3.2 Transportation

This section provides an analysis of transportation changes associated with the Bakersfield to Palmdale Project Section (B-P) of the California High-Speed Rail (HSR) System.

Summary of Results

Access and circulation disruptions would occur throughout the construction period with various intensities, depending on the type of construction activities that occur. Construction impacts would be minimized through compliance with the Construction Transportation Plan (CTP) and other impact avoidance and minimization features (IAMF).

Since the implementation of a high-speed rail project is a major capital investment, it is important to identify how the project improves mobility in both the study area and the state compared to the No Project Alternative. It is also important to evaluate the impacts of the proposed project on the existing and future transportation system.

The B-P Build Alternatives 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 reduction in future vehicle trips would improve the levels-of-service (LOS) of the regional roadway system and reduce vehicle miles traveled (VMT) compared with existing conditions and with the future No Project Alternative. The overall reduction of vehicle trips and the improvement to regional roadway LOS would contribute to the beneficial effects of the project.

The B-P Build Alternatives would close the passenger rail gap between Bakersfield and Palmdale, thereby completing a passenger rail connection between Northern California and Los Angeles. In addition, the B-P Build Alternatives include multimodal features such as bikeways/walkways and safety improvements at roadway crossings. This would support California's transportation vision of reducing VMT and greenhouse gas emissions.

The *Bakersfield to Palmdale Project Section Transportation Technical Report* (California High-Speed Rail Authority [Authority] 2018) determined that the majority of the B-P Build Alternatives footprint (i.e., the rail alignments) would not result in significant or adverse impacts to the 70 intersections and 53 roadway segments evaluated in the resource study area (RSA). For information on how to access and review technical reports, please refer to the Authority's website at www.hsr.ca.gov. As described in Chapter 2, Alternatives 1, 2, 3, and 5 share the same alignment or are located in close proximity to each other. The César E. Chávez National Monument Design Option (CCNM Design Option) and the Refined CCNM Design Option are short segments that vary from the B-P Alternative alignments in the Keene area. The CCNM Design Option is a maximum of 480 feet from the centerline of the B-P Build Alternative alignments, while the Refined CCNM Design Option is a maximum of 2,870 feet from the centerline of the B-P Build Alternative alignments. In general, the traffic analysis varies very little among the B-P Build Alternative alignments and the CCNM Design Option and the Refined CCNM Design Option because the project includes grade separations for most of the affected roads; therefore, traffic operations on those roads would not change. Permanent road closures would occur on some low-volume roads, so there is little traffic that would be rerouted because of the B-P Build Alternatives. Furthermore, very few RSA intersections or roadway segments operate at or near capacity under existing conditions, so the potential for impacts is limited.

However, the Palmdale Station would impact 6 intersections and 3 roadway segments in the RSA due to the volume of traffic being drawn to the station, and improvements at several locations in the City of Palmdale are available for consideration to address these impacts under the National Environmental Policy Act (NEPA). Because the Authority has been working closely with local jurisdictions (including the City of Palmdale) with respect to project impacts and has identified mitigation for those impacts, it is reasonable to expect that the City of Palmdale would assume the right-of-way and maintenance responsibilities for any intersection and roadway improvements identified in TRAN-MM#3 that are within the City of Palmdale's jurisdiction; therefore, TRAN-MM#3 is feasible to implement. If TRAN-MM#3 is implemented, no impacts to roadway operations would occur as a result of the Palmdale Station.

The Bakersfield Station—F Street (Locally Generated Alternative) would affect 11 intersections and 2 roadway segments. Improvements would be required to mitigate these impacts.

3.2.1 Introduction

This section describes the regulatory setting, the affected environment for transportation, the impacts on transportation that would result from the project, and the mitigation measures that would reduce these impacts.

The California HSR Program incorporates several project engineering and design features intended to avoid or reduce the potential transportation impacts of implementing the new HSR system between Bakersfield and Palmdale. The *Statewide Final Program Environmental Impact Report/Environmental Impact Statement* (EIR/EIS) (Authority and Federal Railroad Administration [FRA] 2005) presents those features, which include, but are not limited to, locating the proposed project parallel to existing transportation features such as freeways and freight railroads where feasible. The intent of these engineering and design elements is to maintain the basic integrity of the existing surface transportation system so that the proposed project enhances mobility without causing substantial increases in traffic or travel time.

The 2005 Statewide Program EIR/EIS (Authority and FRA 2005) concluded that the California HSR Project would have a positive effect on transportation when viewed on a systemwide basis, particularly by reducing traffic on highways and around airports to the extent that intercity trips are diverted to the HSR system and by eliminating delays at existing at-grade crossings where the HSR system would provide grade separation.

Transportation facilities, including major roadways, pedestrian and bicycle facilities, airports, rail, and transit conditions near the Bakersfield to Palmdale Project Section and vicinity, are important factors because the B-P Build Alternatives would cross roads, railroads, and other transport facilities using overheads or underpasses with at-grade, below-grade, and above-grade (elevated) segments. Seven other resource sections in this EIR/EIS provide additional information related to transportation, as described below.

- **Section 3.3, Air Quality and Global Climate Change**—This section evaluates the air quality and global climate change impacts, primarily those associated with transportation emissions.
- **Section 3.5, Electromagnetic Interference and Electromagnetic Fields**—This section evaluates the impacts of electromagnetic fields on adjacent receptors and facilities such as freight rail.
- **Section 3.11, Safety and Security**—This section evaluates the impacts of constructing the B-P Build Alternatives with respect to adjacent freight rail, traffic safety, airport safety zones, and increases in emergency response times.
- **Section 3.12, Socioeconomics and Communities**—This section provides an analysis of the socioeconomic and community impacts of the B-P Build Alternatives.
- **Section 3.13, Station Planning, Land Use, and Development**—This section evaluates the B-P Build Alternatives' traffic and circulation impacts to existing and planned land uses.
- **Section 3.18, Regional Growth**—This section evaluates growth-inducing impacts of the B-P Build Alternatives with respect to transportation.
- **Section 3.19, Cumulative Impacts**—This section evaluates the cumulative transportation impacts of the B-P Build Alternatives.

3.2.2 Laws, Regulations, and Orders

The following sections summarize key laws and regulations for transportation relevant to the proposed project.

3.2.2.1 Federal

Federal Railroad Administration Procedures for Considering Environmental Impacts (*Federal Register* Volume 64, Page 28545)

Procedures per the FRA state that an EIS should consider possible impacts on transportation, including impacts of passengers and freight transportations; impacts by all modes of transport (including bicycle and pedestrian transport); impacts from relevant perspectives (including local, regional, and state perspectives); and impacts on roadway traffic congestion.

Other federal requirements include:

- Statewide and metropolitan transportation planning (U.S. Code Title 23, Sections 134 and 135, and Code of Federal Regulations Title 23, Part 450)
- State Rail Plans (49 U.S. Code 22701–22706)

3.2.2.2 State

In 2013, the California State Transportation Agency was formed. It looks to achieve the state's mobility, safety, and air quality objectives through the development and coordination of the policies and programs of the state's transportation agencies. Two of the state's transportation agencies that the California State Transportation Agency oversees are the California Department of Transportation (Caltrans) and the Authority.

California Government Code Section 65080

The State of California requires each metropolitan planning organization to prepare and adopt a Regional Transportation Plan (RTP) in order to achieve a coordinated and balanced regional transportation system.

California Streets and Highways Code (Section 1 et seq.)

The California Streets and Highways 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. Operations analysis of Caltrans facilities was conducted according to the methodology set forth in the *Guide for the Preparation of Traffic Impact Studies* (Caltrans 2002).

California Department of Transportation Plans

California Transportation Plan 2040

Federal laws and regulations require a minimum 20-year planning horizon for Caltrans plans. The California Transportation Plan 2040 (Caltrans 2016), a statewide, long-range transportation plan, is Caltrans' response to these requirements and is updated every 5 years. The California Transportation Plan 2040 defines goals, performance-based policies, and strategies for California's statewide, integrated, multimodal transportation system. It looks to California's future mobility needs while meeting current regulations related to the reduction of greenhouse gas emissions and sustainability. The California Transportation Plan 2040 looks to improve transit by implementing the Authority's Phase 1 HSR system by 2029, making it the backbone of a statewide, integrated passenger rail system linking all passenger rail operators with one-stop ticketing and well-coordinated transfers. The California Transportation Plan 2040 looks to shift to more sustainable transportation modes to reduce per-capita VMT.

The California Transportation Plan 2040 transportation scenario planning includes transportation and land use changes associated with regional metropolitan planning organization sustainable communities strategy (SCS) forecasts, strategies designed to reduce per-capita VMT while increasing mobility for all modes, and the use of new clean vehicle fuel and technologies. Recommendations include ensuring that the transportation network is truly multimodal and

integrated to serve all of the state's population. A multimodal transportation system will decrease congestion costs by offering all travelers efficient and economical travel options.

California Government Code Section 14036

This law requires Caltrans to produce a State Rail Plan that includes both passenger and freight rail components. The 2018 California State Rail Plan (Caltrans 2018) satisfies this requirement. It establishes a statewide vision and objectives, sets priorities, and develops policies and implementation strategies to enhance passenger and freight rail service in the public interest. It also details a long-range investment program for California's passenger and freight infrastructure.[1]

The Passenger Rail Element looks at intercity and commuter passenger rail services, operations, capital improvements, and service expansion. The Freight Rail Element provides information on the freight rail network, issues concerning the industry, and policy recommendations for the system's maintenance, preservation, improvement, and funding. The California State Rail Plan Vision Statement includes six goals (Caltrans 2018):

- Improve Multimodal Mobility and Accessibility for All People
- Preserve the Multimodal Transportation System
- Support a Vibrant Economy
- Improve Public Safety and Security
- Foster Livable and Healthy Communities and Promote Social Equity
- Practice Environmental Stewardship

Specific to the transportation RSA, the California State Rail Plan's Vision Statement includes HSR service from Bakersfield to Palmdale (Caltrans 2018).

Regional agencies have played an active role in planning and delivering highway projects since the late 1990s based on state law changes. Currently, passenger rail planning and delivery are undergoing similar changes, bringing the possibility of a more collaborative approach for passenger rail planning between state and local agencies, intercity and commuter rail agencies, and the Authority.

Coordinated transportation planning and interagency cooperation at the state and regional levels will provide a seamless interregional travel experience for California travelers. Per page 42 of the 2018 State Rail Plan, "the FRA has indicated that coordinated system- and project-level planning presented in state rail plans and service development plans will be linked to future funding for high-speed or conventional intercity passenger rail projects." Through a cohesive statewide plan, the State Rail Plan facilitates integration of regional rail investments with blended HSR service. Coordinated transportation improvement projects will benefit the state's transportation system by reducing VMT, reducing vehicle hours traveled (VHT), and shifting car and plane trips to trips by rail.

California Department of Transportation District System Planning

System planning is the long-range transportation planning process for Caltrans. The system planning process fulfills Caltrans' statutory responsibility as owner/operator of the state highway system by evaluating conditions and proposing enhancements to the state highway system. Through system planning, Caltrans focuses on developing an integrated multimodal transportation system that meets its goals of safety, mobility, delivery, stewardship, and service.

[1] Caltrans issued the *2018 State Rail Plan: Connecting California* in September 2018 (www.dot.ca.gov/californiarail/docs/CSRP_Final_rev121818.pdf).

The Caltrans District System Planning process consists primarily of four parts: the District System Management Plan (DSMP), the Transportation Concept Report (TCR), the Corridor System Management Plan (CSMP), and the DSMP Project List. The DSMP Project List is an appendix to the DSMP and provides a list of planned and partially programmed transportation projects used to recommend projects for funding. These system planning products are also intended as resources for stakeholders, the public, and partner regional and local agencies. The DSMP is a strategic policy and planning document that focuses on maintaining, opera ting, managing, and developing the transportation system.

Caltrans District System Planning

It is Caltrans' mission to provide a safe, sustainable, integrated, and efficient transportation system that enhances California's economy and livability.

The transportation resource study area extends into two Caltrans districts (Districts 6 and 7), which each have strategic policy and planning documents intended to be resources for stakeholders, the public, and partner regional and local agencies.

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. District 6 has developed TCRs for all of the state highway system facilities within its borders.

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 required 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. The only state highway in the Bakersfield to Palmdale Project Section corridor, State Route (SR) 58, has a CSMP for its entire length in District 6.

Two Caltrans District 7 facilities are in the Bakersfield to Palmdale Project Section RSA—SR 14 and SR 138. Both TCRs were competed in June 2014 and acknowledge HSR plans in their respective corridors. District 7 had both a DSMP and a Transportation System Development Program in progress as of May 2016 (2016 is the baseline year for this HSR project section).

Districts 6 and 7 also engage in Local Development-Intergovernmental Review with cities and counties in the respective district. The Local Development-Intergovernmental Review is a mandated, ongoing statewide effort focused primarily on avoiding, eliminating, or reducing to insignificance any potential adverse impacts of local development on the transportation system. Caltrans shares its expertise with other jurisdictions and assists them throughout their land use planning and decision-making processes, consistent with the requirements of NEPA, the California Environmental Quality Act (CEQA), the Streets and Highways Code, and numerous planning and zoning laws that affect stewardship of the state highway system. This program is directed to use "best practices" analysis methodologies that focus on: improving the person-capacity of the state's multimodal transportation system; efficiently moving goods and services; and accurately describing transportation tradeoffs with other community values. These values include a sound business economy with housing near employment; a healthy "climate-change-resilient" environment, and equally safe access for both motorized and nonvehicular transportation users.

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 VMT and greenhouse gas emissions. The California Legislature required the Governor's Office of Planning and Research to propose new criteria for determining the significance of transportation. The statute states that upon certification of the new criteria, automobile delay, as described solely by LOS or similar measures of vehicular

capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA, except in any locations specifically identified in the new criteria.

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

The Governor's Office of Planning and Research has provided a technical advisory on evaluating transportation impacts in CEQA (Governor's Office of Planning and Research 2019) and further information related to the change in the CEQA Guidelines in its 2018 Statement of Reasons supporting the guideline change (California Natural Resources Agency 2018), and related to LOS and VMT on its CEQA Update website (Governor's Office of Planning and Research 2019).

3.2.2.3 Regional and Local

Key regional and local regulatory frameworks that are most relevant to the proposed project are summarized below

Regional Transportation Plans and Programs

Region-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 (CMA). The regional entity that is responsible for CMA 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 purposes. CMAs are responsible for preparing metropolitan transportation plans, RTPs, and local transportation plans.

The passage of Proposition 111 in June 1990 increased the gas tax for the purpose of funding transportation-related improvements statewide. To be eligible for the revenues associated with Proposition 111, the Congestion Management Program (CMP) legislation (originally Assembly Bill 471, but amended by Assembly Bill 1791 and other subsequent legislation) required California's urbanized areas—areas with populations of 50,000 or more—to adopt a CMP.

The CMP addresses the impact of local growth on the regional transportation system. Statutory elements of the CMP include highway and roadway system monitoring, multimodal system performance analysis, a transportation demand management program, a land use analysis program, and local conformance for all county jurisdictions.

Table 3.2-1 describes the regional transportation plans and programs applicable to the HSR project.

Table 3.2-1 Regional Transportation Plans and Programs

Regional Plan/Program	Summary
Kern Council of Governments 2014 RTP/SCS[1]	The 2014 RTP/SCS establishes a set of regional transportation goals, policies, and actions intended to guide development of the planned multimodal transportation systems in Kern County. The RTP/SCS includes the following goals, policies, and objectives related to passenger rail. ▪ Create strategies to increase the visibility and importance of transit in Kern County. ▪ Monitor advancement of the California HSR Project. ▪ As the HSR project proceeds to construction: – Identify the preferred corridor to connect Bakersfield and Delano with commuter rail/HSR feeder service – Identify potential funding for commuter rail operations – Work with local transit providers to connect riders to commuter rail/HSR
Southern California Association of Governments 2016 RTP/SCS[2]	The RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The RTP/SCS strategy is to: ▪ Integrate land use planning with planning for transportation ▪ Provide neighborhoods with efficient and plentiful public transit as well as abundant and safe opportunities to engage in active transportation ▪ Preserve more of the remaining natural lands for people to enjoy
Kern Council of Governments 2014 CMP[1] Los Angeles County Metropolitan Transportation Authority 2010 CMP[3]	The CMPs include: ▪ A system of highways and roadways with minimum LOS performance measurements designated for highway segments and key roadway segments ▪ A performance element that includes performance measures to evaluate multimodal system performance ▪ A transportation demand management element that promotes alternative transportation strategies ▪ A land use analysis program to analyze the impacts of local land use decisions on the regional transportation network

[1] *Kern Council of Governments, 2014*
[2] *Southern California Association of Governments, 2016*
[3] *Los Angeles County Metropolitan Transportation Authority, 2010.*
CMP = Congestion Management Program
HSR = high-speed rail
LOS = level-of-service
RTP = Regional Transportation Plan
SCS = Sustainable Communities Strategy

Airport Master Plans

The commercial airport serving Bakersfield is Meadows Field Airport (BFL). BFL is owned by Kern County, and its master plan was last updated in 2006. In 2012, the Kern Council of Governments (Kern COG) prepared an Airport Land Use Compatibility Plan for all 14 publicly owned airports in Kern County (including BFL). For noise planning purposes, the Airport Land Use Compatibility Plan contains undated forecasts of 712 daily aircraft operations (takeoffs and landings) for BFL. The Kern Airport Land Use Compatibility Plan does not forecast passenger activity for BFL.

Public Transportation Plans

Public transportation agencies must adopt plans that guide future service and facilities development. Two such agencies operate within the RSA.

The Kern COG and transit operator Golden Empire Transit District (GET), the Bakersfield public transportation operator, have jointly prepared both short- and long-range plans for services in the

urban core of Kern County, known as Metropolitan Bakersfield. Both reference the Authority's plans for HSR and commit to realigning services to support operation of the HSR system.

The Antelope Valley Transit Authority's (AVTA) Comprehensive Long Range Plan notes the need to plan for HSR at several points. Although no capital funds are committed, on page 81, the plan states that "connection with the most populous areas of California via high-speed train service should further increase the need for local transit coverage…"

Transportation Plans, Policies, and Programs for Nonmotorized Transportation

Both regional and local governments adopt plans for nonmotorized transportation (i.e., bicyclists and pedestrians). These plans guide public investment in capital infrastructure and operational programs.

Kern County and the City of Bakersfield have adopted bicycle plans in 2012 and 2013, respectively. Neither the county nor the city bicycle plan mentions the HSR system.

The City of Tehachapi's Bicycle Master Plan shows a planned bike lane along Burnett Road. The proposed HSR alignment is located parallel to and just north of Burnett Road.

The City of Lancaster's Master Plan of Trails and Bikeways shows an existing Class II (on-street bike lane) facility along Sierra Highway in central Lancaster as well as a Class I (separated path) facility extending into Palmdale to the south. The B-P Build Alternative alignments run parallel to Sierra Highway.

The City of Palmdale is currently engaged in developing an active transportation plan, but this plan had not been adopted as of March 2018. This future plan is applicable to the transportation improvements associated with the proposed HSR alignments and the Palmdale Station.

Local Plans

Counties and cities must prepare general plans with transportation goals and policies. The transportation (or circulation) element of the local general 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 and a circulation diagram. General plans provide important context information for impact assessment. Applicable county and city plans and policies/objectives are shown in Table 3.2-2.

Table 3.2-2 Local Plans and Applicable Policies

Plan	Policy or Objective
Kern County General Plan (2007): Circulation Element	▪ Make certain that transportation facilities needed to support development are available and ensure that these facilities occur in a timely manner so as to avoid traffic degradation. ▪ Provide plans for circulation infrastructure in support of the county's Land Use, Open Space, and Conservation Element. ▪ Plan for transportation modes available to all segments of the population, including people with restricted mobility. ▪ Plan for a reduction of environmental effects without accepting a lower quality of life in the process.
Los Angeles County General Plan (2015): Mobility Element	▪ An efficient multimodal transportation system that serves the needs of all residents. ▪ Land use planning and transportation management that facilitates the use of transit.

Plan	Policy or Objective
City of Bakersfield Metropolitan General Plan (2007)	▪ Provide a safe and efficient street system that links all parts of the area for movement of people and goods. ▪ Provide safe and efficient motorized, nonmotorized, and pedestrian traffic movement. ▪ Develop and maintain a circulation system that supports the land use plan documented in the General Plan.
City of Tehachapi General Plan (2012): Mobility Element	▪ Enhance regional transportation access.
City of Lancaster General Plan (2009): Circulation Element	▪ No goals are directly applicable to the HSR project.
City of Palmdale General Plan (1993): Circulation Element	▪ Reduce the number of trips and VMT by individuals within the planning area to meet regional transportation and air quality goals. ▪ Encourage use of nonvehicular transportation throughout the planning area. ▪ Promote opportunities for rail services to move goods, passengers, and commuters into and out of the planning area.

Sources: County of Kern, 2007; County of Los Angeles, 2015; City of Bakersfield, 2007; City of Tehachapi, 2012; City of Lancaster, 2009; City of Palmdale, 1993
HSR = high-speed rail
VMT = vehicle miles traveled

3.2.3 Regional and Local Policy Analysis

The Council on Environmental Quality regulations and the Authority require the discussion of any inconsistency of a proposed action with regional or local plans and laws. Where inconsistencies or conflicts exist, the Council on Environmental Quality and the Authority require a description of the extent of reconciliation and the reason for proceeding if full reconciliation is not feasible (Code of Federal Regulations Title 40, Part 1506.2(d), and Title 64, Part 28545, 14(n)(15)). The CEQA Guidelines also require that an EIR discuss the inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans (CEQA Guidelines, Section 15125(d)).

The Bakersfield to Palmdale Project Section is an undertaking of the Authority in its capacity as a state agency and representative of a federal agency. It is not subject to local government jurisdictional issues of land use. Therefore, although the EIR/EIS describes the project section's consistency with local plans in order to provide a context for the project, any inconsistency with a local plan is not considered an environmental impact. The Regional and Local Policy Consistency table (Appendix 2-H) lists the transportation goals and policies applicable to the Bakersfield to Palmdale Project Section and notes the proposed project section's consistency with each.

The HSR project was found to be compatible with the goals and policies of local jurisdictions' transportation planning documents because it would: (1) provide an alternative to automobile transportation; (2) provide new transportation facilities to meet demand; (2) complete all approved and planned transportation improvements, including bike lanes and transportation facilities, where existing roads cross the proposed HSR alignment; (3) enhance rail service; and (4) support multimodal facilities.

3.2.4 Methods for Evaluating Impacts

The evaluation of impacts on transportation is a requirement of NEPA and CEQA. This section describes the sources and methods used to analyze potential impacts on transportation resources. These methods apply to both NEPA and CEQA unless otherwise indicated. Refer to Section 3.1.3.4, Methods for Evaluating Impacts, for a description of the general framework for

evaluating impacts under NEPA and CEQA. Refer to the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a) for more information regarding the methods and data sources used in this analysis, which is available upon request from the Authority at records@hsr.ca.gov.

The transportation impact analysis considered both direct and indirect impacts on transportation resources as defined below:

- Direct impacts of implementing the HSR project on transportation resources include temporary road closures and modifications, permanent road closures and modifications, and the resulting impacts on roadway LOS (for NEPA only) and VMT.
- Indirect impacts of implementing the HSR project on transportation resources include impacts to emergency access, property access, trip generation, VMT, transit services, or nonmotorized modes of travel on the regional transportation system.

The first subsection below describes the RSAs used to evaluate HSR project transportation impacts. The next several subsections describe the methods used to analyze impacts on transportation resources.

During the construction period, the B-P Build Alternatives were evaluated based on the potential that construction activities would substantially increase road hazards, result in incompatible uses, create hazards for pedestrians and bicyclists, or result in inadequate emergency access.

During operation, the assessment evaluated potential impacts on all modes of transportation. From north to south along the alignment, all roadway segments (paved and unpaved) that cross the project alignment were identified. Roadway segments were identified using existing aerial maps and field observations. The methods for evaluating roadway impacts involve: (1) identifying roadway facilities that could be impacted by the project; (2) establishing baselines and future years for evaluation of impacts; (3) applying operational standards to impacted facilities; and (4) identifying any needed improvements to meet specified operational standards. The methods for evaluating impacts to other modes of transportation (e.g., aviation, freight rail, transit, pedestrian, and bicycle) involve: (1) identifying direct or indirect project impacts to these facilities; and (2) determining consistency with adopted plans for these facilities, including future implementation of plans for other transportation modes.

Total VMT was derived from the statewide travel demand model estimate of 2040 daily VMT using medium and high ridership forecasts. Please refer to the *Further Background on Cambridge Systematics Explanation of Ridership Forecasts* memorandum (Authority 2020) and *California High-Speed Rail Environmental Analysis: Method for Forecasting Vehicle-Miles of Travel Reduction* (Cambridge Systematics, Inc. 2020) in Appendix 3.2-A for further details on the methodology for calculating VMT.

As summarized in Section 3.2.1, Introduction, seven other sections of this chapter provide additional information related to the assessment of transportation impacts.

3.2.4.1 Study Area for Analysis

The transportation RSA includes roadways that cross the project, roadways and intersections that would be modified as part of the project, roadways and intersections that would experience increased traffic as a result of the project, areas where new roadways or intersections would be constructed, and roadways and intersections that could be affected by the project due to additional traffic volumes. This includes bicycle and pedestrian facilities within the right-of-way of the affected roadway facilities and any bicycle and pedestrian facilities that are outside roadway right-of-way but would be modified as part of the project. Transit systems that use roadways modified by the project are also included. The RSA for these facilities is generally a 0.5-mile radius from the alignments and the stations. The transportation RSA is shown on Figure 3.2-1. This figure shows the RSA's geographical boundary and major highways in the vicinity.

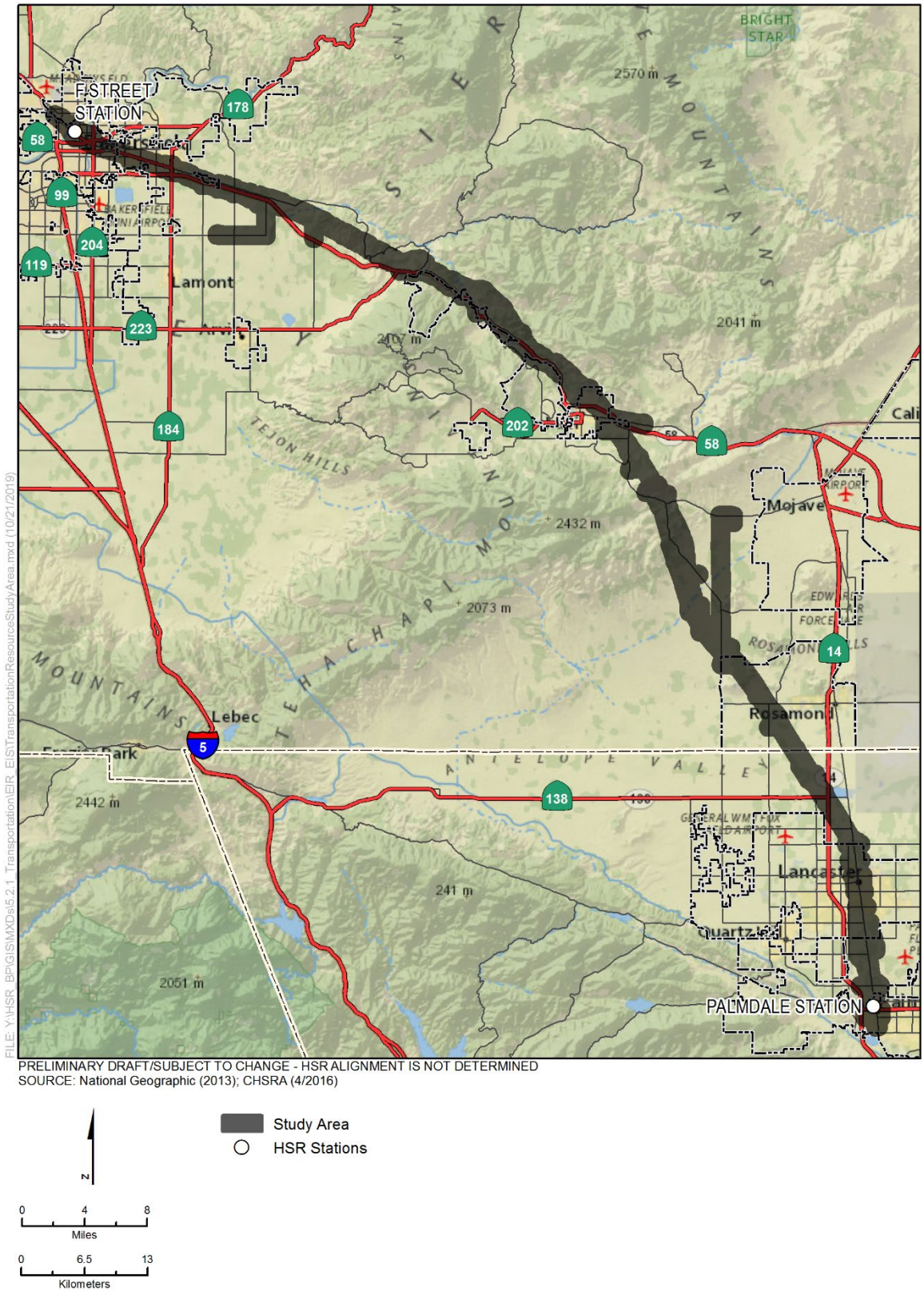

Figure 3.2-1 Transportation Resource Study Area

The RSA for transportation analysis for this project includes the following:

- Roadway segments that the project proposes to cross, including roadway segments that are proposed to be grade-separated and roadway segments that are proposed to be closed.
- Roadway segments and intersections where the project would be expected to cause an increase in traffic of 50 or more trips in the a.m. or p.m. peak hour. The value of 50 additional peak-hour trips was based on a similar value in the Caltrans *Guide for the Preparation of Traffic Impact Studies* (Caltrans 2002). In addition, in cases where the project proposes to close local roadway segments, consideration was given to roadway segments and intersections on alternate routes that would be used by traffic rerouted from the closed segments. These roadway segments and intersections were included in the transportation RSA if they would be expected to experience a traffic increase of 50 or more vehicles in the a.m. or p.m. peak hour as a result of the project.
- All major existing intersections that the project proposes to reconstruct.
- All major new intersections that the project proposes to create.
- Freeway off-ramps where the project would add 100 or more trips in the a.m. or p.m. peak hour (Los Angeles County Metropolitan Transportation Authority 2010).
- Freeway segments where the project would add 150 or more trips in the a.m. or p.m. peak hour (Los Angeles County Metropolitan Transportation Authority 2010).

Major intersections were defined as intersections where both the major street and the cross-street are classified as a collector roadway or a roadway of a category higher than collector.

3.2.4.2 Impact Avoidance and Minimization Features

The B-P Build Alternatives incorporate standardized HSR features to avoid and minimize impacts. These features are referred to as IAMFs. The Authority would incorporate these features during project design and implement them during construction, as relevant to the HSR project section, to avoid or reduce impacts. As such, the analysis of impacts of the B-P Build Alternatives factors in all applicable IAMFs. IAMFs applicable to transportation resources are listed below.

TR-IAMF#1: Protection of Public Roadways during Construction

Prior to Construction, the Contractor shall provide a photographic survey documenting the condition of the public roadways along truck routes providing access to the proposed project site. The photographic survey shall be submitted for approval to the agency responsible for road maintenance and the Authority. The Contractor shall be responsible for the repair of any structural damage to public roadways caused by HSR construction or construction access, returning any damaged sections to the equivalent of their original pre HSR construction structural condition or better. The Contractor shall survey the condition of the public roadways along truck routes providing access to the proposed project site after construction is complete. The Contractor shall complete a before- and after-survey report and submit it to the Authority for review, indicating the location and extent of any damage.

TR-IAMF#2: Construction Transportation Plan

The design-build contractor shall prepare a detailed Construction Transportation Plan (CTP) for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways in close consultation with the local jurisdiction having authority over the site. The Authority must review and approve the CTP before the Contractor commences any construction activities. This plan would address, in detail, the activities to be carried out in each construction phase, with the requirement of maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the routing and scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The CTP would provide traffic controls pursuant to the *California Manual on Uniform Traffic Control Devices* sections on

temporary traffic controls (Caltrans 2012) and would include a traffic control plan that includes, at a minimum, the following elements:

- Temporary signage to alert drivers and pedestrians to the construction zone.
- Flag persons or other methods of traffic control.
- Traffic speed limitations in the construction zone.
- Temporary road closures and provisions for alternative access during the closure.
- Detour provisions for temporary road closures—alternating one-way traffic would be considered as an alternative to temporary closures where practicable and where it would result in better traffic flow than would a detour.
- Identified routes for construction traffic.
- Provisions for safe pedestrian and bicycle passage or convenient detour.
- Provisions to minimize access disruption to residents, businesses, customers, delivery vehicles, and buses to the extent practicable—where road closures are required during construction, limit to the hours that are least disruptive to access for the adjacent land uses.
- Provisions for farm equipment access.
- Provisions for 24-hour access by emergency vehicles.
- Safe vehicular and pedestrian access to local businesses and residences during construction. The plan would provide for scheduled transit access where construction would otherwise impede such access. Where an existing bus stop is within the work zone, the design-builder would provide a temporary bus stop at a safe and convenient location away from where construction is occurring in close coordination with the transit operator. Adequate measures would be taken to separate students and parents walking to and from the temporary bus stop from the construction zone.
- Advance notification to the local school district of construction activities and rigorously maintained traffic control at all school bus loading zones, to provide for the safety of schoolchildren. Review existing or planned Safe Routes to Schools with school districts and emergency responders to incorporate roadway modifications that maintain existing traffic patterns and fulfill response route and access needs during project construction and HSR operations.
- Identification and assessment of the potential safety risks of project construction to children, especially in areas where the project is located near homes, schools, day care centers, and parks.
- Promotion of child safety within and near the project area. For example, crossing guards could be provided in areas where construction activities are located near schools, day care centers, and parks.

CTPs would consider and account for the potential for overlapping construction projects.

TR-IAMF#3: Off-Street Parking for Construction-Related Vehicles

The Contractor shall identify adequate off-street parking for all construction-related vehicles throughout the construction period to minimize impacts to public on-street parking areas. If adequate parking cannot be provided on the construction sites, the Contractor shall designate a remote parking area and arrange for the use a shuttle bus to transfer construction workers to/from the job site. This measure shall be addressed in the CTP.

TR-IAMF#4: Maintenance of Pedestrian Access

The Contractor shall prepare specific construction management plans to address maintenance of pedestrian access during the construction period. Actions that limit pedestrian access would include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or

pedestrian rerouting at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions that may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, provide covered walkways and fencing. The plan objective shall be to maintain pedestrian access where feasible (i.e., meeting design, safety, Americans with Disabilities Act (ADA) requirements). This measure shall be addressed in the CTP.

TR-IAMF#5: Maintenance of Bicycle Access

The Contractor shall prepare specific construction management plans to address maintenance of bicycle access during the construction period. Actions that limit bicycle access would include, but not be limited to, bike lane closures or narrowing, closure or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists during the construction period. Maintain bicycle access where feasible (i.e., meeting design, safety, ADA requirements). This measure shall be addressed in the CTP.

TR-IAMF#6: Restriction on Construction Hours

The Contractor shall limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays to minimize impacts to traffic on roadways. The contractor shall limit the number of construction employees arriving or departing the site between the hours of 7 a.m. and 8:30 a.m. and 4:30 p.m. and 6 p.m. Areas where these restrictions would be implemented would be determined as part of the CTP. Based on Authority review of the CTP the restricted hours maybe altered due to local travel patterns.

TR-IAMF#7: Construction Truck Routes

The Contractor shall deliver all construction-related equipment and materials on the appropriate truck routes and shall prohibit heavy-construction vehicles from using alternative routes to get to the site. Truck routes would be established away from schools, day care centers, and residences, or along routes with the least impact if the Authority determines those areas are unavoidable. This measure shall be addressed in the CTP.

TR-IAMF#8: Construction during Special Events

The Contractor shall provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that substantially (10 percent or more) increase traffic on roadways affect by project construction. Mechanisms include the presence of police officers directing traffic, special-event parking, use of within-the-curb parking, or shoulder lanes for through-traffic and traffic cones. This measure shall be addressed in the CTP.

TR-IAMF#9: Protection of Freight and Passenger Rail during Construction

The Contractor shall repair any structural damage to freight or public railways that may occur during the construction period, and return any damaged sections to their original structural condition. If necessary, during construction, a “shoofly” track would be constructed to allow existing train lines to bypass any areas closed for construction activities. Upon completion, tracks would be opened and repaired; or new mainline track would be constructed, and the “shoofly” would be removed. Contractor repair responsibility would be included in the design/build contract.

TR-IAMF#11: Maintenance of Transit Access

The Contractor shall prepare specific construction management plans to address maintenance of transit access during the construction period. Actions that limit transit access would include, but not be limited to, roadway lane closures or narrowing, closure or narrowing of streets that are designated transit routes, bus stop closures, bridge closures, placement of construction-related materials within designated transit lanes, bus stop or layover zones or along transit routes, and other actions that may affect the mobility or safety of bus transit during the construction period. Maintain transit access where feasible (i.e., meeting design, safety, ADA requirements). This measure shall be addressed in the CTP.

TR-IAMF#12: Pedestrian and Bicycle Safety

Prior to construction, the Contractor shall provide a technical memorandum describing how pedestrian and bicycle accessibility would be provided and supported across the HSR corridor, to and from stations and on station property. Priority of safety for pedestrians and bicycles and vulnerable populations over motor vehicle access would be done in a way so as to encourage maximum potential access from non-motorized modes. Local access programs, such as Safe Routes to Schools, shall be maintained or enhanced. Access to community facilities for vulnerable populations shall be maintained or enhanced.

3.2.4.3 Study Assumptions and Baselines for Transportation Impact Analysis

The framework for the analysis of potential transportation impacts considered the following scenarios:

- Existing (2016) No Project
- Existing (2016) Plus Construction
- Future Year (2040) No Project
- Future Year (2040) Plus Project

The data and qualitative information presented as the Existing (2016) No Project scenario represents the baseline from which future changes were measured during construction and operation. The information presented used the most current data available at the time the analysis was conducted. The Existing (2016) Plus Construction scenario reflects estimated impacts on transportation just prior to the start of operation of the Bakersfield to Palmdale Project Section without consideration of anticipated changes to traffic volumes and planned construction of transportation improvements by others. For this HSR project section, the Existing (2016) Plus Construction scenario includes construction of the HSR system but does not include trips to HSR stations that would occur after the start of operation of the B-P Build Alternatives. The Future Year (2040) No Project analysis presents future conditions based on current forecasts for long-term increases in traffic congestion and planned construction of new transportation infrastructure. This scenario assumes the HSR project section would not be constructed. The Future Year (2040) Plus Project analysis considers changes caused by the HSR project section and assumes completion of Phase 1 of the HSR system. At that time, the HSR system network would extend from Los Angeles to San Francisco. This assumption is consistent with the Authority's 2016 Business Plan (Authority 2016), which forms the basis for operational assumptions for HSR train frequency and ridership regarding the HSR project section.

The framework for the analysis for the Bakersfield Station area, however, is somewhat different. This area encompasses the Fresno to Bakersfield Locally Generated Alternative (F-B LGA) alignment from the intersection of 34th Street and L Street to Oswell Street portion of the Bakersfield to Palmdale Project Section. The transportation impacts for this subsection were analyzed as part of the Fresno to Bakersfield Project Section documents (including the Fresno to Bakersfield Section Draft Supplemental EIR/EIS and Final Supplemental EIR [Authority and FRA 2017a; Authority 2018b]) and the results are incorporated into this Draft EIR/EIS. The Existing (2014) Plus Project scenario includes the trips associated with the Bakersfield Station area. Because that analysis was conducted several years ago, the existing and future conditions analysis was for 2014 and 2035, respectively. However, the results and conclusions of the transportation analysis for the Bakersfield Station area are considered to be valid based on the 2014 existing and 2035 horizon years, and the results and conclusions for the remainder of the project section south of Oswell Street are considered to be valid based on the 2016 existing conditions and 2040 horizon years.

As described in Chapter 2, the planned construction of the Bakersfield to Palmdale Project Section is assumed to occur between 2020 and 2026. These dates are used in all impact analyses in this Draft EIR/EIS. However, the schedule for construction of the project section has been extended. Despite this shift in the construction period, the framework for the analysis of transportation impacts remains a valid approach to assess the types and magnitudes of changes.

Depending on the analysis for a specific impact, assumptions also needed to be made regarding HSR system ridership. For planning purposes, the Authority has evaluated medium and high ridership growth forecasts for operation of the HSR system between the start of operation and 2040. The analysis for changes in VMT on the regional highway system was conducted for both the high ridership forecast (56.8 million in 2040) and the medium ridership forecast (42.8 million in 2040) to show the potential range of outcomes. In contrast, the analysis of impacts on the local roadway network from increased trip generation was based only on the high ridership forecast to conservatively present adverse impacts. The opening year of HSR operations, which is anticipated to have a lower level of ridership, is also considered.

3.2.4.4 Palmdale Station

As part of the analysis developed for the preparation of this Draft EIR/EIS, the Authority developed daily boarding forecasts for the entire HSR system, including each station, for the 2029 and 2040 analysis years. The annual and daily boardings for the Palmdale Station are provided in Table 6-24 of the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a). The Authority determined boardings would be evenly distributed among each hour within the peak service times and would be the same for both the weekday roadway a.m. and p.m. peak hours. In addition, ridership values were projected to be equal to the number of station boardings times two[2] and rounded to ensure an equal number per day. Using these boarding and alighting values, the daily and peak-hour ingress/egress trips were estimated. These also account for overnight and short-term stays.

As discussed in Section 6.4.2.2 of the *Bakersfield to Palmdale Project Section Transportation Technical Report*, the daily boardings and alightings were disaggregated into the following modes of travel:

- Drop-off/pick-up
- Drive and park vehicle
- Rental car
- Taxi
- Transit/shuttle (includes transit-to-train and train-to-train transfers)
- Bike/walk

The forecast daily boardings for the Palmdale Station are the basis for assumed patron trips to and from the HSR station and therefore determine the potential impacts to local and regional roadways, transit systems, and nonmotorized transportation evaluated in Section 3.2.6.3. The 2016 B-P Build Alternatives scenario does not include the trips associated with the Palmdale Station.

3.2.4.5 Roadways and Intersections Analysis

Volume-to-Capacity

Volume-to-capacity is the ratio of the volume of traffic using the facility to the capacity of the facility (volume-to-capacity ratio, or V/C).

The primary unit of measure for describing the operating quality of a highway or roadway is LOS. In general, LOS is measured by the ratio of volume of traffic using the facility to the capacity of the facility (i.e., volume-to-capacity ratio, or V/C). The Highway Capacity Manual (HCM) is a recognized source for the techniques used to measure transportation facility performance. The 2010 version of the HCM (Transportation Research Board 2011) was used for the analysis of the project.

As discussed in Section 3.2.2.2, California is no longer using automobile delay as a measure of transportation impacts under CEQA. The LOS consequences caused by the project may nevertheless be relevant for consideration of other transportation-related environmental effects, including impacts on transit and nonmotorized travel, emergency vehicle access, air quality and

[2] In the forecasts, a "boarding" occurs when a traveler uses the HSR system to go to a destination. Each boarding represents two HSR trips, the outbound trip and then the return (alighting) trip, which is also assumed to be on HSR.

greenhouse gas, and noise. The LOS consequences are therefore presented in the transportation section and referenced in other parts of the EIR/EIS where appropriate.

LOS criteria for identifying effects on signalized intersections, unsignalized intersections, and roadway segments under NEPA are described in the following subsections.

Roadway Levels-of-Service

Using the HCM procedures, the quality of traffic operations is graded into one of six LOS designations. The LOS indicators for the roadway system are based on the actual volume of traffic along designated sections of roadway during a typical peak hour and the attainable vehicular capacity of that segment. The capacity of a roadway is determined by the number of lanes and the facility type. The peak-hour capacities by roadway type used in this analysis vary by region.

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. The lower the V/C ratio, the better the traffic flows, because there is a greater capacity when compared to traffic volume. LOS A identifies the best operating conditions along a section of roadway and is characterized by free-flow traffic, low volumes, and few 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 3.2-3 defines and describes the LOS criteria for the roadway segment analysis by LOS letter, volume-to-capacity ratio, and written definition.

Table 3.2-3 Level-of-Service, Average Vehicular Delay, and Volume-to-Capacity Definition 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 the 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.

Source: California High-Speed Rail Authority, 2018

Traffic Operational Standards

The operating quality of a highway or roadway is also evaluated by the average control delay experienced by vehicles on the facility. This is the delay to traffic on roadways that have signalized and unsignalized intersections. Techniques in the 2010 version of the HCM were used to evaluate the operational quality of roadway intersections within the RSA and resulted in LOS ratings for the intersections.

If not properly adjusted, the operation of a signalized roadway may be determined more by the delays caused by the traffic signal than by traffic volumes and roadway capacity. The average delay per vehicle and LOS rating for signalized intersections are defined in Table 3.2-4 by the delay (number of seconds per vehicle) and volume-to-capacity ratio. Part of the evaluation of signalized intersections is whether or not the queues of vehicles in the roadway traffic lanes are cleared through each cycle of the traffic signal.

Table 3.2-4 Level-of-Service and Average Control Delay for Signalized Intersections

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

Source: Transportation Research Board, 2010
For approach-based and intersection-wide assessments, LOS is defined solely by control delay.
LOS = level-of-service

The operation of an unsignalized roadway is similarly evaluated and rated based on traffic delay at stop signs. The LOS and delay parameters (number of seconds per vehicle and volume-to-capacity ratio) for unsignalized intersections are listed in Table 3.2-5. Unsignalized intersections indicating an LOS of E or F were checked to determine their status with respect to traffic signal warrants as published in the *California Manual on Uniform Traffic Control Devices* (Caltrans 2014). Signal warrants are defined criteria used to evaluate whether or not the unsignalized intersection could operate at a higher LOS rating if a traffic signal were installed. The *California Manual on Uniform Traffic Control Devices* notes, "Since vehicular delay and the frequency of some types of crashes are sometimes greater under traffic signal control than under STOP sign control, consideration should be given to providing alternatives to traffic control signals even if one or more of the signal warrants has been satisfied." It further states that "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal."

Table 3.2-5 Level-of-Service and Average Control Delay for Unsignalized Intersections

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

Source: Transportation Research Board, 2010
The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major street approaches or for the intersection as a whole.
LOS = level-of-service V/C = volume-to-capacity

In cases where an unsignalized intersection did not meet the peak-hour signal warrant, an increase in traffic caused by the HSR project was not considered a significant impact regardless of the LOS result. When traffic levels are low enough that a signal warrant is not met, traffic signals are generally not installed due to overall intersection delay and safety considerations. Since traffic engineers would typically not support the installation of a traffic signal when signal warrants are not met, this is also considered to indicate that any delay or LOS degradation that would occur would not cause a significant or adverse environmental impact. Locations where an LOS of E or F was indicated without meeting the peak-hour warrant are noted in the intersection capacity analysis tables.

Freeway Mainline Level of Service

Like highway and roadway evaluations of operating quality, the LOS indicators for freeway segments also are based on: (1) the volume of traffic for designated sections of the freeway during a typical peak hour, and (2) the practical vehicular capacity of that segment (i.e., V/C). LOS A identifies the best operating conditions along a section of freeway and is characterized by free-flow traffic, low volumes, and little or no restriction on maneuverability. LOS F characterizes forced traffic flow with high traffic densities, slow travel speeds, and often stop-and-go conditions.

As mentioned above, the freeway traffic volume is based on actual traffic counts, but the peak-hour capacity of a freeway is determined by speed, the number of lanes, and the type of lanes. The capacities and posted speed, by freeway lane type, used in this analysis are shown in Table 3.2-6. Table 3.2-7 defines and describes the LOS criteria (letters A–F and volume-to-capacity ratio) for the freeway segment analysis.

Table 3.2-6 Freeway Segment Peak-Hour Capacity

Posted Speed (miles per hour)	Freeway Capacity General-Purpose Lane
55 and below	1,900
60 and 65	2,000
70 and above	2,100

Source: Southern California Association of Governments, 2012

Table 3.2-7 Level-of-Service and Volume-to-Capacity Ratio Definition for Freeway Segments

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

Source: Los Angeles County Metropolitan Transportation Authority, 2010

Freeway Off-Ramp Queuing

Ramp queueing analysis at freeway off-ramps was conducted to determine if increases in traffic volumes on freeways would cause vehicle queue backups from the ramp termini intersection that could affect freeway mainline flow (i.e., would extend back to the freeway mainline, impeding freeway through traffic). The 95th percentile queue is defined as the queue length (in vehicles) that has only a 5 percent probability of being exceeded during the analysis time period. It is a

useful parameter for evaluating the adequacy of the ramp storage capacity. The Synchro 9.0 software package was used to determine queueing at ramp termini intersections.

3.2.4.6 Method for Evaluating Impacts under NEPA

Pursuant to the Council on Environmental Quality NEPA regulations (Code of Federal Regulations Title 40, Parts 1500–1508), project effects are evaluated based on the criteria of context, intensity, and duration (short- and long-term) along with implementation of mitigation measures to determine whether or not there are impacts. Context means 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. When there is no measurable effect, an impact is found not to occur. An impact would be identified and described according to the intensity of the impacts caused by the project after consideration of mitigation measures. Context and intensity are considered together when evaluating effects under NEPA. The effectiveness of measures to avoid, minimize, and/or mitigate impacts is considered in making significance determinations under NEPA. Beneficial effects also are identified and described.

In addition, the Authority identified criteria to be used for the identification of adverse NEPA effects in evaluating operations-related effects on the roadway network, as follows:

- For freeway segments, if the Plus Project conditions would have an LOS of E or F and the project would result in an increase in V/C ratio of 0.04 (4 percent increase) or more over the baseline condition (V/C = 1.00 is equivalent to a facility operating at capacity).
- For signalized intersections, if the Plus Project conditions would have an LOS E or F and the project would result in an increase in average traffic delay of 4 seconds or more over the baseline condition.
- For unsignalized intersections, if the Plus Project conditions would have an LOS E or F and the project would result in an increase in traffic delay of 5 seconds or more (measured as average delay for all-way-stop or worst-movement delay for side-street-stop intersections), and if the intersection satisfies one or more traffic signal warrants for at least 1 hour of the day. Five seconds of delay is the criteria increase for unsignalized intersections (rather than the 4 seconds used for signalized intersections) because it only applies to a single movement.
- For freeway off-ramp analysis, the impact criteria are based on the 95th percentile queue. An impact is considered substantial if the queue exceeds provided capacity (i.e., at least 5 percent of the time the queue length would be longer than the available storage distance of the off-ramp and thus would extend back to the freeway mainline).

3.2.4.7 Method for Determining Significance under CEQA

CEQA requires that an EIR identify the significant environmental impacts of a project (CEQA Guidelines, Section 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, the term “significant” is used only to determine whether an EIS will be required; NEPA requires that an EIS be prepared when the proposed federal action (project) as a whole has the potential to “significantly affect the quality of the human environment.”

Based on the CEQA Guidelines, the project would have a significant transportation impact if conditions change as described below. These changes involve both the construction and operational phases of the project.

Construction Phase

The project would have a significant effect on the environment if it were to do either of the following:

- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access

Temporary construction delays are considered in implementation of a project in order to minimize inconvenience caused by project-related construction activities. Part of the requirement of a Construction Traffic Management Plan is to monitor and update detour plans such that lanes and signage can be adjusted to avoid or minimize extended delays in any one area.

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 with CEQA Guidelines Section 15064.3, Subdivision (b)

The project also could have a significant effect on the environment if it would do the following:

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities related to the safety or security of such facilities (please refer to Section 3.2.3 above, Section 3.11.2.3, and Appendix 2-H for a consistency analysis with adopted policies, plans, or programs related to safety and security of transportation modes)
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access

3.2.5 Affected Environment

This section describes the affected environment related to transportation. The greatest potential for project-related transportation impacts is associated with traffic around HSR stations.

3.2.5.1 Regional Transportation System

The network of regional and local roads in the project vicinity provides mobility within and between local areas. Most travel occurs through a network of interdependent roadways, with each roadway segment moving traffic through the system toward destinations. Functional classification is the process by which streets and roadways are grouped into classes, or systems, according to the type of service they are intended to provide. Fundamental to this process is the recognition that individual streets and roadways do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads. The following are general descriptions of the roadway types in the transportation RSA:

- **Freeways**—High-speed roadways intended for through traffic with no at-grade crossings and access provided only at grade-separated interchanges.
- **Expressways**—High-speed, two- to six-lane divided roadways, primarily servicing through and cross-town traffic, with no direct access to abutting property and at-grade intersections located at approximately 0.5-mile intervals.
- **Arterials**—Four-to six-lane divided roadways with the primary purpose of moving traffic to and from major traffic generators, between community plan areas, and to and from freeways and expressways. Access can typically be limited to signalized driveways and right-turn entrance and exit vehicular movements.

- **Collectors**—Two- to four-lane undivided roadways with the primary function of connecting local streets and arterials and neighborhood traffic generators, and providing access to abutting properties.
- **Local Streets**—Two- to three-lane public or private roadways designed to provide direct access to properties while discouraging through traffic between major streets. They are intended to carry low volumes of traffic and often support unrestricted on-street parking.

3.2.5.2 Existing Major Roadways

Streets and highways provide opportunities for most modes of transportation, including walking, biking, personal vehicles, public transit buses, and heavy freight trucks. They are the most utilized infrastructure in the transportation network and can most easily adapt to changing needs. Existing roadways within the transportation RSA, which are major components of the roadway network, are discussed below.

Major State Routes

As noted previously, state routes are roadway facilities maintained by Caltrans. Below is a list of state routes within the project vicinity. These routes are shown on Figure 3.2-1.

- **SR 58**—SR 58 is a 234-mile highway that traverses the Coastal Ranges, the San Joaquin Valley, the Tehachapi Mountains, and the High Desert. It is a high-volume, interregional east-west route. As a major route in the most productive agricultural region in the world, SR 58 is critical to the economic vitality of the state. It provides significant goods/freight movement connections between Interstate (I) 5 and SR 99 in the Central Valley. SR 58 also links to other important goods movement connections nationwide, such as SR 14, I-15, I-40, and U.S. Route (US) 395. The terrain of SR 58 is generally flat. However, other topographic features include high plains, rolling hills, mountains, and desert in the southern Kern County portion. SR 58 has average annual daily traffic (AADT) ranging from 300 to 76,000, with trucks constituting up to 38 percent of the traffic volume. According to Caltrans' TCR, SR 58 carries between 29,000 and 43,000 daily trips in the project vicinity.
- **SR 184**—SR 184 is a 14-mile highway solely within Caltrans District 6 and Kern County. SR 184 connects SR 223 to SR 178 and provides a north/south corridor for eastern Bakersfield. The southern part of the route is more rural in nature and connects the less urbanized areas with the Bakersfield metropolitan area. It also connects the southern San Joaquin Valley to recreation areas like Lake Isabella, Bodfish, Kernville, and Ridgecrest via SR 178. SR 184 has an AADT ranging from 5,000 to 19,000, with trucks constituting up to 20 percent of the traffic volume.
- **SR 223**—SR 223 is a 30-mile highway entirely in Kern County. SR 223 is an important east/west corridor link south of the fast-growing Bakersfield area. This route primarily provides access to and from the agricultural endeavors that occur along the corridor. SR 223 begins at I-5 and terminates at SR 58 in Kern County. It consists mainly of a two-lane highway facility with a portion consisting of four lanes. SR 223 has an AADT ranging from 2,000 to 9,000, with trucks constituting up to 30 percent of the traffic volume.
- **SR 202**—SR 202 provides commuter, local, commercial, and residential travelers with access to/from SR 58, the City of Tehachapi, and the California Correctional Institution. The facility is approximately 8.5 miles in length and has an AADT ranging from 12,000 to 22,000.
- **SR 14**—SR 14 is a combination four-lane freeway, two- and four-lane conventional highway, and two- and four-lane expressway. Throughout Kern County, it is functionally classified as a Freeway and Principal Arterial. This route is part of the Interregional Road System and, combined with US-395, connects Southern California to the eastern Sierra Nevada and western Nevada. The facility is approximately 116 miles in length and has an AADT ranging from 4,000 to 22,000, with trucks and recreational vehicles constituting up to 19 percent of the traffic volume.

- **SR 138**—SR 138 is an east-west state route that traverses northern Los Angeles County. It is used for interstate, interregional, and intraregional travel and shipping through a rural corridor, serving the northern Los Angeles County area. The route also serves as an interregional connector between the San Joaquin Valley and the Inland Empire.

Regionally Significant Roadways

Regionally significant roadways are state routes or local facilities that serve regional transportation needs, such as activity centers in the region, transportation terminals, sports complexes, major planned developments, or access to and from the area outside of the region. These roadways would typically be included in the modeling of a metropolitan area's transportation network, including principal arterial highways. Table 3.2-8 identifies regionally significant roadways with number of lanes and AADT within the project vicinity in addition to the state route facilities identified above. These roadways are shown on Figure 3.2-2 (Sheets 1 through 9). In addition to regionally significant roadways, Figure 3.2-2 shows regional truck routes and existing rail lines, as well as the RSA.

Table 3.2-8 Regionally Significant Roadways within the Resource Study Area

Regionally Significant Roadways	Number of Lanes	AADT
Oswell Street	4	22,000
Edison Highway	4	9,000
Fairfax Road	4	17,000
Brundage Lane	2	2,000
Edison Road	2	3,000
Comanche Drive	2	5,000
Tejon Highway	2	1,000
Tehachapi Boulevard	2	4,000
Tehachapi Willow Springs Road	2	4,000
Rosamond Boulevard	2	2,000
Avenue A	2	2,000
Avenue D	2	5,000
Avenue G	2	6,000
Sierra Highway	2 to 4	4,000 to 28,000
Avenue H	6	10,000
Avenue I	4 to 6	20,000
Lancaster Boulevard	4	9,000
Avenue J	6	28,000
Avenue K	6	36,000
Avenue L	6	30,000
Columbia Way/Avenue M	4	23,000
Avenue N	2	6,000
Avenue O	2	6,000

Source: California High-Speed Rail Authority, 2016
The roadways listed in this table are generally listed north to south along the Bakersfield to Palmdale Project Section corridor.
AADT = annual average daily traffic

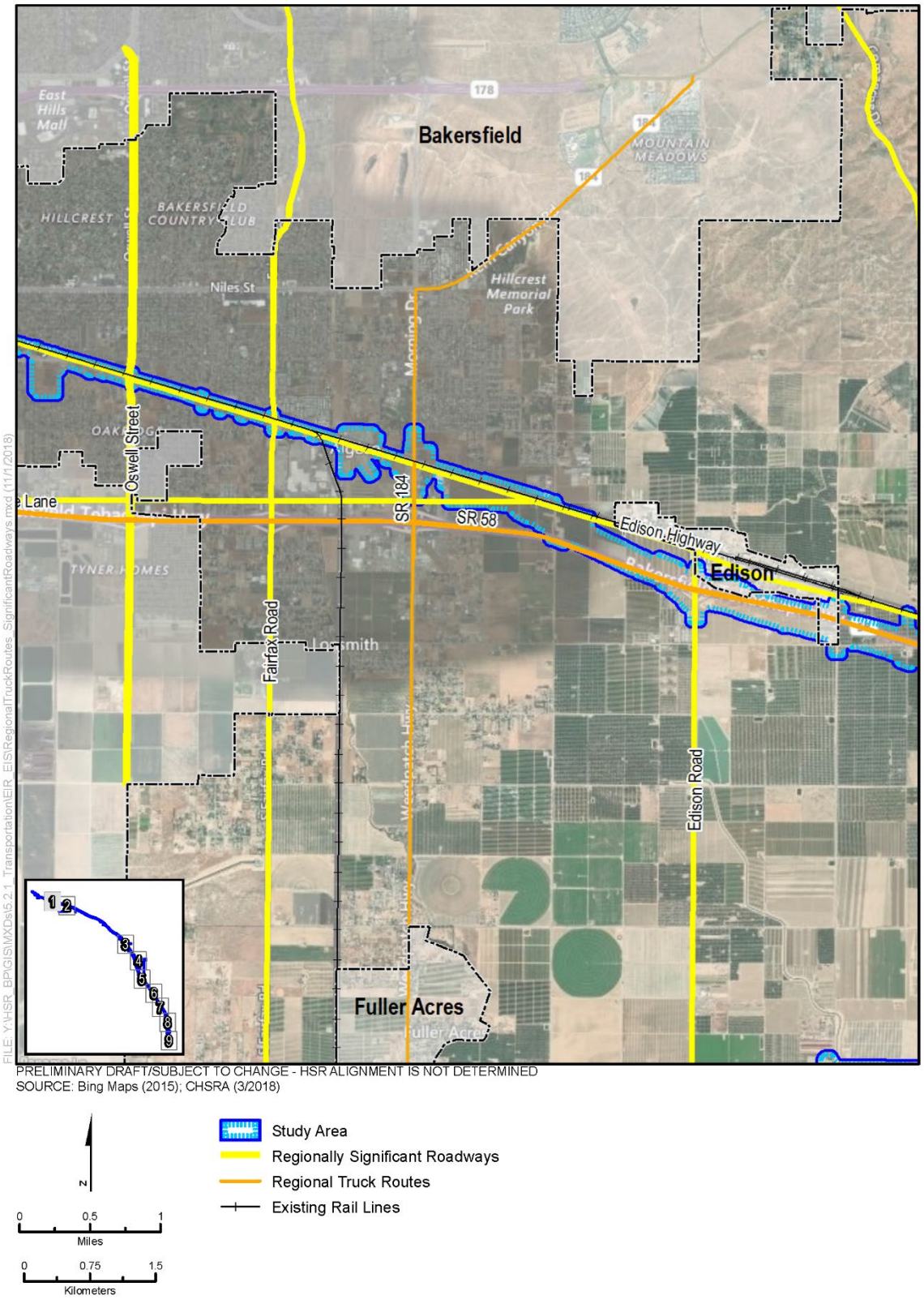

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 1 of 9)

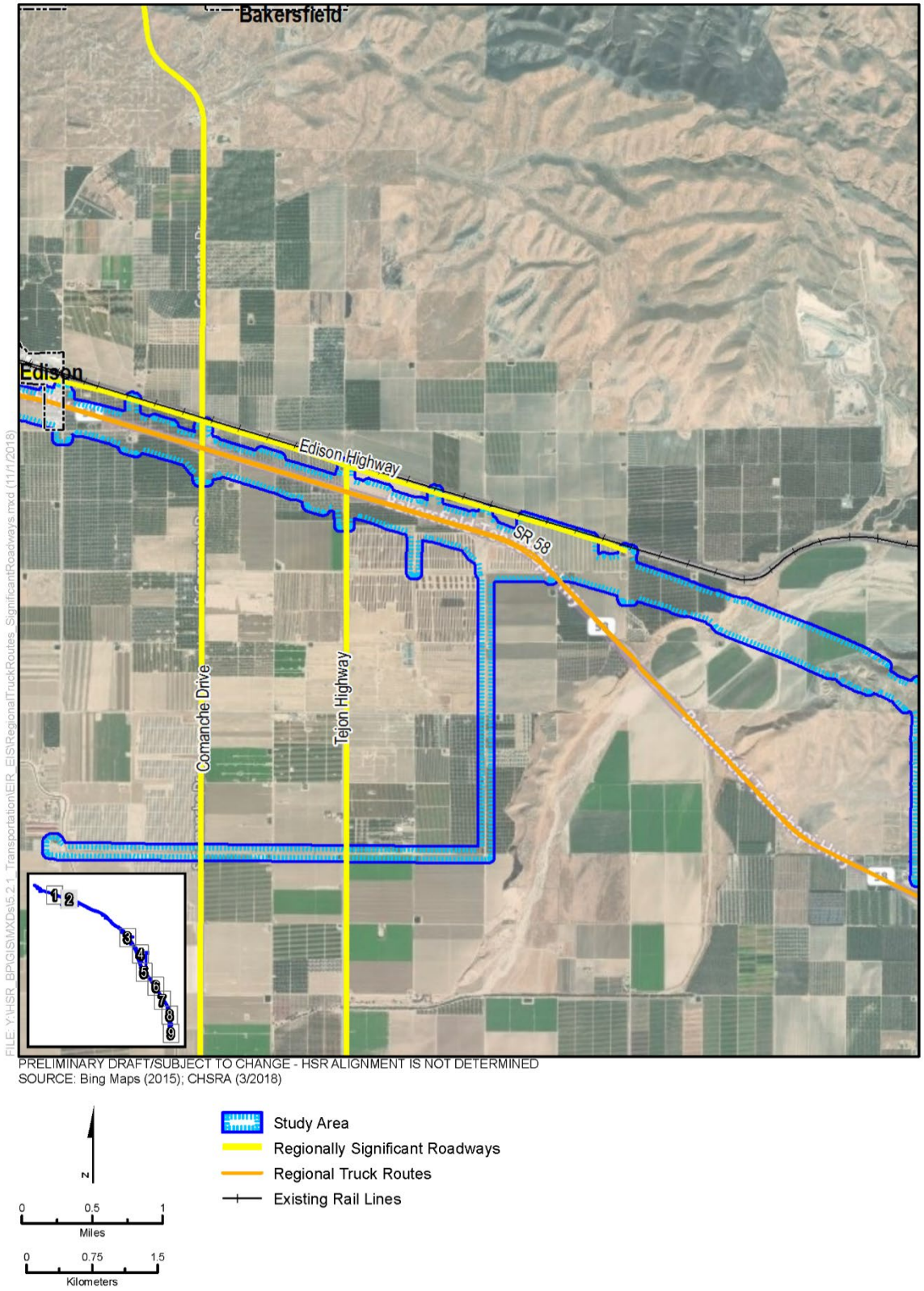

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 2 of 9)

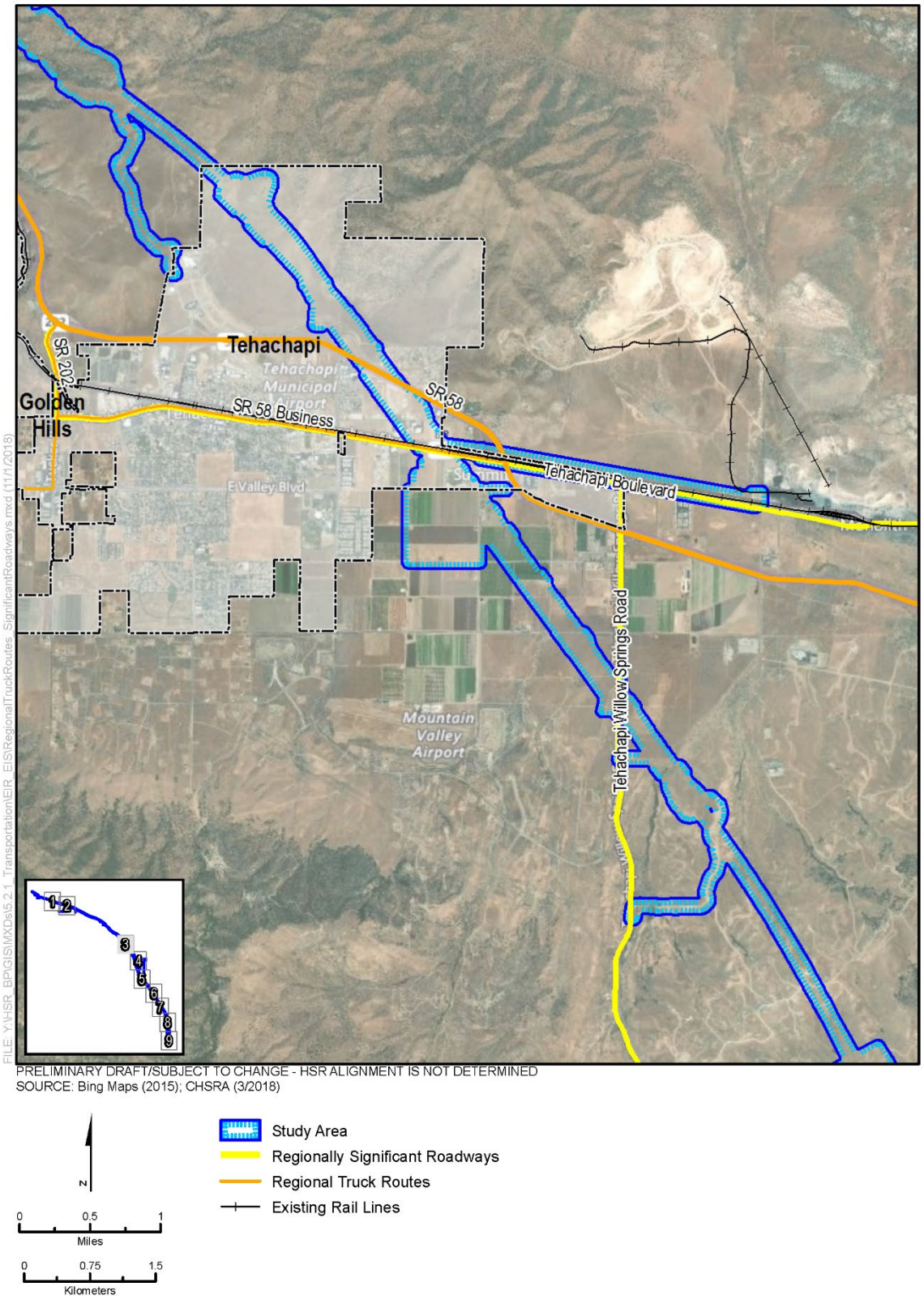

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 3 of 9)

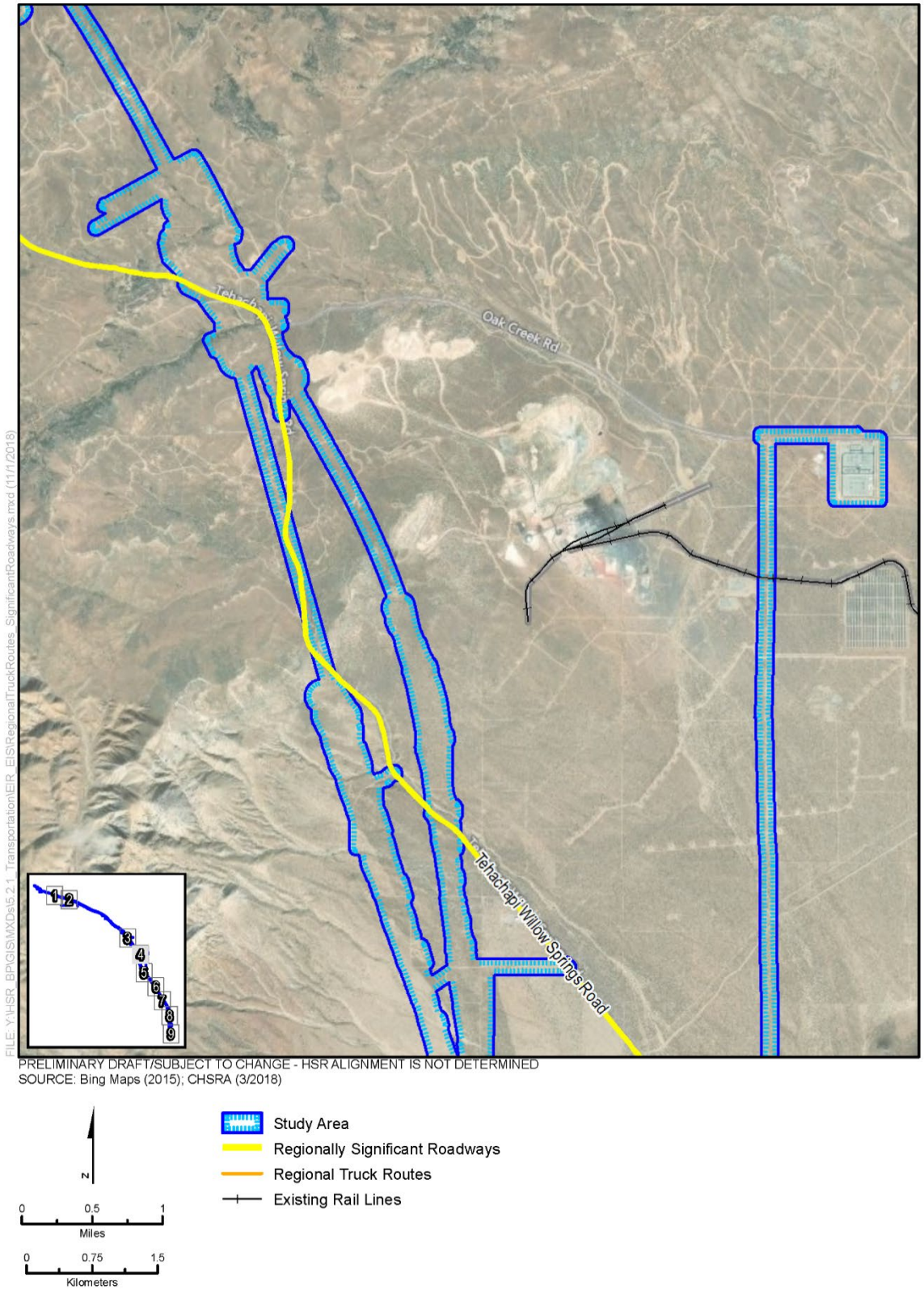

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 4 of 9)

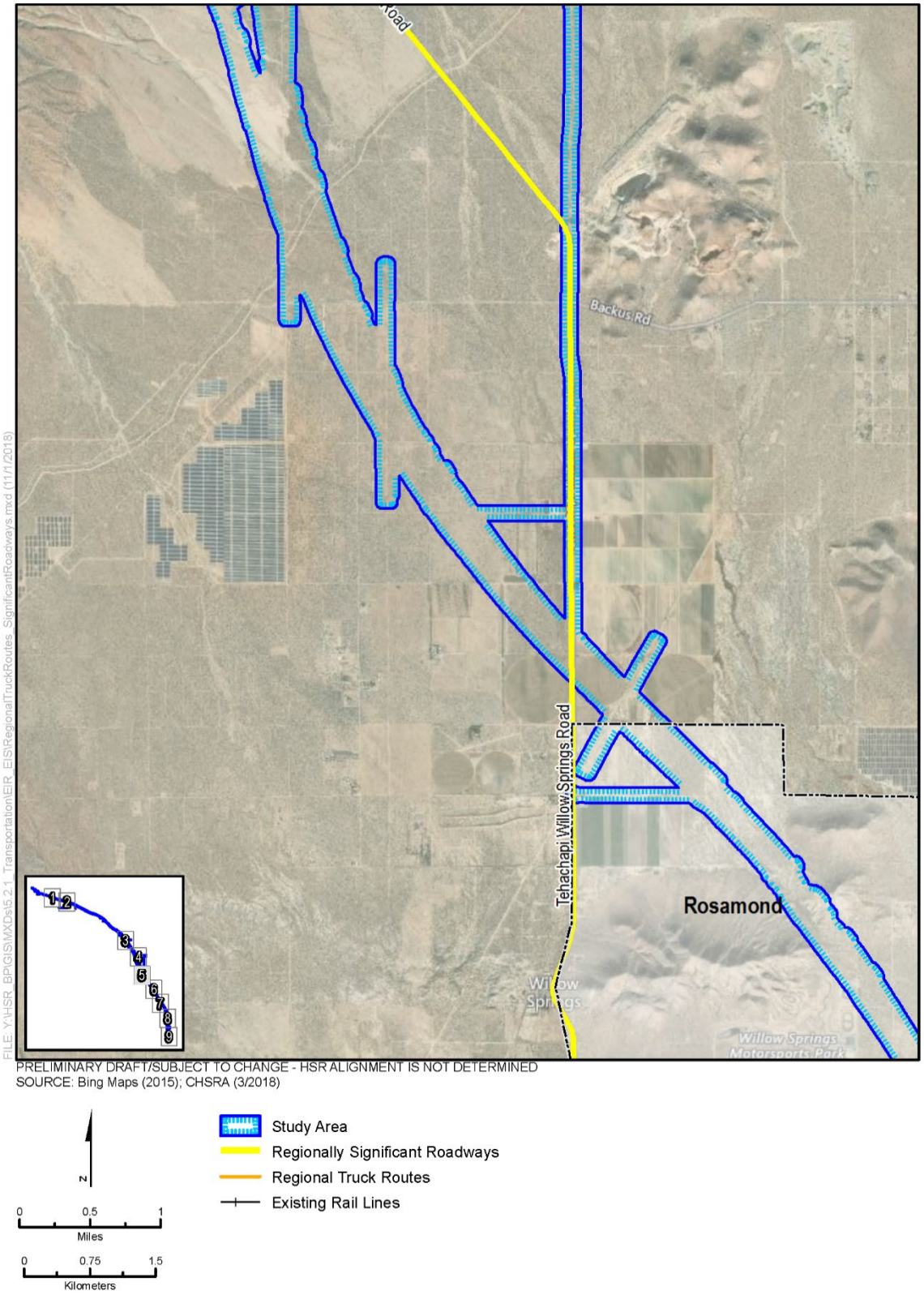

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 5 of 9)

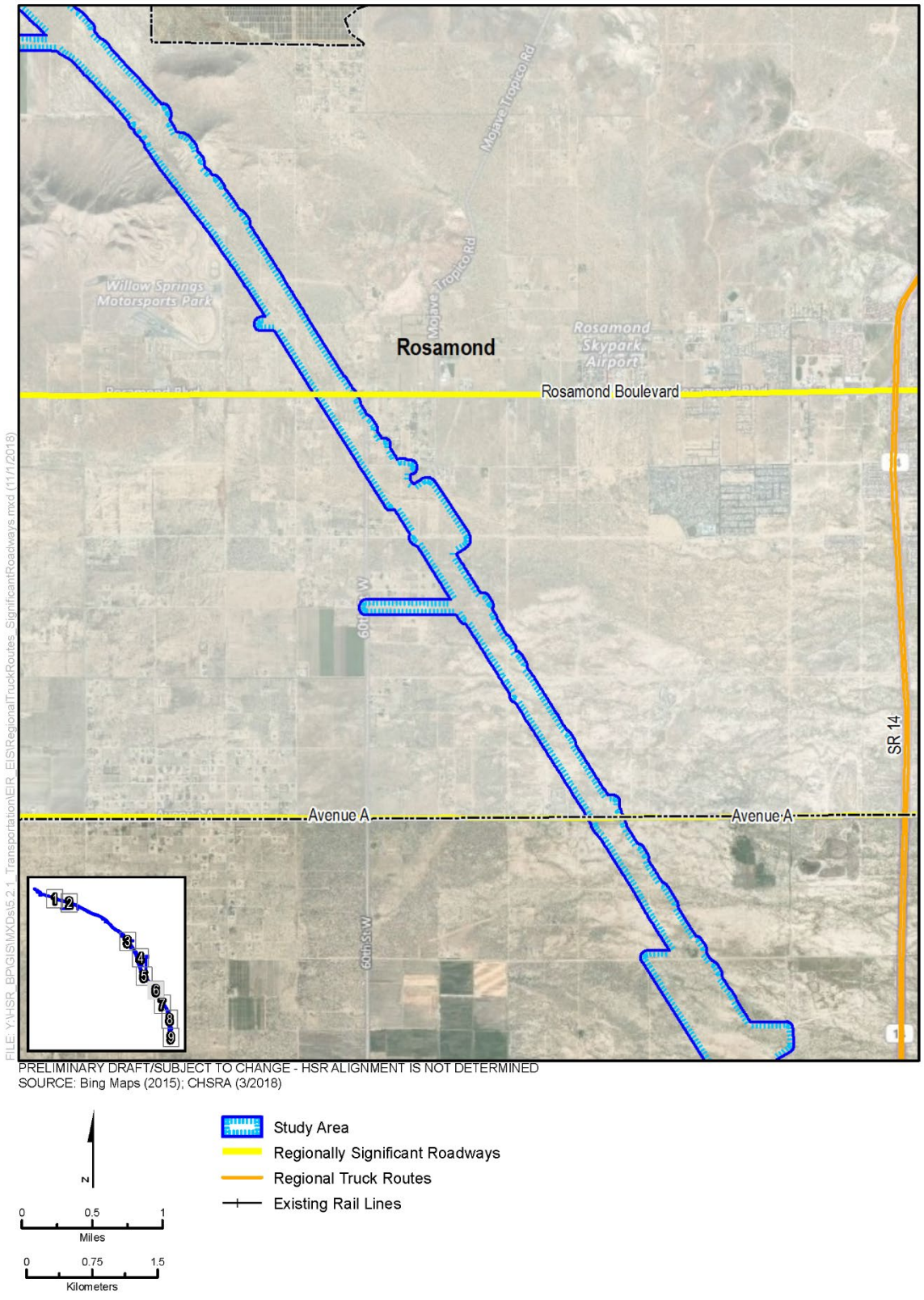

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 6 of 9)

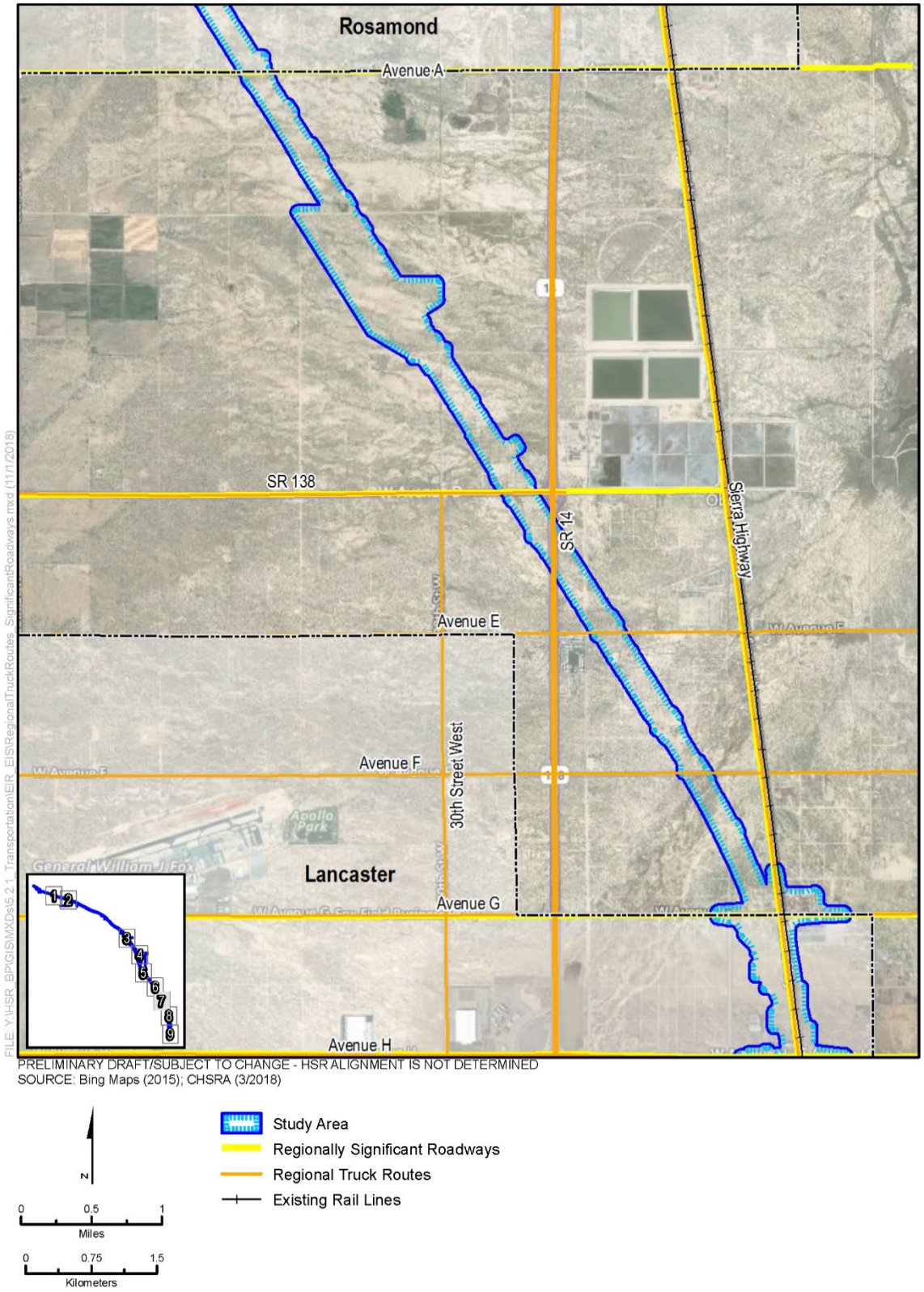

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 7 of 9)

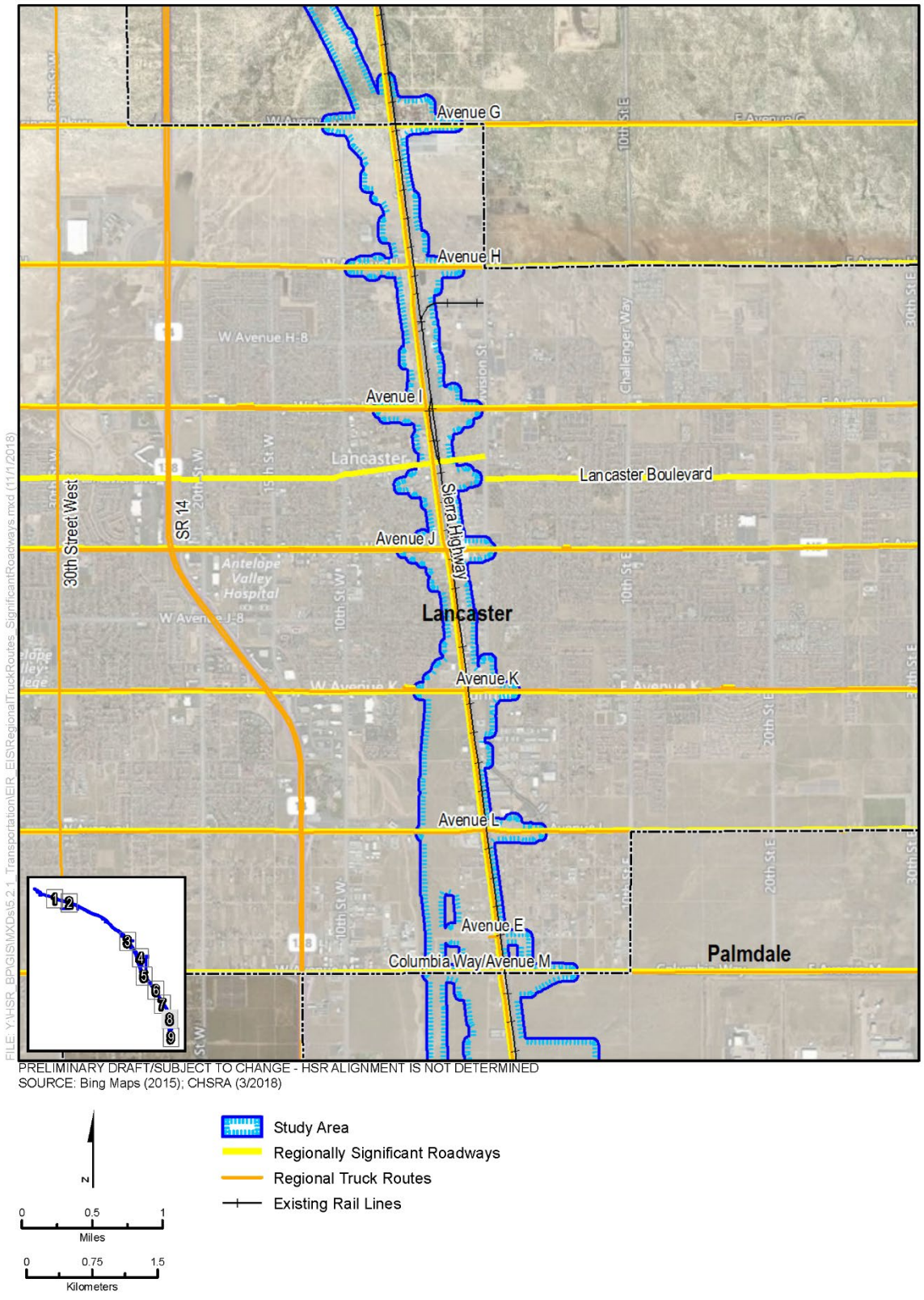

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 8 of 9)

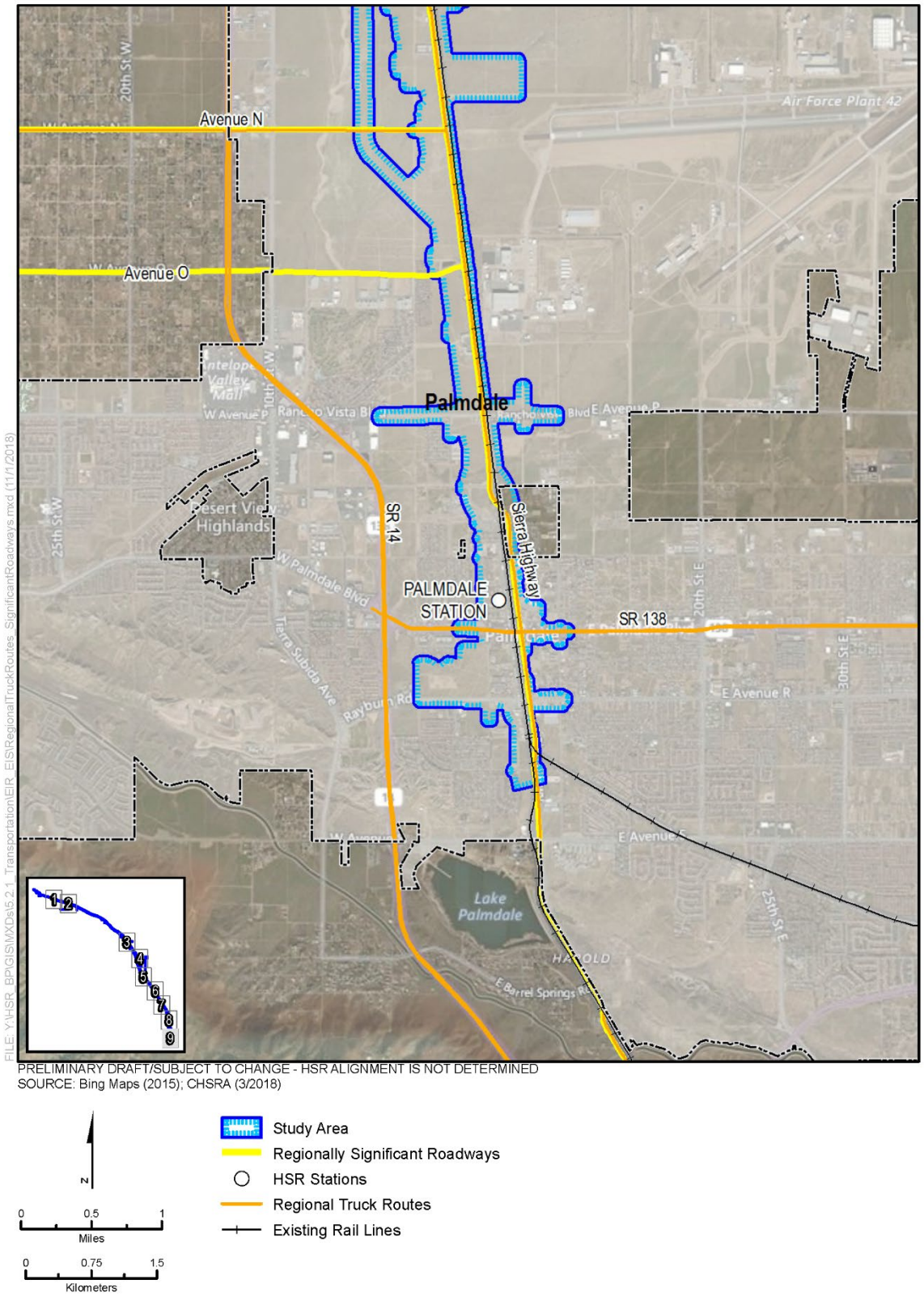

Figure 3.2-2 Major Roadways and Rail Lines

(Sheet 9 of 9)

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. Below is a list of regional truck routes based on information in the Kern Council of Governments and Southern California Association of Governments RTPs. Regional truck routes and corresponding jurisdictions are shown in Table 3.2-9. Truck routes are shown on Figure 3.2-2 (Sheets 1 through 9).

Table 3.2-9 Regional Truck Routes within the Resource Study Area

Regional Truck Routes	Jurisdiction[1]
30th Street W	Kern County/City of Lancaster
Avenue E	City of Lancaster
Avenue F	City of Lancaster
Avenue G	City of Lancaster
Avenue H	City of Lancaster
Avenue I	City of Lancaster
Avenue J	City of Lancaster
Avenue K	City of Lancaster
Avenue L	City of Lancaster
Columbia Way/Avenue M	City of Lancaster/City of Palmdale
Avenue N	City of Palmdale
Sierra Highway	City of Lancaster
Avenue D/SR 138	County of Kern/City of Lancaster/Caltrans
Palmdale Boulevard/SR 138	County of Kern/City of Palmdale/Caltrans
SR 14	Caltrans
SR 184	Caltrans
SR 202	Caltrans
SR 223	Caltrans
SR 58	Caltrans
SR 58 Business Route	City of Tehachapi

Source: California High-Speed Rail Authority, 2016
[1] At the closest point of the intersection to the study area
SR = State Route

3.2.5.3 Corridor Traffic Volumes

Street and highway intersections and segments near and adjacent to the project alignment were analyzed to determine LOS. This section provides a concise summary description of the existing transportation system along the proposed HSR alignment.

Analysis of freeway off-ramps and freeway segments was not necessary in the area between the Bakersfield and Palmdale Stations because the HSR rail alignments would add little or no traffic to the freeway off-ramps and freeway segments.

Major Roadway Traffic Volumes

Existing daily and a.m. and p.m. peak-hour traffic volumes for major intersections and roadway segments along the proposed HSR alignment were collected via existing traffic counts, Caltrans' traffic count website, and the Kern COG's website.

Roadway Operations along Alternative Alignments

Intersection LOS analyses were conducted using the Synchro 9.0 traffic signal timing program. Refer to Table 5-2 in the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a) for a list of intersections studied.

Roadway segment capacity and LOS were determined using information from the Kern Council of Governments modeling process for the County of Kern and the City of Tehachapi, and the Southern California Association of Governments modeling process for the County of Los Angeles and the Cities of Lancaster and Palmdale. Refer to Table 5-3 in the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a) for a list of roadway segments studied.

Most of the transportation RSA roadway segments currently operate at acceptable LOS (D or better). The following roadway segments currently operate below LOS D:

- Columbia Way/E Avenue M, Third Street E to Fifth Street E (LOS E in the a.m. peak hour and LOS F in the p.m. peak hour)
- Oswell Street, Pioneer Drive to Potomac Avenue (LOS F in the a.m. and p.m. peak hours)
- Sierra Highway, Avenue N to Avenue O (LOS F in the a.m. and p.m. peak hours)
- Sierra Highway, Columbia Way to Avenue N (LOS F in the p.m. peak hour)

Most of the transportation RSA's signalized intersections currently operate at LOS D or better. The following intersections currently operate below LOS of D:

- Sierra Highway/Columbia Way (LOS E in the a.m. peak hour and LOS F in the p.m. peak hour)
- W Avenue J/Sierra Highway (LOS E in the p.m. peak hour)

At the following unsignalized intersections, an LOS E or F result occurred but signal warrants were not met. Therefore, all of the following locations demonstrate acceptable intersection operations:

- W Avenue I/Yucca Avenue (LOS E in the a.m. peak hour and LOS F in the p.m. peak hour)
- W Avenue I/Spearman Avenue (LOS E in the p.m. peak hour)
- W Avenue J8/Sierra Highway (LOS E in the p.m. peak hour)
- W Avenue K/Division Street (LOS E in the p.m. peak hour)

The following unsignalized intersection operates below the target LOS of D and signal warrants were met:

- W Avenue J/Cedar Avenue (LOS F in the p.m. peak hour)

Roadway Operations in Palmdale Station Area

Traffic intersection turning movement counts and 24-hour segment counts were completed between November 3, 2015, and December 2, 2015. Additional traffic counts were provided by the local jurisdiction (from February 2014). Average daily traffic was collected for roadway segments. Traffic count data were collected during the a.m. and p.m. peak hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., respectively, for intersections.

All roadway segments operate at LOS D or better under existing conditions during the a.m. peak hour. All roadway segments operate at LOS D or better under existing conditions during the p.m. peak hour, except for the following roadway segments:

- Sierra Highway north of Avenue P (LOS F in the p.m. peak hour)
- Avenue S east of 10th Street (LOS E in the p.m. peak hour)

All intersections operate at LOS D or better, except for the following intersections:

- Sierra Highway at Rancho Vista Boulevard (LOS E in the p.m. peak hour)
- 10th Street at Avenue P (LOS F in the a.m. and p.m. peak hours)
- 50th Street E/47th Street E at Palmdale Boulevard (LOS E in the a.m. peak hour)
- US-395 at Palmdale Road (LOS E in the p.m. peak hour)

A freeway off-ramp queuing analysis was conducted at locations where the project would add more than 100 peak-hour trips. The SR 14 southbound ramps at 10th Street W are the only location that would meet this criterion. Using Synchro 9.0, the 95th percentile queue was calculated to be approximately 27 feet for the a.m. peak hour. During the p.m. peak hour, the 95th percentile queue was forecast to be 342 feet. Given that the existing storage capacity on the ramp is approximately 900 feet, there is currently adequate storage available to accommodate both peak hours' queues.

Freeway segment analysis was conducted for two freeway segments that would be most affected by traffic traveling to and from the Palmdale Station traffic. These freeway segments were: SR 14 north of 10th Street W and SR 14 south of Avenue S. The analysis determined that both of these freeway segments operate at LOS E or better in the a.m. and p.m. peak hours.

3.2.5.4 Vehicle Miles Traveled

The Authority used the statewide travel demand model to estimate VMT (2016) in the RSA for the medium and high ridership scenarios. In 2015, Los Angeles County estimated total VMT ranged between 73.24 and 73.39 billion miles and estimated interregional VMT in Kern County ranged between 4.09 and 4.15 billion miles.

3.2.5.5 Statewide Rail Transportation

The 2040 California Transportation Plan provides an overview of the state transportation system and the system's various components, including rail route mileage and other data. The California Transportation Plan estimates that California rail routes include: 887 miles of passenger state corridors; 1,663 miles of passenger interstate Amtrak corridors; 5,418 miles of Class 1 freight railroads; 1,317 miles of regional and short-line freight railroads; and 275 miles of switching and terminal freight railroads.

Table 3.2-10 shows average travel times between major California cities by rail during peak periods.

Table 3.2-10 Estimated Conventional Rail Travel Times between Cities (Peak Conditions)

City Pair	Conventional Rail Travel Time (2016)
Downtown Los Angeles to Downtown San Francisco	13 hours, 15 minutes[1]
Downtown Bakersfield to Downtown Los Angeles	N/A
Downtown Bakersfield to Downtown Palmdale	N/A
Palmdale to Downtown Los Angeles	1 hour, 54 minutes
Downtown Los Angeles to Downtown San Diego	2 hours, 45 minutes

Sources: Amtrak, 2016; Metrolink, 2016
[1] Includes bus transfer from Oakland to downtown San Francisco.
All travel time is measured in door-to-door travel time.
N/A = not applicable

3.2.5.6 Regional Transit Service (between Counties)

Regional bus service in the project vicinity is provided by Greyhound, which provides scheduled bus service though the San Joaquin Valley and Southern California, with bus terminals in

Bakersfield, Lancaster, and Palmdale. Greyhound also provides daily service from the Bakersfield Station to destinations such as San Jose, San Francisco, Sacramento, Los Angeles, San Diego, and Las Vegas. Greyhound operates 5 daily trips to San Francisco, 4 daily trips to Sacramento, and 10 daily trips to Los Angeles. Service to Las Vegas is provided via transfers at Bakersfield or Los Angeles.

Kern Regional Transit provides service throughout Kern County, with connections between Wasco, Shafter, and Bakersfield. Kern Regional Transit provides several other connections as well, including service from Inyokern to the Eastern Sierra Transit Agency, which serves Inyo and Mono Counties.

In northern Los Angeles County, the Lancaster Metrolink Station is served by Metrolink's Antelope Valley Line from Los Angeles Union Station. Twenty Metrolink trains serve the station each weekday, with 12 trains serving the station on weekends. The station is also served by Amtrak Thruway bus service to Bakersfield and by Kern Regional Transit Route 100 to Bakersfield and Route 250 to California City. Local transit is provided by AVTA Routes 1, 4, 7, 9, 11, and 94.

The Palmdale Transportation Center is a multimodal transportation center that serves as a Metrolink rail station and local and commuter bus hubs in the City of Palmdale. Rebuilt in 2005, it has an enclosed waiting room with concessions and vending, public telephone service, restrooms, and bus and rail ticket and pass sales. The center would be relocated and reconstructed to accommodate both Metrolink and the Palmdale HSR Station. It would also be the terminus of the planned XpressWest HSR line to Las Vegas. The Palmdale Transportation Center is served by Metrolink's Antelope Valley Line from Los Angeles Union Station. Twenty Metrolink trains serve the station each weekday, and 12 trains serve on weekends. Weekday Metrolink service runs primarily at peak hours in the peak direction of travel, while weekend departures and arrivals are more evenly spaced throughout the day.

The Palmdale Transportation Center also serves as a hub for AVTA, as well as a hub for its commuter bus network to locations in Los Angeles. Greyhound serves the station, as does Amtrak's California Thruway Route 12 bus service, which connects with northbound San Joaquin trains in Bakersfield.

Amtrak provides Thruway Bus service to complement its train service. Bus locations are provided in cities that may not have an Amtrak station, such as Palmdale, and are used to escort passengers to and from Amtrak facilities. The Palmdale Transportation Center offers a stop for Amtrak passengers traveling on the Bakersfield-to-Victorville Amtrak bus route. Caltrans provides financial support for the Amtrak Thruway Bus service throughout most of California.

The Palmdale Transportation Center is the city's only intermodal transfer point that offers Metrolink service, Amtrak Thruway Buses, multiple bus lines, and a Greyhound bus station. The bus loading zone for this transportation center is on the west side of the Metrolink station and accommodates Antelope Valley Lines 1, 2, 3, 7, L.A. Lake Express, 94, 97, 98, 99, 785, 786, and 787, and Santa Clarita Line 795.

3.2.5.7 Local Transit (within and between Cities in the Region)

Bakersfield Area

Public transportation in metropolitan Bakersfield includes local buses, intercity buses, Amtrak trains, and paratransit services. The largest local bus transit system operator is GET. Intercity bus operators are Greyhound, Orange Belt Stages, Airport Bus of Bakersfield, and Kern County. Kern Regional Transit provides service between Bakersfield and rural communities, such as Lamont and the Kern River Valley, while the private carriers serve other major cities. Paratransit providers include the taxicab system and various social service agencies that provide specialized transportation to their clients.

Golden Empire Transit District

GET is the main bus line in the City of Bakersfield. GET was formed in 1973 and serves the Bakersfield metropolitan area. GET has an active fleet of 88 buses, plus 19 GET-A-Lift buses, which are fueled by compressed natural gas, an alternative fuel that helps reduce pollution

emissions. All buses are equipped with wheelchair lifts and bike racks. GET operates 16 bus routes throughout the Bakersfield metropolitan area 7 days per week, with 1,000 bus stops, 7.2 million annual boardings, and 4 million annual miles. In total, GET carries approximately 24,000 passengers per day, which amounts to 1 percent of total travel in the City of Bakersfield.

GET provides services throughout the City of Bakersfield and the connecting communities. As discussed in the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a), the Long-Range Transit Plan for GET was completed in 2012. The plan includes revised intracity routes, intercity bus service expansion, and potential bus rapid transit and light-rail transit lines. Continued service is an element of the No Project Alternative, but GET serves only a small portion of the intercity travel market, all within Kern County.

Each weekday, approximately 24,000 citizens ride one of GET's 88 buses. The most recent customer and community satisfaction passenger survey, completed by GET in 2015, shows 62.4 percent of the surveyed riders chose GET because they lack a car, while 21.9 percent noted cost to be the persuading factor. Service attribute ratings have improved over the 2013 survey, which showed dips in ratings, and surpassed the corresponding 2009 score. Fifty-two percent of GET's riders have been customers for more than 5 years. Table 3.2-11 summarizes the bus routes for GET by route and weekday and weekend/holiday frequency in minutes. The transit agency operates every day except Thanksgiving and Christmas, although some routes operate on a holiday schedule for the following holidays: New Year's Day, Easter, Memorial Day, Independence Day, and Labor Day.

Table 3.2-11 Golden Empire Transit Bus Routes: Bakersfield

Bus Route	Weekday Frequency (minutes)	Weekend and Holiday Frequency (minutes)
Route 21: CSUB/Bakersfield College	15	30
Route 22: CSUB/Oildale	15	30
Route 41: Valley Plaza/Cottonwood/Bakersfield College	30	30 weekends 60 holidays
Route 42: Panama Lane (Walmart)/Westchester	30	30 weekends 60 holidays
Route 43: Truxtun/Bakersfield College	30	30 weekends 60 holidays
Route 44: White Lane/Bakersfield College	30	30 weekends 60 holidays
Route 45: Oildale/Foothill	30	30 weekends 60 holidays
Route 46: Stockdale/Foothill	30	30 weekends 60 holidays
Route 47: Panama Lane/Truxtun	30	N/A
Route 61: Stine Harris/Bakersfield College	60	60
Route 62: Ridgeview/Greenfield/Valley Plaza	60	60
Route 81: Valley Plaza/Downtown/Bakersfield College	30	60
Route 82: CSUB/Rosedale	60	60
Route 83: Half Moon/Downtown (South Union)	45	45
Route 84: Northwest (Frontier High School)/Downtown	60	60
Route 17: Tejon Ranch Commerce Center Express	120	N/A

Source: Golden Empire Transit Maps and Timetables, 2016
CSUB = California State University, Bakersfield N/A = not applicable

Through reservation, GET provides transportation between the GET Downtown Transit Center and William Thomas Airport Terminal Service during regular operating hours Monday through Sunday. Kern Regional Transit provides bus service to the outlying Kern County area and stops at GET's Downtown Transit Center.

Taxis

Currently there are several taxi and limousine companies serving the City of Bakersfield. The taxi and limousine companies provide private transportation to and from the existing Amtrak Bakersfield station on an on-call basis.

Lancaster/Palmdale Area

Transit, Taxis, Shuttles, and Air Travel

The Palmdale Transportation Center is served by Metrolink rail service, as well as local and commuter bus services offered by multiple transit providers. A summary of the transit services is presented in Table 3.2-12. Table 3.2-12 lists the service operator, line/route, type (bus/rail), destination, trains per day/bus frequency, and the stop location.

Antelope Valley Transit

AVTA is the main transit service provider within the City of Palmdale. It operates five local bus lines (1, 2, 3, 7, and L.A. Lake Express) and three commuter lines (785, 786, and 787) near the Palmdale Metrolink station. Line 1 is a north-south route offering service to and from areas north of Palmdale with 45-minute headways and no weekend service. Lines 2 and 3 provide east-west service through the city with average headways of 30 minutes during the weekday peak period and 1-hour headways on the weekend. Line 7 is a north-south route offering service to and from areas north of Palmdale with 1- to 1.25-hour headways during weekday peak hours and 1- to 2-hour headways on the weekend. The L.A. Lake Express Line also provides limited local east-west service, with one a.m. trip and two p.m. trips offered during the weekday.

> *Headway*
>
> Headway is the time (usually expressed in minutes) between the passing of successive transit vehicles providing service along the same line or track in the same direction. A shorter headway signifies more frequent service.

In addition to AVTA's normal local service routes, three supplemental lines to local-area high schools are offered during the traditional school year to accommodate the increase in student ridership. Supplemental Route 97 offers one westbound run, which leaves the Palmdale Transportation Center at 7:00 a.m. and arrives at Highland High School at 7:20 a.m., and one eastbound run, which leaves Highland High School at 2:45 p.m. and returns to the Palmdale Transportation Center at 3:05 p.m. Similar routes are provided to Antelope Valley High School and Eastside High School via Supplemental Route 94, Pete Knight High School via Supplemental Route 98, and Littlerock High School via Supplemental Route 99.

Besides its local service, AVTA provides three commuter lines that offer weekday peak-hour service with limited stops to major employment areas outside the Antelope Valley. Lines 785 and 787 are north-south routes that link Antelope Valley to downtown Los Angeles and west San Fernando Valley, respectively. Given that these lines are commuter-oriented, service is only offered during a.m. and p.m. peak periods, Monday through Friday. Headways are 15 to 40 minutes. Line 786 is also a north-south route, offering service to Century City and West Los Angeles; however, only four runs are offered during the a.m. and p.m. peak periods. All AVTA lines can be accessed at the Palmdale Transportation Center, 39000 Clock Tower Plaza Drive.

Miscellaneous Antelope Valley Transit Services

During the summer months (late May to early September), the County of Los Angeles offers a Beach Bus service to residents of the Antelope Valley that provides bus rides from Lancaster City Park and the Palmdale Transportation Center to the beach in Santa Monica for $6 (round-trip). The bus departs from the Palmdale Transportation Center at approximately 9:00 a.m. and returns at approximately 5:30 p.m. This bus service is offered twice per day on Tuesdays, Thursdays, and Saturdays.

Table 3.2-12 Palmdale Transportation Center—Connecting Transit Services

Operator	Line/Route	Type	Destination(s)	Trains per Day/Bus Frequency	Stop Location
Metrolink	Antelope Valley Line	Commuter Rail	Los Angeles Union Station (S), Lancaster (N)	18 trains per day	Station platforms
Antelope Valley Transit	1	Local Bus	Palmdale (S), Lancaster (N)	30 minutes	Palmdale Transportation Center, Palmdale Boulevard/10th Street E
	2	Local Bus	East Palmdale, West Palmdale	30 minutes	Antelope Valley Mall, Palmdale Boulevard/ 10th Street E
	3	Local Bus	East Palmdale, West Palmdale	30 minutes	Palmdale Transportation Center, 10th Street E/Palmdale Boulevard, Antelope Valley Mall
	7	Local Bus	Palmdale (S), Lancaster (N)	60 minutes	Palmdale Transportation Center
	10	Local Bus	Palmdale (S), Lancaster (N)	60 minutes	Palmdale Transportation Center
	98	Local Supplemental Service	Palmdale Transportation Center (E), Pete Knight High School (W)	1:00 a.m. and 1:00 p.m. runs	Palmdale Transportation Center
	785[1]	Commuter Service	Downtown Los Angeles (S), Lancaster (N)	9:00 a.m. and 9:00 p.m. runs	Palmdale Transportation Center
	786[1]	Commuter Service	Century City/West Los Angeles (S), Lancaster (N)	3:00 a.m. and 5:00 p.m. runs	Palmdale Transportation Center
	787[1]	Commuter Service	West San Fernando Valley (S), Lancaster (N)	9:00 a.m. and 9:00 p.m. runs	Palmdale Transportation Center
	790	Commuter Service	Santa Clarita	10 buses per day	Palmdale Transportation Center

Sources: Metrolink, 2016; Antelope Valley Transit, 2016; City of Santa Clarita Transit, 2016
[1] Weekday peak-hour service only.
E = east
N = north
S = south
W = west

School Bus Service

Table 3.2-12 shows the K–12 schools that are located within the RSA, and are served by school buses. Table 3.2-13 includes the approximate distance to each educational facility from the RSA and the direction to the RSA.

Table 3.2-13 Educational Facilities with School Bus Transportation within the Resource Study Area

Facility	Approximate Distance to Property Edge (miles)	Direction from B-P Build Alternatives
Tehachapi High School	0.8	West of B-P Build Alternatives, south of Valley Blvd
Tompkins Elementary School	1.8	West of B-P Build Alternatives, south of Valley Blvd
Cummings Valley Elementary School	8.5	West of B-P Build Alternatives, south of West Valley Blvd
Tropico Middle School	0.6	East of B-P Build Alternatives, north of Rosamond Ave
Westpark Elementary School	1.9	East of B-P Build Alternatives, north of Holiday Ave
Rosamond High School	3.2	East of B-P Build Alternatives, north of Rosamond Ave
Rare Earth High School	3.2	East of B-P Build Alternatives, north of Rosamond Ave
Antelope Valley High School	0.3	East of B-P Build Alternatives, north of Milling St
Lancaster High School	3.0	West of B-P Build Alternatives, south of Lancaster Blvd
SOAR High School	2.8	West of B-P Build Alternatives, south of Ave J8
Phoenix High School—Lancaster Campus	0.5	East of B-P Build Alternatives, south of Ave H8
Desert Winds High School	0.7	East of B-P Build Alternatives, south of Kettering St
Piute Middle School	0.8	East of B-P Build Alternatives, north of Ave H11
Mariposa Elementary School	0.3	West of B-P Build Alternatives, north of Ave H8
Monte Vista Elementary School	0.7	West of B-P Build Alternatives, south of Kettering St
Del Sur Elementary School	8.5	West of B-P Build Alternatives, south of Ave H
Desert View Elementary School	1.0	West of B-P Build Alternatives, south of Ave H8
Endeavor Middle School	4.4	West of B-P Build Alternatives, north of Ave K
El Dorado Elementary School	0.6	East of B-P Build Alternatives, north of Ave J
Northrop Elementary School	0.9	East of B-P Build Alternatives, north of Ave K4
Sierra Elementary School	0.6	West of B-P Build Alternatives, north of Ave J12
Sunnydale Elementary School	1	West of B-P Build Alternatives, North of Ave J8

Sources:
[1] *Antelope Valley School District, www.avdistrict.org/schools/boundary-map*
[2] *Lancaster School District, http://apps.schoolsitelocator.com/?districtcode=10078*
[3] *Tehachapi High School, https://california.hometownlocator.com/schools/profiles,n,tehachapi%20high,z,93561,t,pb,i,1007003.cfm*
[4] *Cummings Valley Elementary School, https://california.hometownlocator.com/schools/profiles,n,cummings%20valley%20 elementary,z,93561,t,pb,i,1016936.cfm*
[5] *Bakersfield City School District, https://1.cdn.edl.io/PVycSTGaHsChnIquI0XIt9gfjZfSoC9E2ACsMb8p0LESb56C.pdf*
[6] *Bakersfield Middle Schools, https://1.cdn.edl.io/otjA7rLMQqZQiA5oivfxTr5r3dNxjUrQS5XZq8CAjoyoVchs.pdf*
[7] *Kern High School District, www.kernhigh.org/apps/pages/schoolboundaries*
[8] *Caliente School District, www.niche.com/k12/d/caliente-union-elementary-school-district-ca/#schools*
[9] *DiGiorgio School District, http://digiorgio.k12.ca.us/*
[10] *Westside Union School District, www.westside.k12.ca.us/*
B-P = Bakersfield to Palmdale Project Section

3.2.5.8 Aviation

Table 3.2-14 shows 2014 enplanements for the four commercial airports within the RSA. It also includes the number of carriers providing in-state service as well as the in-state airports served. An enplanement is a passenger boarding an airplane for departure (a visitor flying in and flying out equals one enplanement). This 2014 data were the most current data available at the time the analysis of transportation impacts was conducted. The table also lists the total number of carriers providing in-state air service and the airports served.

Table 3.2-14 Commercial Air Traffic and Airports

Airport	Total 2014 Enplanements	Number of Carriers Providing In-State Service	In-State Airports Served
Fresno-Yosemite International Airport (FYI)	710,353	3	San Francisco (SFO), Los Angeles (LAX), San Diego (SAN)
Meadows Field Airport (Bakersfield) (BFL)	140,007	1	San Francisco (SFO)
Hollywood Burbank Airport (BUR)	1,928,491	2	Oakland (OAK), San Francisco (SFO), San Jose (SJC), Sacramento (SMF)
Los Angeles International Airport (LAX)	34,314,197	7	Mammoth Lakes (MMH), Monterey/Carmel (MRY), Oakland (OAK), San Francisco (SFO) San Jose (SJC), Sacramento, (SMF), Santa Rosa (STS)

Sources: California High-Speed Rail Authority 2018a; Fresno Yosemite International Airport, 2016; Hollywood Burbank Airport, 2016; Los Angeles World Airports, 2016

BFL currently offers the only commercial passenger service in the project vicinity. Located east of SR 99 and north of the City of Bakersfield, BFL is the second-busiest passenger airport in the San Joaquin Valley, after Fresno-Yosemite International airport. The airport is owned and operated by Kern County and has two carriers providing 16 daily flights (8 departures and 8 arrivals) with service to Denver, Phoenix, and San Francisco. Two of the daily departures travel within California (to San Francisco).

The airport's domestic terminal includes a two-story concourse with three gates currently in use. The facility has two runways—a primary 10,855-foot runway and a secondary 7,703-foot runway. In 2013, the airport had 135,485 passenger enplanements, with approximately half of those passengers traveling within California. Airport use first fell and then rose in the past decade, with the number of enplanements in 2013 being only slightly less than that of 2005. The in-state weekly capacity is approximately 1,136 seats.

Expansion of the number of gates in response to increased demand is possible. Two gates could be added to the current concourse without construction, while concourse expansion could accommodate a total of 12 gates. If warranted, construction of an additional 12-gate terminal would provide for a total of 24 gates at the facility.

Palmdale Regional Airport is located to the immediate northeast of the Palmdale city limits and to the southeast of Lancaster. The two main runways, built for military jets, are each over 2 miles long. From 1970 to 1983, the Los Angeles Department of Airports, now called Los Angeles World Airports, acquired about 17,750 acres of land east and south of Plant 42 in unincorporated Los Angeles County to be developed into a future "Palmdale Intercontinental Airport," an alternative to Los Angeles International Airport (LAX). Los Angeles World Airports did not develop Palmdale Regional Airport beyond a 9,000-square-foot airport terminal. The airport attracted intermittent commercial service from the late 1970s until 2008. The City of Palmdale took over operation of the airport at the end of 2013 and manages it via the Palmdale Airport Authority. The city continues to seek the return of commercial service and expanded use of the airport.

Table 3.2-15 provides a summary of the usage of these two airports in the last decade in terms of enplanements as well as the net change between 2008–2010 and 2010–2013. As Table 3.2-15 illustrates, after declines in passenger usage at Bakersfield Municipal Airport during the economic recession, passenger enplanements have been increasing since 2011.

Table 3.2-15 Passenger Enplanements for Bakersfield and Palmdale Airports

Airport	2008	2009	2010	2011	2012	2013	Change, 2008–2010	Change, 2010–2013
Bakersfield	164,047	171,913	94,570	111,699	135,421	135,485	-69,477	+40,915
Palmdale	10,392	0	0	0	0	0	-10,392	N/A
Total	**174,439**	**171,913**	**94,570**	**111,699**	**135,421**	**135,485**	**-79,869**	**+40,915**

Source: Federal Aviation Administration, 2016
N/A = not applicable

Bakersfield Municipal Airport is owned by the City of Bakersfield. The airport is home to over 100 general aviation aircraft. Bakersfield Municipal Airport is located approximately 3.5 miles south of downtown Bakersfield. Union Avenue provides the most direct access to the airport. The airport covers approximately 200 acres. The airport is certified under Federal Aviation Regulations Part 139, which governs land-based airport operations.

Major airports serving the Palmdale area include LAX, Hollywood Burbank Airport, and Van Nuys Airport.

LAX is the primary airport serving the City of Los Angeles and is approximately 69.3 driving miles from the Palmdale Transportation Center. Hollywood Burbank Airport is in the City of Burbank, approximately 51.2 driving miles south of the Palmdale Transportation Center. Van Nuys Airport is approximately 48.6 driving miles from the Palmdale Transportation Center; it is heavily used by general aviation aircraft but does not currently provide commercial service.

3.2.5.9 Passenger Rail Service

Amtrak operates intercity passenger rail service in California on four principal corridors covering more than 1,300 linear route miles and spanning almost the entire state. The passenger service most relevant to the project is the San Joaquin route, which currently operates a total of seven trains from Northern California (Oakland and Sacramento) to downtown Bakersfield. From the 1970s until July 2015, the San Joaquin service was administered by the Caltrans Division of Rail. On July 1, 2015, administrative services were assumed by a new San Joaquin Joint Powers Authority composed of major San Joaquin Valley metropolitan planning organizations and transit operators. One elected official from each agency makes up the San Joaquin Joint Powers Authority Board.

As an integral part of the San Joaquin service, Amtrak operates connecting Thruway Bus service from the Bakersfield Amtrak Station to Los Angeles Union Station as well as other points in Southern California. Many of these buses essentially run parallel to the Bakersfield to Palmdale Project Section and connect passengers to Amtrak trains in Bakersfield and Los Angeles. Currently, there are nine Thruway Bus routes that meet San Joaquin trains:

- Amtrak Thruway Bus Route 10 (Bakersfield–Oxnard–Santa Barbara)
- Amtrak Thruway Bus Route 12 (Bakersfield–Victorville)
- Amtrak Thruway Bus Route 19a (Bakersfield–Hemet)
- Amtrak Thruway Bus Route 19b (Bakersfield–Indio)
- Amtrak Thruway Bus Route 1a (Bakersfield–San Diego)
- Amtrak Thruway Bus Route 1b (Bakersfield–Los Angeles–San Pedro)
- Amtrak Thruway Bus Route 1c (Bakersfield–Van Nuys–Torrance)
- Amtrak Thruway Bus Route 9 (Bakersfield–Las Vegas)

Each Thruway Bus serves several locations on its route between Bakersfield and its terminus. As many as six buses meet each scheduled train in each direction of travel every day. Only passengers connecting to or from a train may ride Amtrak Thruway Buses.

3.2.5.10 Freight Rail Service

The Bakersfield to Palmdale Project Section runs parallel and/or adjacent to freight rail lines along its entire length. Background information on this freight rail service and related freight rail information are provided below.

Table 3.2-16 shows both California outbound and inbound freight shipments by all modes, including the value of shipments, the weight of shipments, ton-miles of shipments, and average miles per shipment. Table 3.2-17 compares freight shipments by truck and by rail using the same parameters as Table 3.2-16.

Table 3.2-16 California Outbound and Inbound Freight Shipments, All Modes

All Modes	Value of Shipments (million $)	Weight of Shipments (thousand tons)	Ton-Miles of Shipments (millions)[1]	Average Miles per Shipment
California Outbound	1,476,407	718,345	171,432	907
California Inbound	1,345,716	764,736	248,208	841

Sources: California High-Speed Rail Authority 2018a; U.S. Census Bureau, 2012
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network.

Table 3.2-17 California Outbound and Inbound Freight Shipments, by Truck and by Rail

Truck Versus Rail	Value of Shipments (million $)	Weight of Shipments (thousand tons)	Ton-Miles of Shipments (millions)	Average Miles per Shipment
Truck				
California Outbound	893,972	738,550	131,440	361
California Inbound	858,227	738,667	145,563	–
Rail				
California Outbound	15,202	22,101	16,641	832
California Inbound	36,522	51,331	67,911	–

Sources: California High-Speed Rail Authority 2018a

With its location at the southern end of the San Joaquin Valley, Kern County is a prime location to ship goods west to the Central Coast, south to Los Angeles ports, and east to corridors connecting to the rest of the U.S. The county is part of major transportation freight corridors linking to points north as well. Kern County's goods movement is provided by two major Class I rail companies, Union Pacific Railroad (UPRR) and BNSF Railway (BNSF). In 2014, UPRR and BNSF reported operating revenues of $24.0 billion and $23.2 billion, respectively. Both railroads have major yards located in Bakersfield. The San Joaquin Valley lines for both UPRR and BNSF are important segments of their national rail systems. Freight rail traffic has been growing nationally, with a 31.4 percent increase in ton-miles of freight activity between 1997 and 2007 (Bureau of Transportation Statistics 2010).

Freight rail movements in the area are primarily interstate rail movements because the railroads generally focus on shipments of 700 miles or more. However, while trucking is the dominant mode for moving freight (with rail serving only 11 percent of the total tonnage), Kern County is also served by short-line railroads that have interchanges with BNSF at Fresno and Bakersfield,

and with UPRR at Fresno, Goshen Junction, and Bakersfield. The growth in roadway congestion may increase reliance on rail.

UPRR was created by the Pacific Railroad Act of 1862 and has evolved to be the largest railroad in the U.S. The railroad ships a significant volume of intermodal freight and is the largest shipper of chemicals in the country. BNSF is the product of mergers and acquisitions of nearly 400 different railroad lines over the course of 160 years. BNSF is the largest grain-hauling railroad and is the nation's freight rail leader in intermodal (container) volume.

UPRR parallels SR 99 for most of the San Joaquin Valley corridor. Along this corridor, UPRR is primarily single-track and has an average number of 20 to 24 daily one-way train trips within the corridor. UPRR's route to Los Angeles goes through Palmdale and then southeast to Colton. The former Southern Pacific Railroad line south from Palmdale to Los Angeles via Santa Clarita is now owned by the Los Angeles Metropolitan Transportation Authority and is used for Metrolink service between Lancaster and Los Angeles.

The BNSF alignment is generally west of the SR 99 corridor. BNSF is also the primary owner of the railroad right-of-way used by the Amtrak San Joaquin route. The average number of daily one-way train operations within the corridor is 20 to 24 daily train trips, of which 12 are Amtrak trains. The railroad owns a 276-mile section of the San Joaquin corridor from Bakersfield to Port Chicago, 6.5 miles east-northeast of Martinez in Contra Costa County. An increase in operations may constrain plans to increase Amtrak San Joaquin service unless more of the corridor becomes double-track. BNSF will gain capacity from planned improvements for the expansion of Amtrak San Joaquin service, as defined in the State Rail Plan.

Historically, both BNSF and UPRR have added capacity when needed to meet market demand. Future improvements are expected to continue to provide sufficient capacity for interstate needs. The 2014 Kern RTP notes as an information item two major freight rail investments in progress as of 2014: double-tracking of the BNSF sections from Bakersfield to Mojave, and development of the Shafter Intermodal Rail Facility.

The Tehachapi Trade Corridor in Kern County connects Northern California with the major transcontinental UPRR and BNSF routes in Southern California. The corridor is a 68-mile stretch of primarily single-track railroad over the Tehachapi Mountains between Bakersfield and Mojave. Both UPRR and BNSF use the route, which is owned by UPRR, with BNSF having permission to use the tracks. This segment is the busiest single-line route in the world, with about 40 trains per day operating through the corridor, which has a high volume of traffic and tracks traversing grades, curves, and tunnels. Seventy percent of the freight volume transported over this corridor originates in the Central Valley.

UPRR's Los Angeles Service Unit operating from the Ports of Los Angeles and Long Beach is the primary route to the four major gateways of St. Louis, Chicago, Memphis, and New Orleans.

3.2.5.11 Fresno to Bakersfield Locally Generated Alternative from the Intersection of 34th Street and L Street to Oswell Street

The following sections describe the transportation affected environment for the F-B LGA from the intersection of 34th Street and L Street to Oswell Street (south of Bakersfield). Topics covered include highways and roads, intersections, and roadway delay and LOS.

Highways and Roads

The Bakersfield F Street Station area has a street network consisting of arterials, collectors, and local streets generally laid out in a grid pattern. Four state highways provide access to the site area: SR 99, SR 58, SR 204, and SR 178. The major highways and roads are described in Section 3.2.3.2 of the *Fresno to Bakersfield Section Supplemental EIR/EIS* (Authority 2018b). The analysis examined six intersections and six roadway segments.

Intersections

- SR 204/Sumner Street
- Baker Street/Sumner Street
- Beale Avenue/Sumner Street
- Brown Street/Truxtun Avenue
- Oswell Front Street W/Edison Highway
- Oswell Front Street E/Edison Highway

Figure 3.2-7 in Section 3.2.3.2 of the *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017a) shows the locations of these intersections.

Roadway Segments

- Sumner Street between SR 204 and Baker Street
- Sumner Street between Baker Street and Beale Avenue
- Sumner Street between Beale Avenue and Brown Street
- Truxtun Avenue between Beale Avenue and Brown Street
- Edison Highway between Washington Street and Mount Vernon Avenue
- Edison Highway between Mount Vernon Avenue and Oswell Street

Figure 3.2-8 in Section 3.2.3.2 of *the Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017a) shows the locations of these roadway segments and provides the existing (year 2014) average daily traffic, number of lanes, and speed.

Existing (2014) Level-of-Service

Figure 3.2-9 in Section 3.2.3.2 of the *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017a) shows the existing (2014) intersection operating conditions LOS. All but one of the six intersections operates at LOS C or better, as shown in Table 3.2-18. Table 3.2-18 includes the delay in seconds for the AM and PM peak periods.

Table 3.2-18 Existing (2014) Intersection Levels-of-Service—City of Bakersfield: Intersection of 34th Street and L Street to Oswell Street

No.	Intersection	Control	Existing Conditions			
			A.M. Peak		P.M. Peak	
			Delay	LOS	Delay	LOS
4	Brown Street/Truxtun Avenue	Two-Way Stop	*30.1	*D	*76.1	*F

Source: California High-Speed Rail Authority, 2018b
Delay = Average control delay in seconds. (For two-way stop-controlled intersections, reported delay is for worst-case movement.)
* = Exceeds LOS standard
LOS = level-of-service

An analysis of existing roadway segments' daily operating conditions was conducted based on the V/C ratio. A total of six roadway segments were identified for analysis. As described in Section 3.2.3.2 of the *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017a), the analysis determined that all the roadway segments operate at LOS C or better under existing conditions.

3.2.6 Environmental Consequences

3.2.6.1 Overview

This section evaluates how the No Project Alternative and the B-P Build Alternatives would affect transportation. The impacts of the No Project Alternative are described in Section 3.2.6.2. The impacts of the B-P Build Alternatives are described and organized in Section 3.2.6.3, B-P Build Alternatives, as follows:

Construction Impacts

- Impact TR #1: Temporary Road Closures During Construction
- Impact TR #2: Circulation and Emergency Access During Construction

Operations Impacts

- Impact TR #3: Permanent Road Closures During Operation
- Impact TR #4: Circulation and Emergency Access During Operation
- Impact TR #5: Continuous Permanent Impacts on Vehicle Miles Traveled
- Impact TR #6: Roadway Levels-of-Service During Operation

3.2.6.2 No Project Alternative

Development in the San Joaquin Valley to accommodate expected population and economic growth would continue under the No Project Alternative, resulting in associated direct and indirect impacts on transportation resources. Planned projects anticipated to be constructed by 2040 include residential, commercial, industrial, recreational, transportation, and agricultural projects. It is expected that development activities and ongoing infrastructure operations would continue to occur and could affect transportation resources. For example, traffic volumes on regional roadways would continue to increase as a result of development activity, thereby affecting existing roadways, highways, utilities, airports, and railways.

To accommodate this growth, transportation improvements would be completed to maintain or expand existing capacity. A list of anticipated future development projects is provided in Appendix 3.19-A. Planned and programmed transportation improvements under the No Project Alternative would require construction that would result in temporary impacts, including detours and lane closures. Once construction of each project is complete, the impacts on traffic circulation would largely be beneficial in the near term. However, over the long term, the programmed transportation network capacity improvements are not anticipated to meet future regional demand, and traffic congestion would increase. Several intersections and roadway segments in the RSA would exceed the LOS targets in the 2040 No Project Alternative condition, as shown later in Table 3.2-22.

Regionally significant transportation improvements near the transportation RSA that are included in the No Project Alternative analysis include: (1) widening SR 184 between SR 58 and SR 178 to four lanes by 2028, and (2) construction of new four-lane to six-lane facility (SR 18) between SR 14 and US-395 by 2022.

The No Project Alternative would not close the existing passenger rail gap between Bakersfield and Palmdale. Closing this gap is part of a larger state transportation vision of reducing VMT and greenhouse gas emissions.

3.2.6.3 Bakersfield to Palmdale Project Section Build Alternatives

Temporary and permanent transportation impacts are categorized based on whether they occur during construction and/or operation of the Bakersfield to Palmdale Project Section. Construction impacts that would occur for a limited time are considered temporary, and construction impacts that would result in long-term changes to the physical environment are considered permanent. Operations impacts that would occur during the incremental stages of HSR implementation and would change with build-out of the HSR project are considered interim. The impacts that would not be continuous but would recur throughout the life of the system during the operation of the HSR project on an episodic or occasional basis are considered intermittent. The impacts that would be continuous throughout the life of the Bakersfield to Palmdale Project Section are considered permanent. This analysis includes both impacts associated with the B-P Build Alternative alignments (including the CCNM Design Option and the Refined CCNM Design Option) as well as the light maintenance facility/maintenance of infrastructure siding facilities/maintenance-of-way facilities (LMF/MOIS/MOWF) and the Bakersfield and Palmdale Stations.

As discussed and shown in Chapter 2, Alternatives, of this Draft EIR/EIS, Alternatives 1, 2, 3, and 5 share the same alignment or are located in close proximity to each other The CCNM Design Option and Refined CCNM Design Option are short segments that vary from the B-P Build Alternative alignments in the Keene area. The CCNM Design Option is a maximum of 480 feet from the centerline of the B-P Build Alternative alignments and the Refined CCNM Design Option is a maximum of 2,870 feet from the centerline of the B-P Build Alternative alignments in an undeveloped area. In general, the traffic analysis varies very little among the B-P Build Alternative alignments (including with the CCNM Design Option and the Refined CCNM Design Option) because the project includes grade separations for most of the roads it affects; therefore, traffic on those roads would not change. Permanent road closures would occur on low-volume roads, so minimal traffic would need to be rerouted because of the B-P Build Alternative alignments. Furthermore, very few RSA intersections or roadway segments operate at or near capacity under existing conditions, so the potential for impacts is limited.

The Fresno to Bakersfield Project Section environmental documents provide analysis for the section terminating at Oswell Street in Bakersfield, whereas this Bakersfield to Palmdale Project Section environmental document provides analysis from Oswell Street to the Palmdale Station. There is one location under consideration for the Bakersfield Station: the F-B LGA. The *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017a), Final Supplemental EIR (Authority 2018), and Final Supplemental EIS (Authority 2019) are accessible from the Authority's website at: https://www.hsr.ca.gov/programs/environmental/eis_eir/fresno_bakersfield_lga.aspx.

The remainder of this section is divided into three major subsections. The first summarizes transportation impacts around the Bakersfield station based on published environmental documentation associated with the Fresno to Bakersfield Project Section. The next two subsections discuss the construction and operations impacts based on analysis conducted for the Bakersfield to Palmdale Project Section, including transportation impacts associated with the Palmdale Station.

Fresno to Bakersfield Locally Generated Alternative from the Intersection of 34th Street and L Street to Oswell Street (City of Bakersfield)

This section reflects an analysis of the portion of the F-B LGA from the intersection of 34th Street and L Street to Oswell Street and the surrounding study area that is affected due to roadway closures and modifications by the F-B LGA and does not include any impacts from the Bakersfield F Street Station. A detailed description of this portion of the F-B LGA is included in Section 3.2 of the *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017a). Within this portion of the alignment, the F-B LGA would run generally parallel and adjacent to the UPRR corridor. Throughout the City of Bakersfield, the F-B LGA would be on a viaduct.

The following permanent roadway modifications within the portion of the F-B LGA alignment from the intersection of 34th Street and L Street to Oswell Street would require rerouting of traffic:

- **Sumner Street**—No westbound left turns or northbound left turns would be allowed between Truxtun Avenue and Baker Street, with the exception of the intersections of Sumner Street with Baker Street, Beale Avenue, and Truxtun Avenue, which would continue to be full-access.
- **Miller Street**—Would no longer have access to Edison Highway and would terminate in a cul-de-sac at Edison Highway.
- **Haley Street**—Would no longer have access to Edison Highway and would terminate in a cul-de-sac at Edison Highway.
- **Edison Highway**—Would have only one westbound and eastbound lane between Mount Vernon Avenue and Oswell Street.

Existing (2014) Bakersfield to Palmdale Project Section Build Alternative—City of Bakersfield: Intersection of 34th Street and L Street to Oswell Street

As described in Section 3.2.4.3 of the *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017a), the following closures are planned during peak hours of operation:

- **Sumner Street between Haley Street and Inyo Street**—Shut down two blocks at a time.
- **Edison Highway between Mount Vernon Avenue and Oswell Street**—Shut down in two stages, first between Mount Vernon Avenue and Quantico Avenue and then between Quantico Avenue and Oswell Street.

The following study intersections are projected to be affected due to construction:

- **Brown Street/Truxtun Avenue**—Sumner Avenue closure in the p.m. peak hour
- **Quantico Avenue/Edison Highway**—Stage 1: Edison Highway closure in the p.m. peak hour; Stage 2: Edison Highway Closure in the a.m. and p.m. peak hours
- **Oswell Front Street West/Edison Highway**—Stage 2: Edison Highway closure in the p.m. peak hour

Detailed analysis of impacts on circulation and emergency access during construction is included in Section 3.2.4.3 of the *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017b). Overall, additional trips resulting from project construction and temporary road/lane modifications during construction would be short-term and temporary, and would not substantially increase hazards, safety risks, or incompatible uses, or result in lack of emergency access.

The portion of the F-B LGA alignment from the intersection of 34th Street and L Street to Oswell Street would not substantially impact circulation, safety, and emergency access during operation for any transportation modes (i.e., passenger rail service, aviation, freight rail operations, transit, bicycles, and pedestrians). Additionally, this section of the alignment would not substantially change vehicle movements on the regional highway system.

Future Year (2035)[3] No Project—City of Bakersfield: Intersection of 34th Street and L Street to Oswell Street

All the roadway segments are anticipated to operate below LOS D under future year (2035) No Project conditions. Table 3.2-19 shows the intersections that are anticipated to operate below LOS D under year 2035 No Project conditions. Table 3.2-19 includes the delay in seconds for the AM and PM peak periods. Detailed analysis for this scenario is included in Section 3.2.4.2 of the *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017b).

[3] The transportation analysis of the F-B LGA alignment from the intersection of 34th Street and L Street to Oswell Street used 2035 as its horizon year based on information available at the time of preparation of the environmental document. Since the Supplemental EIR/EIS has been completed, the results are not subject to change. A horizon year of 2040 was used in the transportation analysis outside the Bakersfield to Palmdale Project Section (south of Oswell Street) based on information available at the time of preparation of the analysis.

Table 3.2-19 Future Year (2035) No Project Intersections Operating at Levels-of-Service E or F—City of Bakersfield

No.	Intersection	Control	2035 No Project Conditions			
			A.M. Peak		P.M. Peak	
			Delay	LOS	Delay	LOS
3	Beale Avenue/Sumner Street	Two-Way Stop	13.9	B	*>180	*F
4	Brown Street/Truxtun Avenue	Two-Way Stop	24.2	C	*77.1	*F

Source: California High-Speed Rail Authority, 2018b
Delay = Average control delay in seconds. (For two-way stop-controlled intersections, reported delay is for worst-case movement.)
* = Exceeds LOS standard
LOS = level-of-service

Future Year (2035) Bakersfield to Palmdale Project Section Build Alternatives—City of Bakersfield: Intersection of 34th Street and L Street to Oswell Street

As described in Section 3.2.4.3 of the *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* (Authority and FRA 2017b), there would be no impacts due to the project on any roadway segments or intersections under future (2035) B-P Build Alternative conditions. Figure 3.2-19 of the Fresno to Bakersfield Section Supplemental EIR/EIS shows the future year (2035) B-P Build Alternative peak-hour intersection LOS for the City of Bakersfield. Therefore, no substantial impacts from permanent road closures would occur.

CEQA Conclusion

Because the F-B LGA alignment from the intersection of 34th Street and L Street to Oswell Street involves roadway and other property disturbance during construction, temporary and permanent road closures, and roadway modifications to accommodate the HSR alignment, there is a potential for impacts to circulation, safety, and emergency access during construction and operation. In addition, there is the potential for operations impacts associated with vehicle movement on the regional highway system and roadway LOS. IAMFs required to be implemented for this alignment include: TRA-AM#2 (Maintenance of Pedestrian Access); TRA-AM#3 (Maintenance of Bicycle Access); TRA-AM#7 (Maintenance of Public Transit Access and Routes); TRA-AM#8 (Construction Transportation Plan); and TRA-AM#10 Protection of Freight and Passenger Rail during Construction). These IAMFs target all transportation modes in order to avoid or minimize impacts to these modes. Moreover, as explained above, changes in LOS are no longer considered a significant environmental impact under CEQA. Because the project would reduce VMT, it would be fully consistent with CEQA Guidelines Section 15064.3(b).

As discussed in Section 3.2.4.3 of the *Fresno to Bakersfield Section Final Supplemental EIR* (Authority 2018b), no substantial impacts would occur associated with: road closures (Impact TR #1 and Impact TR#3 in this Draft EIR/EIS); circulation or emergency access during construction or operation (Impact TR #2 and Impact TR #4 in this Draft EIR/EIS); continuous permanent impacts on VMT (Impact TR #5 in this Draft EIR/EIS); or roadway LOS (Impact TR #6 in this Draft EIR/EIS). Therefore, no significant impacts to transportation modes or emergency access would occur.

Bakersfield Station—F Street (Locally Generated Alternative)

Since the approval of the 2014 Record of Decision for the Fresno to Bakersfield Project Section, the Authority and the City of Bakersfield have agreed to consider an alternate station location at F Street. This alternative was evaluated through the preparation of a Supplemental EIR/EIS for the Fresno to Bakersfield Project Section. The public review period for the Supplemental EIR/EIS for the F-B LGA was November 9, 2017, to January 16, 2018. The HSR Board of Directors approved a motion to identify the F-B LGA as the preferred alternative in the Draft Supplemental EIR/EIS. The Board certified the Final Supplemental EIR on October 16, 2018. The Final EIS and Record of Decision were approved on October 31, 2019.

The transportation analysis for the Bakersfield Station—F-B LGA analyzed the transportation impacts of building an HSR station just north of the SR 204/F Street intersection and the changes that would occur in the transportation system due to construction of an HSR connection. The results of the analysis identified traffic congestion increases from passengers accessing the station.

The resulting analysis concluded that roadway segments and intersections in the station area would be adversely affected by the project, and mitigation measures were recommended to reduce these impacts. Following mitigation, the traffic impacts at all intersections would be reduced, and the impact would be less than significant under CEQA. However, effects on local circulation would occur in the congested areas of Bakersfield due to a lengthening of the duration of peak periods of congestion. The impact of this increased congestion would be less than significant under CEQA.

Bakersfield to Palmdale Project Section Construction Impacts

During construction, heavy construction activities, such as grading, excavating, constructing the railbed, and laying the tracks, would occur over an approximately 5-year period. Overall, construction activities are expected to take approximately 8 years. Table 2-24 in Chapter 2, Alternatives, describes the updated expected construction schedule. Overall, construction of any of the B-P Build Alternatives (including the CCNM Design Option and Refined CCNM Design Option) would involve temporary delays on roadways as well as roadway detours and closures. As stations and track installation are completed in certain cities, local disruptions would be reduced. The analysis below applies to all B-P Build Alternatives except where differences are noted.

Impact TR #1: Temporary Road Closures during Construction

Construction activities would require temporary lane or road closures for the B-P Build Alternatives (alignments [including the CCNM Design Option and the Refined CCNM Design Option], LMF/MOIS/MOWF locations, and the Palmdale Station) that would affect all transportation modes (emergency service providers, motorists, pedestrians, bicyclists, transit, etc.). For instance, construction of the HSR track alignment would require temporary construction easements, which may require the temporary closure of roadway travel lanes. It is expected that the temporary lane and roadway closures would vary in duration from 1 day to several weeks, depending on the type of work that would occur in a particular area (e.g., staging, removal of existing structures, modification of existing features, and construction of project components). Any road closure or removal as a result of temporary construction easements during construction would be temporary and would be minimized to the greatest extent possible. Upon completion of construction, all temporarily closed roadway lanes would reopen, and facilities that were temporarily removed would be restored.

Each B-P Build Alternative would result in approximately 50 temporary road closures. These closures would increase average vehicle delay times on affected roads, would increase average trip durations in the project vicinity, and would prompt some motorists and alternative transportation mode travelers to avoid traveling through the project vicinity to the extent alternate routes are available. The *Constructability Assessment Report* (Authority and FRA 2017b) presents additional detail on construction plans and roadways affected by temporary lane or road closures for the B-P Build Alternatives.

Construction adjacent to highways (e.g., SR 58 and SR 14) would result in temporary closure of traffic lanes, reduction of lane widths, reduced speed limits, temporary on- and off-ramp closures, detours, and temporary closure of the freeway for placement of structural elements or installation or removal of falsework. The duration of these construction activities could range from several hours in the case of a freeway closure to months in the case of lane-width reductions. These closures and restrictions would increase average vehicle delay times on affected roads, increase average trip durations in the project vicinity, and prompt some motorists and alternative transportation mode travelers to avoid traveling through the project vicinity to the extent alternate routes are available. Temporary road closures would predominantly affect local roads.

Temporary roadway closures for construction would not substantially increase traffic hazards because of minimization practices included in the CTP (TR-IAMF#2).TR-IAMF#2 would also minimize impacts associated with temporary road closures for construction on nearby sensitive uses (e.g., schools, day care centers, residences). For example, the CTP would include requirements such as temporary signage, advance detour notification, and provisions for safe pedestrian and bicycle passage or detours. The main goal of the CTP is to maintain traffic flow on major roadways during peak travel periods while maintaining access for emergency service providers, motorists, pedestrians, bicyclists, transit users, and businesses. Implementation of the CTP would take place in close consultation between the contractor and the affected city or county public works department, with the Authority providing review and approval of the CTP before commencing any construction activities. The CTP would address, in detail, activities to be carried out in each construction phase and would identify affected roadways. All construction personnel would receive training on the various CTP elements prior to working on a site where traffic control measures have been incorporated.

In addition, SOCIO IAMF#1 requires preparation of a Construction Management Plan that focuses on minimizing impacts to community residents and businesses. The Construction Management Plan would include specific protocols for communication with the public with regard to project impacts, including temporary road closures.

In rural areas, the primary traffic impacts during construction would occur at locations where overcrossings are needed to carry minor roadways over the tracks. At these locations, the affected roadway would either be rerouted onto a temporary alignment or temporarily closed. Temporary closures would be viable if traffic volumes on the affected roadway were very low and a detour route was available that did not require an extraordinary amount of additional travel (e.g., more than 10 miles in rural areas). Detours would be limited and would affect few travelers due to the low traffic volume on the local roads. The duration of the temporary construction impacts could range from a few weeks, with the construction impacts of a grade separation over the highway, to several months. The preliminary description of construction activities provided in the Constructability Assessment Report would be refined by the construction contractor during final project design (TR-IAMF#2).

The temporary closure or modification of some local roadways would affect existing property access and require provisions for alternative access. Temporary loss of property access would affect an estimated 500 properties under any of the B-P Build Alternatives. The CTP would include provisions for alternative access during closures, identify routes for construction traffic, and minimize access disruption to residents and businesses. Road closures required during construction would be limited to the hours that are least disruptive to access for the adjacent land uses.

Construction of the B-P Build Alternatives could affect school bus routes for the 37 schools shown in Table 3.2-13, requiring route changes and associated in minor delays. Although school bus routes could be temporarily obstructed during construction activities, alternative access routes would continue to be provided as a provision of the CTP (TR-IAMF#2). Advance notification of construction activities would be provided to the local school district, and traffic control would be rigorously maintained at all school bus loading zones. In addition, any damage to public roads would be repaired by the contractor, benefiting the school bus riders who use them (TR-IAMF#1).

CEQA Conclusion

As noted above, the location and duration of temporary roadway closures vary depending on the type of work in each area and have the potential to result in hazard risks or inadequate access. However, the transportation IAMFs include requirements to maintain circulation and access and avoid hazard risks for all affected transportation modes (transit, automobiles/trucks, pedestrians, and bicycles), thereby addressing temporary road closure impacts. TR-IAMF#2 specifically includes measures to limit temporary traffic interruptions from road closures by providing temporary signage, advance detour notification, and safe pedestrian, bicycle, and transit passage. TR-IAMF#4 (Maintenance of Pedestrian Access), TR-IAMF#5 (Maintenance of Bicycle Access), and TR-IAMF#11 (Maintenance of Transit Access) specifically address maintenance of

access for pedestrians, bicyclists, and transit, respectively. TR-IAMF#12 (Pedestrian and Bicycle Safety) specifically addresses pedestrian and bicyclist safety during construction and operation. Where temporary road closures and detours occur, full access would be restored following construction. Adherence to IAMFs and compliance with applicable regulatory requirements during construction of the B-P Build Alternatives (alignments [including the CCNM Design Option and the Refined CCNM Design Option], LMF/MOIS/MOWF locations, and the Palmdale Station) would address potential increases in hazards or incompatible uses for pedestrians and bicyclists. Impacts under CEQA would be less than significant and no mitigation measures are required.

Impact TR #2: Circulation and Emergency Access during Construction

Emergency vehicle access for police and fire protection services would be maintained at all times. Law enforcement, fire, and emergency services could experience increased response times due to construction-related road closures, detours, and increased traffic congestion in some locations. Delays could be longer in rural areas, where temporary road closures could result in several miles of out-of-direction travel to cross the alignment for each B-P Build Alternative.

Key concerns include shipping and receiving at produce packing house operators in the Edison area, since business activities are concentrated in the harvest season (which can vary depending upon the type of crop) and produce is perishable. These facilities would need adequate access to SR 58 during the harvest season.

Project-related construction traffic associated with the alternative alignments (including the CCNM Design Option and the Refined CCNM Design Option), LMF/MOIS/MOWF locations, and Palmdale Station would contribute to interference with pedestrians, bicyclists, and transit and automobile users where existing sidewalks, paths, and transit stops need to be temporarily closed or relocated to allow for construction of new facilities. Similarly, construction activities may create a temporary operational hazard or limit access to community facilities. This would include heavy truck traffic as materials are brought to the project site and as demolished or excavated materials are hauled out. Construction activities could require temporary lane or road closures and underground utility work.

Construction activities could also lead to both temporary disruption of transportation system operations and possible damage to elements of the roadway system, such as pavement and bridges.

All truck traffic, either for excavation or transporting construction materials to the site, would use the designated truck routes within each city.

The contractor would limit trips for construction workers during peak hours. The proposed project may involve building remote parking areas for these workers, with shuttles to bring them to and from the construction area if the remote parking areas are distant from the project site. Early construction of remote parking lots as the first phase of construction would make them available for construction workers to use for the remainder of the project.

The movement of heavy construction equipment (e.g., cranes, bulldozers, and dump trucks) to and from the site would generally occur during off-peak hours and on designated truck routes. Heavy construction equipment would remain on-site until no longer needed; such equipment would not be moved repeatedly to and from the construction site over public streets.

The construction of the HSR stations, platforms, and track alignment, as well as roadway improvements, may require the temporary closure of parking areas, roadway travel lanes, pedestrian facilities, bicycle lanes, and paths.

In the Lancaster area, Alternatives 1, 2, and 3 would relocate 8 miles of the UPRR and Metrolink track along a parallel alignment to make room for the project. To maintain freight and passenger rail service, a “shoofly track” (i.e., a bypass track) would be constructed prior to rail relocation to allow continuous rail operations. The existing tracks would remain in operation until the shoofly track is constructed to allow for little to no downtime for the UPRR and Metrolink operations. TR-IAMF#9 includes specific requirements to maintain passenger and freight rail operations. Alternative 5 would be located west of the existing UPRR and Metrolink facilities and would

therefore not require relocation of the existing UPRR and Metrolink tracks.TR-IAMF#1 through TR-IAMF#5 and TR-IAMF#7 through TR-IAMF#9, and TR-IAMF#11 through TR-IAMF#12 require adherence to specific procedures to avoid and minimize impacts to circulation and access for all transportation modes during the construction period.

The contractor would prepare a CTP for Authority approval and would implement the approved CTP for each stage of construction. This requirement is included in TR-IAMF#2. The CTP would be reviewed and approved by affected emergency responders and the affected cities to ensure that local circulation is not substantially impacted during the construction period.

Earthwork Truck Routes during Construction

The B-P Build Alternatives would require construction of a number of tunnels in the mountainous and hilly areas near Tehachapi. Dirt removed for these tunnels would be hauled to the flatter portions of the project vicinity east of Bakersfield and north of Palmdale to be used to construct grade separations where the HSR line would cross over roadways and other existing features. Haul trucks would utilize the project right-of-way as an access route.

Because the project right-of-way would be used as an access route, much of the hauling activity would not impact the existing transportation system. However, there are two cases where earthwork haul trips would interact with traffic, pedestrians, and bicycles on existing roadways:

- At locations where the project right-of-way crosses an existing arterial or local paved roadway and heavy traffic levels are present, temporary traffic control personnel (flaggers) would be needed to control traffic at the intersection.
- At locations where the project right-of-way crosses a freeway, construction trucks would need to divert from the project right-of-way and cross the freeway at the nearest existing grade separation.

The locations where haul trucks would need to divert from the project right-of-way are shown on Figure 3.2-3, Earthwork Haul Routes. Figure 3.2-3 also shows existing roadways, the HSR Build Alternatives alignment, proposed grade separations, and proposed roadway closures.

In order to avoid adverse impacts to circulation and emergency access during construction at local crossings of haul trucks, flaggers would be required at the following crossings of the project right-of-way with local roadways:

- SR 184/Weedpatch Highway
- E Brundage Lane
- S Edison Road
- Comanche Drive
- E Tehachapi Boulevard
- Highline Road
- Tehachapi Willow Springs Road (all crossings)
- Rosamond Boulevard
- 60th Street W
- Avenue A
- SR 138
- W Avenue F
- W Avenue G
- W Avenue K
- Columbia Way/E Avenue M
- W Avenue N
- West Avenue O

In order to avoid adverse impacts to circulation and emergency access at freeway crossings of haul trucks, temporary traffic control personnel would be provided to control the major intersections along SR 138 between 25th Street W and 15th Street. At all other locations, existing roadways could accommodate the additional earthwork haul trips.

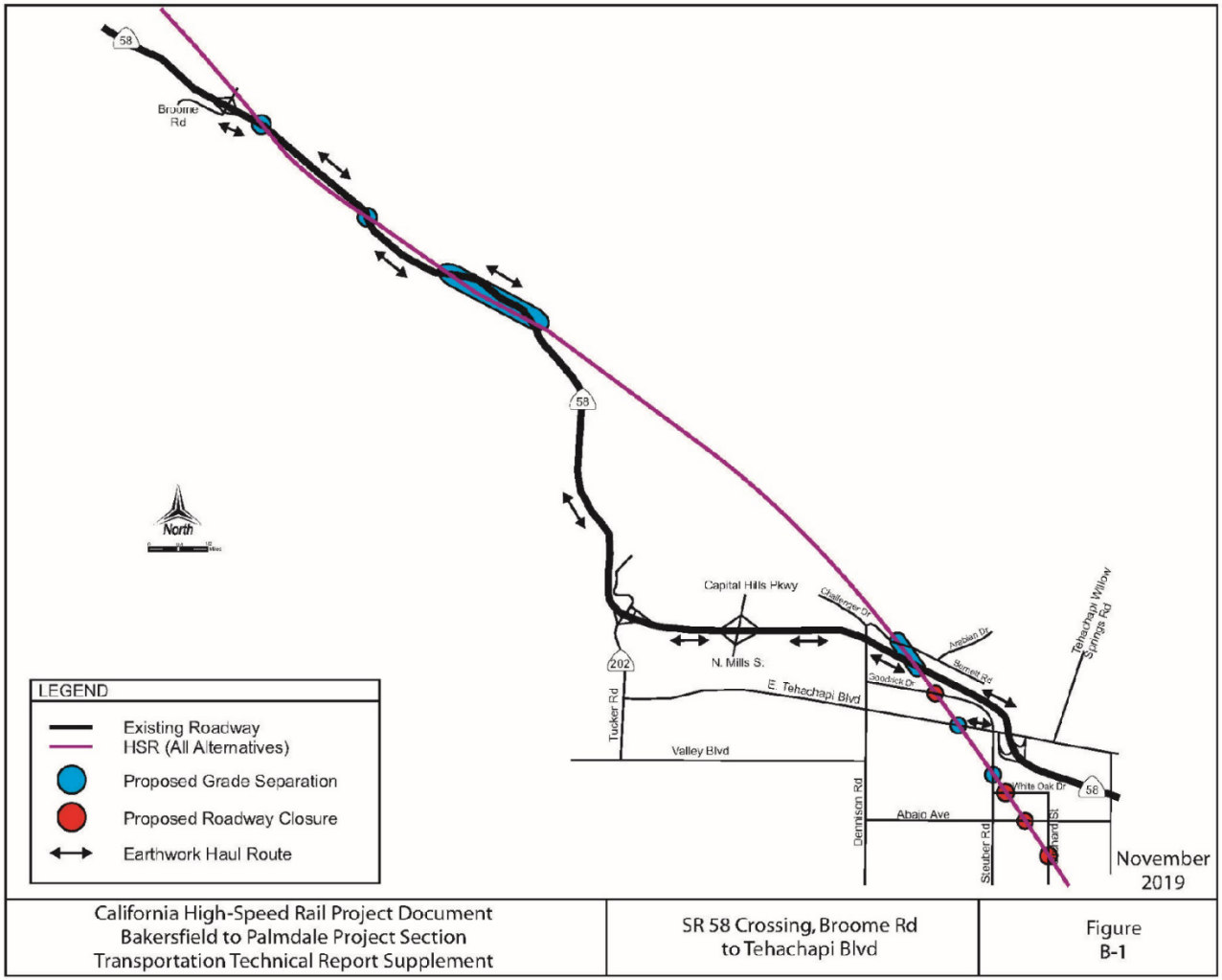

Figure 3.2-3 Earthwork Haul Routes

(Sheet 1 of 3)

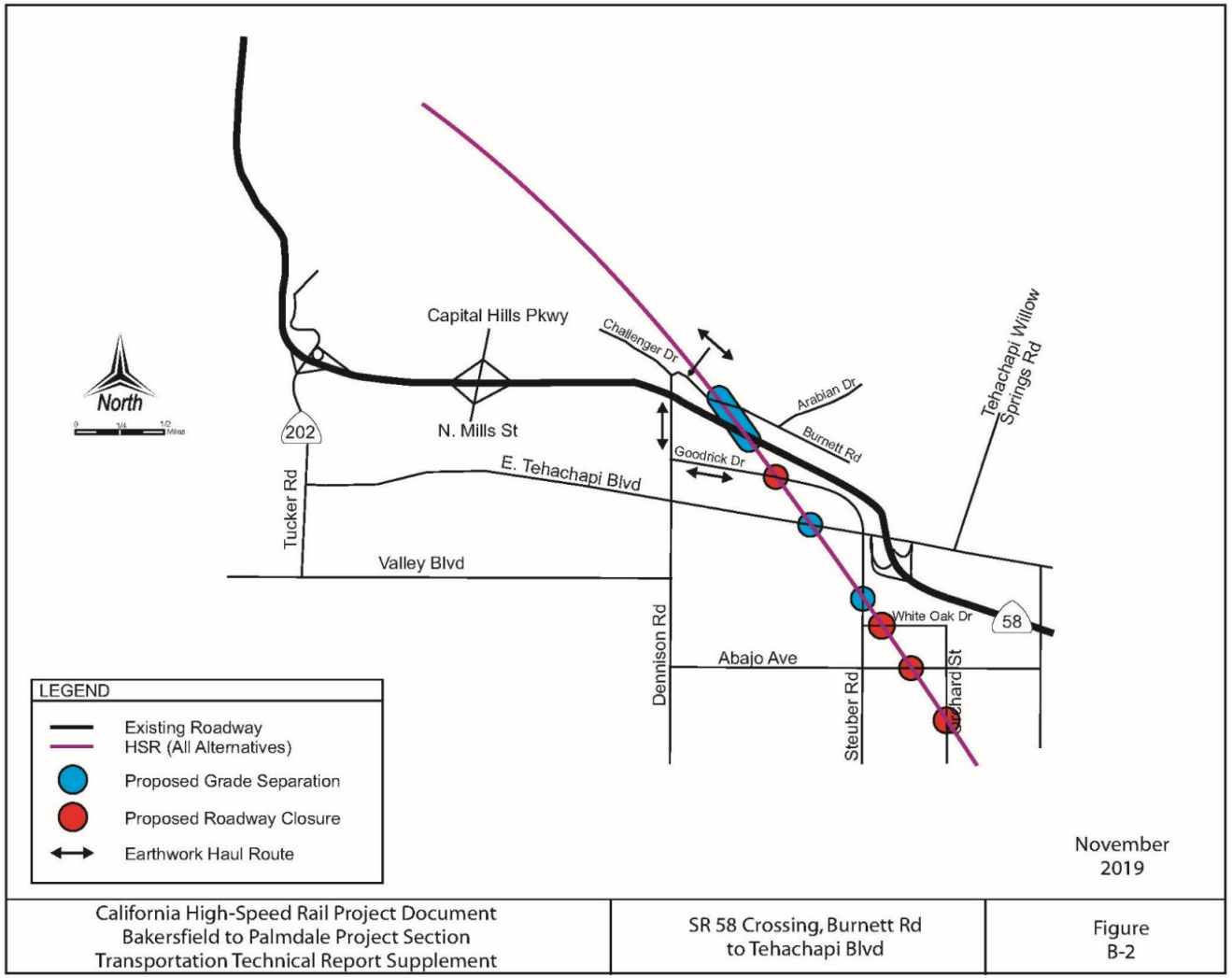

Figure 3.2-3 Earthwork Haul Routes

(Sheet 2 of 3)

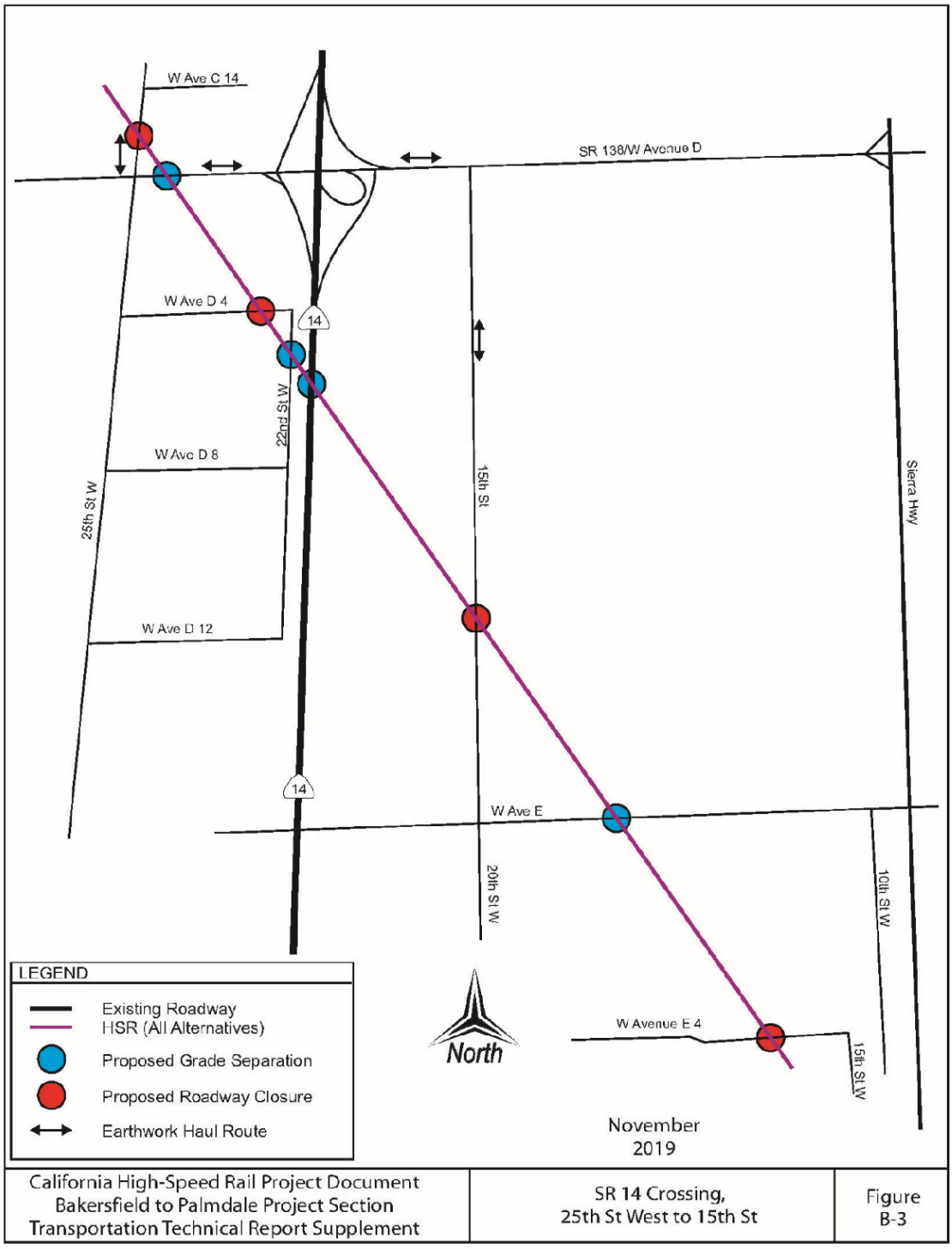

Figure 3.2-3 Earthwork Haul Routes

(Sheet 3 of 3)

Mitigation Measure TRAN-MM#2 includes the requirements for flaggers and temporary traffic control personnel at the specific locations described above. Therefore, with implementation of TRAN-MM#2, no adverse impacts on circulation and emergency access associated with earthwork haul routes during construction would occur.

CEQA Conclusion

There is a potential for the B-P Build Alternatives to result in circulation impacts and inadequate emergency access during the construction period due to the need for road closures, construction vehicles and equipment, staging areas, reconstruction and construction of transportation facilities, and earthwork haul routes. However, TR-IAMF#2 (Construction Transportation Plan) specifically includes measures to limit temporary traffic interruptions from road closures by providing temporary signage, advance detour notification, and 24-hour emergency access. In addition, SOCIO-IAMF#1 (Construction Management Plan) requires communication and access protocols to maintain access for emergency service providers and transportation users.

Several required IAMFs that support circulation and emergency access during construction include TR-IAMF#3 (Off-Street Parking for Construction-Related Vehicles), TR-IAMF#4 (Maintenance of Pedestrian Access), TR-IAMF#5 (Maintenance of Bicycle Access), TR-IAMF#6 (Restriction on Construction Hours), TR-IAMF#7 (Construction Truck Routes), TR-IAMF#8 (Construction During Special Events), TR-IAMF#9 (Protection of Freight and Passenger Rail During Construction), TR-IAMF#11 (Maintenance of Transit Access), and TR-IAMF#12 (Pedestrian and Bicycle Safety). These IAMFs would maintain access for all affected transportation modes and address circulation and emergency access impacts during construction. Adherence to IAMFs and compliance with applicable regulatory requirements during construction of the B-P Build Alternatives would address potential circulation and emergency access impacts related to road closures, construction vehicles and equipment, staging areas, and reconstruction and construction of transportation facilities.

However, in order to avoid significant impacts to circulation and emergency access associated with earthwork truck routes, flaggers/temporary traffic control personnel would be required at specific earthwork truck route intersection crossings. Mitigation Measure TRAN-MM#2 includes the specific requirements for flaggers/temporary traffic control personnel to avoid significant impacts. Therefore, impacts under CEQA would be less than significant with mitigation incorporated under any of the B-P Build Alternatives (alignments [including the CCNM Design Option and the Refined CCNM Design Option], LMF/MOIS/MOWF locations, and the Palmdale Station).

Bakersfield to Palmdale Project Section Operations Impacts

Project operations would include train operations, temporary system termini, mitigation maintenance, and HSR land use development. This section assesses transportation impacts resulting from the operation of the Bakersfield to Palmdale Project Section (alignments, LMF/MOIS/MOWF locations, and the Palmdale Station), which could involve direct or indirect operations impacts. The project does not include any geometric design features that would increase hazards in the transportation RSA. The analysis below applies to all B-P Build Alternatives except where differences are noted.

The CCNM Design Option and the Refined CCNM Design Option involve a modification to the alignments of Alternatives 1, 2, 3, and 5 to avoid physical impacts to Nuestra Señora Reina de La Paz/César E. Chávez National Monument. The CCNM Design Option and Refined CCNM Design Option are shown on Figure 2-57 in Chapter 2, Alternatives, of this EIR/EIS. The distance between the CCNM Design Option and the B-P Build Alternative Alignments is a maximum of 480 feet, and the distance between the Refined CCNM Design Option and the B-P Build Alternative alignments is a maximum of 2,870 feet in an undeveloped area. This option does not change the results of the B-P Build Alternatives operations impact analysis for road closures, circulation, and emergency access, regional movement on the highway system, or roadway operations LOS. As such, there is no additional discussion of the operations impacts of the CCNM Design Option or the Refined CCNM Design Option in this section.

Impact TR #3: Permanent Road Closures during Operation

Any of the B-P Build Alternatives would result in permanent road closures due to grade separations, which would result in permanent changes to circulation in those areas affected by the closures. The B-P Build Alternatives (alignments, LMF/MOIS/MOWF locations, and the Palmdale Station) would also result in the permanent closure or modification of some existing roadways. Traffic from permanently closed or modified roads would be diverted to other nearby streets, increasing traffic volumes and affecting the LOS on those streets still in service. However, permanent road closures were accounted for in the roadway LOS analysis under Impact TR #6. Alternatives 1, 2, and 5 would result in 44 permanent road closures on unpaved roads in rural areas, and Alternative 3 would result in 43 permanent road closures on unpaved roads in rural areas. The locations of the closures are shown on Figure 6-1 of the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a).

Local roads paralleling the proposed HSR alignment and used by rural communities and farm operations may be shifted and reconstructed to maintain their function. Access easements would be provided to maintain access to properties severed by the HSR alignment. Transportation routes modified by the B-P Build Alternatives would be reconstructed consistent with the local jurisdiction's general plan, in coordination with the local jurisdiction.

In general, permanent impacts on property access would result from permanent road closures, particularly when the road closure restricts or eliminates current access to a property, resulting in the property being landlocked. As currently proposed, the B-P Build Alternatives would only result in one permanent road closure that would result in a loss of property access. This closure affects an existing residence that uses Robert Ranch Road to access Tehachapi Willow Springs Road. This situation would apply to all B-P Build Alternatives.

The list of permanent road closures to be required for track alignment and grade separations would be finalized during the final design process by the design-build contractor. During final design, the Authority would identify where property access could be eliminated and would determine whether replacement or alternative access to the property could be provided. If a property's access would be permanently eliminated and no alternative access is available, the Authority would purchase the entire parcel and convert it to transportation uses. The owners of the parcels being acquired would be provided relocation assistance through adherence to the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (SOCIO-IAMF#2, Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act).

The track alignment and grade separations could potentially restrict access to property at certain locations. Access easements would be provided to many of the severed access properties. At certain locations, however, access would continue to be restricted.

Any permanent school bus route changes required by road closures associated with the B-P Build Alternatives would be identified as final design of the B-P Build Alternatives is completed, allowing schools sufficient time to evaluate their existing routes and make any necessary adjustments. Based on the current proposed design, the maximum out-of-direction travel distance for school buses would be 2 miles. However, because no schools would be physically affected by the B-P Build Alternatives, buses could be rerouted to continue to provide service, and no permanent impacts on the ability of school buses to pick up children would be expected.

CEQA Conclusion

Each of the B-P Build Alternatives would result in permanent road closures and grade separations, which would change circulation patterns that have the potential to result in design hazards or incompatible uses. However, the grade-separated intersections would reduce traffic delays and hazards for all transportation modes. In addition, the B-P Build Alternatives do not include sharp curves or dangerous intersections. Farm roads would be shifted to maintain function, and new roadway facilities would accommodate alternative transportation modes such as transit, pedestrian, and bicycle, consistent with the requirements of the local jurisdiction, which would include improvements to the existing condition. Adherence to IAMFs and compliance with

applicable regulatory requirements would address potential geometric design feature or incompatible use hazards. Impacts under CEQA would be less than significant under any of the B-P Build Alternatives (alignments, LMF/MOIS/MOWF locations, and the Palmdale Station) and no mitigation is required.

Impact TR #4: Circulation and Emergency Access during Operation

Transit

High-Speed Rail Project Alignments

Outside of the Palmdale Station area, the B-P Build Alternative alignments would generally have little or no effect on the transit system, since roadways served by transit would be grade-separated from the proposed HSR line. The LMF/MOIS/MOWF locations would have little or no effect on the transit system due to their localized footprints. In a few cases in the Lancaster area, roadways served by transit would be modified slightly. At the intersections of Sierra Highway with Avenue G, Avenue H, Avenue I, Milling Street, Avenue J, Avenue K, and Avenue L, and Columbia Way, the project proposes to build or modify grade separations so that the east-west crossing roadways are grade-separated from Sierra Highway, the parallel freight rail line, and the HSR line. These new and modified grade separations would require minor roadway modifications and slight rerouting of bus routes operated by AVTA.

Portions of Sierra Highway in Lancaster are proposed to be relocated to the west. Bus routes using this roadway would operate on a modified roadway with implementation of the project.

Palmdale Station Area

A number of changes would be made to the roadway system and station infrastructure in Palmdale that may require changes to the current transit services in the area. In particular, the Palmdale Transportation Center and Metrolink station would be relocated south to the proposed HSR station location. AVTA Routes 1, 2, 3, 7, and 10 and its commuter routes would need to be rerouted accordingly. Metrolink access would also change to the new location.

A number of modifications to the roadway system in the City of Palmdale are proposed that would affect bus routes traveling on Avenue P, Avenue Q, and Palmdale Boulevard as well as Sierra Highway. Scheduling and route adjustments would be required for each operator.

The project was forecasted to add approximately 18 peak-hour transit riders at the Palmdale Station. These include local/regional bus and local/regional/intercity rail passengers. Rail passengers would likely directly transfer between the HSR service and Metrolink trains at the Palmdale Station. Depending on the number of routes that would connect with the station, the additional ridership on each provider during the peak hours would be relatively low. Therefore, existing and planned transit facilities serving the vicinity of the proposed Palmdale Station are expected to be adequate to meet the project demand.

In the Palmdale Station area, the project would be expected to increase transit ridership as the station areas would be expected to see increased activity with implementation of the project. It is expected that transit routes and scheduling would be revised to accommodate this increase in transit ridership.

Pedestrian and Bicycle Facilities

High-Speed Rail Project Alignments

Existing pedestrian facilities within the project vicinity consist of sidewalks located along roadways that cross or are adjacent to the proposed HSR line. All pedestrian facilities modified by the B-P Build Alternative alignments and LMF/MOIS/MOWF locations would be reconstructed along roadways, consistent with the local jurisdiction's general plan, in coordination with the local jurisdiction.

Loss of pedestrian and bicycle access associated with the B-P Build Alternative alignments would be limited to a few elevated segments. Permanent changes to pedestrian and bicycle facilities would include enhanced and safe access for bicyclists due to new grade-separated crossings, which is a beneficial effect.

All major roads shown as part of the Kern County and City of Bakersfield bicycle plans would be grade-separated from the HSR system and would allow for current and future planned bikeways.

Within the City of Tehachapi, the planned bikeway along Burnett Road would be accommodated since the HSR alignment would be grade-separated as it crosses Burnett Road. No other existing or planned bikeways in Tehachapi would be affected by the HSR project.

The B-P Build Alternative alignments would parallel Sierra Highway in the City of Lancaster and into the City of Palmdale. The B-P Build Alternative alignments would provide for a Class II bikeway (on-street facility) along Sierra Highway in central Lancaster and a Class I bikeway (separated facility) extending into the City of Palmdale to the south. Along some portions of Sierra Highway, a Class II bikeway is in place and would remain in place with the B-P Build Alternatives. In other locations, the HSR project would rebuild Sierra Highway to include a Class II bikeway. In the southern portion of the City of Lancaster and the northern portion of the City of Palmdale, the B-P Build Alternatives would relocate Sierra Highway to a new alignment and would build a new parallel Class I bikeway,

In addition to designated bikeways, bicycle travel in the transportation RSA occurs along local roadways. All bicycle facilities modified by the project would be reconstructed consistent with the local jurisdiction's general plan.

Palmdale Station Area

Five new pedestrian overcrossings are proposed between Avenue Q and Palmdale Boulevard to provide pedestrian access across the HSR and railroad tracks, and to connect to and from the HSR station entry points.

The proposed Palmdale Boulevard overpass would close the current pedestrian crossing between Fifth Street and Sierra Highway. The Palmdale Boulevard overpass would provide sidewalks, curb ramps, and crosswalks along Palmdale Boulevard and at the intersections of Palmdale Boulevard at Fourth/Fifth Street and 10th Street.

The proposed Avenue R overpass would close the current pedestrian crossing between Sierra Highway and Fifth Street. The proposed Avenue R overpass would provide sidewalks, curb ramps, and crosswalks along the Avenue R overpass and at the intersections with Fifth Street and 10th Street.

The proposed Fourth/Fifth Street and Sierra Highway realignment would close the existing direct connection of Technology Drive and Sierra Highway. The new roadway alignments would continue to provide access to Sierra Highway via the Fourth/Fifth Street realignment connection. The realignment of these roadways proposes to provide pedestrian sidewalks, curb ramps, and crosswalks along Fourth/Fifth Street and Sierra Highway, including the new intersections at Fourth/Fifth Street and Sierra Highway and Fourth/Fifth Street at Technology Drive.

The Palmdale Station would include bike racks, pedestrian connections to the existing sidewalks, and bike connections to existing and planned facilities. Existing and planned pedestrian and bicycle facilities serving the vicinity of the proposed Palmdale Station are expected to adequately meet project demand. The proposed project would add approximately 12 peak-hour nonmotorized trips to the network. Existing and planned pedestrian and bicyclist facilities serving the vicinity of the proposed Palmdale Station are expected to be adequate to meet project demand.

Passenger Rail Service

Passenger rail service would improve as a result of project implementation. Currently, passenger rail service is provided from Bakersfield to the north and from Los Angeles to the south, west, and east via Amtrak. In addition, Amtrak provides connecting bus service between Bakersfield and Los Angeles. The project would provide rail passenger service between Los Angeles and Bakersfield that would replace the existing Amtrak bus service with faster, more convenient service. Metrolink currently provides commuter rail service between Lancaster and Los Angeles, and would continue to provide this service with implementation of the project.

The B-P Build Alternatives would provide services and facilities that complement existing passenger rail services and therefore would not conflict with adopted programs regarding public transit or otherwise decrease the performance of public transit facilities.

Aviation

The Bakersfield to Palmdale Project Section of the HSR project is not adjacent to any existing or planned commercial aviation facilities. Therefore, it would not have any impact on the operation of these facilities. Implementation of the overall HSR project would be expected to result in some changes in the demand for air travel on a statewide basis. No airports that serve commercial aviation are located within the transportation RSA. However, Palmdale Regional Airport is located approximately 1 mile east of the proposed project right-of-way in the northern portion of the city of Palmdale. This airport does not currently offer passenger aviation, but it has offered this service in the past and it has been discussed as a potential location for passenger aviation in the future. BFL, which serves the Bakersfield area, is approximately 15 miles northwest of the northern limit of the project vicinity and would be expected to experience a reduction in demand as a result of the project. Demand for some trips otherwise expected to be made by air would be made using HSR instead. However, the overall HSR system would provide more convenient access to airports for some travelers. This may result in increased demand for air travel in some cases.

While the additional transportation facilities may change air travel demand on a statewide basis, they would also provide more convenient access to airports. The B-P Build Alternatives would not conflict with adopted aviation programs or otherwise decrease the performance of aviation facilities.

Freight Rail

The HSR project would not have any effect on freight rail lines for most of the project alignment, because the HSR line would be a separate system and all proposed crossings of the project and the freight rail lines would be grade separated. In the southern part of the Bakersfield to Palmdale Project Section, the HSR alignments would be adjacent to existing freight rail right-of-way. As discussed in Section 3.5, Electromagnetic Interference and Electromagnetic Fields, EMI/EMF-IAMF#2 requires coordination between the HSR team and freight rail operators to avoid conflicts between the two facilities.

The additional transportation facilities would be on a separate system independent of freight rail. The B-P Build Alternatives would not conflict with adopted freight rail programs or otherwise decrease the performance of freight rail facilities.

The B-P Build Alternatives would not conflict with adopted freight rail programs or otherwise decrease the performance of freight rail facilities. In addition, the B-P Build Alternatives would not permanently sever any freight rail service.

Emergency Access

The B-P Build Alternatives 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. The overall reduction of vehicle trips and the improvement to regional roadway LOS would contribute to the beneficial effects of the project.

It is expected that reduction of trips on the regional roadway system would improve access overall for emergency service providers. With grade separations and other roadway improvements included as part of the project, a beneficial impact on emergency service providers is anticipated.

CEQA Conclusion

As a new transportation facility, any of the B-P Build Alternatives (alignments, LMF/MOIS/MOWF locations, and the Palmdale Station) has the potential to impact circulation and increase hazards for other transportation modes in the RSA as well as impair emergency access. However, the B-P Build Alternatives would provide services and facilities that complement existing passenger rail services and would be located on a separate system independent of freight rail. In addition, the B-P Build Alternatives would have little or no effect on the transit system, with only slight rerouting of bus routes. Any changes in bus transit ridership would occur gradually, allowing bus schedules

to be revised. The B-P Build Alternatives would not conflict with adopted programs regarding passenger rail, freight rail, public transit, aviation, pedestrian, or bicycle, or otherwise decrease the performance of these facilities.

EMI/EMF-IAMF#2 requires coordination between the HSR team and freight rail operators to avoid conflicts between the two facilities. TR-IAMF#1 requires repair of roads damaged during construction, and TR-IAMF#9 requires repair of freight or public railways damaged during construction, which would benefit all transportation modes.

Loss of pedestrian and bicycle access associated with the B-P Build Alternatives would be limited to a few elevated segments. Permanent changes to pedestrian and bicycle facilities would include enhanced and safe access for bicyclists due to new grade-separated crossings, which is a beneficial effect.

IAMFs and applicable regulatory requirements would address potential hazards for public transit, pedestrians, or bicyclists and emergency access. Impacts under CEQA would be less than significant for any of the B-P Build Alternatives.

Impact TR #5: Continuous Permanent Impacts on Vehicle Miles Traveled

The statewide travel demand model provided an estimate of 2040 statewide daily VMT for the No Project and Plus Project scenarios. Information for Kern and Los Angeles Counties is presented in Table 3.2-20. This table shows annual VMT levels in 2040 expected to occur both with and without the HSR project as well as the net change in annual VMT. The range in the table represents the medium to high ridership forecasts. In both Kern and Los Angeles Counties, a reduction in VMT is expected to occur with implementation of the HSR project. The VMT reduction is due to reduced vehicle trips as those trips divert to HSR as a mode of travel. Compared to future background conditions, an approximate 1.772 billion to 2.436 billion overall reduction in daily VMT is projected for the two counties.

Table 3.2-20 Annual Vehicle Miles Traveled

County	Existing (2015) VMT	Future Year (2040) No Project Alternative VMT[1]	Future Year (2040) Plus Project VMT[1]	Net Reduction in VMT Plus Project (2040)[1]
Kern	4,094,480,903 to 4,152,310,619	5,789,706,865 to 6,659,048,685	4,948,613,229 to 5,509,402,743	841,093,636 to 1,149,645,942
Los Angeles	73,236,845,700 to 73,394,193,078	86,055,909,405 to 87,075,870,799	85,124,593,011to 85,788,971,213	931,316,394 to 1,286,899,586
Total (two counties)	77,331,326,603 to 77,546,503,697	91,845,616,270 to 99,734,919,485	90,0736,206,240 to 91,298,373,956	1,772,410,030 to 2,436,545,528

Source: California High-Speed Rail Authority, 2018a
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 ranges of ridership forecasts, consistent with 2040 scenarios as forecasts presented in the California High-Speed Rail Authority's 2016 Business Plan (Authority 2016). 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.
VMT = vehicle miles traveled

The change in VMT represents total number of vehicle miles driven that would be removed from regional roadways. 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. The reduction of VMT on regional roadways is considered a beneficial impact of the project. VMT would be reduced with the commencement of HSR operations, and VMT reductions would be expected to increase with each year of HSR operations. See the Transportation Technical Report for data on VMT reduction in the opening year of HSR operations.

CEQA Conclusion
The B-P Build Alternatives (Future Year [2040] Plus Project) would reduce VMT when compared to the 2040 No Project scenario, which would be a beneficial impact of the project. Because the project would reduce VMT, it would be fully consistent with CEQA Guidelines Section 15064.3(b) and no mitigation is required.

Impact TR #6: Roadway Levels-of-Service during Operation

Traffic forecasts for the No Project Alternative were based on the Kern Council of Governments regional travel model in the Kern County portion of the transportation RSA and the Southern California Association of Governments regional model in the Los Angeles County portion of the transportation RSA. The traffic forecasts were based on the high ridership forecasts, consistent with the 2040 scenarios, as presented in the Authority's 2016 Business Plan (Authority 2016). According to the RTPs for the Kern COG and the Southern California Association of Governments, none of the transportation RSA roadways have funded and programmed roadway improvements. Future transportation improvements were incorporated into the transportation models used as the basis for traffic forecasts, but these improvements would not result in changes in roadway configurations in the transportation RSA for detailed analysis.

The LMF/MOIS/MOWF locations are not analyzed separately because, while these facilities would generate a few trips, the trip increase would not be high enough to warrant a detailed analysis.

Please refer to the corresponding tables in the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a) cited in the sections below for the results of all intersections and roadway segments in the transportation RSA that did not exceed LOS thresholds. As discussed in Section 3.2.5.7, an increase in traffic at an unsignalized intersection that would not meet traffic signal warrants would not be considered a significant impact. Likewise, signalized intersections that would not exceed the identified increase in delay and roadway segments that would not exceed the identified increase in V/C ratio would not be considered an impact that requires mitigation. Furthermore, freeway off-ramps that would not exceed the available storage area and freeway segments that would not meet the identified LOS and increase in V/C ratio would not be considered an impact that requires mitigation.

Existing (2016) Plus Construction
Table 3.2-21 provides a summary of intersections and roadway segments operating at LOS E or F for either the AM or PM peak period for the Existing (2016) condition or the Existing (2016) Plus Construction condition. Table 3.2-21 includes the applicable jurisdiction, whether or not there is an impact, the proposed mitigation for each impact, and the LOS after mitigation, as applicable. As shown in Table 3.2-21, the Existing (2016) Plus Construction condition would in some instances reduce the LOS (increase delay) at an intersection or on a roadway segment; however, these reductions would not exceed the V/C threshold. Therefore, there would be no impacts associated with the completion of the B-P Build Alternatives prior to operation.

There would be impacts to one intersection (20th Street E at Avenue Q) and one roadway segment (10th Street E south of Avenue R) in the City of Palmdale as a result of completion of the Palmdale Station, as shown in Table 3.2-21. TRAN-MM#3 Identifies the roadway widening improvements for these facilities to meet thresholds, which would reduce congestion. Roadways modified by the B-P Build Alternatives would be reconstructed consistent with the local jurisdiction's general plan, which would maintain or improve the existing condition. The Authority has been working closely with local jurisdictions (including the City of Palmdale) with respect to project impacts and has identified mitigation for those impacts. It is reasonable to expect that the City of Palmdale would assume the right-of-way and maintenance responsibilities for any intersection and roadway improvements identified in TRAN-MM#3 such that the mitigation measure is feasible. Therefore, if TRAN-MM#3 is implemented, no adverse impacts would occur to study area roadway segments and intersections based on LOS thresholds.

Table 3.2-21 Roadway Levels-of-Service, Existing (2016) and Existing (2016) Plus Construction

Jurisdiction	Intersection or Roadway Segment	Existing (2016)		Existing (2016) Plus Construction					LOS After Mitigation
		Exceeds LOS Target?		Exceeds LOS Threshold?		Meets Signal Warrants?	Impact?[1]	Identified Mitigation	
		A.M.	P.M.	A.M.	P.M.				
Signalized Intersections									
City of Lancaster	W Avenue K at Division Street	No	Yes, LOS E	No	No	N/A	No	N/A	
	Sierra Highway at Columbia Way	Yes, LOS E	Yes, LOS F	No	No	N/A	No	N/A	
City of Palmdale	Sierra Highway at Rancho Vista Boulevard[2]	No	Yes, LOS E	No	No	N/A	No	N/A	
	20th Street E at Avenue Q[2]	No	No	No	Yes, LOS F	N/A	Yes	Widen intersection; add eastbound through lane	C
	50th Street E/47th Street at Palmdale Boulevard[2]	Yes, LOS E	No	Yes, LOS F	Yes, LOS E	N/A	No	N/A	
	US-395 at Palmdale Road[2]	No	Yes, LOS E	No	Yes, LOS F	N/A	No	N/A	
Unsignalized Intersections									
City of Lancaster	W Avenue I at Yucca Avenue	Yes, LOS E	Yes, LOS F	No	Yes, LOS E	No	No	N/A	
	W Avenue I at Spearman Avenue	No	Yes, LOS E	No	No	No	No	N/A	
	W Avenue J at Cedar Avenue	No	Yes, LOS F	Yes, LOS F	Yes, LOS F	No	No	N/A	
	W Avenue J8 at Sierra Highway	No	Yes, LOS E	No	Yes, LOS E	No	No	N/A	
	Columbia Way at 3rd Street E	No	No	Yes, LOS E	Yes, LOS F	No	No	N/A	
	Columbia Way at 5th Street E	No	No	Yes, LOS F	Yes, LOS F	No	No	N/A	
City of Palmdale	10th Street E at Avenue P[2]	Yes, LOS E	Yes, LOS E	Yes, LOS F	Yes, LOS F	No	No	N/A	
	Sierra Highway at Angeles Forest Highway[4]	No	Yes, LOS F	N/A[5]	N/A[5]	N/A	N/A	N/A	
	Sierra Highway at SR 14 Southbound Ramps[4]	No	Yes, LOS F	N/A[5]	N/A[5]	N/A	N/A	N/A	

Jurisdiction	Intersection or Roadway Segment	Existing (2016)		Existing (2016) Plus Construction					LOS After Mitigation
		Exceeds LOS Target?		Exceeds LOS Threshold?		Meets Signal Warrants?	Impact?[1]	Identified Mitigation	
		A.M.	P.M.	A.M.	P.M.				
Roadway Segments									
County of Kern	Oswell Street, Pioneer Drive to Potomac Avenue	Yes, LOS F	Yes, LOS F	Yes, LOS F	Yes, LOS F	N/A	No	N/A	
City of Lancaster	Columbia Way/E Avenue M, 3rd Street to 5th Street	Yes, LOS E	Yes, LOS F	No	No	N/A	No	N/A	
	Sierra Highway, Columbia Way to Avenue N	No	Yes, LOS F	No	No	N/A	No	N/A	
City of Palmdale	10th St E south of Avenue R[2]	No	No	No	Yes, LOS F	N/A	Yes	Widen roadway from two to four lanes	A
	Avenue Q east of Sierra Highway[2]	No	No	Yes, LOS F	Yes, LOS F	N/A	No	N/A	
	Avenue S east of 10th Street E[2]	No	Yes, LOS E	No	Yes, LOS E	N/A	No	N/A	
	Sierra Highway, north of Avenue P[2]	No	Yes, LOS F	No	No	N/A	No	N/A	
	Sierra Highway, Avenue N to Avenue O	Yes, LOS F	Yes, LOS F	No	No	N/A	No	N/A	

[1] Even if the LOS threshold is exceeded, there is no impact if the threshold for increase in the V/C ratio due to the project would not be exceeded.
[2] Palmdale Station intersection or roadway segment, SR14 Alternative Palmdale HSR Station Area
[3] Palmdale Station intersection or roadway segment; SR14 Alternative – Central Subsection Study Area
[4] Palmdale Station intersection or roadway segment, E1 Alternative – Central Subsection Study Area
[5] Intersection or roadway closed as part of the B-P Build Alternatives
[6] New intersection or roadway segment proposed as part of the B-P Build Alternatives
B-P = Bakersfield to Palmdale Project Section
LOS = level(s)-of-service
N/A = not applicable
SR = State Route
V/C = volume-to-capacity

Within the Bakersfield to Palmdale Project Section, the B-P Build Alternative alignments would cross over several freeway segments but would not make changes in lane configurations or other geometric design features related to the capacity of any freeways or ramps. The B-P Build Alternative alignments, on their own, are not expected to add a substantial number of trips to any freeway segment or ramp. Therefore, there was no need to conduct freeway capacity analysis or ramp capacity analysis. The Existing (2016) Plus Construction condition would result in localized traffic rerouting that would not affect ramps or freeway segments.

Freeway segment traffic volumes and lane geometry would not be anticipated to be affected by the Palmdale Station in the Existing (2016) Plus Construction conditions.

Traffic operations for Existing (2016) Plus Construction conditions for the B-P Build Alternative alignments are shown in Tables 6-7 through 6-10 of the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a). Traffic operations for Existing (2016) Plus Construction conditions with construction of the Palmdale Station are shown in Tables 6-17, 6-18, 6-19, and 6-20 of the *Palmdale to Burbank Project Section Transportation Technical Report* (Authority 2017).

Future Year (2040) No Project

Several intersections and roadway segments would exceed the LOS targets in the No Project Alternative conditions as shown in Table 3.2-21.

Ramp queuing analysis was conducted for off-ramp locations where the project would contribute 100 or more trips to the off-ramp. Based on this criterion, the SR 14 southbound ramps at 10th Street W (Intersection No. 1) queueing analysis is provided for 2040 No Project conditions. For the off-ramp, the 95th percentile queue calculated in Synchro 9.0 during the a.m. peak hour is approximately 38 feet. During the p.m. peak hour, the approximate queue is 326 feet. Given that existing storage capacity on the ramp is approximately 900 feet, adequate storage would be available during both peak hours.

Freeway segment analysis was conducted for the two freeway segments that would be potentially most affected by Palmdale Station traffic: SR 14 north of 10th Street W and SR 14 south of Avenue S. For both segments, it is expected that LOS thresholds would not be exceeded in either the a.m. or p.m. peak hours.

Traffic operations for Future Year (2040) No Project conditions are shown in Tables 6-4, 6-5, and 6-6 of the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a).

Future Year (2040) Plus Project

Table 3.2-22 shows intersections and roadway segments operating at LOS E or F for either the AM or PM peak period in the Future Year (2040) No Project condition and the Future Year (2040) Plus Project condition. Table 3.2-22 includes the applicable jurisdiction, whether or not there is an impact, the proposed mitigation for each impact, and the LOS after mitigation, as applicable. As seen in Table 3.2-22, several intersections and roadway segments that have unacceptable LOS in the No Project condition have acceptable LOS under the B-P Build Alternatives condition, which is a beneficial effect. In addition, five intersections that have unacceptable LOS in the No Project condition would be closed in the B-P Build Alternatives condition to accommodate the B-P Build Alternatives. These closures would not substantially impact LOS on other roadways in the RSA because new roadways built by the project would have sufficient capacity to handle expected traffic demands. Table 3.2-22 also shows that in some instances, the B-P Build Alternative alignments would reduce the LOS (increase delay) at an intersection or on a roadway segment; however, these reductions would not exceed the V/C threshold. Therefore, there would be no impacts associated with the B-P Build Alternative alignments.

One roadway segment (W Milling Street between Cedar Avenue and Sierra Highway) would be constructed as part of the B-P Build Alternatives.

Table 3.2-22 Roadway Levels-of-Service, Future Year (2040) No Project and Future Year (2040) Plus Project Conditions

Jurisdiction	Intersection or Roadway Segment	No Project (2040		Future Year (2040) – Plus Project (2040)					LOS after Mitigation
		Exceeds LOS Target?		Exceeds LOS Threshold?		Meets Signal Warrants?	Impact?[1]	Identified Mitigation	
		A.M.	P.M.	A.M.	P.M.				
Signalized Intersections									
City of Lancaster	W Avenue I/Sierra Highway	No	Yes, LOS F	Intersection would not exist in the Plus Project condition					
	W Avenue J/Sierra Highway	No	Yes, LOS E	Intersection would not exist in the Plus Project condition					
	Sierra Highway at Columbia Way	Yes, LOS E	Yes, LOS F	No	No	N/A	No	N/A	
City of Palmdale	10th Street E at Avenue Q[2]	No	No	No	No	N/A	No	N/A	
	10th Street W at Rancho Vista Boulevard[2]	No	No	No	Yes, LOS E	N/A	No	N/A	
	Sierra Highway at Rancho Vista Boulevard[2]	Yes, LOS F	Yes, LOS F	No	No	N/A	No	N/A	
	Sierra Highway at Palmdale Boulevard[2]	No	Yes, LOS F	Intersection would not exist in the Plus Project condition					
	SR 14 southbound on-ramp at Rancho Vista Boulevard[2]	No	Yes LOS E	No	Yes, LOS E	N/A	Yes	Provide a traffic signal with westbound continuous green phase	A
	25th Street E at Palmdale Boulevard[2]	Yes, LOS E	Yes, LOS F	Yes, LOS E	Yes, LOS F	N/A	No	N/A	
	50th Street E/47th Street E at Palmdale Boulevard[2]	Yes, LOS F	Yes, LOS F	Yes, LOS F	Yes, LOS F	N/A	Yes	▪ Reconfigure southbound approach to include an additional lane on each approach (shared through/right and left lane) ▪ Reconfigure westbound approach to include an additional lane on each approach (shared through/left and right lane)	F

Jurisdiction	Intersection or Roadway Segment	No Project (2040		Future Year (2040) – Plus Project (2040)					LOS after Mitigation
		Exceeds LOS Target?		Exceeds LOS Threshold?		Meets Signal Warrants?	Impact?[1]	Identified Mitigation	
		A.M.	P.M.	A.M.	P.M.				
	Fort Tejon Road/ Pearblossom Highway at Pearblossom Highway/ Avenue T[2]	No	Yes, LOS F	No	Yes, LOS F	N/A	Yes	Modify signal timing ▪ Provide eastbound right-turn overlap phasing ▪ Provide westbound right-turn overlap phasing ▪ Optimize cycle length and splits	D
	U.S. Route 395 at Palmdale Road[2]	No	Yes, LOS F	No	Yes, LOS F	N/A	Yes	Modify signal timing: ▪ Optimize cycle length and splits	E
Unsignalized Intersections									
City of Lancaster	W Avenue I/Yucca Avenue	Yes, LOS E	Yes, LOS F	No	Yes, LOS E	No	No	N/A	
	W Avenue I/Spearman Avenue	No	Yes, LOS F	No	No	No	No	N/A	
	W Avenue J/Cedar Avenue	Yes, LOS F	No	No	No	No	No	N/A	
	W Avenue J/Trevor Avenue	Yes, LOS F	Yes, LOS F	Intersection would not exist in the Plus Project condition					
	W Avenue J8/Sierra Highway	No	No	No	Yes, LOS E	No	No	N/A	
	Columbia Way at 3rd Street E	Yes, LOS F	Yes, LOS F	Yes, LOS E	Yes, LOS F	No	No	N/A	
	Columbia Way at 5th Street E	Yes, LOS F	Yes, LOS F	Yes, LOS F	Yes, LOS F	No	No	N/A	
	Sierra Highway/W Avenue G	No	Yes, LOS F	No	Yes, LOS F	No	No	N/A	

Jurisdiction	Intersection or Roadway Segment	No Project (2040		Future Year (2040) – Plus Project (2040)					LOS after Mitigation
		Exceeds LOS Target?		Exceeds LOS Threshold?		Meets Signal Warrants?	Impact?[1]	Identified Mitigation	
		A.M.	P.M.	A.M.	P.M.				
City of Palmdale	3rd Street E at Avenue Q[2]	No	No	No	Yes, LOS F	Yes	Yes	Provide a traffic signal	D
	6th Street E at Avenue R	No	Yes, LOS F	Intersection would not exist in the Plus Project condition					
	20th Street E at Avenue Q[2]	Yes, LOS F	Yes, LOS F	Yes, LOS F	Yes, LOS F	Yes	Yes	Widen intersection: add eastbound through lane	F
	25th Street E at Palmdale Boulevard[2]	Yes, LOS E	Yes, LOS F	Yes, LOS E	Yes, LOS F	No	No	N/A	
Roadway Segments									
County of Kern	Oswell Street, Pioneer Drive to Potomac Avenue	Yes, LOS F	Yes, LOS F	Yes, LOS F	Yes, LOS F	N/A	No	No	
County of Los Angeles	SR 14, SR 138/W Avenue D to W Avenue F	No	Yes, LOS F	No	Yes, LOS F	N/A	No	No	
City of Lancaster	W Avenue I, Beech Avenue to Sierra Highway	No	Yes, LOS E	No	No	N/A	No	N/A	
City of Lancaster	W Avenue K, Sierra Highway to Division Street	Yes, LOS E	Yes, LOS E	No	No	N/A	No	N/A	
City of Lancaster	W Avenue L, 8th Street W to Sierra Highway	No	Yes, LOS E	No	No	N/A	No	N/A	
City of Lancaster	Columbia Way, Sierra Highway to 3rd Street E	No	Yes, LOS F	No	No	N/A	No	N/A	
City of Lancaster	Columbia Way, 3rd Street E to 5th Street E	Yes, LOS F	Yes, LOS F	No	No	N/A	No	N/A	
City of Lancaster	Sierra Highway, Columbia Avenue to Avenue N	No	Yes, LOS F	No	No	N/A	No	N/A	

Jurisdiction	Intersection or Roadway Segment	No Project (2040		Future Year (2040) – Plus Project (2040)					LOS after Mitigation
		Exceeds LOS Target?		Exceeds LOS Threshold?		Meets Signal Warrants?	Impact?[1]	Identified Mitigation	
		A.M.	P.M.	A.M.	P.M.				
City of Lancaster	W Milling Street, Cedar Avenue to Sierra Highway	This roadway segment does not exist in he No Project condition		No	Yes, LOS E	N/A	No	No. This roadway segment is proposed to be built by the project, and no existing roadway segment would experience an increase in the V/C ratio due to the project. Although roadway segments built by the project would normally be designed to operate at LOS D or better, this is an example of context-sensitive design in central Lancaster where a two-lane roadway is preferable to a four-lane roadway regardless of roadway LOS considerations.	
City of Palmdale	10th Street E south of Avenue R[2]	No	No	Yes, LOS F	Yes, LOS F	N/A	Yes	Widen roadway from two to four lanes	A
City of Palmdale	10th Street E north of Avenue S[2]	No	No	No	Yes, LOS F	N/A	Yes	Widen roadway from two to four lanes	A
City of Palmdale	Avenue P west of Sierra Highway[2]	No	Yes, LOS F	No	No	N/A	No	N/A	
City of Palmdale	Avenue P east of 10th Street E[2]	No	Yes, LOS F	No	Yes, LOS F	N/A	No	N/A	
City of Palmdale	Avenue Q east of Sierra Highway[2]	Yes, LOS E	Yes, LOS F	Yes, LOS F	Yes, LOS F	N/A	No	N/A	
City of Palmdale	Avenue Q west of 20th Street E[2]	Yes, LOS F	Yes, LOS F	Yes, LOS F	Yes, LOS F	N/A	Yes	Widen roadway from two to four lanes	A
City of Palmdale	Palmdale Boulevard east of 10th Street E[2]	Yes, LOS E	Yes, LOS F	Yes, LOS E	Yes, LOS F	N/A	No	N/A	
City of Palmdale	Palmdale Boulevard west of SR 14 southbound ramps[2]	No	Yes, LOS F	No	Yes, LOS F	N/A	No	N/A	

Jurisdiction	Intersection or Roadway Segment	No Project (2040		Future Year (2040) – Plus Project (2040)					LOS after Mitigation
		Exceeds LOS Target?		Exceeds LOS Threshold?		Meets Signal Warrants?	Impact?[1]	Identified Mitigation	
		A.M.	P.M.	A.M.	P.M.				
City of Palmdale	Palmdale Boulevard west of 10th Street E	Yes, LOS E	Yes, LOS F	No	No	N/A	No	N/A	
City of Palmdale	Sierra Highway, Avenue N to Avenue O	Yes, LOS F	Yes, LOS F	No	No	N/A	No	N/A	
City of Palmdale	Sierra Highway north of Avenue P[2]	Yes, LOS E	Yes, LOS F	No	No	N/A	No	N/A	

[1] Even if the LOS threshold is exceeded, there is no substantial impact if the threshold for increase of the V/C ratio would not be exceeded as a result of the project.
[2] Palmdale Station intersection or roadway segment, SR14 Alternative Palmdale HSR Station Area
[3] Palmdale Station intersection or roadway segment; SR14 Alternative – Central Subsection Study Area
[4] Palmdale Station intersection or roadway segment, E1 Alternative – Central Subsection Study Area
[5] Intersection or roadway closed as part of the B-P Build Alternatives
[6] New intersection or roadway segment proposed as part of the B-P Build Alternatives
B-P = Bakersfield to Palmdale Project Section
LOS = level(s)-of-service
N/A = not applicable
SR = State Route
V/C = volume-to-capacity

As shown in Table 3.2-22, in the Future Year (2040) Plus Project conditions, there would be substantial impacts to six intersections and three roadway segments in the City of Palmdale as a result of implementation of the Palmdale Station. These roadways would require improvements (roadway widening or signal modifications) to meet LOS thresholds. TRAN-MM#3 identifies the roadway widening improvements for these facilities to meet thresholds. Because the Authority has been working closely with local jurisdictions (including the City of Palmdale) with respect to project impacts and hasidentified mitigation for those impacts, it is anticipated that the City of Palmdale would assume the right-of-way and maintenance responsibilities for any intersection and roadway improvements identified in TRAN-MM#3, such that the mitigation measure is feasible. Therefore, if TRAN-MM#3 is implemented, no adverse impacts on RSA roadway segments and intersections based on LOS thresholds would occur.

Ramp queuing analysis was conducted for off-ramp locations where the B-P Build Alternatives would contribute 100 or more trips to the off-ramp. Based on this criterion, the SR 14 southbound ramps at 10th Street W (Intersection No. 1) queueing analysis is provided for Future Year (2040) Plus Project conditions. For the off-ramp, the 95th percentile queue calculated in Synchro 9.0 during the a.m. peak hour is approximately 100 feet. During the p.m. peak hour, the approximate queue is 497 feet. Given that existing storage capacity on the ramp is approximately 900 feet, there would be adequate available storage during both peak hours.

Freeway segment analysis was conducted for the two freeway segments that would be potentially most affected by Palmdale Station traffic: SR 14 north of 10th Street W and SR 14 south of Avenue S. For both segments, it is expected that LOS thresholds would not be exceeded in either the a.m. or p.m. peak hours.

Traffic operations for Future Year (2040) Plus Project conditions are shown in Tables 6-15 through 6-18 of the *Bakersfield to Palmdale Project Section Transportation Technical Report* (Authority 2018a). Traffic operations for Future Year (2040) conditions with the Palmdale Station are shown in Tables 6-25, 6-26, 6-27, and 6-28 of the *Palmdale to Burbank Project Section Transportation Technical Report* (Authority 2017).

CEQA Conclusion

The project would result in traffic delays at some intersections under all B-P Build Alternatives as shown in Tables 3.2-21 and 3.2-22. Vehicle delay is not a significant impact under CEQA.

3.2.7 Mitigation Measures

NEPA requires federal agencies to identify potentially adverse effects and discuss measures to mitigate those effects. CEQA requires that each significant impact of a project be identified and feasible mitigation measures be stated and implemented. Mitigation measures are identified for operations impacts that cannot be avoided or minimized adequately by refining project design.

3.2.7.1 Fresno to Bakersfield Locally Generated Alternative Mitigation Measures from 34th Street and L to Oswell Street

The *Fresno to Bakersfield Section Final Supplemental EIR* (Authority 2018b) and the *Final Supplemental EIS* (Authority 2019) identified mitigation measures that are applicable to the entire length of the F-B LGA, from just north of Poplar Avenue to Oswell Street. Not all measures identified in the Final Supplemental EIR and the Final Supplemental EIS are applicable to the portion of the F-B LGA from 34th Street and L Street to Oswell Street. The following transportation-related mitigation measures are available for consideration to address traffic delay impacts under NEPA to the portion of the F-B LGA from 34th Street and L Street to Oswell Street (this is not mitigation under CEQA):

- **F-B LGA TR-MM#2:** Modify signal phasing. Modify traffic signal phasing sequence to improve operations at a signalized intersection, in consultation with the appropriate jurisdiction to ensure the peak hour re-timing of the signal.

- **F-B LGA TR-MM#3:** Add signal to intersection to improve LOS/operation. Add traffic signals to affected non-signalized intersections surrounding the proposed F Street station location to improve LOS and intersection operation.
- **F-B LGA TR-MM#4:** Restripe intersections. Restripe specific intersections surrounding the proposed F Street station location to improve LOS and intersection operation.
- **F-B LGA TR-MM#5:** Revise signal cycle length. Revise signal cycle length at specific intersections surrounding the proposed F Street station location to improve LOS and intersection operation in consultation with the local appropriate jurisdiction.
- **F-B LGA TR-MM#6:** Widen approaches to intersections. Widen approaches to allow for additional turning or through-lanes to improve LOS and intersection operation.
- **F-B LGA TR-MM#7:** Add exclusive turn lanes to intersections. Add exclusive turn lanes at specific intersections to improve LOS and intersection operation.
- **F-B LGA TR-MM#8:** Add new lanes to roadway. Add additional roadway lanes to improve LOS and intersection operation.
- **F-B LGA TR-MM#9:** Restripe roadway segment. Restripe specific roadway segments in the vicinity of the proposed F street station location to improve LOS and roadway segment operation.
- **F-B LGA TR-MM#10:** Convert intersection stop control. Convert intersection stop-control from a two-way stop to an all-way stop.

3.2.7.2 Bakersfield to Palmdale Project Section Mitigation Measures

The following measures are proposed:

TRAN-MM#2: Earthwork Haul Routes

Prior to commencement of construction, the Authority will ensure that the Contractor reviews and refines earthwork haul routes and identifies the specific locations where flaggers and temporary traffic control personnel are required. Haul routes outside of project right-of-way will be identified.

At a minimum, flaggers will be required at the following intersections:

- SR 184/Weedpatch Highway
- East Brundage Lane
- South Edison Road
- Comanche Drive
- East Tehachapi Boulevard
- Highline Road
- Tehachapi Willow Springs Road (all crossings)
- Rosamond Boulevard
- 60th Street West
- Avenue A
- SR 138
- West Avenue F
- West Avenue G
- West Avenue K
- Columbia Way/East Avenue M
- West Avenue N
- West Avenue O

At a minimum, temporary traffic control personnel will be provided to control the major intersections along SR 138 between 25th Street West and 15th Street.

These requirements will be incorporated into the Construction Transportation Plan (TR-IAMF#2).

TRAN-MM#3: Intersection and Roadway Segment Improvements

The following improvements are available for consideration to address traffic delay impacts under NEPA for the project. No mitigation is required under CEQA.

- **SR 14 Southbound on-ramp at Rancho Vista Boulevard**
  - Provide a traffic signal with westbound continuous green phase
- **20th Street E at Avenue Q**
  - Widen intersection and add an eastbound through lane
- **50th Street E/47th Street E at Palmdale Boulevard**
  - Reconfigure southbound approach to include an additional lane on each approach (shared through/right and left lane)
  - Reconfigure westbound approach to include an additional lane on each approach (shared through/left and right lane)
- **Fort Tejon Road/Pearblossom Highway at Pearblossom Highway/Avenue T**
  - Provide eastbound right-turn overlap phasing
  - Provide westbound right-turn overlap phasing
  - Optimize cycle length
  - Optimize splits
- **U.S. Route 395 at Palmdale Road**
  - Modify signal timing: optimize cycle length and splits
- **3rd Street at Avenue Q**
  - Provide traffic signal.
- **10th Street E Between Avenue R and Avenue S**
  - Widen roadway from 2 to 4 lanes
- **Avenue Q Between 10th Street E and 20th Street E**
  - Widen roadway from 2 to 4 lanes

Impacts from Implementing Mitigation Measures

TRAN-MM#1, In-Lieu Traffic & Parking Improvements, which is the Authority's standardized transportation mitigation measure, would be a funding mechanism for transportation improvements and would not have direct physical impacts.

TRAN-MM#2 requires flaggers/temporary traffic control personnel at specific intersections associated with earthwork haul routes. This mitigation measure would improve circulation and emergency access and would not result in any physical impacts.

The impacts associated with implementation of TRAN-MM#3 are shown in Table 3.2-23. Table 3.2-23 includes the applicable intersection or roadway segment, the propose improvement(s) and the impacts of those improvements. No impacts would occur from modifying signal phasing and timing, because these changes are done electronically to the existing signals. Adding signals would generally be done within the existing pavement or disturbed graded right-of-way. Temporary traffic, noise, and dust impacts could occur to nearby properties; however, the improvement at these locations would be limited in duration. Impacts from these mitigation measures would be less than significant under CEQA.

Potential impacts from the intersection and roadway widening improvements were determined based on review of aerial images and compared to the existing inventory of known resources in the area to ensure that potential impacts have been adequately addressed. Appendix 3.2-B

shows the locations of these intersection and roadway widening improvements. The following were considered in the analysis of potential impacts of the intersection and roadway widening improvements:

- Temporary impacts related to roadway closures and traffic delays
- Surrounding land uses
- Construction-related noise impacts
- Construction-related air quality impacts
- Availability of right-of-way
- Property acquisitions and displacements
- Effects to substantial minority and low-income populations
- Physical impacts to existing structures, including historic properties
- Locations of known archaeological resources
- Effects on aquatic and biological resources
- Conversion of prime/statewide important/unique farmland
- Decrease in distance of travel lanes to sensitive receptors for noise and vibration

Impacts of the intersection and roadway widening improvements are detailed in Table 3.2-23. The IAMF and mitigation measures in Section 3.2, Transportation; Section 3.3, Air Quality and Global Climate Change; Section 3.4, Noise and Vibration; Section 3.7, Biological and Aquatic Resources; Section 3.12, Socioeconomics and Communities; and Section 3.17, Cultural Resources would be implemented for the intersection and roadway widening improvements and would address the impacts listed in Table 3.2-23. Additionally, implementation of TRAN-MM#3 would benefit local circulation in the area by improving traffic operations as a result of adding lanes to roadways. For these reasons, impacts from these mitigation measures would be less than significant under CEQA.

Table 3.2-23 Intersection and Roadway Segments Mitigation

Intersection or Roadway Segment	Improvements	Impacts
SR 14 southbound on-ramp at Rancho Vista Boulevard	▪ Provide a traffic signal with a westbound continuous green phase	Traffic impacts could include construction-related lane closures or traffic delays. Impacts to nearby commercial properties could include emissions and fugitive dust from construction equipment and construction-related noise.
50th Street E/47th Street E at Palmdale Boulevard	▪ Reconfigure southbound approach to include an additional lane on each approach (shared through/right and left lane) ▪ Reconfigure westbound approach to include an additional lane on each approach (shared through/left and right lane)	The land surrounding this intersection is undeveloped. Traffic impacts could include construction-related lane closures or traffic delays. Impacts to biological resources could include impacts to potentially suitable habitat for desert tortoise and Mohave ground squirrel, potential foraging habitat for Swainson's hawk, and potential movement and dispersal habitat California red-legged frog. The improvement would be outside the Area of Potential Effects (APE) for cultural resources and outside the record search area; therefore potential impacts could also occur to unknown archaeological resources. No impacts would occur related to displacements, historic properties, farmlands, or aquatic resources. In addition, no noise or air quality impacts to sensitive receptors would occur.

Intersection or Roadway Segment	Improvements	Impacts
Fort Tejon Road/ Pearblossom Highway at Pearblossom Highway/ Avenue T	▪ Modify signal timing ▪ Provide eastbound right-turn overlap phasing ▪ Provide westbound right-turn overlap phasing ▪ Optimize cycle length ▪ Optimize splits	No impacts.
US-395 at Palmdale Road	▪ Modify signal timing ▪ Optimize cycle length ▪ Optimize splits	No impacts.
3rd Street E at Avenue Q	▪ Provide a traffic signal	Traffic impacts could include construction-related traffic delays. Impacts to nearby single-family residential properties could include emissions and fugitive dust from construction equipment and construction-related noise.
20th Street E at Avenue Q	▪ Widen intersection; add eastbound through lane	Partial acquisition of a vacant parcel may be required. Impacts to nearby commercial properties could include emissions and fugitive dust from construction equipment and construction-related noise. Traffic impacts include construction-related lane closures or traffic delays. Impacts to biological resources could include impacts to potentially suitable habitat for desert tortoise and potential foraging habitat for Swainson's hawk. Construction-related air quality, noise, and traffic impacts could occur to substantial minority and low-income populations based on census block data. The improvement would be outside the APE for cultural resources and outside the record search area; therefore, potential impacts could also occur to unknown archaeological resources. No impacts would occur related to displacements, historic properties, farmlands, or aquatic resources.
10th Street E between Avenue R and Avenue S	▪ Widen roadway from two to four lanes	Roadway widening would take place within existing City of Palmdale right-of-way that has been reserved for future widening of 10th Street E. Impacts to nearby industrial properties (self-storage), single-family residents, and one elementary school could include emissions and fugitive dust from construction equipment and construction-related noise. Additionally, increased noise during operation could occur at the single-family residents and school from the additional travel lanes, which would shift the travel lanes toward these sensitive receptors. Traffic impacts could include construction-related lane closures or traffic delays. Impacts to biological resources could include impacts to potentially suitable

Intersection or Roadway Segment	Improvements	Impacts
		habitat for desert tortoise and potential movement and dispersal habitat for California red-legged frog. The improvements could impact two known archaeological resources, P-19-004194, a historic foundation and P-19-000878, a pre-contact habitation site. Potential impacts could also occur to unknown archaeological resources. Construction-related air quality, noise, and traffic impacts could occur to substantial minority and low-income populations based on census block data. No impacts would occur related to displacements, historic properties, farmlands, or aquatic resources.
Avenue Q between 20th Street E and 10th Street E	▪ Widen roadway from two to four lanes	Roadway widening would occur within existing City of Palmdale right-of-way that has been reserved for future widening of Avenue Q. Impacts to nearby commercial properties, single-family residents, multifamily residents, and a senior living facility could include emissions and fugitive dust from construction equipment and construction-related noise. Additionally, increased noise during operation could occur at the residential uses from the additional travel lanes, which would shift the travel lanes toward these sensitive receptors. Traffic impacts include construction-related lane closures or traffic delays. Impacts to biological resources could include impacts to tri-colored blackbird breeding season foraging habitat, potential primary foraging habitat for Swainson's hawk, potentially suitable habitat for desert tortoise and Mohave ground squirrel, and potential movement and dispersal habitat California red-legged frog. Construction-related air quality, noise, and traffic impacts could occur to minority and low-income populations based on census block data. The improvement would be outside the APE for cultural resources and outside the record search area; therefore, potential impacts could also occur to unknown archaeological resources.

APE = Area of Potential Effects
SR = State Route
US- = U.S. Route

3.2.8 NEPA Impact Summary

3.2.8.1 No Project Alternative

Development in the San Joaquin Valley to accommodate expected population and economic growth would continue under the No Project Alternative, resulting in associated direct and indirect impacts on transportation resources. Traffic volumes would continue to increase as a result of development activity, thereby affecting existing local and regional transportation facilities. To accommodate this growth, transportation improvements would be completed to maintain or expand existing capacity. A list of anticipated future development projects is provided in

Appendix 3.19-A. Planned and programmed transportation improvements under the No Project Alternative would require construction that would result in temporary impacts, including detours and lane closures. Once construction of each project is complete, the impacts on traffic circulation would largely be beneficial in the near term. However, over the long term, the programmed transportation network capacity improvements are not anticipated to be sufficient to meet future regional demand, and traffic congestion would increase.

3.2.8.2 Bakersfield to Palmdale Project Section Build Alternatives

All of the B-P Build Alternatives would have similar impacts to transportation facilities under NEPA as discussed in detail in Section 3.2.6. Table 3.2-24 provides a comparison of the potential impacts of each of the B-P Build Alternatives by impact number, summarizing the more detailed information provided in Section 3.2.6, Environmental Consequences.

Table 3.2-24 Comparison of Bakersfield to Palmdale Project Section Build Alternatives Impacts for Transportation

Impact	Alternative 1	Alternative 2	Alternative 3	Alternative 5
Construction				
Impact TR #1: Temporary Road Closures During Construction	Construction-related road closures, detours, and increased traffic congestion would occur in some locations. Delays could be longer in rural areas, where temporary road closures could result in several miles of out-of-direction travel to cross the HSR alignment for each B-P Build Alternative.			
	Potential reduction in emergency response times, mobility interference, access limitations, roadway damage, and temporary parking, roadway lane, and pedestrian and bicyclist facilities closures for all B-P Build Alternatives.			
Impact TR #2: Circulation and Emergency Access During Construction	Construction-related road closures, detours, and increased traffic congestion would occur in some locations. Delays could be longer in rural areas, where temporary road closures could result in several miles of out-of-direction travel to cross the HSR alignment for all B-P Build Alternatives.			
	Relocation of a freight rail line in the Lancaster area for Alternatives 1, 2, and 3.			
Operations				
Impact TR #3: Permanent Road Closures During Operation	49 roadway closures	49 roadway closures	50 roadway closures	49 roadway closures
	Minor roadway modifications and slight rerouting of bus routes would occur for all B-P Build Alternatives.			
	Some changes in access, primarily in rural areas.			
Impact TR #4: Circulation and Emergency Access During Operation	Minimal loss of bicycle access due to elevated segments, bicycle facilities modifications compatible with local plans, and enhanced access at grade-separated crossings would occur for all B-P Build Alternatives.			
	Pedestrian facilities modifications (compatible with local plans) and enhanced access at grade-separated crossings would occur for all B-P Build Alternatives.			
	Passenger rail service would improve under all B-P Build Alternatives.			
	Minor changes in the demand for air travel on a statewide basis and more convenient access to airports for some travelers would occur for all B-P Build Alternatives.			
	A minimal effect on freight rail due to grade-separated crossings would occur for all B-P Build Alternatives.			
Impact TR #5: Continuous Permanent Impacts on Vehicle Miles Traveled	Reduction in regional vehicle miles traveled.			

Impact TR #6: Roadway Levels-of-Service	Minor level-of-service changes for the Existing (2016) B-P Build Alternatives, and Future Year (2040) B-P Build Alternatives.
	Palmdale Station impacts at intersections and roadway segments that require mitigation in the form of: traffic signal modifications, a new traffic signal, intersection restriping, intersection widening, addition of turn lanes, and intersection reconfiguration.

B-P = Bakersfield to Palmdale Project Section
HSR = high-speed rail

Construction Impacts

Access and circulation disruptions would occur throughout the construction period with various intensities depending on the type of construction activities that occur. The CTP (TR-IAMF#2) includes several requirements to minimize disruptions and would be updated for each construction phase to ensure that appropriate control measures are applied to each construction activity.

TR-IAMF#1 through TR-IAMF#9 and TR-IAMF#11 through TR-IAMF#12 provide specific requirements that would address potential circulation and emergency access impacts related to road closures, construction vehicles and equipment, staging areas, and reconstruction and construction of transportation facilities.

Mitigation Measure TRAN-MM#2 includes the specific requirements for flaggers/temporary traffic control personnel to avoid adverse impacts associated with earthwork haul routes.

With adherence to TR-IAMF#1 through TR-IAMF#9 and TR-IAMF#11 through TR-IAMF#12, as well as implementation of Mitigation Measure TRAN-MM#2, construction impacts would be avoided, minimized, or mitigated under NEPA.

Operations Impacts

The B-P Build Alternatives and Palmdale Station would not result in adverse impacts to alternative transportation modes (i.e., transit, bicycles, and pedestrians) and would not interfere with freight rail or aviation operations. In addition, the project would not result in adverse impacts to transportation RSA intersections or roadway segments.

The City of Palmdale would need to agree to the transportation improvements and to accept the right-of-way and maintenance responsibility for the improvements listed in TRAN-MM#3. Because the Authority has been working closely with local jurisdictions (including the City of Palmdale) with respect to project impacts and proposed mitigation for those impacts, it is reasonable to expect that the City of Palmdale would assume the right-of-way and maintenance responsibilities for any intersection and roadway improvements identified in TRAN-MM#3, such that the mitigation measure is feasible. If TRAN-MM#3 is implemented, no adverse transportation impacts associated with the Palmdale Station would occur under NEPA.

The B-P Build Alternatives would provide the following benefits:

- Reduction of vehicle trips on freeways, which would improve freeway LOS
- Reduction of VMT, which would reduce highway maintenance
- New grade-separated roadways, which would improve safety

3.2.9 CEQA Significance Conclusions

This section summarizes the impacts discussed in Section 3.2.6, Environmental Consequences; reports the level of significance prior to mitigation; indicates mitigation measures available to reduce the level of significance for each impact; and concludes by reporting on the level of significance after mitigation is implemented. If implementing a measure would reduce the potential impact below the applicable significance threshold, the impact would be considered less than significant after mitigation. If, however, implementing a mitigation measure cannot reduce the level of impact below the significance threshold, the impact would be considered significant

and unavoidable. This section summarizes the project impacts of the B-P Build Alternatives pursuant to CEQA thresholds for transportation and identifies the CEQA level of significance before and after mitigation.

3.2.9.1 Construction Impacts

Access and circulation disruptions would occur throughout the construction period with various intensities, depending on the type of construction activities that occur. The CTP (TR-IAMF#2) includes several requirements to minimize disruptions and would be updated for each construction phase to ensure that appropriate control measures are applied to each construction activity.

TR-IAMF#1 through TR-IAMF#9 and TR-IAMF#11 through TR-IAMF#12 provide specific requirements to address impacts to transportation facilities and users during project construction. Adherence to IAMFs and compliance with applicable regulatory requirements during construction of the B-P Build Alternatives would address potential circulation and emergency access impacts related to road closures, construction vehicles and equipment, staging areas, and reconstruction and construction of transportation facilities.

Mitigation Measure TRAN-MM#2 includes the specific requirements for flaggers/temporary traffic control personnel to avoid significant impacts at intersections on earthwork haul routes.

Adherence to TR-IAMF#1 through TR-IAMF#9 and TR-IAMF#11 through TR-IAMF#12, compliance with regulations, and implementation of Mitigation Measure TRAN-MM#2 would result in less than significant construction impacts with mitigation incorporated under CEQA.

3.2.9.2 Operations Impacts

The B-P Build Alternatives would not result in substantial hazards or performance impacts to alternative transportation modes (i.e., transit, bicycles, and pedestrians) or emergency access, and would not interfere with freight rail or aviation operations. In addition, the B-P Build Alternatives would not increase hazards due to a geometric design feature or result in incompatible uses.

Reduction in regional VMT would be a beneficial impact under all B-P Build Alternatives.

Table 3.2-25 summarizes the CEQA determination of significance for all impact categories for the B-P Build Alternatives. Table 3.2-25 includes the impact, level of significance before mitigation, mitigation measure (if applicable), and level of significance after mitigation.

Table 3.2-25 Summary of CEQA Significance Conclusions and Mitigation Measures for Transportation

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Construction			
Impact TR #1: Temporary Road Closures During Construction	Less than Significant	No mitigation measures are required	Not applicable
Impact TR #2: Circulation and Emergency Access During Construction	Significant	TRAN-MM#2	Less Than Significant
Operations			
Impact TR #3: Permanent Road Closures During Operation	Less than Significant	No mitigation measures are required	Not applicable
Impact TR #4: Circulation and Emergency Access During Operation	Less than Significant	No mitigation measures are required	Not applicable

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact TR #5: Continuous Permanent Impacts on Vehicle Miles Traveled	Beneficial Impact	No mitigation measures are required	Not applicable

CEQA = California Environmental Quality Act