	
F43	Malden Ave & Valencia Dr[1]	AM	13.2	B	13.2	B	0	N
		PM	11.9	B	11.9	B	0	
F45	Lemon St & Walnut Ave[1]	AM	84.9	**F***	84.9	**F***	0	N
		PM	53.5	**F***	53.5	**F***	0	

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Two-way unsignalized intersection; the delay shown is for the worst minor approach delay.
[2] Four-way unsignalized intersection
LOS = level of service; sec = second; Y/N =yes or no

Existing Year 2015 Plus Project creates no effects that meet thresholds. Of the 60 roadway segments and 61 intersections compared, none of the study locations improved from LOS E or F in the Plus Project scenario. One intersection (F25, Lemon Street and Santa Fe Avenue) was

upgraded to a signalized intersection in the Plus Project condition, which resulted in an improvement in overall LOS.

ARTIC Station Area

Traffic entering and exiting the existing Parking Lot B at ARTIC was relocated to the existing parking lot at the main entrance.

The roadway segment LOS analysis for roadway segments in the ARTIC station area under the Existing (Year 2015) Plus Project condition is presented in Table 6-97. The intersection LOS analysis for intersections in the ARTIC station area under the Existing (Year 2015) Plus Project condition is presented in Table 6-98. Existing Plus Project intersection lane geometries are illustrated in Appendix B. Traffic volumes at the study intersections are illustrated in Appendix B. Of the 49 roadway segments analyzed, 3 are LOS E or F in the AM peak hour, and 4 are LOS E or F in the PM peak hour. Of the 57 intersections analyzed, 1 is LOS E or F in the AM peak hour, and none are LOS E or F in the PM peak hour.

Table 6-97 Major Roadway Segment Level of Service: ARTIC, Existing (Year 2015) Plus Project

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Lewis St	Ball Rd	Cerritos Ave	2,415	700	700	0.27	0.28	A	A
Lewis St	Cerritos Ave	Katella Ave	2,415	700	700	0.26	0.27	A	A
Lewis St	Katella Ave	Anaheim Way	2,300	200	300	0.17	0.24	A	A
State College Blvd	Ball Rd	Cerritos Ave	4,253	2,100	2,400	0.49	0.56	A	A
State College Blvd	Cerritos Ave	Howell Ave	4,883	2,000	2,300	0.41	0.47	A	A
State College Blvd	Howell Ave	Katella Ave	3,938	2,100	2,300	0.53	0.56	A	A
State College Blvd	Katella Ave	Gene Autry Way	3,938	2,700	2,500	0.67	0.62	B	B
State College Blvd	Gene Autry Way	Orangewood Ave	4,253	2,500	2,500	0.58	0.57	A	A
State College Blvd	Orangewood Ave	I-5	6,090	2,600	2,800	0.42	0.45	A	A
Sunkist St	Ball Rd	Cerritos Ave	2,415	1,100	1,200	0.45	0.48	A	A
Sunkist St	Cerritos Ave	Howell Ave	2,835	600	600	0.2	0.19	A	A
Douglass Rd	Cerritos Ave	Katella Ave	2,415	700	900	0.27	0.35	A	A
Main St	Taft Ave	Katella Ave	2,415	1,300	1,100	0.51	0.43	A	A
Main St	Katella Ave	Collins Ave	2,415	1,600	1,600	0.63	0.64	B	B
Main St	Collins Ave	Orangewood Ave	2,835	1,600	1,700	0.54	0.59	A	A
Main St	Orangewood Ave	Chapman Ave	2,415	1,900	2,000	0.76	0.83	C	D
Ball Rd	Harbor Blvd	Anaheim Blvd	3,938	2,600	3,000	0.65	0.75	B	C
Ball Rd	Anaheim Blvd	Lewis St	4,253	2,500	2,800	0.57	0.65	A	B
Ball Rd	Lewis St	State College Blvd	4,253	2,700	2,900	0.63	0.68	B	B
Ball Rd	State College Blvd	Sunkist St	2,415	2,500	2,900	1.01	1.18	**F***	**F***
Ball Rd	Sunkist St	SR 57	4,883	2,700	3,200	0.55	0.64	A	B
Ball Rd	SR 57	Main St	2,835	2,500	2,800	0.88	0.95	D	**E***
Cerritos Ave	Lewis St	State College Blvd	2,415	900	1,000	0.33	0.4	A	A
Cerritos Ave	State College Blvd	Sunkist St	2,300	600	800	0.24	0.32	A	A
Cerritos Ave	Sunkist St	Douglass Rd	2,835	600	700	0.19	0.23	A	A

Roadway	From	To	Capacity (veh/hr)	AM Peak (veh/hr)	PM Peak (veh/hr)	AM V/C	PM V/C	AM LOS	PM LOS
Katella Ave	Anaheim Blvd/Haster St	I-5	4,253	2,000	3,000	0.45	0.71	A	C
Katella Ave	I-5	Lewis St	4,883	2,000	2,700	0.4	0.54	A	A
Katella Ave	Lewis St	State College Blvd	4,253	1,600	2,300	0.37	0.52	A	A
Katella Ave	State College Blvd	Sportstown	5,329	1,900	2,100	0.35	0.39	A	A
Katella Ave	Sportstown	Howell Ave	4,883	2,100	2,400	0.43	0.48	A	A
Katella Ave	Howell Ave	SR 57	4,883	2,100	2,400	0.42	0.48	A	A
Gene Autry Way	I-5	State College Blvd	2,415	500	500	0.18	0.17	A	A
Orangewood Ave	Manchester Ave	State College Blvd	4,253	2,400	2,400	0.56	0.55	A	A
Orangewood Ave	State College Blvd	Rampart St	2,415	2,500	2,500	1	1.03	**E***	**F***
Orangewood Ave	Rampart St	SR 57	3,000	2,300	2,600	0.74	0.84	C	D
Orangewood Ave	SR 57	Eckhoff St	3,150	2,500	2,600	0.79	0.81	C	D
Orangewood Ave	Eckhoff St	Main St	2,835	1,300	1,400	0.43	0.47	A	A
Chapman Ave	I-5 SB on-ramp/NB off-ramp	SR 57	4,253	2,500	2,900	0.58	0.67	A	B
Chapman Ave	SR 57	Main St	4,883	2,200	2,700	0.43	0.54	A	A
Douglass Rd	Katella Ave	ARTIC entrance	2,300	300	400	0.1	0.14	A	A
Katella Ave	Douglass Rd	Main St	4,883	1,700	2,000	0.34	0.4	A	A
Katella Ave	SR 57	Douglass Rd	4,883	2,000	2,100	0.39	0.43	A	A
Chapman Ave	Lewis St	The City Dr	3,938	2,500	3,200	0.63	0.79	B	C
Chapman Ave	The City Dr	I-5 SB on-ramp/NB off-ramp	3,938	2,900	3,600	0.72	0.89	C	D
Disneyland Dr	Ball Rd	I-5 SB off-ramp	3,375	1,400	1,600	0.39	0.45	A	A
State College Blvd	Manchester Ave	Chapman Ave	4,253	2,900	3,300	0.67	0.76	B	C
Manchester Ave	Orangewood Ave	Chapman Ave	2,520	1,400	600	0.52	0.24	A	A
Lewis St	Orangewood Ave	Chapman Ave	800	1,200	1,300	1.4	1.59	**F***	**F***
Ball Rd	I-5 NB ramps	Disneyland Dr	4,650	3,300	3,800	0.69	0.8	B	C

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
ARTIC = Anaheim Regional Transportation Intermodal Center; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; SR = State Route; veh/hr = vehicle per hour; V/C = volume to capacity ratio; Y/N = yes or no

Table 6-98 Intersection Level of Service: ARTIC, Existing (Year 2015) Plus Project

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A1	Manchester Ave/I-5 SB ramps & Katella Ave	19	B	17.1	B
A2	Anaheim Way/I-5 NB ramps & Katella Ave [1]	20.6	C	26.9	C
A3	Lewis St & Katella Ave [1]	23.2	C	23.9	C
A4	I-5 HOV & Gene Autry Way [1]	22.3	C	23.4	C
A6	State College Blvd & Ball Rd	40.4	D	39.7	D
A7	State College Blvd & Winston Rd	6.8	A	8.9	A
A8	State College Blvd & Cerritos Ave	17.7	B	19.6	B
A9	State College Blvd & Howell Ave [1]	38.6	D	23.5	C
A10	State College Blvd & Katella Ave [1]	32	C	33.3	C
A12	State College Blvd & Gene Autry Way	10.5	B	8.3	A
A14	State College Blvd & Orangewood Ave	35.4	D	34.9	C
A15	Stadium Crossing & Katella Ave [1]	26.5	C	24	C
A16	Sunkist St & Ball Rd	36.1	D	41.5	D
A17	Sunkist St & Cerritos Ave	16.5	B	16.5	B
A18	Howell Ave & Katella Ave [1]	24.9	C	30.9	C
A19	Rampart St & Orangewood Ave [1]	15.4	B	12.9	B
A20	SR 57 SB ramps & Ball Rd [1]	28.5	C	29.1	C
A21	SR 57 SB ramps & Katella Ave [1]	21.2	C	24.1	C
A22	SR 57 SB ramps & Orangewood Ave [1]	34.5	C	30.6	C
A23	SR 57 SB ramps & Chapman Ave	22.1	C	33	C
A24	SR 57 NB ramps & Ball Rd	26.4	C	29.9	C
A25	SR 57 NB ramps & Katella Ave [1]	24.4	C	20.2	C
A26	SR 57 NB ramps & Orangewood Ave [1]	19.1	B	13.2	B
A27	SR 57 NB ramps & Chapman Ave [1]	12.3	B	12.3	B
A28	Douglass Rd & Katella Ave [1]	26.8	C	26.3	C
A29	Struck Ave & Katella Ave [1]	4.2	A	4.2	A
A30	Main St & Ball Rd/Taft Ave[1]	37	D	31.9	C
A31	Main St & Katella Ave	28.6	C	28.1	C
A32	Main St & Struck Ave	11	B	12.9	B
A33	Main St & Collins Ave	21.5	C	26.2	C
A34	Main St & Orangewood Ave/Walnut Ave	38.1	D	36.2	D
A41	Anaheim Blvd & Ball Rd	32	C	44	D
A48	East St & Ball Rd	24.4	C	25.5	C
A51	Lewis St & Ball Rd	19.3	B	24.1	C
A52	Lewis St & Cerritos Ave	19.7	B	18.5	B

No.	Intersection	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
A53	Lewis St & Orangewood Ave	55.4	**E***	12.6	B
A54	Lewis St & Chapman Ave	44.8	D	44.8	D
A55	Manchester Ave & Orangewood Ave	25.6	C	17.7	B
A56	The City Dr/State College Blvd & Chapman Ave	39.1	D	36.3	D
A57	Anaheim Way & Orangewood Ave	6.5	A	31	C
A58	Manchester Ave & Chapman Ave	42.5	D	27.9	C
A59	State College Blvd & I-5 SB off-ramp [1]	13.5	B	7.7	A
A60	I-5 SB on-ramp/NB off-ramp & Chapman Ave [1]	24.1	C	20.1	C
A61	State College Blvd & I-5 NB ramps [1]	14.7	B	32.3	C
A62	I-5 NB on-ramp/Rampart St & Chapman Ave	18.4	B	16.2	B
A63	Douglass Rd & ARTIC [1]	28.6	C	26.2	C
A64	Douglass Rd & Bus Entrance	17.5	B	10.7	B
A65	Douglass Rd & Parking Lot B [2]	0	A	0	A
A66	ARTIC Driveway & Katella Ave [2]	13.6	B	13.4	B
A69	Harbor Blvd & Ball Rd	48.6	D	52.3	D
A70	Harbor Blvd & I-5 NB ramps [1]	14.2	B	14.3	B
A71	Harbor Blvd & I-5 SB ramps	17.7	B	15.5	B
A72	Harbor Blvd & Katella Ave	26.8	C	32.4	C
A79	Anaheim Blvd & Cerritos Ave	18.7	B	29.8	C
A80	Disneyland Dr & I-5 SB off-ramp	19.2	B	16.8	B
A81	Disneyland Dr & Ball Rd [1]	39.9	D	43.8	D
A82	Main St & Chapman Ave	37.6	D	40.3	D

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
[1] Delay was based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
[2] 2-way unsignalized intersection; the delay presented is for the worst minor approach delay.
[3] 4-way unsignalized intersection
[4] Intersection closed in Plus Project scenario.
A intersection number prefix indicates intersections within ARTIC station area.
ARTIC = Anaheim Regional Transportation Intermodal Center; EB = eastbound; HOV = high-occupancy vehicle; I = Interstate; LOS = level of service; NB = northbound; SB = southbound; sec/veh = seconds per vehicle; SR = State Route; Y/N = yes or no

Table 6-99, Table 6-100, and Table 6-101 contain side-by-side comparisons of effects for roadway segments, signalized intersections, and unsignalized intersections, respectively. These tables present locations at which there was a change on geometry or volumes between the No Project and Plus Project scenarios for the Existing Year 2015 baseline, as well as the difference in V/C ratio (roadway segments) or control delay (intersections), and whether these conditions meet the thresholds discussed in Section 4.4.3.

Table 6-99 Major Roadway Segments: ARTIC, Existing Year 2015 Effects

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Lewis St	Ball Rd	Cerritos Ave	AM	0.27	A	0.27	A	0	N
			PM	0.28	A	0.28	A	0	N
Lewis St	Cerritos Ave	Katella Ave	AM	0.26	A	0.26	A	0	N
			PM	0.27	A	0.27	A	0	N
Lewis St	Katella Ave	Anaheim Way	AM	0.17	A	0.17	A	0	N
			PM	0.24	A	0.24	A	0	N
State College Blvd	Ball Rd	Cerritos Ave	AM	0.49	A	0.49	A	0	N
			PM	0.56	A	0.56	A	0	N
State College Blvd	Cerritos Ave	Howell Ave	AM	0.41	A	0.41	A	0	N
			PM	0.47	A	0.47	A	0	N
State College Blvd	Howell Ave	Katella Ave	AM	0.53	A	0.53	A	0	N
			PM	0.56	A	0.56	A	0	N
State College Blvd	Katella Ave	Gene Autry Way	AM	0.67	B	0.67	B	0	N
			PM	0.62	B	0.62	B	0	N
State College Blvd	Gene Autry Way	Orangewood Ave	AM	0.58	A	0.58	A	0	N
			PM	0.57	A	0.57	A	0	N
State College Blvd	Orangewood Ave	I-5	AM	0.42	A	0.42	A	0	N
			PM	0.45	A	0.45	A	0	N
Sunkist St	Ball Rd	Cerritos Ave	AM	0.45	A	0.45	A	0	N
			PM	0.48	A	0.48	A	0	N
Sunkist St	Cerritos Ave	Howell Ave	AM	0.2	A	0.2	A	0	N
			PM	0.19	A	0.19	A	0	N
Douglass Rd	Cerritos Ave	Katella Ave	AM	0.27	A	0.27	A	0	N
			PM	0.35	A	0.35	A	0	N
Main St	Taft Ave	Katella Ave	AM	0.51	A	0.51	A	0	N
			PM	0.43	A	0.43	A	0	N
Main St	Katella Ave	Collins Ave	AM	0.63	B	0.63	B	0	N
			PM	0.64	B	0.64	B	0	N
Main St	Collins Ave	Orangewood Ave	AM	0.54	A	0.54	A	0	N
			PM	0.59	A	0.59	A	0	N
Main St	Orangewood Ave	Chapman Ave	AM	0.76	C	0.76	C	0	N
			PM	0.83	D	0.83	D	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Ball Rd	Harbor Blvd	Anaheim Blvd	AM	0.65	B	0.65	B	0	N
			PM	0.75	C	0.75	C	0	N
Ball Rd	Anaheim Blvd	Lewis St	AM	0.57	A	0.57	A	0	N
			PM	0.65	B	0.65	B	0	N
Ball Rd	Lewis St	State College Blvd	AM	0.63	B	0.63	B	0	N
			PM	0.68	B	0.68	B	0	N
Ball Rd	State College Blvd	Sunkist St	AM	1.01	**F***	1.01	**F***	0	N
			PM	1.18	**F***	1.18	**F***	0	N
Ball Rd	Sunkist St	SR 57	AM	0.55	A	0.55	A	0	N
			PM	0.64	B	0.64	B	0	N
Ball Rd	SR 57	Main St	AM	0.88	D	0.88	D	0	N
			PM	0.95	**E***	0.95	**E***	0	N
Cerritos Ave	Lewis St	State College Blvd	AM	0.33	A	0.33	A	0	N
			PM	0.4	A	0.4	A	0	N
Cerritos Ave	State College Blvd	Sunkist St	AM	0.24	A	0.24	A	0	N
			PM	0.32	A	0.32	A	0	N
Cerritos Ave	Sunkist St	Douglass Rd	AM	0.19	A	0.19	A	0	N
			PM	0.23	A	0.23	A	0	N
Katella Ave	Anaheim Blvd/Haster St	I-5	AM	0.45	A	0.45	A	0	N
			PM	0.71	C	0.71	C	0	N
Katella Ave	I-5	Lewis St	AM	0.4	A	0.4	A	0	N
			PM	0.54	A	0.54	A	0	N
Katella Ave	Lewis St	State College Blvd	AM	0.37	A	0.37	A	0	N
			PM	0.52	A	0.52	A	0	N
Katella Ave	State College Blvd	Sportstown	AM	0.43	A	0.35	A	-0.08	N
			PM	0.49	A	0.39	A	-0.1	N
Katella Ave	Sportstown	Howell Ave	AM	0.43	A	0.43	A	0	N
			PM	0.48	A	0.48	A	0	N
Katella Ave	Howell Ave	SR 57	AM	0.42	A	0.42	A	0	N
			PM	0.48	A	0.48	A	0	N
Gene Autry Way	I-5	State College Blvd	AM	0.18	A	0.18	A	0	N
			PM	0.17	A	0.17	A	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Orangewood Ave	Manchester Ave	State College Blvd	AM	0.56	A	0.56	A	0	N
			PM	0.55	A	0.55	A	0	N
Orangewood Ave	State College Blvd	Rampart St	AM	1	**E***	1	**E***	0	N
			PM	1.03	**F***	1.03	**F***	0	N
Orangewood Ave	Rampart St	SR 57	AM	0.74	C	0.74	C	0	N
			PM	0.84	D	0.84	D	0	N
Orangewood Ave	SR 57	Eckhoff St	AM	0.79	C	0.79	C	0	N
			PM	0.81	D	0.81	D	0	N
Orangewood Ave	Eckhoff St	Main St	AM	0.43	A	0.43	A	0	N
			PM	0.47	A	0.47	A	0	N
Chapman Ave	I-5 SB on-ramp/NB off-ramp	SR 57	AM	0.58	A	0.58	A	0	N
			PM	0.67	B	0.67	B	0	N
Chapman Ave	SR 57	Main St	AM	0.43	A	0.43	A	0	N
			PM	0.54	A	0.54	A	0	N
Douglass Rd	Katella Ave	ARTIC entrance	AM	0.1	A	0.1	A	0	N
			PM	0.12	A	0.14	A	0.02	N
Katella Ave	Douglass Rd	Main St	AM	0.34	A	0.34	A	0	N
			PM	0.4	A	0.4	A	0	N
Katella Ave	SR 57	Douglass Rd	AM	0.39	A	0.39	A	0	N
			PM	0.43	A	0.43	A	0	N
Chapman Ave	Lewis St	The City Dr	AM	0.63	B	0.63	B	0	N
			PM	0.79	C	0.79	C	0	N
Chapman Ave	The City Dr	I-5 SB on-ramp/NB off-ramp	AM	0.72	C	0.72	C	0	N
			PM	0.89	D	0.89	D	0	N
Disneyland Dr	Ball Rd	I-5 SB off-ramp	AM	0.39	A	0.39	A	0	N
			PM	0.45	A	0.45	A	0	N
State College Blvd	Manchester Ave	Chapman Ave	AM	0.67	B	0.67	B	0	N
			PM	0.76	C	0.76	C	0	N
Manchester Ave	Orangewood Ave	Chapman Ave	AM	0.52	A	0.52	A	0	N
			PM	0.24	A	0.24	A	0	N
Lewis St	Orangewood Ave	Chapman Ave	AM	1.4	**F***	1.4	**F***	0	N
			PM	1.59	**F***	1.59	**F***	0	N

Roadway	From	To	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Effects	
				V/C	LOS	V/C	LOS	V/C Increase	Y/N
Ball Rd	I-5 NB ramps	Disneyland Dr	AM	0.69	B	0.69	B	0	N
			PM	0.8	C	0.8	C	0	N

* **Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
ARTIC = Anaheim Regional Transportation Intermodal Center; LOS = level of service; V/C = volume to capacity ratio; Y/N = yes or no

Table 6-100 Signalized Intersections: ARTIC, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
A1	Manchester Ave/I-5 SB ramps & Katella Ave	AM	19	B	19	B	0	N
		PM	17.1	B	17.1	B	0	
A2	Anaheim Way/I-5 NB ramps & Katella Ave [1]	AM	23.2	C	20.6	C	-2.6	N
		PM	26.9	C	26.9	C	0	
A3	Lewis St & Katella Ave [1]	AM	22.3	C	23.2	C	0.9	N
		PM	23.9	C	23.9	C	0	
A4	I-5 HOV & Gene Autry Way [1]	AM	25.8	C	22.3	C	-3.5	N
		PM	23.4	C	23.4	C	0	
A6	State College Blvd & Ball Rd	AM	40.4	D	40.4	D	0	N
		PM	39.7	D	39.7	D	0	
A7	State College Blvd & Winston Rd	AM	6.8	A	6.8	A	0	N
		PM	8.9	A	8.9	A	0	
A8	State College Blvd & Cerritos Ave	AM	17.7	B	17.7	B	0	N
		PM	19.6	B	19.6	B	0	
A9	State College Blvd & Howell Ave [1]	AM	38.6	D	38.6	D	0	N
		PM	23.5	C	23.5	C	0	
A10	State College Blvd & Katella Ave [1]	AM	32	C	32	C	0	N
		PM	33.3	C	33.3	C	0	
A12	State College Blvd & Gene Autry Way	AM	10.5	B	10.5	B	0	N
		PM	8.3	A	8.3	A	0	
A14	State College Blvd & Orangewood Ave	AM	35.4	D	35.4	D	0	N
		PM	34.9	C	34.9	C	0	
A15	Stadium Crossing & Katella Ave [1]	AM	25.6	C	26.5	C	0.9	N
		PM	23.8	C	24	C	0.2	

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
A16	Sunkist St & Ball Rd	AM	36.1	D	36.1	D	0	N
		PM	41.5	D	41.5	D	0	
A17	Sunkist St & Cerritos Ave	AM	16.5	B	16.5	B	0	N
		PM	16.5	B	16.5	B	0	
A18	Howell Ave & Katella Ave [1]	AM	26.1	C	24.9	C	-1.2	N
		PM	30.5	C	30.9	C	0.4	
A19	Rampart St & Orangewood Ave [1]	AM	15.4	B	15.4	B	0	N
		PM	12.9	B	12.9	B	0	
A20	SR 57 SB ramps & Ball Rd [1]	AM	28.5	C	28.5	C	0	N
		PM	29.1	C	29.1	C	0	
A21	SR 57 SB ramps & Katella Ave [1]	AM	21.2	C	21.2	C	0	N
		PM	24.1	C	24.1	C	0	
A22	SR 57 SB ramps & Orangewood Ave [1]	AM	34.5	C	34.5	C	0	N
		PM	30.6	C	30.6	C	0	
A23	SR 57 SB ramps & Chapman Ave	AM	22.1	C	22.1	C	0	N
		PM	33	C	33	C	0	
A24	SR 57 NB ramps & Ball Rd	AM	26.4	C	26.4	C	0	N
		PM	29.9	C	29.9	C	0	
A25	SR 57 NB ramps & Katella Ave [1]	AM	24.4	C	24.4	C	0	N
		PM	20.2	C	20.2	C	0	
A26	SR 57 NB ramps & Orangewood Ave [1]	AM	19.1	B	19.1	B	0	N
		PM	13.2	B	13.2	B	0	
A27	SR 57 NB ramps & Chapman Ave [1]	AM	12.3	B	12.3	B	0	N
		PM	12.3	B	12.3	B	0	
A28	Douglass Rd & Katella Ave [1]	AM	26.8	C	26.8	C	0	N
		PM	26.3	C	26.3	C	0	
A29	Struck Ave & Katella Ave [1]	AM	4.2	A	4.2	A	0	N
		PM	4.2	A	4.2	A	0	
A30	Main St & Ball Rd/Taft Ave[1]	AM	37	D	37	D	0	N
		PM	31.9	C	31.9	C	0	
A31	Main St & Katella Ave	AM	28.6	C	28.6	C	0	N
		PM	28.1	C	28.1	C	0	
A32	Main St & Struck Ave	AM	11	B	11	B	0	N
		PM	12.9	B	12.9	B	0	

No.	Intersection	Peak Hour	Existing Year 2015 No Project		Existing Year 2015 Plus Project		Meets Thresholds?	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay Increase (sec)	Y/N
A33	Main St & Collins Ave	AM	21.5	C	21.5	C	0	N
		PM	26.2	C	26.2	C	0	
A34	Main St & Orangewood Ave/Walnut Ave	AM	38.1	D	38.1	D	0	N
		PM	36.2	D	36.2	D	0	
A41	Anaheim Blvd & Ball Rd	AM	32	C	32	C	0	N
		PM	44	D	44	D	0	
A48	East St & Ball Rd	AM	24.4	C	24.4	C	0	N
		PM	25.5	C	25.5	C	0	
A51	Lewis St & Ball Rd	AM	20.9	C	19.3	B	-1.6	N
		PM	24.7	C	24.1	C	-0.6	
A52	Lewis St & Cerritos Ave	AM	20.3	C	19.7	B	-0.6	N
		PM	19.5	B	18.5	B	-1	
A53	Lewis St & Orangewood Ave	AM	55.4	**E***	55.4	**E***	0	N
		PM	12.6	B	12.6	B	0	
A54	Lewis St & Chapman Ave	AM	44.8	D	44.8	D	0	N
		PM	44.8	D	44.8	D	0	
A55	Manchester Ave & Orangewood Ave	AM	25.6	C	25.6	C	0	N
		PM	17.7	B	17.7	B	0	
A56	The City Dr/State College Blvd & Chapman Ave	AM	39.1	D	39.1	D	0	N
		PM	36.3	D	36.3	D	0	
A57	Anaheim Way & Orangewood Ave	AM	6.5	A	6.5	A	0	N
		PM	31	C	31	C	0	
A58	Manchester Ave & Chapman Ave	AM	42.5	D	42.5	D	0	N
		PM	27.9	C	27.9	C	0	
A59	State College Blvd & I-5 SB off-ramp [1]	AM	13.5	B	13.5	B	0	N
		PM	7.7	A	7.7	A	0	
A60	I-5 SB on-ramp/NB off-ramp & Chapman Ave [1]	AM	24.1	C	24.1	C	0	N
		PM	20.1	C	20.1	C	0	
A61	State College Blvd & I-5 NB ramps [1]	AM	14.7	B	14.7	B	0	N
		PM	32.3	C	32.3	C	0	
A62	I-5 NB on-ramp/Rampart St & Chapman Ave	AM	18.4	B	18.4	B	0	N
		PM	16.2	B	16.2	B	0	

No.	Intersection	Peak Hour	Existing Year 2015 No Project Delay (sec)	Existing Year 2015 No Project LOS	Existing Year 2015 Plus Project Delay (sec)	Existing Year 2015 Plus Project LOS	Meets Thresholds? Delay Increase (sec)	Meets Thresholds? Y/N
A63	Douglass Rd & ARTIC [1]	AM	21.7	C	28.6	C	6.9	N
		PM	23.1	C	26.2	C	3.1	
A64	Douglass Rd & Bus Entrance	AM	11.4	B	17.5	B	6.1	N
		PM	10.3	B	10.7	B	0.4	
A69	Harbor Blvd & Ball Rd	AM	48.6	D	48.6	D	0	N
		PM	52.3	D	52.3	D	0	
A70	Harbor Blvd & I-5 NB ramps [1]	AM	14.2	B	14.2	B	0	N
		PM	14.3	B	14.3	B	0	
A71	Harbor Blvd & I-5 SB ramps	AM	17.7	B	17.7	B	0	N
		PM	15.5	B	15.5	B	0	
A72	Harbor Blvd & Katella Ave	AM	26.8	C	26.8	C	0	N
		PM	32.4	C	32.4	C	0	
A79	Anaheim Blvd & Cerritos Ave	AM	18.7	B	18.7	B	0	N
		PM	29.8	C	29.8	C	0	
A80	Disneyland Dr & I-5 SB off-ramp	AM	19.2	B	19.2	B	0	N
		PM	16.8	B	16.8	B	0	
A81	Disneyland Dr & Ball Rd [1]	AM	39.9	D	39.9	D	0	N
		PM	43.8	D	43.8	D	0	
A82	Main St & Chapman Ave	AM	37.6	D	37.6	D	0	N
		PM	40.3	D	40.3	D	0	

*** Boldface** type indicates that the roadway operates at an inadequate LOS (E or F).
A intersection number prefix indicates intersections within ARTIC station area.
[1] Delay is based on HCM 2000 signalized intersection analysis because of HCM 2010 analysis limitations.
ARTIC = Anaheim Regional Transportation Intermodal Center; HOV = high-occupancy vehicle; LOS = level of service; sec = second; Y/N = yes or no

Table 6-101 Unsignalized Intersections: ARTIC, Existing Year 2015 Effects

No.	Intersection	Peak Hour	Existing Year 2015 No Project Delay (sec)	Existing Year 2015 No Project LOS	Existing Year 2015 Plus Project Delay (sec)	Existing Year 2015 Plus Project LOS	Meets Thresholds? Delay Increase (sec)	Meets Thresholds? Y/N
A65	Douglass Rd & Parking Lot B[1]	AM	8.7	A	0	A	-8.7	N
		PM	8.9	A	0	A	-8.9	
A66	ARTIC Driveway & Katella Ave[1]	AM	13.6	B	13.6	B	0	N
		PM	13.4	B	13.4	B	0	

A intersection number prefix indicates intersections within ARTIC station area.
[1] Two-way unsignalized intersection; the delay presented is for the worst minor approach delay.
ARTIC = Anaheim Regional Transportation Intermodal Center; LOS = level of service; sec = second; Y/N = yes or no

Existing Year 2015 Plus Project creates effects that meet thresholds at one roadway segment at the following location

- Chapman Avenue, from The City Drive to I-5 southbound on-ramp/northbound off-ramp

Of the 49 roadway segments and 57 intersections compared, none of the study locations improved from LOS E or F in the Plus Project scenario.

6.7.1.2 Temporary Conditions (Existing Year 2015 Plus Construction)

Alignment Construction Effects

The project alignment contains numerous improvements to overcrossing and undercrossing structures on the LOSSAN Corridor, as well as new viaduct aerial structure segments. Many of these would require short or long-term roadway closures to build the proposed improvements. Traffic would be rerouted temporarily to parallel routes. The sequence of construction of these improvements would affect the amount of delay incurred for each closure operation, because overlapping detour routes would compound delays to parallel routes. In some cases, delays on parallel routes could affect adjacent intersections or roadways that are upstream of the construction, which could further compound delay to vehicles, transit, pedestrians, and bicycles. Construction of new and relocated storm drain, wet utilities, and dry utilities would also result in temporary construction-induced delays, some of which may exceed 30 minutes of delay per vehicle. Several impact avoidance and minimization features (IAMF) have been introduced as design features to avoid or minimize potential effects during construction and provide adequate emergency response. In particular, the development of a Construction Transportation Plan would help reduce these anticipated delays.

The following section describes the temporary closures that would be required to construct the project section, along with detour routes.

Downey Road/Grande Vista Avenue

Construction of a new lead track bridge overpass at Downey Road/Grande Vista Avenue would require temporary short-term lane closures and roadway closures during construction of bridge abutments, support segments, and decking. Depending on the duration for these closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Downey Road would likely turn left at Washington Boulevard, turn right at Soto Street, turn right at Olympic Boulevard, and turn left at Grande Vista Avenue to reach their final destination. Southbound Grade Vista Avenue would follow a similar detour path.

East 26th Street (Vernon)/Pennington Way

E 26th Street would be closed from east of UPRR San Pedro Subdivision to west of Atlantic Boulevard (STA 329+00) intermittently during construction, and permanently closed when relocation is complete.

Indiana Street

Indiana Street may experience occasional closures during reconstruction of E 26xth Street, until the permanent closure of E 26th Street.

Bonnie Beach Place

Bonnie Beach Place may experience occasional closures during reconstruction of E 26th Street, until the permanent closure of E 26th Street.

Ayers Avenue

Ayers Avenue may experience occasional closures during reconstruction of E 26th Street, until the permanent closure of E 26th Street.

Atlantic Boulevard

Construction of a new bridge and widening existing bridge on Mountain Side those at Atlantic Boulevard would require temporary short-term lane closures and roadway closures. Pier foundation, column, and pier cap construction may require short-term lane closures. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Atlantic Boulevard would likely turn right at Bandini Boulevard, turn left at Eastern Avenue, turn left at Washington Boulevard, and turn right at Atlantic Boulevard to reach their final destination. Southbound Atlantic Boulevard would follow a similar detour path.

Eastern Avenue

Construction of a new viaduct (Commerce flyover) and widening of the existing bridge overpass at Eastern Avenue would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Additionally, Eastern Avenue would experience intermittent lane closures or full closures to trench and relocate utilities into the right-of-way. Detoured vehicles for northbound Eastern Avenue would likely turn left at Bandini Boulevard, turn right at Atlantic Boulevard, turn right at Washington Boulevard, and turn left at Eastern Avenue to reach their final destination. Southbound Eastern Avenue would follow a similar detour path.

East 26th Street (Commerce)

Occasional closures would occur during modification of Commerce Yard.

Bandini Boulevard

During construction of the Commerce flyover and modifications to Commerce Yard, Bandini Boulevard would experience intermittent lane closures or full closures to trench and relocate utilities into the right-of-way. Detoured vehicles for eastbound Bandini Boulevard would likely turn right at Washington Boulevard, turn right at Telegraph Road, turn right at Garfield Avenue, and turn left at Bandini Boulevard to reach their final destination. Westbound Bandini Boulevard would follow a similar detour path.

Rio Hondo Access Road

Occasional temporary short-term closures during modifications of the existing railroad bridge over Rio Hondo channel.

Rio Hondo Bike Path

Occasional temporary short-term closures during modifications of the existing railroad bridge over Rio Hondo channel.

State Route 19 (Rosemead Boulevard)

Reprofiling the roadway and building a single-track bridge overpass at Rosemead Boulevard (SR 19) would require temporary long-term full closures during construction of support segments and decking. Temporary long-term local access detour to the surrounding property will be needed. Depending on the time of day and day of week for these long-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Rosemead Boulevard (SR 19) would likely turn left at Slauson Avenue, turn right at Paramount Boulevard, turn right at Washington Boulevard, and turn left at Rosemead Boulevard (SR 19) to reach their final destination. Southbound Rosemead Boulevard (SR 19) would follow a similar detour path.

Passons Boulevard

Widening of the existing bridge at Passons Boulevard would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Passons Boulevard would likely turn

left at Slauson Avenue, turn right at Rosemead Boulevard (SR 19), turn right at Washington Boulevard, and turn left at Passons Boulevard to reach their final destination. Southbound Passons Boulevard would follow a similar detour path.

San Gabriel River Bike Path

Occasional temporary short-term closures during modifications of the existing railroad bridge over San Gabriel River.

Pioneer Boulevard and Rivera Road

Construction of a new undercrossing at Pioneer Boulevard would require temporary long-term full closures. A temporary long-term local access detour to the surrounding property and the community west of I-605 will be needed. Depending on the duration for these closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Pioneer Boulevard would likely turn right at Los Nietos Road, turn left at Norwalk Boulevard, turn left at Slauson Avenue, and turn right at Pioneer Boulevard to reach their final destination. Southbound Pioneer Boulevard would follow a similar detour path.

Construction of a new Rivera Road overpass at Pioneer Boulevard would require temporary long-term full closures. A temporary long-term local access detour to the surrounding properties and the community west of I-605 will be needed. Depending on the duration for these closure operations, delays may exceed 30 minutes per vehicle.

Norwalk Boulevard and Los Nietos Road

Construction of a new undercrossing at Norwalk Boulevard would require temporary long-term lane closures or roadway closures during construction of support segments and decking. A temporary long-term detour for through traffic and local access to the surrounding properties will be needed. Pier foundation, column, and pier cap construction may require long-term lane closures. Depending on the duration for these long-term closure operations, delays may exceed 30 minutes per vehicle. Construction delays for the Norwalk Boulevard undercrossing may be compounded by construction of the Los Nietos Road undercrossing, because the two roadways would need to be lowered at the same time. Detoured vehicles for northbound Norwalk Boulevard would likely turn left at Telegraph Road, turn right at Pioneer Boulevard, turn right at Orr and Day Road/Pioneer Boulevard, turn right at Slauson Avenue, and turn left at Norwalk Boulevard to reach their final destination. Southbound Norwalk Boulevard would follow a similar detour path.

Construction of a new undercrossing at Los Nietos Road would require temporary long-term full closures during construction of support segments and decking. A temporary long-term detour for local access to the surrounding properties will be needed. Pier foundation, column, and pier cap construction may require long-term lane closures. Depending on the duration for these long-term closure operations, delays may exceed 30 minutes per vehicle. Construction delays for the Los Nietos Road undercrossing may be compounded by construction of the Norwalk Boulevard undercrossing, because the two roadways would need to be lowered at the same time. Detoured vehicles for eastbound Los Nietos Road would likely continue on Pioneer Boulevard, turn right on Slauson Avenue, turn right on Sorensen Avenue, turn left on Santa Fe Springs Road, and turn left at Los Nietos Road to reach their final destination. Westbound Los Nietos Road would follow a similar detour path.

Santa Fe Springs Road

Widening of the existing bridge overpass at Santa Fe Springs Road would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Santa Fe Springs Road would likely turn left at Telegraph Road, turn right at Norwalk Boulevard, turn right at Los Nietos Road, and turn left at Santa Fe Springs Road to reach their final destination. Southbound Santa Fe Springs Road would follow a similar detour path.

Telegraph Road

Widening of the existing bridge overpass at Telegraph Road would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for eastbound Telegraph Road would likely turn right at Bloomfield Avenue, turn left at Florence Avenue, turn left at Shoemaker Avenue, and turn right at Telegraph Road to reach their final destination. Westbound Telegraph Road would follow a similar detour path.

Florence Avenue

Construction of a bridge overpass at Florence Avenue would require temporary short-term lane closures or roadway closures. Pier foundation, column, and pier cap construction may require long-term lane closures. Detoured vehicles for eastbound Florence Avenue would likely turn left at Bloomfield Avenue, turn right at Telegraph Road, turn right at Shoemaker Avenue, and turn left at Florence Avenue to reach their final destination. Westbound Florence Avenue would follow a similar detour path.

Lakeland Road

Construction of the viaduct overpass at Lakeland Road would require temporary short-term lane closures or roadway closures. Pier foundation, column, and pier cap construction may require long-term lane closures. Detoured vehicles for eastbound Lakeland Road would likely turn left at Bloomfield Avenue, turn right at Florence Avenue, turn right at Shoemaker Avenue, and turn left at Lakeland Road to reach their final destination. Westbound Lakeland Road would follow a similar detour path.

Imperial Highway

Construction of the viaduct overpass at Imperial Highway would require temporary short-term lane closures or roadway closures. Pier foundation, column, and pier cap construction may require long-term lane closures. Detoured vehicles for eastbound Imperial Highway would likely turn right at Bloomfield Avenue, turn left at Rosecrans Avenue, turn left at Carmenita Avenue, and turn right at Imperial Highway to reach their final destination. Westbound Imperial Highway would follow a similar detour path.

Carmenita Road

Reprofiling roadway and widening existing bridge overpass at Carmenita Road would require temporary long-term full closures. Pier foundation, column, and pier cap construction may require long-term lane closures. Detoured vehicles for northbound Carmenita Road would likely turn right at Rosecrans Avenue, turn left at Valley View Avenue, turn left at Imperial Highway, and then turn right at Carmenita Road to reach their final destination. Southbound Carmenita Road would follow a similar detour path.

Valley View Avenue

Construction of a single-track bridge overpass at Valley View Avenue would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Valley View Avenue would likely turn right at Alondra Boulevard, turn left at La Mirada Boulevard, turn left at Rosecrans Avenue, and turn right at Valley View Avenue to reach their final destination. Southbound Valley View Avenue would follow a similar detour path.

Alondra Boulevard and Stage Road

Reconstruction of the overcrossing at Alondra Boulevard would require long-term lane closures or roadway closures during construction of support segments and decking. A temporary long-term detour for local access to the surrounding properties will be needed. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per

vehicle. Detoured vehicles for eastbound Alondra Boulevard would likely turn left at Valley View Avenue, turn right at Rosecrans Avenue, and turn right at La Mirada Boulevard to reach their final destination. Westbound Alondra Boulevard would follow a similar detour path.

Reconstruction of the retaining wall structure on the south side of Stage Road between Coyote Creek and Alondra Boulevard would require long-term lane closures or roadway closures during construction of the retaining wall and backfilling. A temporary long-term detour for local access to the surrounding properties will be needed. Depending on the duration for these closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for eastbound Stage Road would likely turn left at Valley View Avenue, turn right at La Mirada Boulevard, and turn left at Beach Boulevard (SR 39) to reach their final destination. Westbound Stage Road would follow a similar detour path.

State Route 39 (Beach Boulevard)

Widening of the existing bridge overpass at Beach Boulevard (SR 39) would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Beach Boulevard (SR 39) would likely turn right at Commonwealth Avenue, turn left at Gilbert Street, turn left at Malvern Avenue, and turn right at Beach Boulevard (SR 39) to reach their final destination. Southbound Beach Boulevard (SR 39) would follow a similar detour path.

Dale Street

Reprofiling roadway and widening existing bridge overpass at Dale Street would require temporary long-full closures during construction of support segments and decking. A temporary long-term detour for local access to the surrounding properties will be needed. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Dale Street would likely turn right at Commonwealth Avenue, turn left at Gilbert Street, turn left at Malvern Avenue, and turn right at Dale Street to reach their final destination. Southbound Dale Street would follow a similar detour path.

Gilbert Street and Artesia Avenue

Construction of a new bridge overpass at Gilbert Street would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Gilbert Street would likely turn left at Commonwealth Avenue, turn right at Dale Street, turn right at Malvern Avenue, and turn left at Gilbert Street to reach their final destination. Southbound Gilbert Street would follow a similar detour path.

Reprofiling roadway and reconstruction of the roadway on the south side and retaining wall structure on the north side of Artesia Avenue between Fullerton Airport and Gilbert Street would require long-term full closures during construction of the roadway, retaining wall, and backfilling. A temporary long-term detour for local access to the surrounding properties will be needed. Depending on the duration for these closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for eastbound Artesia Avenue would likely turn right at Dale Street, turn left at Commonwealth Avenue, and turn left at Gilbert Street to reach their final destination. Westbound Artesia Avenue would follow a similar detour path.

Commonwealth Avenue

Reprofiling the roadway and widening the existing bridge overpass at Commonwealth Avenue would require temporary long-term full roadway closures during construction of the structure. A temporary long-term detour for local access to the surrounding property will be needed. The skew angle at this particular structure would likely result in a more lengthy and complex construction period than typical undercrossing structures. Depending on the duration of closure operations, delays would likely exceed 30 minutes per vehicle. Detoured vehicles for eastbound

Commonwealth Avenue would likely turn left at Gilbert Street, turn right at Malvern Avenue, turn right at Euclid Street, and turn left at Commonwealth Avenue to reach their final destination. Westbound Commonwealth Avenue would follow a similar detour path.

Euclid Street

Demolishing the existing roadway bridge overpass and building a new bridge at Euclid Street would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Euclid Street would likely turn right at Orangethorpe Avenue, turn left at Harbor Boulevard, turn left at Commonwealth Avenue, and turn right at Euclid Street to reach their final destination. Southbound Euclid Street would follow a similar detour path.

Highland Avenue and Walnut Avenue

Demolishing the existing roadway bridge overpass and building a new bridge at Highland Avenue would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Depending on the time of day and day of week for these short-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Highland Avenue would likely turn left at Valencia Drive, turn right at Euclid Street, turn right at Commonwealth Avenue, and turn left at Highland Avenue to reach their final destination. Southbound Highland Avenue would follow a similar detour path.

Reconstruction of the roadway on the south side and retaining wall structure on the north side of Walnut Avenue between Richman Avenue and Highland Avenue would require long-term full closures during construction of the roadway, retaining wall, and backfilling. A temporary long-term detour for local access to the surrounding properties will be needed. Depending on the duration for these closure operations, delays may exceed 30 minutes per vehicle. Construction at Walnut Street was designed to allow most trucks to be able to access abutting businesses, but larger trucks (e.g., intermodal freight) may not be able to adequately access loading zones along this segment during construction. Detoured vehicles for eastbound Walnut Avenue would likely continue on Valencia Drive, turn right at Highland Avenue, and then turn either left or right on Walnut Avenue to reach their final destination. Westbound Walnut Avenue would follow a similar detour path.

Harbor Boulevard

Widening of the existing bridge to support platform and building a new bridge overpass at Harbor Boulevard would require temporary short-term lane closures or roadway closures during construction of support segments and decking. Pier foundation, column, and pier cap construction may require short-term lane closures. Depending on the duration for these closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound Harbor Boulevard would likely turn right at Orangethorpe Avenue, turn left at Lemon Street, turn left at Chapman Avenue, and turn right at Harbor Boulevard to reach their final destination. Southbound Harbor Boulevard would follow a similar detour path.

Lewis Street

Reprofiling the roadway, widening the existing undercrossing, and building a new storage tracks bridge overpass at Lewis Street would require temporary long-term lane closures or roadway closures during construction of support segments and decking. A temporary long-term detour for through traffic and local access to the surrounding properties will be needed and applied to all connected minor streets such as Cerritos Avenue. Pier foundation, column, and pier cap construction may require long-term lane closures. Depending on the duration for these long-term closure operations, delays may exceed 30 minutes per vehicle. Construction delays for the Lewis Street undercrossing may be compounded by construction of the Cerritos Avenue undercrossing, because the two roadways would need to be lowered at the same time. Detoured vehicles for northbound Lewis Street would likely turn left at Cerritos Avenue, turn right at Haster Street, and

turn right at Ball Road to reach their final destination. Southbound Lewis Street would follow a similar detour path.

Cerritos Avenue

Construction of a new undercrossing at Cerritos Avenue would require temporary long-term lane closures or roadway closures during construction of support segments and decking. A temporary long-term detour for through traffic and local access to the surrounding properties will be needed and applied to all connected minor streets such as Lewis Street and Vernon Street. Pier foundation, column, and pier cap construction may require long-term lane closures. Depending on the duration for these long-term closure operations, delays may exceed 30 minutes per vehicle. Construction delays for the Cerritos Avenue undercrossing may be compounded by construction of the Lewis Street undercrossing, because the two roadways would need to be lowered at the same time. Detoured vehicles for eastbound Cerritos Avenue would likely continue on Anaheim Boulevard, turn right on Ball Road, turn right on State College Boulevard, and turn left at Cerritos Avenue to reach their final destination. Westbound Cerritos Avenue would follow a similar detour path.

State College Boulevard

Construction of a new undercrossing at State College Boulevard would require temporary long-term lane closures or roadway closures during construction of support segments and decking. A temporary long-term detour for through traffic and local access to the surrounding properties would be needed and applied to connected minor streets such as Howell Avenue. Pier foundation, column, and pier cap construction may require long-term lane closures. Depending on the duration of these long-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for northbound State College Boulevard would likely continue on Katella Avenue, turn right on Lewis Street, turn right on Cerritos Avenue, and turn left at State College Boulevard to reach their final destination. Southbound State College Boulevard would follow a similar detour path.

Katella Avenue

Reprofiling the roadway and reconstructing the undercrossing at Katella Avenue would require temporary long-term lane closures or roadway closures during construction of support segments and decking. A temporary long-term detour for through traffic and local access to the surrounding properties will be needed and applied to all connected minor streets such as Stadium Crossing and Howell Avenue. Pier foundation, column, and pier cap construction may require long-term lane closures. Depending on the duration for these long-term closure operations, delays may exceed 30 minutes per vehicle. Detoured vehicles for eastbound Katella Avenue would likely turn right at State College Boulevard, turn left at Orangewood Avenue, turn left at Main Street, and turn right at Katella Avenue to reach their final destination. Westbound Katella Avenue would follow a similar detour path.

Douglass Road

Reprofiling the roadway and reconstructing the undercrossing at Douglass Road would require temporary long-term lane closures or roadway closures during construction of support segments and decking. A temporary long-term detour for local access to the surrounding properties will be needed and applied to all connected minor streets. Pier foundation, column, and pier cap construction may require long-term lane closures. Depending on the duration for these long-term closure operations, delays may exceed 30 minutes per vehicle. Access to Angel Stadium would be preserved, because multiple entrance and egress routes leading to stadium parking are available. Detoured vehicles for southbound Douglass Road would likely turn right at Katella Avenue and turn left at Stadium Crossing to reach Angel Stadium. Detoured vehicles exiting Angel Stadium continuing to Douglass Road would likely turn right at Stadium Crossing and turn left at Douglass Road to reach their final destination.

High-Speed Rail Station Area Construction Effects

LAUS

The HSR project would provide new passenger facilities, overhead contact system, and rail platforms at LAUS, while other and separate LAUS Master Plan improvements would provide improvements to the LAUS transit and pedestrian access scheme and the passenger concourse. The HSR improvements would be an addition to the Master Plan improvements.

The HSR station facilities at LAUS would be near the east end of the LAUS site, in the vicinity of Vignes Street. Construction of the HSR LAUS improvements would require daily trips during the construction period by hauling/delivery trucks and would also require a daily construction employee population that would travel to and from the site or the vicinity in personal vehicles.

Construction trucks and employee vehicles would use the most direct routes to and from the site. Trucks would not deviate from designated truck routes, accept to access the site directly from Vignes Street or other nearby construction laydown/storage sites as needed. The regional freeway system is accessible via the US 101 northbound off-ramp and on-ramp at Vignes Street, and the US 101 southbound off-ramp and on-ramp at Commercial Street (east of Alameda Street). Center Street and Ramirez Street provide a local roadway underpass connection between the south and north sides of US 101.

Alternate access to the regional freeway system is provided by the Broadway corridor to/from the north of the LAUS vicinity with interchanges to I-5 with direct on-ramps and off-ramps or via connections on Avenue 21 (for the southbound off-ramp). This route avoids the current at-grade railroad crossings on Main Street on both banks of the Los Angeles River.

Norwalk/Santa Fe Springs High-Speed Rail Station Option

Intersections within the station vicinity that are expected to experience temporary construction effects are Intersection 17, N18, N20, and N74, which would likely require long-term temporary lane closures. Roadway segments that are anticipated to be affected by station construction are Shoemaker Avenue and Imperial Highway. Construction traffic into and out of the main station facility are also likely to affect Norwalk Boulevard, Bloomfield Avenue, and Carmenita Road between I-5 (Intersection N15, N7, N27, N30, N63, N31, N32, N64, N65, N50, N51, N53, N54, N21, N25, N67, N145, N58, N61, and N62).

Fullerton High-Speed Rail Station Option

Intersections within the station vicinity that are expected to experience temporary construction effects are Intersection F40 and F17, which would likely require long-term temporary lane closures. Roadway segments that are anticipated to be affected by station construction are Walnut Avenue and Santa Fe Avenue. Construction of the HSR south platform at Walnut Street was designed to allow most trucks to be able to access abutting businesses, but larger trucks (e.g., intermodal freight) may not be able to adequately access loading zones along this segment during construction of the station platform. Construction traffic into and out of the main station facility and the west platforms are also likely to affect Truslow Avenue, Chapman Avenue, Harbor Boulevard, and Lemon Street between SR 91 and SR 57 (Intersection F42, F18, F45, F44. F46, F19, F26, F20, F27, F21, F28, F17, F25, F16, F24, F15, F23, F29, F32, F35, F36, and F37). Construction activities at Fullerton HSR Station Option may temporarily disrupt some Metrolink and Amtrak operations because of the proximity of the two facilities.

ARTIC

Intersections within the station vicinity that are expected to experience temporary construction effects are Intersection A63, A64, and A65. A roadway segment that is anticipated to be affected by station construction is Douglass Avenue. Construction traffic into and out of the main station facility and the Westside PUDO facility are also likely to affect Katella Avenue, and intersections between each site and SR 57 (Intersection A15, A18, A21, A25, and A28). Construction activities at ARTIC may temporarily disrupt operation of the Angel Stadium entrance and exit off Douglass Avenue.

Maintenance of Infrastructure Facility Construction Effects

Shared Passenger Track Alternative A: Light Maintenance Facility at 26th Street

Construction traffic into and out of the proposed LMF may affect Bandini Street, Sheila Street, and 26th Street in Vernon.

Shared Passenger Track Alternative B: Light Maintenance Facility at 15th Street

Construction traffic into and out of the proposed LMF may affect First Street, Fourth Street, and Sixth Street/Whittier Boulevard in Los Angeles.

Ancillary Facilities

Construction traffic into and out of the proposed traction power and other ancillary station facilities may affect Soto Street, Washington Boulevard, and Downey Road in Los Angeles, Telegraph Road in Commerce and Montebello, Los Nietos Road in Santa Fe Springs, Artesia Boulevard in Fullerton, and Cerritos Avenue and Lewis Street in Anaheim.

Other Alignment Construction Effects

Metrolink Stations

Commerce Metrolink Station (Existing)
No interruptions to Metrolink operations are anticipated, and no closures of at-grade crossings at the existing Metrolink Commerce Station are anticipated. Lane closures may be required on E 26th Street, as well as temporary disturbances to parking facilities. Construction traffic into and out of the existing Commerce Metrolink Station may affect Garfield Avenue, Telegraph Road, and Bandini Boulevard in Commerce between I-5 ramps (Intersection G100, G101, G110, G111, and G168).

Commerce Metrolink Station (Relocated)
No interruptions to Metrolink operations are anticipated. A new pedestrian crossing will be provided. Construction traffic into and out of the relocated Commerce Metrolink Station may affect Garfield Avenue, Telegraph Road, and Bandini Boulevard in Commerce between I-5 ramps (Intersection G100, G101, G110, G111, and G168).

Norwalk/Santa Fe Springs Metrolink Station (Existing)
The proposed alignment of the project section would not require interruption of rail operations at the existing Norwalk/Santa Fe Springs Metrolink Station. The existing site has not been evaluated for suitability for use as a construction staging or spoil storage site, or any other temporary use.

Buena Park Metrolink Station (Existing)
The proposed alignment of the project section would permanently remove all rail operations at the existing Buena Park Metrolink Station. The existing site has not been evaluated for suitability for use as a construction staging or spoil storage site, or any other temporary use.

Buena Park Metrolink Station (Relocated)
Intersections adjacent to the relocated Buena Park Metrolink Station that are expected to experience temporary construction effects are Intersection G147, G148, and G180, which are anticipated to require lane closures. A roadway segment that is anticipated to be affected by construction is Stage Road. Construction traffic into and out of the relocated Buena Park Metrolink Station may also affect Beach Boulevard (SR 39) in Buena Park between the I-5 ramps (Intersection G151, G152, and G178).

Haul Routes

Haul routes are paths designated for the movement of materials (such as earthwork to and from borrow and disposal sites, to provide fill or cut material) in and out of the construction areas. 74 roadway segments in total would serve as haul routes as a result of construction activities. Table 6-102 lists all conceptual haul routes organized by the crossing, roadway, total distance, and total number of trips estimated for earthwork activities.

Table 6-102 Designated Haul Routes for the Los Angeles to Anaheim Project Section

Crossing	Haul Routes	Total Distance (miles)	Total Earthwork Trips
Downey Rd	North on Downey Rd (0.13 mile) to Washington Blvd East on Washington Blvd (1.5 miles) to I-710	1.63	0
Atlantic Blvd/ East 26th St	South on Atlantic Blvd (0.14 mile) to I-710	0.26	60
Eastern Ave	South on Eastern Ave (0.31 mile) to Bandini Blvd West on Bandini Blvd (1.00 miles) to I-710	1.3	30
Greenwood Ave	South on Greenwood Ave (0.37 mile) to Telegraph Rd Northwest on Telegraph Rd (0.55 mile) to I-5	0.92	0
Rio Hondo	South on river maintenance road (0.47 mile) to Slauson Ave West on Slauson Ave (0.39 mile) to I-5	0.86	30
Paramount Blvd	North on Paramount Blvd (0.39 mile) to Slauson Ave East on Slauson Ave (0.50 mile) to Rosemead Blvd (SR 19)	0.89	0
Rosemead Blvd (SR 19)	North or South on Rosemead Blvd (SR 19)	0.0	990
Passons Blvd	(Assumed to be balanced)	0.0	0
Slauson Blvd	(Assumed to be balanced)	0.0	0
San Gabriel River	North on river maintenance road (0.75 mile) to Washington Blvd East on Washington Blvd (0.10 mile) to I-605	0.85	35
Pioneer Blvd	North on Pioneer Blvd (0.35 mile) to I-605	0.35	555
Norwalk Blvd	North on Norwalk Blvd (0.48 mile) to Slauson Ave West on Slauson Ave (0.72 mile) to Pioneer Blvd North on Pioneer Blvd (0.35 mile) to I-605	1.55	700
Los Nietos Rd	West on Los Nietos Rd (0.15 mile) to Norwalk Blvd North on Norwalk Blvd (0.52 mile) to Slauson Ave West on Slauson Ave (0.72 mile) to Pioneer Blvd North on Pioneer Blvd (0.35 mile) to I-605	1.74	700
Santa Fe Springs Rd	(Assumed to be balanced)	0.0	0
Telegraph Rd	(Assumed to be balanced)	0.0	0
Florence Ave	(Aerial viaduct structure)	0.0	0
Imperial Hwy	(Aerial viaduct structure)	0.0	0
Carmenita Rd	South on Carmenita Rd (0.35 mile) to Rosecrans Ave West on Rosecrans Ave (0.97 mile) to Bloomfield Ave Northwest on Bloomfield Ave (0.30 mile) to I-5	1.32	650
Coyote Creek, North Fork	(Assumed to be balanced)	0.0	0
Valley View Ave	South on Valley View Ave (0.67 mile) to Alondra Blvd West on Alondra Blvd (0.43 mile) to I-5	1.1	20
La Mirada Creek	(Assumed to be balanced)	0.0	0
Alondra Blvd	West on Alondra Blvd (1.35 miles) to I-5	1.35	900

Crossing	Haul Routes	Total Distance (miles)	Total Earthwork Trips
Artesia Ave	West on Alondra Blvd (1.35 miles) to I-5	1.35	335
Coyote Creek	(Assumed to be balanced)	0.0	0
Beach Blvd (SR 39)	(Assumed to be balanced)	0.0	0
Brea Creek	(Assumed to be balanced)	0.0	0
Dale St	South on Dale St (0.15 mile) to Artesia Blvd West on Artesia Blvd (0.70 mile) to Beach Blvd (SR 39)	0.85	300
Gilbert St	(Assumed to be balanced)	0.0	0
Commonwealth Ave	West on Commonwealth Ave (2.47 miles) to Beach Blvd (SR 39) North on Beach Blvd (SR 39) (0.27 mile) to Artesia Blvd West on Artesia Blvd (0.59 mile) to I-5	3.33	1,800
Highland Ave/ Walnut Ave	South on Highland Ave (0.17 mile) to Valencia Dr East on Valencia Dr (0.25 mile) to Harbor Blvd South on Harbor Blvd (0.83 mile) to SR 91	1.25	420
Euclid St	South on Euclid St (0.98 mile) to SR 91	0.98	30
Harbor Blvd	South of Harbor Blvd (1.00 mile) to SR 91	1.0	45
Lemon St	South of Lemon St (1.00 mile) to SR 91	1.0	35
Orangethorpe Ave	East on Orangethorpe Ave (0.25 mile) to Raymond Ave South On Raymond Ave (0.35 mile) to SR 91	0.6	4,340
La Palma Ave	East on La Palma Ave (1.95 miles) to SR 57	1.95	3,490
Broadway	West on Broadway (0.78 mile) to Harbor Blvd North on Harbor Blvd (0.15 mile) to Lincoln Ave West on Lincoln Ave (0.63 mile) to I-5	1.56	3,650
Vermont Ave	East on Vermont Ave (0.23 mile) to East St South on East St (0.54 mile) to Ball Rd West on Ball Rd (1.20 miles) to I-5	1.97	3,420
	East on Vermont Ave (0.23 mile) to East St South on East St (0.54 mile) to Ball Rd East on Ball Rd (1.15 miles) to SR 57	1.15	3,420
Ball Rd	West on Ball Rd (0.95 mile) to I-5	0.95	5,590
	East on Ball Rd (1.37 miles) to SR 57	1.37	5,590
Lewis St	North on Lewis St (0.36 mile) to Ball Rd East on Ball Rd (1.29 miles) to SR 57	1.65	1,220
Cerritos Ave	East on Cerritos Ave (0.40 mile) to State College Blvd North of State College Blvd (0.52 mile) to Ball Rd East on Ball Rd (0.76 mile) to SR 57	1.68	6,390
State College Blvd	South on State College Blvd (0.17 mile) to Katella Ave East on Katella Ave (0.57 mile) to SR 57	0.74	0
	North on State College Blvd (0.33 mile) to Cerritos Ave West on Cerritos Ave (0.97 mile) to Anaheim Blvd South on Anaheim Blvd (0.17 mile) to I-5	1.47	0

Crossing	Haul Routes	Total Distance (miles)	Total Earthwork Trips
Katella Ave	Northeast on Katella Ave (0.34 mile) to SR 57	0.34	1,165
Douglass Rd	North on Douglass Rd (0.29 mile) to Katella Ave West on Katella Ave (0.10 mile) to SR 57	0.31	895

I = Interstate; SR = State Route

Construction Staging Sites

Construction staging sites for the Shared Passenger Track Alternatives would potentially be between Station SBY 336+50 to SBY 445+00, SBN 513+00 to SBN 1313+80, and SOC 360+00 to SOC 1594+00. In addition to open areas within railroad right-of-way that would be used for staging, determined by BNSF, Metro, and OCTA agreement, staging areas could also be used for railroad construction phasing after coordinating track work and OCS. The Commerce relocated Metrolink station, Buena Park relocated Metrolink station, ARTIC station, and Hobart Storage/26th Street realignment would use the proposed station right-of-way. The West Bank Level I Yard would use the existing BNSF yard. The new grade separations would use existing street limits for staging, in addition to proposed right-of-way, if full closure of street during construction is allowed by local jurisdiction. However, these assumptions are conceptual, and the contractor may find other, and more efficient, options. Access to and from these construction staging sites would use the previously identified conceptual construction haul routes.

Transit Construction Effects

Bus routes and stops would likely require temporary closure or relocation during construction activities to continue to provide service.

Nonmotorized Transportation Construction Effects

Pedestrian and bicycle travel may be temporarily affected because of roadway or lane closures. Detoured vehicular traffic would likely result in longer delays at pedestrian and bicycle crossings because of the increase in vehicle demand at traffic signals and other traffic control devices.

Pedestrians and bicycles would follow the most reasonable detour at the Rio Hondo Channel because of the widening of the viaduct structure. This would result in delays to both pedestrians and bicyclists.

Emergency Access During Construction

Emergency access through and to the project site may be affected by construction of the Shared Passenger Track Alternatives. During long-term road closures, emergency vehicles would be detoured to adjacent project section crossings, which would likely result in increased response times. Emergency vehicles may encounter delays while accessing construction sites, particularly sites where roadway grade is being raised or lowered on roadways crossing the project section.

Several IAMFs have been introduced as design features to avoid or minimize potential effects during construction and provide adequate emergency response. In particular, the development of a Construction Transportation Plan would help reduce these anticipated delays.

6.7.2 Construction Adjacent to Freeways: Construction Effects on Circulation

6.7.2.1 Permanent Conditions (Existing Year 2015 Plus Project)

Because no proposed geometry modifications are at freeway mainline segments and freeway ramp intersections, and because the Shared Passenger Track Alternatives do not propose modifications to freeway facilities, no increase to freeway facilities are anticipated during the construction period related to operational trips.

6.7.2.2 *Temporary Conditions (Existing Year 2015 Plus Construction)*

Several potential detour routes would result in increased traffic through freeway ramp intersections, as described in Section 6.7.1.2, Temporary Conditions (Existing Year 2015 Plus Construction). The added traffic from these detour routes would result in temporary, increased delay at these freeway ramp locations. Several IAMFs have been introduced as design features to avoid or minimize potential effects during construction. In particular, the Authority's designated contractor will prepare a detailed Construction Transportation Plan (CTP) for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways in close consultation with the local jurisdiction or property owners having authority over a site. The CTP will address, in detail, the activities to be carried out in each construction phase, with the requirement of maintaining traffic flow during peak travel periods, including, but not limited to, the routing and scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The CTP will also provide Caltrans-approved traffic controls, including, but not limited to, temporary signage to alert drivers and pedestrians of construction zones, flag persons or other methods of traffic control, detour provisions for temporary road closures, and identified routes for construction traffic. Therefore, through preparation and implementation of the CTP, temporary impacts on freeway mainline segments and ramps would not occur.

6.7.3 Environmental Baseline #4: Phase 1 Full Operation Condition (Horizon Year 2040)

Table 6-103 and Table 6-104 summarize the number of trucks entering and exiting Hobart Yard and Commerce Yard using I-10 and SR 60 in the peak hour for Horizon Year 2040, respectively.

Table 6-103 Peak Hour Trips from/to Hobart Yard Using Interstate 10 and State Route 60: Horizon Year 2040 Plus Project

Fwy	Eastbound (number of trucks)		Westbound (number of trucks)	
	AM	PM	AM	PM
I-10	4	4	4	4
SR 60	4	4	4	4

I = Interstate; SR = State Route

Table 6-104 Peak Hour Trips from/to Commerce Yard Using Interstate 10 and State Route 60: Horizon Year 2040 Plus Project

Fwy	Eastbound (number of trucks)		Westbound (number of trucks)	
	AM	PM	AM	PM
I-10	3	3	3	3
SR 60	3	3	3	3

I = Interstate; SR = State Route

6.7.3.1 *Freeway Mainline Segments*

The freeway mainline segment Horizon Year 2040 Plus Project analysis results for AM and PM peak hours are presented in Table 6-105, Table 6-106, and Table 6-107.

Table 6-105 Freeway Mainline Segment Level of Service: Norwalk/Santa Fe Springs High-Speed Rail Station Option Area, Horizon Year 2040 Plus Project

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
I-105	West of I-605	Eastbound	1,102	0.551	C	1,143	0.572	C
		Westbound	1,273	0.637	C	1,166	0.583	C

fwy = freeway; I = Interstate; LOS = level of service; pce/ln = passenger car equivalents per lane; V/C = volume to capacity ratio

Table 6-106 Freeway Mainline Segment Level of Service: Fullerton High-Speed Rail Station Option Area, Horizon Year 2040 Plus Project

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
SR 91	East of State College Blvd	Eastbound	1,439	0.719	C	1,656	0.828	D
		Westbound	1,375	0.688	C	1,275	0.638	C
SR 57	North of Yorba Linda Blvd	Northbound	1,421	0.711	C	1,493	0.747	C
		Southbound	1,638	0.819	D	1,582	0.791	D

fwy = freeway; LOS = level of service; pce/ln = passenger car equivalents per lane; SR = State Route; V/C = volume to capacity ratio

Table 6-107 Freeway Mainline Segment Level of Service: ARTIC Station Area, Horizon Year 2040 Plus Project

Fwy	Segment	Direction	AM Peak Hour (pce/ln)			PM Peak Hour (pce/ln)		
			Volume	V/C	LOS	Volume	V/C	LOS
I-5	South of SR 22	Northbound	1,853	0.927	D	1,738	0.869	D
		Southbound	1,343	0.672	C	1,376	0.688	C

fwy = freeway; I = Interstate; LOS = level of service; pce/ln = passenger car equivalents per lane; SR = State Route; V/C = volume to capacity ratio

6.7.3.2 Freeway Ramps

Forecasted volumes entering and exiting interchange intersections were used to conduct an analysis of queued vehicles at off-ramps and on-ramps for Phase 1 Horizon Year 2040 with the proposed Shared Passenger Track Alternative A and Shared Passenger Track Alternative B. The calculated queue lengths for on-ramps with at least 100 project-related trips are presented in Table 6-108. The calculated queue lengths for off-ramps with at least 100 project-related trips are presented in Table 6-109.

Table 6-108 Freeway Service On-Ramp Queue Lengths: Horizon Year 2040 Plus Project

Fwy	Direction	Interchange	Available Queue Storage (ft)	AM Peak Volume (veh/hr)	AM Peak Queue Length (ft)	PM Peak Volume (veh/hr)	PM Peak Queue Length (ft)
SR 57	SB	WB Katella Ave	1,430	733	**1,490**	1,133	2,300
SR 91	EB	Lemon St	1,500	1,772	**3,600**	1,372	**2,780**
I-5	SB	State College Blvd	1,660	611	1,240	611	1,240

* **Boldface** type indicates that the queue length exceeds available storage at those ramp locations.
EB = eastbound; ft = feet; fwy = freeway; I = Interstate; SB = southbound; SR = State Route; veh/hr = vehicles per hour

Table 6-109 Freeway Service Off-Ramp Queue Lengths: Horizon Year 2040 Plus Project

Fwy	Direction	Interchange	Available Queue Storage (ft)	AM Peak Volume (veh/hr)	AM Peak Queue Length (ft)	PM Peak Volume (veh/hr)	PM Peak Queue Length (ft)
SR 57	NB	Katella Ave	2,500	2,090	921	2,100	1,102
SR 91	WB	Lemon St	1,720	1,240	948	1,280	1,058
I-5	NB	State College Blvd	2,200	1,170	536	1,800	992

ft = feet; fwy = freeway; I = Interstate; NB = northbound; SR = State Route; veh/hr = vehicles per hour; WB = westbound

Queue length exceeds available storage at these on-ramp locations:

- SR 57 southbound Katella westbound on-ramp
- SR 91 eastbound Lemon on-ramp

Queue length does not exceed available storage length for any of the studied off-ramps.

Table 6-110 provides a side-by-side comparison for queue length increases that would result from the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B for on-ramps. Table 6-111 provides a side-by-side comparison for queue length increases that would result from the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B for off-ramps.

Table 6-110 Freeway Service On-Ramp Queue Lengths: Horizon Year 2040 Effects

Fwy	Direction	Interchange	Peak Hour	Available Queue Storage (ft)	No Project Queue Length (ft)	Plus Project Queue Length (ft)	Queue Length Increase (ft)
SR 57	SB	WB Katella Ave	AM	1,430	810	**1,490**	680
			PM	1,430	1,620	**2,300**	680
SR 91	EB	Lemon St	AM	1,500	**3,250**	**3,600**	350
			PM	1,500	**2,440**	**2,780**	340
I-5	SB	State College Blvd	AM	1,660	810	1,240	430
			PM	1,660	810	1,240	430

* **Boldface** type indicates that the queue length exceeds available storage at those ramp locations.
EB = eastbound; ft = feet; fwy = freeway; I = Interstate; SB = southbound; SR = State Route

Table 6-111 Freeway Service Off-Ramp Queue Lengths: Horizon Year 2040 Effects

Fwy	Direction	Interchange	Peak Hour	Available Queue Storage (ft)	No Project Queue Length (ft)	Plus Project Queue Length (ft)	Queue Length Increase (ft)
SR 57	NB	Katella Ave	AM	2,500	574	921	347
			PM	2,500	719	1,102	383
SR 91	WB	Lemon St	AM	1,720	628	948	320
			PM	1,720	799	1,058	259

Fwy	Direction	Interchange	Peak Hour	Available Queue Storage (ft)	No Project Queue Length (ft)	Plus Project Queue Length (ft)	Queue Length Increase (ft)
I-5	NB	State College Blvd	AM	2,200	405	536	131
			PM	2,200	852	992	140

ft = feet; fwy = freeway; I = Interstate; NB = northbound; SR = State Route; WB = westbound

6.8 Effect on Statewide Model Annual Vehicle Miles Traveled

Annual roadway VMT was calculated based on the methodology described in Section 4.2.3, Vehicle Miles Traveled Calculations. The VMT reductions are presented in Table 6-112.

Table 6-112 Reduction in Statewide Annual Vehicle Miles Traveled: Plus Project

Alternative/Option	Annual Statewide VMT		
	No Project	Plus Project	VMT Change
Shared Passenger Track Alternatives A and B	97,525,790,530	95,658,503,838	-1,867,286,692
With inclusion of Norwalk/Santa Fe Springs HSR Station Option	97,525,790,530	97,086,923,954	-438,866,576
With inclusion of Fullerton HSR Station Option	97,525,790,530	97,050,734,457	-475,056,073

Source: Authority 2024a
HSR = high-speed rail; VMT = vehicle miles traveled

6.9 Effect on Freight and Passenger Rail Operations

6.9.1 Shared Passenger Track Alternative A

6.9.1.1 Project Construction Effects

Shared Passenger Track Alternative A would maintain some of the existing tracks within the corridor and would shift or realign the existing tracks in some locations. Construction of HSR station facilities and modifications to existing passenger rail stations would require building in certain areas currently used for freight and passenger rail service and may require the temporary closure of tracks.

Where tracks would be shifted or realigned, the work would be minor and consist of moving existing track and then reconnecting it to the rest of the mainline. For more extensive track realignments, the new tracks would be built first in the new and permanent location while the existing tracks would remain in place and operational. Once construction of the relocated track is completed, the new tracks would be connected to the existing tracks at the project limits and the original tracks would be removed. For all types of track construction activities, including reconnecting lines, temporary closures would be required. While specific work windows would be defined through coordination with freight and passenger rail agencies during subsequent phases of or following project design, pursuant to industry standard practices, the work would be scheduled to be completed during windows in which potential disruptions to existing freight and passenger rail service would be minimized. The closure windows could be as short as a few hours for minor work or would be scheduled to occur intermittently across 1 to 2 days for more extensive track work. During track closures, freight and passenger rail services could be temporarily rerouted onto one of the other open tracks within the corridor, if needed. It should also be noted that Caltrans' High Desert Operational Efficiency Project, which is expected to complete construction by July 2027 and is described in more detail in Section 6.2.5.1, High Desert Operational Efficiency Project, will provide staging capacity for freight during HSR project construction. The staging tracks will allow freight trains to be staged outside of the LOSSAN

Corridor, instead of having to stage them on tracks within the constrained project section, thus, minimizing delay for all passenger and freight operators in the project corridor during construction (Authority 2019, 2024b).

In some areas with heavy construction activities, such as for the new grade separations, shoofly tracks would be built, which would allow existing freight and passenger trains to bypass the construction areas entirely. On completion of the new mainline tracks, the temporary shoofly track would be removed. Shoofly tracks are only feasible in areas with unconstrained right-of-way with adequate space and are not feasible in constrained areas. Within the construction areas, speed restrictions may be imposed on freight and passenger rail operations until the work is complete. Scheduling of specific work windows for construction activities would also minimize the effect of the closures on businesses that rely on freight rail access.

Construction of the 26th Street LMF would occur off the mainline tracks and would not affect freight or passenger rail service. When the LMF tracks are completed, they would be connected to the mainline tracks, which would require a short, temporary closure as described above.

Construction occurring in the vicinity of the passenger rail stations would also require the same temporary track closures, rerouting, or speed restrictions described above, but would not require the temporary closure of any passenger rail stations. The following passenger rail stations would be affected:

- Modifications to the Norwalk/Santa Fe Springs Metrolink Station would bypass the existing station, because construction would occur within the reconfigured site (where the Metrolink platforms and parking would be shifted), while the existing tracks and station would remain open and operational. When construction of the modified Norwalk/Santa Fe Springs Metrolink Station is complete, a short-term closure would be required to connect the new tracks to the existing tracks, and the existing station would be decommissioned. The parking lot on the western side of the corridor would remain open, while portions of the parking lots along the eastern side of the corridor would be used for temporary construction easements and would ultimately be converted to new Metrolink parking areas. Some portions of the eastern parking lots could remain open during construction, but with decreased parking availability, there could be temporary increased vehicle congestion and queuing around the existing station.
- Modifications to the Fullerton Metrolink/Amtrak Station would require a portion of the southernmost platform to be closed to build the new Metrolink/Amtrak center platform. However, the existing tracks would remain in place and operational, and Metrolink would continue to serve the remaining eastern portion of the platform; during peak periods, there could be passenger congestion at the shortened platform. When construction of the new Metrolink/Amtrak center platform and new southernmost track is complete, short-term closure would be required to connect the new tracks to the existing tracks. The existing parking structure on the northern side of the corridor would be unaffected, but some of the parking along the southern side of the corridor would be removed during construction (approximately 27 spaces as well as a small amount of on-street parking spaces). The existing parking structure on the northern side of the corridor has 1,321 spaces and is expected to have sufficient capacity to accommodate passengers, and there are also multiple paid parking structures nearby in downtown Fullerton as well as free parking options. Therefore, temporary increased vehicle congestion and queuing around the existing station are not anticipated.
- Construction of the HSR platforms and station facilities at ARTIC would not affect existing passenger rail operations. Construction of the new platforms and tracks would occur south of the existing platforms and tracks, which would remain open and operational. When construction of the HSR platforms and tracks is complete, a short-term closure would be required to connect the new tracks to the existing tracks. Portions of the surface parking lots immediately south of the existing Metrolink tracks and to the west and east of SR 57 would be displaced as a result of construction activities associated with the new ARTIC HSR tracks and platform. However, a new parking structure adjacent to SR 57 and Katella Avenue would be constructed, providing 1,350 HSR parking spaces and 626 replacement parking spaces to

account for the displaced existing ARTIC parking spaces, for a total of 1,976 parking spaces. To minimize disruptions to the existing surface parking lots, construction would be staged such that the new parking structure would be completed and opened prior to the closure and removal of existing surface parking areas.

- Construction of the relocated Commerce and Buena Park Metrolink Stations would not affect existing passenger rail operations or parking at the existing stations. The existing stations would remain open and operational until the relocated stations are fully constructed and in operation. The new locations for the relocated Commerce and Buena Park Metrolink Stations would provide parking spaces at a 1:1 ratio compared to the stations' existing parking stalls (140 and 313 parking spaces, respectively). The station relocations would also not preclude cities from expanding parking in the future to accommodate future Metrolink ridership needs. When the relocated stations are complete, there would be short-term closures of the track to tie the new tracks to the existing tracks, and the existing Metrolink stations would then be decommissioned.

Overall, construction of HSR is anticipated to have minimal impacts on freight and passenger rail operations, because service could be maintained with limited disruptions. Several IAMFs have been introduced as design features to avoid or minimize potential effects during construction. In particular, the Authority will work closely with all agencies that provide freight and passenger rail services, bus services, or maintain operating rights within the corridor, so that service levels are not affected during construction. In addition, the contractor will also identify specific measures to maintain passenger rail access and provide safe and adequate access for passenger rail users during construction activities. The project contractor will repair any structural damage to railways that may occur during the construction period and return any damaged sections to their original structural condition. Nonetheless, because specific work windows for track construction activities have not yet been defined, the avoidance or minimization of potential disruptions to freight and passenger rail weekday services cannot be ensured at this time and an adverse effect could occur.

6.9.1.2 Project Operation Effects

During project operation, a fourth mainline track would be available from LAUS to Fullerton Junction, with two tracks to be used by BNSF and two tracks to be shared between BNSF and passenger operators. Under Shared Passenger Track Alternative A, there would be up to two HSR trains per hour in each direction. In 2023, the Authority conducted operational analysis to determine the theoretical capacity of the corridor, assuming two HSR trains per hour per direction and considering projected freight and passenger rail volumes based on the 2018 California State Rail Plan (Authority 2023). The analysis found that with these train volumes and the addition of the fourth mainline track, implementation of HSR would not put any constraints on the current passenger operator agreements within the corridor or preclude plans for growth. Additionally, the project would improve overall efficiency along the corridor, in part, by building five new grade separations and by modifying tracks at Commerce Yard and Fullerton Junction to separate freight and passenger trains. Furthermore, minor alterations to the proposed crossover layouts in Montebello and Fullerton to minimize freight and passenger train conflicts would provide sufficient freight train slots per day—equivalent to one train per hour per direction. Thus, Shared Passenger Track Alternative A would maintain current and projected freight and passenger train volume within the corridor.

Because of the amount and speed of both HSR and Metrolink operations and the need to maintain established service as scheduled, the one freight train per hour per direction would only be able to access the shared tracks during certain windows in peak hours in the morning and evening. Freight trains would be able to operate with fewer restrictions outside peak hours, especially during late night and early morning hours. The adopted FRA rules concerning the sharing of HSR with conventional freight and passenger services (FRA 2018) allow for the blending of HSR with heavier freight rail.

Although freight train windows on the shared tracks may be constrained compared to existing conditions, existing and forecasted 2040 freight levels can be accommodated in the areas where

HSR, Metrolink, and freight rail would share tracks, because adequate durations of track access would be available to complete track moves to serve freight customers, based on review of data on freight operations in the corridor. Additionally, the High Desert Operational Efficiency Project would provide staging capacity for freight trains during HSR operation. The High Desert Operational Efficiency staging tracks allow freight trains to be staged outside of the LOSSAN Corridor, instead of having to stage them on tracks within the constrained project section. Freight trains held on the High Desert Operational Efficiency tracks would be scheduled so they are in the correct operating window when they reach Fullerton Junction, minimizing delay for all passenger and freight operators in the corridor.

The container parking areas at Hobart Yard would be modified, but the displaced parking would be replaced and relocated adjacent to the new consolidated storage area. This modification would not affect BNSF's ability to load and unload containers. As the project would not limit BNSF's operations and, therefore, would not cause diversions to truck or other rail modes, there would not be secondary impacts related to air quality, GHG emissions, noise, and traffic congestion.

Several IAMFs have been introduced as design features to avoid or minimize potential effects during construction. In particular, the Authority will further define the roles and responsibilities within the shared corridor, including operational and maintenance responsibilities. Overall, HSR operations would not affect the ability of either other passenger rail operators or BNSF to maintain current or planned service levels.

Finally, additional demand for freight rail services within the project corridor beyond planned growth already anticipated by the Authority and other operators agencies would not occur as a consequence of Shared Passenger Track Alternative A (refer to Section 3.18 of the Draft EIR/EIS for further details).

6.9.2 Shared Passenger Track Alternative B

Impacts for Shared Passenger Track Alternative B would be the same as those described for Shared Passenger Track Alternative A during construction and operation, because the same modifications to freight and passenger railroad facilities would be required. The 15th Street LMF construction would occur off the mainline tracks, and would not affect freight or passenger rail service. When the LMF tracks are completed, they would be connected to the mainline tracks, which would require a short, temporary closure as described above for Shared Passenger Track Alternative A.

6.10 Cumulative Effects

This section presents potential cumulative impacts based on current knowledge of the project section. Subsequent to this technical report, the Authority will further refine the cumulative impacts described herein and present the information in Section 3.19 of the EIR/EIS.

Cumulative effects are those resulting from past, present, and reasonably foreseeable future actions, combined with the potential traffic effects of the Shared Passenger Track Alternative A and Shared Passenger Track Alternative B. On April 7, 2016, SCAG's Regional Council adopted the SCAG 2020 RTP/SCS, the second RTP/SCS developed under Senate Bill 375. This RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental and public health goals. A revised Traffic Demand Model and revised fiscally constrained project list were also completed as part of the SCAG 2020 RTP/SCS.

7 IMPACT AVOIDANCE AND MINIMIZATION FEATURES

7.1 Introduction

The Authority and FRA pledged to integrate programmatic IAMF consistent with the (1) 2005 Statewide Program EIR/EIS, (2) 2008 Bay Area to Central Valley Program EIR/EIS, and (3) 2012 Partially Revised Final Program EIR into the HSR project. The Authority will implement these features during project design and construction, as relevant to the Shared Passenger Track Alternatives, to avoid or reduce impacts.

IAMFs are incorporated into the project design and construction that would avoid or minimize the environmental or community impacts. The description of each measure details the means and effectiveness of the measure in avoiding or minimizing impacts, as well as the environmental benefits of implementing the measure. For example, an IAMF can require development of measures to reduce impacts on air quality and hydrology based on applicable design standards that would also reduce impacts on biological resources. Mitigation measures avoid or reduce significant impacts that exist after application of all IAMFs through project construction and operation. Specific mitigation measures are identified for each significant environmental impact.

Each IAMF is described in the EIR/EIS. The factual basis for their efficacy, feasibility, and implementation is provided. The IAMFs are included in the Mitigation Monitoring and Enforcement Plan to enhance implementation tracking, identify responsible party, and clarify implementation timing.

7.2 Impact Avoidance and Minimization Features for Transportation

The Shared Passenger Track Alternatives incorporate standardized HSR features to avoid and minimize impacts. These features are referred to as IAMFs. The Authority would implement IAMFs during project design and construction. A detailed description of IAMFs is provided in the following sections.

7.2.1 TR-IAMF#1: Protection of Public Roadways During Construction

Prior to construction, the Authority-designated contractor shall provide a photographic survey documenting the condition of the public roadways along truck routes providing access to the proposed project site. The photographic survey will be submitted for approval to the agency responsible for road maintenance and the Authority. The Authority-designated contractor will be responsible for the repair of any structural damage to public roadways caused by HSR construction or construction access, returning any damaged sections to the equivalent of their original pre-HSR construction structural condition or better. The Authority-designated contractor will survey the condition of the public roadways along truck routes providing access to the proposed project site after construction is complete. The Authority-designated contractor will complete a before- and after-survey report and submit it to the Authority for review, indicating the location and extent of any damage.

7.2.2 TR-IAMF#2: Construction Transportation Plan

The Authority-designated contractor shall prepare a detailed Construction Transportation Plan (CTP) for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways in close consultation with the local jurisdiction or property owners having authority over the site. The Authority must review and approve the CTP before the Authority-designated contractor commences any construction activities. This plan will address, in detail, the activities to be carried out in each construction phase, with the requirement of maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the routing and scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The CTP will provide traffic controls pursuant to the *California Manual on Uniform Traffic Control Devices* sections on temporary traffic controls (Caltrans 2017) and will include a traffic control plan that includes, at a minimum, the following elements:

- Temporary signage to alert drivers and pedestrians to the construction zone.
- Flag persons or other methods of traffic control.
- Traffic speed limitations in the construction zone.
- Temporary road closures and provisions for alternative access during the closure.
- Detour provisions for temporary road closures—alternating one-way traffic will be considered as an alternative to temporary closures where practicable and where it will result in better traffic flow than will a detour.
- Identified routes for construction traffic.
- Provisions for safe pedestrian and bicycle passage or convenient detour.
- Provisions to minimize access disruption to residents, businesses, customers, delivery vehicles, and buses to the extent practicable. Where road closures are required during construction, limit to the hours that are least disruptive to access for the adjacent land uses.
- Provisions for 24-hour access by emergency vehicles.
- Safe vehicular and pedestrian access to local businesses and residences during construction. The plan will provide for scheduled transit access where construction will otherwise impede such access. Where an existing bus stop is within the work zone, the Authority-designated contractor will provide a temporary bus stop at a safe and convenient location away from where construction is occurring in close coordination with the transit operator. Adequate measures will be taken to separate students and parents walking to and from the temporary bus stop from the construction zone.
- Advance notification to the local school district of construction activities and rigorously maintained traffic control at all school bus loading zones, to provide for the safety of schoolchildren. Review existing or planned Safe Routes to Schools with school districts and emergency responders to incorporate roadway modifications that maintain existing traffic patterns and fulfill response route and access needs during project construction and HSR operations.
- Identification and assessment of the potential safety risks of project construction to children, especially in areas where the project is near homes, schools, daycare centers, and parks.
- Promotion of child safety within and near the resource study area. For example, crossing guards could be provided in areas where construction activities are near schools, daycare centers, and parks.

CTPs will consider and account for the potential for overlapping construction projects.

7.2.3 TR-IAMF#3: Off-Street Parking for Construction-Related Vehicles

The Authority-designated contractor will identify adequate off-street parking for all construction-related vehicles throughout the construction period to minimize impacts on public on-street parking areas. If adequate parking cannot be provided on the construction sites, the Authority-designated contractor shall designate a remote parking area and arrange for the use a shuttle bus to transfer construction workers to/from the job site. This measure will be addressed in the CTP.

7.2.4 TR-IAMF#4: Maintenance of Pedestrian Access

The Authority-designated contractor will prepare specific construction management plans, as part of the CTP, to address maintenance of pedestrian access during the construction period, to the extent feasible, in accordance with design, safety, and ADA requirements. Construction actions that limit pedestrian access will include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian rerouting at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions that may affect the mobility or

safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, the Authority-designated contractor will provide covered walkways and fencing.

7.2.5 TR-IAMF#5: Maintenance of Bicycle Access

The Authority-designated contractor will prepare specific construction management plans to address maintenance of bicycle access during the construction period, to the extent feasible, in accordance with design, safety, and ADA requirements. Construction actions that limit bicycle access will include, but not be limited to, bike lane closures or narrowing, closure or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists during the construction period.

7.2.6 TR-IAMF#6: Restriction on Construction Hours

The Authority-designated contractor will limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays to minimize impacts on traffic on roadways. The Authority-designated contractor will limit the number of construction employees arriving or departing the site between the hours of 7 a.m. and 8:30 a.m. and 4:30 p.m. and 6 p.m. Areas where these restrictions will be implemented will be determined as part of the CTP. Based on Authority review of the CTP, the restricted hours may be altered to accommodate local travel patterns.

7.2.7 TR-IAMF#7: Construction Truck Routes

The Authority-designated contractor will deliver all construction-related equipment and materials on the designated truck routes identified in the CTP and will prohibit heavy-construction vehicles from using alternative routes to get to the site. Truck routes will be established away from schools, daycare centers, and residences, or along routes with the least impact if the Authority determines those areas are unavoidable. This measure will be addressed in the CTP.

7.2.8 TR-IAMF#8: Construction During Special Events

The Authority-designated contractor will provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that substantially (10 percent or more) increase traffic on roadways affected by project construction. Mechanisms include the presence of police officers directing traffic, special-event parking, use of within-the-curb parking, or shoulder lanes for through-traffic and traffic cones. This measure will be addressed in the CTP.

7.2.9 TR-IAMF#9: Protection of Freight and Passenger Rail During Construction

The Authority-designated contractor will repair any structural damage to freight or public railways that may occur during the construction period, and return any damaged sections to their original structural condition. If necessary, during construction, a “shoofly” track will be built to allow existing train lines to bypass any areas closed for construction activities. On completion, tracks will be opened and repaired, or new mainline track will be built, and the “shoofly” will be removed. Authority-designated contractor repair responsibility will be included in the contract.

7.2.10 TR-IAMF#11: Maintenance of Transit Access

The Authority-designated contractor will prepare specific construction management plans, as part of the CTP, to address maintenance of transit access during the construction period, to the extent feasible, in accordance with design, safety, and ADA requirements. Construction actions that limit transit access will include, but not be limited to, roadway lane closures or narrowing, closure or narrowing of streets that are designated transit routes, bus stop closures, bridge closures, placement of construction-related materials within designated transit lanes, bus stop or layover zones or along transit routes, and other actions that may affect the mobility or safety of bus transit during the construction period.

7.2.11 TR-IAMF#12: Pedestrian and Bicycle Safety

Prior to construction, the Authority-designated contractor will provide a technical memorandum describing how, during operation, pedestrian and bicycle accessibility will be provided and supported across the HSR corridor, to and from stations and on station property. Priority of safety for pedestrians and bicycles and vulnerable populations over motor vehicle access will be carried out in a manner to encourage maximum potential access from nonmotorized modes. Local access programs, such as Safe Routes to Schools, will be maintained or enhanced. Access to community facilities for vulnerable populations will be maintained or enhanced.

7.2.12 TR-IAMF#13: Stakeholder Coordination with Transportation Agencies

As design of the project section progresses, the Authority shall continue to coordinate with agencies that provide existing or planned rail services, bus services, or maintain passenger rail operating rights in the corridor, including BNSF, Southern California Regional Rail Authority (Metrolink), LOSSAN Rail Corridor Agency, Amtrak, OCTA, and Riverside County Transportation Commission. The purpose of this ongoing stakeholder coordination is to ensure that the design, construction, and operation of the project section does not negatively affect existing and planned rail service, including bus routes that service existing and planned rail stations. The Authority shall work with the agencies to define roles and responsibilities within the shared corridor, including operational and maintenance responsibilities.

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