California High-Speed Rail Authority

Burbank to Los Angeles Project Section

Transportation Technical Report

May 2020

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 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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ACRONYMS AND ABBREVIATIONS

AADT	average annual daily traffic
ADT	average daily traffic
Amtrak	National Railroad Passenger Corporation
Authority	California High-Speed Rail Authority
AVTA	Antelope Valley Transit Authority
AWSC	all-way stop control
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMF	Central Maintenance Facility (Metrolink)
CSMP	Corridor System Management Plan
EB	eastbound
EIR	environmental impact report
EIS	environmental impact statement
FRA	Federal Railroad Administration
FTIP	Federal Transportation Improvement Program
GHG	greenhouse gas
HMF	heavy maintenance facility
HOT	high-occupancy toll
HSR	high-speed rail
I-	Interstate
IOS	Initial Operating Section
KNR	kiss-and-ride
LADOT	City of Los Angeles Department of Transportation
LAUS	Los Angeles Union Station
LAX	Los Angeles International Airport
LMF	light maintenance facility
LOS	level(s)-of-service
LOSSAN	Los Angeles-San Diego-San Luis Obispo
Metro	Los Angeles County Metropolitan Transportation Authority
MOIF	maintenance of infrastructure facility
NB	northbound
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NOP	Notice of Preparation

OCTA	Orange County Transportation Authority
OPR	Office of Planning and Research
OWSC	one-way stop control
PAA	Preliminary Alternatives Analysis
PNR	park-and-ride
PUC	public utilities commission
RSA	resource study area
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SAA	Supplemental Alternatives Analysis
SB	southbound
SCAG	Southern California Association of Governments
SCS	Sustainable Communities Strategy
SR	State Route
STIP	State Transportation Improvement Program
TAZ	traffic analysis zone
TCR	Transportation Concept Report
TPSS	traction power substation
TWSC	two-way stop control
US-	U.S. Route
USC	University of Southern California
UPRR	Union Pacific Railroad
V/C	volume-to-capacity
WB	westbound

EXECUTIVE SUMMARY

The Burbank to Los Angeles Project Section of the California High-Speed Rail (HSR) System would extend approximately 14 miles, with the Burbank Airport Station on the north and Los Angeles Union Station on the south. This corridor runs through a narrow and constrained urban environment, with other existing rail operators in the area, including trains operated by the National Railroad Passenger Corporation (Amtrak), the Southern California Regional Rail Authority (Metrolink) and the Union Pacific Railroad.

The purpose of this document is to describe the existing and future baseline and plus project conditions for the environmental analysis of the project's potential transportation impacts for the Burbank to Los Angeles Project Section Environmental Impact Report/Environmental Impact Study (EIR/EIS). This technical report defines the resource study area (RSA) for transportation, the applied methodology and impact standards, and existing and estimated future operating conditions of the area transportation network for each of the included analysis scenarios.

Procedures for considering National Environmental Policy Act (NEPA) environmental effects 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, pedestrian access, and bicycle access. Based on the California Environmental Quality Act (CEQA) Guidelines, the project would have a transportation effect if conditions change involving both the operational phase of the project and its construction phase. Although local agency significance criteria should be considered and documented, these criteria do not specifically indicate a level of significance for this regional project. For the HSR system, pursuant to U.S. Code Title 23 Section 327, under the NEPA Assignment Memorandum of Understanding between FRA and the State of California, effective July 23, 2019, the Authority is the federal lead agency for environmental reviews and approvals for all Authority Phase 1 and Phase 2 California HSR System projects. In this role, the Authority is the project sponsor and the lead federal agency for complying with NEPA and other federal laws for the California HSR System, including the Burbank to Los Angeles Project Section..

The RSA for this report is the area in which all environmental investigations specific to transportation are conducted to determine the resource characteristics and potential effects of the Burbank to Los Angeles Project Section. The RSA is defined based on anticipated increased or decreased measures of effectiveness, such as control delay or traffic queuing/congestion.

This report analyzed the following transportation analysis scenarios:

- Existing Year (2015)—These are the conditions at the time when environmental analyses were initiated.
  - Of the 243 RSA intersections analyzed, 32 are currently operating at level-of-service (LOS) E or F. Of the 38 area roadway segments analyzed, five are operating at LOS E or F.
- Existing Year (2015) Plus Project Construction—This represents conditions with project construction superimposed on Existing Year conditions.
  - Of the 32 RSA intersections analyzed for potential construction impacts, 9 would operate at LOS E or F. Of the 16 area roadway segments analyzed, 5 would operate at LOS E or F.
- Opening Year (2029) No Project Conditions—This scenario adds to Existing Year Conditions the land use and transportation network changes that are expected by 2029. These changes are based on the adopted 2012 RTP/SCS.
  - Forty analyzed intersections would operate at LOS E or F. Eight of the roadway segments would operate at LOS E or F.

- Horizon Year (2040) No Project Conditions—This represents conditions with full build-out of the project superimposed on Opening Year No Project conditions. These changes are based on the adopted 2012 RTP/SCS.
  - Forty-nine analyzed intersections would operate at LOS E or F. Nine of the roadway segments would operate at LOS E or F.
- Opening Year (2029) Plus Project Conditions—This represents conditions with full build-out of the project superimposed on Opening Year No Project conditions.
  - Forty-four analyzed intersections would operate at LOS E or F. 10 of the roadway segments would operate at LOS E or F.
- Horizon Year (2040) Plus Project Conditions—This represents conditions with full build-out of the project superimposed on Horizon Year No Project conditions.
  - Fifty-three analyzed intersections would operate at LOS E or F. 10 of the roadway segments would operate at LOS E or F.

1 INTRODUCTION

1.1 California High-Speed Rail System Background

The California High-Speed Rail Authority (Authority) is responsible for planning, designing, building, and operating the first high-speed passenger rail service in the nation. The California High-Speed Rail (HSR) System will connect the mega-regions of the state, contribute to economic development and a cleaner environment, create jobs, and preserve agricultural and protected lands. When it is completed, it will run from San Francisco to the Los Angeles basin in under three hours at speeds capable of exceeding 200 miles per hour. The system will eventually extend to Sacramento and San Diego, totaling 800 miles with up to 24 stations, as shown on Figure 1-1.[1] In addition, the Authority is working with regional partners to implement a statewide rail modernization plan that will invest billions of dollars in local and regional rail lines to meet the state's 21st century transportation needs.

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.[2] Phase 2 would connect the Central Valley to Sacramento, and another extension is planned from Los Angeles to San Diego. The California HSR System would meet the requirements of Proposition 1A,[3] including the requirement for a maximum nonstop service travel time between San Francisco and Los Angeles of two hours and 40 minutes.

1.2 Background

The Burbank to Los Angeles Project Section would be a critical link in Phase 1 of the California HSR System connecting San Francisco and the Bay Area to Los Angeles and Anaheim. The Authority and the Federal Railroad Administration (FRA) selected the existing railroad right-of-way as the corridor for the preferred alternative between Sylmar and Los Angeles Union Station (LAUS) in the 2005 *Statewide Program Environmental Impact Report/Environmental Impact Statement* (EIR/EIS) (Authority and FRA 2005). Therefore, the Project EIR/EIS for the Burbank to Los Angeles Project Section focuses on alignment alternatives along the existing railroad corridor.

The Burbank to Los Angeles Project Section was formerly part of the Palmdale to Los Angeles Project Section. The 2010 Palmdale to Los Angeles Preliminary Alternative Analysis recommended alignment alternatives and station options for the Palmdale to Los Angeles Project Section based on the program-level corridor selected in 2005. The 2011 Palmdale to Los Angeles Supplemental Alternatives Analysis (SAA) focused specifically on the subsections from the community of Sylmar to LAUS, and reevaluated the alternatives and station options. In June 2014, the Authority published a Palmdale to Los Angeles SAA Report, which introduced the concept of splitting the Palmdale to Los Angeles Project Section into two sections. On July 24, 2014, the Authority released a Notice of Preparation, and the FRA published a Notice of Intent to prepare EIR/EIS documents for the Palmdale to Burbank and Burbank to Los Angeles Project Sections.

[1] The alignments on Figure 1-1 are based on Authority/FRA decisions made in the 2005, 2008, and 2012 Programmatic EIR/EIS documents.

[2] Phase 1 may be constructed in smaller operational segments, depending on available funds.

[3] www.catc.ca.gov/programs/hsptbp.htm.

Source: California High-Speed Rail Authority, 2017

Figure 1-1 California HSR System

1.3 Project Description Purpose

This project description describes the project for use during environmental impact analyses to complete technical reports to inform the Burbank to Los Angeles Project Section EIR/EIS. The basis of this project description is the HSR Build Alternative as defined in the *Burbank to Los Angeles Project Section Draft Preliminary Engineering for Project Definition* document. This project description describes the physical design elements of the project and does not define all operating plans and scenarios, construction plans, or capital and operating costs. This project description will serve as the basis for Chapter 2, Alternatives, of the project EIR/EIS. Chapter 2 of the EIR/EIS will include additional detail beyond the content of this report.

This report documents the detailed transportation analysis conducted for the Burbank to Los Angeles Project Section of the California HSR System. This report includes the following:

- A brief description of the project and the alternatives under study
- A discussion of the statutes and regulations pertinent to transportation
- A description of the existing conditions, including transportation in the study area
- A description of the analytical methodologies and assumptions used for this study
- The results of these analyses, including adverse or beneficial effects resulting from the project

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2 PROJECT DESCRIPTION

The Burbank to Los Angeles Project Section of the California HSR System is approximately 14 miles long, crossing the cities of Burbank, Glendale, and Los Angeles on an existing railroad corridor. HSR for this project section would be within a narrow and constrained urban environment, crossing major streets and highways and, in some portions, adjacent to the Los Angeles River. The Los Angeles County Metropolitan Transportation Authority (Metro) owns the railroad right-of-way, the Southern California Regional Rail Authority owns the track and operates the Metrolink commuter rail service, the National Railroad Passenger Corporation (Amtrak) provides intercity passenger service, and the Union Pacific Railroad (UPRR) holds track access rights and operates freight trains.

This section describes the No Project Alternative and the HSR Build Alternative to be evaluated in the Burbank to Los Angeles Project EIR/EIS.

2.1 No Project Alternative

Under the No Project Alternative, the California HSR System would not be built. The No Project Alternative represents the condition of the Burbank to Los Angeles Project Section as it existed in 2015, and as it would exist without the HSR System at the horizon year (2040).

The No Project Alternative assumes that all currently known programmed and funded improvements to the intercity transportation system (highway, transit, and rail) and reasonably foreseeable local land development projects (with funding sources identified) would be developed by 2040. The No Project Alternative is based on a review of the following: regional transportation plans for all modes of travel; the State Transportation Improvement Program; the Federal Transportation Improvement Program; Southern California Regional Rail Authority strategic plans, transportation plans and programs for Los Angeles County; airport master plans; and city and county general plans.

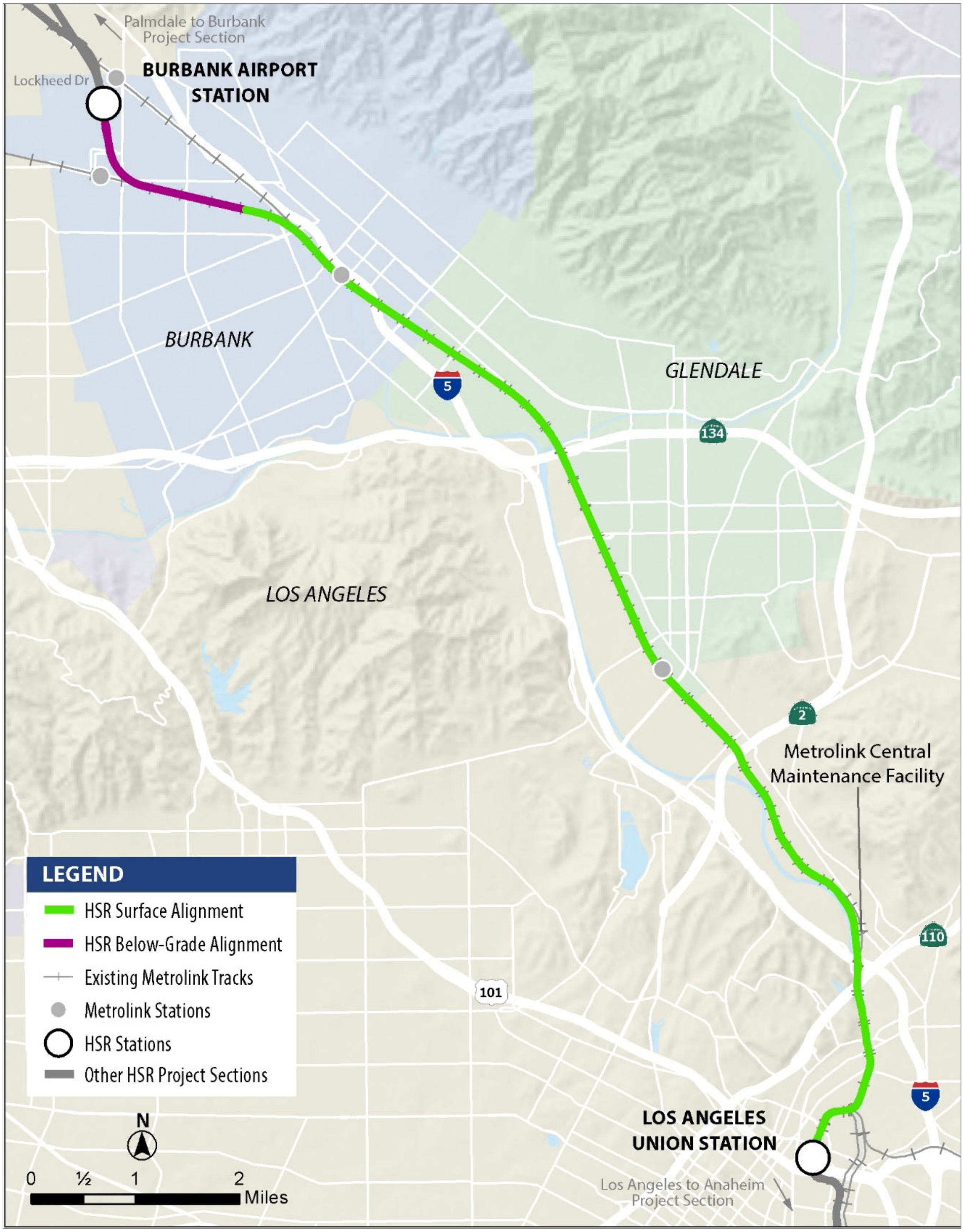
2.2 High-Speed Rail Build Alternative

The HSR Build Alternative includes new and upgraded track, maintenance facilities, grade separations, drainage improvements, communications towers, security fencing, passenger train stations, and other necessary facilities to introduce HSR service into the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Corridor from near Hollywood Burbank Airport to LAUS. In portions of the alignment, new and upgraded tracks would allow other passenger trains to share tracks with the HSR system. HSR stations would be located near Hollywood Burbank Airport and at LAUS. The alignment would be entirely grade-separated at crossings, meaning that roads, railroads, and other transport facilities would be located at different heights so the HSR system would not interrupt or interface with other modes of transport, including vehicle, bicycle, and pedestrian.

For most of the project section, the HSR alignment would be within the existing railroad right-of-way, which is typically 70 to 100 feet wide. The HSR alignment includes northbound and southbound electrified tracks for high-speed trains. The right-of-way would be fenced to prohibit pedestrian and public or unauthorized vehicle access.

The project footprint (the area required to build, operate, and maintain HSR service) is based on the following elements of design: station areas, hydrology, track, roadway, structures, systems, and utilities.

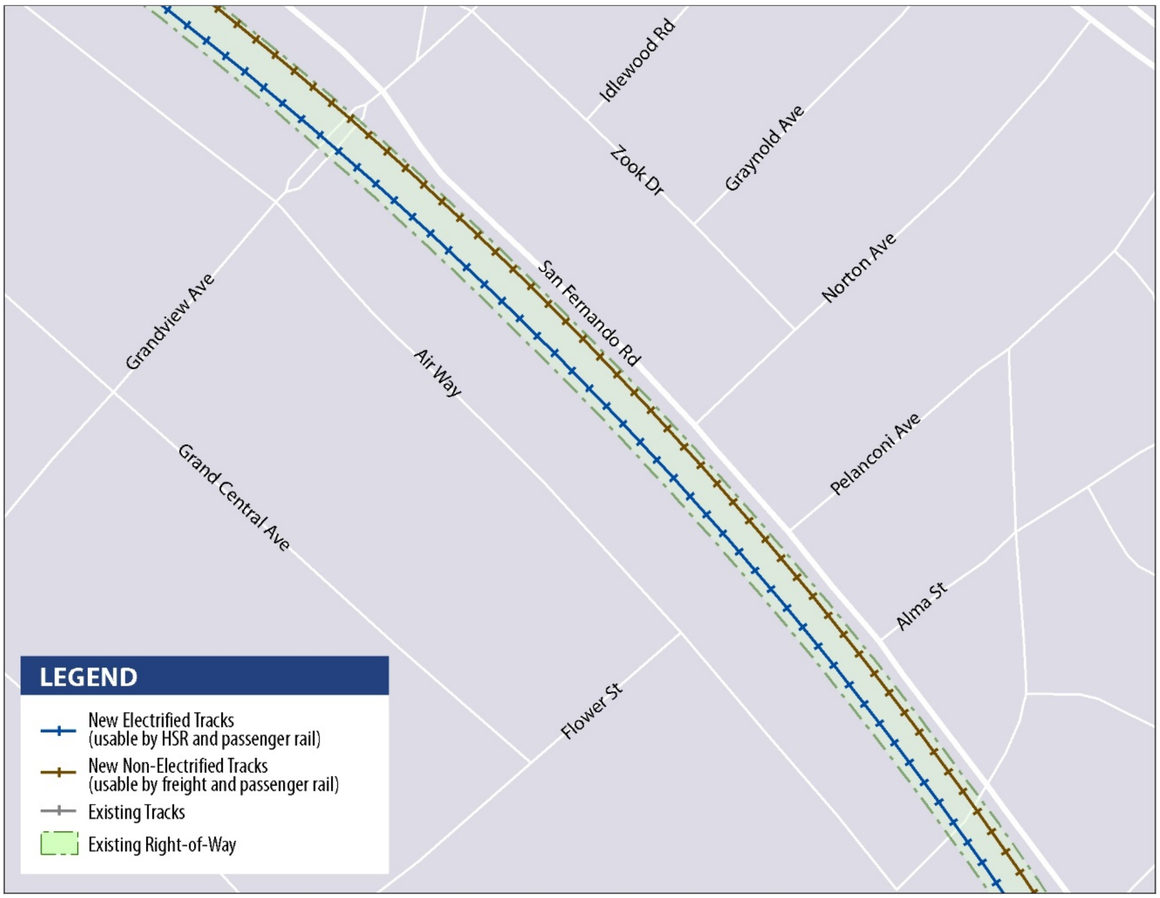
Figure 2-1 shows an overview of the Burbank to Los Angeles Project Section.



Source: California High-Speed Rail Authority, 2019

Figure 2-1 Overview of Burbank to Los Angeles Project Section

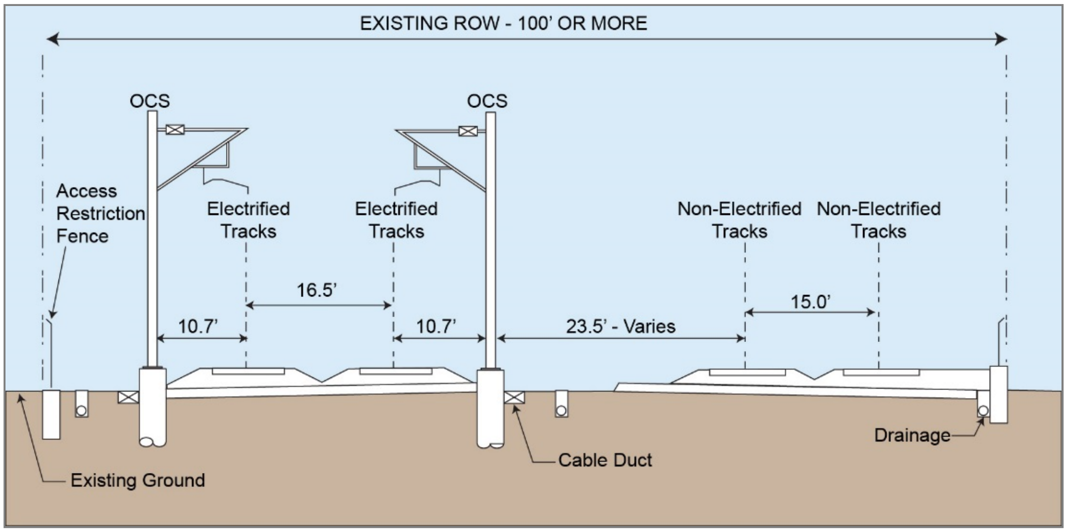
The Burbank to Los Angeles Project Section includes a combination of at-grade, below-grade, and retained-fill track, depending on corridor and design constraints. The at-grade and retained-fill portions of the alignment would be designed with structural flexibility to accommodate shared operations with other passenger rail operators. Throughout most of the project section (between Alameda Avenue and State Route [SR] 110), two new electrified tracks would be placed along the west side of the existing railroad right-of-way and would be useable for HSR and other passenger rail operators. The existing non-electrified tracks would be realigned closer to the east side of the existing right-of-way, for a total of four tracks; these realigned, non-electrified tracks would be usable for freight and other passenger rail operators, but not for HSR. Figure 2-2 illustrates the placement of the new electrified tracks and realigned, non-electrified tracks relative to the existing tracks.



Source: California High-Speed Rail Authority. 2019

Figure 2-2 New Electrified and Non-Electrified Tracks Within Existing Right-of-Way

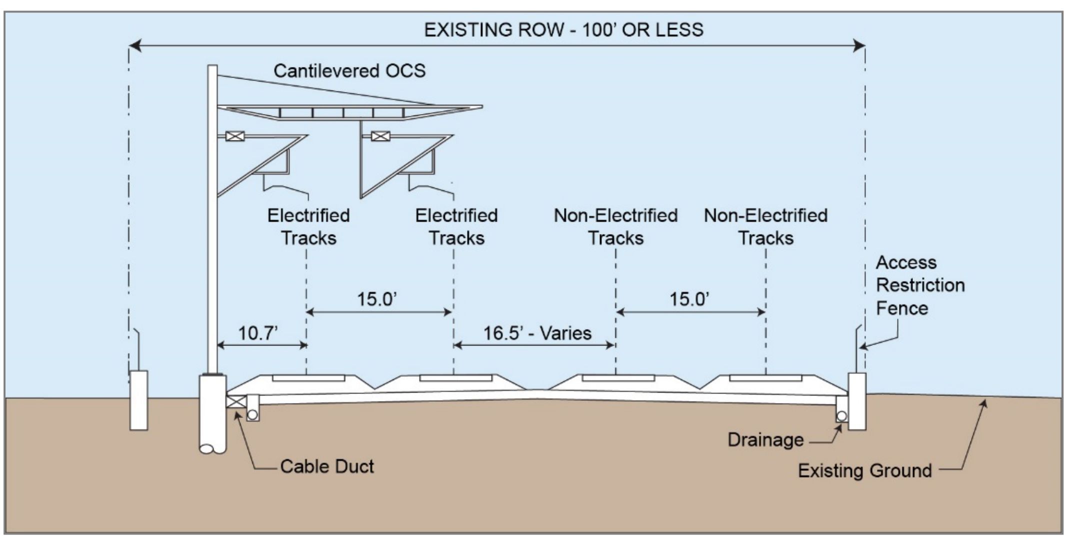
Throughout most of the Burbank to Los Angeles Project Section, the electrified track centerline and the non-electrified track centerline would have a minimum separation of 23.5 feet, and the northbound and southbound electrified tracks would have a separation of 16.5 feet, following the Authority's *Technical Memorandum 1.1.21 Typical Cross Sections for 15% Design* (2013). These standard separations are illustrated on Figure 2-3.



Source: California High-Speed Rail Authority, 2019
This illustration shows the standard separations between the electrified and non-electrified tracks in areas where the railroad right-of-way is at least 100 feet wide. (Figure not to scale.)

Figure 2-3 Standard Track Separations within Non-Constrained Right-of-Way

However, in several areas of the corridor, the right-of-way is less than 100 feet wide, a threshold that constrains the design. As a result, reduced track separations were used in these constrained areas in order to stay within the existing right-of-way to the greatest extent possible and thus minimize property impacts. The reduced separations between the electrified and non-electrified track centerlines would be a minimum of 16.5 feet, and between the two electrified track centerlines would be 15 feet. The narrower cross-section separations are illustrated on Figure 2-4.



Source: California High-Speed Rail Authority. 2019
This illustration shows the narrow separations between the electrified and non-electrified tracks, which would minimize property impacts in areas where right-of-way is constrained. The reduced separations are applied in areas where the railroad right-of-way is less than 100 feet wide. (Figure not to scale.)

Figure 2-4 Reduced Track Separations within Constrained Right-of-Way

2.2.1 HSR Build Alternative Description

The following section describes the HSR Build Alternative in greater detail. Figure 2-5 (Sheets 1 to 3) shows the HSR Build Alternative, including the HSR alignment, new/modified non-electrified tracks, and roadway crossings.

The HSR alignment would begin at the underground Burbank Airport Station and would consist of two new electrified tracks. After exiting the underground station, the alignment would travel southeast beneath the Hollywood Burbank Airport runway in a tunnel, which would be constructed using the sequential excavation method without any disruptions to airport operations. The alignment from south of the airport to where it would join the Metrolink Ventura Subdivision would be constructed as cut-and-cover, and the alignment would then transition to a trench within the Metrolink Ventura Subdivision. The existing Metrolink Ventura Subdivision tracks would be realigned north within the existing right-of-way, and an existing UPRR siding track between Buena Vista Street and Beachwood Drive would be realigned north of the relocated Metrolink Subdivision tracks within the existing right-of-way. These non-electrified tracks would remain at-grade. The trench, which would be south of and parallel to the relocated non-electrified tracks, would be dedicated for HSR tracks only. Figure 2-6, Figure 2-7, and Figure 2-8 depict the typical cross-sections of the below-grade portion of the alignment. During construction of the below-grade alignment, shoofly tracks would be provided to support Metrolink operations. The proposed shoofly tracks would be aligned between Hollywood Way and Buena Vista Street outside the existing right-of-way and would result in temporary roadway impacts to Vanowen Street.

The HSR tracks would transition from the trench and emerge to at-grade within the existing railroad right-of-way near Beachwood Drive in the city of Burbank. Near Beachwood Drive, the HSR tracks would curve south out of the existing railroad right-of-way and cross Victory Place on a new railroad bridge, which would be directly south of the existing Victory Place bridge. South of Burbank Boulevard, the HSR tracks would re-enter the railroad right-of-way and run parallel to the Metrolink Antelope Valley Subdivision tracks. Between Burbank Boulevard and Magnolia Boulevard, several UPRR industry tracks west of the right-of-way would be removed.

Continuing south, the HSR alignment would pass the Downtown Burbank Metrolink Station, which would be modified. HSR tracks would be placed within the existing parking lot west of the southbound platforms, and new pedestrian connections and relocated parking would be provided. Section 2.6.1 provides more details on design modifications for the Downtown Burbank Metrolink station.

Source: California High-Speed Rail Authority, 2019

Figure 2-5 HSR Build Alternative Overview

(Sheet 1 of 3)

Source: California High-Speed Rail Authority, 2019

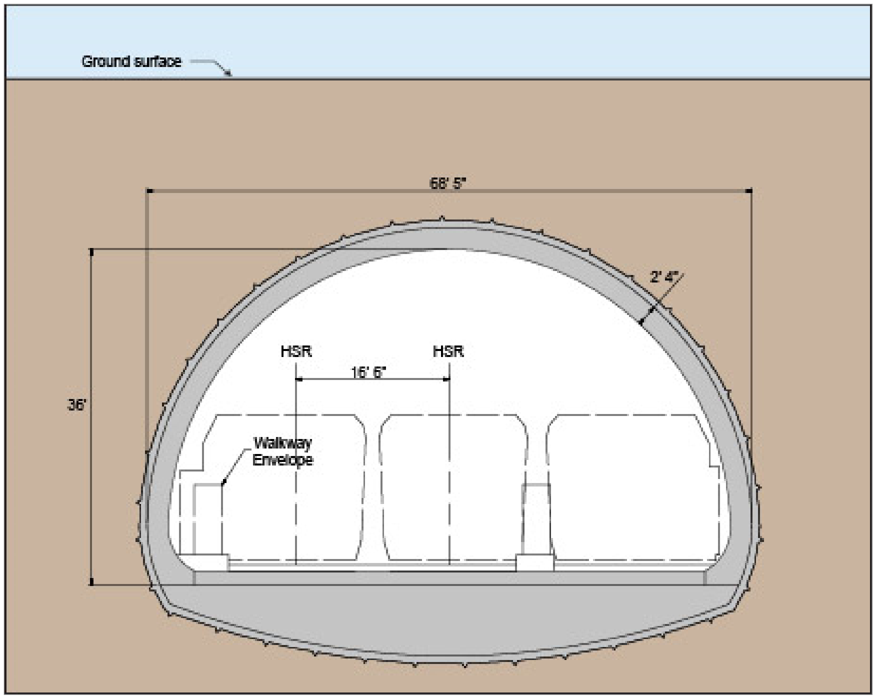
Figure 2-5 HSR Build Alternative Overview

(Sheet 2 of 3)

Source: California High-Speed Rail Authority, 2019

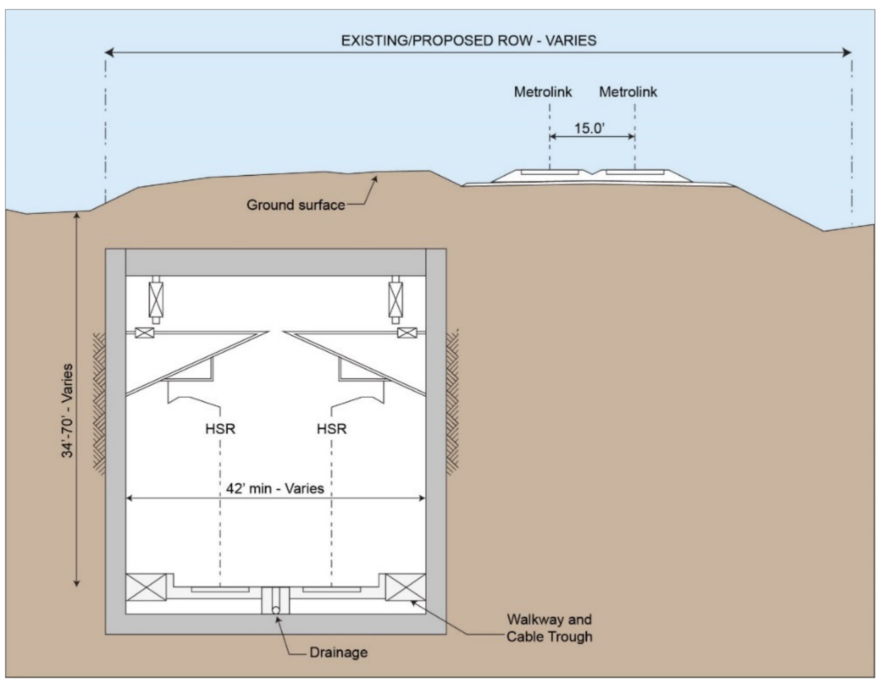
Figure 2-5 HSR Build Alternative Overview

(Sheet 3 of 3)



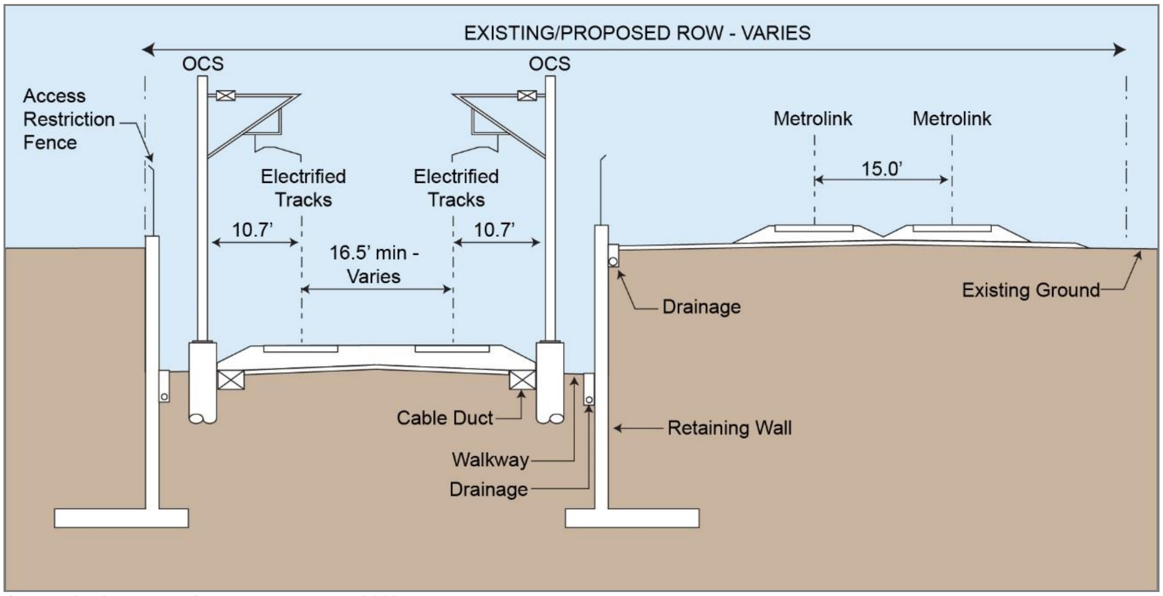
Source: California High-Speed Rail Authority, 2019

Figure 2-6 Typical Tunnel Cross-Section



Source: California High-Speed Rail Authority, 2019

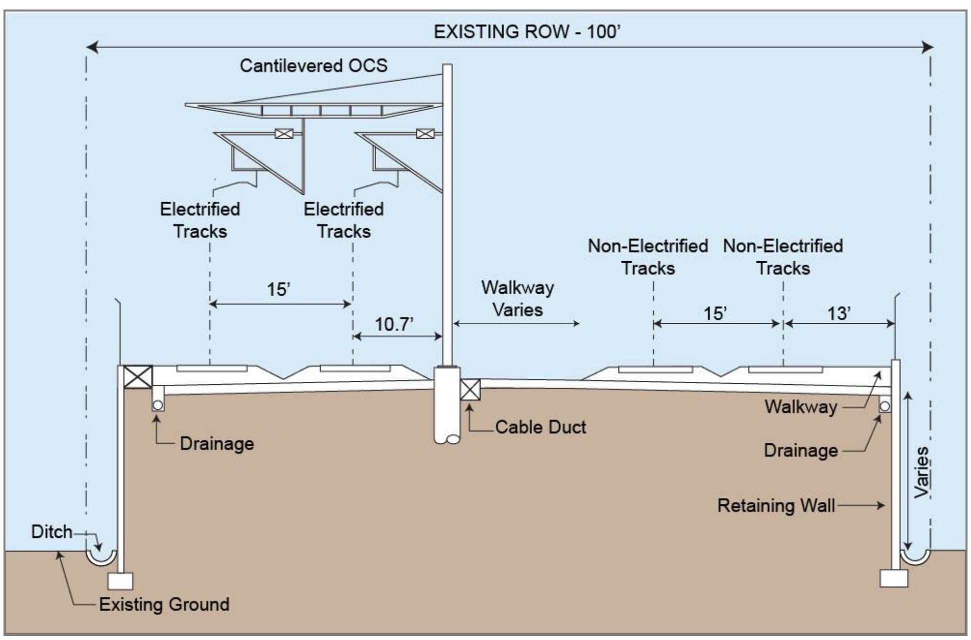
Figure 2-7 Typical Cut-and-Cover Tunnel Cross-Section



Source: California High-Speed Rail Authority, 2019

Figure 2-8 Typical Trench Cross-Section

Between Olive Avenue to the north end of the Metrolink Central Maintenance Facility (CMF), the existing non-electrified tracks would be shifted east within the right-of-way to accommodate the addition of the electrified tracks within the right-of-way. Throughout this area, both sets of tracks would be at-grade, with a retained fill segment between Western Avenue and SR 134. Figure 2-9 shows a typical cross-section of the alignment on retained fill.

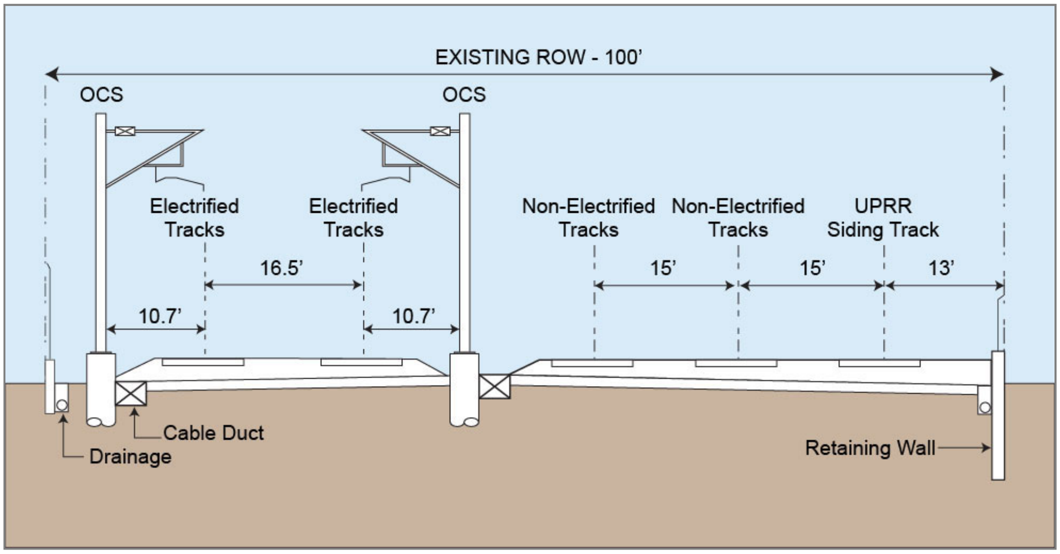


Source: California High-Speed Rail Authority, 2019

Figure 2-9 Typical Retained-Fill Cross-Section

The alignment would cross Verdugo Wash, where an existing railroad bridge would be rebuilt as a new clear-span structure, to accommodate the additional set of electrified tracks. The alignment

The alignment would cross Verdugo Wash, where an existing railroad bridge would be rebuilt as a new clear-span structure, to accommodate the additional set of electrified tracks. The alignment would continue south within the existing railroad right-of-way, which follows the Glendale and Los Angeles city borders. Between SR 134 and Chevy Chase Drive, a UPRR siding track would be realigned to the east of the non-electrified tracks, for a total of five tracks within the right-of-way through this area. This siding track is currently located at the Metrolink Central Maintenance CMF but would need to be relocated to accommodate HSR at the CMF. Figure 2-10 shows the typical cross-section for this area.



Source: California High-Speed Rail Authority. 2019

Figure 2-10 Typical Cross-Section Between State Route 134 and Chevy Chase Drive

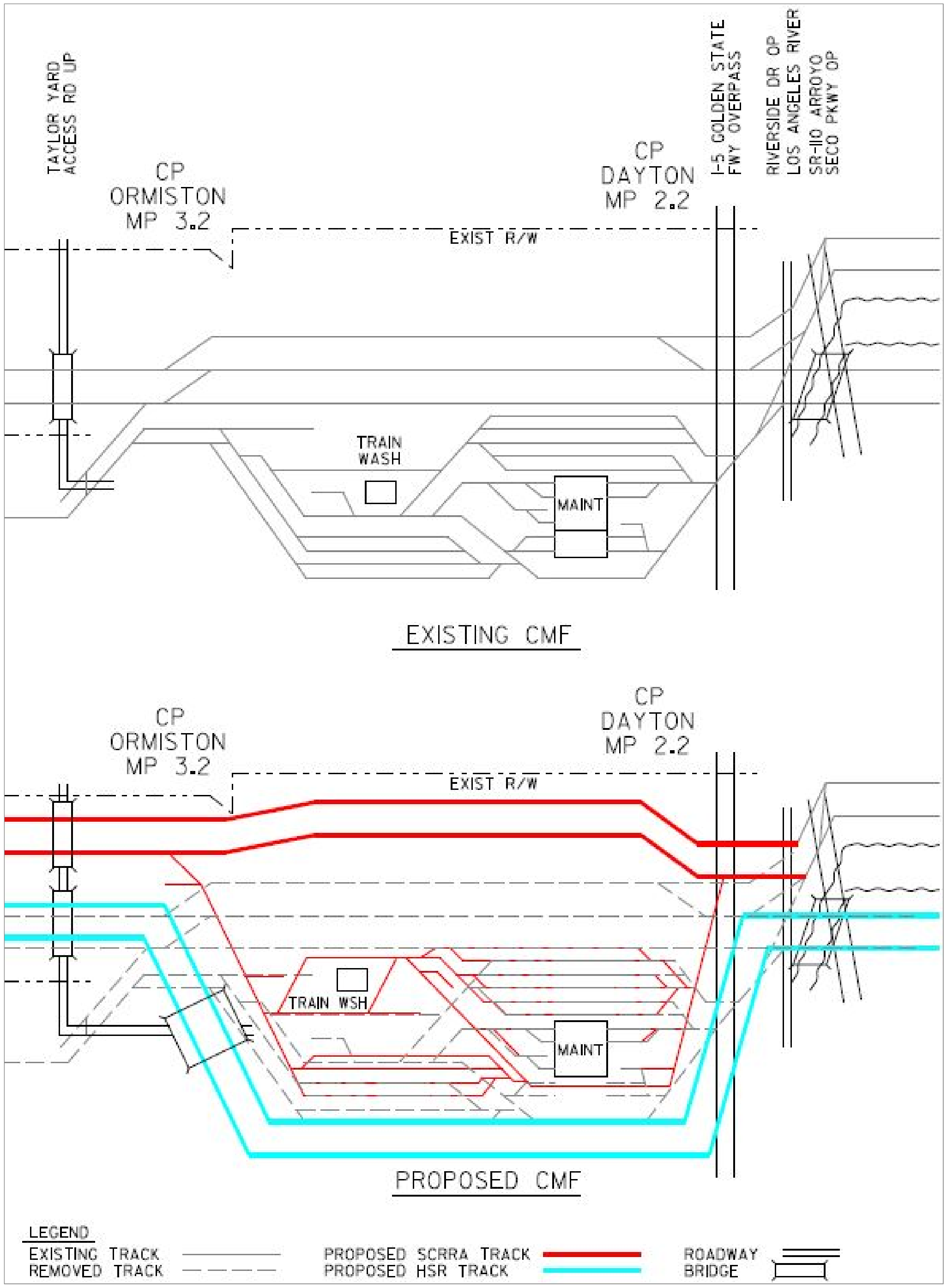
The alignment would pass by the Glendale Metrolink Station (originally known as the Southern Pacific Railroad Depot), a known historical resource listed on the National Register of Historic Places and located north of Glendale Boulevard. No modifications would be needed for the Glendale Metrolink Station. At Tyburn Street, the alignment would enter the city of Los Angeles. Continuing south, the two sets of tracks would diverge at the north end of the Metrolink CMF. The electrified tracks would travel along the west side of the CMF, and the non-electrified, mainline tracks would travel along the east side of the facility.

The CMF is Metrolink's major daily servicing location and maintenance facility in the region. The Burbank to Los Angeles Project Section proposes reconfiguring the various yard and maintenance facilities within the CMF to accommodate HSR while maintaining as many of the existing yard operations as possible. Figure 2-11 displays a schematic diagram of the existing CMF and the proposed changes, which include new mainline-to-yard track connections, partial demolition of the existing maintenance shop, a revised roadway network with reconfigured parking areas, track relocation shifts, and construction to provide additional storage capacity. Additionally, several facilities would need to be relocated or reconstructed within the CMF, including a train washing/reclamation building, a yard pumphouse, and two service and inspection tracks. Utilities would also need to be relocated with the CMF, including domestic and fire water, underdrains and reconstructed catch basins, power facilities, fueling facilities and storage tanks, and sanitary sewer systems. The proposed design would not be able to accommodate wheel truing operations or progressive maintenance bays; these would relocate to another Metrolink facility. All other facilities and infrastructure would remain in place. The construction work at the CMF would be phased to minimize the disruption to the existing operations and to maintain the key operational facilities.

At the south end of the CMF, the two electrified and two non-electrified tracks would converge briefly within the right-of-way and then diverge again south of Figueroa Street. The electrified tracks would cross over to the west bank of the Los Angeles River on the existing Metrolink Downey Bridge. The existing tracks on the Downey Bridge would be electrified, which would allow for both HSR and passenger rail operations. The non-electrified tracks would remain on the east bank of the Los Angeles River and cross the Arroyo Seco on an existing railroad bridge, which would not require modifications. These non-electrified tracks would connect with the existing tracks on the east bank, which currently serve UPRR and nonrevenue trains. An illustrative cross-section for this area is shown on Figure 2-12.

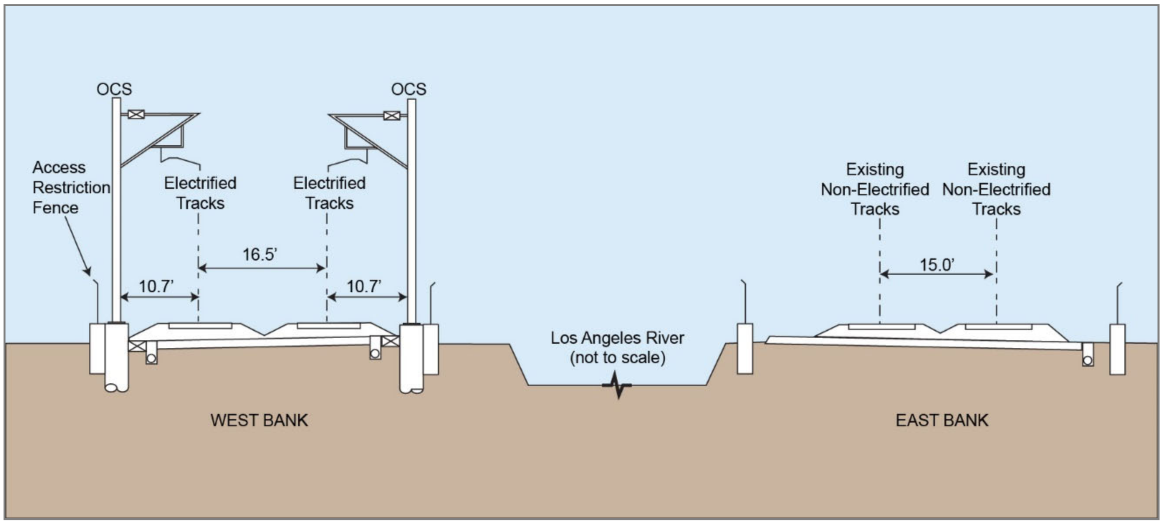
South of Main Street, on the east bank of the river, the existing tracks would be modified at Mission Junction to be used by freight and passenger rail. They would cross the Los Angeles River on the existing Mission Tower bridge to join the electrified tracks within the railroad right-of-way. The existing Mission Tower bridge has two tracks, but currently only one track is functional and used by Metrolink. The HSR Build Alternative would replace the trackwork to conform to the most current design standards and specifications, which may require a retrofit to the bridge.

The two sets of tracks would continue south to terminate at LAUS. The electrified tracks and HSR station platforms would be on the west side of the station, while the non-electrified tracks would merge with the Metrolink and Amtrak tracks. The configuration at LAUS is described in further detail in Section 2.3.2.



Source: Burbank to Los Angeles Draft Preliminary Engineering for Project Description Design Submittal, 2019

Figure 2-11 Diagram of Existing and Proposed Metrolink Central Maintenance Facility



Source: California High-Speed Rail Authority. 2019
The electrified tracks would cross the Los Angeles River just north of State Route 110 and run along the west bank of the river. The non-electrified tracks would run along the east bank of the river. (Figure not to scale.)

Figure 2-12 Typical Cross-Section from State Route 110 to Mission Junction

2.2.2 Roadway Crossings

The HSR Build Alternative would cross a total of 34 roadways, 15 of which would require modifications. Figure 2-5 shows the crossings throughout the project section, and Table 2-2 lists their configurations before and after the introduction of the HSR Build Alternative.

Modifications to existing crossings

- Victory Place: A new bridge for the HSR tracks would be constructed directly south of the existing railroad bridge over Victory Place, and the roadway would be lowered to cross under the new bridge.
- Burbank Boulevard: The roadway bridge would be reconstructed to cross over the tracks, and Burbank Boulevard would be raised in elevation on the west side.
- Alameda Avenue: The railroad bridge would be reconstructed to be wider.
- Colorado Street: The railroad bridge would be reconstructed to be wider.
- Los Feliz Boulevard: The railroad bridge would be reconstructed to be wider, and the roadway would be lowered slightly
- Glendale Boulevard: The railroad bridge would be reconstructed to be wider, and the roadway would be lowered slightly
- Kerr Road: The railroad bridge would be reconstructed to be wider, and the roadway would be lowered slightly

New grade separations

- Buena Vista Street: The crossing would be modified and remain at-grade for Metrolink and UPRR tracks, but a new undercrossing would be constructed to grade-separate the HSR tracks only from the roadway.
- Sonora Avenue: A new roadway undercrossing would be constructed, with the tracks slightly raised on retained fill and the roadway slightly lowered (see Section 2.6).
- Grandview Avenue: A new roadway undercrossing would be constructed, with the tracks slightly raised on retained fill and the roadway slightly lowered (see Section 2.6).

- Flower Street: A new roadway undercrossing would be constructed, with the tracks slightly raised on retained fill and the roadway slightly lowered (see Section 2.6).
- Goodwin Avenue: The road currently does not cross the railroad right-of-way, but the project would grade-separate it as a new roadway undercrossing (see Section 2.6).
- Main Street: A new roadway bridge would be constructed north of the existing Main Street bridge, which would cross the railroad right-of-way and the Los Angeles River (see Section 2.6).

Closures

- Chevy Chase Drive: The roadway would be closed, and a new pedestrian undercrossing would be provided (see Section 2.6).
- Private driveway: A driveway that currently provides access to a Los Angeles Department of Water and Power facility parking lot would be closed, and the Los Angeles Department of Water and Power parking would be relocated to a new facility on Main Street.

Table 2-1 Roadway Crossings within the Burbank to Los Angeles Project Section

Roadway	Current Crossing Configuration	Proposed Crossing Configuration[1]
Buena Vista Street	At-Grade*	**At-Grade* (modified)** **Undercrossing** (new)**
Victory Place	Undercrossing"	Undercrossing* **Undercrossing (new)**
Burbank Boulevard	Overcrossing	**Overcrossing (modified)**
Magnolia Boulevard	Overcrossing	Overcrossing
Olive Avenue	Overcrossing	Overcrossing
Interstate 5	Overcrossing	Overcrossing
Alameda Avenue	Undercrossing	**Undercrossing (modified)**
Western Avenue	Overcrossing	Overcrossing
Sonora Avenue	At-Grade	**Undercrossing (new)**
Grandview Avenue	At-Grade	**Undercrossing (new)**
Flower Street	At-Grade	**Undercrossing (new)**
Fairmont Avenue	Overcrossing	Overcrossing
SR 134	Overcrossing	Overcrossing
Salem/Sperry St[2]	No Crossing	Overcrossing (Metro project)
Colorado Street	Undercrossing	**Undercrossing (modified)**
Goodwin Avenue	No Crossing	**Undercrossing (new)**
Chevy Chase Drive	At-Grade	**Closed**
Los Feliz Boulevard	Undercrossing	**Undercrossing (modified)**
Glendale Boulevard	Undercrossing	**Undercrossing (modified)**
Fletcher Drive	Undercrossing	Undercrossing
SR 2	Overcrossing	Overcrossing
Kerr Road	Undercrossing	**Undercrossing (modified)**
Interstate 5	Overcrossing	Overcrossing
Figueroa Street	Overcrossing	Overcrossing

Roadway	Current Crossing Configuration	Proposed Crossing Configuration[1]
SR 110	Overcrossing	Overcrossing
Metro Gold Line	Overcrossing	Overcrossing
Broadway	Overcrossing	Overcrossing
Spring Street	Overcrossing	Overcrossing
Main Street	At-Grade	**Overcrossing (new)**
Private LADWP road	At-Grade	**Closed**
Vignes Street	Undercrossing	Undercrossing
Cesar E. Chavez Avenue	Undercrossing	Undercrossing

Source: California High-Speed Rail Authority, 2019
[1] All proposed grade crossing configurations are pending Public Utilities Commission approval.
[2] Salem/Sperry Street would be grade-separated as a part of the Metro Doran Street and Broadway/Brazil Grade Separation Project. The project also proposes closing the existing at-grade railroad crossings at Doran Street and Broadway/Brazil Street. As the Metro project would be completed before the introduction of HSR service, the crossing configurations are considered part of the existing conditions for the HSR project.
*Crossings apply to Metrolink and/or UPRR tracks only
**Crossing applies to HSR tracks only
Bold denotes change from existing condition under the HSR Build Alternative.
Overcrossing = Road over train tracks Undercrossing = Road under train tracks
HSR = high-speed rail
LADWP = Los Angeles Department of Water and Power
Metro = Los Angeles County Metropolitan Transportation Authority
SR = State Route
UPRR = Union Pacific Railroad

2.3 Station Sites

The HSR stations for the Burbank to Los Angeles Project Section would be in the vicinity of Hollywood Burbank Airport and at LAUS. Stations would be designed to optimize access to the California HSR System, particularly to allow for intercity travel and connections to local transit, airports, highways, and the bicycle and pedestrian network. Both stations would include the following elements:

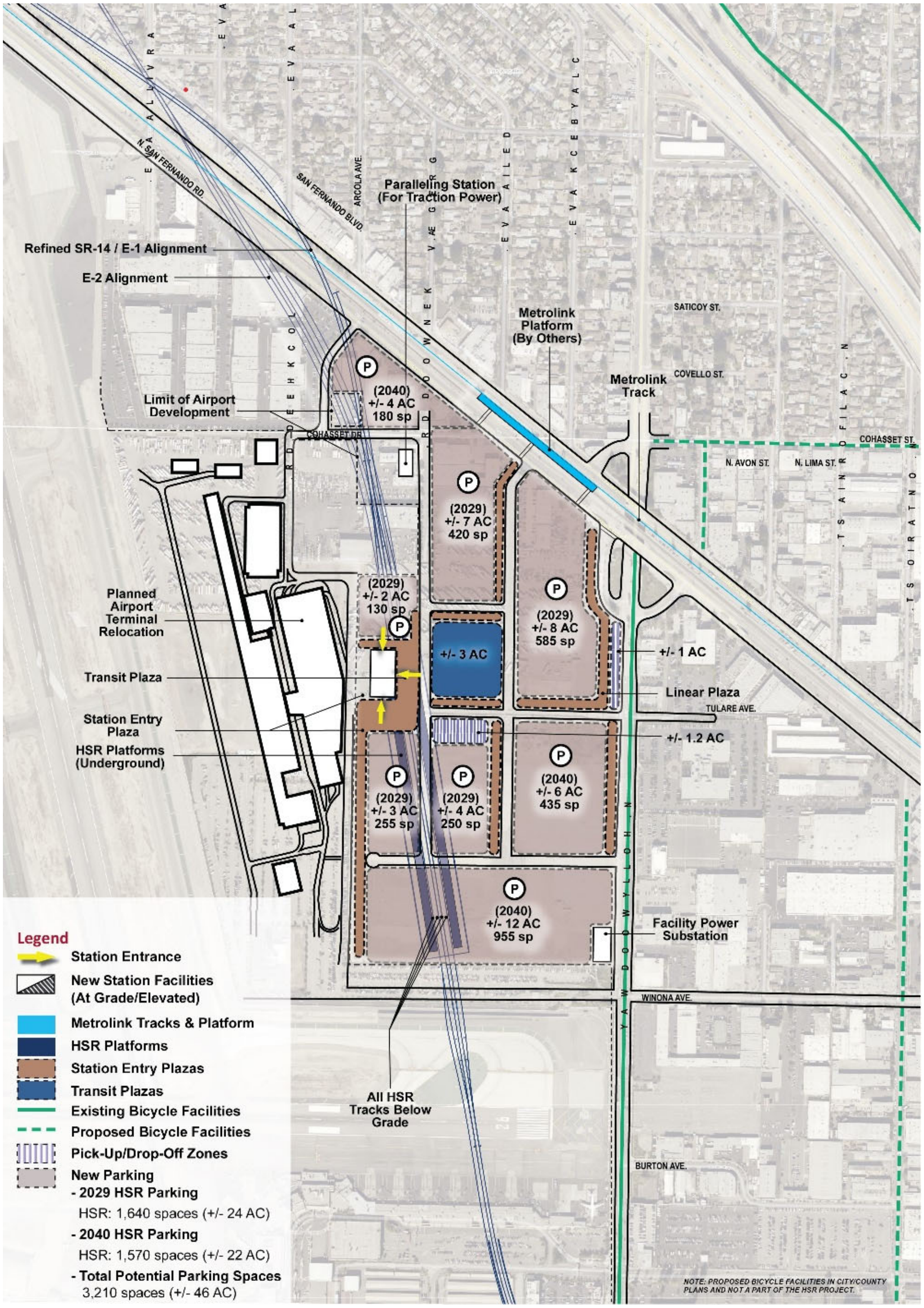
- Passenger boarding and alighting platforms
- Station head house with ticketing, waiting areas, passenger amenities, vertical circulation, administration and employee areas, and baggage and freight-handling service
- Vehicle parking (short-term and long-term)
- Pick-up and drop-off areas
- Motorcycle/scooter parking
- Bicycle parking
- Waiting areas and queuing space for taxis and shuttle buses
- Pedestrian walkway connections

2.3.1 Burbank Airport Station

The Burbank Airport Station site would be west of Hollywood Way and east of Hollywood Burbank Airport. The airport and ancillary properties occupy much of the land south of the Burbank Airport Station site, while industrial and light industrial land uses are to the east and residential land uses are found north of the Burbank Airport Station site. Interstate (I-) 5 runs parallel to the station site, approximately 0.25 mile north of the proposed Metrolink platform.

The Burbank Airport Station would have both underground and aboveground facilities that would span approximately 70 acres. Station facilities would include train boarding platforms, a station building (that would house ticketing areas, passenger waiting areas, restrooms, and related facilities), pick-up/drop-off facilities for private autos, a transit center for buses and shuttles, and surface parking areas. Underground portions of the station would be beneath Cohasset Street, along which runs the boundary between the city of Los Angeles to the north and the city of Burbank to the south. There would be two HSR tracks at the station.

The Burbank Airport Station would have up to 3,200 surface parking spaces. About 2,980 spaces would be between the proposed Replacement Terminal and N Hollywood Way. An additional 220 spaces would be in surface lots in the area bounded by Lockheed Drive to the west, Cohasset Street to the south, and N San Fernando Boulevard to the north and east. The preliminary station layout concept plan is shown on Figure 2-13. The Burbank to Los Angeles Project Section EIR/EIS analyzes the Burbank Airport Station project footprint displayed on Figure 2-13 as permanently impacted because no additional temporary construction easements are identified beyond the permanent area required to construct, operate, and maintain the station. This is the assumption based on the current level of design.



Source: California High-Speed Rail Authority 2019

Figure 2-13 Preliminary Station Concept Layout Plan, Burbank Airport Station

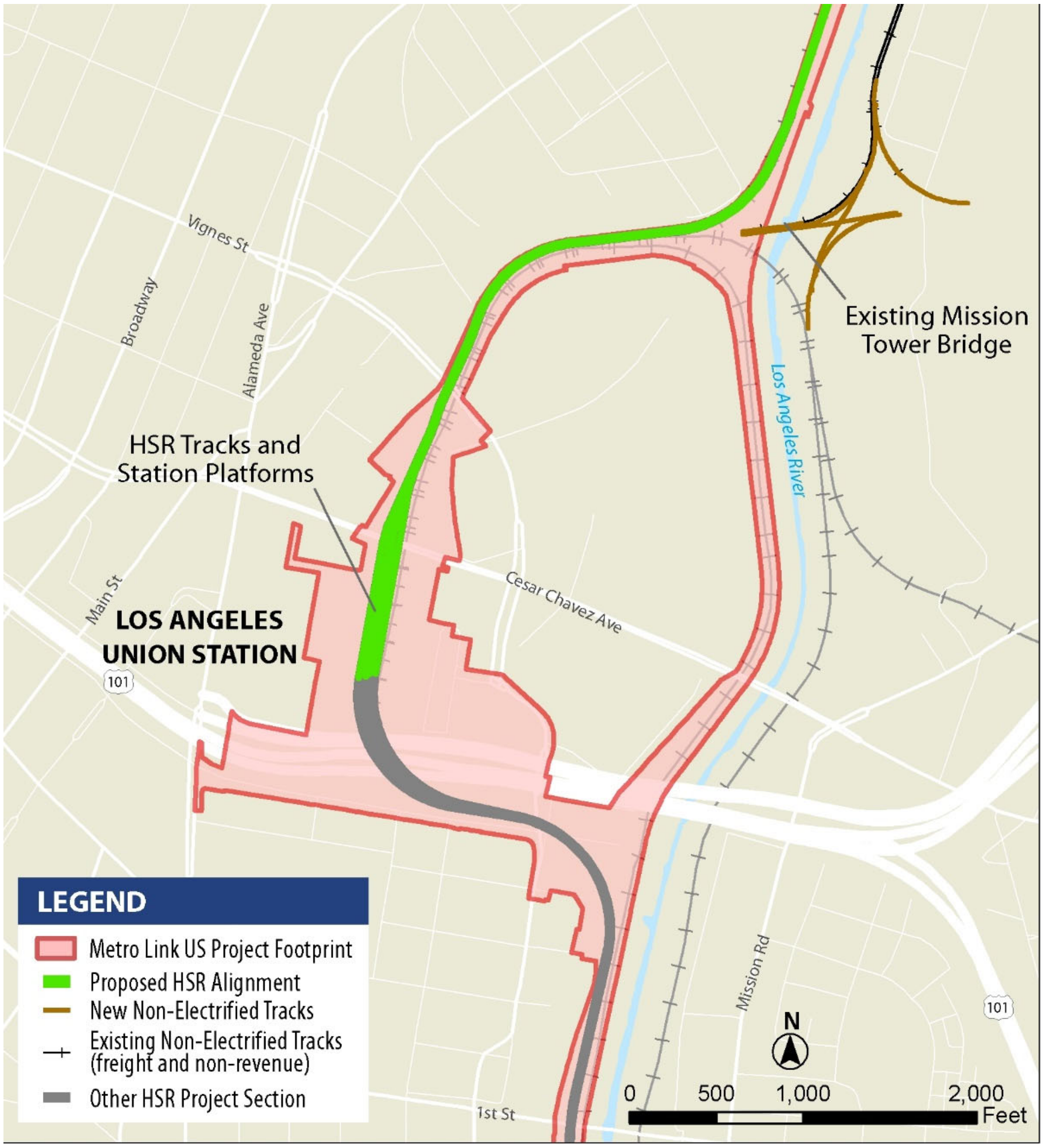
2.3.2 Los Angeles Union Station

The existing LAUS campus and surrounding tracks are being reconfigured as a part of the Metro Link Union Station (Link US)[4] Project. The Metro Link US Project would reconfigure the station entry tracks from north of Mission Junction and construct an elevated structure through the station arrival and boarding area, which would extend south over U.S. Route 101 and come back to grade near First Street. Reconfiguration would take place over two construction phases. The first phase would include an elevated structure for non-HSR passenger rail operators between Vignes Street and First Street. The second phase would add additional tracks to the structure for use by HSR. The Metro Link US EIR/EIS, on which the Authority is a cooperating agency, would evaluate these changes, along with an expanded passenger concourse area and changes to the Metro Gold Line. These changes would be completed prior to the introduction of HSR service.

While Metro would environmentally clear and construct the trackwork and new passenger concourse, the HSR project would require additional modifications within the Link US area. HSR improvements include raising the platform heights and installing an overhead contact system. The Burbank to Los Angeles Project EIR/EIS evaluates these modifications, as well as potential increases in traffic associated with the introduction of HSR service.

The proposed HSR station at LAUS would include up to four HSR tracks and two 870-foot platforms (with the possibility of extending to 1,000 feet). The HSR system would share passenger facilities, such as parking and pick-up/drop-off, with other operators. HSR would require 1,180 parking spaces in 2029 and 2,010 spaces in 2040. This new demand may be met by existing underutilized parking supply within 0.5 mile of LAUS. This parking would be shared with other LAUS service providers and businesses.

[4] Link US will transform LAUS from a “stub-end” station to a “run-through” station by extending tracks south over U.S. Route 101. The project will add a new passenger concourse, as well as a new loop track that will provide improved operational flexibility for rail service. The Draft Final EIR is available at: https://www.metro.net/projects/link-us/final-ei-report/.



Sources: California High-Speed Rail Authority and Los Angeles Metropolitan Transportation Authority, 2018

Figure 2-14 Preliminary Station Elements Plan, Los Angeles Union Station

2.4 Maintenance of Infrastructure

The California HSR System includes four types of maintenance facilities: maintenance of infrastructure facilities (MOIF), Maintenance of infrastructure siding facilities (MOIS), heavy maintenance facilities, and light maintenance facilities (LMF).[5] The California HSR System would require one heavy maintenance facility for the system, located in the Central Valley. The design and spacing of maintenance facilities along the HSR system do not require the Burbank to Los Angeles Project Section to include any of the maintenance facilities within the limits of the project section.

For purposes of environmental analysis, FRA and the Authority have defined each project section to have the capability to operate as a stand-alone project in the event that other project sections

[5] Maintenance facilities are described in the Authority's *Summary of Requirements for O&M Facilities* (2013).

of the HSR system are not constructed. Because this project section does not provide a heavy maintenance facility or MOIF, an independent contractor would need to be retained to handle all maintenance functions for vehicles and infrastructure if this project section were built as a stand-alone project for purposes of independent utility. Independent utility is discussed further in Section 2.9.

2.4.1 Maintenance of Infrastructure Facilities

The HSR system infrastructure will be maintained from regional MOIFs located at approximately 150-mile intervals. Each MOIF is estimated to be approximately 28 acres in size and would provide a location for regional maintenance machinery servicing storage, materials storage, and maintenance and administration. The MOIFs could be co-located with the MOIS within each 75-mile segment. The MOIFs would be outside of the Burbank to Los Angeles Project Section.

2.4.2 Maintenance of Infrastructure Sidings

The MOISs would be centrally located within the 75-mile maintenance sections on either side of each MOIF. Each MOIS would support MOIF activities by providing a location for the layover of maintenance of infrastructure equipment and temporary storage for materials. The MOIS is estimated to be about 4 acres in size. The MOISs would be outside of the Burbank to Los Angeles Project Section.

2.4.3 Heavy Maintenance Facility

Only one heavy maintenance facility is required for the HSR system, and it would be within either the Merced to Fresno Project Section or the Fresno to Bakersfield Project Section. The heavy maintenance facility would include all activities associated with train fleet assembly, disassembly, and complete rehabilitation; all on-board components of the trainsets; and overnight layover accommodations and servicing facilities. The site would include a maintenance shop, a yard Operations Control Center building, one traction power substation (TPSS), other support facilities, and a train interior cleaning platform.

2.4.4 Light Maintenance Facility

An LMF would be used for all activities associated with fleet storage, cleaning, repair, overnight layover accommodations, and servicing facilities. The LMF closest to the Burbank to Los Angeles Project Section would be sited in proximity to LAUS but within the Los Angeles to Anaheim Project Section, and would likely support the following functions:

- **Train Storage:** Some trains would be stored at the LMF prior to start of revenue service.
- **Examinations in Service:** Examinations would include inspections, tests, verifications, and quick replacement of certain train components on the train.
- **Inspection:** Periodic inspections would be part of the planned preventive maintenance program requiring specialized equipment and facilities.

The LMF site will be sized to support the level of daily revenue service dispatched by the nearby terminal at the start of each revenue service day. The Authority defines three levels of maintenance that can be performed at an LMF:

- **Level I:** Daily inspections, pre-departure cleaning, and testing
- **Level II:** Monthly inspections
- **Level III:** Quarterly inspections, including wheel-truing

A Level I LMF is proposed on the west bank of the Los Angeles River at the existing Amtrak Railroad Yard. The facility would be where the current BNSF Railway storage tracks are located and would require their relocation.

2.5 Ancillary and Support Facilities

2.5.1 Electrification

Trains on the California HSR System would draw power from California's existing electricity grid distributed via an overhead contact system. The Burbank to Los Angeles Project Section would not include the construction of a separate power source, although it would include the extension of power lines from potential TPSSs to a series of independently owned power substations positioned along the HSR corridor if necessary. The transformation and distribution of electricity would occur in three types of stations:

- TPSSs transform high-voltage electricity supplied by public utilities to the train operating voltage. TPSSs would be adjacent to existing utility transmission lines and the right-of-way, and would be located approximately every 30 miles along the HSR system route.
- Switching stations connect and balance the electrical load between tracks, and switch overhead contact system power on or off to tracks in the event of a power outage or emergency. Switching stations would be midway between, and approximately 15 miles from, the nearest TPSSs. Each switching station would be 120x80 feet and be adjacent to the HSR right-of-way.
- Paralleling stations, or autotransformer stations, provide voltage stabilization and equalize current flow. Paralleling stations would be located approximately every 5 miles between the TPSSs and the switching stations. Each paralleling station would approximately be 100x80 feet and located adjacent to the right-of-way.

Table 2-2 lists the proposed switching station and paralleling station sites within the Burbank to Los Angeles Project Section. A TPSS is not required for the Burbank to Los Angeles Project Section because of the HSR system's facilities spacing requirements. The Burbank to Los Angeles Project Section would be able to use the TPSSs within the Palmdale to Burbank Project Section and/or Los Angeles to Anaheim Project Section. In the event the other project sections of the HSR system are not constructed, a standalone TPSS would be required within the Burbank to Los Angeles Project Section for purposes of independent utility. Independent utility is discussed further in Section 2.8.

Table 2-2 Traction Power Facility Locations for the Burbank to Los Angeles Project Section

Type of Facility	Location
Paralleling Station	Los Angeles, south of Main Street between railroad right-of-way and Los Angeles River
Switching Station	Los Angeles, south of Verdant Street and west of railroad right-of-way

Source: California High-Speed Rail Authority, 2019

2.5.2 Signaling and Train-Control Elements

To reduce the safety risks associated with freight and passenger trains, the National Transportation Safety Board, the FRA, and other agencies have mandated Positive Train Control (PTC). PTC is a train safety system designed to automatically implement safety protocols and provide communication with other trains to reduce the risk of a potential collision. The U.S. Rail Safety Improvement Act of 2008 requires the implementation of PTC technology across most railroad systems; in October 2015, Congress extended the deadline for implementation to December 31, 2018. The FRA published the Final Rule regarding PTC regulations on January 15, 2010.

Communication towers and ancillary facilities are included in the Burbank to Los Angeles Project Section to implement the FRA PTC requirements. PTC infrastructure consists of integrated command, control, communications, and information systems for controlling train movements that improve railroad safety by significantly reducing the probability of collisions between trains, casualties to roadway workers and equipment, and over-speed accidents. PTC is especially important in “blended”[6] corridors, such as in the Burbank to Los Angeles Project Section, where passenger and freight trains need to share the same tracks safely.

PTC for the HSR project would use a radio-based communications network that would include 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 located in the fenced HSR corridor in a fenced area of approximately 20x15 feet, including a 10x8-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, the communications facilities would be located near the HSR corridor in a fenced area of approximately 20 feet by 15 feet.

2.6 Early Action Projects

As described in the 2016 Business Plan, the Authority has made a commitment to invest in regionally significant connectivity projects in order to provide early benefits to transit riders and local communities while laying a solid foundation for the HSR system. These early actions will be made in collaboration with local and regional agencies. These types of projects include grade separations and improvements at regional passenger rail stations, which increase capacity, improve safety, and provide immediate benefits to freight and passenger rail operations. Local and regional agencies may take the lead on coordinating the construction of these early action projects. Therefore, they are described in further detail below and are analyzed within the Burbank to Los Angeles Project Section EIR/EIS to allow the agencies, as Responsible Agencies under CEQA, to adopt the findings and mitigation measures as needed to construct these projects.

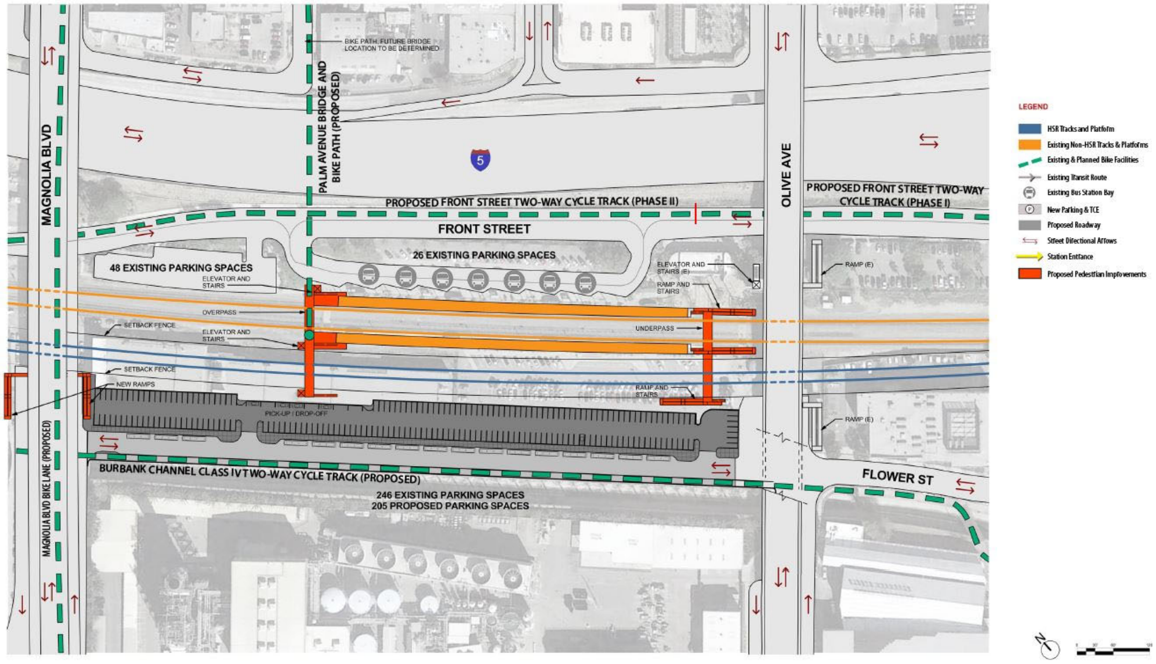
2.6.1 Downtown Burbank Metrolink Station

Although the HSR system will not serve the Downtown Burbank Metrolink Station, modifications at the station would be required to ensure continued operations of existing operators. The HSR tracks would be located within the existing parking lot west of the southbound platforms; the platforms and existing Metrolink tracks would not change. The parking would be relocated to between Magnolia Boulevard and Olive Avenue, and Flower Street would be extended from where it currently ends at the south side of the Metrolink Station. Pedestrian bridges would be provided for passengers to cross over the HSR tracks to access the Metrolink platforms. Other accessibility improvements would include additional vehicle parking, bus parking, and bicycle pathways. Figure 2-15 shows the proposed site plan for the Downtown Burbank Metrolink Station.

2.6.2 Sonora Avenue Grade Separation

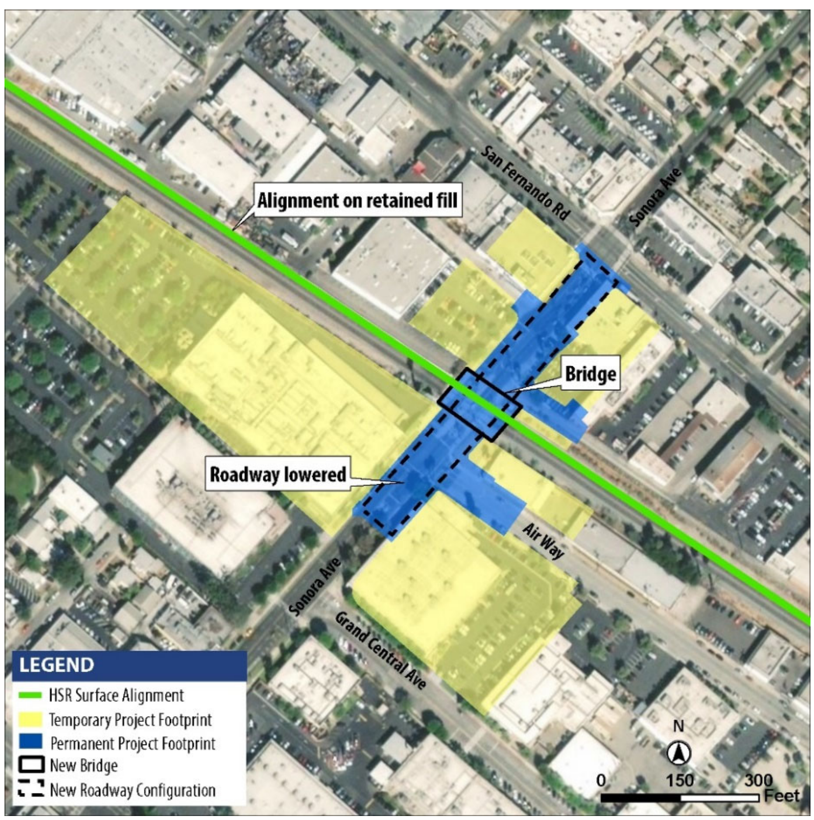
Sonora Avenue is an existing at-grade crossing. The existing roadway configuration consists of two traffic lanes in both the eastbound and westbound directions. The Burbank to Los Angeles Project Section proposes a “hybrid” grade separation, with Sonora Avenue slightly depressed and the HSR alignment and non-electrified tracks raised on a retained-fill structure. A 10-foot-wide median would be added and the lanes would be narrowed, so the overall width of Sonora Avenue would not change. Sonora Avenue would be lowered in elevation between Air Way and San Fernando Road, and the lowest point of the undercrossing would be approximately 10 feet below the original grade. The height of the new retained-fill structure would be approximately 28 feet. Figure 2-16 shows the temporary and permanent project footprint areas.

[6] California HSR Project Business Plans (http://www.hsr.ca.gov/About/Business_Plans/) 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).



Source: California High-Speed Rail Authority, 2019

Figure 2-15 Downtown Burbank Metrolink Station Site Plan



Source: California High-Speed Rail Authority, 2019

Figure 2-16 Sonora Avenue Grade Separation Footprint

2.6.3 Grandview Avenue Grade Separation

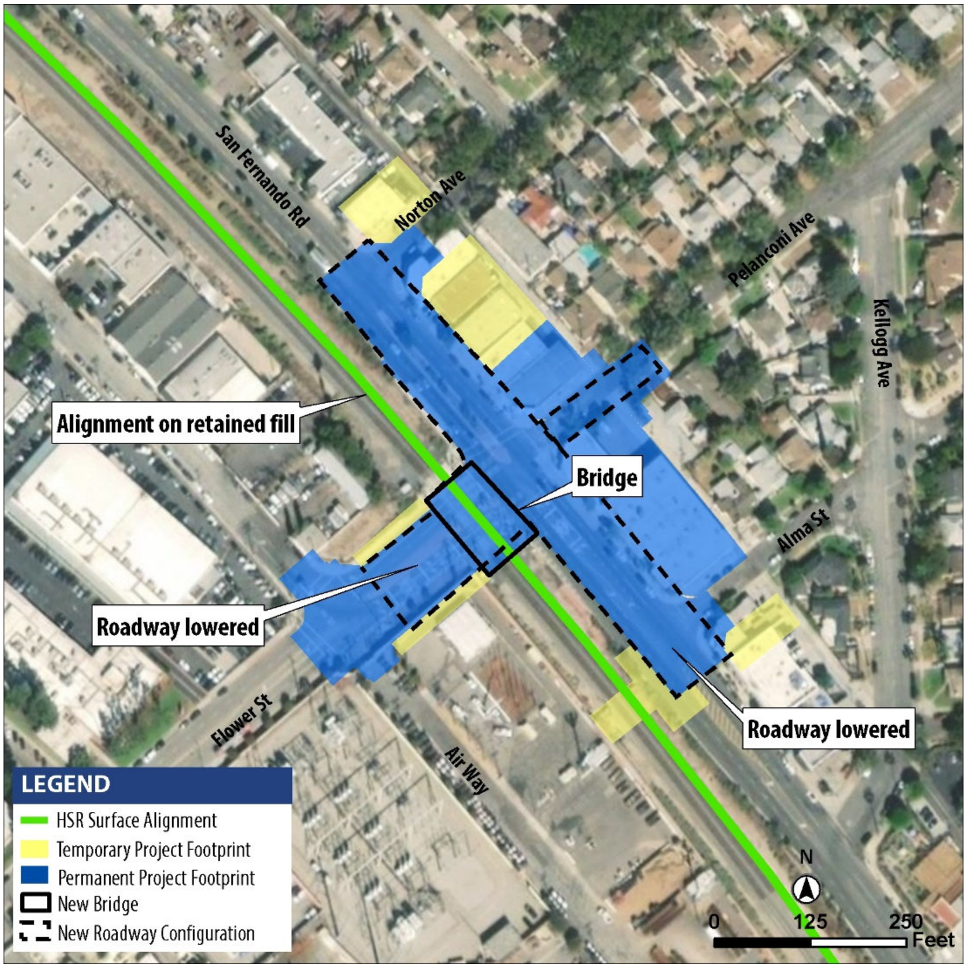
Grandview Avenue is an existing at-grade crossing. The existing roadway configuration consists of three traffic lanes in both the eastbound and westbound directions. The Burbank to Los Angeles Project Section proposes a "hybrid" grade separation, with Grandview Avenue slightly depressed and the HSR alignment and non-electrified tracks raised on retained fill. Grandview Avenue would be lowered in elevation between Air Way and San Fernando Road, and the lowest point of the undercrossing would be approximately 3 feet below original grade. The lanes and overall width of Grandview Avenue would not change. The height of the new retained-fill structure would be approximately 30 feet. Figure 2-17 shows the temporary and permanent project footprint areas.

Source: California High-Speed Rail Authority, 2019

Figure 2-17 Grandview Avenue Grade Separation Footprint

2.6.4 Flower Street Grade Separation

Flower Street is an existing at-grade crossing, with Flower Street ending in a T-shaped intersection with San Fernando Road, which runs parallel on the east side of the railroad right-of-way. Existing Flower Street consists of two traffic lanes in both the westbound and eastbound directions, with a right-turn-only lane in the westbound direction. The Burbank to Los Angeles Project Section proposes a "hybrid" grade separation, with Flower Street and San Fernando Road slightly depressed, and the HSR alignment and non-electrified tracks raised on a retained-fill structure. Flower Street would be lowered in elevation between Air Way and San Fernando Road, and the lowest point of the undercrossing would be approximately 10 feet below original grade. The existing median would be modified on Flower Street, and the overall width of Flower Street would remain the same. San Fernando Road would be lowered in grade between Norton Avenue and Alma Street, and Pelanconi Avenue would be extended to connect to San Fernando Road. The height of the new retained-fill structure would be approximately 28 feet. Figure 2-18 shows the temporary and permanent project footprint areas.



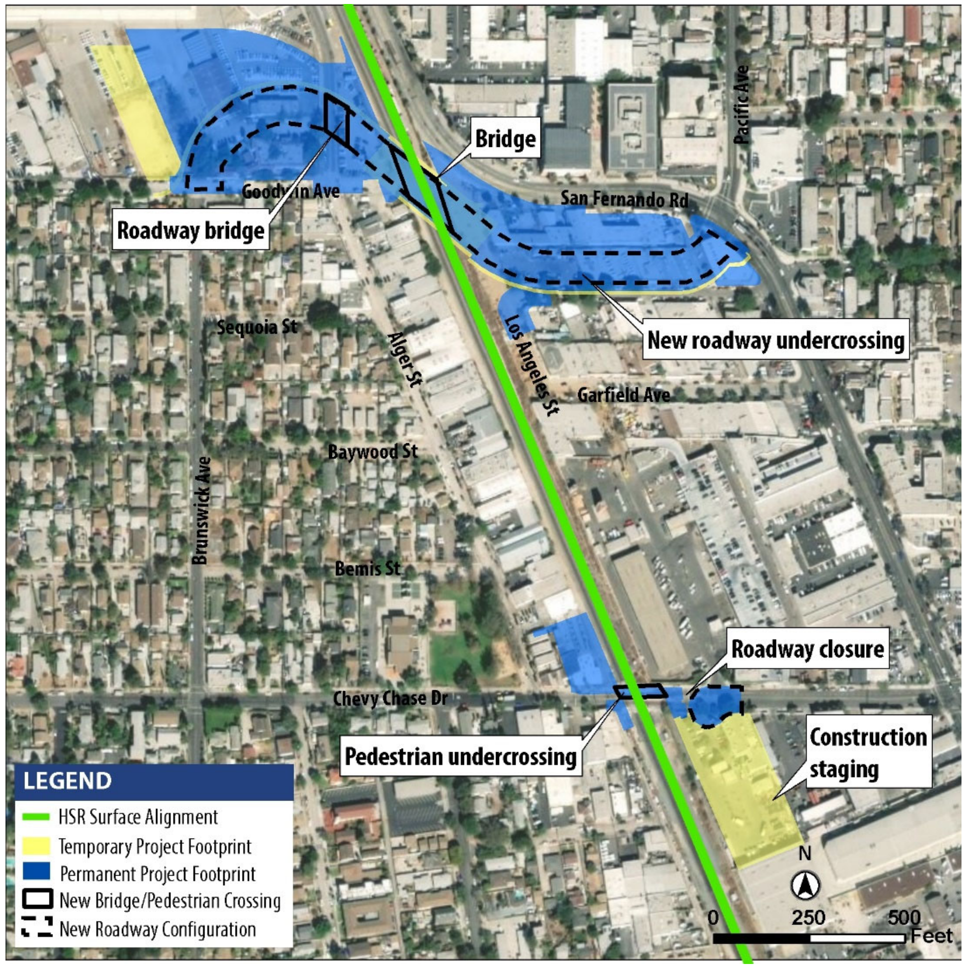
Source: California High-Speed Rail Authority, 2019

Figure 2-18 Flower Street Grade Separation Footprint

2.6.5 Goodwin Avenue/Chevy Chase Drive Grade Separation

There is currently no crossing at Goodwin Avenue, which ends in a cul-de-sac on the west side of the railroad right-of-way. The Burbank to Los Angeles Project Section proposes a grade separation, with Goodwin Avenue realigned and depressed to cross under a new railroad bridge supporting the HSR and non-electrified tracks. A new roadway bridge would also be required to carry Alger Street over the depressed Goodwin Avenue, connecting to W San Fernando Road. The new depressed roadway would curve north from Brunswick Avenue, cross under the new roadway and railroad bridges, and connect with Pacific Avenue on the east side of the railroad right-of-way. The lowest point of the undercrossing would be approximately 28 feet below original grade.

Chevy Chase Drive is an at-grade crossing. With the construction of a new grade separation at Goodwin Avenue, Chevy Chase Drive would be closed on either side of the rail crossing and a pedestrian undercrossing would be provided. Figure 2-19 shows the temporary and permanent project footprint areas for Goodwin Avenue and Chevy Chase Drive.



Source: California High-Speed Rail Authority, 2019

Figure 2-19 Goodwin Avenue Grade Separation

2.6.6 Main Street Grade Separation

Main Street is an existing at-grade crossing. It crosses the existing tracks at-grade on the west bank of the Los Angeles River, crosses over the river on a bridge, and then crosses the existing tracks at-grade on the east bank of the river. The existing bridge carries two traffic lanes in both directions. The Burbank to Los Angeles Project Section proposes a grade separation, with a new Main Street bridge spanning the tracks on the west bank, the Los Angeles River, and the tracks on the east bank. The new Main Street bridge would be 86 feet wide and 75 feet high at its highest point over the Los Angeles River and would place three columns within the river channel. Main Street would be raised in elevation, starting from just east of Sotello Street on the west side of the Los Angeles River. The new bridge would come down to grade at Clover Street on the east side of the Los Angeles River. Several roadways on the east side of the Los Angeles River would be reconfigured, including Albion Street, Lamar Street, Avenue 17, and Clover Street. The existing Main Street bridge would not be modified, but it would be closed to public access. Figure 2-20 shows the temporary and permanent project footprint areas.

Source: California High-Speed Rail Authority, 2019

Figure 2-20 Main Street Grade Separation Footprint

2.7 Project Construction

For the Burbank to Los Angeles Project Section of the California HSR System, specific construction elements would include at-grade and underground track, grade-separated roadway crossings, retaining walls, and installation of a PTC system. 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. The at-grade track would be laid on an earthen railbed topped with rock ballast approximately 3 feet off the ground. Fill and ballast for the railbed would be obtained from permitted borrow sites and quarries.

Retaining walls are used when it is necessary to transition between an at-grade and elevated profile. In this project section, retained fill would be used between Western Avenue and SR 134. The tracks would be raised in elevation on a retained-fill platform made of reinforced walls, much like a freeway ramp. Short retaining walls would have a similar effect and would protect the adjacent properties from a slope extending beyond the proposed rail right-of-way.

The preferred construction method for the tunnel alignment underneath the Burbank Airport runway is the sequential excavation method. The tunnel alignment south of the airport would be constructed using cut-and-cover.

Pre-construction activities would be conducted during final design and would include geotechnical investigations, interpretation of anticipated ground behavior and ground support requirements, 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 be conducted as needed.

Major construction activities for the Burbank to Los Angeles 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 is envisioned to be underway 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 but could be expected to extend to 24 hours per day, seven days per week.

2.8 Independent Utility of the Burbank to Los Angeles Project Section

The Burbank to Los Angeles Project Section would have independent utility if it is able to operate as a standalone project in the event the other project sections of the HSR system are not constructed. As none of the four types of maintenance facilities would be located within the limits of the Burbank to Los Angeles Project Section, all maintenance functions for vehicles and infrastructure would be handled through an independent contractor to achieve independent utility. For power, one potential location for a TPSS has been preliminarily identified within the project section. Because the addition of a TPSS would alter the spacing of the other systems facilities, further design and environmental study would be required to environmentally clear the TPSS site and the alteration of the other systems facilities in the absence of the Palmdale to Burbank and Los Angeles to Anaheim project sections being built and operated.

Any electrical interconnections between a potential future TPSS site and existing utility providers would also have to be environmentally evaluated and cleared in subsequent documentation.

2.9 Operations of the Burbank to Los Angeles Project Section

The conceptual HSR service plan for Phase 1, starting in 2029, 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 north of Sacramento. These extensions do not have an anticipated implementation date.

Currently, the Metrolink Ventura and Antelope Valley Lines, Amtrak Pacific Surfliner and Coast Starlight, and UPRR freight trains operate within the Burbank to Los Angeles Project Section. As the proposed HSR Build Alternative is within the active LOSSAN passenger and freight rail corridor, all existing operators would have to change their operation patterns and frequency. New and realigned tracks would change the tracks on which the various users operate, with passenger rail and freight trains shifted closer to the east side of the right-of-way. With the introduction of HSR service, the proposed general operational characteristics are shown in Table 2-3.

Table 2-3 Existing and Future Trains per Day in the Los Angeles–San Diego–San Luis Obispo Rail Corridor Within the Burbank and Los Angeles Project Section

Operator	2016 Existing Conditions	2029 Opening Day	2040 Horizon Year
California High-Speed Rail Authority[1]	N/A	196	196
Metrolink[2]	61	99	99
Amtrak[3]	12	16	18
UPRR[4]	11	18	23

[1] 2029 Opening Day and 2040 Horizon Year projections are from the California High-Speed Rail Authority's "Year 2029 and Year 2040 Concept Timetable for EIR/EIS Analysis."
[2] Existing Conditions data are from the 2016 Metrolink Schedule (effective October 3, 2016); 2029 Opening Day projections are extrapolated from the 2016 Metrolink 10-Year Strategic Plan, *"Growth Scenario 2: Overlay of Additional Service Patterns."*
[3] Existing Conditions data are from the 2016 LOSSAN Corridor Schedule; 2029 Opening Day projections are extrapolated from 2012 LOSSAN Corridorwide Strategic Implementation Plan "Long-Term Operations Analysis" (increase of approximately one train every four years for the Amtrak Pacific Surfliner and no growth for the Amtrak Coast Starlight between Hollywood Burbank Airport and LAUS).
[4] Existing Conditions data are from the 2012 LOSSAN Corridorwide Strategic Implementation Plan "Long-Term Operations Analysis"; 2029 Opening Day projections are extrapolated from the 2012 LOSSAN Corridorwide Strategic Implementation Plan "Long-Term Operations Analysis" (increase of approximately one train every 2 years for UPRR between Hollywood Burbank Airport and LAUS).
Amtrak = National Railroad Passenger Corporation
LAUS = Los Angeles Union Station
N/A = not applicable
UPRR = Union Pacific Railroad

3 LAWS, REGULATIONS, ORDERS

3.1 Federal

The California Department of Transportation (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 for assembling a statewide short-term improvement plan called the Federal Statewide Transportation Improvement Program (STIP). Federal law requires the State of California to update the STIP at least once every 4 years. The Federal STIP compiles all Federal Highway Administration and Federal Transit Administration projects that have been programmed throughout the state using federal funds.

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 require 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 Federal Highway Administration, Federal Transit Administration and FRA are also responsible for implementing certain federal environmental protection laws, including the NEPA.

Federal regulations that need to be considered as part of the project traffic technical analysis are summarized below.

3.1.1 Procedures for Considering Environmental Impacts (64 Federal Register 28545)

The FRA's *Procedures for Considering Environmental Impacts* defines procedures for environmental documents for the consideration of possible impacts on transportation. The categories of these impacts include impacts on passengers and freight transportation; impacts by modes of transport, including bicyclists and pedestrians; and impacts on roadways.

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 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 capacity-increasing and operations-improving projects related to rail, mass transportation, local highways, and the state highway system programmed through the state using state or federal funds, thus including the HSR project.

3.2.1 State Greenhouse Gas Reduction Goals

In 2005, California set statewide targets for reducing greenhouse gas (GHG) emissions via Executive Order S-3-05. The California State Legislature soon after adopted Assembly Bill 32, the Global Warming Solutions Act of 2006. Assembly Bill 32 requires the California Air Resources Board, the state agency charged with regulating air quality, to create a plan and implement rules to achieve real, quantifiable, cost-effective reductions of GHGs in California. The plan supports the implementation of an HSR system to provide more mobility choice and reduce GHG emissions.

Senate Bill 375 was adopted in September 2008 and provided a new planning process to coordinate the community development and land use planning process with Regional Transportation Plans (RTP). Senate Bill 375 sets priorities to help California meet its GHG reduction goals and requires the RTPs prepared by metropolitan planning organizations (including the Councils of Governments for Kern and Los Angeles counties) to include a "Sustainable Communities Strategy (SCS)" or, if infeasible, an "alternative planning strategy" that would support the GHG emission reduction targets for automobiles and light trucks set by the California Air Resources Board.

3.2.2 California Government Code Section 65080

California Government Code Section 65080 requires each transportation planning agency to prepare and adopt an RTP directed at achieving a coordinated and balanced regional transportation system.

3.2.3 California Streets and Highways Code Section 1 et seq.

The code includes the provisions and standards for administration of the statewide streets and highways system. Designated state route and interstate highway facilities are under the jurisdiction of Caltrans, except where management of the facility has been delegated to local jurisdictions.

3.2.4 Senate Bill 743 and CEQA Guidelines section 15064.3

Senate Bill 743, codified in Public Resources Code section 21099, created a shift in transportation impact analysis under CEQA from a focus on automobile delay as measured by LOS and similar metrics toward a focus on reducing vehicle miles traveled (VMT) and GHG emissions. The Legislature required the Governor's Office of Planning and Research (OPR) 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 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 this Authority has done), and is required to shift to a VMT metric by July 1, 2020.

OPR has provided a technical advisory on evaluating transportation impacts in CEQA (OPR 2018a) and further information related to the change in Guidelines in its 2018 Statement of Reasons supporting the guideline change (OPR 2018b), and related to LOS and VMT on its CEQA Update website (OPR 2018c).

3.2.5 California Streets and Highways Code Section 890

California law defines bicycle facilities, as presented in Table 3-1.

Table 3-1 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

3.2.6 Complete Streets Implementation Action Plan 2.0

This Plan defines the target implementation period as June 2014 to June 2017. The first version of the Plan had an implementation timeframe of March 2010 to June 2013. The Plan defines the current Caltrans complete streets policy framework and summarizes the agency's complete streets implementation efforts. It also defines the structure for monitoring, reporting, and overcoming barriers to integrate complete streets implementation into all Caltrans functions and processes. The Plan includes action items in the categories of Guidance, Manuals, and Handbooks; Policy and Plans; Funding and Project Selection; Awareness and Outreach; Data and Performance Measures; Training; Research; and Partnerships and Coordination.

3.2.7 California State Bicycle and Pedestrian Plan

In June 2017, Caltrans adopted the Toward an Active California State Bicycle and Pedestrian Plan, which is the first statewide plan that lays out the policies and actions that Caltrans and its partner agencies will take to achieve the statewide goals to double walking and triple bicycling trips by 2020. The plan includes an evaluation of existing relevant actions, and defines goals and objectives for active transportation projects implementation. It also defines performance measures, and includes public outreach and engagement strategies.

3.2.8 California Transportation Plan 2040

This plan is a core document that ties together 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 identifies a sustainable transportation system by pulling together the following 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

3.2.9 California Department of Transportation District Plans

Caltrans plans at the district level provide information on future development affecting state facilities. The Caltrans district system planning process is primarily composed of four parts: the District System Management Plan, the Transportation Concept Report (TCR), the Corridor System Management Plan (CSMP), and the District System Management Plan Project List. These system planning products are also intended as resources for stakeholders, the public, and partner regional and local agencies.

The district-wide District System Management Plan is a strategic policy and planning document that focuses on maintaining, operating, managing, and developing the transportation system. The District System Management Plan Project List is an appendix to the District System Management Plan and provides a list of planned and partially programmed transportation projects used to recommend projects for funding.

The TCR is a planning document that identifies the existing and future route conditions as well as future needs for each route on the state highway system.

The CSMP is a complex, multijurisdictional planning document that identifies future needs within corridors experiencing or expected to experience high levels of congestion. The CSMP is the direct result of the November 2006 voter-approved Proposition 1B. This ballot measure included a funding program deposited into a Corridor Mobility Improvement Account. To receive Corridor Mobility Improvement Account funds, the California Transportation Commission guidelines require that project nominations describe in a CSMP how mobility gains from funded corridor improvements would be maintained over time. A CSMP therefore aims to define how corridors will be managed over time, focusing on operational strategies in addition to the already funded expansion projects. The goal is to get the most out of the existing system and maintain or improve corridor performance. The CSMP serves as a TCR for segments covered by the CSMP.

Caltrans District 7 has TCRs for the following routes, as described below in Table 3-2 in the excerpts from the agency's website.

Table 3-2 Freeway Characteristics and Transportation Concept Report—Routes in the Transportation Resource Study Area

Route	Summary
I-5	I-5 (Santa Ana Freeway/Golden State Freeway) provides general north-south access in the overall study area between Burbank, Glendale, and Los Angeles. It provides access to the east side of downtown Los Angeles, and also interchanges with other downtown-serving freeways, including I-110 and I-10. Overall, the facility provides access to the entire State of California, terminating on the south at the border with Mexico and terminating on the north at the border with Canada. It is a major link between San Diego County, Orange County, Los Angeles County, the Central Valley, and areas further north, including Sacramento. The average annual daily traffic on I-5 in the project vicinity is as high as 270,000 vehicles. High-occupancy vehicle/HOT lanes are planned, programmed, and recommended for I-5 in the study area in the 2012–2035 RTP/SCS, as well as in the Caltrans District 7 TCR.
SR 14	SR 14 is a major east-west state route that traverses Los Angeles County and is used for international, interstate, interregional, and intraregional travel and shipping through an urbanized corridor. It is also used as a commuter route. Traffic volumes are forecast to increase on SR 14 in 2035. Additional lanes will be necessary to achieve the acceptable concept level-of-service. Several capacity improvements are planned, programmed, and recommended for this corridor in the 2012–2035 RTP/SCS.
US-101	US-101 is a major north-south highway route that traverses Los Angeles County and is used for interregional and intraregional travel and shipping. The segments through the San Fernando Valley are heavily congested during peak periods and often during the off-peak and weekends as well. The route is part of the California Freeway and Expressway System. Traffic volume is forecast to increase on US-101 in 2035, but no capacity improvements are programmed for this corridor.

Route	Summary
SR 110	I-110/SR 110 is a major north-south freeway facility that traverses Los Angeles County and is used for international, interstate, interregional, and intraregional travel and shipping through an urbanized corridor, serving the four major import-export terminals of Long Beach Municipal Airport, Los Angeles International Airport, and the Ports of Long Beach and Los Angeles. It is also used as a commuter route. Traffic volume is forecast to increase on I-110/SR 110 in 2035. Additional lanes will be necessary to achieve the acceptable concept level-of-service. The 2012–2035 RTP/SCS plans for and recommends several capacity improvements for this corridor, including a regional Express/HOT Lanes network on I-405 from I-5 (north San Fernando Valley) to the Los Angeles/Orange County line. There is currently an HOT lane demonstration project on I-110. During the study period, single-occupant vehicles with a transponder will be allowed to use the HOT lanes for a fee. The fee will vary depending on time of day and the congestion of the mainline. Registered carpoolers with transponders will continue to be allowed to use the HOT lanes for free (the facility now operates as a permanent HOT facility).
SR 134	SR 134 is a major east-west state route that traverses Los Angeles County and is used for interstate, interregional, and intraregional travel and shipping through an urbanized corridor It is also used as a commuter route. Traffic volume is forecast to increase on SR 134 in 2035. Additional lanes will be necessary to achieve the concept level-of-service. Several capacity improvements are planned, programmed, and recommended for this corridor. SR 134 serves primarily as an interregional commute corridor. It provides a connection between the San Fernando Valley and the San Gabriel Valley. The 2012–2035 RTP/SCS and Caltrans District 7 TCR proposed several capacity-increasing and mainline improvements throughout this corridor.

Sources: Southern California Association of Governments 2012–2035 RTP (2012); Caltrans District 7 TCR (2013)

Caltrans = California Department of Transportation
HOT = high-occupancy toll
I- = Interstate
RTP/SCS = Regional Transportation Plan/Sustainable Communities Strategy
SR = State Route
TCR = Transportation Concept Report
US- = U.S. Route

3.3 Regional and Local

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

Regional-scale planning for transportation infrastructure and programs, management of transport-related air quality impacts, and guidance for local land use decisions related to transportation are governed by a designated congestion management agency. The regional entity that is responsible for congestion management agency actions may be a council of governments; a county association of governments; a county or local transportation commission; a transportation or transit authority, agency, or district; or a joint powers agency, depending on local agency preferences, population density (e.g., urban or rural counties or municipalities), and transportation purpose. Congestion management agencies are responsible for preparing metropolitan transportation plans, RTPs, and local transportation plans.

In Los Angeles County, the Southern California Association of Governments (SCAG) is the regional transportation authority and metropolitan planning organization (MPO), and Metro serves as the congestion management agency. Table 3-3 contains a summary of the relevant regional plans and policies from these two agencies.

Table 3-3 Regional Transportation Plans and Policies Summary

Policy Title	Summary
Metropolitan Planning Organization	
Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy [SCAG RTP/SCS] (2016)	The SCAG RTP/SCS is a long-range metropolitan transportation plan that is developed and updated by SCAG every 4 years. The RTP/SCS provides a vision for transportation investments throughout the region. Using growth forecasts and economic trends that project over a 20–25 year period, the RTP/SCS considers the role of transportation in the broader context of economic, environmental, and quality-of-life goals for the future, identifying regional transportation strategies to address our mobility needs. Goals include: • Developing long-range regional plans and strategies that provide for efficient movement of people, goods, and information; enhance economic growth and international trade; and improve the environment and quality of life • Providing quality information service and analysis for the region • Using an inclusive decision-making process that resolves conflicts and encourages trust • Creating an educational and work environment that cultivates creativity, initiative, and opportunity Strategies include: • Expanding the region's high-speed and commuter rail systems • Establishing rail connections to the region's airports to improve accessibility and connectivity • Reducing the impact of air passenger trips on ground transportation congestion, including continuing to support regional and inter-regional projects that facilitate airport ground access (e.g., High-Speed Train) • Investing financially in passenger rail. Maintaining the commitments in the 2012 RTP/SCS, including Phase 1 of the California High-Speed Train and the Southern California High-Speed Rail Memorandum of Understanding, which identifies a candidate project list to improve the Metrolink system and the LOSSAN rail corridor • Reducing the impact of air passenger trips on ground transportation congestion, including continuing to support regional and inter-regional projects that facilitate airport ground access (e.g., High-Speed Train) • Support the development of a High-Speed Train station on Hollywood Way and provide convenient access between the station and the airport
SCAG FTIP (Adopted for 2019)	The SCAG FTIP is a capital listing of all transportation projects proposed over a 6-year period for the SCAG region. The projects include highway improvements, transit, rail, and bus facilities; high-occupancy vehicle lanes; signal synchronization; intersection improvements; and freeway ramps. In the SCAG region, a biennial FTIP update is produced on an even-year cycle. The FTIP is prepared to implement projects and programs listed in the RTP and is developed in compliance with state and federal requirements. County Transportation Commissions have the responsibility under state law of proposing county projects—using the current RTP's 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 this list, SCAG develops the FTIP based on consistency with the current RTP, inter-county connectivity, financial constraint, and conformity satisfaction. The goals of the FTIP 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

<table>
<tr><th>Policy Title</th><th>Summary</th></tr>
<tr><td>SCAG Regional Comprehensive Plan (RCP) (2008)</td><td>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</td></tr>
<tr><td>SCAG Sustainability Planning Grants Program/Compass Blueprint Plan (2005)</td><td>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</td></tr>
<tr><td colspan="2">Regional Transportation Planning Agency (State)</td></tr>
<tr><td>Metro RTIP (2018)</td><td>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 FSTIP 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</td></tr>
</table>

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).
Metro First-Last Mile Strategic Plan (2014)	The First-Last Mile 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: • Expanding the reach of transit through infrastructure improvements • Maximization of multi-modal benefits and efficiencies • Building upon the RTP/SCS and Countywide Sustainable Planning Policy (multi-modal, green, equitable, and smart)
Metro Complete Streets Policy (2014)	The Complete Streets Policy was developed to establish a standard of excellence for multimodal design. The term "Complete Streets" describes a comprehensive, integrated transportation network with infrastructure and design that allows safe and convenient travel along and across streets for all users, including pedestrians, users and operators of public transit, bicyclists, persons with disabilities, seniors, children, motorists, users of green modes, and movers of commercial goods. Goals include: • Maximizing the benefit of transit service and improving access to public transit by making it convenient, safe, and attractive for users • Maximizing multimodal benefits and efficiencies • Improving safety for all users on the transportation network • Facilitating multi-jurisdictional coordination and leveraging partnerships and incentive programs to achieve a "complete" and integrated transportation system that serves all users • Establishing active transportation improvements as integral elements of the countrywide transportation system • Fostering healthy, equitable, and economically vibrant communities where all residents have greater mobility choices

Sources: SCAG 2005, 2012b, 2012c, 2014, 2016a, 2016b, and 2019; Metro 2009, 2010, 2013, 2014a, 2014b, and 2018

Caltrans = California Department of Transportation
CMP = Congestion Management Plan
EIR = environmental impact report
EIS = environmental impact study
FTIP = Federal Transportation Improvement Program
GHG = greenhouse gas
LOS = level(s)-of-service
LOSSAN = Los Angeles-San Diego-San Luis Obispo
Metro = Los Angeles County Metropolitan Transportation Authority
RTP = Regional Transportation Plan
RTIP = Regional Transportation Improvement Program
SCAG = Southern California Association of Governments
SCS = Sustainable Communities Strategy
USDOT = U.S. Department of Transportation

3.3.2 County or Municipal General Plans or Community Plans

Counties and cities must prepare general plans with transportation policies and ordinances. While general plans provide important context information for effect assessment, 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 County or Municipal General Plans Summary

Policy Title	Summary
Los Angeles County General Plan (2015)	Los Angeles County's jurisdiction for planning purposes is generally the unincorporated areas of the county. 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 Traffic Impact Analysis Guidelines (1997)	The guidelines provide 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 ICU LOS of ≥ 0.04 for LOS C, ≥ 0.02 for LOS D, and ≥ 0.01 for LOS E and LOS F • Establishing that all CMP intersections where at least 50 trips during either peak hour will be added must be studied (150 trips per peak hour for freeway mainlines)
City of Los Angeles Mobility Plan 2035 (2016)	The City of Los Angeles General Plan 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. While 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

Policy Title	Summary
City of Glendale General Plan (1998)	The City of Glendale 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 effects of transportation. Significant transportation effects are defined by the City of Glendale traffic study guidelines as a difference in intersection V/C and LOS of ≥ 0.02 at LOS D, E, or F. General goals of the plan include: • Balance land use/zoning with roadway capacity by establishing congestion thresholds and avoiding unacceptable levels of congestion from future development
City of Burbank 2035 General Plan Mobility Element (2013)	The General Plan establishes policies and goals to ensure the efficient movement of people and goods, promote compatibility between transportation modes and land uses, and reduce the adverse air quality effects of transportation. Significant transportation effects are defined by the City of Burbank traffic study guidelines as a difference in intersection V/C and LOS of ≥ 0.02 for LOS D, ≥ 0.01 for LOS E, and ≥ 0.005 for LOS F. Unsignalized intersection impacts are defined as 2 percent, 1 percent, and five or more project trips under the same LOS values. General policies in the plan include: • Improve Burbank's alternative transportation access to local and regional destinations through land use decisions that support multimodal transportation. • Require new projects to contribute to the city's transit and/or non-motorized transportation network in proportion to its expected traffic generation. • Design street improvements so they preserve opportunities to maintain or expand bicycle, pedestrian, and transit systems. • Improve transit connections with nearby communities and connections to Downtown Los Angeles, West San Fernando Valley, Hollywood, and the Westside. • Implement the Bicycle Master Plan by maintaining and expanding the bicycle network, providing end-of-trip facilities, improving bicycle/transit integration, encouraging bicycle use, and making bicycling safer. • Provide bicycle connections to major employment centers, shopping districts, residential areas, and transit connections.

Source: County of Los Angeles 1997, 2015; City of Los Angeles 2001, 2007, 2015; City of Glendale 1998; City of Burbank, 2013

CMP = Congestion Management Plan
LOS = level(s)-of-service
ICU = intersection capacity utilization
V/C = volume-to-capacity

3.3.3 Airport Master Plans

Airport authorities prepare master plans that identify future air travel demand and development strategies to meet this demand. The master plans provide forecasts for future aviation demand as well as new or expanded airport projects. The following commercial airport facilities are in or near the RSA and would be likely sources of trip diversion from air trips to HSR trips.

3.3.3.1 Los Angeles International Airport Master Plan

Los Angeles International Airport (LAX) is owned and operated by Los Angeles World Airports. 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. The LAX Master Plan (City of Los Angeles 2004) was designed to serve 78.9 million annual passengers and 3.1 million tons of cargo. At the time of publication, the number of passengers was forecast to be 98 million by 2015. According to the *LAX 2011 Economic Impact Analysis* (County of Los Angeles 2012a), 61 million passengers moved in and out of the airport on 265,000 flights and more than 1.9 million tons of air freight and mail were carried.

3.3.3.2 Hollywood Burbank Airport Improvements

Hollywood Burbank Airport (formerly Burbank Bob Hope Airport) is owned and operated by the Burbank-Glendale-Pasadena Airport Authority. It is located 3 miles northwest of downtown Burbank and serves the northern Greater Los Angeles area, including Glendale, Pasadena, and the San Fernando Valley. The airport authority is planning for construction of a 14-gate Replacement Terminal, with improved spacing from runways and updated earthquake design standards.

A portion of the excess land gained by the project will be developed for commercial office and other land uses. Transportation improvements at the airport include the recently-completed Regional Intermodal Transportation Center near the intersection of Hollywood Way/Empire Avenue, which provides direct linkages between the Metrolink Ventura County Line at the south side of the airport, bus transit services at the Regional Intermodal Transportation Center, and the airport terminals.

3.3.4 Public Transportation Plans

Public transportation agencies serve the public interest by adopting plans that guide future services and facilities developments. Table 3-5 contains a summary of relevant data from public transportation plans and studies.

Table 3-5 Summary of Data from Relevant Public Transportation Plans and Studies

Policy Title	Summary
Metro Long Range Transportation Plan (2009)	Metro is currently updating the LRTP adopted in 2009. The LRTP provides a visionary blueprint for transportation improvements for Los Angeles County and input into the development of the RTP. 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. 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 at the same time
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
Glendale Downtown Mobility Plan (2007)	The Downtown Mobility Study was adopted by the Glendale City Council in March 2007 and complements the Downtown Specific Plan approved by the city council in November 2006. The Mobility Study strives to accommodate new growth and enhance mobility. For transit connections, the study recommended new seamless connections between regional and local services, including the incorporation of a downtown circulator route that would connect the Glendale Transportation Center (now the “Larry Zarian Transportation Center”), to proposed new east-west transit services in north Glendale.

Sources: Metro, 2009, 2014b; City of Glendale, 2007
Metro = Los Angeles County Metropolitan Transportation Authority
LRTP = Long-Range Transportation Plan
RTP = Regional Transportation Plan
SRTP = Short-Range Transportation Plan

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 3-6 contains a summary of relevant regional, county, and city plans and policies pertaining to nonmotorized transportation.

Table 3-6 Summary of Nonmotorized Transportation Plans

Agency	Plans and Policies
Regional Agencies	
SCAG	2012–2035 RTP/SCS Active Transportation Chapter (2012)
Metro	First Last Mile Strategic Plan (2014) Complete Streets Policy (2014) Bicycle Transportation Strategic Plan (2006)
Metro	The Bicycle Transportation Strategic Plan was prepared to improve mobility in the region through the use of bicycles. The plan is designed for the use of cities, the County of Los Angeles, and transit agencies in planning bicycle facilities around transit and setting priorities that contribute to regional improvements. The plan includes: • A listing of 167 identified “bike-transit hubs” in the county • Audit procedures for evaluating obstacles to bicycle access • Non-motorized “best practices” in a tool box of design measures • Gaps in the inter-jurisdictional bikeway network • Two prototype Bike-Transit Hub Access Plans in different geographical and demographic regions in the county
Los Angeles County and Cities	
Los Angeles County (2012)	The Los Angeles County Bicycle Master Plan, a component of the county’s General Plan Mobility Element, proposes a bicycle system that would make bicycling more accessible to the public by providing 695 miles of new bikeways throughout the county.
City of Los Angeles (2011)	The 2010 Bicycle Plan is part of the City of Los Angeles Transportation Element. The city’s Mobility Plan 2035 proposed a potential bike lane along Riverside Drive.
City of Glendale (2012)	The Glendale Bicycle Master Plan contains programs and policies to better accommodate and encourage bicycling in Glendale. The planned improvements include new bikeways, bicycle parking, and links to transit.
City of Burbank (2009)	The Burbank Bicycle Master Plan serves to guide both the development and maintenance of a bicycle network and support facilities for a 25-year planning horizon. The policies and programs defined in the plan address bikeway facility planning, community involvement, utilization of existing resources, facility design, multimodal integration, safety, education, related programs, implementation, maintenance, and funding.

Source: SCAG 2008, 2012; Metro 2006, 2014, 2015; County of Los Angeles 2012b; City of Los Angeles 2011; City of Glendale 2012; City of Burbank, 2009
HSR = high-speed rail
Metro = Los Angeles County Metropolitan Transportation Authority
RTP = Regional Transportation Plan
SCAG = Southern California Association of Governments
SCS = Sustainable Communities Strategy

4 METHODS FOR EVALUATING IMPACTS

This section describes the methodology for determining study locations within the resource study area (RSA) and the methodology for evaluating transportation operations and for evaluating effects under CEQA and the National Environmental Policy Act (NEPA). This Transportation Technical Report does not define significant impacts of the project, nor does it define mitigation measures. Standards for defining impacts and analysis methodology are defined here, but significant impacts and mitigation measures are defined within the Project EIR/EIS.

This methodology has been developed based on the Authority's *Project EIR/EIS Environmental Methodology Guidelines, Version 5* (June 2014), as well as supplemental information and direction provided by the Authority.

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 Burbank to Los Angeles 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 improvements, the RSA is defined based on anticipated increased or decreased measures of effectiveness, such as control delay or traffic density. The general geographic limits of the RSA include the Burbank Airport Station at the north and LAUS at the south, generally following the existing railroad corridor. Determination of the transportation RSA followed the guidelines summarized below:

- Roadway segments that will be closed or grade-separated as a result of the project
- If roadways closures are proposed, the most likely alternate routes that will 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 project section will expand, signalize, or physically reconfigure
- All major new intersections created by the project
- Critical intersections of collector (or higher) facility types that have an increase of 50 or more vehicles in the peak hour as a result of the project section
- The location of the LAUS HSR Station area parking and pick-up/drop-off areas[7]
- The proposed HSR Burbank Airport Station location
- Freight and passenger rail facilities that are proposed to be removed, added, or modified

The initial transportation study locations selected were defined based on these guidelines and utilized the most recent available ridership and trip projections available at the time. The final RSA was refined as the designs, project footprint, and ridership and vehicle trip projections were updated throughout the process. The finalized study area analyzed for this report included 202 study intersections and 37 study roadway segments. The RSA is illustrated on Figure 4-1,

The lane configuration figures of all the study intersections are provided in Appendix A.

[7] A final footprint/site configuration plan for the HSR project elements at LAUS has not been finalized. Assumptions have been made on parking locations and pick-up/drop-off locations, based on the current station design framework provided by HSR.

Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

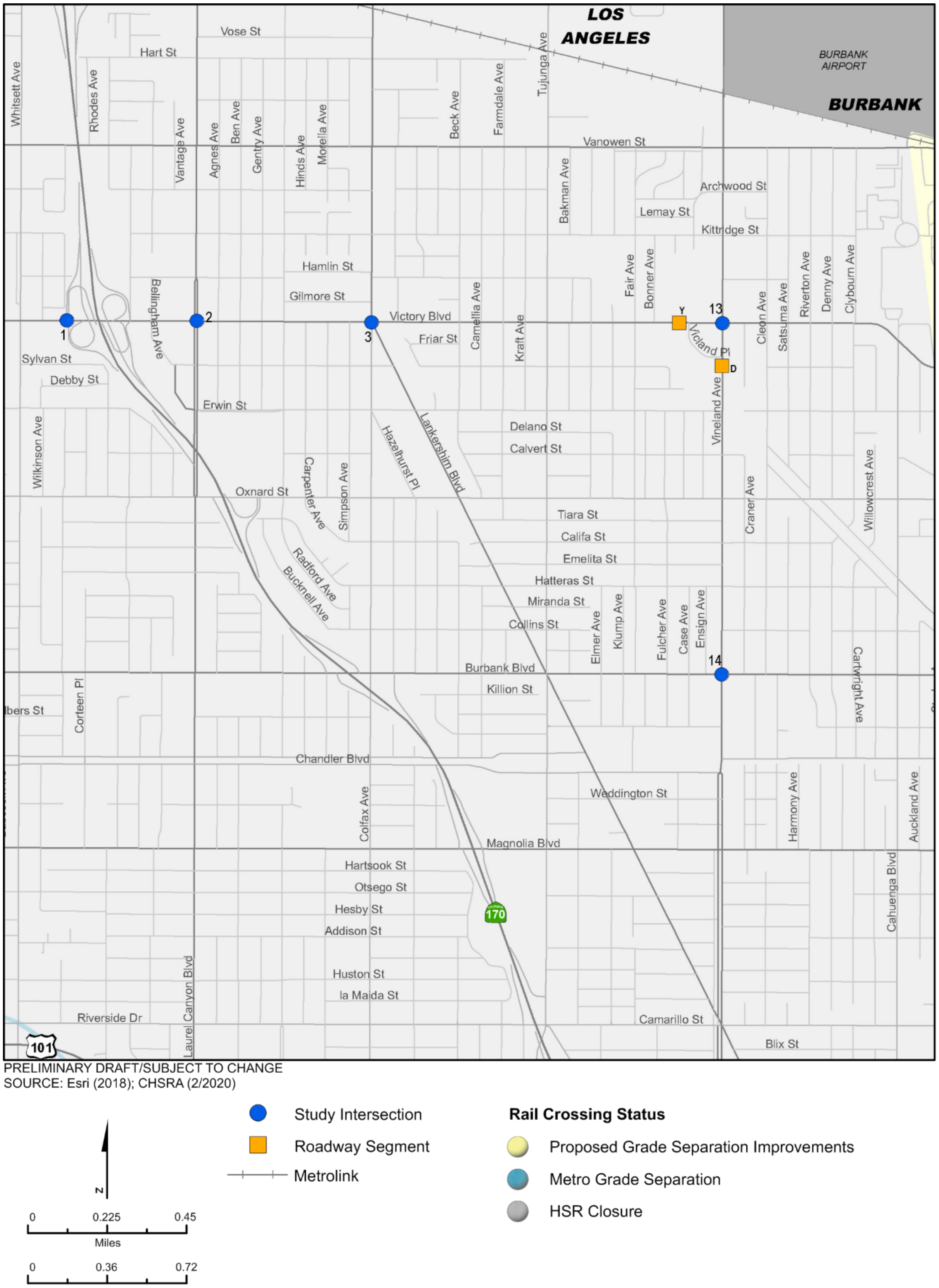
Figure 4-1 Transportation Resource Study Area

(Sheet 1 of 10)

Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

Figure 4-1 Transportation Resource Study Area

(Sheet 2 of 10)



Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

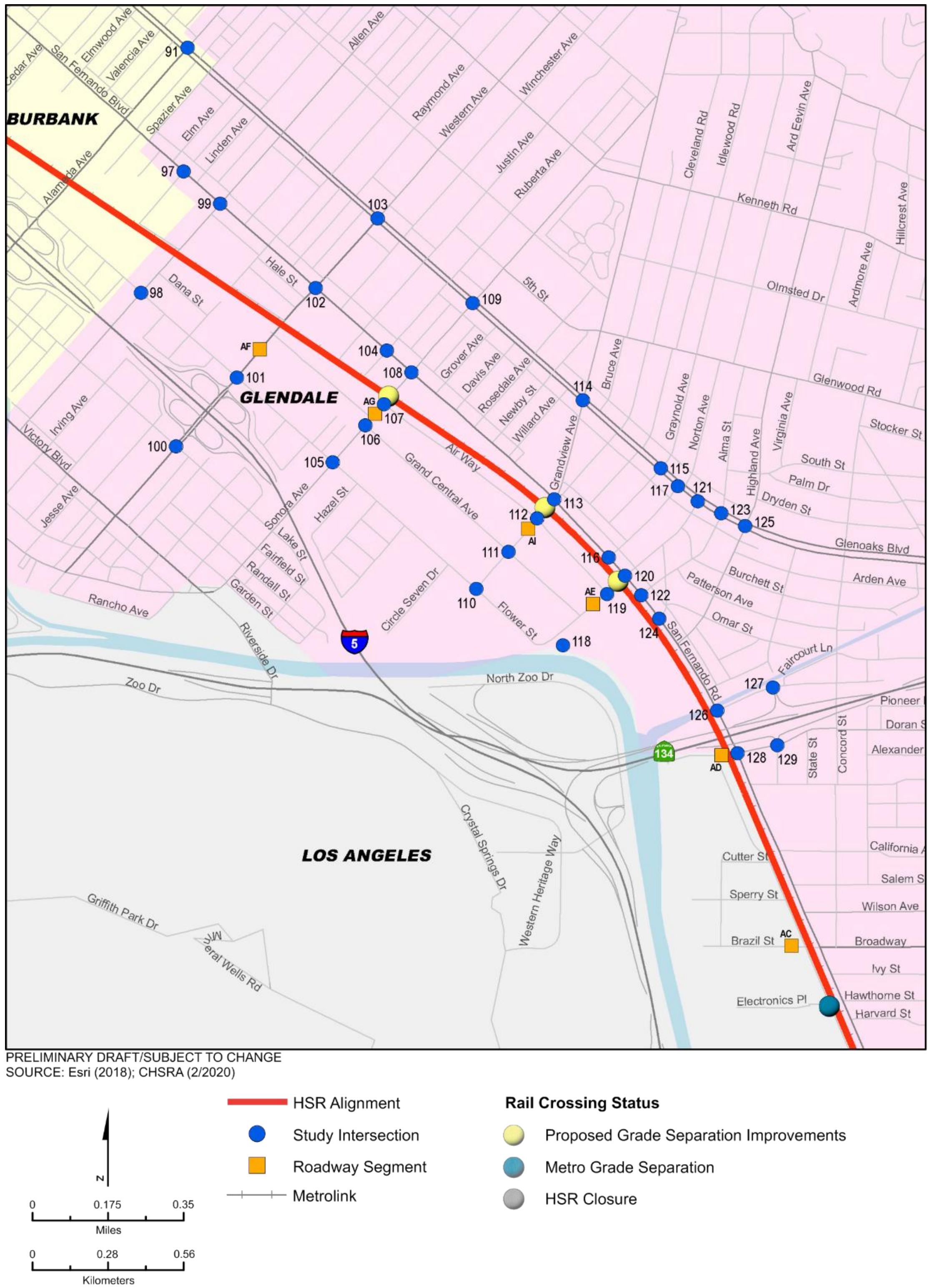
Figure 4-1 Transportation Resource Study Area

(Sheet 3 of 10)

Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

Figure 4-1 Transportation Resource Study Area

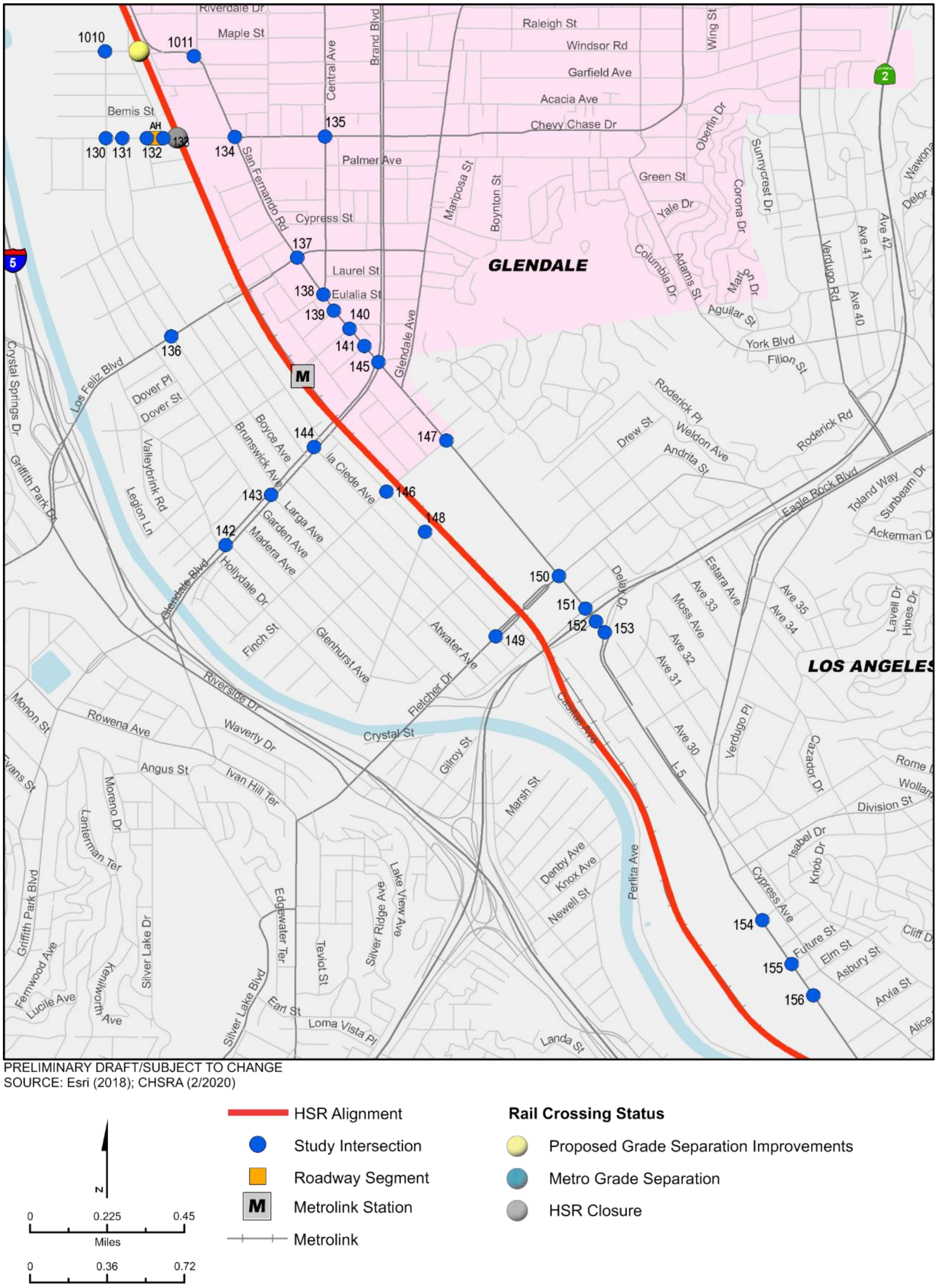
(Sheet 4 of 10)



Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

Figure 4-1 Transportation Resource Study Area

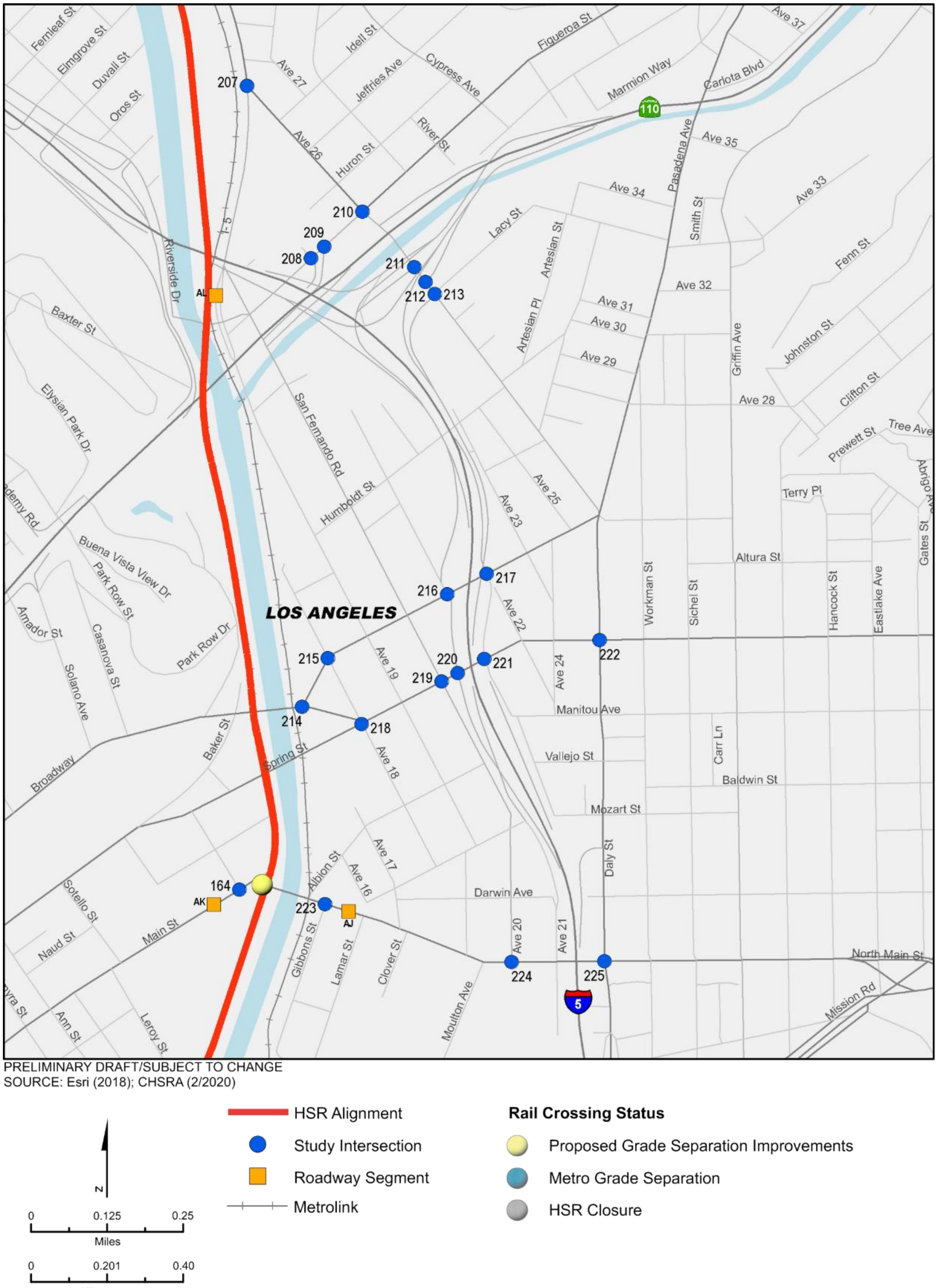
(Sheet 5 of 10)



Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

Figure 4-1 Transportation Resource Study Area

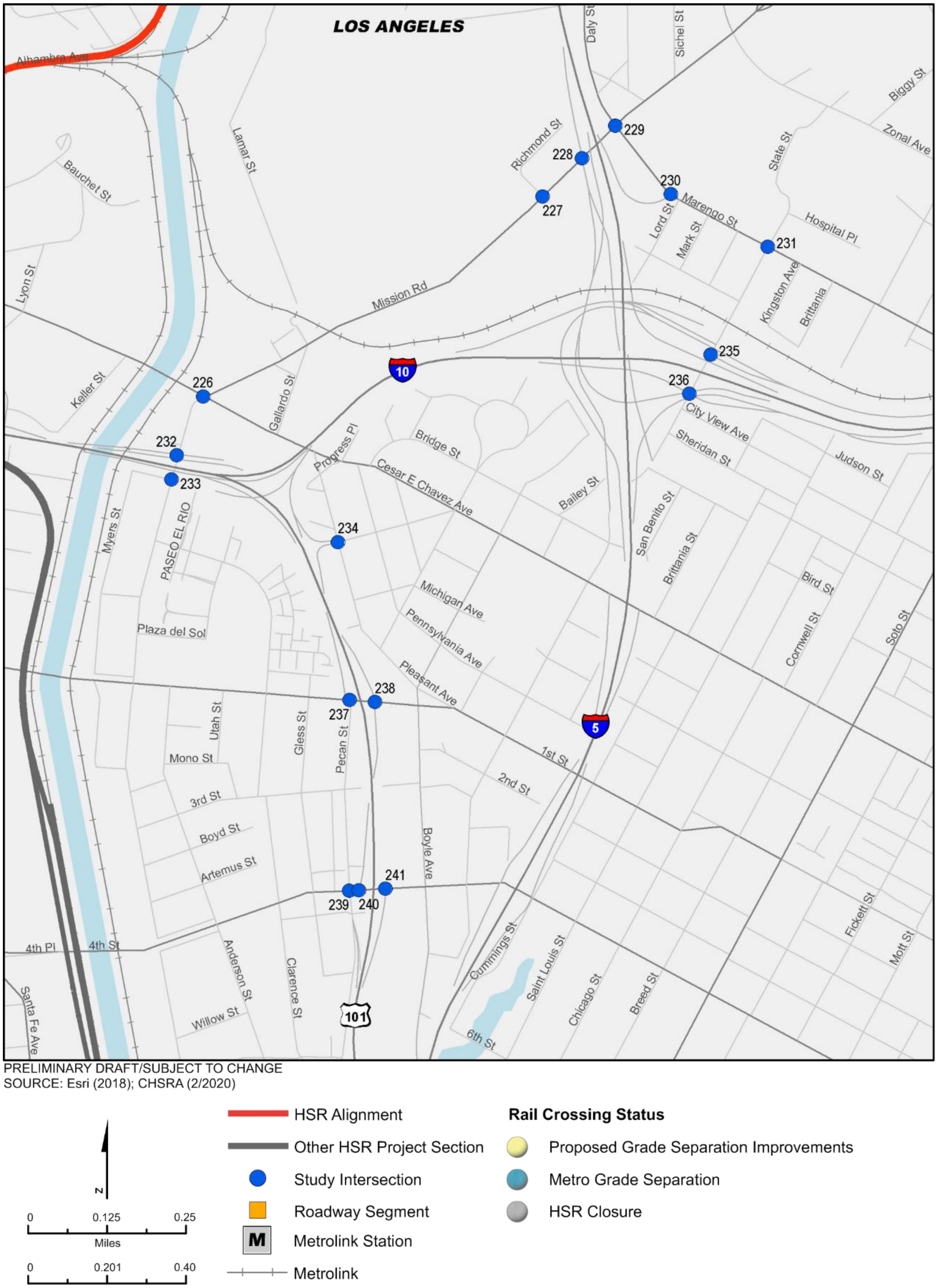
(Sheet 6 of 10)



Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

Figure 4-1 Transportation Resource Study Area

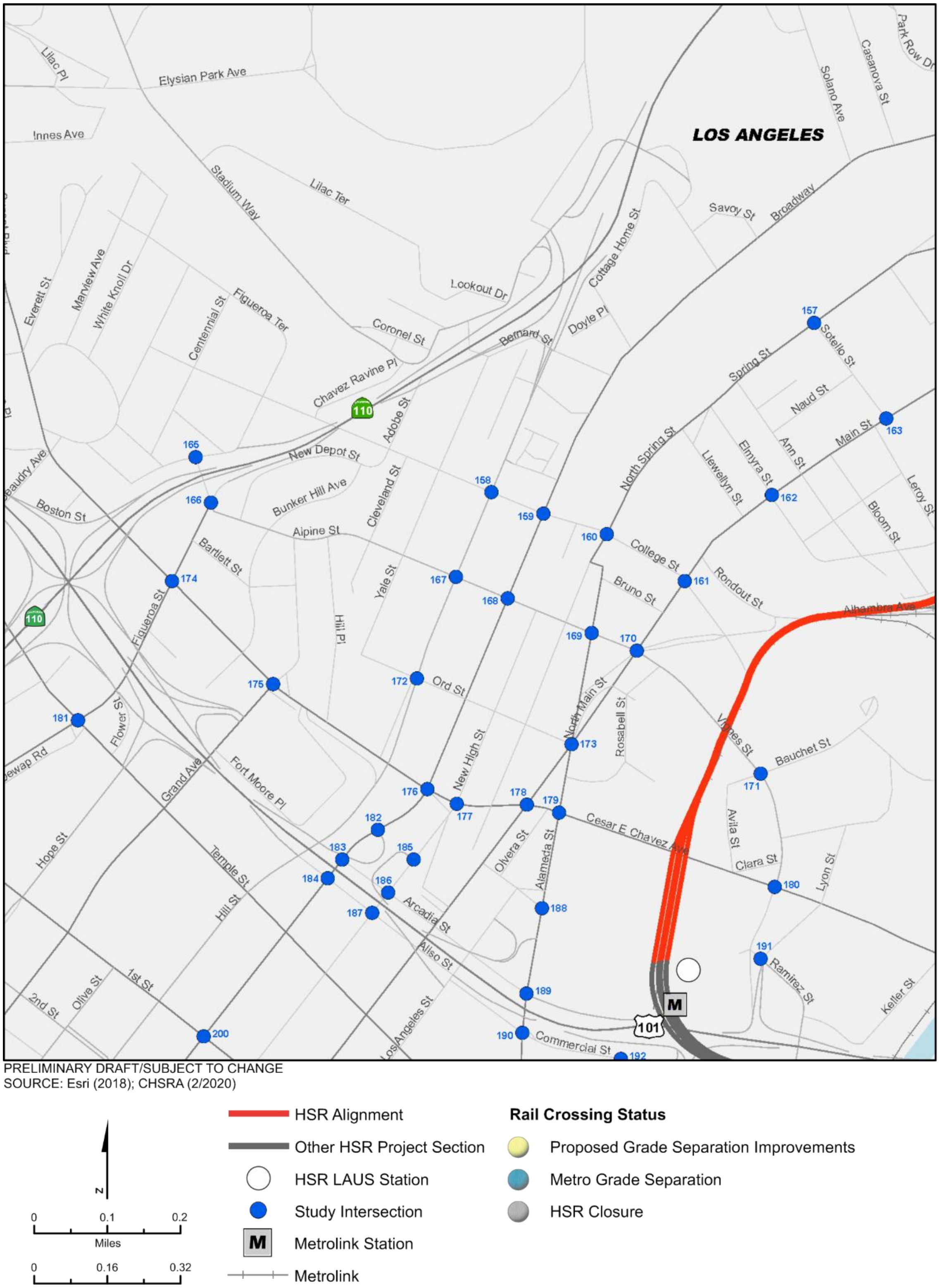
(Sheet 7 of 10)



Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

Figure 4-1 Transportation Resource Study

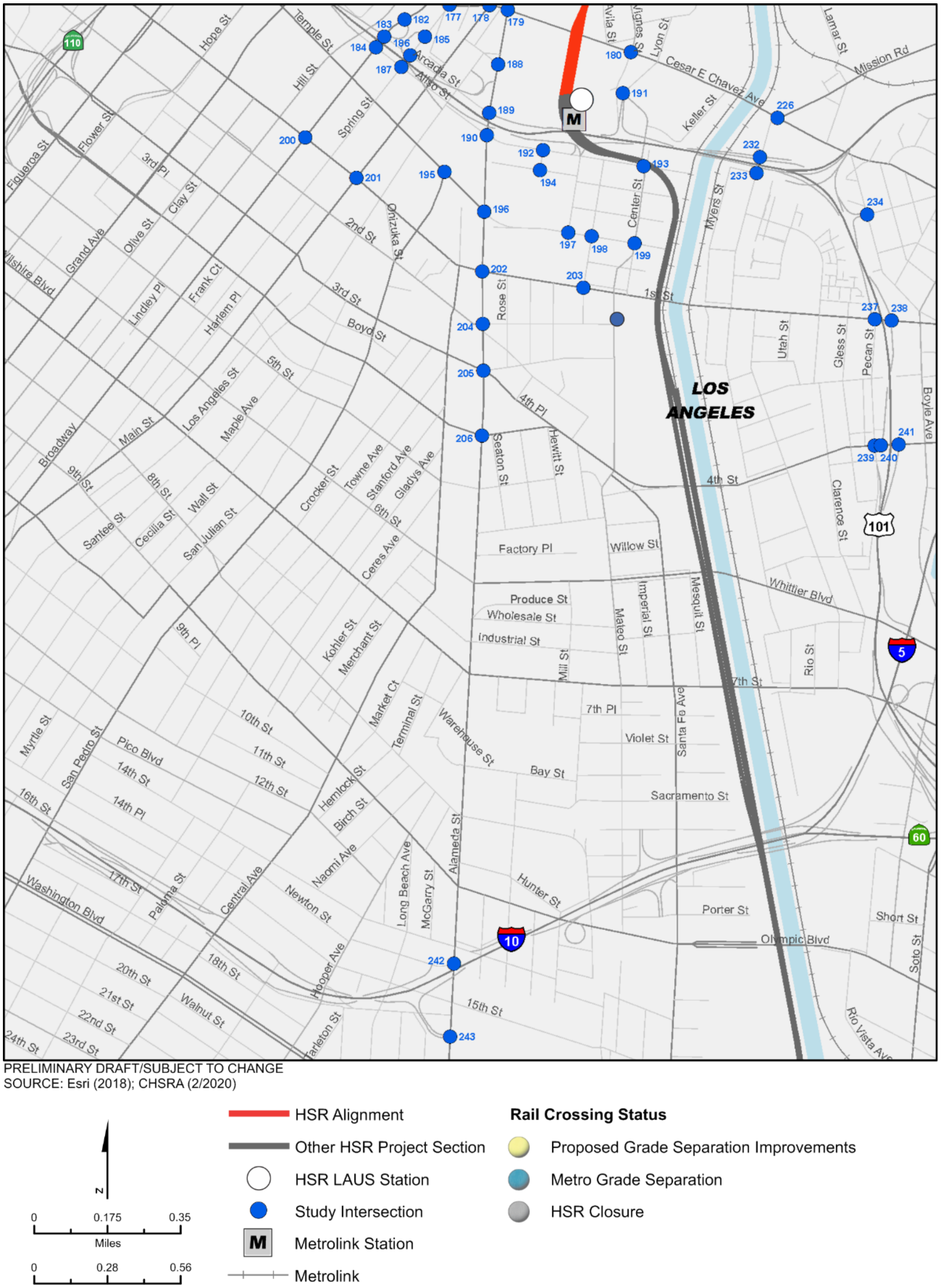
(Sheet 8 of 10)



Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

Figure 4-1 Transportation Resource Study Area

(Sheet 9 of 10)



Source: California High-Speed Rail Authority and Federal Railroad Administration, 2019

Figure 4-1 Transportation Resource Study Area

(Sheet 10 of 10)

4.2 Methodology for Effect Analysis

Major intersections are defined as intersections where both the major street and the cross-street are classified as a collector roadway or higher classification. Roadways that are proposed to be grade-separated can be expected to have the following impacts:

- Temporary transportation impacts during construction (analyzed qualitatively)
- Increases in traffic due to the diversion of traffic from roadways that would be either temporarily closed, resulting in major detours, and roadways that are permanently closed for the operations period (analyzed quantitatively)

Roadways that are permanently closed would be expected to experience a decrease in traffic due to the project in terms of capacity utilization, but travelers would be expected to experience an increase in travel time as trips would be diverted to roadways with grade separations.

4.2.1 Study Approach and Potential Baselines

The following sections describe the approaches and assumptions used for the analysis, as well as the baselines.

The SCAG RTP/SCS with a baseline year of 2008 and a buildout year of 2035 was utilized for the growth projections used in the traffic analysis, as it was the best available data source at the time of this study. The analysis of the HSR project required forecasts for 2029 and 2040, which had to be interpolated for 2029 and extrapolated for 2040 from the difference in volumes between the 2008 and 2035 model years output, and calculations of annual and compounded growth.

Due to the potential for the project to impact roadway facilities, the transportation analysis focused on the roadway facilities that the project would cross, roadway facilities that would be modified by the project 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 the analysis of the following scenarios:

- Existing (2015) No Project
- Existing (2015) Plus Project Construction
- Opening Year (2029) No Project
- Opening Year (2029) Plus Project
- Horizon Year (2040) No Project
- Horizon Year (2040) Plus Project

The Project EIR/EIS Environmental Methodology Guidelines, Version 5 (Authority 2014) 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.

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

This baseline was used as input for two analysis scenarios:

- Existing Year (2015)
- Existing Year (2015) with Project Construction

The existing year transportation operations analysis incorporated traffic counts that were conducted for this study, and other recent traffic count data from other projects where it was shown to be more conservative (higher volumes). The traffic counts were conducted in early December 2015, while area schools were in session and area traffic conditions were generally normal, i.e. not during the late-December holiday season.

A comparison with traffic counts also conducted in December 2015 for Metro’s LAUS Master Plan project indicated that the counts for the Metro project were generally higher (based on higher area traffic activity on the day the counts were collected). Therefore, for purposes of providing a conservative analysis, those higher volume counts were used for intersections that overlapped in the HSR project and Metro LAUS projects.

The existing traffic counts were applied to the analysis of RSA traffic conditions for the Existing (2015) No Project and Existing (2015) Plus Project Construction scenarios.

The vehicle turning movement counts for study intersections are provided in Appendix B-1. The 24 hour traffic volume counts are provided in Appendix B-2.

4.2.1.2 Environmental Baseline #2: Project Implementation Condition (Opening Year 2029)

This baseline was used as input for two analysis scenarios:

- Opening Year (2029) No Project
- Opening Year (2029) Plus Project

No Project Conditions – Planned Infrastructure Projects

State and local roadway improvement funding programs were reviewed and confirmed to be incorporated into the highway network of the SCAG regional model as relevant to the project alignment. The reviewed programs included the following:

- City of Burbank Capital Improvement Program
- City of Glendale Capital Improvement Program
- City of Los Angeles Capital Improvement Program
- California State Transportation Improvement Program

In each case, only the portion of the program that is in the financially constrained part of the RTP was included by SCAG in the model data. These are the projects for which funding is reasonably foreseeable.

No Project Conditions – Traffic Growth

Projected traffic growth from the existing scenario year to the baseline scenario year was calculated through the use of data from the SCAG regional traffic model.

The official land use and transportation assumptions for the regional traffic model were adopted by SCAG in 2012 in the form of the RTP/SCS. These assumptions were incorporated into the SCAG RTP 2012 Travel Demand Model. This model includes existing roadway networks and capacity assumptions, land use growth assumptions for all area jurisdictions, and planned network changes, including capacity enhancements. The model is used by SCAG and by cities and counties to estimate future transportation network vehicle volumes.

The highway networks in the SCAG model have a base year of 2008 and a future year of 2035. The a.m. peak period is three hours (6:00 a.m. to 9:00 a.m.), and the p.m. peak period is four hours (3:00 p.m. to 7:00 p.m.).

The ratio of the base year 2008 and future year 2035 link volumes in the SCAG model were used to compute the separate annualized growth factors for the entering and exiting volumes for each leg of each study intersection. The growth factors between the existing year 2015 and the Opening Year 2029 and Horizon Year 2040 scenario years were then calculated based on an annualized growth factor. The growth factor for the a.m. peak period was applied to the existing-year a.m. peak-hour traffic counts and the factor for the p.m. peak period was applied to the existing-year p.m. peak-hour traffic counts to produce the future baseline turning movement volumes for analysis. The forecasts therefore reflect both actual existing traffic volumes and the officially adopted growth forecasts.

The Furness model data processing procedure was applied to calculate the future intersection turning movement volumes based on existing turning movements and future link volumes. The methodology is discussed in the National Cooperative Highway Research Program (NCHRP) Report 765, published by the Transportation Research Board in 2014. The method is commonly referred as the NCHRP 765 procedure.

Any negative growth was removed after the Furness process was performed. Within a regional model, the forecasting and assignment process can result in negative volumes at the local link and intersection level. The locations where negative growth was forecast were removed to provide a conservative net positive change in traffic conditions for analysis purposes. The baseline data calculated based on this method was used for the Opening Year (2029) and Horizon Year (2040) No Project scenarios.

Plus Project Analysis – Station Trip Generation and Distribution

The California High-Speed Rail Ridership and Revenue Model's forecasting results were used to determine vehicle trip generation from the HSR Burbank Airport and LAUS stations based on expected HSR project activity. The data include the following:

- The station passenger trips and vehicle trips summary
- Vehicle trips to and from the stations by traffic analysis zone (TAZ)

The Authority provided estimates of daily boardings by station, along with information on mode of access/egress, average vehicle occupancy, and parking demand for opening year 2029 and horizon year 2040. The ridership forecasting methodology was provided in the *Ridership and Revenue Forecasting – 2016 Business Plan: Technical Supporting Document*, published by the Authority on April 8, 2016. The opening year analysis assumes an operating HSR system with Phase 1 active. The horizon year analysis assumes a fully operating HSR network.

The Authority provided daily passenger trip distribution data in the form of the location of each trip's origin/destination by TAZ. Daily passenger trips by auto modes by TAZ were further estimated based on mode split results, the walking distance between TAZs and stations, as well as each TAZ's accessibility to transit service.

The steps involved in the calculations and analysis for trip generation at the stations is discussed below:

1. The daily passenger trips by auto modes by TAZ were aggregated into zones based on the general access routes of the TAZs to the stations. All trips that would access a station from a particular freeway corridor were added together.
2. The daily passenger trips by auto modes were split into park-and-ride (PNR) trips and kiss-and-ride (KNR) trips based on the mode of access/egress estimation from the HSR Model.
3. The daily passenger trips were converted to vehicle trips by applying vehicle occupancy rates, which were calculated based on the mode split results.
4. The daily vehicle trips were converted to peak-period trips, then to peak-hour trips. It was assumed that the a.m. peak hour and p.m. peak hour would have approximately identical shares of the peak-period trips, and that the six hour period from the HSR Model included three a.m. peak hours and three p.m. peak hours. The peak-hour trips were calculated by dividing the peak-period trip totals by six.
5. The vehicle trips have been analyzed and calculated so far only represent the boarding trips, or inbound trips. It is assumed that the alighting trips, or outbound trips, will approximately follow a symmetric pattern.

Using the trip generation estimates, the peak hour vehicle trips were coded into a geographic analysis network that represents the stations and their surrounding areas. PNR trips were assigned to major parking garages/lots in the station areas based on the ratio of their parking supply. KNR trips were routed to the designated passenger loading areas at each station through the primary entrance/exit point.

The vehicle trips were assigned to the study intersections based on the expected distribution of trips from each direction and the most likely paths through the street network. The volumes at each study intersection were added to the opening year and horizon year no project baseline volumes. The result was a set of plus-project volumes to be applied to the related plus project analysis scenarios.

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

This baseline was used as input for two analysis scenarios:

- Horizon Year (2040) No Project
- Horizon Year (2040) Plus Project

Planned Infrastructure Projects

Inclusion of infrastructure project details anticipated to be implemented within the timeframe between the existing year and the future year for this baseline was conducted in a similar manner to that of the Environmental Baseline #2.

No Project Conditions – Traffic Growth

Inclusion of traffic growth from the existing year to the baseline year data for this baseline was conducted in a similar manner to that of the Environmental Baseline #2. The detailed methodology is discussed in section 4.2.1.2.

Plus Project Analysis – Station Trip Generation and Distribution

Project trip generation and distribution was conducted in a similar manner to that of the Environmental Baseline #2. The detailed methodology is discussed in section 4.2.1.2.

4.2.2 Traffic Operational Standards

This section describes transportation operating conditions standards and analysis procedures like delay in terms of LOS and V/C.[8]

LOS is the primary unit of measure for stating the operating quality of a highway or roadway. LOS is calculated by comparing the actual number of vehicles using a roadway to its carrying capacity. In general, LOS is measured by the ratio of traffic volume to capacity (V/C) or by the average delay experienced by vehicles on the facility. The Highway Capacity Manual (Transportation Research Board 2010) is a recognized source for the techniques used to measure transportation facility performance.

Using the Highway Capacity Manual procedures, the quality of traffic operations is graded into one of six LOS designations: A, B, C, D, E, or F. LOS A represents the best range of operating conditions (least delay to motorists) and LOS F represents the worst (greatest delay).

The following sections describe LOS standards more specifically for intersections and for roadway segments.

4.2.2.1 Intersections

At intersections, LOS is defined based on the delay experienced per vehicle. The LOS methodology for signalized intersections accounts for the effects of signal type, timing, phasing, and progression on average delay. The average delay per vehicle and LOS for signalized intersections based on the Highway Capacity Manual methodology are defined quantitatively in Table 4-1.

Unsignalized intersections include two-way stop-controlled and all-way stop-controlled intersections. The LOS for an all-way stop control intersection is defined by delay for the intersection as a whole, whereas for a two-way stop-controlled intersection, LOS is based on the delay for the worst-case operations by movement.

[8] Once the State of California has approved final guidance on the implementation of Senate Bill 743, this guidance may be revisited.

Table 4-1 Level-of-Service Values and Average Vehicular Delay Definitions for Signalized Intersections

LOS	Definition	Average Stop Delay per Vehicle (seconds)
A	LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at the boundary intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.	≤10
B	LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted, and control delay at the boundary intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.	>10 and < 20
C	LOS C describes stable operation. The ability to maneuver and change lanes at midsegment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.	>20 and < 35
D	LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed.	>35 and < 55
E	LOS E is characterized by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed.	>55 and < 80
F	LOS F is characterized by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed. Also, LOS F is assigned to the subject direction of travel if the through movement at one or more boundary intersections has a volume-to-capacity ratio greater than 1.0.	>80

Source: Tranportation Research Board, 2010
LOS = level(s)-of-service

The average delays per vehicle and LOS for unsignalized intersections are defined in Table 4-2.

Table 4-2 Level-of-Service and Average Vehicular Delay Definitions for Unsignalized Intersections

Level-of-Service	Delay per Vehicle (seconds)
A	< 10
B	>10 and < 15
C	>15 and < 25
D	>25 and < 35
E	>35 and < 50
F	>50

Source: Highway Capacity Manual, 2010

The Synchro software package, published by Trafficware, was used for the analysis. The Synchro program allows for analysis of signal timing, traffic progression through adjacent signal locations, and overall signal synchronization. Existing intersection approach traffic controls and lane configurations/striping were collected via aerial maps and checked in the field.

4.2.2.2 Roadway Segments

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.

Table 4-3 defines and describes the LOS criteria for the roadway segment analysis.

Table 4-3 Level-of-Service and Volume-to-Capacity Definitions for Roadway Segments

Level-of-Service	Volume-to-Capacity Ratio	Definition
A	0.00–0.60	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.
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	0.80–0.90	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: Highway Capacity Manual, 2010

The peak-hour capacity of a roadway is determined by the number of lanes and the roadway category (facility type). The peak-hour capacities by roadway type used in this analysis vary by area type such as urban, urban business, and so on. The operations analysis of roadway segments was conducted using roadway capacity values defined by the SCAG Regional Model.[9] The applied capacities for the study roadway segments throughout the RSA are provided in Table 4-4.

[9] SCAG Regional Travel Demand Model and 2008 Model Validation, Table 4.3, June 2012.

Table 4-4 Applied Capacities on Study Roadway Segments

ID.	Roadway Segment	Area Type	No. of Lanes (on)	No of Lanes (crossing)	Hourly Capacity	Daily Capacity
A	Sunland Boulevard - South of I-5 Northbound Ramps	Urban	4	4	2,900	65,400
B	Sunland Boulevard - North of San Fernando Road Minor	Urban	4	2	3,200	65,400
C	Vineland Avenue - South of San Fernando Road	Urban	4	4	2,900	65,400
D	Vineland Avenue - South of Victory Boulevard	Urban	4	4	2,900	69,000
E	Hollywood Way - South of I-5 Northbound Ramp	Urban	4	4	2,900	69,000
F	Hollywood Way - South of San Fernando Road Ramp	Urban	5	4	3,625	93,600
G	Hollywood Way - South of Winona Avenue	Urban	5	4	3,625	93,600
H	Hollywood Way - South of Thornton Avenue	Urban	4	2	3,200	69,000
I	Hollywood Way - North of Avon Street	Urban	4	2	3,200	69,000
J	Hollywood Way - North of Victory Boulevard	Urban	4	4	2,900	69,000
K	Hollywood Way - South of Victory Boulevard	Urban	4	4	2,900	69,000
L	Buena Vista Street - North of San Fernando Road	Urban	4	4	2,900	69,000
M	Buena Vista Street - South of San Fernando Road	Urban	4	4	2,900	69,000
N	Buena Vista Street - South of Empire Avenue	Urban	5	4	3,625	93,600
O	Lincoln Boulevard - South of San Fernando Road	Urban	4	4	2,900	69,000
P	Empire Avenue - East of Buena Vista Street	Urban	4	4	2,900	69,000
Q	Burbank Boulevard - South of I-5 Northbound ramps	Urban	6	4	4,950	118,200
R	San Fernando Road - West of Vineland Avenue	Urban	4	4	2,900	69,000
S	San Fernando Road - West of Hollywood Way	Urban	4	4	2,900	69,000
T	San Fernando Road - West of Buena Vista Street	Urban	4	4	2,900	69,000
U	Victory Place - West of Empire Street	Urban	2	4	1,100	27,600
V	San Fernando Road Minor - East of Vineland Avenue	Urban	2	4	1,100	26,400

ID.	Roadway Segment	Area Type	No. of Lanes (on)	No of Lanes (crossing)	Hourly Capacity	Daily Capacity
W	San Fernando Road Minor - West of I-5 Southbound Ramps	Urban	2	4	1,100	26,400
X	Sherman Way - West of Vineland Avenue	Urban	4	4	2,900	69,000
Y	Victory Boulevard - West of Vineland Avenue	Urban	6	4	4,950	118,200
Z	Victory Boulevard - West of Hollywood Way	Urban	4	4	2,900	69,000
AA	Victory Boulevard - East of Hollywood Way	Urban	4	4	2,900	69,000
AB	San Fernando Road - West of Arvilla Avenue	Urban	4	4	2,900	69,600
AC	Brazil Street - West of Railroad Track	Urban Business	2	2	1,200	28,800
AD	Doran Street - West of Railroad Track	Urban Business	2	2	1,200	28,800
AE	Flower Street - West of Air Way	Urban Business	4	2	3,000	72,000
AF	Western Avenue - East of Flower Street	Urban Business	4	4	2,700	64,800
AG	Sonora Avenue - West of Air Way	Urban Business	4	4	2,700	64,800
AH	Chevy Chase Drive - West of railroad track	Urban Business	2	2	1,200	28,800
AI	Grandview Avenue - West of Air Way	Urban Business	4	2	3,000	72,000
AJ	Main Street - East of Los Angeles River	Urban Business	4	2	3,000	72,000
AK	Main Street - West of Los Angeles River	Urban Business	4	2	3,000	72,000
AL	Avenue 19 - North of Figueroa Street (bridge)	Urban	2	2	1,250	30,000

Source: California High Speed Rail Authority, 2017
I-5 = Interstate 5

4.2.2.3 Freeway Ramp Queuing

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. For on-ramps, capacity was estimated by the existing geometry, using maximum throughput capacities in the Caltrans Ramp Metering Design Manual (2016). Peak hour queue length was determined using a similar methodology to the procedure for calculating minimum queue length storage for new or reconstructed ramps. For off-ramps, ramp capacity, volume approaching the intersection, and queue length was determined from the resulting Synchro intersection analysis and 95th percentile queue length output.

4.2.2.4 Vehicle Miles Traveled Calculations

VMT is calculated based on the number of vehicles multiplied by the distance traveled by each vehicle. Calculations of the project reduction in regional VMT due to the shifting of long-distance auto trips to the HSR system were based on the medium and high range of project ridership forecasts, as defined within the California High-Speed Rail Authority's Business Plan. The Plan forecasts are based on a statewide model developed by the Authority.

Analysts developed ridership forecasts for the HSR system using the latest 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 3. The model incorporates socioeconomic growth assumptions (population, housing, and employment forecasts) consistent with the California Statewide Travel Demand Model and adjusts them for the 2029 and 2040 forecast years. The statewide conventional passenger rail and urban transit networks are consistent with current and planned routes in the Caltrans 2013 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 to 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 of vehicles that would travel on the freeways and roads in the RSA using a version of the SCAG Trip-Based Transportation Model. This forecasting tool was identified as the most appropriate for the project because it encompasses all of the RSA intersections and freeway segments, as well as all local counties.

Modeling adjustments in the SCAG model were made to include the HSR LAUS and Burbank stations in order to develop vehicle forecasts for this analysis. The traffic analysis applied intersection and freeway LOS analytical methods to evaluate the vehicular traffic impacts from the HSR stations. Analysis volumes were defined by existing counts and 2029 and 2040 No Project traffic volumes for the RSA station areas and alignment by using growth factors by roadway link defined by the SCAG model. The growth factors were applied to the existing volumes to arrive at the future No Project volumes for the RSA intersections. Vehicle trips were manually added to the HSR station sites to the 2029 and 2040 No Project traffic volumes based on distribution data derived from the SCAG model to estimate the project-related traffic volumes.

4.3 Determining Significance under the National Environmental Policy Act

NEPA does not provide a definitive threshold to determine significant or potentially significant effects to transportation. Procedures for considering environmental effects (Federal Register Volume 64, Page 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 and the intensity and duration of the potential effect, along with implementation of mitigation measures to determine whether an effect is significant or less than significant.

Pursuant to Council on Environmental Quality NEPA regulations (Code of Federal Regulations Title 40, Part 1500–1508), project effects are evaluated based on the criteria of context and intensity. Context refers to the affected environment in which a proposed project occurs. Intensity refers to the severity of the effect, which is examined in terms of the type, quality, and sensitivity of the resource involved, the location and extent of the effect, the duration of the effect (short- or long-term), and other considerations. Beneficial effects are identified and described. When there is no measurable effect, effect is found not to occur. The intensity of adverse effects is the degree or magnitude of a potential adverse effect, described as negligible, moderate, or substantial.

Context and intensity are considered together when determining whether an effect is significant under NEPA. Thus, it is possible that a significant adverse effect may still exist when, on balance, the effect has negligible intensity or even is beneficial. An effect with negligible intensity on transportation is defined as a worsening in transportation service levels that is measureable but not perceptible to the transportation system user. An effect with moderate intensity on transportation is defined as a worsening in transportation service levels that is measurable and perceptible to the transportation service user but does not meet the thresholds for an effect with substantial intensity. An effect with substantial intensity on transportation is defined as an adverse effect on transportation service levels.

4.4 Determining Significance under the California Environmental Quality Act

4.4.1 State

- Would the project conflict with state policy seeking to reduce vehicles miles traveled?

CEQA requires that an EIR identify the significant environmental impacts of a project (State CEQA Guidelines § 15126). One of the primary differences between NEPA and CEQA is that CEQA requires a significance determination for each impact using a threshold-based analysis. By contrast, under NEPA, significance is used to determine whether an EIS is required; NEPA requires an EIS to be prepared when the proposed federal action (project) as a whole has the potential to "significantly affect the quality of the human environment." The Authority is using the following thresholds to determine if a significant impact on transportation would occur as a result of the HSR Build Alternative.

Construction Phase

The HSR Build Alternative would have a significant impact on the environment during construction if it would:

- Result in inadequate emergency access
- Substantially increase hazards due to a geometric 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

Operational Phase

Under CEQA Guidelines section 15064.3, automobile delay no longer constitutes a significant environmental impact. Accordingly, this analysis does not characterize a particular level of automobile delay on roadways, freeways, and intersections as a significant environmental impact.

Operations-caused effects on the roadway network would be significant if they:

- Result in a net increase in VMT over baseline conditions, or otherwise conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)

VMT for the Los Angeles County roadway network was estimated based on statewide traffic modeling prepared for the project.

The HSR Build Alternative also could have a significant impact on the environment during operation if it would:

- Result in inadequate emergency access
- Substantially increase hazards due to a geometric 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

4.4.2 Local

Section 3.3.2 provides a description of local impact standards by agencies that are used for CEQA impact analysis[10].

4.4.3 High-Speed Rail Recommended Criteria

The following are the project traffic analysis criteria for signalized and unsignalized intersections, and roadway segments, as defined in the Project EIR/EIS Environmental Methodology Guidelines, Version 5 (Authority 2014). These criteria are consistent with the criteria used in transportation analyses of other HSR project sections in California.

4.4.3.1 Roadway Segments

For roadway segments, an impact would occur if the addition of project traffic results in an LOS of E or F and the V/C ratio increases 0.04 or more over the baseline condition.

4.4.3.2 Signalized Intersections

For signalized intersections, an impact would occur if the addition of project traffic results in an LOS of E or F and an increase in average traffic delay of four seconds or more.

4.4.3.3 Unsignalized Intersections

For unsignalized intersections, an impact would occur if the addition of project traffic results in an LOS of E or F and an increase in traffic delay of five seconds or more (measured as average delay for an all-way stop-controlled intersection or worst-movement delay for a side-street-stop control intersection), and if the intersection satisfies one or more traffic signal warrants (per Chapter 4C of the 2014 California Manual on Uniform Traffic Control Devices, published by Caltrans 2014a) for more than 1 hour of the day.

The guidelines do not specifically address potential effects on freeway facilities, nor do they have effects due to station areas been applicable on previous HSR project section environmental studies.

4.4.3.4 Freeway Ramps

The project would have an effect on the environment if the 95th percentile queue in the Plus Project condition exceeds the storage length while does not in the baseline condition.

[10] The most recent guidance received indicates that although local agency criteria should be considered and documented, locally-adopted criteria do not apply to this regional project.

5 AFFECTED ENVIRONMENT

This section describes the affected environment related to transportation conditions in the Burbank to Los Angeles Project Section. It describes the transportation facilities and operating conditions throughout the project section, including the highway and street network, transit services, aviation, and railroads.

The affected environment discussion considers the characteristics of roadways within the project segment, including the analyzed average daily traffic, a.m. peak-hour, and p.m. peak-hour traffic volumes, and potential future plans that may affect the development of the transportation network. As discussed in Section 4, local jurisdiction general plans were reviewed, including RTPs and public transportation plans.

The RSA for this Transportation Technical Report is generally defined by the area of study intersections and roadway segments included in this analysis, as described in Section 4.1.

5.1 Regional and Local Roadway Network

The network of interstate highways, state route highways, and arterials and local roads in the study area provide mobility among the city of Los Angeles, the city of Burbank, and the city of Glendale; between neighborhoods within the area; and throughout adjoining jurisdictions and other areas within the larger urbanized Los Angeles County region.

Functional classifications define the position of each roadway within the overall hierarchy of the roadway network, from regional travel arteries at the top to local residential roadways at the bottom:

- **Freeways and State Highways:** These facilities serve subregional and regional trips and generally have limited access configurations via on-ramps, off-ramps, and interchanges with other freeway/highway facilities.
- **Primary Arterials:** These facilities serve as links between freeways, highways, and other arterials, as well as roadways lower in the hierarchy, such as collector roadways. These facilities usually are configured with four to six travel lanes and may have raised medians and/or center two-way left-turn lanes.
- **Secondary Arterials:** These facilities serve the role of a primary arterial but with lower capacity usually not exceeding four travel lanes. They may not have raised medians or center turn lanes.
- **Collectors:** These facilities generally connect arterials to local/residential roadways and are usually two-lane roadways. A striped centerline is usually provided.
- **Local/Residential Roadways:** These facilities are the lowest level in the hierarchy, primarily serving adjoining land uses, usually in primarily residential areas. Usually, striped centerlines are not provided.

Each local jurisdiction further defines the classifications of the roadways that fall within their corporate limits. A single source of roadway capacity values was applied to the roadway segment analysis, as discussed in Section 4.2.2.2.

Streets and highways provide travel for most modes of transportation, including walking, biking, personal vehicles, public transit buses, and heavy-duty freight trucks. Existing major roadways within the study area are discussed below.

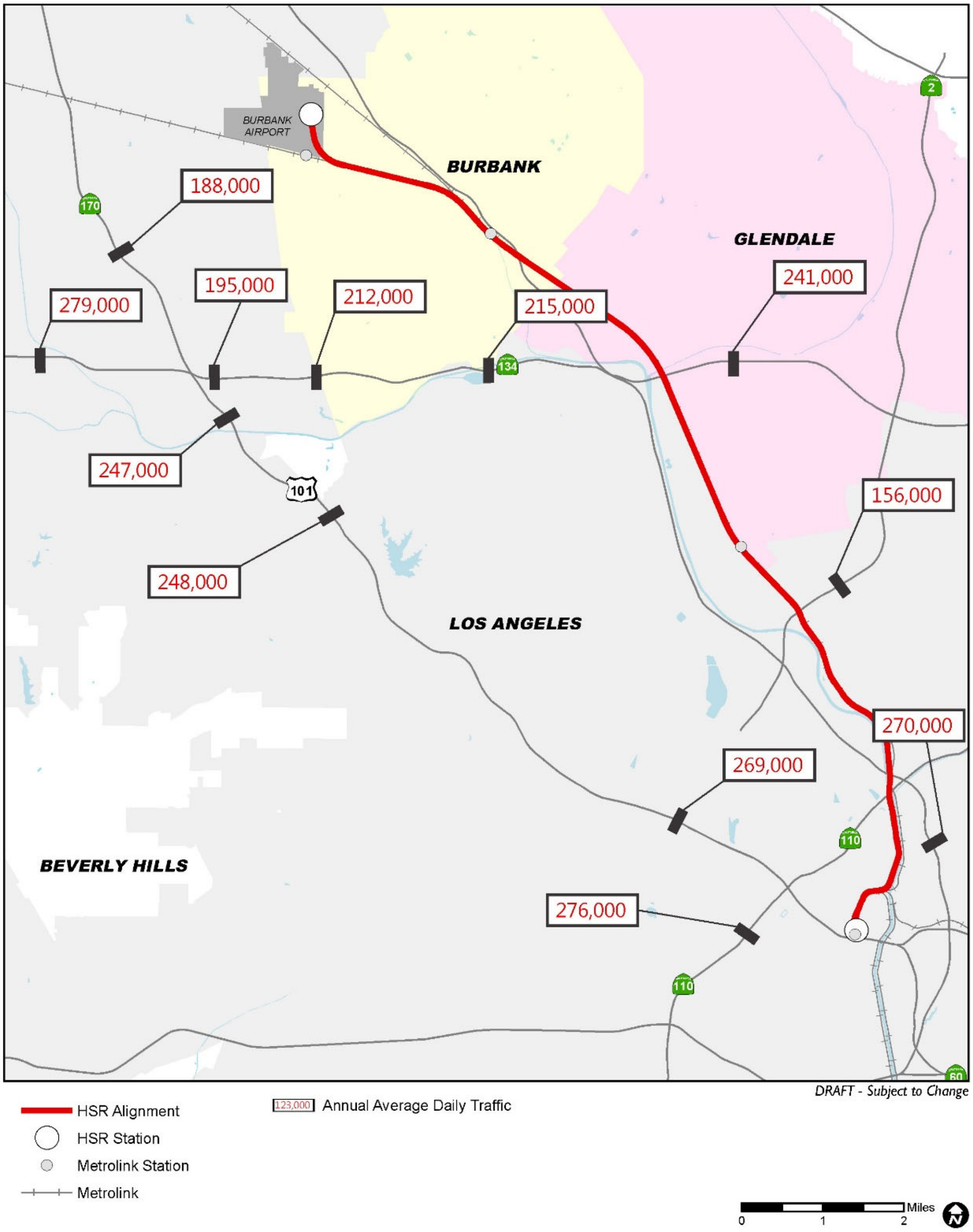
5.2 Existing Major Roadways

5.2.1 Major Freeways and State Routes

The following interstate and state routes highways provide regional access into and out of the general study area:

- **I-5 (Golden State Freeway):** This facility provides general north-south access in the overall study area between Burbank, Glendale, and Los Angeles. It provides access to the east side of downtown Los Angeles and also interchanges with other downtown-serving freeways, including I-110 and I-10. Overall, the facility provides access to the entire State of California, terminating on the south at the border with Mexico and terminating on the north at the border with Canada. It is the major link between San Diego County, Orange County, Los Angeles County, the Central Valley, and areas further north, including Sacramento. The average annual daily traffic (AADT) on I-5 in the vicinity of the RSA is as high as 270,000 vehicles (Caltrans 2016).
- **SR 2 (Glendale Freeway):** This facility provides access between the Silver Lake neighborhood of Los Angeles on the south and I-210 on the north. At the southern terminus of the freeway portion, it transitions into Glendale Boulevard and does not interchange with a freeway. The southernmost interchange of the freeway is at I-5, north of its terminus in Silver Lake. SR 2 continues south and west via arterial links to the city of Santa Monica, and continues north from I-210 via the Angeles Crest Highway in the San Gabriel Mountains. The AADT on SR 2 in the vicinity of the RSA is as high as 156,000 vehicles (Caltrans 2016).
- **U.S. Route 101 (US-101) (Santa Ana Freeway):** This pre-Interstate era highway provides access to East Los Angeles, the north side of downtown Los Angeles, Hollywood, and the San Fernando Valley within Los Angeles County. The northern terminus of this freeway is in the State of Washington. In the San Fernando Valley, it becomes the Ventura Freeway (with SR 134 serving as the east link of that freeway to Pasadena). The AADT on US-101 in the vicinity of the RSA is as high as 269,000 vehicles (Caltrans 2016).
- **SR 134 (Ventura Freeway):** This freeway provides access between the east side of the San Fernando Valley, Glendale, the Eagle Rock neighborhood of Los Angeles, and Pasadena. The AADT on SR 134 in the vicinity of the RSA is as high as 241,000 vehicles (Caltrans 2016).
- **I-110/SR 110 (Harbor Freeway/Arroyo Seco Parkway):** This freeway provides access between the Port of Los Angeles on the south and Pasadena on the north. It provides access to the west side of downtown Los Angeles. North of its interchange with I-10, it is designated as SR 110, and north of US-101 it is also designated with the name Arroyo Seco Parkway due to its historic status in the freeway network. The AADT on SR 110 in the vicinity of the RSA is as high as 276,000 vehicles (Caltrans 2016).

These regional freeway/highway routes and the related AADT data are illustrated on Figure 5-1.



Source: California High-Speed Rail Authority, 2017

Figure 5-1 Major Freeways/Highways and Traffic Volumes

5.2.2 Regionally Significant Roadways

Metro designates regionally significant arterial highways within Los Angeles County to prioritize funding of surface transportation improvement projects. Summary tables of the characteristics and classifications of primary roadways that traverse the study intersections within the RSA are provided within Appendix C.

5.2.3 Regional Truck Routes

The highway and local road system is the primary freight infrastructure in the RSA, and trucking is the dominant freight mode. This is particularly important for local and regional freight movements, which are essentially all carried by truck. Regional truck routes are intended to be used for long-distance truck movement. Truck movements for local deliveries within a community may use the most direct route to the particular delivery location, including local streets.

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, including I-5, US-101, and SR 134.

5.2.4 Road Network in the Vicinity of High-Speed Rail Stations

5.2.4.1 Burbank Airport Station

The following roadway provides general access in the vicinity of the proposed Burbank Airport Station:

- San Fernando Road: This northwest to southeast trending roadway would provide access on the north side of the station site. The road currently connects to N. Hollywood Way and allows for access to the existing airport area and I-5.
- **Hollywood Way:** This north-south roadway would provide access near the east side of the station site. This roadway provides direct access to Hollywood Burbank Airport and to a remote parking lot and private parking facilities on the west. A full-access interchange with I-5 is provided to the north.
- **Buena Vista Street:** This is a north-south roadway and is located east of the proposed Burbank Airport Station. There is a full access interchange with I-5. The southbound I-5 ramps are located on San Fernando road to the west of Buena Vista Street while the northbound ramps are located on Buena Vista Street
- **Empire Avenue:** This east-west roadway is located south of the proposed station. This roadway provides direct access to the Hollywood Burbank Airport and airport parking facilities. It also provides access to the Hollywood Burbank Airport Metrolink Station.

5.2.4.2 Los Angeles Union Station

The following roadways are in vicinity of LAUS and 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. It 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.

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

- **Chinatown Parking Cluster:** This parking area is roughly bounded by College Street, Grand Avenue, Alameda Street, and Cesar E. Chavez Avenue.
- **Pueblo Parking Cluster:** This parking area is roughly bounded by Cesar E. Chavez Avenue, Grand Avenue, Alameda Street, and US-101.
- **South of US-101 Parking Cluster:** This parking area is roughly bounded by US-101, Grand Avenue, Second Street, and the Los Angeles River.

5.3 Corridor Traffic Volumes

This section provides a summary and analysis of study roadway segment volumes within the RSA. The roadways along the HSR Build Alternative have been analyzed to review potential effects due to the construction and post-project operations of HSR related grade separations. Existing roadway configurations and conditions have been analyzed as part of the overall RSA traffic analysis and are summarized below.

5.3.1 Major Roadway Traffic Volumes

Table 5-1 provides a summary of existing daily vehicle volumes and roadway capacities on the analyzed roadway segments along the project alignment. These roadway segments were analyzed in this report for potential effects from project construction and permanent roadway changes.

Table 5-1 Roadway Segment Volumes for Existing Conditions- Alignment

ID.	Roadway Segment	Lanes	Daily Capacity	Existing Volumes
AC	Brazil Street - West of Railroad Track	2	28,800	1,832
AD	Doran Street - West of Railroad Track	2	28,800	5,812
AE	Flower Street - West of Air Way	4	72,000	2,006
AF	Western Avenue - East of Flower Street	4	64,800	25,242
AG	Sonora Avenue - West of Air Way	4	64,800	13,949
AH	Chevy Chase Drive - West of railroad track	2	28,800	6,451
AI	Grandview Avenue - West of Air Way	4	72,000	2,210
AJ	Main Street - East of Los Angeles River	4	72,000	15,398
AK	Main Street - West of Los Angeles River	4	72,000	16,356
AL	Avenue 19 - North of Figueroa Street (bridge)	2	30,000	12,430

Source: California High-Speed Rail Authority, 2017
ADT = average daily traffic

The 24-hour traffic volumes are provided in Appendix B-2.

5.3.2 Roadway Operations

Table 5-2 provides a summary of existing peak hour vehicle volumes and LOS values at the analyzed roadway segments along the project alignment. The LOS analysis was conducted by using the traffic counts and capacity defined in Table 4-4 in Section 4.2.2.2.

All roadway segments except one are currently operating at LOS D or better during the peak hours. Avenue 19 – North of Figueroa is currently operating at LOS F during both the a.m. and p.m. peak hours.

Table 5-2 Roadway Segment Operations Analysis for Existing Conditions - Alignment

ID.	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
AC	Brazil Street - West of Railroad Tracks	1,200	115	0.096	A	122	0.102	A
AD	Doran Street - West of Railroad Tracks	1,200	438	0.365	A	452	0.377	A
AE	Flower Street - West of Air Way	3,000	169	0.056	A	316	0.105	A
AF	Western Avenue - East of Flower Street	2,700	1,557	0.577	A	1,902	0.704	C
AG	Sonora Avenue - West of Air Way	2,700	985	0.365	A	1,208	0.447	A
AH	Chevy Chase Drive - West of Railroad Tracks	1,200	403	0.336	A	555	0.463	A
AI	Grandview Avenue - West of Air Way	3,000	159	0.053	A	263	0.088	A
AJ	Main Street - East of Los Angeles River	3,000	1,736	0.579	A	1,485	0.495	A
AK	Main Street - West of Los Angeles River	3,000	1,735	0.578	A	1,415	0.472	A
AL	Avenue 19 - North of Figueroa Street (bridge)	1,250	1,837	1.470	**F**	1,368	1.094	**F**

Source: California High-Speed Rail Authority, 2017
ADT = average daily traffic V/C =Volume per Capacity
veh/hr = vehicle per hour LOS = Level of Service

Intersection LOS analyses were conducted using the traffic counts, analyzed and processed volumes, and fieldwork and other data within the Synchro analysis program. The results of the existing conditions scenario analysis for the RSA study intersections are provided in Table 5-3.

Table 5-3 Study Intersection Operations Analysis for Existing Conditions - Alignment

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
97	San Fernando Road at Linden Avenue	TWSC	14.2	B	27.9	D
98	Flower Street at Allen Avenue	AWSC	9.2	A	11.2	B
99	San Fernando Road at Allen Avenue	Signal	5.9	A	5.5	A
100	Lake Street at Western Avenue	Signal	24.4	C	25.9	C
101	Flower Street at Western Avenue	Signal	21.7	C	27.7	C
102	San Fernando Road at Western Avenue	Signal	19.5	B	34.3	C
103	Glenoaks Boulevard at Western Avenue	Signal	30.6	C	33.5	C
104	San Fernando Road at Ruberta Avenue	TWSC	19.6	C	35.9	**E**
105	Flower Street at Sonora Avenue	Signal	20.3	C	20	B
106	Grand Central Avenue at Sonora Avenue	OWSC	17.0	C	>180	**F**
107	Airway at Sonora Avenue	Signal	35.2	D	27.8	C
108	San Fernando Road at Sonora Avenue	Signal	30.7	C	22.2	C

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
109	Glenoaks Boulevard at Sonora Avenue	Signal	16.3	B	23.7	C
110	Flower Street at Grandview Avenue	AWSC	12.9	B	25.1	D
111	Grand Central Avenue at Grandview Avenue	AWSC	8.5	A	11.4	B
112	Air Way at Grandview Avenue	Signal	37.2	D	25.4	C
113	San Fernando Road at Grandview Avenue	Signal	20	B	24.3	C
114	Glenoaks Boulevard at Grandview Avenue	Signal	22.5	C	8.2	A
115	Glenoaks Boulevard at Graynold Avenue	Signal	9.3	A	8.1	A
116	San Fernando Road at Norton Avenue	OWSC	22.9	C	41.4	**E**
117	Glenoaks Boulevard at Norton Avenue	TWSC	17.5	C	21.9	C
118	Flower Street at Fairmont Avenue	OWSC	12.0	B	>180	**F**
119	Air Way at Flower Street	Signal	19.2	B	18.2	B
120	San Fernando Road at Flower Street-Pelanconi Avenue	Signal	4.1	A	4.7	A
121	Glenoaks Boulevard at Pelanconi Avenue	OWSC	17.1	C	20.7	C
122	San Fernando Road at Alma Street	OWSC	23.7	C	36.8	**E**
123	Glenoaks Boulevard at Alma Street	TWSC	17.0	C	20.8	C
124	San Fernando Road at Kellogg Avenue	OWSC	17.0	C	22.7	C
125	Glenoaks Boulevard at Highland Avenue	Signal	26.7	C	15.8	B
126	San Fernando Road at Fairmont Avenue	Signal	9.3	A	7.4	A
127	SR 134 WB On-/Off-Ramp at Fairmont Avenue	Signal	25.7	C	19.6	B
128	San Fernando Road at Doran Street	Signal	15.0	B	17.9	B
129	SR 134 EB On-/Off-Ramp-Commercial Street at Doran Street	Signal	>180	**F**	>180	**F**
130	Brunswick Avenue at Chevy Chase Drive	Signal	15.7	B	16.6	B
131	Perlita Avenue at Chevy Chase Drive	OWSC	9.1	A	9.6	A
132	La Clede Avenue at Chevy Chase Drive	AWSC	8.6	A	8.8	A
133	Alger Street at Chevy Chase Drive	OWSC	11.1	B	12.6	B
134	San Fernando Road at Chevy Chase Drive	Signal	27	C	26.7	C
135	Central Avenue at Chevy Chase Drive	Signal	19.6	B	18.9	B
136	Brunswick Avenue at Los Feliz Boulevard	Signal	16.4	B	16.2	B
137	San Fernando Road at Los Feliz Boulevard	Signal	31.2	C	42.3	D
138	San Fernando Road at Central Avenue	Signal	9.4	A	8.0	A
139	San Fernando Road at El Bonito Avenue	OWSC	15.3	C	16.5	C
140	San Fernando Road at Cerritos Avenue	Signal	6.1	A	7.2	A
141	San Fernando Road at Mira Loma Avenue	OWSC	12.3	B	12.4	B
142	Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue	Signal	>180	**F**	26.2	C
143	Glendale Boulevard at Larga Avenue	Signal	14.0	B	9.2	A

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
144	Glendale Boulevard at La Clede Avenue	OWSC	14.1	B	20.8	C
145	San Fernando Road at Brand Boulevard	Signal	61.8	**E**	52.1	D
146	Casitas Avenue at Tyburn Street	AWSC	7.1	A	7.4	A
147	San Fernando Road at Tybur Street	OWSC	14.4	B	17.7	C
148	Silver Lake Boulevard at Casitas Avenue	OWSC	9.2	A	9.3	A
149	La Clede Avenue at Fletcher Drive	Signal	16.1	B	28.2	C
150	San Fernando Road at Fletcher Drive	Signal	29.5	C	18.9	B
151	San Fernando Road at SR 2 SB On-/Off-Ramps	Signal	12.1	B	12.5	B
152	San Fernando Road at SR 2 NB Off-Ramp	Signal	13.8	B	11.6	B
153	San Fernando Road at SR 2 NB On-Ramp	TWSC	1.4	A	5.1	A
154	San Fernando Road at Macon Street	Signal	1.7	A	1.6	A
155	San Fernando Road at Future Street	Signal	9.8	A	3.3	A
156	San Fernando Road at Private Road	OWSC	42.9	**E**	19.1	C
164	Wilhardt Street at Main Street	OWSC	22.7	C	16.5	C
207	San Fernando Road at Avenue 26	Signal	18.2	B	28.3	C
208	SR 110 SB On-Ramp at Figueroa Street	Signal	12.1	B	16.5	B
209	SR 110 NB Off-Ramp at Figueroa Street	Signal	10.3	B	12.0	B
210	Avenue 26 at Figueroa Street	Signal	33.6	C	31.7	C
211	Avenue 26 at I-5 SB On-Ramp	TWSC	0.4	A	0.2	A
212	Avenue 26 at SR 110 NB On-Ramp	TWSC	0.7	A	0.8	A
213	Avenue 26 at I-5 NB Off-Ramp	Signal	8.9	A	8.9	A
214	Pasadena Avenue at Broadway	Signal	32.9	C	15.6	B
215	Avenue 18 at Pasadena Avenue	Signal	19.4	B	21.6	C
216	I-5 SB On-/Off-Ramps - Avenue 21 at Pasadena Avenue	Signal	24.8	C	19.7	B
217	I-5 NB On-/Off-Ramps at Pasadena Avenue	Signal	13.4	B	18.9	B
218	Avenue 18 at Spring Street at Broadway	Signal	>180	**F**	20.5	C
219	Avenue 20 at Broadway	Signal	18.5	B	23.8	C
220	Avenue 21 at I-5 SB On-/Off-Ramps at Broadway	Signal	17	B	15.2	B
221	I-5 NB on/off Ramps - Avenue 21 at Broadway	Signal	22.4	C	16.1	B
222	Daly Street at Broadway	Signal	28.3	C	31.4	C
223	Gibbons Street at Main Street	OWSC	15.9	C	19.5	C
224	Avenue 20 at Main Street	Signal	20.6	C	11.8	B
225	Daly Street at Main Street	Signal	21.4	C	25.2	C
226	Mission Road at Cesar E. Chavez Avenue	Signal	93.3	**F**	33.9	D
228	I-5 SB On-/Off-Ramps at Mission Road	Signal	20.6	C	20.4	C
229	Marengo Street at Mission Road	Signal	28.9	C	22.8	C

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
230	I-5 NB On-Ramp at Marengo Street	TWSC	6.0	A	2.5	A
231	State Street at Marengo Street	Signal	28.2	C	22.7	C
235	State Street at I-10 WB Off-Ramp	Signal	12.1	B	7.3	A
236	State Street at I-10 EB On-/Off-Ramps	Signal	10.5	B	18.4	B

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
AWSC = all-way stop control
EB = eastbound
I- = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way-stop control
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
WB = westbound

The analyzed existing study intersection turn-movement volumes are provided in Appendix D-1. The LOS worksheets for existing conditions are provided in Appendix D-2.

Most of the study intersections currently operate at LOS D or better. The following 11 intersections currently operate at LOS values of E or F:

- San Fernando Road at Ruberta Avenue
- Grand Central Avenue at Sonora Avenue
- San Fernando Road at Norton Avenue
- Flower Street at Fairmont Avenue
- San Fernando Road at Alma Street
- SR 134 eastbound on-/off-Ramp-Commercial Street at Doran Street
- Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue
- San Fernando Road at Brand Boulevard
- San Fernando Road at private road
- Avenue 18 at Spring Street at Broadway
- Mission Road at Cesar E. Chavez Avenue

5.3.3 Vehicle Miles Traveled

The Authority used the statewide travel demand model to estimate VMT (2016) in the RSA for medium and high scenarios. In 2015, Los Angeles County estimated total VMT ranged between 73.24 and 73.39 billion miles.

5.4 Existing Transit Conditions

Several providers operate transit services throughout the project section. These include local and regional bus, as well as local and regional rail. These providers and their routes are described below.

5.4.1 Regional Transit Service

The City of Los Angeles Department of Transportation (LADOT) provides commuter express bus service between downtown Los Angeles and the San Fernando Valley. The City of Santa Clarita Transit provides commuter express bus service between LAUS and Santa Clarita. These systems travel on the freeway during the express portions of trips and do not use the surface roadway network within the RSA.

Foothill Transit and other municipal bus operators provide commuter express bus service to the San Gabriel Valley and other areas, and serve LAUS as part of express service or long-haul local service to and from downtown Los Angeles.

Greyhound, Megabus, and BoltBus operate regional bus service throughout California and the western U.S. from LAUS. Some have stops at the existing Downtown Burbank Metrolink station.

5.4.2 Local Transit

The Burbank to Los Angeles Project Section is served by bus transit lines operated by Metro, the City of Glendale, and the City of Burbank. The core bus transit lines in the project section are Metro Rapid Bus Lines, including the following:

- **Metro Rapid Line 794:** Serves the San Fernando Road corridor from downtown Los Angeles to Hollywood Burbank Airport, and the Sylmar/San Fernando Metrolink station.
- **Metro Rapid Line 780:** Serves the Los Feliz corridor within the RSA, connecting to Hollywood on the west and Pasadena on the east.
- **Metro Rapid Line 751:** Serves the south end of the San Fernando Road corridor in the RSA, with connections to the Los Angeles County/University of Southern California Medical Center and Boyle Heights

Metro maintains an overall transit map for the Los Angeles County area, including neighboring county connections, for all municipal bus operators, all Metro Bus and Metro Rail routes, and Metrolink lines.

The City of Glendale's transit system, the Glendale Beeline, includes nine fixed routes serving the cities of Glendale and La Cañada Flintridge, and the unincorporated areas of La Crescenta and Montrose. The Beeline is primarily a community circulator system, complementing regional transit.

The City of Burbank's transit system, BurbankBus, operates four local routes that connect employment hubs, local amenities, and regional transportation. The system connects the Media District, Hollywood Burbank Airport, the North Hollywood Red Line and Orange Line, and the Downtown Burbank Metrolink Station.

5.5 Bicycle Facilities

Off-street bike paths within or near the project alignment include:

- Burbank Channel Bike Path North 1 between Cohasset Street and Tulare Avenue
- Burbank Channel Bike Path North 2 between Buena Vista Street/Winona Avenue and Jackson Street
- San Fernando Bike Path-Burbank (Planned) between the Burbank-Los Angeles city limit and Downtown Burbank Metrolink Station
- San Fernando Railroad Bike Path (Planned) along San Fernando Road between northern and southern city limits
- Chandler Bikeway (Planned) between on W Chandler Boulevard between N Clybourn Avenue and N Mariposa Street
- Burbank Western Channel Bike Path along the Burbank-Western Flood Control Channel between Alameda Avenue and the Downtown Burbank Metrolink Station
- Burbank Western Channel Bike Path (Planned) along the Burbank-Western Flood Control Channel from Alameda Avenue and the Glendale city limit
- Golden State Connector Bike Path (Caltrans) adjacent to the Golden State Freeway in the vicinity of Providencia Avenue
- Glendale Narrows Bikeway, which traverses the entire Glendale Narrows Riverwalk East
- Verdugo Wash Bike Path (Planned) along Verdugo Wash Channel between the northern Glendale city limit (near New York Avenue) and the Los Angeles River

- Los Angeles River Bike Path along the west bank of the Los Angeles River between approximately 7 miles from the north side of Griffith Park at Riverside Drive (at Zoo Drive) and Barclay Street in Elysian Valley

5.6 Aviation

5.6.1 Hollywood Burbank Airport

The Hollywood Burbank Airport is at the northern end of the Burbank to Los Angeles Project Section.

Hollywood Burbank Airport is owned and managed by the Burbank-Glendale-Pasadena Airport Authority. As of October 2015, the airport served 126,149 flight operations per year. The facility serves commercial flights as well as general aviation.

The airport has access to the Hollywood Burbank Airport Metrolink Station on the Ventura County Line, with an adjacent transit center served by Burbank City Bus. An on-site parking structure currently provides paid short- and long-term parking for airport travelers.

The Burbank-Glendale-Pasadena Airport Authority is planning a relocation of its passenger terminal to a new location on the airport site. The Burbank-Glendale-Pasadena Airport Authority completed a ground access study and a transit-oriented development study for the airport area in 2014 to help develop improvements to the accessibility of the airport and its adjacent land uses (Burbank-Glendale-Pasadena Airport Authority 2014). The Hollywood Burbank Airport Terminal Replacement project was approved by the City of Burbank voters under Measure B in November 2016.

5.6.2 Other Regional Airports

Whiteman Airport is a general aviation airport located in Pacoima, located approximately 2.5 miles to the north of the RSA. There are over 80,000 general aviation takeoffs and landings each year at this airport. The facility is owned and operated by the County of Los Angeles and is publicly available to general aviation aircraft (County of Los Angeles Department of Public Works, Aviation Division, 2017). The Whiteman Airport runway is adjacent to and directly northeast of the HSR alignment. Access is provided via roadways on the northeast side of the airport.

Other regional airports in the area that may be used by residents and employees within the RSA include LAX to the southwest and Ontario International Airport to the east.

5.7 Passenger Rail Service

Metrolink operates the Ventura County Line and the Antelope Valley Line within the RSA. The two services share the UPRR Valley Subdivision rail corridor north of LAUS and split into their respective corridors at the rail junction located south of the Burbank Airport Station. Both of these Metrolink lines serve the Burbank-Downtown Station, located to the south of that rail junction, as well as LAUS. Amtrak Pacific Surfliner trains serve both LAUS and the existing Hollywood Burbank Airport Station.

The HSR Build Alternative would travel through the LOSSAN Corridor. Under existing conditions, 73 passenger trains travel through the Burbank to Los Angeles Project Section each day (see Section 2.9).

The Antelope Valley Metrolink Line will serve the Burbank Airport Station area in the future as part of the new Burbank Airport station that is planned to be constructed by 2029. The Ventura County Metrolink line will also continue to serve the Burbank Airport Station area.

The LOSSAN Rail Corridor Agency, overseer of the Amtrak Pacific Surfliner service between San Luis Obispo, Santa Barbara, LAUS, and San Diego, is planning a service expansion that would increase ridership by 50 percent in the corridor by 2030. Table 5-4 shows the projected change in rail traffic within the corridor for Metrolink and Amtrak. This long-term increase in rail passenger service frequency would provide net benefits to the roadways within the study area.

Table 5-4 Existing and Future Trains per Day in the LOSSAN Corridor between Burbank and Los Angeles

Operator	2016 Existing Conditions	2029 Opening Day	2040 Horizon Year
California High-Speed Rail[1]	N/A	196	196
Metrolink[2]	61	99	99
Amtrak[3]	12	16	18

[1] *This includes 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"*
[2] *Existing Conditions from 2016 Metrolink Schedule (Southern California Regional Rail Authority 2016c; effective October 3, 2016); 2029 Opening Day projections extrapolated from 2016 Metrolink 10-Year Strategic Plan,* "Growth Scenario 2: Overlay of Additional Service Patterns" (*Southern California Regional Rail Authority* 2016d).
[3] *Existing Conditions from 2016 LOSSAN Corridor Schedule; 2029 Opening Day projections extrapolated from 2012 LOSSAN Corridorwide Strategic Implementation Plan "Long-Term Operations Analysis" (Caltrans 2012; increase of about 1 train every 4 years for the Amtrak Pacific Surfliner and no growth for the Amtrak Coast Starlight between Hollywood Burbank Airport and LAUS).*
EIR/EIS = Environmental Impact Report/Environmental Impact Statement
LOSSAN = Los Angeles-San Diego-San Luis Obispo
N/A = not applicable

5.8 Freight Rail Service

UPRR operates a rail network of 3,283 miles throughout California. Major destinations include the San Joaquin Valley, the Port of Oakland, the metropolitan San Francisco Bay Area, and the metropolitan Los Angeles area.

The UPRR Los Angeles Service Unit operates trains with commodities moving in and out of the Ports of Los Angeles and Long Beach, linking to other major gateways, including St. Louis, Chicago, Memphis, and New Orleans. A major system classification/transfer yard is in West Colton and a regional yard is in the city of Commerce.

Under existing conditions (2015), UPRR had 11 freight trains travel through the Burbank to Los Angeles Project Section each day (see Table 2-3 of this report).

Future study conditions assume future plans and projects that are fully funded in the SCAG 2012–2035 RTP/SCS. According to the Caltrans California State Rail Plan, the freight corridor will grow by up to 30 trains per day.

5.9 Railroad Accident History

The FRA Office of Safety Analysis provided data on rail accidents/incidents at grade crossings. The historical data for years 1975 to 2016 for the existing at-grade rail crossings within the project section provided the following findings:

- **Buena Vista Street:** One incident involving a Metrolink train and three incidents involving Amtrak trains.
- **Sonora Avenue:** One incident involving a Metrolink train
- **Grandview Street:** Three incidents involving Metrolink trains and one incident involving a Southern Pacific Railroad (now UPRR) train
- **Main Street:** One incident involving a Metrolink train and two incidents involving an Atchison, Topeka & Santa Fe (now BNSF Railway) train

No other rail accidents were reported by FRA for the existing at-grade rail crossings that would be grade-separated as part of the HSR project.

5.10 Existing Conditions Near Burbank Airport Station

The following section describes the general aspects of the RSA in the vicinity of the Burbank Airport station site.

5.10.1 Station Areas

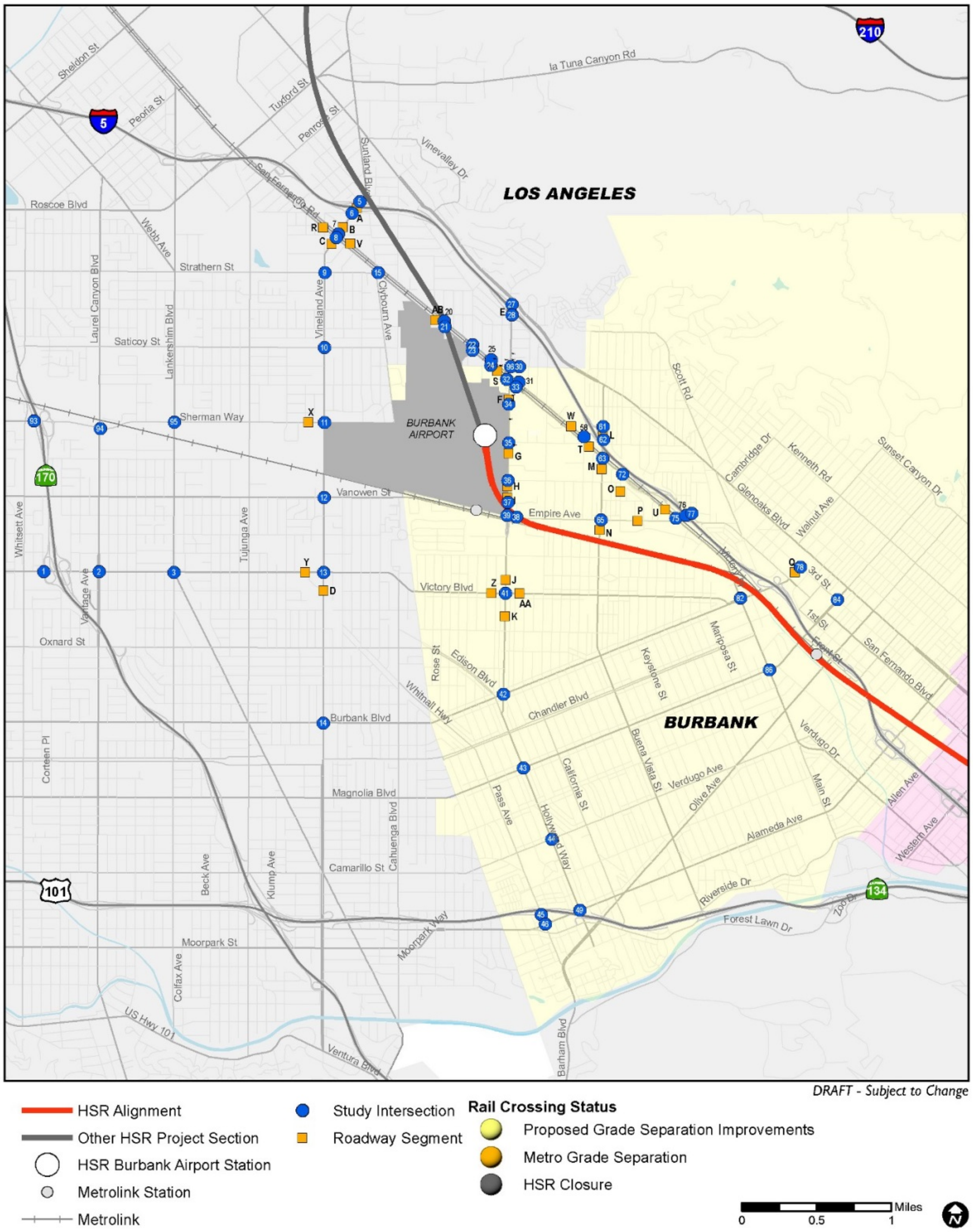
The Burbank HSR Station is proposed to be between N Hollywood Way, N San Fernando Boulevard, and the Hollywood Burbank Airport. The Burbank Airport Station area includes light industrial and residential areas within the city of Burbank, the Hollywood Burbank Airport, the I-5 corridor to the northeast and north of the airport, and SR 134 to the south.

5.10.2 Station Traffic Study Area

The RSA was developed based on potential vehicle travel routes to and from the Burbank Airport Station site, with long-term parking, passenger loading and KNR operations located at the station site or in the immediate vicinity. The RSA study intersections and roadway segments were selected based on both alignment construction and Burbank Airport Station facility construction.

5.10.3 Roadways and Intersections

Figure 5-2 provides a map of the study intersections in the vicinity of the Burbank Airport Station.



Source: California High-Speed Rail Authority, 2017

Figure 5-2 Study Intersections in Vicinity of Burbank Airport Station

5.10.4 Existing Traffic Volumes

Table 5-5 provides a summary of existing daily vehicle volumes at the analyzed roadway segments within the Burbank Airport Station area. These roadway segments were analyzed in this report for potential effects from project construction and permanent roadway changes.

The 24-hour traffic volumes for the roadway segments are provided in Appendix B-2.

Table 5-5 Roadway Segment Volumes for Existing Conditions—Burbank Airport Station

ID.	Roadway Segment	Lanes	Daily Capacity	Existing
A	Sunland Boulevard - South of I-5 Northbound Ramps	4	69,600	19,780
B	Sunland Boulevard - North of San Fernando Road Minor	4	76,800	19,770
C	Vineland Avenue - South of San Fernando Road	4	69,600	18,760
D	Vineland Avenue - South of Victory Boulevard	4	69,600	19,795
E	Hollywood Way - South of I-5 Northbound Ramp	4	69,600	27,875
F	Hollywood Way - South of San Fernando Road Ramp	5	87,000	27,030
G	Hollywood Way - South of Winona Avenue	5	87,000	27,620
H	Hollywood Way - South of Thornton Avenue	4	76,800	28,490
I	Hollywood Way - North of Avon Street	4	76,800	27,780
J	Hollywood Way - North of Victory Boulevard	4	69,600	26,340
K	Hollywood Way - South of Victory Boulevard	4	69,600	23,375
L	Buena Vista Street - North of San Fernando Road	4	69,600	20,895
M	Buena Vista Street - South of San Fernando Road	4	69,600	19,150
N	Buena Vista Street - South of Empire Avenue	5	87,000	24,820
O	Lincoln Boulevard - South of San Fernando Road	4	69,600	13,550
P	Empire Avenue - East of Buena Vista Street	4	69,600	16,500
Q	Burbank Boulevard - South of I-5 Northbound ramps	6	118,800	31,060
R	San Fernando Road - West of Vineland Avenue	4	69,600	8,505
S	San Fernando Road - West of Hollywood Way	4	69,600	13,785
T	San Fernando Road - West of Buena Vista Street	4	69,600	13,710
U	Victory Place - West of Empire Street	2	26,400	7,155
V	San Fernando Road Minor - East of Vineland Avenue	2	26,400	3,615
W	San Fernando Road Minor - West of I-5 Southbound Ramps	2	26,400	5,120
X	Sherman Way - West of Vineland Avenue	4	69,600	12,485
Y	Victory Boulevard - West of Vineland Avenue	6	118,800	21,095
Z	Victory Boulevard - West of Hollywood Way	4	69,600	21,840
AA	Victory Boulevard - East of Hollywood Way	4	69,000	19,325
AB	San Fernando Road - West of Arvilla Avenue	4	69,600	15,795

Source: California High-Speed Rail Authority, 2017
I-5 = Interstate 5

Table 5-6 provides a summary of existing peak hour vehicle volumes and LOS values at the analyzed roadway segments around the Burbank Airport Station. The LOS analysis was conducted by using the traffic counts and capacity defined in Table 4-4 in Section 4.2.2.2.

Table 5-6 Roadway Segment Operations Analysis for Existing Conditions - Burbank Airport Station

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
A	Sunland Boulevard - South of I-5 Northbound Ramps	2,900	1,898	0.697 0.654	B	2,058	0.710	C
B	Sunland Boulevard - North of San Fernando Road Minor	3,200	1,870	0.686 0.584	BA	2,084	0.651	B
C	Vineland Avenue - South of San Fernando Road	2,900	1,729	0.634 0.596	BA	2,023	0.698	B
D	Vineland Avenue - South of Victory Boulevard	2,900	1,985	0.690 0.684	B	1,974	0.681	B
E	Hollywood Way - South of I-5 Northbound Ramp	2,900	2,743	**0.954** 0.946	**E**	2,832	0.977	**E**
F	Hollywood Way - South of San Fernando Road Ramp	3,625	2,607	0.668 0.719	BC	2,799	0.772	C
G	Hollywood Way - South of Winona Avenue	3,625	2,583	0.662 0.713	BC	2,941	0.811	D
H	Hollywood Way - South of Thornton Avenue	3,200	2,720	**0.946** 0.850	ED	2,978	0.931	**E**
I	Hollywood Way - North of Avon Street	3,200	2,649	**0.921** 0.828	ED	2,907	0.908	**E**
J	Hollywood Way - North of Victory Boulevard	2,900	2,507	0.872 0.864	D	2,761	0.952	**E**
K	Hollywood Way - South of Victory Boulevard	2,900	2,268	0.789 0.782	C	2,407	0.830	D
L	Buena Vista Street - North of San Fernando Road	2,900	1,950	0.672	B	2,229	0.769	C
M	Buena Vista Street - South of San Fernando Road	2,900	1,890	0.652	B	1,940	0.669	B
N	Buena Vista Street - South of Empire Avenue	3,625	2,277	0.628	B	2,687	0.741	C
O	Lincoln Boulevard - South of San Fernando Road	2,900	1,292	0.446	A	1,418	0.489	A
P	Empire Avenue - East of Buena Vista Street	2,900	1,268	0.437	A	2,032	0.701	C
Q	Burbank Boulevard - South of I-5 Northbound ramps	4,950	3,019	0.610	B	3,193	0.645	B
R	San Fernando Road - West of Vineland Avenue	2,900	891	0.307	A	810	0.279	A
S	San Fernando Road - West of Hollywood Way	2,900	1,445	0.498	A	1,312	0.452	A
T	San Fernando Road - West of Buena Vista Street	2,900	1,379	0.476	A	1,363	0.470	A
U	Victory Place - West of Empire Street	1,100	643	0.585	A	788	0.716	C

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
V	San Fernando Road Minor - East of Vineland Avenue	1,100	350	0.318	A	373	0.339	A
W	San Fernando Road Minor - West of I-5 Southbound Ramps	1,100	564	0.513	A	460	0.418	A
X	Sherman Way - West of Vineland Avenue	2,900	1,170	0.403	A	1,327	0.458	A
Y	Victory Boulevard - West of Vineland Avenue	4,950	1,948	0.394	A	2,271	0.459	A
Z	Victory Boulevard - West of Hollywood Way	2,900	2,129	0.734	C	2,239	0.772	C
AA	Victory Boulevard - East of Hollywood Way	2,900	1,856	0.640	B	2,009	0.693	B
AB	San Fernando Road - West of Arvilla Avenue	2900	1,715	0.591	A	1,444	0.498	A

Source: California High-Speed Rail Authority, 2017
I-5 = Interstate 5

Four of the study roadway segments currently operate at LOS E or F, which designates poor operating conditions:

- Hollywood Way - South of I-5 northbound ramp
- Hollywood Way - South of Thornton Avenue
- Hollywood Way - North of Avon Street
- Hollywood Way - North of Victory Boulevard

The remaining study roadway segments currently operate at good operating conditions, LOS D or better.

5.10.5 Existing Level of Service

Intersection LOS analyses were conducted using the traffic counts, analyzed and processed volumes, and fieldwork and other data within the Synchro analysis program. The results of the existing conditions scenario analysis for the RSA study intersections in the Burbank Airport Station area are provided in Table 5-7.

Table 5-7 Study Intersection Operations Analysis for Existing Conditions - Burbank Airport Station

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1	SR 170 SB Ramps at Victory Boulevard	TWSC	>180	**F**	>180	**F**
2	Laurel Canyon at Victory Boulevard	Signal	32.2	C	32.1	C
3	Lankershim Boulevard at Victory Boulevard	Signal	27.4	C	30.8	C
5	Sunland Boulevard at I-5 NB Ramps	Signal	20.8	C	21.0	C
6	Sunland Boulevard at I-5 SB Ramps	Signal	18.3	B	22.5	C
7	Sunland Boulevard at San Fernando Road Minor	Signal	29.9	C	34.1	C
8	Sunland Boulevard at San Fernando Road	Signal	16.2	B	19.4	B
9	Vineland Avenue at Strathern Street	Signal	13.4	B	12.9	B

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
10	Vineland Avenue at Saticoy Street	Signal	10.4	B	7.9	A
11	Vineland Avenue at Sherman Way	Signal	21.7	C	20.3	C
12	Vineland Avenue at Vanowen Street	Signal	22.2	C	23.2	C
13	Vineland Avenue at Victory Boulevard	Signal	19.3	B	19.4	B
14	Vineland Avenue at Burbank Boulevard	Signal	22.8	C	24.8	C
15	Clybourn Avenue at San Fernando Road	Signal	29.7	C	23.1	C
20	Arvilla Avenue at San Fernando Road Minor	Signal	11.1	B	11.9	B
21	Arvilla Avenue at San Fernando Road	Signal	14.8	B	21.7	C
22	Arcola Avenue at San Fernando Road Minor	TWSC	25.0	D	10.9	B
23	Lockhead Drive at San Fernando Road	TWSC	26.6	D	14.4	C
24	Cohasset Street at San Fernando Road	TWSC	14.2	B	14.7	B
25	Cohasset Street at San Fernando Road Minor	Signal	4.4	A	4.6	A
27	Hollywood Way at I-5 NB Ramps	Signal	18.9	B	16.0	B
28	Hollywood Way at I-5 SB Ramps	TWSC	>180	**F**	36.0	**E**
30	Avon Street at Cohasset Street	TWSC	10.9	B	12.9	B
31	Avon Street at San Fernando Road Minor	Signal	5.7	A	5.7	A
32	Hollywood Way SB at San Fernando Road	Signal	3.8	A	3.3	A
33	Hollywood Way NB at San Fernando Road	Signal	3.9	A	4.0	A
34	Hollywood Way at Tulare Avenue	Signal	1.4	A	3.1	A
35	Hollywood Way at Winona Avenue	Signal	6.2	A	11.8	B
36	Hollywood Way at Thornton Avenue	Signal	13.5	B	21.9	C
37	Hollywood Way at Avon Street	Signal	11.5	B	14.6	B
38	Avon Street at Empire Avenue	Signal	4.3	A	3.8	A
39	Hollywood Way at Empire Avenue	Signal	4.8	A	5.6	A
41	Hollywood Way at Victory Boulevard	Signal	27.5	C	29.7	C
42	Hollywood Way at Burbank Boulevard	Signal	24.7	C	27.9	C
43	Hollywood Way at Magnolia Boulevard	Signal	23.8	C	26.0	C
44	Hollywood Way at Verdugo Avenue	Signal	21.3	C	24.9	C
45	Pass Avenue at SR 134 EB Ramps	Signal	11.0	B	8.8	A
46	Pass Avenue at Alameda Avenue	Signal	15.1	B	16.4	B
49	Hollywood Way at Alameda Avenue	Signal	24.6	C	26.2	C
58	San Fernando Road Minor at I-5 SB Ramps	TWSC	98.2	**F**	47.9	**E**
61	Buena Vista Street at I-5 NB Ramps	Signal	12.0	B	16.5	B
62	Buena Vista Street at Winona Avenue	Signal	72.7	**E**	30.4	C
63	Buena Vista Street at San Fernando Road	Signal	35.7	C	42.2	D
64	Buena Vista Street at Thornton Avenue	Signal	10.7	B	12.1	B
65	Buena Vista Street at Empire Avenue	Signal	18.4	B	34.1	C
72	Lincoln Street at San Fernando Road	Signal	6.1	A	2.9	A

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
75	Empire Avenue at San Fernando Road	Signal	5.6	A	8.4	A
76	I-5 SB Ramps at San Fernando Road	TWSC	13.1	B	22.2	C
77	I-5 NB Ramps at San Fernando Road	TWSC	13.3	B	35.2	**E**
78	Burbank Boulevard at 3rd Street	Signal	8.3	A	11.4	B
82	Burbank Boulevard at Victory Boulevard	Signal	32.2	C	38.5	D
84	Magnolia Boulevard at 3rd Street	Signal	12.5	B	17.4	B
86	Magnolia Boulevard at Victory Boulevard	Signal	21.9	C	28.0	C
93	SR 170 SB Ramps at Sherman Way	Signal	27.8	C	45.7	D
94	Laurel Canyon at Sherman Way	Signal	63.6	**E**	>180	**F**
95	Lankershim Boulevard at Sherman Way	Signal	19.7	B	25.1	C
96	Hollywood Way at Cohasset Street	TWSC	112.9	**F**	37.3	**E**

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
AWSC = all-way stop control
EB = eastbound
I- = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way-stop control
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
WB = westbound

The analyzed existing study intersection turn-movement volumes are provided in Appendix D-1. The LOS worksheets for existing conditions are provided in Appendix D-2.

Most of the study intersections currently operate at LOS D or better within the Burbank Airport Station area. The following 10 intersections currently operate at LOS values of E or F:

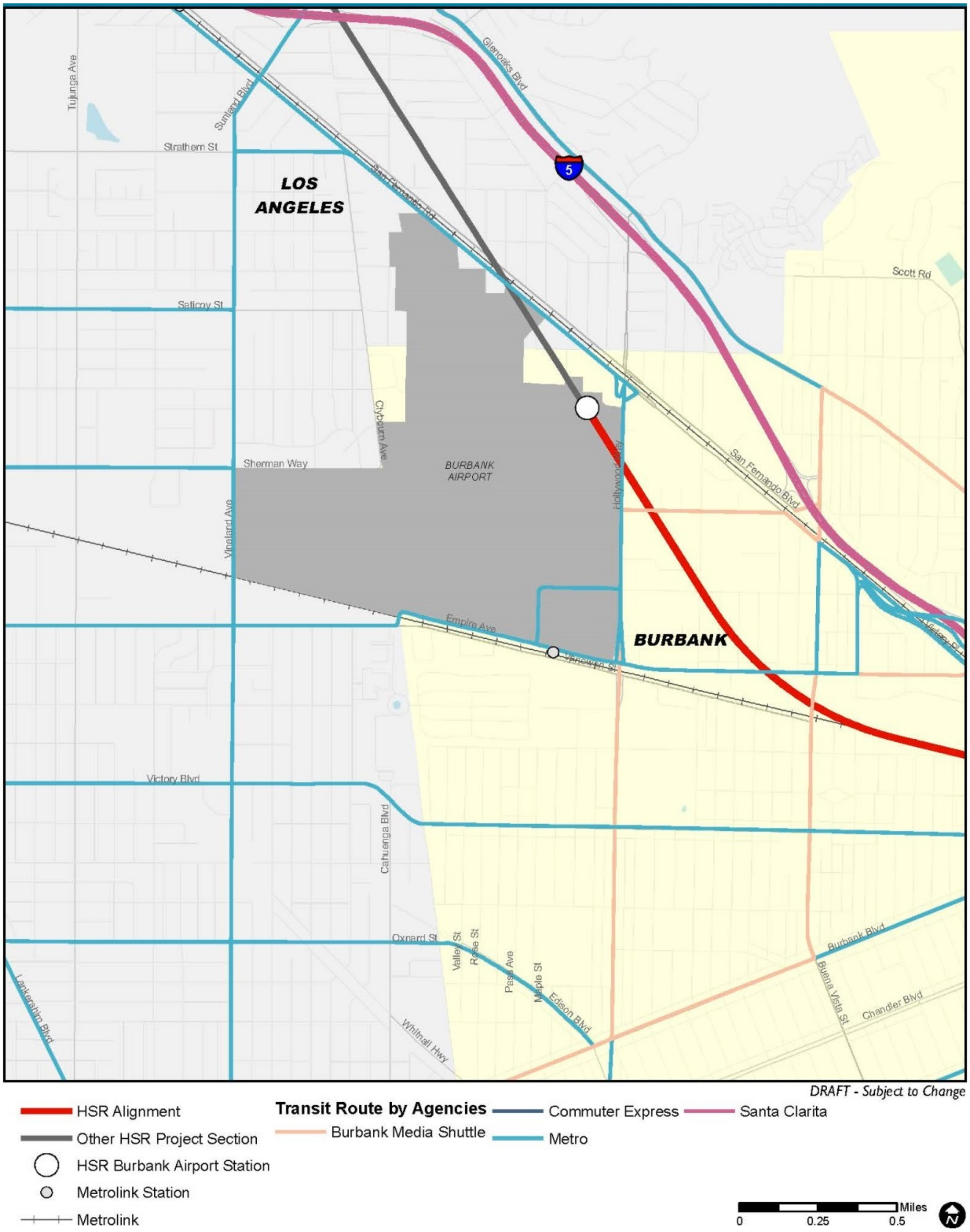
- SR 170 SB ramps at Victory Boulevard
- Hollywood Way at I-5 SB ramps
- San Fernando Road Minor at I-5 SB ramps
- Buena Vista Street at Winona Avenue
- I-5 NB ramps at San Fernando Road
- Laurel Canyon at Sherman Way
- Hollywood Way at Cohasset Street

5.10.6 Existing Transit

Bus service in the vicinity of the proposed Burbank Airport Station is operated by Metro and the City of Burbank (Burbank Bus). Multiple lines serve Hollywood Way on the east site of the existing airport. These lines run adjacent to the proposed station site, which would be located on the east side of Hollywood Way near the airport. The Burbank Bus services provide connections across Burbank and specifically to the nearby Empire commercial/office district and downtown Burbank.

Metro operates local and regional bus service throughout the Hollywood Burbank Airport Station study area, including Routes 94, 169, 222, and 794.

Table 5-8 provides a list of the transit services provided within the vicinity of the proposed HSR Burbank Airport Station under existing conditions. Figure 5-3 depicts the transit network in the Burbank area near the station site.



Source: California High-Speed Rail Authority, 2017

Figure 5-3 Bus Transit Network—Burbank Airport Station Area

Table 5-8 Summary of Transit Service at Burbank Airport Station

Agency	Name / Line #	M-F Peak Frequency (mins)	M-F All-Day Service / Weekend Service	Average Weekday Ridership
Metro	94	15 to 20	Y / Y	4,441
	169	60	Y / Y	2,156
	222	26 to 45	Y / Y	1,359
	Rapid 794	15 to 20	Y / N	4,228
Burbank Bus	Empire / Downtown	18	N / N	N/A
	Noho / Airport	15 to 20	Y / N	N/A

Source: California High-Speed Rail Authority, 2017
M–F = Monday through Friday
mins = minutes
Metro = Los Angeles County Metropolitan Transportation Authority

5.10.7 Existing Pedestrian Facilities

For pedestrian access to the proposed Burbank Airport Station site, there are existing sidewalks along roadways in the vicinity of the station site, including Hollywood Way, San Fernando Way, and Winona Avenue. Other streets near the station site that also provide pedestrian access are Buena Vista Street, Thornton Avenue, and Ontario Street.

The future replacement airport terminal at Hollywood Burbank Airport and adjacent planned commercial development will be located directly west of the planned HSR station site. Existing and future signalized intersections will provide crossing points for pedestrians at Hollywood Way to facilitate pedestrian travel between the planned HSR station site and the future airport terminal site.

5.10.8 Existing Bicycle Facilities

The existing bicycle network in the vicinity of the planned Burbank Airport Station is somewhat limited, as the roadways in the area are oriented toward existing low-density uses and the airport property. Nonetheless, an existing network is available on some roadways, and the City of Burbank Bicycle Master Plan identifies the existing bicycle facilities

There is an existing bicycle lane on Hollywood Way from San Fernando Boulevard to Pacific Ave. The lane connects to bicycle routes on the south and to a bicycle path parallel to San Fernando Road on the north.

The Burbank Bicycle Master Plan includes definitions of Class I, Class II, Class III, and Bicycle Boulevard facilities (defined below).

- Class I—Off-street bicycle path providing travel on a paved right-of-way completely separated from any street or highway. Existing Class I bicycle facilities are located along San Fernando Boulevard and portions of the storm water channel along the east side of I-5.
- Class II—On-street, marked bicycle lanes which provide a striped and stenciled lane for one-way travel on a street or highway. Existing Class II bicycle facilities are located along Hollywood Way as described above and also on Victory Boulevard.
- Class III—On-street, shared-use bicycle routes which provide for shared-use with pedestrian or motor vehicle traffic and are identified only by signage. Class III bicycle facilities are located along Pacific Avenue.
- Bicycle Boulevard—A generally low-traffic neighborhood street that has been optimized for bicycling. There are not any of these facilities in the vicinity of the Burbank Airport Station area.

Figure 5-4 illustrates the locations of existing and planned bicycle facilities within the vicinity of the Burbank Airport Station site.

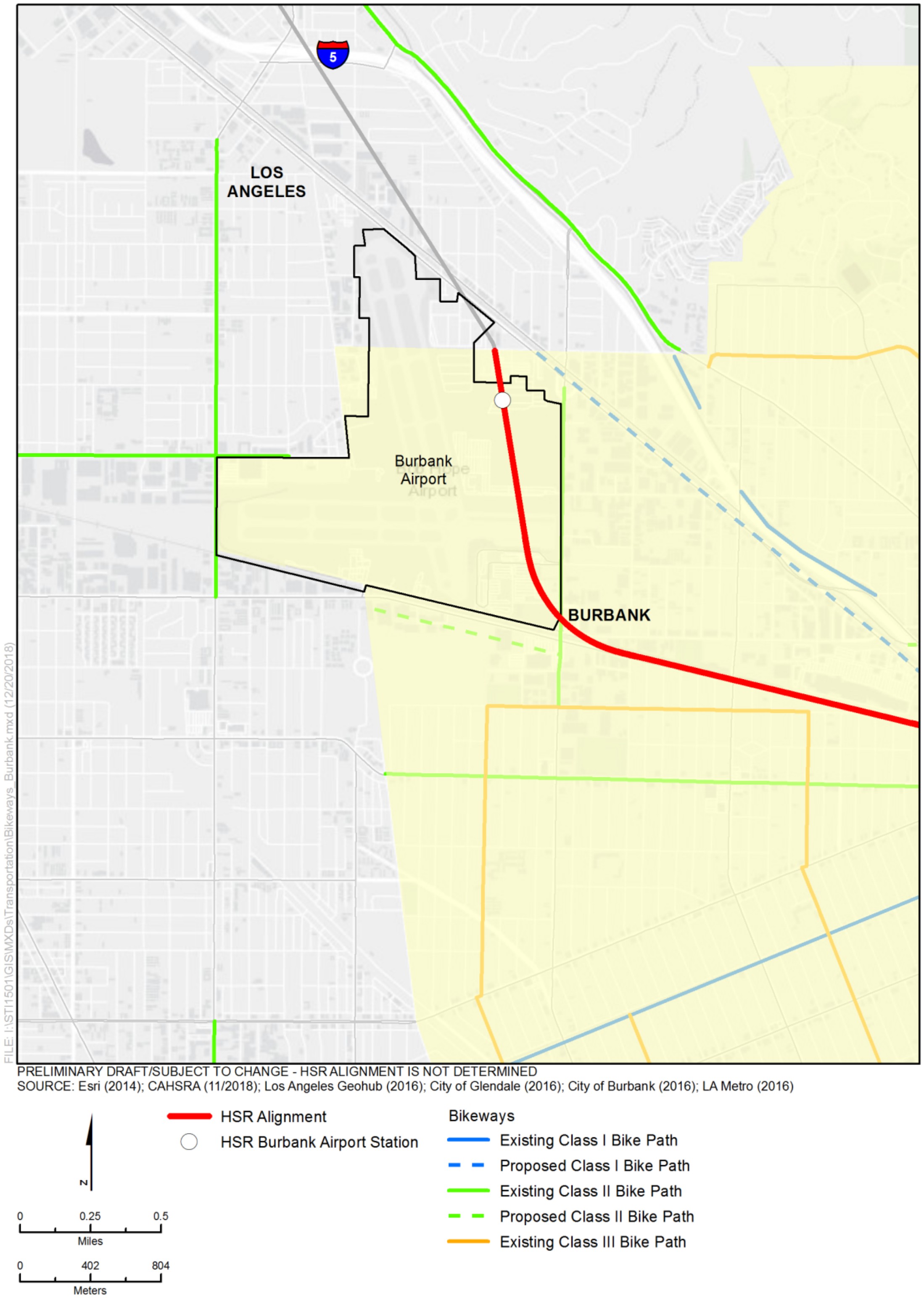


Figure 5-4 Bicycle Facilities in the Vicinity of the Burbank Airport Station

5.10.9 Existing Parking Facilities

Hollywood Burbank Airport parking is provided in on-site structures to the south of the main existing terminal building, in remote lots at the northeast side of the airport, and to the east of the airport across Hollywood Way. Other privately operated lots exist as well, including the Burbank Marriott.

5.11 Existing Conditions Near LAUS

The following section describes the general aspects of the RSA in the vicinity of the LAUS site.

5.11.1 Station Areas

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

5.11.2 Station Traffic Study Area

The RSA was developed based on potential vehicle travel routes to and from the LAUS sites, planned long-term parking locations in the area, and passenger loading and KNR locations at the LAUS site. The RSA study intersections and roadway segments were selected based on both alignment construction and LAUS HSR facility construction.

5.11.3 Roadways and Intersections

A map of the study intersections located in the vicinity of the LAUS site is provided on Figure 5-5.

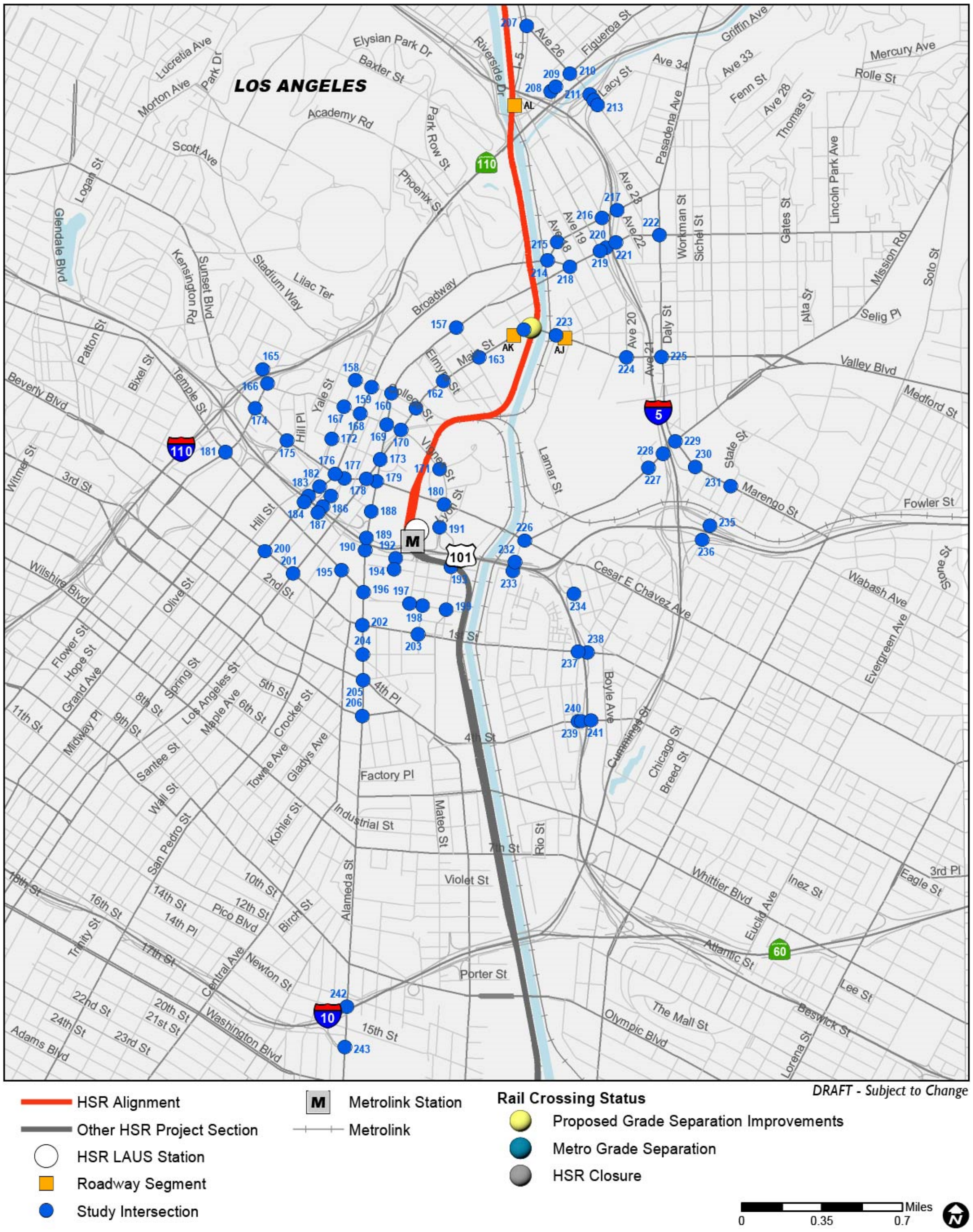
5.11.4 Existing Traffic Volumes

Existing volumes in the vicinity of the LAUS site were analyzed at study intersections. No roadway segments were identified for analysis in the LAUS area.

5.11.5 Existing Level of Service

Intersection LOS analyses were conducted using the traffic counts, analyzed and processed volumes, and fieldwork and other data within the Synchro analysis program. The results of the existing conditions scenario analysis for the RSA study intersections in the vicinity of LAUS are provided in Table 5-9.

The analyzed existing study intersection turn-movement volumes are provided in Appendix D-1. The LOS worksheets for existing conditions are provided in Appendix D-2.



Source: California High Speed Rail Authority, 2017

Figure 5-5 Study Intersections in Vicinity of Los Angeles Union Station

Table 5-9 Study Intersection Operations Analysis for Existing Conditions - LAUS

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
157	Sotello Street at Spring Street	OWSC	12.1	B	19.8	C
158	Hill Street at College Street	Signal	14.7	B	12.3	B
159	Broadway at College Street	Signal	17.6	B	20.7	C
160	Spring Street-Alameda Street at College Street	Signal	20.7	C	11.9	B
161	Main Street at College Street	TWSC	>180	**F**	>180	**F**
162	Elmyra Street at Main Street	TWSC	30.7	D	47.3	**E**
163	Sotello Street at Main Street	OWSC	24.7	C	26.8	D
165	Figueroa Street at Figueroa Terrace	AWSC	16.8	C	12.9	B
166	Figueroa Street at Alpine Street	Signal	16.7	B	15.3	B
167	Hill Street at Alpine Street	Signal	8.0	A	7.4	A
168	Broadway at Alpine Street	Signal	12.6	B	10.2	B
169	Alameda Street at Alpine Street	Signal	12.7	B	17.3	B
170	Main Street at Alpine Street	Signal	19.9	B	36.8	D
171	Vignes Street at Bauchet Street	Signal	4.8	A	8.5	A
172	Hill Street at Ord Street	Signal	>180	**F**	6.5	A
173	Alameda Street at Main Street - Ord Street	OWSC	22.7	C	13.6	B
174	Figueroa Street at Sunset Boulevard - Cesar E. Chavez Avenue	Signal	36.4	D	29.9	C
175	Grand Avenue at Cesar E. Chavez Avenue	Signal	26.1	C	26.1	C
176	Broadway at Cesar E. Chavez Avenue	Signal	36.3	D	36.9	D
177	New High Street - Spring Street at Cesar E. Chavez Avenue	Signal	21.8	C	17.8	B
178	Main Street at Cesar E. Chavez Avenue	Signal	5.3	A	10.0	A
179	Alameda Street at Cesar E. Chavez Avenue	Signal	23.4	C	23.1	C
180	Vignes Street at Cesar E. Chavez Avenue	Signal	28.5	C	30.6	C
181	Figueroa Street at Temple Street	Signal	81.3	**F**	>180	**F**
182	Broadway at US-101 NB On-Ramp	Signal	2.3	A	1.3	A
183	Broadway at Arcadia Street	Signal	17.9	B	13	B
184	Broadway at Aliso Street	Signal	11.4	B	10.2	B
185	Spring Street at US-101 NB Off-Ramp	OWSC	0.8	A	1.7	A
186	Spring Street at Arcadia Street	Signal	25	C	>180	**F**
187	Spring Street at Aliso Street	Signal	6.9	A	0.1	A
188	Alameda Street at Paseo de la Place	Signal	8.3	A	12.3	B
189	Alameda Street at Arcadia Street – US-101 NB Off-Ramp	Signal	18.0	B	11.1	B
190	Alameda Street at Aliso Street - Commercial Street	Signal	20.2	C	11.8	B

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
191	Vignes Street at Gateway Plaza - Ramirez Street	Signal	97.0	**F**	>180	**F**
192	Garey Street US-101 SB On-/Off-Ramps at Commercial Street	Signal	34.5	C	40.8	D
193	Center Street at Commercial Street	AWSC	16.2	C	38.0	**E**
194	Garey Street at Ducommun Street	TWSC	9.8	A	11.3	B
195	Judge John Aliso Street at Temple Street	Signal	26.1	C	24.1	C
196	Alameda Street at Temple Street	Signal	21.7	C	22.7	C
197	Garey Street at Temple Street	AWSC	11.0	B	12.5	B
198	Vignes Street at Temple Street	AWSC	11.0	B	9.4	A
199	Center Street at Temple Street	OWSC	12.8	B	13.3	B
200	Broadway at 1st Street	Signal	14.8	B	14.5	B
201	Main Street at 1st Street	Signal	9.8	A	13.3	B
202	Alameda Street at 1st Street	Signal	18.9	B	24.3	C
203	Vignes Street at 1st Street	Signal	32.6	C	27.7	C
204	Alameda Street at 2nd Street	Signal	13.7	B	18.1	B
205	Alameda Street at 3rd Street – 4th Place	Signal	25.4	C	22.9	C
206	Alameda Street at 4th Street	Signal	11.6	B	27.8	C
227	Richmond Street at Mission Road	OWSC	28.7	C	16.4	B
232	Mission Road at US-101 NB On-/Off-Ramps	Signal	9.2	A	5.9	A
233	Mission Road at Aliso Street US-101 SB On-/Off-Ramps	Signal	14.6	B	9.1	A
234	Pleasant Avenue at I-10 EB On-/Off-Ramps / Kearney Street	TWSC	44.0	**E**	45.8	**E**
237	US-101 SB On-Ramp - Pecan Street at 1st Street	TWSC	13.5	B	14.4	B
238	US-101 NB On-/Off-Ramps at 1st Street	Signal	20.3	C	22.2	C
239	US-101 SB On-Ramp - Pecan Street at 4th Street	Signal	>180	**F**	18.1	B
240	US-101 SB Off-Ramp at 4th Street	Signal	>180	**F**	6.4	A
241	US-101 NB Off-Ramp at 4th Street	Signal	>180	**F**	16.9	B
242	Alameda Street at Newton Street (I-10 WB On-Ramp)	OWSC	13.8	B	32.1	D
243	Alameda Street at I-10 EB On-/Off-Ramps	Signal	19.3	B	19.9	B

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
AWSC = all-way stop control
EB = eastbound
I = Interstate
LAUS = Los Angeles Union Station
LOS = level(s)-of-service
NB = northbound
OWSC = one-way-stop control
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
US = U.S. Route
WB = westbound

The following 11 analyzed RSA intersections in the vicinity of the LAUS site operate at LOS E or F under existing conditions:

- Main Street at College Street
- Elmyra Street at Main Street
- Hill Street at Ord Street
- Figueroa Street at Temple Street
- Spring Street at Arcadia Street
- Vignes Street at Gateway Plaza - Ramirez Street
- Center Street at Commercial Street
- Pleasant Avenue at I-10 EB On-/Off-Ramps / Kearney Street
- US-101 southbound on-ramp - Pecan Street at Fourth Street
- US-101 southbound off-ramp at Fourth Street
- US-101 northbound off-ramp at Fourth Street

5.11.6 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 will 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, LADOT Commuter Express and LADOT 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.

Metrolink provides commuter rail transit at LAUS, and Amtrak provides intercity rail service. Metro provides urban rail services with the Red, Purple and Gold Lines.

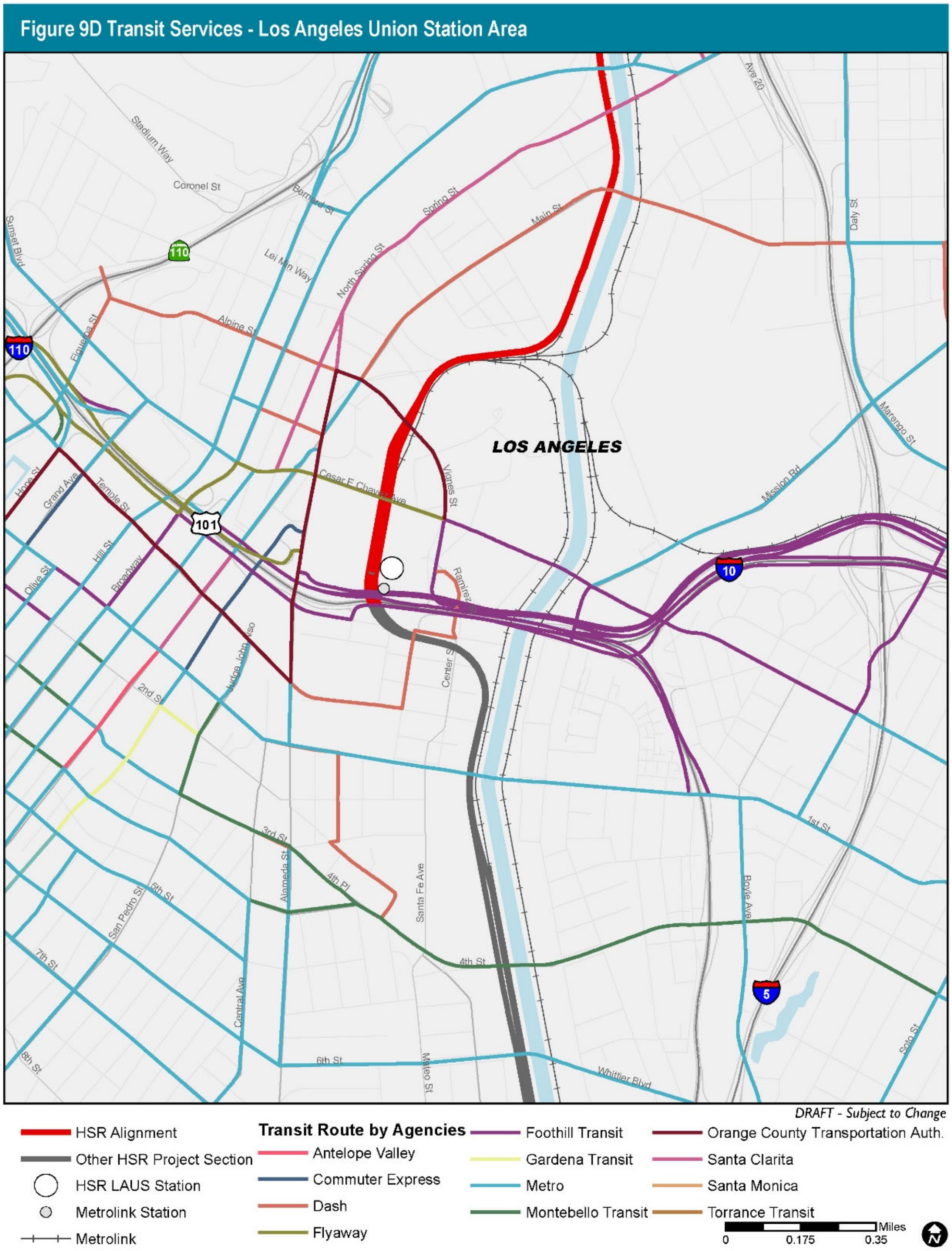
Table 5-10 provides a list of the transit services provided at LAUS under existing conditions. Figure 5-6 depicts the transit network in the area near the LAUS station site.

Table 5-10 Summary of Transit Service at Los Angeles Union Station

	Agency	Name / Line #	M-F Peak Frequency (mins)	M-F All-Day Service/Weekend Service	Average Weekday Ridership
Rail Lines On-Site	Metrolink	Antelope Valley Line	60	N / Y	5,883
		Ventura County Line	25	N / Y	3,800
		San Bernardino Line	26	N / Y	9,523
		Riverside Line	45 to 60	N / Y	4,282
		91/Perris Valley Line	30	N / Y	2,891
		Orange County Line	30	N / Y	8,562
	Amtrak	Coast Starlight	N/A	Y / -	N/A
		Southwest Chief	N/A	Y / -	N/A
		Pacific Surfliner	N/A	Y / -	N/A
		Sunset Limited	N/A	Y / -	N/A
	Metro Rail	Red Line	5 to 10	Y / Y	144,528
		Purple Line	6 to 10	Y / Y	
		Gold Line	7 to 14	Y / Y	51,814
Bus Service Off-Site	AVTA	785	30	N / N	N/A
	Big Blue Bus Rapid	Freeway Express 10	15 to 30	Y /N	N/A
	Bolt Bus	Bay	-	N / Y	N/A
		Los Angeles	-	N / Y	N/A
	CA Shuttle	California Shuttle Bus	-	N / Y	N/A
	City of Commerce	Transit Citadel Express	45	Y / Y	N/A
	FlyAway	Union Station	30	Y / Y	N/A
	Foothill Transit	699	7 to 15	N / N	358
	LADOT	DASH Downtown B	8	Y /N	N/A
		DASH Downtown D	5 to 15	Y /N	N/A
		DASH Lincoln Heights/Chinatown	30	Y / Y (SAT ONLY)	N/A
		Commuter Express Union Station/Bunker Hill Shuttle	buses wait for each Metrolink train	N / N	N/A
		Commuter Express 431	25	N / N	N/A
		Commuter Express 534	25 to 30	N / N	N/A
	OCTA	701	20 to 30	N / N	N/A
	Santa Clarita	794	25 to 60	N / N	N/A
	Torrance Transit	Express 4	30 to 35	N / N	N/A
	USC	Intercampus Route	-	-	N/A
	Megabus	Bay	-	-	N/A
		Los Angeles	-	-	N/A
	Metro	Dodger Stadium Express	10	- / Game Days Only	N/A

	Agency	Name / Line #	M-F Peak Frequency (mins)	M-F All-Day Service/Weekend Service	Average Weekday Ridership
Bus Service Off-Site	Metro	33 Overnight	10 to 20	Y / Y	10,073
		40	15 to 20	Y / Y	15,320
		68	18 to 20	Y / Y	4,965
		70	11 to 15	Y / Y	9,819
		71	15 to 20	N / Y	1,525
		76	14 to 27	Y / Y	8,762
		78/378	10 to 15	Y / Y	8,801
		79	10 to 15	Y / Y	N/A
		Express 442	40 to 50	N / N	215
		Express 485	20 to 50	N / N	1,409
		Rapid 704	10 to 15	Y / Y	10,171
		Rapid 728	13 to 20	Y / N	5,369
		Rapid 733	9 to 20	Y / Y	8,538
		Rapid 745	10 to 14	Y / Y	5,646
		Rapid 770	15 to 20	Y / Y (SAT ONLY)	6,918
Bus Service On-Site *	Burbank Bus	Empire / Downtown	18	N / N	N/A
		Noho / Airport	15 to 20	Y / N	N/A
	Foothill Transit	Silver Streak	8 to 60	Y / Y	4,785
		481	10 to 20	N / N	277
		493	10 to 15	N / N	714
		495	20	N / N	369
		497	15	N / N	439
		498	10 to 20	N / N	793
		499	10 to 15	N / N	581
	Metro	94	15 to 20	Y / Y	4,441
		169	60	Y / N	2,156
		222	26 to 45	Y / Y	1,359
		Express 487	20 to 30	Y / N	3,445
		Express 489	30 to 35	Y / Y	N/A
		Rapid 794	15 to 20	Y / N	4,228
		Silver Line 910/950	5 to 11	Y / Y	14,509

Source: California High-Speed Rail Authority, 2017
* "On site" refers to the Patsaouras Transit Plaza at the east end of LAUS.
AVTA = Antelope Valley Transit Authority
LADOT = City of Los Angeles Department of Transportation
LAUS = Los Angeles Union Station
M–F = Monday through Friday
Metro = Los Angeles County Metropolitan Transportation Authority
mins = minutes
N/A = not available
N = no
OCTA = Orange County Transportation Authority
USC = University of Southern California
Y = yes



Source: Los Angeles County Metropolitan Transportation Authority, 2017

Figure 5-6 Bus Transit Network—Los Angeles Union Station Area

5.11.7 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. The following lists an inventory of crosswalks and signalized intersections that provide safe pedestrian connections.

- **Alameda Street/Interstate 10 Westbound Off-Ramps-Arcadia Street:** Located on the southwest corner of the LAUS site, this 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 that operate along the El Monte Busway, such as the Metro Silver Line and Foothill Transit Silver Streak. The pedestrian facilities provide safe movement for transit users of these bus lines.
- **Alameda Street/Los Angeles Street:** Located to the west of LAUS, this intersection provides protected pedestrian phasing that provides safe access between LAUS and the historic El Pueblo de Los Angeles Historical Monument and the shops and restaurants in Olvera Street. The intersection also has bus stops that service Metro and LADOT bus lines.
- **Alameda Street/Cesar E. Chavez Avenue:** Located on the northwest corner of the LAUS site, this 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 E. Chavez Avenue:** Located on the northeast corner of the LAUS site, this intersection also provides protected pedestrian phasing and safe access between LAUS, the Metro headquarters, and the newly constructed 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, this 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 government facilities to the east.

Pedestrian access to and from the Los Angeles 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.

5.11.8 Existing Bicycle Facilities

The LADOT bicycle program features seven types of bike lanes/routes:

- **Bike Path:** A bike path is a paved pathway separated from motorized vehicle traffic by an open space or barrier and located either within the highway right-of-way or within an independent alignment.
- **Cycle Track (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 located 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:** A Neighborhood Enhanced Street is a roadway that provides comfortable and safe localized travel for slower-moving modes such as walking, bicycling, or slow-speed motorized means of travel.

Figure 5-7 illustrates the locations of existing bicycle facilities within the vicinity of the LAUS site.

Three roadways in the LAUS area currently include buffered bike lanes, which are listed below. These facilities all provide connections between the south and north sides of US-101. The Los Angeles Street segment provides a direct link to the LAUS site.

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

Two roadways in the vicinity of LAUS provide bicycle lanes:

- First Street between Beaudry 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 renting bicycles. The bike station has 18 docks available to users. The system provides internet-based tracking of available bicycles and return bays for users.

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

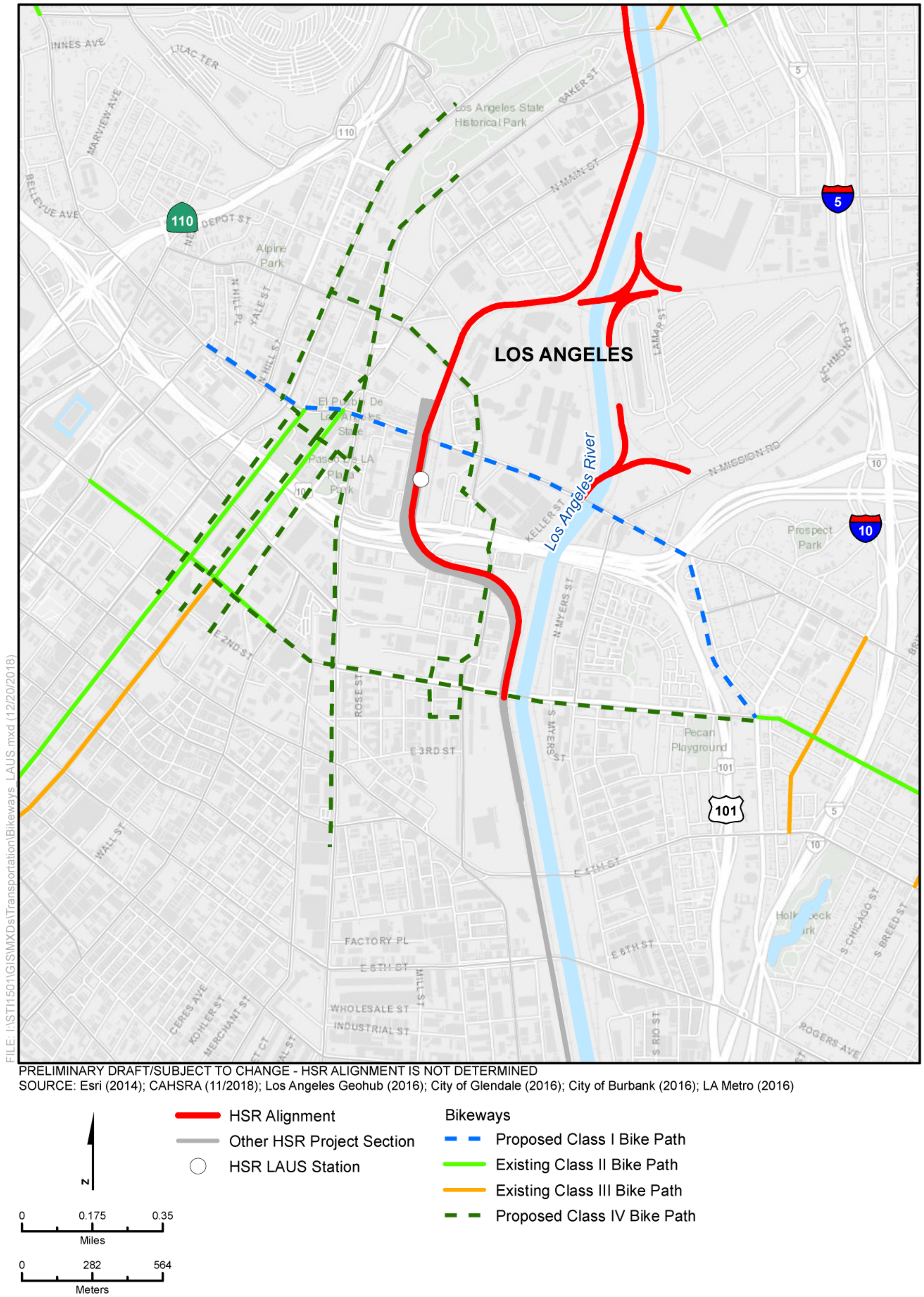


Figure 5-7 Bicycle Facilities in the Vicinity of LAUS

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6 EFFECTS ANALYSIS

6.1 Introduction

This section provides the analysis of Existing Year (2015) conditions with the project, as well as Opening Year (2029) and Horizon Year (2040) conditions with and without the project.

Traffic operations for existing conditions without the project are documented in Section 5, Affected Environment. Traffic forecasts for the no project condition were based on the SCAG Regional Model.

Traffic forecasts with the project were determined as follows:

- In areas where the project proposes to reconstruct roadways, existing or future forecasted traffic for the no project condition was rerouted to conform to the new roadway network proposed by the project.
- In areas where the project proposes roadway closures across the project alignment, existing or future forecasted traffic was rerouted to the nearest grade separation.
- New vehicle trip activity in and out of the proposed HSR Hollywood Burbank Airport and LAUS stations due to HSR service was calculated using the trip generation, distribution, and assignment methodology discussed earlier in this report.

6.2 No Project Alternative

6.2.1 Highway Element

The RTP identifies freeway and surface roadway improvement projects within the RSA, and those are defined in Table 6-1 in the RTP. These projects were incorporated into the analysis of no project and plus-project conditions.

Table 6-1 Summary of Resource Study Area Freeway and Roadway Projects in the Regional Transportation Plan

RTP ID	Description	Completion Year
LA000358	Interstate 5: - From State Route (SR) 134 to SR 170 HOV lanes (increasing from 8 to 10 total lanes). Construct modified interchange at Empire Ave, auxiliary lanes northbound and southbound between Burbank Blvd and Empire Ave; and modify existing structures. Add auxiliary lane between N Alameda Street and N Olive Street	2019
LA0G1050	Doran Street grade separation. Develop a grade separation at Doran Street on the Metrolink Valley Subdivision to improve safety.	2020

HOV = high-occupancy vehicle
RTP = Regional Transportation Plan

Metro and Caltrans are currently implementing the I-5 corridor project within the RSA. The current project segment will be completed by the year 2019 and is located between Magnolia Boulevard and Buena Vista Street in Burbank.

Future improvements on area roadways assumed to be in place under the year 2029 No Project conditions based on the I-5 corridor project described above, include the following:

- Burbank Boulevard widening from Lankershim Boulevard to Cleon Avenue (two to four lanes)
- San Fernando Road closure north of Victory Place and south of Grismer Avenue
- Closure of I-5 slip ramps along San Fernando Road
- Extension of Empire Avenue north of Victory Place to connect with San Fernando Road south of Grismer Avenue

- New I-5 full access diamond interchange along new Empire Avenue Extension
- All-way Stop control installation at San Fernando Road Mirror at I-5 Southbound Ramps

The proposed I-5/Empire Avenue interchange is illustrated on Figure 6-1.

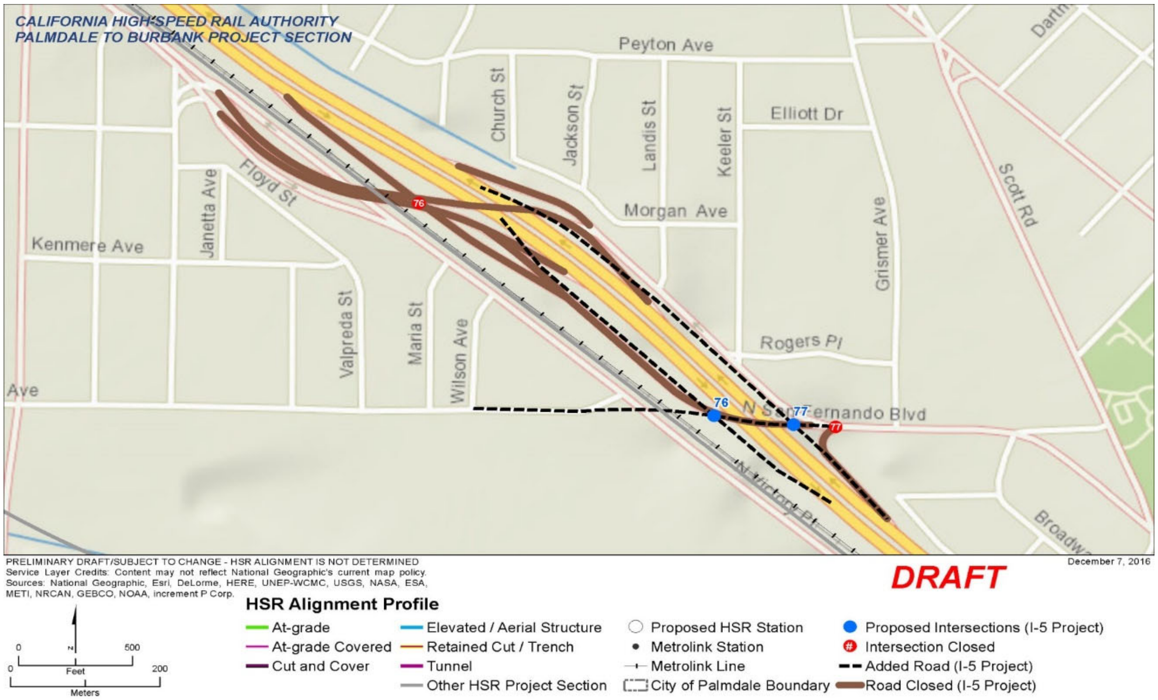


Figure 6-1 Empire Avenue Ramp Reconfiguration

As shown on this figure, existing Intersections 76 and 77 are located at this interchange. These study intersection numbers relate to nearby existing intersections that would be removed as part of project construction. The intersection numbers and locations for future conditions are used for proposed intersections at the planned I-5/Empire Avenue full-access interchange, as the intersections on this figure that were analyzed under existing conditions would be removed as part of the I-5 project construction.

The geometry of the new interchange intersections is provided in Appendix H.

6.2.2 Regional Bus Service

Metro provides core transit service via its Rapid Bus lines, which complement and connect to local bus service. An overall plan for Rapid Bus service and a future network for all Rapid Bus lines has been defined by Metro. There are no identified plans for new Rapid Bus service within the RSA. A bus rapid transit project, with additional infrastructure improvements, has been studied in the Metro *North Hollywood to Pasadena BRT Corridor Technical Study* (2017). The goal of this study is to provide connections between the North Hollywood Metro Orange Line/Red Line station on the west, the Burbank area, and the Metro Gold Line in Pasadena on the east.

Express bus services provided by Foothill Transit, Santa Clarita Transit, and other municipal operators at the proposed HSR stations will continue to provide such services in the future and there are not any identified major service changes planned by these operators.

6.2.3 Aviation Element

The Hollywood Burbank Airport Terminal Replacement project was approved by city of Burbank voters under Measure B in November 2016. The project will include development of surplus land into commercial uses but the airport will not increase in size, in that the number of gates is proposed to not increase from the current number. The number of daily flights will also not increase. The airport, therefore, will have limited growth in new vehicle trips to and from the site when the project is completed. The growth will come only from increases in passenger loads within the number of existing flights.

The *Environmental Impact Report For A Replacement Airline Passenger Terminal At Burbank Bob Hope Airport* (RS&H 2016) indicates that the forecast for passenger activity within the upcoming 10-year period (the study horizon) will not exceed the maximum levels experienced in 2008. The SCAG RTP has estimated that annual activity at the airport would reach 9.4 million passengers by 2035. This growth would be from regional growth trends over the 24-year forecast period.

The separate but adjacent commercial project at Hollywood Burbank Airport, using surplus land from the terminal replacement project, will generate some new local area vehicle trips. However, land use projections are included in the SCAG model, and therefore the applied growth rates in the opening-year and future-year analysis take this project into account.

Construction of the project alignment or operation of the HSR station facilities will not affect airport ground traffic or air operations. Construction of the project alignment grade separations will not directly affect ground access to and from local airport properties within the RSA. There are no other air-carrier airports within or near the project RSA.

6.2.4 Freight Rail

UPRR operates a freight rail line in the study area. According to the LOSSAN Corridor Strategic Implementation Plan, the daily freight train trips within the project corridor are expected to grow from 11 in 2014 to 18 in 2030. According to the Caltrans California State Rail Plan, the freight activity on both rail lines within the RSA will grow by up to 30 trains per day by 2018.

No major freight rail improvement projects are identified in the Strategic Implementation Plan or the State Rail Plan.

6.2.5 Conventional Passenger Rail Element

The LOSSAN Rail Corridor Agency, overseer of the Amtrak Pacific Surfliner service between San Luis Obispo/Santa Barbara, LAUS, and San Diego, plans a service expansion that would increase intercity rail traffic from 12 daily trips to 18 daily trips in the corridor by 2040 (extrapolated from planned annual increases and data in Section 2.9). This long-term increase in rail passenger service frequency would provide net benefits to the roadways within the RSA to some extent.

In the vicinity of the HSR Burbank Airport Station, Metrolink will be opening a new station on the Antelope Valley commuter rail line, which would be located immediately north of the Hollywood Burbank Airport. This would provide access to the airport and would be in close proximity to the future terminal area once that project is completed. The station is expected to be completed in 2018. Metrolink service in the corridor is expected to increase from 61 daily trains to 99 daily trains by 2040.

Table 6-2 lists the improvements in the RSA defined by the 2013 and 2018 California State Rail Plans.

Table 6-2 Programmed Improvements – 2013 and 2018 State Rail Plans

Planning Area	Corridor	Project
2020 Projects (from 2013 Plan) and 2022 Projects		
LOSSAN North	Hollywood Burbank Airport Station, Antelope Valley Line	New station at Hollywood Burbank Airport, adjacent to or coterminus with HSR station (Hollywood Way)
LOSSAN North	Hollywood Burbank Airport Station, Ventura County Line	Pedestrian grade separation and connection, from regional intermodal transportation center to Metrolink Ventura County Line Station.
Los Angeles Urban Mobility Corridor	LAUS	Metro Frequency Improvement at LAUS
2027 Projects		
Los Angeles Urban Mobility Corridor	LAUS	LAUS passenger capacity expansion and run-through tracks
	Burbank-Los Angeles-Anaheim	Corridor capacity and grade separation projects for first phase of integrated local and express service
LOSSAN North	Goleta/Santa Clarita-Burbank-LA	Bi-hourly express service Goleta-LA
		Hourly local service Chatsworth-LA
		Hourly local service Santa Clarita-LA
2040 Projects		
LOSSAN North	Goleta/Santa Clarita-Burbank-LA	Hourly express service Goleta-LA
		Implement half-hourly express and local rail service Chatsworth-LA
		Implement half-hourly local rail service Santa Clarita-LA

HSR = high-speed rail
LA = Los Angeles
LAUS = Los Angeles Union Station
LOSSAN = Los Angeles-San Diego-San Luis Obispo rail corridor

6.2.6 Roadway and Intersection Operations

6.2.6.1 Opening Year (2029) No Project Conditions

Traffic operations at the study roadway segments for Opening Year (2029) No Project conditions are summarized in Table 6-3.

Table 6-3 Roadway Segment Operations Analysis for Opening Year (2029) No Project Conditions

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
A	Sunland Boulevard - South of I-5 Northbound Ramps	2,900	1,950	0.672	B	2,220	0.766	C
B	Sunland Boulevard - North of San Fernando Road Minor	3,200	2,010	0.628	B	2,300	0.719	C
C	Vineland Avenue - South of San Fernando Road	2,900	1,852	0.639	B	2,222	0.766	C
D	Vineland Avenue - South of Victory Boulevard	2,900	2,180	0.752	C	2,130	0.734	C

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
E	Hollywood Way - South of I-5 Northbound Ramp	2,900	2,800	0.966	**E**	3,100	1.069	**F**
F	Hollywood Way - South of San Fernando Road Ramp	3,625	2,640	0.728	C	2,810	0.775	C
G	Hollywood Way - South of Winona Avenue	3,625	2,720	0.750	C	3,080	0.850	D
H	Hollywood Way - South of Thornton Avenue	3,200	2,850	0.891	D	3,190	0.997	**E**
I	Hollywood Way - North of Avon Street	3,200	2,690	0.841	D	2,940	0.919	**E**
J	Hollywood Way - North of Victory Boulevard	2,900	2,570	0.886	D	2,860	0.986	**E**
K	Hollywood Way - South of Victory Boulevard	2,900	2,330	0.803	D	2,510	0.866	D
L	Buena Vista Street - North of San Fernando Road	2,900	1,888	0.651	B	2,128	0.734	C
M	Buena Vista Street - South of San Fernando Road	2,900	2,686	0.926	**E**	2,840	0.979	**E**
N	Buena Vista Street - South of Empire Avenue	3,625	2,043	0.564	A	2,329	0.642	B
O	Lincoln Boulevard - South of San Fernando Road	2,900	556	0.192	A	534	0.184	A
P	Empire Avenue - East of Buena Vista Street	2,900	2,036	0.702	C	2,736	0.943	**E**
Q	Burbank Boulevard - South of I-5 Northbound ramps	4,950	3,098	0.626	B	3,042	0.615	B
R	San Fernando Road - West of Vineland Avenue	2,900	956	0.330	A	856	0.295	A
S	San Fernando Road - West of Hollywood Way	2,900	1,540	0.531	A	1,420	0.490	A
T	San Fernando Road - West of Buena Vista Street	2,900	1,540	0.531	A	1,530	0.528	A
U	Victory Place - West of Empire Street	1,100	1,069	0.972	**E**	1,025	0.932	**E**
V	San Fernando Road Minor - East of Vineland Avenue	1,100	400	0.364	A	400	0.364	A
W	San Fernando Road Minor - West of I-5 Southbound Ramps	1,100	600	0.545	A	570	0.518	A
X	Sherman Way - West of Vineland Avenue	2,900	1,320	0.455	A	1,580	0.545	A
Y	Victory Boulevard - West of Vineland Avenue	4,950	1,980	0.400	A	2,330	0.471	A
Z	Victory Boulevard - West of Hollywood Way	2,900	2,190	0.755	C	2,290	0.790	C

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
AA	Victory Boulevard - East of Hollywood Way	2,900	1,910	0.659	B	2,060	0.710	C
AB	San Fernando Road - West of Arvilla Avenue	2900	1,760	0.607	B	1,510	0.521	A
AC	Brazil Street - West of Railroad Track	1,200	115	0.096	A	122	0.102	A
AD	Doran Street - West of Railroad Track	1,200	438	0.365	A	452	0.377	A
AE	Flower Street - West of Air Way	3,000	169	0.056	A	316	0.105	A
AF	Western Avenue - East of Flower Street	2,700	1,557	0.577	A	1,902	0.704	C
AG	Sonora Avenue - West of Air Way	2,700	985	0.365	A	1,208	0.447	A
AH	Chevy Chase Drive - West of railroad track	1,200	403	0.336	A	555	0.463	A
AI	Grandview Avenue - West of Air Way	3,000	159	0.053	A	263	0.088	A
AJ	Main Street - East of Los Angeles River	3,000	1,736	0.579	A	1,485	0.495	A
AK	Main Street - West of Los Angeles River	3,000	1,735	0.578	A	1,415	0.472	A
AL	Avenue 19 - North of Figueroa Street (bridge)	1,250	1,837	1.470	**F**	1,368	1.094	**F**

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
I-5 = Interstate 5
LOS = level-of-service
V/C = Volume to Capacity Ratio

Eight of the study roadway segments are expected to operate at LOS E or F during the a.m. or p.m. peak hour under the Opening Year (2029) No Project conditions:

- Hollywood Way - South of I-5 northbound ramp
- Hollywood Way - South of Thornton Avenue
- Hollywood Way - North of Avon Street
- Hollywood Way - North of Victory Boulevard
- Buena Vista Street - South of San Fernando Road
- Empire Avenue - East of Buena Vista Street
- Victory Place - West of Empire Street
- Avenue 19 - North of Figueroa Street (bridge)

Traffic operations at the study intersections for Opening Year (2029) No Project conditions are provided in Table 6-4. Peak-hour turning movements at these intersections for this scenario are provided in Appendix F-1. The LOS worksheets are provided in Appendix F-2.

Table 6-4 Study Intersection Operations Analysis for Opening Year (2029) No Project Conditions

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1	SR 170 SB Ramps at Victory Boulevard	TWSC	>180	**F**	>180	**F**
2	Laurel Canyon at Victory Boulevard	Signal	33.7	C	32.2	C
3	Lankershim Boulevard at Victory Boulevard	Signal	27.8	C	31.8	C
5	Sunland Boulevard at I-5 NB ramps	Signal	22.2	C	23.2	C
6	Sunland Boulevard at I-5 SB ramps	Signal	20.8	C	25.6	C
7	Sunland Boulevard at San Fernando Road Minor	Signal	37.0	D	35.6	D
8	Sunland Boulevard at San Fernando Road	Signal	17.4	B	21.7	C
9	Vineland Avenue at Strathern Street	Signal	14.0	B	13.9	B
10	Vineland Avenue at Saticoy Street	Signal	12.9	B	8.6	A
11	Vineland Avenue at Sherman Way	Signal	23.4	C	23.9	C
12	Vineland Avenue at Vanowen Street	Signal	23.4	C	24.3	C
13	Vineland Avenue at Victory Boulevard	Signal	20.2	C	20.4	C
14	Vineland Avenue at Burbank Boulevard	Signal	19.4	B	20.1	C
15	Clybourn Avenue at San Fernando Road	Signal	32.2	C	24.8	C
20	Arvilla Avenue at San Fernando Road Minor	Signal	11.6	B	12.5	B
21	Arvilla Avenue at San Fernando Road	Signal	15.7	B	24.0	C
22	Arcola Avenue at San Fernando Road Minor	TWSC	22.5	C	11.1	B
23	Lockhead Drive at San Fernando Road	TWSC	31.4	D	15.0	C
24	Cohasset Street at San Fernando Road	TWSC	19.5	C	15.2	C
25	Cohasset Street at San Fernando Road Minor	Signal	5.0	A	4.6	A
27	Hollywood Way at I-5 NB Ramps	Signal	19.6	B	18.2	B
28	Hollywood Way at I-5 SB Ramps	TWSC	>180	**F**	61.1	**F**
30	Avon Street at Cohasset Street	TWSC	11.1	B	13.1	B
31	Avon Street at San Fernando Road Minor	Signal	5.7	A	5.9	A
32	Hollywood Way SB at San Fernando Road	Signal	3.9	A	3.3	A
33	Hollywood Way NB at San Fernando Road	Signal	3.8	A	4.0	A
34	Hollywood Way at Tulare Avenue	Signal	1.9	A	3.3	A
35	Hollywood Way at Winona Avenue	Signal	7.8	A	14.2	B
36	Hollywood Way at Thornton Avenue	Signal	16.6	B	31.0	C
37	Hollywood Way at Avon Street	Signal	12.4	B	15.8	B
38	Avon Street at Empire Avenue	Signal	4.4	A	4.0	A
39	Hollywood Way at Empire Avenue	Signal	4.8	A	6.0	A
41	Hollywood Way at Victory Boulevard	Signal	28.1	C	30.1	C
42	Hollywood Way at Burbank Boulevard	Signal	25.4	C	28.0	C
43	Hollywood Way at Magnolia Boulevard	Signal	23.5	C	27.7	C

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
44	Hollywood Way at Verdugo Avenue	Signal	23.7	C	28.5	C
45	Pass Avenue at SR 134 EB Ramps	Signal	14.9	B	12.8	B
46	Pass Avenue at Alameda Avenue	Signal	17.2	B	18.1	B
49	Hollywood Way at Alameda Avenue	Signal	26.8	C	28.4	C
58	San Fernando Road Minor at I-5 SB Ramps	TWSC	22.1	C	15.0	B
61	Buena Vista Street at I-5 NB Ramps	Signal	12.2	B	12.8	B
62	Buena Vista Street at Winona Avenue	Signal	33.4	C	20.0	B
63	Buena Vista Street at San Fernando Road	Signal	82.9	**F**	51.3	D
65	Buena Vista Street at Empire Avenue	Signal	88.3	**F**	>180	**F**
72	Lincoln Street at San Fernando Road	Signal	1.5	A	2.3	A
75	Empire Avenue at San Fernando Road	Signal	3.4	A	4.0	A
76	I-5 SB Ramps at San Fernando Road	TWSC	11.9	B	13.1	B
77	I-5 NB Ramps at San Fernando Road	TWSC	11.6	B	25.0	C
78	Burbank Boulevard at 3rd Street	Signal	8.3	A	10.8	B
82	Burbank Boulevard at Victory Boulevard	Signal	32.6	C	37.3	D
84	Magnolia Boulevard at 3rd Street	Signal	13.4	B	26.4	C
86	Magnolia Boulevard at Victory Boulevard	Signal	22.2	C	29.6	C
93	SR 170 SB Ramps at Sherman Way	Signal	31.2	C	49.0	D
94	Laurel Canyon at Sherman Way	Signal	84.9	**F**	>180	**F**
95	Lankershim Boulevard at Sherman Way	Signal	22.0	C	26.4	C
96	Hollywood Way at Cohasset Street	TWSC	152.3	**F**	41.4	**E**
97	San Fernando Road at Linden Avenue	TWSC	17.6	C	35.4	**E**
98	Flower Street at Allen Avenue	AWSC	9.6	A	11.4	B
99	San Fernando Road at Allen Avenue	Signal	6.2	A	11.6	B
100	Lake Street at Western Avenue	Signal	26.3	C	36.9	D
101	Flower Street at Western Avenue	Signal	20.4	C	48.4	D
102	San Fernando Road at Western Avenue	Signal	28.4	C	35.1	D
103	Glenoaks Boulevard at Western Avenue	Signal	30.5	C	49.2	D
104	San Fernando Road at Ruberta Avenue	TWSC	27.5	D	>97.4	**F**
105	Flower Street at Sonora Avenue	Signal	22.6	C	26.9	C
106	Grand Central Avenue at Sonora Avenue	OWSC	18.1	C	>180	**F**
107	Airway at Sonora Avenue	Signal	24.9	C	24.5	C
108	San Fernando Road at Sonora Avenue	Signal	26	C	29.8	C
109	Glenoaks Boulevard at Sonora Avenue	Signal	23.9	C	26.1	C
110	Flower Street at Grandview Avenue	AWSC	13.6	B	27.3	D
111	Grand Central Avenue at Grandview Avenue	AWSC	8.6	A	11.8	B
112	Air Way at Grandview Avenue	Signal	35.2	D	25.4	C

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
113	San Fernando Road at Grandview Avenue	Signal	17.4	B	21.1	C
114	Glenoaks Boulevard at Grandview Avenue	Signal	32.7	C	10.1	B
115	Glenoaks Boulevard at Graynold Avenue	Signal	6.5	A	8.6	A
116	San Fernando Road at Norton Avenue	OWSC	23.9	C	43.7	**E**
117	Glenoaks Boulevard at Norton Avenue	TWSC	17.8	C	23.5	C
118	Flower Street at Fairmont Avenue	OWSC	12.7	B	>180	**F**
119	Air Way at Flower Street	Signal	22	C	27.8	C
120	San Fernando Road at Flower Street-Pelanconi Avenue	Signal	4.1	A	7.1	A
121	Glenoaks Boulevard at Pelanconi Avenue	OWSC	17.2	C	21.4	C
122	San Fernando Road at Alma Street	OWSC	23.4	C	42.1	**E**
123	Glenoaks Boulevard at Alma Street	TWSC	17.2	C	21.2	C
124	San Fernando Road at Kellogg Avenue	OWSC	17.2	C	26.6	D
125	Glenoaks Boulevard at Highland Avenue	Signal	32.6	C	30.7	C
126	San Fernando Road at Fairmont Avenue	Signal	10.4	B	7.3	A
127	SR 134 WB On-/Off-Ramp at Fairmont Avenue	Signal	25.8	C	20.1	C
128	San Fernando Road at Doran Street	Signal	16.1	B	18.4	B
129	SR 134 EB On-/Off-Ramp-Commercial Street at Doran Street	Signal	>180	**F**	>180	**F**
130	Brunswick Avenue at Chevy Chase Drive	Signal	15.1	B	16.8	B
131	Perlita Avenue at Chevy Chase Drive	OWSC	9.5	A	10	A
132	La Clede Avenue at Chevy Chase Drive	AWSC	8.3	A	8.6	A
133	Alger Street at Chevy Chase Drive	OWSC	11.3	B	13.7	B
134	San Fernando Road at Chevy Chase Drive	Signal	54	D	30.5	C
135	Central Avenue at Chevy Chase Drive	Signal	19.6	B	19.2	B
136	Brunswick Avenue at Los Feliz Boulevard	Signal	17.2	B	16.6	B
137	San Fernando Road at Los Feliz Boulevard	Signal	37.8	D	44.8	D
138	San Fernando Road at Central Avenue	Signal	9.6	A	9.9	A
139	San Fernando Road at El Bonito Avenue	OWSC	18.7	C	19.6	C
140	San Fernando Road at Cerritos Avenue	Signal	6.5	A	7.8	A
141	San Fernando Road at Mira Loma Avenue	OWSC	13.8	B	13.2	B
142	Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue	Signal	>180	**F**	27.4	C
143	Glendale Boulevard at Larga Avenue	Signal	14.6	B	8.8	A
144	Glendale Boulevard at La Clede Avenue	OWSC	14.8	B	21.6	C
145	San Fernando Road at Brand Boulevard	Signal	68.2	**E**	62.9	**E**
146	Casitas Avenue at Tyburn Street	AWSC	7.2	A	7.1	A
147	San Fernando Road at Tybur Street	OWSC	16.5	C	19.8	C

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
148	Silver Lake Boulevard at Casitas Avenue	OWSC	9.4	A	9.7	A
149	La Clede Avenue at Fletcher Drive	Signal	15.7	B	27.3	C
150	San Fernando Road at Fletcher Drive	Signal	33.4	C	19.4	B
151	San Fernando Road at SR 2 SB On-/Off-Ramps	Signal	11.6	B	12.1	B
152	San Fernando Road at SR 2 NB Off-Ramp	Signal	13.9	B	11.5	B
153	San Fernando Road at SR 2 NB On-Ramp	TWSC	2.9	A	12.2	B
154	San Fernando Road at Macon Street	Signal	1.9	A	1.9	A
155	San Fernando Road at Future Street	Signal	10.1	B	3.4	A
156	San Fernando Road at Private Road	OWSC	48.2	**E**	20	C
157	Sotello Street at Spring Street	OWSC	13.1	B	21.3	C
158	Hill Street at College Street	Signal	15.5	B	19.5	B
159	Broadway at College Street	Signal	17.8	B	65.8	**E**
160	Spring Street-Alameda Street at College Street	Signal	21.3	C	14.1	B
161	Main Street at College Street	TWSC	>180	**F**	4.2	A
162	Elmyra Street at Main Street	TWSC	83.5	**F**	95.1	**F**
163	Sotello Street at Main Street	OWSC	40.2	**E**	45.7	**E**
164	Wilhardt Street at Main Street	OWSC	43.2	**E**	32.2	D
165	Figueroa Street at Figueroa Terrace	AWSC	16.6	C	14.1	B
166	Figueroa Street at Alpine Street	Signal	17.3	B	20.7	C
167	Hill Street at Alpine Street	Signal	8.1	A	8	A
168	Broadway at Alpine Street	Signal	13.2	B	10.2	B
169	Alameda Street at Alpine Street	Signal	11	B	20.2	C
170	Main Street at Alpine Street	Signal	24.2	C	54.3	D
171	Vignes Street at Bauchet Street	Signal	4.9	A	8	A
172	Hill Street at Ord Street	Signal	52	D	8.7	A
173	Alameda Street at Main Street - Ord Street	OWSC	42.1	**E**	17.7	C
174	Figueroa Street at Sunset Boulevard - Cesar E. Chavez Avenue	Signal	37.6	D	30.7	C
175	Grand Avenue at Cesar E. Chavez Avenue	Signal	34	C	30.1	C
176	Broadway at Cesar E. Chavez Avenue	Signal	>180	**F**	39.8	D
177	New High Street - Spring Street at Cesar E. Chavez Avenue	Signal	19.2	B	13.4	B
178	Main Street at Cesar E. Chavez Avenue	Signal	4.5	A	9.5	A
179	Alameda Street at Cesar E. Chavez Avenue	Signal	23.9	C	24.6	C
180	Vignes Street at Cesar E. Chavez Avenue	Signal	28.8	C	31.7	C
181	Figueroa Street at Temple Street	Signal	140.3	**F**	>180	**F**
182	Broadway at US-101 NB On-Ramp	Signal	4.9	A	6.4	A
183	Broadway at Arcadia Street	Signal	17.6	B	13.7	B

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
184	Broadway at Aliso Street	Signal	11.7	B	10.1	B
185	Spring Street at US-101 NB Off-Ramp	OWSC	11.8	B	9.7	A
186	Spring Street at Arcadia Street	Signal	24.8	C	>180	**F**
187	Spring Street at Aliso Street	Signal	0.1	A	0.1	A
188	Alameda Street at Paseo de la Place	Signal	10.1	B	14.2	B
189	Alameda Street at Arcadia Street – US-101 NB Off-Ramp	Signal	34.9	C	11.1	B
190	Alameda Street at Aliso Street - Commercial Street	Signal	18.9	B	22.4	C
191	Vignes Street at Gateway Plaza - Ramirez Street	Signal	99.6	**F**	>95.2	**F**
192	Garey Street – US-101 SB On-/Off-Ramps at Commercial Street	Signal	36.8	D	48.1	D
193	Center Street at Commercial Street	AWSC	16.8	C	37.9	**E**
194	Garey Street at Ducommun Street	TWSC	10.2	B	12.3	B
195	Judge John Aliso Street at Temple Street	Signal	26	C	24.3	C
196	Alameda Street at Temple Street	Signal	26.8	C	26.4	C
197	Garey Street at Temple Street	AWSC	11.3	B	12.1	B
198	Vignes Street at Temple Street	AWSC	11	B	9.3	A
199	Center Street at Temple Street	OWSC	12.8	B	15.1	C
200	Broadway at 1st Street	Signal	15	B	14.6	B
201	Main Street at 1st Street	Signal	12.5	B	13.6	B
202	Alameda Street at 1st Street	Signal	31	C	27.7	C
203	Vignes Street at 1st Street	Signal	35.1	D	30.3	C
204	Alameda Street at 2nd Street	Signal	24.6	C	20.4	C
205	Alameda Street at 3rd Street - 4th Place	Signal	32.2	C	24.1	C
206	Alameda Street at 4th Street	Signal	13.8	B	29.8	C
207	San Fernando Road at Avenue 26	Signal	18.8	B	29.8	C
208	SR 110 SB On-Ramp at Figueroa Street	Signal	12.8	B	17.6	B
209	SR 110 NB Off-Ramp at Figueroa Street	Signal	10.6	B	14.1	B
210	Avenue 26 at Figueroa Street	Signal	38.7	D	29.7	C
211	Avenue 26 at I-5 SB On-Ramp	TWSC	1.1	A	0.4	A
212	Avenue 26 at SR 110 NB On-Ramp	TWSC	1.8	A	2.6	A
213	Avenue 26 at I-5 NB Off-Ramp	Signal	9.1	A	10	A
214	Pasadena Avenue at Broadway	Signal	77.6	**E**	14.9	B
215	Avenue 18 at Pasadena Avenue	Signal	30	C	14.8	B
216	I-5 SB On-/Off-Ramps - Avenue 21 at Pasadena Avenue	Signal	16.7	B	14.1	B
217	I-5 NB On-/Off-Ramps at Pasadena Avenue	Signal	22.6	C	13.6	B
218	Avenue 18 at Spring Street at Broadway	Signal	161.1	**F**	21.3	C

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
219	Avenue 20 at Broadway	Signal	11.8	B	23.1	C
220	Avenue 21 at I-5 SB On-/Off-Ramps at Broadway	Signal	17.9	B	17.6	B
221	I-5 NB on/off Ramps - Avenue 21 at Broadway	Signal	24.7	C	16.4	B
222	Daly Street at Broadway	Signal	32.1	C	25.6	C
223	Gibbons Street at Main Street	OWSC	20.4	C	27.7	D
224	Avenue 20 at Main Street	Signal	13.2	B	10.3	B
225	Daly Street at Main Street	Signal	32.2	C	28.5	C
226	Mission Road at Cesar E. Chavez Avenue	Signal	164.1	**F**	42.4	**E**
227	Richmond Street at Mission Road	OWSC	37.4	D	17.2	B
228	I-5 SB On-/Off-Ramps at Mission Road	Signal	24.7	C	20.7	C
229	Marengo Street at Mission Road	Signal	32.9	C	24	C
230	I-5 NB On-Ramp at Marengo Street	TWSC	12	B	5.6	A
231	State Street at Marengo Street	Signal	35.9	D	22.9	C
232	Mission Road at US-101 NB On-/Off-Ramps	Signal	10.5	B	6.7	A
233	Mission Road at Aliso Street – US-101 SB On-/Off-Ramps	Signal	15.2	B	16.8	B
234	Pleasant Avenue at I-10 EB On-/Off-Ramps / Kearney Street	TWSC	108.7	**F**	>180	**F**
235	State Street at I-10 WB Off-Ramp	Signal	12	B	14	B
236	State Street at I-10 EB On-/Off-Ramps	Signal	11	B	18.7	B
237	US-101 SB On-Ramp - Pecan Street at 1st Street	TWSC	13.7	B	20	C
238	US-101 NB On-/Off-Ramps at 1st Street	Signal	20.4	C	21.8	C
239	US-101 SB On-Ramp - Pecan Street at 4th Street	Signal	>180	**F**	26.1	C
240	US-101 SB Off-Ramp at 4th Street	Signal	>180	**F**	6.8	A
241	US-101 NB Off-Ramp at 4th Street	Signal	>180	**F**	35.9	D
242	Alameda Street at Newton Street (I-10 WB On-Ramp)	OWSC	15.1	C	>180	**F**
243	Alameda Street at I-10 EB On-/Off-Ramps	Signal	19.8	B	18.2	B

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
AWSC = all-way stop control
EB = eastbound
I- = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way-stop control
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
US- = US Route
WB = westbound

The following 40 intersections within the RSA are expected to operate at LOS E or F under Opening Year (2029) No Project conditions:

- SR 170 SB Ramps at Victory Boulevard
- Roscoe Boulevard at I-5 SB Ramps
- Hollywood Way at Glenoaks Boulevard
- Hollywood Way at I-5 SB Ramps
- Ontario Street at Thornton Avenue

- Buena Vista Street at San Fernando Road
- Buena Vista Street at Empire Avenue
- Burbank Boulevard at San Fernando Road
- Alameda Avenue at Glenoaks Boulevard
- Laurel Canyon at Sherman Way
- Hollywood Way at Cohasset Street
- San Fernando Road at Linden Avenue
- San Fernando Road at Ruberta Avenue
- Grand Central Avenue at Sonora Avenue
- San Fernando Road at Norton Avenue
- Flower Street at Fairmont Avenue
- San Fernando Road at Alma Street
- SR 134 EB on-/off-ramp-Commercial Street at Doran Street
- Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue
- San Fernando Road at Brand Boulevard
- San Fernando Road at private road
- Broadway at College Street
- Main Street at College Street
- Elmyra Street at Main Street
- Sotello Street at Main Street
- Wilhardt Street at Main Street
- Alameda Street at Main Street-Ord Street
- Broadway at Cesar E. Chavez Avenue
- Figueroa Street at Temple Street
- Spring Street at Arcadia Street
- Vignes Street at Gateway Plaza-Ramirez Street
- Center Street at Commercial Street
- Pasadena Avenue at Broadway
- Avenue 18 at Spring Street at Broadway
- Mission Road at Cesar E. Chavez Avenue
- Pleasant Avenue at I-10 Eastbound On-/Off-Ramps / Kearney Street
- US-101 SB on-ramp - Pecan Street at Fourth Street
- US-101 SB off-ramp at Fourth Street
- US-101 NB off-ramp at Fourth Street
- Alameda Street at Newton Street (I-10 Westbound on-ramp

6.2.6.2 Horizon Year (2040) No Project Conditions

Traffic operations at the study roadway segments for Horizon Year (2040) No Project conditions are summarized in Table 6-5.

Table 6-5 Roadway Segment Operations Analysis for Horizon Year (2040) No Project Conditions

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
A	Sunland Boulevard - South of I-5 Northbound Ramps	2,900	1,970	0.679	B	2,310	0.797	C
B	Sunland Boulevard - North of San Fernando Road Minor	3,200	2,090	0.653	B	2,370	0.741	C
C	Vineland Avenue - South of San Fernando Road	2,900	1,906	0.657	B	2,286	0.788	C
D	Vineland Avenue - South of Victory Boulevard	2,900	2,300	0.793	C	2,230	0.769	C

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
E	Hollywood Way - South of I-5 Northbound Ramp	2,900	2,821	0.973	**E**	3,210	1.107	**F**
F	Hollywood Way - South of San Fernando Road Ramp	3,625	2,640	0.728	C	2,810	0.775	C
G	Hollywood Way - South of Winona Avenue	3,625	2,760	0.761	C	3,150	0.869	D
H	Hollywood Way - South of Thornton Avenue	3,200	2,850	0.891	D	3,230	1.009	**F**
I	Hollywood Way - North of Avon Street	3,200	2,690	0.841	D	2,940	0.919	**E**
J	Hollywood Way - North of Victory Boulevard	2,900	2,590	0.893	D	2,900	1.000	**E**
K	Hollywood Way - South of Victory Boulevard	2,900	2,370	0.817	D	2,560	0.883	D
L	Buena Vista Street - North of San Fernando Road	2,900	1,922	0.663	B	2,170	0.748	C
M	Buena Vista Street - South of San Fernando Road	2,900	2,744	0.946	**E**	2,900	1.000	**E**
N	Buena Vista Street - South of Empire Avenue	3,625	2,083	0.575	A	2,384	0.658	B
O	Lincoln Boulevard - South of San Fernando Road	2,900	575	0.198	A	539	0.186	A
P	Empire Avenue - East of Buena Vista Street	2,900	2,237	0.771	C	2,817	0.971	**E**
Q	Burbank Boulevard - South of I-5 Northbound ramps	4,950	3,336	0.674	B	3,121	0.631	B
R	San Fernando Road - West of Vineland Avenue	2,900	978	0.337	A	855	0.295	A
S	San Fernando Road - West of Hollywood Way	2,900	1,590	0.548	A	1,470	0.507	A
T	San Fernando Road - West of Buena Vista Street	2,900	1,650	0.569	A	1,630	0.562	A
U	Victory Place - West of Empire Street	1,100	1,156	1.051	**F**	1,116	1.015	**F**
V	San Fernando Road Minor - East of Vineland Avenue	1,100	410	0.373	A	400	0.364	A
W	San Fernando Road Minor - West of I-5 Southbound Ramps	1,100	610	0.555	A	640	0.582	A
X	Sherman Way - West of Vineland Avenue	2,900	1,380	0.476	A	1,760	0.607	B
Y	Victory Boulevard - West of Vineland Avenue	4,950	1,980	0.400	A	2,350	0.475	A
Z	Victory Boulevard - West of Hollywood Way	2,900	2,220	0.766	C	2,300	0.793	C
AA	Victory Boulevard - East of Hollywood Way	2,900	1,940	0.669	B	2,080	0.717	C
AB	San Fernando Road - West of Arvilla Avenue	2900	1,941	1.038	**F**	1,570	0.840	D

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
AC	Brazil Street - West of Railroad Track	1,200	115	0.096	A	122	0.102	A
AD	Doran Street - West of Railroad Track	1,200	438	0.365	A	452	0.377	A
AE	Flower Street - West of Air Way	3,000	169	0.056	A	316	0.105	A
AF	Western Avenue - East of Flower Street	2,700	1,557	0.577	A	1,902	0.704	C
AG	Sonora Avenue - West of Air Way	2,700	985	0.365	A	1,208	0.447	A
AH	Chevy Chase Drive - West of railroad track	1,200	403	0.336	A	555	0.463	A
AI	Grandview Avenue - West of Air Way	3,000	159	0.053	A	263	0.088	A
AJ	Main St - east of Los Angeles River	3,000	1,736	0.579	A	1,485	0.495	A
AK	Main St - west of Los Angeles River	3,000	1,735	0.578	A	1,415	0.472	A
AL	Avenue 19 - north of Figueroa Street (Bridge)	1,250	1,837	1.470	**F**	1,368	1.094	**F**

Source: California High-Speed Rail Authority, 2017
ADT = average daily traffic
I-5 = Interstate 5
LOS = level-of-service
V/C = volume-to-capacity ratio
veh/hr = vehicles per hour

Nine of the study roadway segments are expected to operate at LOS E or F during the a.m. or p.m. peak hour under the 2040 No Project conditions:

- Hollywood Way - South of I-5 Northbound Ramp
- Hollywood Way - South of Thornton Avenue
- Hollywood Way - North of Avon Street
- Hollywood Way - North of Victory Boulevard
- Buena Vista Street - South of San Fernando Road
- Empire Avenue - East of Buena Vista Street
- Victory Place - West of Empire Street
- San Fernando Road - West of Arvilla Avenue
- Avenue 19 - North of Figueroa Street (bridge)

Traffic operations for the study intersections for Horizon Year (2040) No Project conditions are provided in Table 6-6.

Table 6-6 Study Intersection Operations Analysis for Horizon Year (2040) No Project Conditions

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1	SR 170 SB Ramps at Victory Boulevard	TWSC	>180	**F**	>180	**F**
2	Laurel Canyon at Victory Boulevard	Signal	33.7	C	32.3	C
3	Lankershim Boulevard at Victory Boulevard	Signal	28.0	C	31.9	C
5	Sunland Boulevard at I-5 NB Ramps	Signal	22.0	C	24.4	C
6	Sunland Boulevard at I-5 SB Ramps	Signal	21.9	C	26.2	C
7	Sunland Boulevard at San Fernando Road Minor	Signal	37.3	D	36.0	D
8	Sunland Boulevard at San Fernando Road	Signal	17.9	B	22.7	C

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
9	Vineland Avenue at Strathern Street	Signal	14.7	B	14.1	B
10	Vineland Avenue at Saticoy Street	Signal	11.2	B	8.7	A
11	Vineland Avenue at Sherman Way	Signal	24.1	C	27.2	C
12	Vineland Avenue at Vanowen Street	Signal	24.4	C	24.9	C
13	Vineland Avenue at Victory Boulevard	Signal	21.3	C	21.1	C
14	Vineland Avenue at Burbank Boulevard	Signal	20.8	C	22.6	C
15	Clybourn Avenue at San Fernando Road	Signal	37.5	D	17.2	B
20	Arvilla Avenue at San Fernando Road Minor	Signal	11.6	B	12.5	B
21	Arvilla Avenue at San Fernando Road	Signal	16.7	B	23.7	C
22	Arcola Avenue at San Fernando Road Minor	TWSC	22.5	C	11.1	B
23	Lockhead Drive at San Fernando Road	TWSC	32.7	D	15.0	C
24	Cohasset Street at San Fernando Road	TWSC	19.6	C	15.2	C
25	Cohasset Street at San Fernando Road Minor	Signal	4.9	A	4.6	A
27	Hollywood Way at I-5 NB Ramps	Signal	19.8	B	19.5	B
28	Hollywood Way at I-5 SB Ramps	TWSC	>180	**F**	66.3	**F**
30	Avon Street at Cohasset Street	TWSC	11.1	B	13.1	B
31	Avon Street at San Fernando Road Minor	Signal	5.7	A	5.8	A
32	Hollywood Way SB at San Fernando Road	Signal	3.9	A	3.2	A
33	Hollywood Way NB at San Fernando Road	Signal	3.8	A	4.1	A
34	Hollywood Way at Tulare Avenue	Signal	1.9	A	3.3	A
35	Hollywood Way at Winona Avenue	Signal	8.1	A	16.0	B
36	Hollywood Way at Thornton Avenue	Signal	17.8	B	33.0	C
37	Hollywood Way at Avon Street	Signal	12.4	B	15.8	B
38	Avon Street at Empire Avenue	Signal	4.4	A	4.0	A
39	Hollywood Way at Empire Avenue	Signal	4.7	A	6.1	A
41	Hollywood Way at Victory Boulevard	Signal	28.4	C	30.7	C
42	Hollywood Way at Burbank Boulevard	Signal	25.5	C	28.7	C
43	Hollywood Way at Magnolia Boulevard	Signal	24.6	C	28.2	C
44	Hollywood Way at Verdugo Avenue	Signal	25.2	C	29.9	C
45	Pass Avenue at SR 134 EB Ramps	Signal	13.3	B	11.7	B
46	Pass Avenue at Alameda Avenue	Signal	18.1	B	19.6	B
49	Hollywood Way at Alameda Avenue	Signal	27.7	C	33.0	C
58	San Fernando Road Minor at I-5 SB Ramps	TWSC	26.3	D	17.2	C
61	Buena Vista Street at I-5 NB Ramps	Signal	12.8	B	12.7	B
62	Buena Vista Street at Winona Avenue	Signal	37.1	D	21.0	C
63	Buena Vista Street at San Fernando Road	Signal	89.7	**F**	56.7	**E**
65	Buena Vista Street at Empire Avenue	Signal	90.3	**F**	>180	**F**

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
72	Lincoln Street at San Fernando Road	Signal	1.4	A	2.2	A
75	Empire Avenue at San Fernando Road	Signal	3.4	A	3.8	A
76	I-5 SB Ramps at San Fernando Road	TWSC	13.1	B	16.4	B
77	I-5 NB Ramps at San Fernando Road	TWSC	12.8	B	23.6	C
78	Burbank Boulevard at 3rd Street	Signal	8.5	A	10.8	B
82	Burbank Boulevard at Victory Boulevard	Signal	34.5	C	41.0	D
84	Magnolia Boulevard at 3rd Street	Signal	13.8	B	33.4	C
86	Magnolia Boulevard at Victory Boulevard	Signal	22.9	C	30.8	C
93	SR 170 SB Ramps at Sherman Way	Signal	34.0	C	49.0	D
94	Laurel Canyon at Sherman Way	Signal	142.7	**F**	>180	**F**
95	Lankershim Boulevard at Sherman Way	Signal	25.0	C	28.0	C
96	Hollywood Way at Cohasset Street	TWSC	148.6	**F**	40.1	**E**
97	San Fernando Road at Linden Avenue	TWSC	19.6	C	35.4	**E**
98	Flower Street at Allen Avenue	AWSC	9.6	A	11.8	B
99	San Fernando Road at Allen Avenue	Signal	6	A	6.9	A
100	Lake Street at Western Avenue	Signal	24.1	C	42.1	D
101	Flower Street at Western Avenue	Signal	20.4	C	151.1	**F**
102	San Fernando Road at Western Avenue	Signal	30	C	44	D
103	Glenoaks Boulevard at Western Avenue	Signal	49.1	D	130.1	**F**
104	San Fernando Road at Ruberta Avenue	TWSC	27.8	D	97.4	**F**
105	Flower Street at Sonora Avenue	Signal	25	C	27	C
106	Grand Central Avenue at Sonora Avenue	OWSC	18.1	C	>180	**F**
107	Airway at Sonora Avenue	Signal	24.8	C	20.3	C
108	San Fernando Road at Sonora Avenue	Signal	28.8	C	31.7	C
109	Glenoaks Boulevard at Sonora Avenue	Signal	21.4	C	29.3	C
110	Flower Street at Grandview Avenue	AWSC	13.8	B	35.2	**E**
111	Grand Central Avenue at Grandview Avenue	AWSC	8.7	A	12	B
112	Air Way at Grandview Avenue	Signal	35.6	D	24.9	C
113	San Fernando Road at Grandview Avenue	Signal	20.6	C	19.4	B
114	Glenoaks Boulevard at Grandview Avenue	Signal	18.4	B	12.7	B
115	Glenoaks Boulevard at Graynold Avenue	Signal	9.9	A	8.6	A
116	San Fernando Road at Norton Avenue	OWSC	23.9	C	43.7	**E**
117	Glenoaks Boulevard at Norton Avenue	TWSC	17.8	C	23.5	C
118	Flower Street at Fairmont Avenue	OWSC	13.5	B	>180	**F**
119	Air Way at Flower Street	Signal	21.6	C	31.6	C
120	San Fernando Road at Flower Street-Pelanconi Avenue	Signal	4.2	A	7.8	A

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
121	Glenoaks Boulevard at Pelanconi Avenue	OWSC	17.2	C	21.4	C
122	San Fernando Road at Alma Street	OWSC	23.4	C	42.1	**E**
123	Glenoaks Boulevard at Alma Street	TWSC	17.2	C	22	C
124	San Fernando Road at Kellogg Avenue	OWSC	19.2	C	22.6	C
125	Glenoaks Boulevard at Highland Avenue	Signal	34.7	C	34	C
126	San Fernando Road at Fairmont Avenue	Signal	9.5	A	7.2	A
127	SR 134 WB On-/Off-Ramp at Fairmont Avenue	Signal	25.8	C	19.5	B
128	San Fernando Road at Doran Street	Signal	17.1	B	18.8	B
129	SR 134 EB On-/Off-Ramp-Commercial Street at Doran Street	Signal	>180	**F**	>180	**F**
130	Brunswick Avenue at Chevy Chase Drive	Signal	15.2	B	16.8	B
131	Perlita Avenue at Chevy Chase Drive	OWSC	9.4	A	10	A
132	La Clede Avenue at Chevy Chase Drive	AWSC	8.4	A	8.6	A
133	Alger Street at Chevy Chase Drive	OWSC	11.5	B	13.1	B
134	San Fernando Road at Chevy Chase Drive	Signal	59.4	**E**	29.2	C
135	Central Avenue at Chevy Chase Drive	Signal	19.7	B	19.3	B
136	Brunswick Avenue at Los Feliz Boulevard	Signal	17.9	B	16.4	B
137	San Fernando Road at Los Feliz Boulevard	Signal	35.6	D	43.8	D
138	San Fernando Road at Central Avenue	Signal	9.4	A	9.1	A
139	San Fernando Road at El Bonito Avenue	OWSC	19.1	C	19.8	C
140	San Fernando Road at Cerritos Avenue	Signal	6.2	A	7.7	A
141	San Fernando Road at Mira Loma Avenue	OWSC	13.8	B	13.2	B
142	Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue	Signal	>180	**F**	26.9	C
143	Glendale Boulevard at Larga Avenue	Signal	14.9	B	8.5	A
144	Glendale Boulevard at La Clede Avenue	OWSC	15.2	C	21.6	C
145	San Fernando Road at Brand Boulevard	Signal	72.8	**E**	69.9	**E**
146	Casitas Avenue at Tyburn Street	AWSC	7.2	A	7.1	A
147	San Fernando Road at Tybur Street	OWSC	16.5	C	20.1	C
148	Silver Lake Boulevard at Casitas Avenue	OWSC	9.4	A	9.7	A
149	La Clede Avenue at Fletcher Drive	Signal	15.6	B	25.3	C
150	San Fernando Road at Fletcher Drive	Signal	32.6	C	20.3	C
151	San Fernando Road at SR 2 SB On-/Off-Ramps	Signal	12.1	B	11.4	B
152	San Fernando Road at SR 2 NB Off-Ramp	Signal	14	B	11.5	B
153	San Fernando Road at SR 2 NB On-Ramp	TWSC	2.9	A	14	B
154	San Fernando Road at Macon Street	Signal	1.9	A	1.9	A
155	San Fernando Road at Future Street	Signal	10.2	B	3.4	A
156	San Fernando Road at Private Road	OWSC	48.2	**E**	23.4	C

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
157	Sotello Street at Spring Street	OWSC	13.5	B	21.7	C
158	Hill Street at College Street	Signal	15.8	B	25.7	C
159	Broadway at College Street	Signal	18.1	B	58.2	**E**
160	Spring Street-Alameda Street at College Street	Signal	21.6	C	15.5	B
161	Main Street at College Street	TWSC	>180	**F**	>180	**F**
162	Elmyra Street at Main Street	TWSC	>180	**F**	146.1	**F**
163	Sotello Street at Main Street	OWSC	45.8	**E**	91.7	**F**
164	Wilhardt Street at Main Street	OWSC	48.2	**E**	50.1	**F**
165	Figueroa Street at Figueroa Terrace	AWSC	19.8	C	15.8	C
166	Figueroa Street at Alpine Street	Signal	18.1	B	23.4	C
167	Hill Street at Alpine Street	Signal	8.7	A	8.3	A
168	Broadway at Alpine Street	Signal	13.9	B	12	B
169	Alameda Street at Alpine Street	Signal	11.4	B	23.2	C
170	Main Street at Alpine Street	Signal	26.6	C	76.4	**E**
171	Vignes Street at Bauchet Street	Signal	4.8	A	7.4	A
172	Hill Street at Ord Street	Signal	59.8	**E**	9.1	A
173	Alameda Street at Main Street - Ord Street	OWSC	141.9	**F**	22.4	C
174	Figueroa Street at Sunset Boulevard - Cesar E. Chavez Avenue	Signal	39.5	D	34.3	C
175	Grand Avenue at Cesar E. Chavez Avenue	Signal	85.9	**F**	39.9	D
176	Broadway at Cesar E. Chavez Avenue	Signal	>180	**F**	51.2	D
177	New High Street - Spring Street at Cesar E. Chavez Avenue	Signal	18.7	B	11.7	B
178	Main Street at Cesar E. Chavez Avenue	Signal	3.6	A	13	B
179	Alameda Street at Cesar E. Chavez Avenue	Signal	20	B	26.5	C
180	Vignes Street at Cesar E. Chavez Avenue	Signal	37.7	D	38.4	D
181	Figueroa Street at Temple Street	Signal	>180	**F**	>180	**F**
182	Broadway at US-101 NB On-Ramp	Signal	5.1	A	7.8	A
183	Broadway at Arcadia Street	Signal	18.4	B	14.7	B
184	Broadway at Aliso Street	Signal	11.9	B	15.5	B
185	Spring Street at US-101 NB Off-Ramp	OWSC	11.9	B	9.9	A
186	Spring Street at Arcadia Street	Signal	25.4	C	>180	**F**
187	Spring Street at Aliso Street	Signal	0.1	A	0.1	A
188	Alameda Street at Paseo de la Place	Signal	10.8	B	14.1	B
189	Alameda Street at Arcadia Street - US-101 NB Off-Ramp	Signal	35.1	D	10.6	B
190	Alameda Street at Aliso Street - Commercial Street	Signal	20.1	C	43.1	D
191	Vignes Street at Gateway Plaza - Ramirez Street	Signal	>180	**F**	113.5	**F**

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
192	Garey Street - US-101 SB On-/Off-Ramps at Commercial Street	Signal	38.9	D	58.9	**E**
193	Center Street at Commercial Street	AWSC	18.5	C	48.4	**E**
194	Garey Street at Ducommun Street	TWSC	10.3	B	12.7	B
195	Judge John Aliso Street at Temple Street	Signal	26	C	24.3	C
196	Alameda Street at Temple Street	Signal	27.9	C	27.6	C
197	Garey Street at Temple Street	AWSC	12.4	B	12.3	B
198	Vignes Street at Temple Street	AWSC	11.8	B	9.5	A
199	Center Street at Temple Street	OWSC	13	B	14.2	B
200	Broadway at 1st Street	Signal	14.9	B	14.6	B
201	Main Street at 1st Street	Signal	12.5	B	13.7	B
202	Alameda Street at 1st Street	Signal	26.2	C	30.4	C
203	Vignes Street at 1st Street	Signal	37.0	D	32.0	C
204	Alameda Street at 2nd Street	Signal	26.0	C	19.1	B
205	Alameda Street at 3rd Street - 4th Place	Signal	33.9	C	25.3	C
206	Alameda Street at 4th Street	Signal	12.5	B	30.1	C
207	San Fernando Road at Avenue 26	Signal	19.4	B	30.7	C
208	SR 110 SB On-Ramp at Figueroa Street	Signal	12.9	B	19.3	B
209	SR 110 NB Off-Ramp at Figueroa Street	Signal	10.6	B	15.3	B
210	Avenue 26 at Figueroa Street	Signal	41.1	D	36.9	D
211	Avenue 26 at I-5 SB On-Ramp	TWSC	1.3	A	0.4	A
212	Avenue 26 at SR 110 NB On-Ramp	TWSC	1.8	A	2.6	A
213	Avenue 26 at I-5 NB Off-Ramp	Signal	9.3	A	10.4	B
214	Pasadena Avenue at Broadway	Signal	161.3	**F**	16.0	B
215	Avenue 18 at Pasadena Avenue	Signal	29.9	C	13.7	B
216	I-5 SB On-/Off-Ramps - Avenue 21 at Pasadena Avenue	Signal	12.8	B	17.4	B
217	I-5 NB On-/Off-Ramps at Pasadena Avenue	Signal	15.2	B	11.3	B
218	Avenue 18 at Spring Street at Broadway	Signal	167.8	**F**	21.1	C
219	Avenue 20 at Broadway	Signal	11.8	B	9.9	A
220	Avenue 21 at I-5 SB On-/Off-Ramps at Broadway	Signal	19.3	B	22.5	C
221	I-5 NB on/off Ramps - Avenue 21 at Broadway	Signal	23.8	C	16.7	B
222	Daly Street at Broadway	Signal	33.6	C	27.4	C
223	Gibbons Street at Main Street	OWSC	24.1	C	32.6	D
224	Avenue 20 at Main Street	Signal	10.0	A	11.0	B
225	Daly Street at Main Street	Signal	81.6	**F**	48.0	D
226	Mission Road at Cesar E. Chavez Avenue	Signal	>180	**F**	63.0	**F**
227	Richmond Street at Mission Road	OWSC	38.0	D	17.9	B

No.	Study Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
228	I-5 SB On-/Off-Ramps at Mission Road	Signal	31.7	C	22.6	C
229	Marengo Street at Mission Road	Signal	40.9	D	25	C
230	I-5 NB On-Ramp at Marengo Street	TWSC	16.4	C	7.8	A
231	State Street at Marengo Street	Signal	49.8	D	23	C
232	Mission Road at US-101 NB On-/Off-Ramps	Signal	12.3	B	7.1	A
233	Mission Road at Aliso Street - US-101 SB On-/Off-Ramps	Signal	16.3	B	14.3	B
234	Pleasant Avenue at I-10 EB On-/Off-Ramps / Kearney Street	TWSC	>180	**F**	>180	**F**
235	State Street at I-10 WB Off-Ramp	Signal	12	B	7.7	A
236	State Street at I-10 EB On-/Off-Ramps	Signal	11	B	18.7	B
237	US-101 SB On-Ramp - Pecan Street at 1st Street	TWSC	13.8	B	20	C
238	US-101 NB On-/Off-Ramps at 1st Street	Signal	22.9	C	21.7	C
239	US-101 SB On-Ramp - Pecan Street at 4th Street	Signal	>180	**F**	79.9	**E**
240	US-101 SB Off-Ramp at 4th Street	Signal	>180	**F**	7.9	A
241	US-101 NB Off-Ramp at 4th Street	Signal	>180	**F**	70.3	**E**
242	Alameda Street at Newton Street (I-10 WB On-Ramp)	OWSC	15.5	C	>180	**F**
243	Alameda Street at I-10 EB On-/Off-Ramps	Signal	19.9	B	20.6	C

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
AWSC = all-way stop control
EB = eastbound
I- = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way-stop control
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
WB = westbound
US- = US Route

Peak-hour turning movements at these intersections for this scenario are provided in Appendix G-1. LOS worksheets are provided in Appendix G-2.

The following 49 intersections are expected to operate at LOS E or F under Horizon Year (2040) No Project conditions:

- SR 170 SB Ramps at Victory Boulevard
- Roscoe Boulevard at I-5 SB ramps
- Hollywood Way at Glenoaks Boulevard
- Hollywood Way at I-5 SB ramps
- Ontario Street at Thornton Avenue
- Buena Vista Street at San Fernando Road
- Buena Vista Street at Empire Avenue
- Burbank Boulevard at San Fernando Road
- Alameda Avenue at Glenoaks Boulevard
- Laurel Canyon at Sherman Way

- Hollywood Way at Cohasset Street
- San Fernando Road at Linden Avenue
- Flower Street at Western Avenue
- Glenoaks Boulevard at Western Avenue
- San Fernando Road at Ruberta Avenue
- Grand Central Avenue at Sonora Avenue
- Flower Street at Grandview Avenue
- San Fernando Road at Norton Avenue
- Flower Street at Fairmont Avenue
- San Fernando Road at Alma Street
- SR 134 EB on-/off-ramp-Commercial Street at Doran Street
- San Fernando Road at Chevy Chase Drive
- Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue
- San Fernando Road at Brand Boulevard
- San Fernando Road at private road
- Broadway at College Street
- Main Street at College Street
- Elmyra Street at Main Street
- Sotello Street at Main Street
- Wilhardt Street at Main Street
- Main Street at Alpine Street
- Hill Street at Ord Street
- Alameda Street at Main Street - Ord Street
- Grand Avenue at Cesar E. Chavez Avenue
- Broadway at Cesar E. Chavez Avenue
- Figueroa Street at Temple Street
- Spring Street at Arcadia Street
- Vignes Street at Gateway Plaza - Ramirez Street
- Garey Street - US-101 southbound on-/off-ramps at Commercial Street
- Center Street at Commercial Street
- Pasadena Avenue at Broadway
- Avenue 18 at Spring Street at Broadway
- Daly Street at Main Street
- Mission Road at Cesar E. Chavez Avenue
- Pleasant Avenue at I-10 eastbound on-/off-Ramps/Kearney Street
- US-101 southbound on-ramp - Pecan Street at Fourth Street
- US-101 southbound off-ramp at Fourth Street
- US-101 northbound off-ramp at Fourth Street
- Alameda Street at Newton Street (I-10 westbound on-ramp)

6.2.7 Freeway Ramp Analysis

Table 6-7 provides a summary of the queuing analysis conducted for only those RSA intersections that are freeway ramp intersections with local surface roadways, in the vicinity of LAUS.

The analysis within Table 6-7 indicates that none of these intersections is estimated to have ramp vehicle queues that exceed the design length (combined length of all ramp lanes) of the ramps. The possible lengthening of these queues by activity from the HSR facilities at LAUS is examined later in this report. The calculations for these locations do not show queue lengths that exceed the design capacity under the 2029 and 2040 No Project scenarios.

The queuing analysis worksheets are included in Appendix F-2 for the Opening Year (2029) No Project conditions and in Appendix G-2 for the Horizon Year (2040) No Project conditions. For the existing conditions, the queueing analysis worksheets are included in Appendix D-2.

For the Burbank Airport Station area, ramp queuing analysis for freeway operations was conducted at off-ramp locations where the project contributes 100 or more trips.

Table 6-7 Freeway Access Ramp Queuing at Los Angeles Union Station Area Freeway Intersections—Existing, 2029, and 2040 No Project Conditions

Ramp Locations	Total Lane Storage Length (ft)	Existing Conditions		2029 No Project		2040 No Project	
		AM Peak Queue (ft)	PM Peak Queue (ft)	AM Peak Queue (ft)	PM Peak Queue (ft)	AM Peak Queue (ft)	PM Peak Queue (ft)
Spring Street and US-101 Northbound Off-Ramp	716	50	50	50	50	50	50
Alameda Street and Arcadia Street - US-101 Northbound Off-Ramp	2,080	992	401	1,251	430	1,251	425
Garey Street - US-101 Southbound On-Off Ramps and Commercial Street	1,290	297	216	327	231	350	234
SR 110 Northbound Off-Ramp and Figueroa Street	1,186	0	0	0	0	0	0
Avenue 26 and I-5 Northbound Off-Ramp	1,048	365	369	379	422	389	445
I-5 Southbound On-Off Ramps - Avenue 21 and Pasadena Ave	2,008	200	131	229	167	223	210
I-5 Northbound On-Off Ramps - Avenue 21 and Broadway	3,261	319	264	368	300	360	293
I-5 Southbound On-Off Ramps and Mission Rd	1,207	767	314	948	363	995	453
Mission Rd and US-101 Northbound On-Off Ramps	860	132	74	163	88	168	95
Mission Rd and Aliso Street - US-101 Southbound On-Off Ramps	1,164	171	134	178	147	186	152
Pleasant Ave and I-10 Eastbound On-Off Ramps / Kearney Street	420	23	22	26	29	30	35
State Street and I-10 Westbound Off-Ramp	872	519	169	526	177	526	177
US-101 Northbound On-Off Ramps and 1st Street	710	203	129	217	190	223	187
US-101 Southbound Off-Ramp and 4th Street	540	60	69	73	72	74	72
US-101 Northbound Off-Ramp and 4th Street	1,143	794	275	861	413	888	497
Alameda Street and I-10 Eastbound On-Off Ramps	1,315	412	191	458	205	458	227

Source: California High-Speed Rail Authority, 2017
Shaded cells denote an estimated exceedance of the ramp length (capacity).
ft: feet
I- = Interstate
SR = State Route
US- = U.S. Route

The analysis within Table 6-8 indicates that one of these intersections is estimated to have ramp vehicle queues that exceed the design length (combined length of all ramp lanes) of the ramps. The possible lengthening of these queues by activity from the HSR facilities at Burbank Airport Station is examined later in this report. The calculations for the other locations do not show queue lengths that exceed the design capacity under the 2029 and 2040 No Project scenarios.

Table 6-8 Freeway Access Ramp Queuing at Burbank Area Freeway Intersections—Existing, 2029, and 2040 No Project Conditions

Ramp Locations	Total Lane Storage Length (ft)	Existing Conditions		2029 No Project		2040 No Project	
		AM Peak Queue (ft)	PM Peak Queue (ft)	AM Peak Queue (ft)	PM Peak Queue (ft)	AM Peak Queue (ft)	PM Peak Queue (ft)
Sunland Boulevard at I-5 NB Ramps	1,370	237	390	252	528	252	608
Sunland Boulevard at I-5 SB Ramps	1,226	292	374	315	387	315	387
SR 170 SB Ramps at Sherman Way	1,562	358	588	449	459	474	459
Hollywood Way at I-5 NB Ramps	922	190	198	198	240	194	252
Hollywood Way at I-5 SB Ramps	2,115	1,080	142	1,113	220	1,155	236
San Fernando Road Minor at I-5 SB Ramps [a]	913	410	230	-	-	-	-
Buena Vista Street at I-5 NB Ramps	854	291	242	305	268	316	244
I-5 SB Ramps at San Fernando Road [b]	1,480	0	0	277	252	324	245
I-5 NB Ramps at San Fernando Road [b]	540	27	133	372	397	371	390
SR 170 SB Ramps at Victory Boulevard	1,150	1,491	875	1,627	1,007	1,401	762
Pass Avenue at SR 134 EB Ramps	1,432	521	236	822	560	716	505

Source: California High-Speed Rail Authority, 2017
ft: feet
I- = Interstate
SR = State Route

The queuing analysis worksheets are included in Appendix F-2 for the Opening Year (2029) No Project conditions and in Appendix G-2 for the Horizon Year (2040) No Project conditions. For the existing conditions, the queueing analysis worksheets are included in Appendix D-2.

6.3 Project Trip Generation and Distribution

Trips to and from each HSR station were calculated during the peak hour of traffic, based on ridership and model of travel information provided by the Authority.

6.3.1 Burbank Airport Station

This section presents the trip generation and distribution results for the HSR Burbank Airport station. The methodology is discussed in more detail in Section 4.2.1.2.

6.3.1.1 Trip Generation

Table 6-9 and Table 6-10 provide peak hour passenger trips by auto modes at the Burbank Airport Station for Opening Year (2029) and Horizon Year (2040), respectively.

Table 6-9 Burbank Station Peak-Hour Trip Generation—2029 Conditions (AM and PM)

Mode	Peak-Hour Inbound	Peak-Hour Outbound	Peak-Hour Total
Drop-Off/Pick-Up	199	199	398
Park and Ride	97	97	194
Rental Car	36	36	72
Taxi	22	22	44

Source: California High-Speed Rail Authority, 2016

Table 6-10 Burbank Station Peak-Hour Trip Generation—2040 Conditions (AM and PM)

Mode	Peak-Hour Inbound	Peak-Hour Outbound	Peak-Hour Total
Drop-Off/Pick-Up	357	357	714
Park and Ride	191	191	381
Rental Car	62	62	124
Taxi	42	42	84

Source: California High-Speed Rail Authority, 2016

6.3.1.2 Trip Distribution

Table 6-11 presents the applied trip distribution for Burbank Airport Station trips, based on information provided by the Authority. This distribution was aggregated into major travel corridors to and from the Burbank Airport Station area.

Table 6-11 Burbank Airport Station Trip Distribution

Zone Name	Location Description	Percentage of Trips
I-5 North	All zones north of the city of Burbank using I-5	33
I-5 South/SR 134 East	All zones southeast of the city of Burbank using I-5 or SR 134	8
US-101 West	All zones west of the city of Burbank using US-101	45
Vanowen West	All zones west of SR 170 and along Vanowen Street	2
Victory West	All zones west of SR 170 and along Victory Boulevard	1
San Fernando West	All zones west of the City of Burbank using San Fernando Road	3
Sunland North	All zones north of I-5 using Sunland Boulevard	1
Hollywood South	All zones south of SR 134 using Hollywood Way	2
Local Buena Vista	Local zone along Buena Vista Street and south of Victory Boulevard	1
Local Downtown	Local zone in downtown Burbank	1

Zone Name	Location Description	Percentage of Trips
Sherman West	All zones west of SR 170 and along Sherman Way	1
Vineland South	All zones south of Victory Boulevard along Vineland Boulevard	2

Source: California High-Speed Rail Authority, 2016
I- = Interstate
SR = State Route
US- = U.S. Route

6.3.1.3 Parking at Station

The Burbank HSR Station parking demand estimates are based on the maximum forecast from HSR System Ridership and Station Area Parking levels, an unlimited amount of parking spaces at market price, and assumptions for average passenger occupancy and trip duration. Based on the HSR System Ridership forecasts, the Burbank station unconstrained daily parking demand would be 1,640 spaces under Opening Year (2029) Plus Project Conditions and 3,210 spaces under Horizon Year (2040) Plus Project Conditions.

The Burbank HSR Station would be constructed with a total of 1,640 parking spaces within PNR facilities within the station area by 2029, and with a total of 3.210 spaces by 2040, the parking supply would therefore be adequate to meet the projected daily parking demand.

6.3.2 Los Angeles Union Station

This section presents the trip generation and distribution results for the HSR LAUS station. The methodology is discussed in more detail in Section 4.2.1.2.

6.3.2.1 Trip Generation

Table 6-12 and Table 6-13 provide peak hour passenger trips by automobile at LAUS for Opening Year (2029) and Horizon Year (2040), respectively.

Table 6-12 Station Peak-Hour Trip Generation—2029 Conditions (AM and PM Peak Hours)

Mode	LAUS		
	Peak-Hour Inbound	Peak-Hour Outbound	Peak-Hour Total
Drop-Off/Pick-Up	181	181	362
Park and Ride	130	130	260
Rental Car	57	57	114
Taxi	44	44	87

Source: California High-Speed Rail Authority, 2016
LAUS = Los Angeles Union Station

Table 6-13 Station Peak-Hour Trip Generation—2040 Conditions (AM and PM Peak Hours)

Mode	LAUS		
	Peak-Hour Inbound	Peak-Hour Outbound	Peak-Hour Total
Drop-Off/Pick-Up	289	289	579
Park and Ride	222	222	444
Rental Car	91	91	182
Taxi	76	76	152

Source: California High-Speed Rail Authority, 2016
LAUS = Los Angeles Union Station

Table 6-14 presents the applied trip distribution for station trips, based on information provided by the Authority. This distribution was conglomerated into major travel corridors to and from the LAUS area.

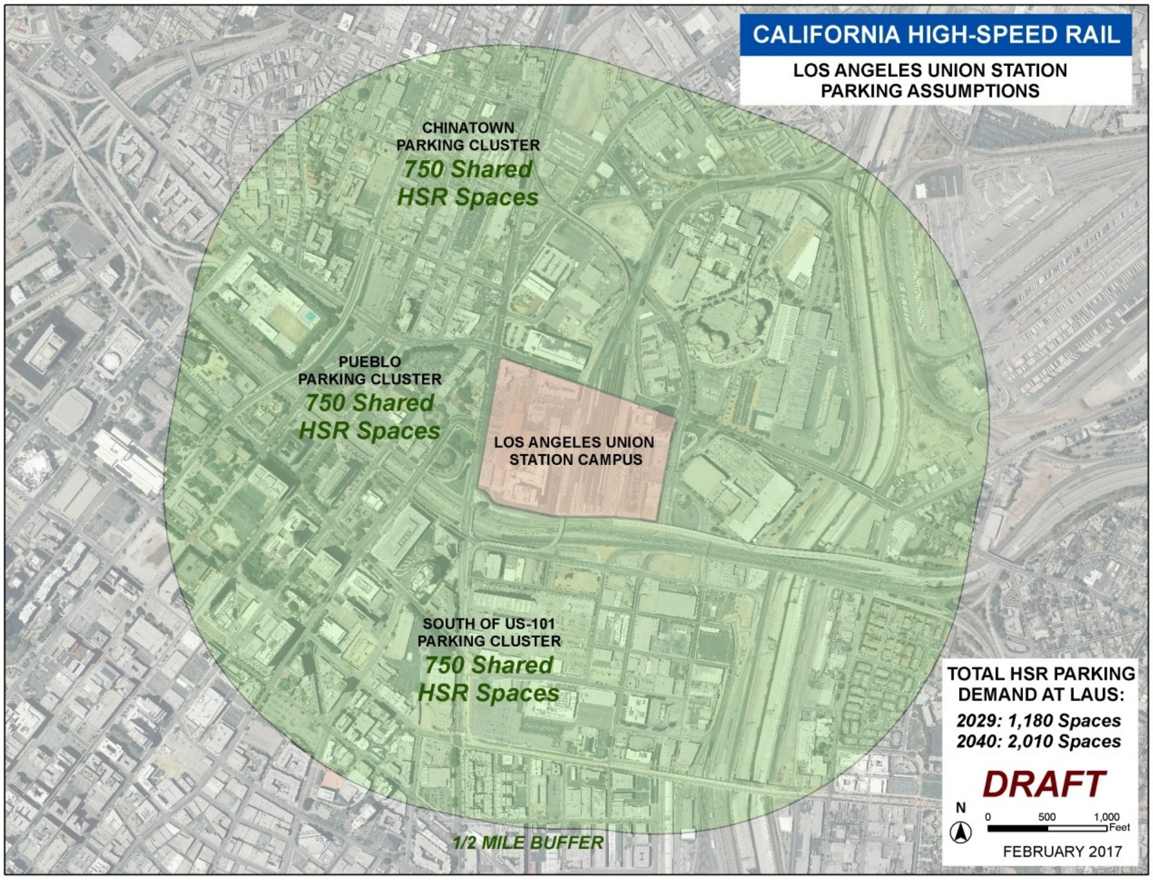
Table 6-14 Station Trip Distribution

Zone Name	Location Description	Percent of Trips
I-10/I-110	I-10 corridor to the west and the I-110 corridor to the south	37
US-101	US-101 corridor to the north	6
I-5/SR 60	I-5 corridor to the south and the SR 60 corridor to the east	34
I-10	I-10 corridor to the east	10
I-5/I-110	I-5 corridor to the north and the I-110 corridor to the north	13

Source: California High-Speed Rail Authority, 2016
I = Interstate
SR = State Route
US = U.S. Route

6.3.2.2 Parking at Los Angeles Union Station

All of the KNR trips at LAUS were distributed to the pick-up/drop-off location at the current Patsaouras Transit Plaza, on the west side of Vignes Street north of US-101. The PNR 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 the US-101 Parking Cluster). These general locations are illustrated on Figure 6-2. There would be an estimated parking supply in the area of 2,250 vehicle spaces.



Source: California High Speed Rail Authority, 2016

Figure 6-2 Parking Locations in the Vicinity of Los Angeles Union Station

Total parking demand at LAUS generated by the HSR station is estimated by the Authority to be 1,180 spaces in the Opening Year (2029) and 2,010 spaces in the Horizon Year of (2040).

The PNR trips were distributed to these general parking locations based on the estimated available supply defined above.

6.3.3 Maintenance Facilities

There are no planned HSR maintenance facilities within the Burbank to Los Angeles Project Section. The nearest planned maintenance facility would be located to the south of the RSA but within the city of Los Angeles.

6.3.4 Electric Power Improvements

Power facilities would be necessary for the operation of the HSR system within the project section. These facilities would be unmanned utility systems that will be located at the edge of the alignment and would have a spacing of several miles. Occasional maintenance trips to these facilities would be necessary but would not generate trips on a daily basis that would add measurable volumes within the transportation RSA.

6.4 Plus-Project Roadway and Intersection Levels-of-Service

This section summarizes Plus Project conditions analysis for the two future analysis years.

6.4.1 Effects on Regional Transportation System

6.4.1.1 Opening Year (2029) Plus Project Effects

The Opening Year (2029) Plus Project scenario roadway operations and intersection operations analyses are presented in this section, organized by study locations along the alignment, in the vicinity of Burbank Airport Station, and in the vicinity of LAUS.

Alignment

Table 6-15 provides the Opening Year (2029) Plus Project scenario roadway segment V/C ratios and LOS values for the roadway segments along the alignment.

Table 6-15 Roadway Segment Operations Analysis for Opening Year (2029) Plus Project Conditions—Alignment

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
AC	Brazil Street - West of Railroad Track	1,200	115	0.096	A	122	0.102	A
AD	Doran Street - West of Railroad Track	1,200	438	0.365	A	452	0.377	A
AE	Flower Street - West of Air Way	3,000	169	0.056	A	316	0.105	A
AF	Western Avenue - East of Flower Street	2,700	1,557	0.577	A	1,902	0.704	C
AG	Sonora Avenue - West of Air Way	2,700	985	0.365	A	1,208	0.447	A
AH	Chevy Chase Drive - West of railroad track	1,200	403	0.336	A	555	0.463	A
AI	Grandview Avenue - West of Air Way	3,000	159	0.053	A	263	0.088	A
AJ	Main St - east of Los Angeles River	3,000	1,740	0.580	A	1,489	0.496	A
AK	Main St - west of Los Angeles River	3,000	1,739	0.580	A	1,419	0.473	A
AL	Avenue 19 - north of Figueroa Street (Bridge)	1,250	1,839	1.471	**F**	1,370	1.096	**F**

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
V/C = volume-to-capacity ratio LOS = level(s)-of-service
veh/hr – vehicle per hour

As shown in Table 6-15, the segment Avenue 19 – north of Figueroa Street (bridge) would operate at LOS F during the a.m. and p.m. peak hours. The remaining roadway segments are expected to operate at LOS D or better during the peak hours under the Opening Year 2029 Plus Project conditions.

Table 6-16 below compares the Opening Year (2029) No Project and Plus Project scenario intersection V/C ratios and LOS values. Peak-hour turning movements at these intersections for this scenario are provided in Appendix I-1. Intersection LOS worksheets are provided in Appendix I-2.

Table 6-16 Comparison of Study Intersection Operations Analysis for Opening Year (2029) No Project and Plus Project Conditions — Alignment

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
97	San Fernando Road at Linden Avenue	TWSC	17.6	C	17.6	C	35.4	**E**	35.4	**E**
98	Flower Street at Allen Avenue	AWSC	9.6	A	9.6	A	11.4	B	11.4	B
99	San Fernando Road at Allen Avenue	Signal	6.2	A	6.2	A	11.6	B	11.6	B
100	Lake Street at Western Avenue	Signal	26.3	C	27.1	C	36.9	D	36.9	D
101	Flower Street at Western Avenue	Signal	20.4	C	20.4	C	48.4	D	48.4	D
102	San Fernando Road at Western Avenue	Signal	28.4	C	28.4	C	35.1	D	35.1	D
103	Glenoaks Boulevard at Western Avenue	Signal	30.5	C	30.5	C	49.2	D	52.4	D
104	San Fernando Road at Ruberta Avenue	TWSC	27.5	D	27.5	D	97.4	**F**	97.4	**F**
105	Flower Street at Sonora Avenue	Signal	22.6	C	24.3	C	26.9	C	26.9	C
106	Grand Central Avenue at Sonora Avenue	OWSC	18.1	C	18.1	C	>180	**F**	>180	**F**
107	Airway at Sonora Avenue	Signal	24.9	C	24.9	C	24.5	C	29.6	D
108	San Fernando Road at Sonora Avenue	Signal	26.0	C	26.0	D	29.8	C	30.4	D
109	Glenoaks Boulevard at Sonora Avenue	Signal	23.9	C	15.1	B	26.1	C	25.2	C
110	Flower Street at Grandview Avenue	AWSC	13.6	B	13.6	B	27.3	D	27.3	D
111	Grand Central Avenue at Grandview Avenue	AWSC	8.6	A	8.6	A	11.8	B	11.8	B
112	Air Way at Grandview Avenue	Signal	35.2	D	35.2	**E**	25.4	C	25.4	D
113	San Fernando Road at Grandview Avenue	Signal	17.4	B	17.4	B	21.1	C	21.1	C
114	Glenoaks Boulevard at Grandview Avenue	Signal	32.7	C	32.7	C	10.1	B	9.4	A
115	Glenoaks Boulevard at Graynold Avenue	Signal	6.5	A	6.5	A	8.6	A	8.6	A

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
116	San Fernando Road at Norton Avenue	OWSC	23.9	C	23.9	C	43.7	**E**	43.7	**E**
117	Glenoaks Boulevard at Norton Avenue	TWSC	17.8	C	17.8	C	23.5	C	23.5	C
118	Flower Street at Fairmont Avenue	OWSC	12.7	B	12.7	B	>180	**F**	>180	**F**
119	Air Way at Flower Street	Signal	22.0	C	20.4	C	27.8	C	29.4	C
120	San Fernando Road at Flower Street-Pelanconi Avenue	Signal	4.1	A	4.1	A	7.1	A	7.1	A
121	Glenoaks Boulevard at Pelanconi Avenue	OWSC	17.2	C	17.2	C	21.4	C	21.4	C
122	San Fernando Road at Alma Street	OWSC	23.4	C	23.4	C	42.1	**E**	42.1	**E**
123	Glenoaks Boulevard at Alma Street	TWSC	17.2	C	17.2	C	21.2	C	21.2	C
124	San Fernando Road at Kellogg Avenue	OWSC	17.2	C	17.2	C	26.6	D	22.6	C
125	Glenoaks Boulevard at Highland Avenue	Signal	32.6	C	30.7	C	30.7	C	30.6	C
126	San Fernando Road at Fairmont Avenue	Signal	10.4	B	9.4	A	7.3	A	7.3	A
127	SR 134 WB On-/Off-Ramp at Fairmont Avenue	Signal	25.8	C	25.8	C	20.1	C	20.1	C
128	San Fernando Road at Doran Street	Signal	16.1	B	16.1	B	18.4	B	18.4	B
129	SR 134 EB On-/Off-Ramp-Commercial Street at Doran Street	Signal	>180	**F**	>180	**F**	>180	**F**	>180	**F**
130	Brunswick Avenue at Chevy Chase Drive	Signal	15.1	B	12.9	B	16.8	B	14.6	B
131	Perlita Avenue at Chevy Chase Drive	OWSC	9.5	A	9.3	A	10.0	A	9.7	A
132	La Clede Avenue at Chevy Chase Drive	AWSC	8.3	A	8.0	A	8.6	A	8.1	A
133	Alger Street at Chevy Chase Drive	OWSC	11.3	B	10.3	B	13.7	B	10.9	B
134	San Fernando Road at Chevy Chase Drive	Signal	54.0	D	>180	**F**	30.5	C	140.9	**F**

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
135	Central Avenue at Chevy Chase Drive	Signal	19.6	B	19.6	B	19.2	B	19.1	B
136	Brunswick Avenue at Los Feliz Boulevard	Signal	17.2	B	17.2	B	16.6	B	16.6	B
137	San Fernando Road at Los Feliz Boulevard	Signal	37.8	D	38.1	D	44.8	D	44.8	D
138	San Fernando Road at Central Avenue	Signal	9.6	A	9.6	A	9.9	A	9.9	A
139	San Fernando Road at El Bonito Avenue	OWSC	18.7	C	18.7	C	19.6	C	19.6	C
140	San Fernando Road at Cerritos Avenue	Signal	6.5	A	6.1	A	7.8	A	7.4	A
141	San Fernando Road at Mira Loma Avenue	OWSC	13.8	B	14.7	B	13.2	B	13.2	B
142	Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue	Signal	>180	**F**	>180	**F**	27.4	C	27.4	C
143	Glendale Boulevard at Larga Avenue	Signal	14.6	B	14.6	B	8.8	A	8.8	A
144	Glendale Boulevard at La Clede Avenue	OWSC	14.8	B	14.8	B	21.6	C	21.6	C
145	San Fernando Road at Brand Boulevard	Signal	68.2	**E**	68.2	**E**	62.9	**E**	62.9	**E**
146	Casitas Avenue at Tyburn Street	AWSC	7.2	A	7.2	A	7.1	A	7.1	A
147	San Fernando Road at Tybur Street	OWSC	16.5	C	16.5	C	19.8	C	19.8	C
148	Silver Lake Boulevard at Casitas Avenue	OWSC	9.4	A	9.4	A	9.7	A	9.7	A
149	La Clede Avenue at Fletcher Drive	Signal	15.7	B	15.7	B	27.3	C	27.3	C
150	San Fernando Road at Fletcher Drive	Signal	33.4	C	31.9	C	19.4	B	19.4	B
151	San Fernando Road at SR 2 SB On-/Off-Ramps	Signal	11.6	B	11.6	B	12.1	B	12.1	B
152	San Fernando Road at SR 2 NB Off-Ramp	Signal	13.9	B	13.9	B	11.5	B	11.6	B
153	San Fernando Road at SR 2 NB On-Ramp	TWSC	2.9	A	2.9	A	12.2	B	12.2	B
154	San Fernando Road at Macon Street	Signal	1.9	A	1.9	A	1.9	A	1.9	A

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
155	San Fernando Road at Future Street	Signal	10.1	B	10.1	B	3.4	A	3.4	A
156	San Fernando Road at Private	OWSC	48.2	**E**	48.2	**E**	20.0	C	23.2	C
164	Wilhardt Street at Main Street	OWSC	PROPOSED CLOSURE				PROPOSED CLOSURE			
207	San Fernando Road at Avenue 26	Signal	18.8	B	18.8	B	29.8	C	29.9	C
208	SR 110 SB On-Ramp at Figueroa Street	Signal	12.8	B	12.8	B	17.6	B	18.2	B
209	SR 110 NB Off-Ramp at Figueroa Street	Signal	10.6	B	10.6	B	14.1	B	14.3	B
210	Avenue 26 at Figueroa Street	Signal	38.7	D	38.8	D	29.7	C	29.8	C
211	Avenue 26 at I-5 SB On-Ramp	TWSC	1.1	A	1.1	A	0.4	A	0.4	A
212	Avenue 26 at SR 110 NB On-Ramp	TWSC	1.8	A	1.8	A	2.6	A	2.6	A
213	Avenue 26 at I-5 NB Off-Ramp	Signal	9.1	A	9.0	A	10.0	A	10.0	A
214	Pasadena Avenue at Broadway	Signal	77.6	**E**	79.2	**E**	14.9	B	15.0	B
215	Avenue 18 at Pasadena Avenue	Signal	30.0	C	30.0	C	14.8	B	21.7	C
216	I-5 SB On-/Off-Ramps - Avenue 21 at Pasadena Avenue	Signal	16.7	B	20.1	C	14.1	B	19.5	B
217	I-5 NB On-/Off-Ramps at Pasadena Avenue	Signal	22.6	C	22.6	C	13.6	B	17.2	B
218	Avenue 18 at Spring Street at Broadway	Signal	161.1	**F**	158.9	**F**	21.3	C	22.2	C
219	Avenue 20 at Broadway	Signal	11.8	B	19.0	B	23.1	C	20.0	B
220	Avenue 21 at I-5 SB On-/Off-Ramps at Broadway	Signal	17.9	B	18.2	B	17.6	B	17.7	B
221	I-5 NB on/off Ramps - Avenue 21 at Broadway	Signal	24.7	C	24.8	C	16.4	B	16.4	B
222	Daly Street at Broadway	Signal	32.1	C	31.5	C	25.6	C	22.0	C
223	Gibbons Street at Main Street	OWSC	20.4	C	8.5	A	27.7	D	8.6	A

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
224	Avenue 20 at Main Street	Signal	13.2	B	13.3	B	10.3	B	10.3	B
225	Daly Street at Main Street	Signal	32.2	C	25.8	C	28.5	C	29.6	C
226	Mission Road at Cesar E. Chavez Avenue	Signal	164.1	**F**	>180	**F**	42.4	**E**	47.8	**E**
228	I-5 SB On-/Off-Ramps at Mission Road	Signal	24.7	C	24.8	C	20.7	C	21.4	C
229	Marengo Street at Mission Road	Signal	32.9	C	43.3	D	24.0	C	23.6	C
230	I-5 NB On-Ramp at Marengo Street	TWSC	12.0	B	12.2	B	5.6	A	5.6	A
231	State Street at Marengo Street	Signal	35.9	D	35.9	D	22.9	C	23.3	C
235	State Street at I-10 WB Off-Ramp	Signal	12.0	B	12.0	B	14.0	B	7.6	A
236	State Street at I-10 EB On-/Off-Ramps	Signal	11.0	B	11.3	B	18.7	B	18.7	B

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
AWSC = all-way stop control
EB = eastbound
I = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way stop control
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
WB = westbound

Fifteen study intersections along the alignment are expected to operate at LOS E or F during the a.m. or p.m. peak hour under the Opening Year (2029) Plus Project conditions:

- San Fernando Road at Linden Avenue
- San Fernando Road at Ruberta Avenue
- Grand Central Avenue at Sonora Avenue
- Air Way at Grandview Avenue
- San Fernando Road at Norton Avenue
- Flower Street at Fairmont Avenue
- San Fernando Road at Alma Street
- SR 134 EB on-/off-ramp-Commercial Street at Doran Street
- San Fernando Road at Chevy Chase Drive
- Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue
- San Fernando Road at Brand Boulevard
- San Fernando Road at private road
- Pasadena Avenue at Broadway
- Avenue 18 at Spring Street at Broadway
- Mission Road at Cesar E. Chavez Avenue

Burbank Airport Station

Table 6-17 provides the Opening Year (2029) Plus Project scenario roadway segment V/C ratios and LOS values for the Burbank Airport Station area.

Table 6-17 Roadway Segment Operations Analysis for Opening Year (2029) Plus Project Conditions—Burbank Airport Station

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
A	Sunland Boulevard - South of I-5 Northbound Ramps	2,900	1,958	0.675	B	2,228	0.818	D
B	Sunland Boulevard - North of San Fernando Road Minor	3,200	2,040	0.749	C	2,330	0.855	D
C	Vineland Avenue - South of San Fernando Road	2,900	1,922	0.705	C	2,292	0.841	D
D	Vineland Avenue - South of Victory Boulevard	2,900	2,194	0.763	C	2,144	0.746	C
E	Hollywood Way - South of I-5 Northbound Ramp	2,900	3,060	1.064	**F**	3,360	1.169	**F**
F	Hollywood Way - South of San Fernando Road Ramp	3,625	2,900	0.744	C	3,070	0.787	C
G	Hollywood Way - South of Winona Avenue	3,625	3,040	0.779	C	3,400	0.872	D
H	Hollywood Way - South of Thornton Avenue	3,200	3,170	1.103	**F**	3,510	1.221	**F**
I	Hollywood Way - North of Avon Street	3,200	3,011	1.047	**F**	3,261	1.134	**F**
J	Hollywood Way - North of Victory Boulevard	2,900	2,870	0.998	**E**	3,160	1.099	**F**
K	Hollywood Way - South of Victory Boulevard	2,900	2,484	0.864	D	2,664	0.927	**E**
L	Buena Vista Street - North of San Fernando Road	2,900	1,888	0.657	B	2,128	0.740	C
M	Buena Vista Street - South of San Fernando Road	2,900	2,692	0.936	**E**	2,846	0.990	**E**
N	Buena Vista Street - South of Empire Avenue	3,625	2,045	0.524	A	2,331	0.598	A
O	Lincoln Boulevard - South of San Fernando Road	2,900	556	0.193	A	534	0.186	A
P	Empire Avenue - East of Buena Vista Street	2,900	2,044	0.711	C	2,744	0.954	**E**
Q	Burbank Boulevard - South of I-5 Northbound ramps	4,950	3,102	0.630	B	3,046	0.618	B
R	San Fernando Road - West of Vineland Avenue	2,900	1,328	0.462	A	1,348	0.469	A
S	San Fernando Road - West of Hollywood Way	2,900	1,601	0.557	A	1,481	0.515	A

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
T	San Fernando Road - West of Buena Vista Street	2,900	1,548	0.538	A	1,538	0.535	A
U	Victory Place - West of Empire Street	1,100	1,071	0.931	**E**	1,027	0.893	**D**
V	San Fernando Road Minor - East of Vineland Avenue	1,100	743	0.675	B	847	0.770	C
W	San Fernando Road Minor - West of I-5 Southbound Ramps	1,100	600	0.545	A	570	0.518	A
X	Sherman Way - West of Vineland Avenue	2,900	1,388	0.483	A	1,648	0.573	A
Y	Victory Boulevard - West of Vineland Avenue	4,950	2,116	0.430	A	2,466	0.501	A
Z	Victory Boulevard - West of Hollywood Way	2,900	2,336	0.813	D	2,436	0.847	D
AA	Victory Boulevard - East of Hollywood Way	2,900	1,910	0.664	B	2,060	0.717	C
AB	San Fernando Road - West of Arvilla Avenue	2900	1,680	1.461	F	1,330	1.157	A

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
I- = Interstate
LOS = level(s)-of-service
v/c = volume-to-capacity ratio
veh/hr = vehicle per hour

Eight of the analyzed Burbank Airport Station area roadway segments are expected to operate at LOS E or F under Opening Year (2029) Plus Project conditions:

- Hollywood Way - South of I-5 northbound ramp
- Hollywood Way - South of Thornton Avenue
- Hollywood Way - North of Avon Street
- Hollywood Way - North of Victory Boulevard
- Hollywood Way - South of Victory Boulevard
- Buena Vista Street - South of San Fernando Road
- Empire Avenue - East of Buena Vista Street
- Victory Place - West of Empire Street

Table 6-18 compares the Opening Year (2029) No Project and Plus Project scenario intersection V/C ratios and LOS values for the Burbank Airport Station area. Peak-hour turning movements at these intersections for this scenario are provided in Appendix I-1. Intersection LOS worksheets are provided in Appendix I-2.

Table 6-18 Comparison of Study Intersection Operations Analysis for Opening Year (2029) No Project and Plus Project Conditions — Burbank Airport Station

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	SR 170 SB Ramps at Victory Boulevard	TWSC	>180	**F**	>180	**F**	>180	**F**	>180	**F**
2	Laurel Canyon at Victory Boulevard	Signal	33.7	C	36.6	D	32.2	C	34.6	C
3	Lankershim Boulevard at Victory Boulevard	Signal	27.8	C	28.6	C	31.8	C	32.9	C
5	Sunland Boulevard at I-5 NB Ramps	Signal	22.2	C	23.0	C	23.2	C	23.9	C
6	Sunland Boulevard at I-5 SB Ramps	Signal	20.8	C	21.7	C	25.6	C	26.9	C
7	Sunland Boulevard at San Fernando Road Minor	Signal	37.0	D	20.0	B	35.6	D	77.4	**E**
8	Sunland Boulevard at San Fernando Road	Signal	17.4	B	**66.0**	**E**	21.7	C	103.6	**F**
9	Vineland Avenue at Strathern Street	Signal	14.0	B	14.3	B	13.9	B	14.1	B
10	Vineland Avenue at Saticoy Street	Signal	12.9	B	13.1	B	8.6	A	8.7	A
11	Vineland Avenue at Sherman Way	Signal	23.4	C	23.6	C	23.9	C	24.2	C
12	Vineland Avenue at Vanowen Street	Signal	23.4	C	23.6	C	24.3	C	24.5	C
13	Vineland Avenue at Victory Boulevard	Signal	20.2	C	20.6	C	20.4	C	20.7	C
14	Vineland Avenue at Burbank Boulevard	Signal	19.4	B	19.5	B	20.1	C	20.2	C
15	Clybourn Avenue at San Fernando Road	Signal	32.2	C	33.2	C	24.8	C	25.1	C
20	Arvilla Avenue at San Fernando Road Minor	Signal	11.6	B	5.4	A	12.5	B	5.1	A
21	Arvilla Avenue at San Fernando Road	Signal	15.7	B	5.2	A	24.0	C	5.0	A
22	Arcola Avenue at San Fernando Road Minor	TWSC	22.5	C	22.5	C	11.1	B	11.1	B
23	Lockhead Drive at San Fernando Road	TWSC	31.4	D	4.9	A	15.0	C	4.1	A
24	Cohasset Street at San Fernando Road	TWSC	19.5	C	Proposed Closure		15.2	C	Proposed Closure	

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
25	Cohasset Street at San Fernando Road Minor	Signal	5.0	A	5.0	A	4.6	A	4.6	A
27	Hollywood Way at I-5 NB Ramps	Signal	19.6	B	21.2	C	18.2	B	19.6	B
28	Hollywood Way at I-5 SB Ramps	TWSC	>180	**F**	**>180.0**	**F**	61.1	**F**	**121.8**	**F**
30	Avon Street at Cohasset Street	TWSC	11.1	B	11.41	B	13.1	B	13.1	B
31	Avon Street at San Fernando Road Minor	Signal	5.7	A	6.2	A	5.9	A	6.1	A
32	Hollywood Way SB at San Fernando Road	Signal	3.9	A	4.4	A	3.3	A	3.5	A
33	Hollywood Way NB at San Fernando Road	Signal	3.8	A	4.2	A	4.0	A	4.5	A
34	Hollywood Way at Tulare Avenue	Signal	1.9	A	8.5	A	3.3	A	8.9	A
35	Hollywood Way at Winona Avenue	Signal	7.8	A	8.1	A	14.2	B	16.0	B
36	Hollywood Way at Thornton Avenue	Signal	16.6	B	20.1	C	31.0	C	43.2	D
37	Hollywood Way at Avon Street	Signal	12.4	B	13.6	B	15.8	B	18.0	B
38	Avon Street at Empire Avenue	Signal	4.4	A	4.5	A	4.0	A	4.0	A
39	Hollywood Way at Empire Avenue	Signal	4.8	A	4.8	A	6.0	A	6.0	A
41	Hollywood Way at Victory Boulevard	Signal	28.1	C	33.0	C	30.1	C	36.1	D
42	Hollywood Way at Burbank Boulevard	Signal	25.4	C	27.4	C	28.0	C	30.2	C
43	Hollywood Way at Magnolia Boulevard	Signal	23.5	C	24.8	C	27.7	C	29.7	C
44	Hollywood Way at Verdugo Avenue	Signal	23.7	C	24.4	C	28.5	C	28.9	C
45	Pass Avenue at SR 134 EB Ramps	Signal	14.9	B	16.1	B	12.8	B	12.8	B
46	Pass Avenue at Alameda Avenue	Signal	17.2	B	17.7	B	18.1	B	19.2	B
49	Hollywood Way at Alameda Avenue	Signal	26.8	C	27.8	C	28.4	C	32.8	C

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
58	San Fernando Road Minor at I-5 SB Ramps	TWSC	22.1	C	22.1	C	15.0	B	15.0	B
61	Buena Vista Street at I-5 NB Ramps	Signal	12.2	B	12.2	B	12.8	B	12.8	B
62	Buena Vista Street at Winona Avenue	Signal	33.4	C	33.4	C	20.0	B	20.0	B
63	Buena Vista Street at San Fernando Road	Signal	82.9	**F**	**83.8**	**F**	51.3	D	51.8	D
65	Buena Vista Street at Empire Avenue	Signal	88.3	**F**	**89.4**	**F**	>180	**F**	>180	**F**
72	Lincoln Street at San Fernando Road	Signal	1.5	A	1.5	A	2.3	A	2.3	A
75	Empire Avenue at San Fernando Road	Signal	3.4	A	3.4	A	4.0	A	4.0	A
76	I-5 SB Ramps at San Fernando Road	TWSC	11.9	B	11.9	B	13.1	B	13.2	B
77	I-5 NB Ramps at San Fernando Road	TWSC	11.6	B	11.6	B	25.0	C	25.0	C
78	Burbank Boulevard at 3rd Street	Signal	8.3	A	8.4	A	10.8	B	10.8	B
82	Burbank Boulevard at Victory Boulevard	Signal	32.6	C	32.6	C	37.3	D	37.3	D
84	Magnolia Boulevard at 3rd Street	Signal	13.4	B	13.5	B	26.4	C	26.5	C
86	Magnolia Boulevard at Victory Boulevard	Signal	22.2	C	22.2	C	29.6	C	29.6	C
93	SR 170 SB Ramps at Sherman Way	Signal	31.2	C	32.9	C	49.0	D	51.0	D
94	Laurel Canyon at Sherman Way	Signal	84.9	**F**	**84.8**	**F**	>180	**F**	**>180.0**	**F**
95	Lankershim Boulevard at Sherman Way	Signal	22.0	C	22.5	C	26.4	C	27.1	C
96	Hollywood Way at Cohasset Street	TWSC	152.3	**F**	**>180.0**	**F**	41.4	**E**	**51.5**	**F**
1001	Project driveway 2 at San Fernando Road	Signal	0.0	0	2.5	A	0.0	0	2.6	A
1002	Hollywood Way at Project driveway 4	Signal	-	-	2.9	A	-	-	2.7	A
1007	Hollywood Way at Project Driveway 10	TWSC	[a]	[a]	0.0	A	[a]	[a]	0.0	A

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1008	Hollywood Way at Project driveway 11 (out)	TWSC	-	-	27.4	D	-	-	16.9	C

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
[a] = Proposed new study intersection as part of the HSR Project
AWSC = all-way stop control
EB = eastbound
I- = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way-stop control
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
WB = westbound

Seven study intersections around Burbank Airport Station are expected to operate at LOS E or F during the a.m. or p.m. peak hours:

- SR 170 SB ramps at Victory Boulevard
- Sunland Boulevard at San Fernando Road Minor
- Sunland Boulevard at San Fernando Road
- Hollywood Way at I-5 SB ramps
- Buena Vista Street at San Fernando Road
- Laurel Canyon at Sherman Way
- Hollywood Way at Cohasset Street

The estimated operations of three new intersections were analyzed under the Plus Project scenario. Intersections 1011, 1012, and 1013 would be constructed to provide replacement access as part of the HSR grade separation projects. The geometry of these two new study intersections is provided in Appendix H. These new intersections that would be constructed as part of the HSR project were assumed to be configured with optimal traffic signal configurations, with dedicated left-turn lanes and right-turn lanes where needed. These intersections would operate at LOS D or better.

Los Angeles Union Station

As described in Section 5.10.4, existing volumes in the vicinity of the LAUS site were analyzed at study intersections. Table 6-19 compares the Opening Year (2029) No Project and Plus Project scenario intersection V/C ratios and LOS values for the LAUS area. Peak-hour turning movements at these intersections for this scenario are provided in Appendix I-1. Intersection LOS worksheets are provided in Appendix I-2.

Table 6-19 Comparison of Study Intersection Operation Analysis for Opening Year (2029) No Project and Plus Project Conditions—Los Angeles Union Station

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
157	Sotello Street at Spring Street	OWSC	13.1	B	13.1	B	21.3	C	21.4	C
158	Hill Street at College Street	Signal	15.5	B	15.8	B	19.5	B	20.2	C
159	Broadway at College Street	Signal	17.8	B	17.9	B	65.8	**E**	65.6	**E**
160	Spring Street-Alameda Street at College Street	Signal	21.3	C	21.3	C	14.1	B	14.1	B
161	Main Street at College Street	TWSC	>180	**F**	>180	**F**	4.2	A	4.2	A
162	Elmyra Street at Main Street	TWSC	83.5	**F**	85.1	**F**	95.1	**F**	97.3	**F**
163	Sotello Street at Main Street	OWSC	40.2	**E**	46.1	**E**	45.7	**E**	>180	**F**
165	Figueroa Street at Figueroa Terrace	AWSC	16.6	C	17.0	C	14.1	B	14.2	B
166	Figueroa Street at Alpine Street	Signal	17.3	B	17.5	B	20.7	C	20.8	C
167	Hill Street at Alpine Street	Signal	8.1	A	8.1	A	8.0	A	8.0	A
168	Broadway at Alpine Street	Signal	13.2	B	13.3	B	10.2	B	10.3	B
169	Alameda Street at Alpine Street	Signal	11.0	B	12.7	B	20.2	C	20.3	C
170	Main Street at Alpine Street	Signal	24.2	C	23.9	C	54.3	D	47.6	D
171	Vignes Street at Bauchet Street	Signal	4.9	A	4.9	A	8.0	A	8.7	A
172	Hill Street at Ord Street	Signal	52.0	D	46.0	D	8.7	A	8.7	A
173	Alameda Street at Main Street - Ord Street	OWSC	42.1	**E**	42.9	**E**	17.7	C	17.8	C
174	Figueroa Street at Sunset Boulevard - Cesar E. Chavez Avenue	Signal	37.6	D	37.6	D	30.7	C	31.6	C
175	Grand Avenue at Cesar E. Chavez Avenue	Signal	34.0	C	33.0	C	30.1	C	31.0	C
176	Broadway at Cesar E. Chavez Avenue	Signal	>180	**F**	>180	**F**	39.8	D	43.1	D
177	New High Street - Spring Street at Cesar E. Chavez Avenue	Signal	19.2	B	19.7	B	13.4	B	17.1	B
178	Main Street at Cesar E. Chavez Avenue	Signal	4.5	A	4.5	A	9.5	A	9.4	A
179	Alameda Street at Cesar E. Chavez Avenue	Signal	23.9	C	27.6	C	24.6	C	24.6	C
180	Vignes Street at Cesar E. Chavez Avenue	Signal	28.8	C	29.0	C	31.7	C	37.1	D
181	Figueroa Street at Temple Street	Signal	140.3	**F**	141.1	**F**	>180	**F**	>180	**F**
182	Broadway at US-101 NB On-Ramp	Signal	4.9	A	5.1	A	6.4	A	6.7	A
183	Broadway at Arcadia Street	Signal	17.6	B	20.8	C	13.7	B	13.7	B
184	Broadway at Aliso Street	Signal	11.7	B	11.7	B	10.1	B	10.4	B

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
185	Spring Street at US-101 NB Off-Ramp	OWSC	11.8	B	11.9	B	9.7	A	9.7	A
186	Spring Street at Arcadia Street	Signal	24.8	C	24.8	C	>180	**F**	>180	**F**
187	Spring Street at Aliso Street	Signal	0.1	A	0.1	A	0.1	A	0.1	A
188	Alameda Street at Paseo de la Place	Signal	10.1	B	9.7	A	14.2	B	13.5	B
189	Alameda Street at Arcadia Street - US-101 NB Off-Ramp	Signal	34.9	C	37.6	D	11.1	B	11.1	B
190	Alameda Street at Aliso Street - Commercial Street	Signal	18.9	B	18.9	B	22.4	C	23.0	C
191	Vignes Street at Gateway Plaza - Ramirez Street	Signal	99.6	**F**	110.0	**F**	95.2	**F**	94.5	**F**
192	Garey Street - US-101 SB On-/Off-Ramps at Commercial Street	Signal	36.8	D	37.2	D	48.1	D	69.3	**E**
193	Center Street at Commercial Street	AWSC	16.8	C	18.5	C	37.9	**E**	52.5	**F**
194	Garey Street at Ducommun Street	TWSC	10.2	B	10.3	B	12.3	B	12.4	B
195	Judge John Aliso Street at Temple Street	Signal	26.0	C	26.1	C	24.3	C	24.1	C
196	Alameda Street at Temple Street	Signal	26.8	C	25.7	C	26.4	C	26.8	C
197	Garey Street at Temple Street	AWSC	11.3	B	11.4	B	12.1	B	12.3	B
198	Vignes Street at Temple Street	AWSC	11.0	B	11.1	B	9.3	A	9.4	A
199	Center Street at Temple Street	OWSC	12.8	B	15.3	C	15.1	C	16.2	C
200	Broadway at 1st Street	Signal	15.0	B	15.0	B	14.6	B	14.6	B
201	Main Street at 1st Street	Signal	12.5	B	9.7	A	13.6	B	13.6	B
202	Alameda Street at 1st Street	Signal	31.0	C	26.5	C	27.7	C	21.9	C
203	Vignes Street at 1st Street	Signal	35.1	D	34.7	C	30.3	C	30.4	C
204	Alameda Street at 2nd Street	Signal	24.6	C	24.7	C	20.4	C	15.8	B
205	Alameda Street at 3rd Street - 4th Place	Signal	32.2	C	30.7	C	24.1	C	24.1	C
206	Alameda Street at 4th Street	Signal	13.8	B	12.1	B	29.8	C	29.0	C
227	Richmond Street at Mission Road	OWSC	37.4	D	38.0	D	17.2	B	17.3	B
232	Mission Road at US-101 NB On-/Off-Ramps	Signal	10.5	B	11.2	B	6.7	A	7.3	A
233	Mission Road at Aliso Street - US-101 SB On-/Off-Ramps	Signal	15.2	B	25.3	C	16.8	B	15.9	B
234	Pleasant Avenue at I-10 EB On-/Off-Ramps / Kearney Street	TWSC	108.7	**F**	108.7	**F**	>180	**F**	>180	**F**
237	US-101 SB On-Ramp - Pecan Street at 1st Street	TWSC	13.7	B	13.8	B	20.0	C	20.0	C

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2029 No Project Conditions		2029 Plus Project Conditions		2029 No Project Conditions		2029 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
238	US-101 NB On-/Off-Ramps at 1st Street	Signal	20.4	C	23.0	C	21.8	C	21.8	C
239	US-101 SB On-Ramp - Pecan Street at 4th Street	Signal	>180	**F**	>180	**F**	26.1	C	26.5	C
240	US-101 SB Off-Ramp at 4th Street	Signal	>180	**F**	>180	**F**	6.8	A	6.9	A
241	US-101 NB Off-Ramp at 4th Street	Signal	>180	**F**	1>80	**F**	35.9	D	39.4	D
242	Alameda Street at Newton Street (I-10 WB On-Ramp)	OWSC	15.1	C	15.7	C	>180	**F**	>180	**F**
243	Alameda Street at I-10 EB On-/Off-Ramps	Signal	19.8	B	20.0	C	18.2	B	20.5	C
1011	Brunswick Ave and Goodwin Avenue [a]	Signal	-	-	12.0	B	-	-	12.5	B
1012	San Fernando Rd and Pacific Avenue [a]	Signal	-	-	30.2	D	-	-	29.8	D
1013	Main Street at Clover Street/Avenue 17 [a]	Signal	-	-	33.2	D	-	-	27.0	D

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
[a] = Proposed new study intersection as part of the HSR Project
AWSC = all-way stop control
EB = eastbound
I- = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way-stop control
SB = southbound
sec = seconds
TWSC = two-way stop control
WB = westbound
US- = U.S. Route

Sixteen study intersections around LAUS are expected to operate at LOS E or F during the a.m. or p.m. peak hours:

- Broadway at College Street
- Main Street at College Street
- Elmyra Street at Main Street
- Sotello Street at Main Street
- Alameda Street at Main Street - Ord Street
- Broadway at Cesar E. Chavez Avenue
- Figueroa Street at Temple Street
- Spring Street at Arcadia Street
- Vignes Street at Gateway Plaza - Ramirez Street
- Garey Street - US-101 SB on-/off-ramps at Commercial Street
- Center Street at Commercial Street
- Pleasant Avenue at I-10 EB on-/off-Ramps/Kearney Street
- US-101 SB on-ramp - Pecan Street at Fourth Street
- US-101 SB off-ramp at Fourth Street
- US-101 NB off-ramp at Fourth Street
- Alameda Street at Newton Street (I-10 WB on-ramp)

The estimated operations of three new intersections are analyzed under the plus project scenario. Intersections 1011, 1012, and 1013 would be constructed to provide replacement access as part of the HSR grade separation projects. The geometry of these three new study intersection are provided in Appendix H. All of these intersections that would be constructed as part of the HSR project were assumed to be configured with optimal traffic signal configurations, with dedicated left-turn lanes and right-turn lanes where needed. These intersections would operate at LOS D or better.

6.4.1.2 Horizon Year (2040) Plus Project

The Opening Year (2029) Plus Project scenario roadway operations and intersection operations analyses are presented in this section, organized by study locations along the alignment, in the vicinity of Burbank Airport Station, and in the vicinity of LAUS.

Alignment

Table 6-20 presents the Opening Year (2040) Plus Project scenario roadway segment V/C ratios and LOS values for segments along the alignment.

Table 6-20 Roadway Segment Operations Analysis for Horizon Year (2040) Plus Project Conditions—Alignment

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
AC	Brazil Street - West of Railroad Track	1,200	115	0.096	A	122	0.102	A
AD	Doran Street - West of Railroad Track	1,200	438	0.365	A	452	0.377	A
AE	Flower Street - West of Air Way	3,000	169	0.056	A	316	0.105	A
AF	Western Avenue - East of Flower Street	2,700	1,557	0.577	A	1,902	0.704	C
AG	Sonora Avenue - West of Air Way	2,700	985	0.365	A	1,208	0.447	A
AH	Chevy Chase Drive - West of railroad track	1,200	403	0.336	A	555	0.463	A
AI	Grandview Avenue - West of Air Way	3,000	159	0.053	A	263	0.088	A
AJ	Main St - east of Los Angeles River	3,000	1,743	0.581	A	1,492	0.497	A
AK	Main St - west of Los Angeles River	3,000	1,742	0.581	A	1,422	0.474	A
AL	Avenue 19 - north of Figueroa Street (Bridge)	1,250	1,840	1.472	**F**	1,371	1.097	**F**

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
LOS = level(s)-of-service
V/C = volume-to-capacity ratio
veh/hr = vehicle per hour

As shown in Table 6-20, the segment Avenue 19 – north of Figueroa Street (bridge) would operate at LOS F during the a.m. and p.m. peak hours. The remaining roadway segments are expected to operate at LOS D or better during the peak hours under this scenario.

Table 6-21 compares traffic operations for the study intersections along the alignment between Horizon Year (2040) No Project and Plus Project conditions. Peak-hour turning movements at these intersections for this scenario are provided in Appendix J-1. LOS worksheets are provided in Appendix J-2.

Table 6-21 Comparison of Study Intersection Operations Analysis for Horizon Year (2040) No Project and Plus Project Conditions— Alignment

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
97	San Fernando Road at Linden Avenue	TWSC	19.6	C	19.6	C	35.4	**E**	35.4	**E**
98	Flower Street at Allen Avenue	AWSC	9.6	A	9.6	A	11.8	B	11.8	B
99	San Fernando Road at Allen Avenue	Signal	6.0	A	6.0	A	6.9	A	6.9	A
100	Lake Street at Western Avenue	Signal	24.1	C	26.2	C	42.1	D	42.1	D
101	Flower Street at Western Avenue	Signal	20.4	C	26.5	C	151.1	**F**	146.2	**F**
102	San Fernando Road at Western Avenue	Signal	30.0	C	30.7	C	44.0	D	43.1	D
103	Glenoaks Boulevard at Western Avenue	Signal	49.1	D	35.8	D	130.1	**F**	124.2	**F**
104	San Fernando Road at Ruberta Avenue	TWSC	27.8	D	27.8	D	97.4	**F**	97.4	**F**
105	Flower Street at Sonora Avenue	Signal	25.0	C	25.0	C	27.0	C	28.2	C
106	Grand Central Avenue at Sonora Avenue	OWSC	18.1	C	18.1	C	>180	**F**	>180	**F**
107	Airway at Sonora Avenue	Signal	24.8	C	24.8	C	20.3	C	29.2	D
108	San Fernando Road at Sonora Avenue	Signal	28.8	C	27.8	D	31.7	C	34.4	D
109	Glenoaks Boulevard at Sonora Avenue	Signal	21.4	C	25.7	C	29.3	C	25.6	C
110	Flower Street at Grandview Avenue	AWSC	13.8	B	13.8	B	35.2	**E**	35.2	**E**
111	Grand Central Avenue at Grandview Avenue	AWSC	8.7	A	8.7	A	12.0	B	12.0	B
112	Air Way at Grandview Avenue	Signal	35.6	D	35.6	**E**	24.9	C	24.9	C
113	San Fernando Road at Grandview Avenue	Signal	20.6	C	19.0	B	19.4	B	23.3	C
114	Glenoaks Boulevard at Grandview Avenue	Signal	18.4	B	32.7	C	12.7	B	15.0	B
115	Glenoaks Boulevard at Graynold Avenue	Signal	9.9	A	6.5	A	8.6	A	8.6	A

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
116	San Fernando Road at Norton Avenue	OWSC	23.9	C	23.9	C	43.7	**E**	43.7	**E**
117	Glenoaks Boulevard at Norton Avenue	TWSC	17.8	C	17.8	C	23.5	C	23.5	C
118	Flower Street at Fairmont Avenue	OWSC	13.5	B	14.2	B	>180	**F**	>180	**F**
119	Air Way at Flower Street	Signal	21.6	C	24.9	C	31.6	C	31.8	C
120	San Fernando Road at Flower Street-Pelanconi Avenue	Signal	4.2	A	4.2	A	7.8	A	7.8	B
121	Glenoaks Boulevard at Pelanconi Avenue	OWSC	17.2	C	17.2	C	21.4	C	21.4	C
122	San Fernando Road at Alma Street	OWSC	23.4	C	23.4	C	42.1	**E**	42.1	**E**
123	Glenoaks Boulevard at Alma Street	TWSC	17.2	C	17.2	C	22.0	C	22.0	C
124	San Fernando Road at Kellogg Avenue	OWSC	19.2	C	17.2	C	22.6	C	22.6	C
125	Glenoaks Boulevard at Highland Avenue	Signal	34.7	C	31.2	C	34.0	C	34.2	C
126	San Fernando Road at Fairmont Avenue	Signal	9.5	A	9.5	A	7.2	A	7.2	A
127	SR 134 WB On-/Off-Ramp at Fairmont Avenue	Signal	25.8	C	25.8	C	19.5	B	19.5	B
128	San Fernando Road at Doran Street	Signal	17.1	B	16.4	B	18.8	B	18.8	B
129	SR 134 EB On-/Off-Ramp-Commercial Street at Doran Street	Signal	>180	**F**	>180	**F**	>180	**F**	>180	**F**
130	Brunswick Avenue at Chevy Chase Drive	Signal	15.2	B	12.9	B	16.8	B	14.6	B
131	Perlita Avenue at Chevy Chase Drive	OWSC	9.4	A	9.2	A	10.0	A	9.7	A
132	La Clede Avenue at Chevy Chase Drive	AWSC	8.4	A	8.0	A	8.6	A	8.1	A
133	Alger Street at Chevy Chase Drive	OWSC	11.5	B	10.5	B	13.1	B	10.9	B
134	San Fernando Road at Chevy Chase Drive	Signal	59.4	**E**	>180	**F**	29.2	C	146.5	**F**

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
135	Central Avenue at Chevy Chase Drive	Signal	19.7	B	19.7	B	19.3	B	19.2	B
136	Brunswick Avenue at Los Feliz Boulevard	Signal	17.9	B	17.8	B	16.4	B	16.4	B
137	San Fernando Road at Los Feliz Boulevard	Signal	35.6	D	35.7	D	43.8	D	43.3	D
138	San Fernando Road at Central Avenue	Signal	9.4	A	9.4	A	9.1	A	9.9	A
139	San Fernando Road at El Bonito Avenue	OWSC	19.1	C	19.1	C	19.8	C	19.8	C
140	San Fernando Road at Cerritos Avenue	Signal	6.2	A	6.7	A	7.7	A	8.1	A
141	San Fernando Road at Mira Loma Avenue	OWSC	13.8	B	13.8	B	13.2	B	13.2	B
142	Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue	Signal	>180	**F**	>180	**F**	26.9	C	23.2	C
143	Glendale Boulevard at Larga Avenue	Signal	14.9	B	14.5	B	8.5	A	8.5	A
144	Glendale Boulevard at La Clede Avenue	OWSC	15.2	C	15.2	C	21.6	C	21.6	C
145	San Fernando Road at Brand Boulevard	Signal	72.8	**E**	70.8	**E**	69.9	**E**	71.6	**E**
146	Casitas Avenue at Tyburn Street	AWSC	7.2	A	7.2	A	7.1	A	7.1	A
147	San Fernando Road at Tybur Street	OWSC	16.5	C	16.5	C	20.1	C	20.1	C
148	Silver Lake Boulevard at Casitas Avenue	OWSC	9.4	A	9.4	A	9.7	A	9.7	A
149	La Clede Avenue at Fletcher Drive	Signal	15.6	B	16.0	B	25.3	C	27.2	C
150	San Fernando Road at Fletcher Drive	Signal	32.6	C	43.9	D	20.3	C	20.3	C
151	San Fernando Road at SR 2 SB On-/Off-Ramps	Signal	12.1	B	11.6	B	11.4	B	12.0	B
152	San Fernando Road at SR 2 NB Off-Ramp	Signal	14.0	B	14.0	B	11.5	B	11.5	B
153	San Fernando Road at SR 2 NB On-Ramp	TWSC	2.9	A	2.9	A	14.0	B	14.0	B

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
154	San Fernando Road at Macon Street	Signal	1.9	A	1.9	A	1.9	A	1.9	A
155	San Fernando Road at Future Street	Signal	10.2	B	10.2	B	3.4	A	3.4	A
156	San Fernando Road at Private Road	OWSC	48.2	**E**	48.2	**E**	23.4	C	20.2	C
164	Wilhardt Street at Main Street	OWSC	PROPOSED CLOSURE				PROPOSED CLOSURE			
207	San Fernando Road at Avenue 26	Signal	19.4	B	19.5	B	30.7	C	23.9	C
208	SR 110 SB On-Ramp at Figueroa Street	Signal	12.9	B	12.9	B	19.3	B	19.9	B
209	SR 110 NB Off-Ramp at Figueroa Street	Signal	10.6	B	10.7	B	15.3	B	15.3	B
210	Avenue 26 at Figueroa Street	Signal	41.1	D	45.2	D	36.9	D	37.2	D
211	Avenue 26 at I-5 SB On-Ramp	TWSC	1.3	A	1.3	A	0.4	A	0.4	A
212	Avenue 26 at SR 110 NB On-Ramp	TWSC	1.8	A	1.8	A	2.6	A	2.6	A
213	Avenue 26 at I-5 NB Off-Ramp	Signal	9.3	A	9.3	A	10.4	B	10.3	B
214	Pasadena Avenue at Broadway	Signal	161.3	**F**	>180	**F**	16.0	B	15.0	B
215	Avenue 18 at Pasadena Avenue	Signal	29.9	C	29.7	C	13.7	B	13.5	B
216	I-5 SB On-/Off-Ramps - Avenue 21 at Pasadena Avenue	Signal	12.8	B	12.8	B	17.4	B	13.6	B
217	I-5 NB On-/Off-Ramps at Pasadena Avenue	Signal	15.2	B	18.9	B	11.3	B	12.4	B
218	Avenue 18 at Spring Street at Broadway	Signal	167.8	**F**	163.4	**F**	21.1	C	22.6	C
219	Avenue 20 at Broadway	Signal	11.8	B	11.8	B	9.9	A	14.3	B
220	Avenue 21 at I-5 SB On-/Off-Ramps at Broadway	Signal	19.3	B	18.9	B	22.5	C	17.4	B
221	I-5 NB on/off Ramps - Avenue 21 at Broadway	Signal	23.8	C	23.8	C	16.7	B	16.8	B
222	Daly Street at Broadway	Signal	33.6	C	32.8	C	27.4	C	26.2	C

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
223	Gibbons Street at Main Street	OWSC	24.1	C	8.5	A	32.6	D	8.6	A
224	Avenue 20 at Main Street	Signal	10.0	A	9.7	A	11.0	B	11.0	B
225	Daly Street at Main Street	Signal	81.6	**F**	83.7	**F**	48.0	D	48.6	D
226	Mission Road at Cesar E. Chavez Avenue	Signal	>180	**F**	>180	**F**	63.0	**F**	>80	**F**
228	I-5 SB On-/Off-Ramps at Mission Road	Signal	31.7	C	31.7	C	22.6	C	22.7	C
229	Marengo Street at Mission Road	Signal	40.9	D	41.3	D	25.0	C	25.4	C
230	I-5 NB On-Ramp at Marengo Street	TWSC	16.4	C	16.4	C	7.8	A	7.8	A
231	State Street at Marengo Street	Signal	49.8	D	72.4	**E**	23.0	C	23.4	C
235	State Street at I-10 WB Off-Ramp	Signal	12.0	B	12.0	B	7.7	A	7.8	A
236	State Street at I-10 EB On-/Off-Ramps	Signal	11.0	B	11.0	B	18.7	B	18.7	B

Source: California High-Speed Rail Authority, 2017
Bold text = Impact identified per HSR environmental guidelines
AWSC = all-way stop control
EB = eastbound
I- = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way stop control
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
WB = westbound

Twenty study intersections along the alignment would operate at LOS E or F during the a.m. or p.m. peak hour under the Horizon Year (2040) Plus Project Conditions:

- San Fernando Road at Linden Avenue
- Flower Street at Western Avenue
- Glenoaks Boulevard at Western Avenue
- San Fernando Road at Ruberta Avenue
- Grand Central Avenue at Sonora Avenue
- Flower Street at Grandview Avenue
- Air Way at Grandview Avenue
- San Fernando Road at Norton Avenue
- Flower Street at Fairmont Avenue
- San Fernando Road at Alma Street

- SR 134 EB on-/off-ramp-Commercial Street at Doran Street
- San Fernando Road at Chevy Chase Drive
- Glendale Boulevard at Glenfeliz Boulevard - Glenhurst Avenue
- San Fernando Road at Brand Boulevard
- San Fernando Road at private road
- Pasadena Avenue at Broadway
- Avenue 18 at Spring Street at Broadway
- Daly Street at Main Street
- Mission Road at Cesar E. Chavez Avenue
- State Street at Marengo Street

Burbank Airport Station

Table 6-22 provides the Opening Year (2040) Plus Project scenario roadway segment V/C ratios and LOS values for the Burbank Airport Station area.

Table 6-22 Roadway Segment Operations Analysis for Horizon Year (2040) Plus Project Conditions—Burbank Airport Station

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
A	Sunland Boulevard - South of I-5 Northbound Ramps	2,900	1,984	0.728	C	2,324	0.853	D
B	Sunland Boulevard - North of San Fernando Road Minor	3,200	2,130	0.782	C	2,410	0.884	D
C	Vineland Avenue - South of San Fernando Road	2,900	1,986	0.729	C	2,366	0.868	D
D	Vineland Avenue - South of Victory Boulevard	2,900	2,326	0.809	D	2,256	0.785	C
E	Hollywood Way - South of I-5 Northbound Ramp	2,900	3,315	1.153	**F**	3,704	1.288	**F**
F	Hollywood Way - South of San Fernando Road Ramp	3,625	3,152	0.808	D	3,322	0.852	D
G	Hollywood Way - South of Winona Avenue	3,625	3,402	0.872	D	3,792	0.972	**E**
H	Hollywood Way - South of Thornton Avenue	3,200	3,492	1.215	**F**	3,872	1.347	**F**
I	Hollywood Way - North of Avon Street	3,200	3,332	1.159	**F**	3,582	1.246	**F**
J	Hollywood Way - North of Victory Boulevard	2,900	3,188	1.109	**F**	3,498	1.217	**F**
K	Hollywood Way - South of Victory Boulevard	2,900	2,676	0.931	**E**	2,866	0.997	**E**
L	Buena Vista Street - North of San Fernando Road	2,900	1,922	0.669	B	2,170	0.755	C
M	Buena Vista Street - South of San Fernando Road	2,900	2,752	0.957	**E**	2,908	1.011	F
N	Buena Vista Street - South of Empire Avenue	3,625	2,085	0.535	A	2,386	0.612	B
O	Lincoln Boulevard - South of San Fernando Road	2,900	575	0.200	A	539	0.187	A

ID	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
P	Empire Avenue - East of Buena Vista Street	2,900	2,253	0.784	C	2,833	0.985	**E**
Q	Burbank Boulevard - South of I-5 Northbound ramps	4,950	3,342	0.679	B	3,127	0.635	B
R	San Fernando Road - West of Vineland Avenue	2,900	1,368	0.476	A	1,365	0.475	A
S	San Fernando Road - West of Hollywood Way	2,900	1,682	0.585	A	1,582	0.550	A
T	San Fernando Road - West of Buena Vista Street	2,900	1,660	0.577	A	1,640	0.570	A
U	Victory Place - West of Empire Street	1,100	1,158	1.007	**F**	1,118	0.972	**E**
V	San Fernando Road Minor - East of Vineland Avenue	1,100	753	0.685	B	847	0.770	C
W	San Fernando Road Minor - West of I-5 Southbound Ramps	1,100	610	0.555	A	640	0.582	A
X	Sherman Way - West of Vineland Avenue	2,900	1,464	0.509	A	1,844	0.641	B
Y	Victory Boulevard - West of Vineland Avenue	4,950	2,252	0.457	A	2,622	0.532	A
Z	Victory Boulevard - West of Hollywood Way	2,900	2,512	0.874	D	2,592	0.902	**E**
AA	Victory Boulevard - East of Hollywood Way	2,900	1,940	0.675	B	2,080	0.723	C
AB	San Fernando Road - West of Arvilla Avenue	2900	1,828	1.590	**F**	1,428	1.242	**F**

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
LOS = level(s)-of-service
V/C = volume-to-capacity ratio
veh/hr = vehicle per hour

Eleven of the analyzed Burbank Airport Station area roadway segments are expected to operate at LOS E or F under Horizon Year (2040) Plus Project conditions:

- Hollywood Way - South of I-5 northbound ramp
- Hollywood Way - South of Winona Avenue
- Hollywood Way - South of Thornton Avenue
- Hollywood Way - North of Avon Street
- Hollywood Way - North of Victory Boulevard
- Hollywood Way - South of Victory Boulevard
- Buena Vista Street - South of San Fernando Road
- Empire Avenue - East of Buena Vista Street
- Victory Place - West of Empire Street
- Victory Boulevard - West of Hollywood Way
- San Fernando Road - West of Arvilla Avenue

Table 6-23 compares the traffic operations for the study intersections in the Burbank Airport Station area between Horizon Year (2040) No Project and Plus Project conditions. Peak-hour turning movements at these intersections for this scenario are provided in Appendix J-1. LOS worksheets are provided in Appendix J-2.

Table 6-23 Comparison of Study Intersection Operations Analysis for Horizon Year (2040) No Project and Plus Project Conditions — Burbank Airport Station

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	SR 170 SB Ramps at Victory Boulevard	TWSC	>180	**F**	>180	**F**	>180	**F**	>180	**F**
2	Laurel Canyon at Victory Boulevard	Signal	33.7	C	40.4	D	32.3	C	38.3	D
3	Lankershim Boulevard at Victory Boulevard	Signal	28.0	C	29.8	C	31.9	C	34.6	C
5	Sunland Boulevard at I-5 NB Ramps	Signal	22.0	C	22.6	C	24.4	C	25.4	C
6	Sunland Boulevard at I-5 SB Ramps	Signal	21.9	C	23.2	C	26.2	C	28.1	C
7	Sunland Boulevard at San Fernando Road Minor	Signal	37.3	D	22.4	C	36.0	D	**86.9**	**F**
8	Sunland Boulevard at San Fernando Road	Signal	17.9	B	67.6	E	22.7	C	**97.2**	**F**
9	Vineland Avenue at Strathern Street	Signal	14.7	B	15.0	B	14.1	B	14.3	B
10	Vineland Avenue at Saticoy Street	Signal	11.2	B	11.4	B	8.7	A	8.8	A
11	Vineland Avenue at Sherman Way	Signal	24.1	C	24.4	C	27.2	C	27.7	C
12	Vineland Avenue at Vanowen Street	Signal	24.4	C	24.9	C	24.9	C	25.3	C
13	Vineland Avenue at Victory Boulevard	Signal	21.3	C	22.2	C	21.1	C	22.2	C
14	Vineland Avenue at Burbank Boulevard	Signal	20.8	C	20.9	C	22.6	C	22.8	C
15	Clybourn Avenue at San Fernando Road	Signal	37.5	D	39.9	D	17.2	B	42.2	D
20	Arvilla Avenue at San Fernando Road Minor	Signal	11.6	B	5.4	A	12.5	B	5.1	A
21	Arvilla Avenue at San Fernando Road	Signal	16.7	B	5.4	A	23.7	C	5.1	A
22	Arcola Avenue at San Fernando Road Minor	TWSC	22.5	C	22.5	C	11.1	B	11.1	B
23	Lockhead Drive at San Fernando Road	TWSC	32.7	D	5.2	A	15.0	C	4.1	A
24	Cohasset Street at San Fernando Road	TWSC	19.6	C	Proposed Closure			C	Proposed Closure	

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
25	Cohasset Street at San Fernando Road Minor	Signal	4.9	A	4.9	A	4.6	A	4.6	A
27	Hollywood Way at I-5 NB Ramps	Signal	19.8	B	23.0	C	19.5	B	23.0	C
28	Hollywood Way at I-5 SB Ramps	TWSC	>180	**F**	**>180.0**	**F**	66.3	**F**	**>180.0**	**F**
30	Avon Street at Cohasset Street	TWSC	11.1	B	11.1	B	13.1	B	13.1	B
31	Avon Street at San Fernando Road Minor	Signal	5.7	A	6.2	A	5.8	A	6.1	A
32	Hollywood Way SB at San Fernando Road	Signal	3.9	A	4.4	A	3.2	A	3.4	A
33	Hollywood Way NB at San Fernando Road	Signal	3.8	A	4.3	A	4.1	A	5.1	A
34	Hollywood Way at Tulare Avenue	Signal	1.9	A	44.2	D	3.3	A	22.4	C
35	Hollywood Way at Winona Avenue	Signal	8.1	A	8.8	A	16.0	B	25.3	C
36	Hollywood Way at Thornton Avenue	Signal	17.8	B	29.8	C	33.0	C	**63.2**	**E**
37	Hollywood Way at Avon Street	Signal	12.4	B	15.5	B	15.8	B	22.2	C
38	Avon Street at Empire Avenue	Signal	4.4	A	4.6	A	4.0	A	4.2	A
39	Hollywood Way at Empire Avenue	Signal	4.7	A	4.8	A	6.1	A	6.2	A
41	Hollywood Way at Victory Boulevard	Signal	28.4	C	43.6	D	30.7	C	48.8	D
42	Hollywood Way at Burbank Boulevard	Signal	25.5	C	30.4	C	28.7	C	35.2	D
43	Hollywood Way at Magnolia Boulevard	Signal	24.6	C	28.6	C	28.2	C	32.7	C
44	Hollywood Way at Verdugo Avenue	Signal	25.2	C	27.6	C	29.9	C	30.7	C
45	Pass Avenue at SR 134 EB Ramps	Signal	13.3	B	14.9	B	11.7	B	12.0	B
46	Pass Avenue at Alameda Avenue	Signal	18.1	B	19.6	B	19.6	B	22.5	C
49	Hollywood Way at Alameda Avenue	Signal	27.7	C	33.1	C	33.0	C	49.2	D
58	San Fernando Road Minor at I-5 SB Ramps	TWSC	26.3	D	26.3	D	17.2	C	17.2	C
61	Buena Vista Street at I-5 NB Ramps	Signal	12.8	B	12.8	B	12.7	B	12.7	B
62	Buena Vista Street at Winona Avenue	Signal	37.1	D	37.1	D	21.0	C	21.0	C

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
63	Buena Vista Street at San Fernando Road	Signal	89.7	**F**	90.9	**F**	56.7	**E**	**57.7**	**E**
65	Buena Vista Street at Empire Avenue	Signal	90.3	**F**	91.0	**F**	>180	**F**	>180	**F**
72	Lincoln Street at San Fernando Road	Signal	1.4	A	1.4	A	2.2	A	2.2	A
75	Empire Avenue at San Fernando Road	Signal	3.4	A	3.4	A	3.8	A	3.8	A
76	I-5 SB Ramps at San Fernando Road	TWSC	13.1	B	13.3	B	16.4	B	16.9	B
77	I-5 NB Ramps at San Fernando Road	TWSC	12.8	B	12.8	B	23.6	C	23.5	C
78	Burbank Boulevard at 3rd Street	Signal	8.5	A	8.5	A	10.8	B	10.8	B
82	Burbank Boulevard at Victory Boulevard	Signal	34.5	C	34.7	C	41.0	D	41.2	D
84	Magnolia Boulevard at 3rd Street	Signal	13.8	B	13.9	B	33.4	C	33.7	C
86	Magnolia Boulevard at Victory Boulevard	Signal	22.9	C	23.0	C	30.8	C	30.9	C
93	SR 170 SB Ramps at Sherman Way	Signal	34.0	C	35.8	C	49.0	D	51.3	D
94	Laurel Canyon at Sherman Way	Signal	142.7	**F**	**141.5**	**F**	>180	**F**	**>180.0**	**F**
95	Lankershim Boulevard at Sherman Way	Signal	25.0	C	25.9	C	28.0	C	29.1	C
96	Hollywood Way at Cohasset Street	TWSC	148.6	**F**	**>180.0**	**F**	40.1	**E**	**61.5**	**F**
1001	Project driveway 2 at San Fernando Road	Signal	-	-	2.6	A	-	-	2.7	A
1002	Hollywood Way at Project driveway 4	Signal	-	-	5.1	A	-	-	5.0	A
1007	Hollywood Way at Project Driveway 10	TWSC			0.0	A			0.0	A
1008	Hollywood Way at Project driveway 11 (out)	TWSC	-	-	34.8	D	-	-	19.4	C

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
[a] = Proposed new study intersection as part of the HSR project
AWSC = all-way stop control
EB = eastbound
I- = Interstate
LOS = level(s)-of-service
NB = northbound
SB = southbound
sec = seconds
SR = State Route
TWSC = two-way stop control
WB = westbound

Nine study intersections in the Burbank Station Area would operate at LOS E or F during the a.m. or p.m. peak hour under the Horizon Year (2040) Plus Project conditions:

- SR 170 SB ramps at Victory Boulevard
- Sunland Boulevard at San Fernando Road Minor
- Sunland Boulevard at San Fernando Road
- Hollywood Way at I-5 SB ramps
- Hollywood Way at Thornton Avenue
- Buena Vista Street at San Fernando Road
- Buena Vista Street at Empire Avenue
- Laurel Canyon at Sherman Way
- Hollywood Way at Cohasset Street

As described in Section 6.4.1.1, Intersections 1011, 1012, and 1013 are new intersections that would be constructed as part of the HSR project and were assumed to be configured with optimal traffic signal configurations, with dedicated left-turn lanes and right-turn lanes where needed. These intersections would operate at LOS D or better.

Los Angeles Union Station

As described in Section 5.10.4, existing volumes in the vicinity of the LAUS site were analyzed at study intersections. Table 6-24 compares traffic operations for the study intersections in the LAUS area for Horizon Year (2040) No Project and Plus Project conditions. Peak-hour turning movements at these intersections for this scenario are provided in Appendix J-1. LOS worksheets are provided in Appendix J-2.

Table 6-24 Study Intersection Operations Analysis for Horizon Year (2040) Plus Project Conditions — Los Angeles Union Station

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
157	Sotello Street at Spring Street	OWSC	13.5	B	13.6	B	21.7	C	21.8	C
158	Hill Street at College Street	Signal	15.8	B	16.6	B	25.7	C	26.4	C
159	Broadway at College Street	Signal	18.1	B	17.7	B	58.2	**E**	57.8	**E**
160	Spring Street-Alameda Street at College Street	Signal	21.6	C	21.2	C	15.5	B	15.6	B
161	Main Street at College Street	TWSC	>180	**F**	>180	**F**	>180	**F**	>180	**F**
162	Elmyra Street at Main Street	TWSC	>180	**F**	>180	**F**	146.1	**F**	155.2	**F**
163	Sotello Street at Main Street	OWSC	45.8	**E**	55.0	**F**	91.7	**F**	>180	**F**
165	Figueroa Street at Figueroa Terrace	AWSC	19.8	C	20.8	C	15.8	C	16.1	C
166	Figueroa Street at Alpine Street	Signal	18.1	B	18.1	B	23.4	C	23.8	C
167	Hill Street at Alpine Street	Signal	8.7	A	8.6	A	8.3	A	8.3	A
168	Broadway at Alpine Street	Signal	13.9	B	14.6	B	12.0	B	11.3	B

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
169	Alameda Street at Alpine Street	Signal	11.4	B	11.1	B	23.2	C	25.2	C
170	Main Street at Alpine Street	Signal	26.6	C	27.2	C	76.4	**E**	78.2	**E**
171	Vignes Street at Bauchet Street	Signal	4.8	A	4.8	A	7.4	A	7.4	A
172	Hill Street at Ord Street	Signal	59.8	**E**	56.3	**E**	9.1	A	10.5	B
173	Alameda Street at Main Street - Ord Street	OWSC	141..9	**F**	148.6	**F**	22.4	C	22.5	C
174	Figueroa Street at Sunset Boulevard - Cesar E. Chavez Avenue	Signal	39.5	D	40.3	D	34.3	C	33.6	C
175	Grand Avenue at Cesar E. Chavez Avenue	Signal	85.9	**F**	99.4	**F**	39.9	D	48.5	D
176	Broadway at Cesar E. Chavez Avenue	Signal	>180	**F**	>180	**F**	51.2	D	74.4	**E**
177	New High Street - Spring Street at Cesar E. Chavez Avenue	Signal	18.7	B	18.9	B	11.7	B	12.2	B
178	Main Street at Cesar E. Chavez Avenue	Signal	3.6	A	3.2	A	13.0	B	9.0	A
179	Alameda Street at Cesar E. Chavez Avenue	Signal	20.0	B	24.5	C	26.5	C	27.2	C
180	Vignes Street at Cesar E. Chavez Avenue	Signal	37.7	D	35.0	C	38.4	D	52.4	D
181	Figueroa Street at Temple Street	Signal	>180	**F**	>180	**F**	>180	**F**	>180	**F**
182	Broadway at US-101 NB On-Ramp	Signal	5.1	A	5.4	A	7.8	A	8.4	A
183	Broadway at Arcadia Street	Signal	18.4	B	20.9	C	14.7	B	14.6	B
184	Broadway at Aliso Street	Signal	11.9	B	12.1	B	15.5	B	10.3	B
185	Spring Street at US-101 NB Off-Ramp	OWSC	11.9	B	12.0	B	9.9	A	9.9	A
186	Spring Street at Arcadia Street	Signal	25.4	C	25.4	C	>180	**F**	>180	**F**
187	Spring Street at Aliso Street	Signal	0.1	A	0.1	A	0.1	A	0.1	A
188	Alameda Street at Paseo de la Place	Signal	10.8	B	10.9	B	14.1	B	14.4	B
189	Alameda Street at Arcadia Street - US-101 NB Off-Ramp	Signal	35.1	D	39.6	D	10.6	B	10.6	B

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
190	Alameda Street at Aliso Street - Commercial Street	Signal	20.1	C	20.7	C	43.1	D	55.5	**E**
191	Vignes Street at Gateway Plaza - Ramirez Street	Signal	>180	**F**	167.5	**F**	113.5	**F**	112.5	**F**
192	Garey Street - US-101 SB On-/Off-Ramps at Commercial Street	Signal	38.9	D	39.3	D	58.9	**E**	117.7	**F**
193	Center Street at Commercial Street	AWSC	18.5	C	21.4	C	48.4	**E**	80.6	**F**
194	Garey Street at Ducommun Street	TWSC	10.3	B	10.3	B	12.7	B	12.8	B
195	Judge John Aliso Street at Temple Street	Signal	26.0	C	26.6	C	24.3	C	24.2	C
196	Alameda Street at Temple Street	Signal	27.9	C	28.3	C	27.6	C	26.5	C
197	Garey Street at Temple Street	AWSC	12.4	B	12.4	B	12.3	B	12.6	B
198	Vignes Street at Temple Street	AWSC	11.8	B	12.1	B	9.5	A	9.6	A
199	Center Street at Temple Street	OWSC	13.0	B	17.1	C	14.2	B	17.7	C
200	Broadway at 1st Street	Signal	14.9	B	14.9	B	14.6	B	14.6	B
201	Main Street at 1st Street	Signal	12.5	B	9.7	A	13.7	B	13.7	B
202	Alameda Street at 1st Street	Signal	26.2	C	29.1	C	30.4	C	30.4	C
203	Vignes Street at 1st Street	Signal	37.0	D	38.1	D	32.0	C	32.3	C
204	Alameda Street at 2nd Street	Signal	26.0	C	26.5	C	19.1	B	21.6	C
205	Alameda Street at 3rd Street - 4th Place	Signal	33.9	C	34.2	C	25.3	C	25.4	C
206	Alameda Street at 4th Street	Signal	12.5	B	12.6	B	30.1	C	30.1	C
227	Richmond Street at Mission Road	OWSC	38.0	D	38.3	D	17.9	B	17.9	B
232	Mission Road at US-101 NB On-/Off-Ramps	Signal	12.3	B	14.8	B	7.1	A	8.0	A
233	Mission Road at Aliso Street - US-101 SB On-/Off-Ramps	Signal	16.3	B	18.4	B	14.3	B	20.4	C

No.	Study Intersection	Control Type	AM Peak Hour				PM Peak Hour			
			2040 No Project Conditions		2040 Plus Project Conditions		2040 No Project Conditions		2040 Plus Project Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
234	Pleasant Avenue at I-10 EB On-/Off-Ramps/ Kearney Street	TWSC	>180	**F**	>180	**F**	>180	**F**	>180	**F**
237	US-101 SB On-Ramp - Pecan Street at 1st Street	TWSC	13.8	B	14.0	B	20.0	C	20.0	C
238	US-101 NB On-/Off-Ramps at 1st Street	Signal	22.9	C	20.5	C	21.7	C	21.7	C
239	US-101 SB On-Ramp - Pecan Street at 4th Street	Signal	>180	**F**	>180	**F**	79.9	**E**	120.5	**F**
240	US-101 SB Off-Ramp at 4th Street	Signal	>180	**F**	>180	**F**	7.9	A	8.4	A
241	US-101 NB Off-Ramp at 4th Street	Signal	>180	**F**	>180	**F**	70.3	**E**	56.0	**E**
242	Alameda Street at Newton Street (I-10 WB On-Ramp)	OWSC	15.5	C	16.7	C	>180	**F**	>180	**F**
243	Alameda Street at I-10 EB On-/Off-Ramps	Signal	19.9	B	20.2	C	20.6	C	20.8	C
1011	Brunswick Ave and Goodwin Avenue [a]	Signal	-	-	12.2	B	-	-	12.6	B
1012	San Fernando Rd and Pacific Avenue [a]	Signal	-	-	32.1	C	-	-	30.4	C
1013	Main Street at Clover Street/Avenue 17 [a]	Signal	-	-	43.9	D	-	-	26.8	C

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
[a] = Proposed new study intersection as part of the HSR Project
AWSC = all-way stop control
EB = eastbound
I = Interstate
LOS = level(s)-of-service
NB = northbound
OWSC = one-way stop control
SB = southbound
sec = seconds
TWSC = two-way stop control
US = U.S. Route
WB = westbound

Twenty study intersections around LAUS are expected to operate at LOS E or D during the a.m. or p.m. peak hour under the Horizon Year (2040) Plus Project conditions:

- Broadway at College Street
- Main Street at College Street
- Elmyra Street at Main Street
- Sotello Street at Main Street
- Main Street at Alpine Street
- Hill Street at Ord Street
- Alameda Street at Main Street - Ord Street
- Grand Avenue at Cesar E. Chavez Avenue
- Broadway at Cesar E. Chavez Avenue
- Figueroa Street at Temple Street

- Spring Street at Arcadia Street
- Vignes Street at Gateway Plaza - Ramirez Street
- Garey Street - US-101 SB on-/off-ramps at Commercial Street
- Center Street at Commercial Street
- Pleasant Avenue at I-10 EB on-/off-ramps / Kearney Street
- US-101 SB on-ramp - Pecan Street at Fourth Street
- US-101 SB off-ramp at Fourth Street
- US-101 NB off-ramp at Fourth Street
- Alameda Street at Newton Street (I-10 WB on-ramp)

As described in Section 6.4.1.1, Intersections 1011, 1012, and 1013 are new intersections that would be constructed as part of the HSR project and assumed to be configured with optimal traffic signal configurations, with dedicated left-turn lanes and right-turn lanes where needed. These intersections would operate at LOS D or better.

6.4.2 Freeway Analysis

Table 6-25 provides a summary of the queuing analysis conducted for the analyzed RSA intersections that are freeway ramp intersections with local surface roadways.

Table 6-25 Freeway Access Ramp Queuing at Los Angeles Union Station Area Freeway Intersections—2029 and 2040 Plus Project Conditions

Ramp Locations	Ramp Lane-Storage Length (Feet)	2029 Plus Project		2040 Plus Project	
		AM Peak Hour Queue (Feet)	PM Peak Hour Queue (Feet)	AM Peak Hour Queue (Feet)	PM Peak Hour Queue (Feet)
Spring Street and US-101 Northbound Off-Ramp	716	50	50	50	50
Alameda Street and Arcadia Street - US-101 Northbound Off-Ramp	2,080	1,270	421	1,284	445
Garey Street - US-101 Southbound On-Off Ramps and Commercial Street	1,290	346	250	393	262
SR 110 Northbound Off-Ramp and Figueroa Street	1,186	0	0	0	0
Avenue 26 and I-5 Northbound Off-Ramp	1,048	379	422	389	445
I-5 Southbound On-Off Ramps - Avenue 21 and Pasadena Ave	2,008	225	169	226	214
I-5 Northbound On-Off Ramps - Avenue 21 and Broadway	3,261	360	281	363	293
I-5 Southbound On-Off Ramps and Mission Rd	1,207	939	360	1,005	457
Mission Rd and US-101 Northbound On-Off Ramps	860	163	88	163	95
Mission Rd and Aliso Street - US-101 Southbound On-Off Ramps	1,164	191	157	197	167
Pleasant Ave and I-10 Eastbound On-Off Ramps / Kearney Street	420	25	30	30	35
State Street and I-10 Westbound Off-Ramp	872	527	460	527	185
US-101 Northbound On-Off Ramps and 1st Street	710	221	194	231	195
US-101 Southbound Off-Ramp and 4th Street	540	73	72	74	73
US-101 Northbound Off-Ramp and 4th Street	1,143	864	419	895	496
Alameda Street and I-10 Eastbound On-Off Ramps	1,315	435	211	473	235

Source: California High-Speed Rail Authority, 2017
I- = Interstate US- = U.S. Route

The analysis within this table for plus project conditions indicates that none of these intersections are estimated to have ramp vehicle queues that exceed the design length (combined length of all off-ramp lanes) of the ramps.

None of the queues at these locations would be lengthened by trip generation activity from the HSR facilities at LAUS.

The queuing analysis worksheets are included in Appendix G-2 for the 2029 Plus Project conditions and in Appendix H-2 for the 2040 Plus-Project conditions.

For the Burbank Airport Station area, ramp queuing analysis for freeway operations was conducted at off-ramp locations where the project contributes 100 or more trips.

The analysis within Table 6-26 for plus project conditions indicates that one of these intersections is estimated to have ramp vehicle queues that exceed the design length (combined length of all off-ramp lanes) of the ramps. This location is the SR 170 SB Ramps at Victory Boulevard intersection.

Table 6-26 Freeway Access Ramp Queuing at Burbank Area Freeway Intersections—2029 and 2040 Plus Project Conditions

Ramp Locations	Ramp Lane-Storage Length (Feet)	2029 Plus Project		2040 Plus Project	
		AM Peak Hour Queue (Feet)	PM Peak Hour Queue (Feet)	AM Peak Hour Queue (Feet)	PM Peak Hour Queue (Feet)
Sunland Boulevard at I-5 NB Ramps	1,370	252	529	252	608
Sunland Boulevard at I-5 SB Ramps	1,226	317	389	319	392
SR 170 SB Ramps at Sherman Way	1,562	449	459	474	459
Hollywood Way at I-5 NB Ramps	922	215	105	245	314
Hollywood Way at I-5 SB Ramps	2,115	1,394	311	1,751	456
San Fernando Road Minor at I-5 SB Ramps [a]	913	-	-	-	-
Buena Vista Street at I-5 NB Ramps	854	305	268	316	244
I-5 SB Ramps at San Fernando Road [b]	1,480	278	252	326	247
I-5 NB Ramps at San Fernando Road [b]	540	372	397	371	390
SR 170 SB Ramps at Victory Boulevard	1,150	1,650	1,030	1,403	763
Pass Avenue at SR 134 EB Ramps	1,432	899	598	869	579

Source: California High-Speed Rail Authority, 2017
Note: Shaded cells denote an estimated exceedance of the ramp length (capacity).
[a] Existing conditions were analyzed as a two-way stop control intersection based on Highway Capacity Manual. All future scenarios were analyzed as an all-way stop control intersection, and queuing results were not generated based on HCM unsignalized intersection methodology.
[b] Existing conditions were analyzed as an unsignalized intersection. Due to ramp reconfiguration and signalization in the near future, all future scenarios for these locations were analyzed as signalized intersections.
I- = Interstate
SR = State Route

None of the queues at these locations would be lengthened by trip generation activity from the HSR facilities at Burbank.

The queuing analysis worksheets are included in Appendix G-2 for the 2029 Plus Project conditions and in Appendix H-2 for the 2040 Plus-Project conditions.

6.4.3 Effects on the Local Roadway Network due to Station Activity

The effects on the local roadway network due to station activity were discussed under Section 6.4.1.1 for Opening Year (2029) and under Section 6.4.1.2 for Horizon Year (2040).

6.5 Effect on Transit Services

Within the project section, transit lines that travel in an east-west direction in the RSA and cross existing at-grade railroad crossings will operate with less delay as a result of the new grade separations as a part of the HSR project. Travel delays will no longer be caused by passing trains and active grade-crossing safety equipment at Sonora Avenue, Grandview Avenue, Flower Street, and Main Street.

At the HSR Burbank Airport and LAUS station sites, some transit services will experience an increase in passenger loads during peak times. The HSR activity will increase demand for connecting transit services at the Burbank Airport Station (primarily Metro Bus and Metrolink) and at LAUS (Metrolink, Metro Rail, Metro Bus, and other municipal bus and shuttle service operators).

Mode split analysis was conducted by TAZ in the Statewide Model as discussed in the methodology section of this document. Resulting passenger ridership for bus and rail transit modes for Phase 1 Opening Year 2029 and Phase 1 Horizon Year 2040 are shown in Table 6-27. Based on these calculations, ridership for both rail and bus transit modes would increase due to the Burbank to Los Angeles project section operations. Travel times and service times for transit lines that directly connect to each proposed HSR station should not increase as a result of this increased ridership.

Table 6-27 Daily Forecasted Transit Ridership Analysis from Statewide Model

HSR Station	Phase 1 Opening Year 2029	Phase 1 Horizon Year 2040
Burbank Station	1,313	2,995
Los Angeles Union Station	12,699	29,880

Source: California High-Speed Rail Authority, 2017

6.6 Effect on Rail Service

The operation of HSR in the project section will result in increased trains using shared tracks through the project segment corridor. Table 6-28 provides a summary of future Plus Project daily HSR train volumes along the project section. The added HSR train movements will require schedule adjustments for Metrolink, Amtrak, and UPRR trains to allow for proper operations and spacing of all trains.

Table 6-28 Existing and Future Trains per Day in the Los Angeles–San Diego–San Luis Obispo Rail Corridor Within the Burbank and Los Angeles Project Section [from PD]

Operator	2016 Existing Conditions	2029 Opening Day	2040 Horizon Year
California High-Speed Rail Authority[1]	N/A	196	196
Metrolink[2]	61	99	99
Amtrak[3]	12	16	18
UPRR[4]	11	18	23

[1] 2029 Opening Day and 2040 Horizon Year projections are from the California High-Speed Rail Authority's "Year 2029 and Year 2040 Concept Timetable for EIR/EIS Analysis."
[2] Existing Conditions data are from the 2016 Metrolink Schedule (effective October 3, 2016); 2029 Opening Day projections are extrapolated from the 2016 Metrolink 10-Year Strategic Plan (2016d), *"Growth Scenario 2: Overlay of Additional Service Patterns."*
[3] Existing Conditions data are from the 2016 LOSSAN Corridor Schedule; 2029 Opening Day projections are extrapolated from 2012 LOSSAN Corridorwide Strategic Implementation Plan "Long-Term Operations Analysis" (increase of approximately one train every four years for the Amtrak Pacific Surfliner and no growth for the Amtrak Coast Starlight between Hollywood Burbank Airport and LAUS).
[4] Existing Conditions data are from the 2012 LOSSAN Corridorwide Strategic Implementation Plan "Long-Term Operations Analysis"; 2029 Opening Day projections are extrapolated from the 2012 LOSSAN Corridorwide Strategic Implementation Plan "Long-Term Operations Analysis" (increase of approximately one train every two years for UPRR between Hollywood Burbank Airport and LAUS).
Amtrak = National Railroad Passenger Corporation
LAUS = Los Angeles Union Station
N/A = not applicable
UPRR = Union Pacific Railroad

6.7 Effect on Nonmotorized Modes of Travel

The re-alignment of San Fernando Boulevard would close the current pedestrian access along San Fernando Boulevard, Arvilla Avenue, Lockheed Drive, Cohasset Street, Hollywood Way, and Ontario Street. The proposed San Fernando Boulevard re-alignment would provide sidewalks, curb ramps, and crosswalks along the roadway and at the intersection re-alignments with Arvilla Avenue, Hollywood Way, and Ontario Street.

The station would include bike racks, pedestrian connections to the existing sidewalks, and bike lanes/facilities where they can be accommodated within the streets. Existing and planned pedestrian and bicycle facilities serving the vicinity of the proposed Burbank Airport Station are expected to adequately meet the project demand.

At the Burbank Airport Station, the proposed project would add approximately 34 peak hour non-motorized trips to the network. Existing and planned pedestrian and bicyclist facilities serving the vicinity of the proposed Burbank Airport Station are expected to be adequate to meet the project demand in 2029.

6.8 Vehicle Miles Traveled Reduction

As of December 28, 2018, the State CEQA Guidelines have been amended to state that as of July 1, 2020, VMT will be the performance measure for the evaluation of transportation impacts. For the purposes of this project, the performance measure (LOS) was used and analyzed in Impacts TR-6, TR-7, and TR-8, above. However, VMT analysis has been provided to indicate the project's impacts if VMT had been used as the performance measure, because it will be a new requirement in 2020.

Under the revised CEQA guidelines that will take effect in 2020, transportation projects that reduce VMT would be presumed to have a less than significant impact on transportation. This would be the case with the HSR Build Alternatives, because total VMT would be reduced, overall, with the HSR project in operation. In 2040, implementation of the HSR Build Alternative would result in a net reduction in VMT ranging from 931,316,394 to 1,286,899,586, as shown in Table 6-29. The change in VMT represents total number of vehicle miles driven that would be removed from regional roadways. The HSR Build Alternative would provide benefits to the regional transportation system by reducing vehicle trips on the freeways through the diversion of intercity trips from road trips to HSR. This is a net benefit to transportation and traffic operations because a reduction in VMT helps maintain or potentially improve the operating conditions of regional roadways. This reduction in future vehicle trips would potentially improve the LOS of the regional roadway system and reduce the overall VMT compared with existing conditions and compared with the No Project Alternative.

Table 6-29 Annual Vehicle Miles Traveled

County	VMT with No Project Alternative (2040) [1]	VMT with HSR Build Alternatives (2040)[1]	Net Reduction in VMT with HSR Build Alternatives (2040)[1]
Los Angeles	86,055,909,405 to 87,075,870,799	85,124,593,011 to 85,788,971,213	931,316,394 to 1,286,899,586

Source: EMFAC2014 on-road emission factor model
Totals may not add up exactly because of rounding.
[1] The values in the table represent the ranges of VMT based on the medium and high range of ridership forecasts, consistent with 2040 scenarios as forecasts presented in the California High-Speed Rail Authority's Business Plan (2016d). The lower end of the range for VMT corresponds to the high-ridership forecast and the higher end of the range for VMT corresponds to the medium-ridership forecast.
HSR = high-speed rail
VMT = vehicle miles traveled

6.9 Project Construction Period Impacts

For the Burbank to Los Angeles Project Section, potential temporary construction impacts will occur in the vicinity of the Burbank Airport and LAUS station sites. These impacts would be from truck hauling/delivery, construction employee trips, and access reconfigurations during construction phasing that would affect vehicle, pedestrian, and bicyclist access. The effects of these potential impacts will need to be lessened and mitigated to the extent possible through well-signed detour routes, access provisions during staging, scheduling of truck trips to overlap peak periods as little as possible, and construction employee off-site parking and shuttling/transit promotion.

6.9.1 Urban Area Construction Impacts on Circulation and Emergency Access

6.9.1.1 Temporary Construction Impacts

Buena Vista Street Impacts

Construction of a tunnel section serving the proposed Burbank Airport Station under Hollywood Way to the north of the railroad corridor, near the Empire Avenue and Vanowen Street intersections, would require closure of vehicle travel on Buena Vista Street from a point north of the grade crossing to the Vanowen Street intersection for a reprofiling of the roadway. A major detour route would be necessary to reroute traffic around this closure via Victory Boulevard, Vineland Avenue, Buena Vista Street, and San Fernando Boulevard. The closure of Buena Vista Street would be temporary.

Vanowen Street Impacts

A shoofly track is a temporary track used to avoid an obstacle that blocks movement on the existing track. The shoofly track would be constructed partially within the existing rail right-of-way; however, the majority of the shoofly track would be constructed within Vanowen Street to the south. The shoofly would temporarily reduce the width of Vanowen Street to one lane in each direction during the construction of the HSR trench and relocation of the Metrolink tracks near Hollywood Way.

Burbank Boulevard Impacts

Construction of a new overhead roadway structure for Burbank Boulevard over I-5 would be necessary as part of project construction. When full closures of the interchange are necessary, freeway access detours would occur and traffic would be rerouted to the Verdugo Avenue/Olive Avenue interchange to the south and the Empire Avenue/San Fernando Road or Buena Vista interchanges to the north. Detours would occur via Buena Vista Street, Victory Boulevard, Victory Place, and San Fernando Boulevard.

Empire Avenue Impacts

Proposed cut-and-cover and extended Lockheed channel structure may require closures along Empire Avenue. One lane in each direction would be maintained during construction, if possible. However, potential full closure of the roadway may be required during construction. Vehicles would be detoured to Buena Vista Street to the east and Clybourn to the West.

Buena Vista Street Impacts

Buena Vista Street would be grade-separated for HSR tracks, while Metrolink and UPRR would be maintained at-grade. During construction, Buena Vista Street would potentially be fully closed. Detours would take place at Pacific Avenue to the south and Empire Avenue to the north.

Other Impacts – Grade Crossing Modifications

Temporary construction effects would occur at other grade crossing locations where permanent new grade separations are not being constructed, but existing structures would be modified. Construction of modified undercrossings at these locations would require temporary long-term lane closures or roadway closures during construction of support segments and decking. Pier foundation, column, and pier cap construction may require long-term lane closures. Depending on the duration for these closure operations, delays would be experienced by drivers that traverse the construction area when partial lane capacity is provided. The following provides a brief discussion of each location.

- At N Victory Place, where the roadway has an undercrossing at the railroad corridor, detoured vehicles would need to use Buena Vista Street to the west, to travel north and south over the alignment. San Fernando Boulevard to the east could also serve as a detour route.
- At Magnolia Boulevard, where the roadway has an overcrossing at the railroad corridor, impacts may be less severe as work would not be conducted over the roadway. If detours are necessary, vehicles would need to use Olive Avenue to the south, to travel east and west over the alignment.
- At Olive Avenue, the same type of construction conditions would apply as those at Magnolia Boulevard. Magnolia Boulevard would need to be used to travel east and west over the alignment.
- At Alameda Avenue, where the roadway has an undercrossing at the railroad corridor, detoured vehicles would need to use Western Avenue to the south, to travel north and south over the alignment. This detour, if necessary, would be longer than other detours described here.
- At Western Avenue, where the roadway has an overcrossing at the railroad corridor, detoured vehicles would need to use Alameda Avenue to the north or Sonora Avenue to the south, to travel north and south over the alignment. This detour, if necessary, would also be longer than other detours described here.

Construction at Proposed Burbank Airport Station

Throughout the final design and implementation of the proposed project, the Authority would continue to work with local and regional transportation agencies to do the following:

- Develop and implement transit-oriented development strategies around the HSR stations
- Coordinate transit services, increase service, and/or add routes, as necessary, to serve the HSR station areas

Construction and operation of the proposed Burbank Airport Station would not require modifications to any of the existing or planned pedestrian or bicycle routes/access in the immediate vicinity of the station or along Hollywood Way.

The station would include bike racks, pedestrian connections to the existing sidewalks, and bike lanes/facilities where they can be accommodated within the roadway widths. Existing and planned pedestrian and bicycle facilities serving the vicinity of the proposed Burbank Airport Station are expected to adequately meet the project demand.

Construction at Proposed LAUS Station

The construction at LAUS for the HSR project would be limited to raising platform heights and installing the overhead catenary system. As described in Section 2.3.2, Metro's Link Union Station project would construct all other station improvements prior to HSR project construction. Construction of the limited HSR improvements at LAUS would require daily trips during the construction period by hauling/delivery trucks and would also require a daily construction employee population that will 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 except 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- and on-ramps at Vignes Street, and the US-101 southbound off- and on-ramps 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- 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.

6.9.1.2 Temporary Transit Service Impacts

Project construction activities that would restrict existing roadway capacity or create full detours for temporary periods for tunnel sections, new overhead roadway structures, and grade separation replacements or new grade separation elements would affect public bus transit service. The effects would range from potential schedule delays where capacity is restricted to rerouting of service and provision of temporary replacement bus stops where roadway closures would take place. The following bus lines would be potentially affected by project construction based on existing service, grouped by the locations of major project construction elements.

Tunnel Section Construction Under Hollywood Way

- Burbank Bus Golden State Circulator
- Burbank Bus – NoHo to Airport
- Metro Bus Line 94
- Metro Bus Line 165
- Metro Bus Line 169
- Metro Bus Line 222
- Metro Bus line 794

Burbank Boulevard/I-5 Overhead Structure

- Metro Bus Line 154
- Metro Bus Line 164

Victory Place Reconfiguration

- Metro Bus Line 94
- Metro Bus Line 165
- Metro Bus line 794

Alameda Avenue Railroad Bridge Modification

- Metro Bus Line 96
- Glendale Beeline Line 7

The Sonora Avenue, Grandview Avenue, and Flower Street-Pelanconi Avenue project grade separation elements would be constructed adjacent to San Fernando Road, and bus lines that operate on that roadway may be affected during construction for reprofiling of the roadway to raise or lower it.

Sonora Avenue Grade Separation

- Metro Bus Line 94
- Metro Bus Line 183
- Metro Bus line 794

Grandview Avenue Grade Separation

- Metro Bus Line 94
- Metro Bus Line 183
- Metro Bus line 794
- Glendale Beeline Line 12

Flower Street-Pelanconi Avenue Grade Separation

- Metro Bus Line 94
- Metro Bus Line 183
- Metro Bus line 794
- Glendale Beeline Line 12

Chevy Chase Drive-Goodwin Avenue Grade Separation

- Metro Bus Line 94
- Metro Bus Line 201
- Metro Bus Line 603
- Metro Bus line 794
- Glendale Beeline Line 12

Main Street Bridge

- Metro Bus Line 76
- LADOT Dash Lincoln Heights/Chinatown Shuttle

6.9.1.3 Permanent Construction Impacts

Construction of the project alignment would require new grade separations in some areas. In other locations where roadways cross the alignment, grade crossings either currently exist or Metro would implement grade-separation projects, separate from the HSR project, that would be completed before the project opening year.

During some or all construction stages at these locations, access may be prohibited entirely due to construction. Traffic would be detoured to other crossing locations, adding vehicle volumes and delays to intersections near those locations. Pedestrians and bicyclists would need to be detoured, creating increased travel time delays, especially for pedestrians. Clear detour signage would help to mitigate these impacts to some extent.

The construction-period closures related to project grade-separation elements along the alignment were analyzed based on the estimated shifts in area traffic that would occur due to construction-related roadway closures.

The following provides a summary, by grade separation location, of the roadway construction activities that could affect traffic flow in the study area during the construction period. The design details are described in more detail in Section 2.6.

Sonora Avenue

The roadway intersections of Air Way/Sonora Avenue and San Fernando Road/Sonora Avenue would be lowered in grade, and property access to neighboring parcels would be affected to varying extents. However, intersections would remain intact after construction is completed and vehicle access patterns would not be modified.

Grandview Avenue

Some restrictions to traffic flow would occur during construction of the grade separation. It is expected that full closures of Grandview Avenue would be limited in nature, and that limited access would be provided adjacent to the construction area for most of the construction timeframe.

Flower Street-Pelanconi Avenue

San Fernando Road would be lowered, which would potentially affect intersections on that roadway, including those of Norton Avenue, Alma Street, Kellogg Avenue, and Highland Avenue. Some restrictions to traffic flow would occur during construction of the grade separation. It is expected that full closures of San Fernando Road would be limited in nature, and that limited access would be provided adjacent to the construction area for most of the construction timeframe.

Chevy Chase Drive/Goodwin Avenue

The existing at-grade crossing at Chevy Chase Drive would be closed. The primary alternate crossing points for vehicles between neighborhoods to the east and west would be Los Feliz Boulevard to the south and a new roadway connection under the alignment near Goodwin Avenue to the north. The new roadway connection would provide an undercrossing from the intersection of Pacific Avenue/San Fernando Road on the east and the residential neighborhood on the west. A four-leg intersection would be provided at Pacific Avenue.

On the west side of the alignment, the extended roadway would connect with the at-grade intersection of Brunswick Avenue/Goodwin Avenue.

Detours and partial lane closures would take place at the intersection of Pacific Avenue and San Fernando Road during construction of a new southwest leg of the intersection to provide the new roadway connection across the railroad corridor to Goodwin Avenue. These closures are not likely to affect the entire intersection and would be temporary in nature.

Detours and partial or full closures would take place on the segment of Goodwin Avenue from a point west of Brunswick Avenue to the railroad corridor, and on West San Fernando Road in the vicinity of the intersection with Goodwin Avenue. These closures would take place during new roadway construction and during reprofiling of the roadways. Full—but temporary—closures are likely for these roadways.

Main Street

The construction of the new bridge structure would remove direct connections to and from Main Street at Wilhardt Street on the west side of the river, and also at Gibbons Street and Lamar Street on the east side of the river. A new roadway connection to the south of Main Street would provide an east-west link between Lamar Street and Clover Street. The Main Street/Clover Street intersection would be the main intersection link to Main Street for this eastern area. Wilhardt Street would only have access to the north via Spring Street.

Some restrictions to traffic flow would occur during construction of the grade separation. It is expected that full closures of Main Street would be limited in nature, and that limited access would be provided via the existing Main Street bridge structure for most of the construction timeframe for the bridge element.

Grade Crossing Construction and Bicycle Access

Construction of the HSR grade crossing elements would potentially affect bicycle travel. Table 6-30 identifies the presence of existing bicycle or planned bicycle facilities at the grade crossing locations. Grade crossing closures, or the construction of grade crossings, may have impacts on these facilities.

Table 6-30 Existing and Planned Bicycle Facilities at/near Alignment Grade Separations

Roadway Segments	Bike Lane
Buena Vista Street	None
Alameda Street	None
Flower Street - west of Air Way	Proposed Class III: Sharrows
Western Avenue - east of Flower Street	Proposed Class III: Sharrows
Sonora Avenue - west of Air Way	Proposed Class II: Colored Bicycle Lane
Chevy Chase Drive - west of railroad track	Proposed Class III: B-Type Sharrows
Grandview Avenue - west of Air Way	Proposed Class III: B-Type Sharrows
Main Street - east of Los Angeles River	Class I - Protected Bicycle Lanes
Main Street - west of Los Angeles River	Class I - Protected Bicycle Lanes
Avenue 19	Class I - Protected Bicycle Lanes
Sonora Avenue	Proposed Class II: Colored Bicycle Lan
Grandview Avenue	Proposed Class III: B-Type Sharrows
Flower Street	Proposed Class III: Sharrows
Chevy Chase Drive	Proposed Class III: B-Type Sharrows
Main Street	Class I - Protected Bicycle Lanes

Source: California High-Speed Rail Authority, 2017

Quantified Resource Study Area Construction Impact Analysis

Estimates of traffic rerouting from the closure areas (including closed/removed intersections or roadway segments) were made based on the construction closure areas for the HSR project grade separation elements and other construction elements within the project alignment. The resulting analysis provides the effects of the traffic rerouting patterns at the intersections that would need to accommodate that traffic.

Table 6-31 provides a summary of existing with construction daily vehicle volumes at the analyzed RSA roadway segments. These roadway segments were analyzed in this report for potential effects from project construction and permanent roadway changes.

Six roadway segments would operate at LOS values of E or F during existing with construction conditions:

- Hollywood Way - south of Thornton Avenue
- Hollywood Way - north of Avon Street
- Hollywood Way - north of Victory Boulevard
- Victory Place - west of Empire Street
- Victory Boulevard - east of Hollywood Way
- San Fernando Road- West of Arvilla Avenue

Table 6-31 Roadway Segment Volumes for Existing with Construction Conditions

No.	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
H	Hollywood Way - South of Thornton Avenue	3,200	3,488	1.090	**F**	3,849	1.203	**F**
I	Hollywood Way - North of Avon Street	3,200	3,417	1.068	**F**	3,778	1.181	**F**
J	Hollywood Way - North of Victory Boulevard	2,900	3,783	1.304	**F**	4,159	1.434	**F**
K	Hollywood Way - South of Victory Boulevard	2,900	2,268	0.782	C	2,407	0.830	D
L	Buena Vista Street - North of San Fernando Road	2,900	1,392	0.480	A	1,745	0.602	B
M	Buena Vista Street - South of San Fernando Road	2,900	1,511	0.521	A	1,588	0.548	A
N	Buena Vista Street - South of Empire Avenue	3,625	254	0.070	A	315	0.087	A
P	Lincoln Boulevard - East of Buena Vista Street	2,900	964	0.332	A	1,523	0.525	A
Q	Burbank Boulevard - South of I-5 Northbound ramps	4,950	0	0.000	A	0	0.000	A
R	San Fernando Road- West of Vineland Avenue		1,232	0.429	A	1,269	0.441	A
T	San Fernando Road - West of Buena Vista Street	2,900	1,389	0.479	A	1,378	0.475	A
V	San Fernando Road Minor- East of Vineland Avenue		666	0.605	B	795	0.723	C
U	Victory Place - West of Empire Street	1,100	1,022	0.929	**E**	1,140	1.036	**F**
Z	Victory Boulevard - West of Hollywood Way	2,900	2,229	0.769	C	2,313	0.798	C
AA	Victory Boulevard - East of Hollywood Way	2,900	2,674	0.922	**E**	2,959	1.020	**F**
AB	San Fernando Road- West of Arvilla Avenue		1,491	1.297	**F**	1,128	0.981	**E**
AH	Chevy Chase Drive - West of railroad track	1,200	149	0.124	A	203	0.169	A

No.	Roadway Segment	Capacity (veh/hr)	AM Peak (veh/hr)	AM V/C	AM LOS	PM Peak (veh/hr)	PM V/C	PM LOS
AJ	Main Street - East of Los Angeles River	3,000	2,198	0.733	C	1,965	0.655	B
AK	Main Street - West of Los Angeles River	3,000	1,710	0.570	A	1,944	0.648	B

Source: California High-Speed Rail Authority, 2017
I- = Interstate
LOS = level-of-service
V/C = vehicle-to-capacity ratio
veh/hr = vehicles per hour

Table 6-32 provides the results of the construction period analysis of the potentially affected RSA intersections. The LOS worksheets for the Existing Year (2015) Plus Construction Conditions appear in Appendix E-2. The volumes figures are provided in Appendix E-1.

Table 6-32 Study Intersection Operations Analysis for Existing Year (2015) Plus Construction Conditions

No.	Study Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
5	Sunland Boulevard at I-5 NB Ramps	Signal	57.0	**E**	75.9	**E**
6	Sunland Boulevard at I-5 SB Ramps	Signal	24.7	C	45.5	D
7	Sunland Boulevard at San Fernando Road Minor	Signal	16.7	B	60.9	**E**
8	Sunland Boulevard at San Fernando Road	Signal	131.3	**F**	218.6	**F**
9	Vineland Avenue at Strathern Street	Signal	11.9	B	12.9	B
10	Vineland Avenue at Saticoy Street	Signal	8.8	A	7.7	A
11	Vineland Avenue at Sherman Way	Signal	21.5	C	23.8	C
12	Vineland Avenue at Vanowen Street	Signal	32.9	C	71.8	**E**
13	Vineland Avenue at Victory Boulevard	Signal	20.3	C	29.3	C
15	Strathern Street/Clybourn Avenue at San Fernando Road	Signal	191.9	**F**	18.0	B
26	Hollywood Way at Glenoaks Boulevard	Signal	39.7	D	90.5	**F**
27	Hollywood Way at I-5 NB Ramps	Signal	13.8	B	13.9	B
28	Hollywood Way at I-5 SB Ramps	TWSC	517.9	**F**	35.3	**E**
29	Hollywood Way at Keswick Street	Signal	6.5	A	3.0	A
32	Hollywood Way SB at San Fernando Road	Signal	71.2	**E**	10.9	B
33	Hollywood Way NB at San Fernando Road	Signal	4.0	A	3.9	A
34	Hollywood Way at Tulare Avenue	Signal	2.3	A	3.4	A
35	Hollywood Way at Winona Avenue	Signal	4.9	A	7.9	A
36	Hollywood Way at Thornton Avenue	Signal	12.2	B	20.7	C
37	Hollywood Way at Avon Street	Signal	Proposed Closure			
38	Avon Street at Empire Avenue	Signal	Proposed Closure			
39	Hollywood Way at Empire Avenue	Signal	Proposed Closure			
41	Hollywood Way at Victory Boulevard	Signal	555.7	F	352.9	F
56	Ontario Street at Empire Avenue	Signal	6.8	A	7.2	A

No.	Study Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
60	Glenoaks Blvd and Buena Vista St	Signal	19.9	B	16.9	B
61	I-5 NB Ramps and Buena Vista St	Signal	11.8	B	17.8	B
62	Buena Vista St and San Fernando Rd Minor/Winona	Signal	40.4	D	19.1	B
63	Buena Vista Street at San Fernando Road	Signal	212.8	**F**	136.3	F
64	Buena Vista Street at Thornton Avenue	Signal	60.2	**E**	38.6	D
65	Buena Vista Street at Empire Avenue	Signal	142.3	**F**	87.3	**F**
66	Buena Vista Street at Vanowen Street	Signal	117.6	**F**	62.1	**E**
67	Buena Vista Street at Victory Boulevard	Signal	240.8	**F**	231.0	**F**
72	Lincoln Street at San Fernando Road	Signal	5.9	A	3.3	A
73	Lincoln Street at Empire Avenue	Signal	9.4	A	11.9	B
74	Valpreda Street at Empire Avenue	Signal	13.0	B	20.3	C
75	Empire Avenue at San Fernando Road	Signal	5.6	A	8.0	A
76	I-5 SB On-ramp at Empire Avenue	Signal	5.4	A	6.9	A
77	I-5 NB Ramp at Empire Avenue	Signal	5.6	A	6.8	A
78	Burbank Boulevard at 3rd Street	Signal	8.2	A	11.0	B
79	Burbank Boulevard at San Fernando Road	Signal	109.2	**F**	231.7	**F**
80	Burbank Boulevard at I-5 NB Ramps	Signal	5.6	**A**	5.6	**A**
81	Burbank Boulevard at I-5 SB off-ramp/Front St	Signal	Proposed Closure			
82	Burbank Boulevard at Victory Boulevard	Signal	483.0	**F**	333.6	**F**
84	Magnolia Boulevard at 3rd Street	Signal	13.2	B	22.2	C
85	Magnolia Boulevard at 1st Street	Signal	208.7	**F**	277.3	**F**
86	Magnolia Boulevard at Victory Boulevard	Signal	487.7	**F**	591.8	**F**
89	Olive Ave at 1st St	Signal	129.3	**F**	209.7	**F**
90	Olive Ave at Victory Boulevard	Signal	148.2	**F**	186.5	**F**
96	Hollywood Way at Cohasset East	TWSC	9.8	A	18.7	C
130	Brunswick Avenue at Chevy Chase Drive	Signal	13.2	B	14.6	B
131	Perlita Avenue at Chevy Chase Drive	OWSC	8.9	A	9.7	A
132	La Clede Avenue at Chevy Chase Drive	AWSC	8.2	A	8.5	A
133	Alger Street at Chevy Chase Drive	OWSC	10.0	A	10.9	B
134	San Fernando Road at Chevy Chase Drive	Signal	185.2	**F**	144.1	**F**
163	Sotello Street at Main Street	OWSC	20.1	C	421.2	**F**
164	Wilhardt Street at Main Street	OWSC	Proposed Closure			
223	Gibbons Street at Main Street	OWSC	8.4	A	8.6	A
1011	Brunswick Ave and Goodwin Avenue [a]	TWSC	11.6	B	12.1	B

No.	Study Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1012	San Fernando Rd and Pacific Avenue [a]	Signal	29.7	C	29.0	C
1013	Main Street at Clover Street/Avenue 17 [a]	Signal	29.5	C	27.0	C

Source: California High-Speed Rail Authority, 2017
Bold text = intersection operates at a poor LOS (LOS E/F)
[a] = Proposed new study intersection as part of the HSR project
AWSC = all-way stop control
I- = Interstate
LOS = level(s)-of-service
SB = southbound
NB = northbound
OWSC = one-way-stop control
sec = seconds

During construction activities, 22 intersections would operate at LOS E or F during the a.m. peak hour or the p.m. peak hour:

- Sunland Boulevard at I-5 NB ramps
- Sunland Boulevard at San Fernando Road Minor
- Sunland Boulevard at San Fernando Road
- Vineland Avenue at Vanowen Street
- Hollywood Way at Glenoaks Boulevard
- Hollywood Way at I-5 SB ramps
- Hollywood Way at Thornton Avenue
- Hollywood Way at Victory Boulevard
- Buena Vista Street at San Fernando Road
- Buena Vista Street at Victory Boulevard
- Burbank Boulevard at San Fernando Road
- Burbank Boulevard at Victory Boulevard
- Magnolia Boulevard at 1st Street
- Magnolia Boulevard at Victory Boulevard
- Olive Ave at 1st St
- Olive Ave at Victory Boulevard
- San Fernando Road at Chevy Chase Drive
- Sotello Street at Main Street
- Strathern Street/Clybourn Avenue at San Fernando Road
- Hollywood Way SB at San Fernando Road
- Buena Vista Street at Thornton Avenue
- Buena Vista Street at Empire Avenue

The three new intersections that would be constructed as part of the HSR grade separation projects would operate at LOS D or better.

6.9.2 Construction Adjacent to Freeways: Construction Impacts on Circulation

A majority of the project alignment will not be constructed adjacent to freeways where construction closures might affect mainline or access ramp traffic flows. Construction of the project alignment adjacent to the Burbank Boulevard/I-5 interchange, however, would require reconfiguration of the access ramps. This would require detours to San Fernando Road to the north or Olive Avenue to the south, when one or more ramps may be fully closed during the most intense phases of construction. During other times, the number of lanes on the ramps may be reduced, or the approach/receiving lanes at the ramp intersections with Burbank Boulevard may be reduced, causing congestion at the interchange, and potential deviations of traffic to other interchanges may result with or without signed detour during those construction stages.

The Burbank Airport Station and LAUS improvements would not be constructed directly adjacent to any freeway facilities.

6.9.3 Rural Area Construction: Impacts on Circulation

Neither the project alignment nor the project improvements at the Burbank Airport Station or LAUS will be constructed in any rural areas.

6.10 Cumulative Effects

Cumulative effects are assumed to be included in the 2012 RTP/SCS model. The model includes land use data from all local jurisdictions for the existing baseline and future baseline periods. The area traffic growth that would occur due to the development of these new land uses a whole was incorporated into the traffic analysis. Therefore, cumulative effects were encapsulated in the analysis. Therefore, additional quantitative analysis for cumulative impacts is not required.

On April 7, 2016, SCAG's Regional Council adopted the 2016 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.

The overarching strategy of this RTP/SCS seeks to integrate land use planning with transportation networks, including transit. It calls for more compact communities in existing urban areas, providing neighborhoods with effective public transit, safe opportunities for walking, opportunities for bicycling and other active transportation modes, and as much open space as possible.

Therefore, future development in the area can potentially have lower impacts each year of the period between existing conditions and the future analysis years. Nonetheless, cumulative impacts, as they are defined based on the current RTP model, have been incorporated into this analysis.

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7 IMPACT AVOIDANCE AND MINIMIZATION FEATURES

The HSR Build Alternative incorporates standardized HSR features to avoid and minimize impacts. These features are referred to as Impact Avoidance and Minimization Features. The Authority will implement these measures during project design and construction to avoid or reduce impacts.

The Authority will enter cooperative agreements with HSR station host cities and/or partner transportation providers to implement transportation improvements in-lieu of parking expansion or general roadway traffic improvements to address identified parking or traffic impacts. This approach supports the Authority's guidelines and policies to encourage HSR access via non-automobile modes, helping reduce traffic congestion and associated air quality impacts at and around HSR stations. *In-lieu* improvements would be negotiated with host cities and partner transportation providers and include, but are not limited to, these types of improvements:

- Pedestrian facilities including but not limited to sidewalks, curb-cuts, pathways, multi-use trails and signage and wayfinding within 0.5 mile of HSR stations
- Bicycle facilities including, but not limited to, on-street bicycle lanes and cycle tracks, off-street bicycle or multi-use trails, signalization, bicycle parking, and bicycle rental, sharing or repair facilities and signage and wayfinding within 3 miles of HSR stations
- On- and off-street bus transit facilities including, but not limited to, transit centers, stations, stops, shelters, lighting, terminal layover facilities, operator restrooms, fare vending equipment, information and wayfinding, bus pads, electric charging stations, transit lanes, and traffic signal priority equipment and software within 3 miles or HSR stations
- Public transit bus rolling stock
- On- or off-street vehicle pick-up/drop-off and queueing space within 0.25 mile of HSR stations
- Ongoing bus, streetcar or urban rail service operations and maintenance funding to support expanded connecting transit service at HSR stations

Table 7-1 Transportation Mitigation Details

Transportation Mitigation Details						
Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Frequency	Implementation Mechanism
Pre-construction during construction and post-construction	Station access and funding agreements	Annual	Authority	Authority, in consultation with partner cities and transportation providers	One-time	Memoranda of Understanding

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8 REFERENCES

California Department of Transportation (Caltrans). LOSSAN Corridorwide Strategic Implementation Plan. www.dot.ca.gov/dist11/departments/planning/pdfs/corridor/2012_LOSSAN_Corridorwide_Strategic_Implementation_Plan.pdf. Sacramento: April 2012.

———. 2013. *2013 California State Rail Plan*. Prepared by AECOM: May 2013.

——— .2014a. *California Manual on Uniform Traffic Control Devices*. Revision 3, March 2018.

———. 2014b. *Complete Streets Implementation Action Plan 2.0*. Prepared by Caltrans. Sacramento: June 2014.

———. 2015. *Highway Design Manual.* Prepared by Caltrans. Sacramento: December 2015.

———.2016. *Traffic Census Program*. https://dot.ca.gov/programs/traffic-operations/census.

———. 2017. *California State Bicycle and Pedestrian Plan.* Prepared by Caltrans. Sacramento: February 2017. www.dot.ca.gov/activecalifornia/theplan.html.

California Environmental Resources Evaluation System. *2014 California Environmental Quality Act (CEQA) Statute and Guidelines*. Environmental Checklist form. http://resources.ca.gov/ceqa/docs/2014_CEQA_Statutes_and_Guidelines.pdf (accessed August 2016).

California High-Speed Rail Authority (Authority). 2013. *Technical Memorandum 1.1.21 Typical Cross Sections for 15% Design*. August 2013.

———. 2016. California High-Speed Rail 2016 Business Plan, Ridership, and Revenue Forecasting Model. Prepared by Cambridge Systematics, Inc. Oakland: April 2016.

———. 2017. Data collected and analyzed by KOA Corporation for Burbank to Los Angeles Project Section Transportation Technical Report. December 2017.

California High-Speed Rail Authority and USDOT Federal Railroad Administration (Authority and FRA). 2005. *Final EIR/EIS for the Proposed California High-Speed Train System. Vol. 1, Report*. Sacramento and Washington, D.C.: prepared by California High-Speed Rail Authority and USDOT Federal Railroad Administration. August 2005. www.hsr.ca.gov/Programs/Environmental_Planning/EIR_EIS/index.html.

California Governor's Office of Planning and Research (OPR). 2018a. *Technical Advisory on Evaluating Transportation Impacts In CEQA.* December 2018. http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf.

———. 2018b. *Initial Statement of Reasons for Regulatory Action.* January 2018. http://resources.ca.gov/ceqa/docs/update2018/initial-statement-of-reasons.pdf.

———.2018c. *CEQA Update* web site. http://opr.ca.gov/ceqa/updates/sb-743/. 2018.

Cambridge Systematics, Inc. 2014a. *California High-Speed Rail 2014 Business Plan Ridership and Revenue Forecasting Technical Memorandum.*

———. 2014b. *California High-Speed Rail Ridership and Revenue Model version 2.0 Model Documentation Final Report.*

City of Burbank. 2009. *City of Burbank Bicycle Master Plan.* December 2009. https://www.burbankca.gov/home/showdocument?id=5371.

———. 2013. *Burbank 2035 General Plan: Mobility Element*. February 2013.

City of Glendale. 1998. Glendale General Plan Update. Prepared by City of Glendale Planning and Public Works Division, August 1998.

———. 2007. *Glendale Downtown Mobility Plan*. March 2007.

———. 2012. *City of Glendale Bicycle Transportation Plan*. September 2012. https://www.glendaleca.gov/home/showdocument?id=19862.

City of Los Angeles. 2004. *Los Angeles International Airport (LAX) Master Plan*, April 204. https://www.lawa.org/en/lawa-our-lax/environmental-documents/documents-certified/2004-lax-master-plan-program/2004-lax-master-plan-laxmp (accessed November 2016).

———. 2010 *Bicycle Plan*. Planning Department. Adopted March 2011. http://planning.lacity.org/cwd/gnlpln/transelt/NewBikePlan/Txt/LA%20CITY%20BICYCLE%20PLAN.pdf (accessed November 2016).

———. 2014. *Mobility Plan 2035: An Element of the General Plan.* October 2014. https://planning.lacity.org/odocument/523f2a95-9d72-41d7-aba5-1972f84c1d36/Mobility_Plan_2035.pdf.

———. Active Transportation. http://bike.lacity.org (accessed November 2016).

County of Los Angeles. 1997. *Los Angeles County Traffic Impact Guidelines.* Prepared by Los Angeles County Department of Public Works. January 1997.

———. 2012a. *LAX 2011 Economic Impact Analysis.* Prepared by Los Angeles County Economic Development Corporation. August 2012.

———. 2012b. *Bicycle Master Plan*. Prepared by the County of Los Angeles Department of Public Works and by Alta Planning + Design. Los Angeles: adopted March, 2012. http://dpw.lacounty.gov/pdd/bike/docs/bmp/FINAL%20Bicycle%20Master%20Plan.pdf.

———. 2015. *Los Angeles County General Plan 2035*. Prepared by County of Los Angeles Department of Regional Planning. Los Angeles: adopted October 6, 2015. http://planning.lacounty.gov/generalplan.

Federal Railroad Administration. 2016. Office of Safety Analysis. www.safetydata.fra.dot.gov/officeofsafety/default.aspx (accessed August 2016).

Interim Materials on Highway Capacity. 1982. *NCHRP Circular 212.*

Kittelson & Associates. *California High Speed Rail Palmdale to Burbank Project Section. Transportation Technical Report.* December 2016.

Los Angeles County Metropolitan Transportation Authority (Metro). 2006. *2006 Metro Bicycle* Transportation *Strategic Plan.* Prepared by Los Angeles County Metropolitan Transportation Authority, Alta Planning + Design, Inc, Transight Limited, and Les Scott Consulting. Los Angeles: June 2006. http://media.metro.net/board/Items/006/02_february/20060215P&PItem6%20Atta.pdf.

———. 2009. *Long Range Transportation Plan.* Prepared by Metro, December 2009. https://media.metro.net/projects_studies/images/final-2009-LRTP.pdf.

———. 2010a. *Bus and Metro Rail System Map*. https://media.metro.net/riding_metro/maps/images/system_map.pdf (accessed December 2016).

———. 2010b. *2010 Congestion Management Program for Los Angeles County.* Prepared by Metro, 2010. http://media.metro.net/projects_studies/cmp/images/CMP_Final_2010.pdf.

———. 2014a. *First Last Mile Strategic Plan.* Prepared by Metro and SCAG, March 2014. https://media.metro.net/docs/First_Last_Mile_Strategic_Plan.pdf.

———. 2014b. *Metro Complete Streets Policy.* Prepared by Metro, October 2014. https://media.metro.net/projects_studies/sustainability/images/policy_completestreets_2014-10.pdf.

———. 2014c. *Short Range Transportation Plan.* Prepared by Metro, December 2014. http://media.metro.net/projects_studies/srtp/report_srtp_2014.pdf.

———. 2016. Bus and Metro Rail System Map. https://media.metro.net/riding_metro/maps/images/system_map.pdf (accessed December 2016).

———. 2017a. *Interactive Estimated Ridership Stats*. http://isotp.metro.net/MetroRidership/Index.aspx (accessed March 2017).

———. 2017b. *North Hollywood to Pasadena BRT Corridor Technical Study. Prepared by Metro, March 2017.* https://www.metro.net/projects/bus-rapid-transit-studies/noho-pas-technical-study/.

———. 2018a. *Los Angeles County Regional Transportation Improvement Program. Prepared by Metro, December 2017.* https://media.metro.net/projects_studies/funding/images/2018_LAC_rtip_submittal_2017-12.pdf.

———. 2018b. *Los Angeles County Regional Transportation Improvement Program.* Prepared by Metro, December 2017. https://media.metro.net/riding_metro/maps/images/system_map.pdf.

Metrolink. 2016a. *Burbank Station*. https://www.metrolinktrains.com/rider-info/general-info/stations/burbankbob-hope-airport/l (accessed December 2016).

———. 2016b. *Los Angeles Union Station*. www.metrolinktrains.com/stations/detail/station_id/131.html (accessed December 2016).

———. 2016c. Metrolink Schedule. October 3, 2016.

———. 2016d. *Growth Scenario 2: Overlay of Additional Service Patterns* in 10-Year Strategic Plan.

RS&H. *Environmental Impact Report for A Replacement Airline Passenger Terminal at Burbank Bob Hope Airport, Volume 6.* June 2016. https://elevatebur.com/pdf/BUR-FEIR16-Volume6.pdf.

Southern California Association of Governments (SCAG). 2005. *SCAG Sustainability Planning Grants Program/Compass Blueprint Plan*.

———. 2012a. *SCAG Regional Travel Demand Model and 2008 Model Validation*. www.scag.ca.gov/dataandtools/documents/validationsummaryreport_scag2008val_2012_06_05.pdf (accessed February 2017).

———. 2012b. *SCAG Regional Travel Demand Model 2008 Base Year and Future Year Loaded Highway Networks*.

———. 2012c. *Regional Transportation Plan 2012-2035: Sustainable Communities Strategy.* Prepared by SCAG, April 2012. http://rtpscs.scag.ca.gov/Documents/2012/final/f2012RTPSCS.pdf (accessed November 2016)

———. 2016a. *SCAG Regional Comprehensive Plan (RCP).* 2008. https://www.scag.ca.gov/Documents/f2008RCP_Complete.pdf (accessed November 2016).

———. 2016b. SCAG 2016–2040 Final Regional Transportation Plan/ Sustainable Communities Strategy. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx (accessed November 2016).

———. 2019. *SCAG Regional Federal Transportation Improvement Program (FTIP).* Adopted 2019. http://ftip.scag.ca.gov/Pages/2019/adopted.aspx (accessed January 2019)

———. n.d. “Regional Bus Routes.” http://gisdata.scag.ca.gov/Pages/GIS-Library.aspx (accessed November 2016).

Transportation Research Board (TRB). 2010. *Highway Capacity Manual 2010*.

———. 2014. National Cooperative Highway Research Program (NCHRP) Report 765 Analytic Travel Forecasting Approaches for Project-Level Planning and Design. www.princeton.du/alaink/Orf467F14/AnalyticalTravelForecastingNCHRP765_091314.pdf (accessed August 2016).

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9 PREPARERS

9.1 KOA Corporation

Joel Falter – Chief Operating Officer/Principal Planner

Brian A. Marchetti, AICP – Senior Transportation Planner

Mengzhao Hu – Senior Transportation Planner

Ivy Hang – Associate Transportation Planner

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