California High-Speed Rail Authority

San Jose to Merced Project Section

Draft Environmental Impact Report/Environmental Impact Statement

Chapter 1
Project Purpose, Need, and Objectives

April 2020

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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ACRONYMS AND ABBREVIATIONS

2005 Statewide Program EIR/EIS	*Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System*
2008 Bay Area to Central Valley Final Program EIR/EIS	*Final San Francisco Bay Area to Central Valley High-Speed Train Final Program Environmental Impact Report/Environmental Impact Statement*
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACE	Altamont Corridor Express
Airport Master Plan	*Airport Master Plan for Norman Y. Mineta San Jose International Airport*
Authority	California High-Speed Rail Authority
BART	Bay Area Rapid Transit
BNSF	BNSF Railway
BRT	bus rapid transit
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDOF	California Department of Finance
CEMOF	Centralized Equipment Maintenance and Operation Facility
CEQA	California Environmental Quality Act
CHP	California Highway Patrol
CO_2	Carbon dioxide
CSBCG	Council of San Benito County Governments
CSRP	California State Rail Plan
CTP 2040	*California Transportation Plan 2040*
EIR	environmental impact report
EIS	environmental impact statement
FAST Act	Fixing America's Surface Transportation Act
FRA	Federal Railroad Administration
GHG	greenhouse gas
HSR	high-speed rail
I-	Interstate
MCAG	Merced County Association of Governments
Merced County RTP	*Draft Regional Transportation Plan/Sustainable Communities Strategy for Merced County*
MOU	Memorandum of Understanding
MPO	metropolitan planning organization

MTC	Metropolitan Transportation Commission
NEPA	National Environmental Policy Act
O_3	ozone
OAK	Oakland International Airport
PCJPB	Peninsula Corridor Joint Powers Board
PM_{10}	particulate matter smaller than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter smaller than or equal to 2.5 microns in diameter
RTP	regional transportation plan
SB	Senate Bill
SCS	sustainable communities strategy
SFO	San Francisco International Airport
SJC	Norman Y. Mineta San Jose International Airport
SJJPA	San Joaquin Joint Powers Authority
SJRRC	San Joaquin Regional Rail Commission
SR	State Route
STB	Surface Transportation Board
U.S.C.	United States Code
UPRR	Union Pacific Railroad
US 101	U.S. Highway 101
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled
VTA	(Santa Clara) Valley Transportation Authority
VTP 2040	*Valley Transportation Plan 2040: The Long-Range Transportation Plan for Santa Clara County*

1 PROJECT PURPOSE, NEED, AND OBJECTIVES

1.1 Introduction

1.1.1 The High-Speed Rail System

The California Legislature passed the High-Speed Rail Act in 1996, forming the California High-Speed Rail Authority (Authority) as a state governing body responsible for planning, designing, constructing, and operating the California High-Speed Rail (HSR) System. In establishing the Authority, the Legislature found that the state's transportation facilities were insufficient to meet the needs of the state's existing population, that the state's population and the travel demands of its citizens would continue to grow, and that the development of an HSR system is a necessary and viable alternative to automobile and air travel in the state. The Authority's mandate under the High-Speed Rail Act is to develop an HSR system that coordinates with the state's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports.

The Authority proposes to construct, operate, and maintain an electric-powered HSR system in California, connecting the San Francisco Bay Area and Central Valley to Southern California. When completed, the nearly 800-mile train system would provide new passenger rail service to more than 90 percent of the state's population. An estimated 176 weekday trains would serve the statewide intercity travel market.[1] The system would use state-of-the-art, electrically powered, steel-wheel-on-steel-rail technology, including contemporary safety, signaling, and automatic train control systems, with trains capable of operating speeds of up to 220 miles per hour in HSR sections that are fully grade-separated and on a dedicated track alignment.

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

[1] *Intercity rail passenger transportation* is defined at 49 United States Code (U.S.C.) 24102(4) as ''rail passenger transportation except commuter rail passenger transportation." *Commuter rail passenger transportation* is defined at 49 U.S.C. Section 24102(3) as "short-haul rail passenger transportation in metropolitan and suburban areas usually having reduced fare, multiple-ride, and commuter tickets and morning and evening peak period operations." The number of trains on different parts of the HSR system will vary depending in schedules and ridership.

Note: HSR System described in described in Program EIR/EIS MAY 2019

Figure 1-1 Statewide High-Speed Rail System—Implementation Phases

1.1.2 The Decision to Develop a Statewide High-Speed Rail System

The Authority and the Federal Railroad Administration (FRA) used a tiered environmental review process to support tiered decisions for the HSR system. Tiering of environmental documents means addressing a broad program in "Tier 1" environmental documents, then analyzing the details of individual projects under the larger program in subsequent project-specific or "Tier 2" environmental documents.

The *Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System* (2005 Statewide Program EIR/EIS) (Authority and FRA 2005) provided a programmatic analysis of implementing the HSR system across the state and compared it to the impacts of a no project alternative and a "modal alternative" that involved expanding airports, freeways, and conventional rail to meet the state's future transportation needs. The HSR alternative included consideration of different train technologies and vehicles types, as well as potential corridors and station locations. At the conclusion of the 2005 Statewide Program EIR/EIS, the Authority and FRA made the following decisions:

2005 Tier 1 Decisions	
Selection of transportation option	Selected the HSR alternative over the modal alternative (expanded airports and freeways) and the no project alternative (do nothing) to serve California's growing transportation needs.
Selection of train technology	Selected very high speed, electrified steel-wheel-on-steel-rail technology over magnetic levitation; lower speed, electrified steel wheel on steel rail; and lower speed diesel (non-electrified) steel-wheel-on-steel-rail technology.
Selection of preferred alignment corridors	Selected preferred corridors for most of the statewide system to be studiedin more detail in Tier 2 EIR/EISs. Deferred selection of preferred corridors for Bay Area to Central Valley to a second Tier 1 EIR/EIS process.
Selection of preferred station locations	Selected station locations along the preferred corridors to be studied in more detail in Tier 2 EIR/EISs.
Adoption of mitigation strategies	Adopted broad mitigation strategies to be refined and applied at Tier 2, as part of project planning and development and environmental review.

Sources: Authority 2005; FRA 2005
HSR = high-speed rail
EIR = environmental impact report
EIS = environmental impact statement

After completing the 2005 Statewide Program EIR/EIS, the Authority and FRA prepared a second program EIR/EIS to identify corridor and station locations for the HSR connection between the Bay Area and the Central Valley, examining connections through the Pacheco Pass, the Altamont Pass, or both (i.e., the *Final San Francisco Bay Area to Central Valley High-Speed Train Final Program Environmental Impact Report/Environmental Impact Statement* [2008 Bay Area to Central Valley Final Program EIR/EIS] [Authority and FRA 2008]). In 2008, the Authority and FRA selected a Pacheco Pass connection, with corridors and station locations to be further examined in Tier 2 environmental reviews. As a result of litigation, the Authority prepared additional programmatic environmental review for the Bay Area and the Central Valley section, and again selected the Pacheco Pass connection (in the *Bay Area to Central Valley Partially Revised Final Program Environmental Impact Report* [Authority 2012a]).

2008/2012 Tier 1 Decisions	
Selection of preferred alignment corridors	Selected preferred corridors for connecting the Bay Area to the Central Valley north of Fresno to be studied in more detail in Tier 2 EIR/EIS.
Selection of preferred station locations	Selected stations locations along the preferred corridors to be studied in more detail in Tier 2 EIR/EISs.

2008/2012 Tier 1 Decisions	
Adoption of mitigation strategies	Adopted broad mitigation strategies to be refined and applied at Tier 2, as part of project planning and development and environmental review.

Source: FRA 2008; Authority 2012b, 2012c, 2012d
EIR = environmental impact report
EIS = environmental impact statement

These Tier 1 decisions established the broad framework for the HSR system that serves as the foundation for the Tier 2 environmental review of individual projects. Between San Jose and Merced, the corridor advanced for Tier 2 study was the Pacheco Pass via Henry Miller Road (Union Pacific Railroad [UPRR] Connection) from San Jose to the Central Valley. The station locations advanced for Tier 2 study were a downtown San Jose/Diridon Station and a downtown Gilroy/Caltrain station, with no station between Gilroy and Merced.

The Authority and FRA prepared these Tier 1 documents in coordination with the U.S. Environmental Protection Agency (USEPA) and the U.S. Army Corps of Engineers (USACE). The USEPA and the USACE concurred that the corridors selected by the Authority and FRA in Tier 1 were most likely to yield the least environmentally damaging practicable alternative under Section 404 of the Clean Water Act.

Electronic copies of the Tier 1 documents are available on request by calling the Authority office at 800-455-8166. The Tier 1 documents may also be reviewed at the Authority's offices during business hours at: 770 L Street, Suite 620, Sacramento, CA 95814 and 100 Paseo de San Antonio, Suite 300, San Jose, CA 95113.

1.1.3 Implementation of the Statewide High-Speed Rail System

Since completion of the Tier 1 documents, the State of California has taken a series of steps to advance the implementation of a statewide HSR system. These efforts have resulted in securing dedicated funding for construction of the initial part of the system in the Central Valley and have further defined the State's vision for completing the system. The HSR system has also become a key component of the State's strategy for reducing greenhouse gas (GHG) emissions as discussed in the next subsection.

1.1.3.1 California State Legislation and Funding

In August 2008, the California Legislature adopted Assembly Bill (AB) 3034, finding "it imperative that the state proceed quickly to construct a ... high-speed passenger train system to serve the major metropolitan areas," and submitting The Safe, Reliable, High-Speed Passenger Train Bond Act for the 21st Century (Prop 1A) to the voters. In November 2008, California voters approved Prop 1A, making $9.95 billion in bond funds available to the Authority for initiating construction of the HSR system from San Francisco to the Los Angeles basin and linking the state's major population centers. Prop 1A includes provisions for continuing legislative oversight and requires the Authority to follow certain procedures to access bond funds. In 2012, the Legislature passed Senate Bill (SB) 1029, which appropriated $7.9 billion in federal funds (see Section 1.1.3.4, The Federal Railroad Administration Grant Agreement) and Prop 1A bond funds to begin construction of the HSR system.

The HSR system is identified as an integral GHG reduction measure in the Climate Change Scoping Plan prepared by the California Air Resources Board (CARB) pursuant to AB 32, the California Global Warming Solutions Act of 2006, which required a reduction in GHG emissions to 1990 levels by 2020 (CARB 2008, 2017). In 2014, the Legislature passed SB 862, which continuously appropriated 25 percent of specified cap-and-trade[2] auction proceeds to Phase 1 (San Francisco to Anaheim) of the HSR system. The Legislature found that the HSR system, once completed and operational, "will contribute significantly toward the goal of reducing emissions of greenhouse gases and other air pollutants" and provides "the foundation for a large-

[2] *Cap and trade* refers to the market-based mechanism established by the CARB for achieving the GHG reduction requirements in AB 32.

scale transformation of California's transportation infrastructure" by reducing millions of vehicle miles traveled by automobile and reducing the demand for air travel. In 2017, the Legislature extended the cap-and-trade program from 2020 to 2031.

1.1.3.2 Business Plans for the Statewide High-Speed Rail System

The High-Speed Rail Act requires the Authority to prepare, adopt, and submit a business plan to the State Legislature every 2 years describing its implementation approach for the statewide HSR system. Since 2008, the Authority has adopted business plans in accordance with this requirement. Most recently, the Authority adopted its 2018 Business Plan on May 15, 2018, and submitted it to the Legislature on June 1, 2018 (Authority 2018a, 2018b).

The 2018 Business Plan identifies major anticipated milestones for upcoming years, focusing on construction and program delivery. The key objectives and principles from prior business plans remain the same:

- Initiate HSR passenger service as soon as possible.
- Make strategic, concurrent investments throughout the system that will be linked together over time.
- Position the Authority to construct additional increments of the HSR system as funding becomes available.

Like the previous business plans, the 2018 Business Plan describes the phased implementation of the California HSR System. As shown on Figure 1-1, Phase 1 would connect the state's major metropolitan areas, extending from San Francisco and Merced to Los Angeles and Anaheim (the San Francisco Bay Area and Los Angeles Basin regions are considered the "bookends" of the HSR system). Phase 2 would complete extensions to Sacramento and San Diego. Phased implementation of the HSR system is consistent with the provisions of Prop 1A. The 2018 Business Plan also continues to incorporate the concept of "blended" service[3] in certain shared corridors in Northern and Southern California, including between San Francisco and Gilroy, and between Burbank and Anaheim.

With regard to the timing of Phase 1 implementation, the 2018 Business Plan continues the overall approach presented in 2016, which prioritizes connecting the Silicon Valley to the Central Valley. To achieve that objective, the 2018 Business Plan calls for completing two lines initially—one in the Central Valley from an interim station in Madera to Bakersfield, and one in the Bay Area/Silicon Valley, from San Francisco and San Jose to Gilroy—and then completing the connection from the Silicon Valley to the Central Valley via the Pacheco Pass tunnels. Completion of this "valley-to-valley" connection would provide continuous HSR service from San Francisco to Bakersfield. After that portion of the system is built, it is anticipated that the system would be extended to complete all of Phase 1 and, ultimately, Phase 2.

The 2018 Business Plan supports concurrent investments to deliver early benefits to Southern California in the Burbank–Los Angeles–Anaheim corridor and to Northern California in the San Francisco–Gilroy corridor, as well as completion of the environmental review for all Phase 1 project sections statewide from Merced/San Francisco to Los Angeles/Anaheim by 2022.

The Authority released a Draft 2020 Business Plan in February 2020 for public review and comment. The plan's final adoption is expected at the April 2020 Board meeting for submittal to the Legislature by May 1, 2020 (Authority 2020).

1.1.3.3 The California State Rail Plan

The federal Passenger Rail Investment and Improvement Act of 2008 required states to develop state rail plans no less frequently than every 5 years as a condition of eligibility for federal funding for HSR and intercity passenger rail programs. In accordance with the act, the State of California adopted the *California State Rail Plan* (CSRP) in 2013 (California Department of Transportation

[3] A "blended" system involves integrating the HSR system with existing intercity and commuter and regional rail systems.

[Caltrans] 2013a). The 2013 CSRP stated that it "establishes a statewide vision and objectives, sets priorities, and develops implementation strategies to enhance passenger and freight rail service in the public interest" (Caltrans 2013a). The Plan called for implementation of a statewide HSR system that is integrated into the existing intercity and commuter passenger rail network.

Caltrans released an updated 2018 CSRP in September 2018 that continues to emphasize HSR as a foundational component of the statewide, integrated rail transportation network (Caltrans 2018).

1.1.3.4 The Federal Railroad Administration Grant Agreement

In 2009, FRA announced a competitive grant program to fund HSR projects under the American Recovery and Reinvestment Act of 2009 through its High-Speed Intercity Passenger Rail Program. The State of California, acting through the Authority, successfully competed for these grant funds and received awards totaling approximately $3.5 billion. In 2010, the Authority entered into cooperative agreements with FRA under which the FRA committed to provide the grant funds to support initial construction of the first phase of the HSR system in the Central Valley, as well as related efforts for continued planning, engineering, and right-of-way preservation for the rest of the Phase 1 system between San Francisco and Anaheim.[4]

1.1.3.5 Project-Level Environmental Reviews

In accordance with the tiered approach to environmental review described above in Section 1.1.2, the Authority is preparing Tier 2 (project-level) EIR/EISs for individual sections of the statewide HSR system. Each Tier 2 EIR/EIS evaluates a project section of the HSR system that serves a useful transportation purpose on its own and could function independently even if the adjacent sections were not completed. Each Tier 2 EIR/EIS evaluates proposed alignments and stations in site-specific detail to provide a complete assessment of the direct, indirect, and cumulative effects of the proposed project; considers public and agency participation in the screening process; and is developed in consultation with resource and regulatory agencies, including USEPA and USACE. Each Tier 2 EIR/EIS is intended to be sufficient to support USACE's permit decisions, where applicable. Figure 1-2 illustrates the Tier 2 project sections. On July 23, 2019, the State of California and FRA signed a Memorandum of Understanding (MOU) that delegated FRA's responsibilities to the State to implement the National Environmental Policy Act (NEPA) and other federal statutes, regulations, and executive orders and to issue a record of decision for each of the Tier 2 reviews underway at that time.

To date, Tier 2 EIS/EIRs have been completed for the following sections:

- Merced to Fresno
- Fresno to Bakersfield

Tier 2 EIR/EISs for the other Phase 1 project sections, listed below, are all in progress:

- San Francisco to San Jose
- Bakersfield to Palmdale
- Palmdale to Burbank
- Burbank to Los Angeles
- Los Angeles to Anaheim

In addition, the Authority is in the process of preparing or has completed a supplemental EIR/EISs for:

- Merced to Fresno: Central Valley Wye
- Fresno to Bakersfield: Locally Generated Alternative (Bakersfield Station)

In October 2018, the Authority certified a Final Supplemental EIR and approved the Fresno to Bakersfield: Locally Generated Alternative. The Authority's Chief Executive Officer signed the

[4] The grant agreements are available by request via the Authority's website: www.hsr.ca.gov/About/Funding_Finance/funding_agreements.html.

Record of Decision in October 2019 and a Record of Decision Combined with a Final Supplemental EIS for the Locally Generated Alternative was released on November 8, 2019.

The Authority published the Merced to Fresno Section: Central Valley Wye Draft Supplemental EIR/EIS in May 2019 (Authority 2019). The Authority conducted the public review of the Central Valley Wye Draft Supplemental EIR/EIS under the California Environmental Quality Act (CEQA) in May and June 2019 and released the same document for NEPA public review in September 2019 to support a federal decision on the Central Valley Wye. The comment period ended October 28, 2019. The Authority is now preparing a written response to the comments and is planning to issue a Final Supplemental EIR/EIS in fall 2020.

Note: HSR System described in described in Program EIR/EIS

APRIL 2016

Figure 1-2 Statewide High-Speed Rail System, Phase 1 and Phase 2—Project Sections

1.1.4 The San Jose to Merced Project Section

Consistent with the Tier 1 decisions, the San Jose to Merced Project Section would provide HSR service from the San Jose Diridon Station to a station in downtown Merced. This Project Section would allow trains to and from the Bay Area to transition smoothly from north/south to east/west travel with a minimum reduction in speed and follow existing transportation corridors as much as feasible. HSR stations at San Jose Diridon, Gilroy, and Merced would support transit-oriented development, provide an interface with regional and local mass transit services, and provide connectivity to the South Bay[5] and Central Valley[6] highway network.

The Project Section has been evaluated in three extents as illustrated on Figure 1-3: from San Jose to the western limit of the Central Valley Wye; the Central Valley Wye itself; and from the northern limit of the Central Valley Wye to Merced (i.e., the northern portion of the Merced to Fresno Project Section).

The following terms are defined as follows for purposes of this report:

- **Project Section:** This signifies the San Jose to Merced project with the station termini.
- **Project Extent:** The term "*Project extent*" is used to refer to the three portions of the Project Section: (1) San Jose to Central Valley Wye (Scott Boulevard to Carlucci Road); (2) Central Valley Wye (Carlucci Road to Ranch Road in the north and Avenue 19 in the south); and (3) Merced North (Ranch Road in the south to the Merced Station). Collectively these three "project extents" form the Project Section connecting San Jose and Merced.

Source: Authority and FRA 2016 APRIL 2016

Figure 1-3 San Jose to Merced Project Section

The Central Valley Wye connects the Merced to Fresno and Bay Area to Central Valley HSR corridors. The Central Valley Wye is a track configuration that allows north/south trains to transition to east/west travel to reach the Bay Area and vice versa. Portions of the track are elevated to allow trains to travel up and over other track. The Central Valley Wye is an extent of both the Merced to Fresno and San Jose to Merced Project Sections. These sections overlap from Carlucci Road in Merced County, along the east/west portion of the Central Valley Wye and

[5] *South Bay* refers to Santa Clara County.

[6] The Sacramento and San Joaquin Valleys combined are called the Central Valley.

the northern extent of the alignment along State Route (SR) 99 to Merced. The Merced to Fresno Section Final EIR/EIS (Authority and FRA 2012) has been completed. The Authority and FRA selected the north/south track alignments and station sites, including the northern part of the alignment along SR 99/UPRR that travels into the Downtown Merced Station, but they deferred a decision on the wye connection. The Authority published a draft supplemental EIR for the Merced to Fresno Section in May 2019 (*Merced to Fresno Section: Central Valley Wye Draft Supplemental EIR* [Authority 2019]). As noted above, the Authority conducted the public review of the Central Valley Wye Draft Supplemental EIR/EIS under the California Environmental Quality Act (CEQA) in May and June 2019 and released the same document for NEPA public review in September 2019 to support a federal decision on the Central Valley Wye. The comment period ended October 28, 2019. The Authority is now preparing a written response to the comments and is planning to issue a Final Supplemental EIR/EIS in fall 2020. This document evaluates additional alignment alternatives for the Central Valley Wye. Upon completing the supplemental EIR/EIS process, the Authority will select a wye configuration, including an east-west track alignment to Carlucci Road in Merced County and a north-south wye track alignment in Merced and Madera Counties.

1.1.4.1 The San Jose to Central Valley Wye Project Extent

This *San Jose to Merced Project Section Environmental Impact Report/Environmental Impact Statement* (Draft EIR/EIS) documents project-level analyses of new HSR features that enable HSR operations and service to the San Jose Diridon, Gilroy, and Merced Stations.

For the purposes of this Draft EIR/EIS, the detailed evaluation is focused on the San Jose to Central Valley Wye Project Extent (project or project extent), which extends from Scott Boulevard in Santa Clara, north of the San Jose Diridon Station, to the western limit of the Central Valley Wye at Carlucci Road in Merced County. This analysis overlaps with the southern portion of the San Francisco to San Jose Project Section starting in Santa Clara at Scott Boulevard, just north of Diridon Station, and ending at West Alma Avenue in San Jose.

The project extent between Scott Boulevard and Carlucci Road is about 90 miles of the approximately 145-mile-long Project Section (Figure 1-3). Depending on the project alternative selected for implementation, train operations would transition to blended service north of the San Jose Diridon Station (either at Scott Boulevard or Interstate [I-] 880 in Santa Clara) or at Gilroy. Also depending on the selected alternative, the project would be a fully dedicated HSR system to the Central Valley Wye either south of the San Jose Diridon Station or eastward from an HSR station in downtown Gilroy.

Southward from the vicinity of the Caltrain Tamien Station (approximately 2.5 miles south of San Jose Diridon), the dedicated HSR alignments would follow the UPRR/Monterey Road transportation corridor or along the west side of U.S. Highway (US) 101 to avoid downtown Morgan Hill (approximately 23 miles south of San Jose Diridon), to a dedicated HSR station in downtown Gilroy or east of Gilroy. The HSR alignment would extend from the existing railroad right-of-way owned by Caltrain at the Tamien Station to Gilroy via the existing railroad right-of-way owned by UPRR. Caltrain and UPRR provide diesel-powered passenger and freight services along the Monterey Road corridor to Gilroy. HSR would electrify this segment to enable blended operation with Caltrain electric-powered passenger rail equipment. Between the Gilroy Station and I-5, a new, dedicated HSR corridor near SR 152 would traverse Pacheco Pass of the Diablo Range north of the San Luis Reservoir, then into the Central Valley east of I-5. The Authority would construct tunnels through two portions of Pacheco Pass. East of Pacheco Pass, the new HSR alignment would pass north of Volta and Los Banos and east toward Henry Miller Road in Merced County. The alignment would extend along the south side of Henry Miller Road to its connection with the Central Valley Wye at Carlucci Road in Merced County. More detail on the San Jose to Merced Project Section is provided in Chapter 2, Alternatives, of the Draft EIR/EIS.

1.1.5 Lead Agencies, Cooperating Agencies, and Responsible Agencies

Pursuant to 23 United States Code (U.S.C.) Section 327, under the NEPA Assignment MOU between FRA and the State of California, effective July 23, 2019, the Authority is the federal lead

agency for environmental reviews and approvals for all Authority Phase 1 and Phase 2 California HSR System projects (FRA and State of California 2019). In this role, the Authority is the project sponsor and the lead federal agency for complying with NEPA and other federal laws. The FRA administers the High-Speed Intercity Passenger Rail Program and has awarded California $3.48 billion in grant funding for statewide HSR system environmental studies, as well as in the Central Valley. The FRA has primary responsibility for developing and enforcing railroad safety regulations in accordance with Title 49 U.S.C. Subtitle V, Part A (49 U.S.C. § 20101 et seq.) and for performing Clean Air Act Conformity determinations and other federal approvals retained by the FRA.

Three cooperating agencies participate in the NEPA review process. The USACE agreed by letter, dated April 13, 2010, to participate as a cooperating agency under NEPA based on its role in the permitting and approvals process. The U.S. Bureau of Reclamation acknowledged cooperating agency status in a memorandum of agreement with the Authority on April 30, 2013. The Surface Transportation Board (STB), by letter dated May 2, 2013, is also a cooperating agency under NEPA based on its role in approving rail line construction.[7]

Multiple other federal agencies have been involved with and contributed to the environmental review, including the USEPA, U.S. Fish and Wildlife Service, National Marine Fisheries Service, National Park Service, Federal Emergency Management Agency, U.S. Department of Veterans Affairs, and the Advisory Council on Historic Preservation.

A number of state and regional California agencies serve as CEQA responsible agencies for the project. These are the California Department of Fish and Wildlife, Caltrans, California Department of Water Resources, California Office of Historic Preservation, California Public Utilities Commission, California State Lands Commission, Peninsula Corridor Joint Powers Board (PCJPB) (Caltrain), Pajaro River Watershed Flood Prevention Authority, Regional Water Quality Control Boards, State Water Resources Control Board, Santa Clara Valley Water District, Central Valley Flood Protection Board, Bay Area Air Quality Management District, Monterey Bay Unified Air Pollution Control District, and San Joaquin Valley Unified Air Pollution Control District. The Final EIR/EIS for the San Jose to Merced Project Section can be used by these agencies either through the provisions of CEQA Guidelines Section 15220 et seq. or CEQA Guidelines Section 15096 to approve or permit aspects of the HSR project.

1.1.6 Compatibility with Federal Transportation Policy

In 2008, the U.S. Congress enacted a major reauthorization of intercity rail passenger legislation, creating a new priority for rail passenger services in the nation's transportation system. The Passenger Rail Investment and Improvement Act of 2008 (Division B of Public Law 110-432) authorized the appropriation of federal funds to support implementing high-speed and intercity rail passenger service, including authority for the Secretary of Transportation to establish and implement an HSR corridor development program. In the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), Congress appropriated $8 billion in capital assistance for HSR corridors and intercity rail passenger service. Congress provided an additional $2.5 billion in the Department of Transportation Appropriations Act (Title I, Division A of the Consolidated Appropriations Act, 2010). Public Law 112-110 reduced available funding by $400 million. In addition, FRA also issued a strategic plan, *Vision for High-Speed Rail in America* (FRA 2009), which described the agency's plan for intercity passenger rail development and subsequent program guidance to implement the High-Speed Intercity Passenger Rail Program with funding provided by Congress through the appropriations acts.

The HSR system is also consistent with recent expressions of federal multimodal transportation policy—most notably the Fixing America's Surface Transportation Act (FAST Act) (Public Law 114-94, December 4, 2015); the Moving Ahead for Progress in the 21st Century Act (Public Law

[7] The STB is an independent federal agency with jurisdiction over the construction and operations of new interstate rail lines (49 U.S.C. §§ 10502, 10901). In 2013, the STB determined it has jurisdiction over all sections of the proposed California statewide HSR system, including the San Jose to Merced Project Section, because of the HSR system's connection to the existing interstate rail network. STB, Docket No. FD 35724 (April 18, 2013).

112-141, July 6, 2012); the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users; the Transportation Equity Act for the 21st Century (Public Law 109-59, August 10, 2005); and the Intermodal Surface Transportation Efficiency Act of 1991 (Public Law 102-240, December 18, 1991). These laws encourage public transportation investment that increases national productivity and domestic and international competition, while improving safety and social and environmental conditions. These laws encourage investments that offer benefits such as the following:

- Link all major forms of transportation.
- Improve public transportation systems and services.
- Provide better access to seaports and airports.
- Enhance efficient operation of transportation facilities and service.

As the most current expression of federal multimodal transportation policy, the FAST Act seeks to improve surface transportation infrastructure, including roads, bridges, transit systems, and the passenger rail network. It provides long-term funding certainty for surface transportation, meaning that states and local governments can move forward with critical transportation projects, such as new highways and transit lines, with the confidence that they will have a federal partner over the long term. Overall, the FAST Act maintains current program structures and shares funding between highways and transit. The law also makes changes and reforms to many federal transportation programs, including streamlining the approval processes for new transportation projects and financing, providing new safety tools, and establishing new programs to advance critical freight projects.

1.2 Purpose of and Need for the High-Speed Rail System and the San Jose to Merced Project Section

1.2.1 Purpose of the High-Speed Rail System

The 2005 Statewide Program EIR/EIS established the purpose of the statewide HSR system and identified and evaluated alternative HSR corridor alignments and stations as part of a statewide HSR system (Authority and FRA 2005).

> *The purpose of the statewide HSR system is to provide a reliable high-speed electrified train service that links the major metropolitan areas of the state and delivers predictable and consistent travel times. A further objective is to provide an interface with commercial airports, mass transit, and the highway network and to relieve capacity constraints of the existing transportation system as increases in intercity travel demand in California occur in a manner sensitive to and protective of California's unique natural resources.*

1.2.2 Purpose of the San Jose to Merced Project Section

The purpose of this project is to implement the San Jose to Merced section of the California HSR system: to provide the public with electric-powered high-speed rail service that provides predictable and consistent travel times between major urban centers and connectivity to airports, mass transit systems, and the highway network in the south San Francisco Bay Area and Central Valley; and to connect the Northern and Southern portions of the statewide HSR system.

The purpose and need for the San Jose to Merced Project Section was developed through a process established by the Authority, FRA, USACE, and USEPA pursuant to a November 2010 memorandum of understanding that was intended to facilitate the integration of NEPA, Section 404 of the Clean Water Act, and Section 14 of the Rivers and Harbor Act (MOU). The parties reached agreement on the purpose and need in August 2011.

For Clean Water Act Section 404(b)(1) compliance, the USACE must take into consideration the applicant's needs in the context of the geographic area of the proposed action and the type of project being proposed. The USACE has determined that the overall project purpose (as stated above) allows for a reasonable range of alternatives to be analyzed, as is acceptable as the basis for the USACE 404(b)(1) alternatives analysis.

1.2.3 CEQA Project Objectives of the High-Speed Rail System in California and in the San Jose to Merced Project Section Area

The Authority's statutory mandate is to plan, build, and operate an HSR system coordinated with California's existing transportation network, particularly intercity rail and bus lines, commuter rail lines, urban rail lines, highways, and airports. As the lead agency, the Authority is preparing this Draft EIR/EIS consistent with specific CEQA EIR content and processing requirements. CEQA Guidelines Section 15124 requires an EIR to include a statement of objectives that will support the underlying purpose of the project. In response to its statutory mandate and CEQA requirements, the Authority has adopted the following objectives and policies for the proposed HSR system and the Project Section:

- Provide intercity travel capacity to supplement critically overused interstate highways and commercial airports.
- Meet future intercity travel demand that will be unmet by current transportation systems and increase capacity for intercity mobility.
- Maximize intermodal transportation opportunities by locating stations to connect with local transit, airports, and highways.
- Improve the intercity travel experience for Californians by providing comfortable, safe, frequent, and reliable high-speed travel.
- Provide a sustainable reduction in travel time between major urban centers.
- Increase the efficiency of the intercity transportation system.
- Maximize the use of existing transportation corridors and rights-of-way to the extent feasible.
- Develop a practical and economically viable transportation system that can be implemented in phases by 2030, and generate revenues in excess of operations and maintenance costs.
- Provide intercity travel in a manner sensitive to and protective of the region's natural and agricultural resources, and reduce emissions and vehicle miles traveled for intercity trips.

While these CEQA project objectives are not directly incorporated into the Purpose and Need under NEPA, an alternative's ability to achieve these CEQA project objectives will be considered in evaluating the reasonableness of an alternative under NEPA.

1.2.4 Statewide and Regional Need for the High-Speed Rail System in the San Jose to Merced Project Section Area

The approximately 145-mile-long San Jose to Merced Project Section is an essential component of the statewide HSR system. The Project Section would provide access to a new transportation mode, contribute to increased mobility throughout California, and connect the Bay Area to the rest of the statewide HSR system via four counties: Santa Clara, San Benito, Merced, and Madera, as illustrated on Figure 1-3. As major population and economic centers for California, the South Bay and Central Valley regions contribute significantly to the statewide need for a new intercity transportation service that would connect San Francisco with the Central Valley and Los Angeles.

The capacity of California's intercity transportation system, including the southern Bay Area and Central Valley systems, is insufficient to meet existing and future travel demand. The current and projected future system congestion will continue to result in deteriorating air quality, reduced reliability, increased travel times, more highway accidents, and increasing GHG emissions. The system has not kept pace with the tremendous increase in population, economic activity, and tourism in the state, including in the Bay Area and Central Valley.

The interstate highway system, commercial airports, and the conventional passenger rail system serving the intercity travel market are operating at or near capacity and will require large public investments in maintenance and expansion to meet existing demand and future growth over the

next 25 years and beyond. Moreover, the feasibility of expanding many major highways and key airports is uncertain; some needed expansions may be impractical or may be constrained by physical, regulatory, environmental, political, and other factors.

The need for improvements to intercity travel in California, including intercity travel between the Bay Area and the Central Valley, relates to the following issues:

- Future growth in demand for intercity travel, including the growth in demand in the Bay Area and Central Valley regions
- Capacity constraints that will result in increasing congestion and travel delays, including those in the South Bay and Central Valley regions
- Unreliability of travel stemming from congestion and delays, weather conditions, accidents, and other factors that affect the quality of life and economic well-being of residents, businesses, and tourists in California, including in the South Bay and Central Valley regions
- Reduced mobility as a result of increasing demand on limited modal connections among major airports, transit systems, and passenger rail in the state, including in the South Bay and Central Valley regions
- Poor and deteriorating air quality and pressure on natural resources and agricultural lands due to expansion of highways and airports, as well as continued urban development, including in the Bay Area and Central Valley
- Legislative mandates to moderate the effects of transportation on climate change, including required reductions in GHG emissions caused by vehicles powered by the combustion of carbon-based fuels

As major population and economic centers, the southern San Francisco Bay Area and Central Valley regions contribute significantly to the statewide need for a new intercity transportation service that would connect these regions to each other and to other major population and economic centers of the state. The following sections provide additional information about the factors contributing to the need for the Project Section.

1.2.4.1 Travel Demand and Capacity Constraints

Long-distance intercity trips, defined as those trips greater than 50 miles, are a large and growing proportion of the total travel market in California as a result of population and employment growth. To accommodate this increased demand, the state's long-distance passenger transportation infrastructure—highways, railroads, and air service—will require capacity expansion.

Population and Employment

Between 2010 and 2040, the California Department of Finance (CDOF) projects that California's population will increase by almost 10 million residents, from approximately 37 million to 47 million people (approximately 26 percent growth), as shown in Table 1-1. Total population is expected to grow steadily to approximately 50 million people by 2050 (CDOF 2014). Santa Clara County growth rates are similar to statewide projected growth, while the population growth rate in the much smaller San Benito, Merced, and Madera Counties will be about double that of state population growth. The CDOF projects the four-county population to increase by 35 percent, from 2.2 million to 2.9 million residents, between 2010 and 2040.

Table 1-1 Population Growth in California and the Counties of the San Jose to Merced Project Section

Area	Population		
	2010	2040 (projected)	Percent Growth 2010 to 2040
Santa Clara County	1,785,089	2,331,887	31%
San Benito County	55,547	82,969	49%
Merced County	256,800	389,934	52%
Madera County	151,466	238,514	57%
Counties of the San Jose to Merced Project Section combined[1]	2,248,902	2,954,900	35%
California	37,341,978	47,233,240	26%

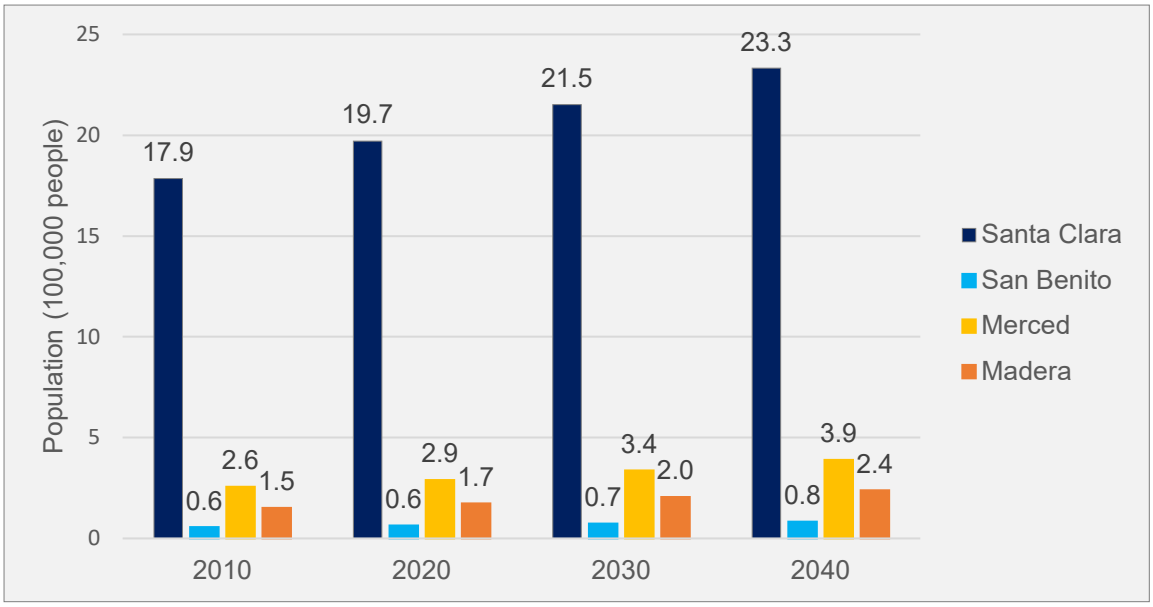
Source: CDOF 2014

[1] The San Jose to Central Valley Wye Project Extent crosses three counties: Santa Clara, San Benito, and Merced; the full Project Section extends into Madera County.

Between 2010 and 2040, the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) project that the Bay Area will experience a growth of 1.3 million jobs, over 2 million people, and approximately 820,000 households (ABAG and MTC 2017).

The population will become older and more diverse, influencing types of households and their location choices. While the 2040 population as a whole is projected to be 22 percent larger than the 2010 population, growth will differ widely by age group. The number of school-aged children (5–17 years old) is projected to decline, while people 65 and over will account for more than half of all growth in the region. ABAG and MTC's estimate of net commuting between Bay Area counties and other areas shows that net in-commuting will be expected to grow by up to 53,000 workers between 2010 and 2040 (ABAG and MTC 2017). Between 2010 and 2040, the Central Valley population is projected to grow by 43 percent, from 7.1 million to 10.2 million (CDOF 2014). This growth away from urban centers is likely the result of people seeking affordable housing within commuting range of major metropolitan areas. Realization of this growth will place increased demands on the Central Valley local roads, highways, airports, and transit systems.

Figure 1-4 illustrates the projected population growth (in units of 100,000 people) between 2010 and 2040 by 10-year increments in Santa Clara, San Benito, Merced, and Madera Counties.



Source: CDOF 2014 DECEMBER 2016

Figure 1-4 Population Growth for Santa Clara, San Benito, Merced, and Madera Counties

Of all the counties in the Bay Area, Santa Clara County is projected to experience the greatest household and employment growth (31 and 30 percent of the total projected growth, respectively). Substantial job growth is expected in Bayside communities and the city of San Jose (ABAG and MTC 2017). This increase in people living and working in southern Santa Clara County will put additional pressure on the already congested existing transportation network in the region.

In Merced County, Caltrans projects employment to increase by approximately 38 percent from approximately 68,600 jobs in 2010 to nearly 93,700 jobs in 2040 (Caltrans 2015). Employment is projected to grow in the agricultural sector, a primary component of the region's economy; Merced County ranks fifth in agricultural production in California. Outside the agricultural sector, the California Employment Development Department expects employment growth in private educational services/health care/social assistance, manufacturing, retail trade, and leisure and hospitality (California Employment Development Department 2016).

As shown in Table 1-2, the unemployment rate in San Benito, Merced, and Madera Counties is currently higher than the statewide rate, and the counties' per capita personal income is much lower than the state's as a whole. The California Employment Development Department expects employment growth in some industry sectors. The amount of employment growth projected is less than the amount of projected population growth. San Benito, Merced, and Madera Counties, therefore, will be challenged to reduce their unemployment and increase the per capita incomes of their residents. Because of Santa Clara County's already low unemployment rates, the increased employment opportunities in the immediate area could exceed worker availability to fill positions. Projected increases in Merced County employment opportunities may also provide more opportunities for currently unemployed residents.

Table 1-2 Unemployment and Income in California and Santa Clara, San Benito, Merced, and Madera Counties

Area	Unemployment Rate (2015)	Income Per Capita (2015)
California	6.2	$53,224
Santa Clara County	4.2	$79,302
San Benito County	7.6	$43,630
Merced County	11.4	$33,852
Madera County	10.5	$33,730

Sources: CEDD 2016; Caltrans 2016a

The growth of this region combined with the growth of the Bay Area means that already congested local roads, highways, airports, and transit systems will face unprecedented demand in the years ahead as people migrate to the state. Operation of the HSR system between San Jose and Merced would reduce stress on the existing transportation systems by reallocating some of the regional demand away from highways and airports.

The HSR system would serve planned mixed-use developments at the proposed HSR stations in San Jose and Gilroy. The new housing proposed as part of the HSR station area planning would bring more employees into the area to help meet the projected job growth. Providing HSR service would also support economic growth, providing a new regional transportation service that would allow more direct access to San Francisco and Silicon Valley economic centers. HSR would not offer a below-market, subsidized passenger rail service, but instead would provide rapid long-distance travel, priced at commercial market rates. The pricing structure for HSR fares would be expected to be similar to typical airline fares, but fares would fluctuate based on a variable pricing strategy (Authority 2018a). The cost of the HSR fares would discourage a daily commute to and from the Bay Area and Los Angeles basin.

Travel Demand

The population and employment growth in California has resulted in increased travel demand, which is expected to continue to increase through 2040. Figure 1-5 illustrates the long-distance intercity trips[8] in California in 2010 and 2040 for automobiles, air travel, and conventional rail. Long-distance intercity travel in California is estimated to increase by approximately 51 percent between 2010 and 2040, from 548 million to about 828 million trips. The fastest-growing mode of transit for intercity trips is conventional rail, which is expected to increase 86 percent between 2010 and 2040. However, without HSR the automobile will continue to account for the greatest share of long-distance intercity travel, and by 2040 is expected to account for more than 96 percent of all long-distance intercity travel. Figure 1-6 illustrates the major routes and airports used for long-distance travel among the markets potentially served by the HSR system.

[8] Defined as trips greater than 50 miles.

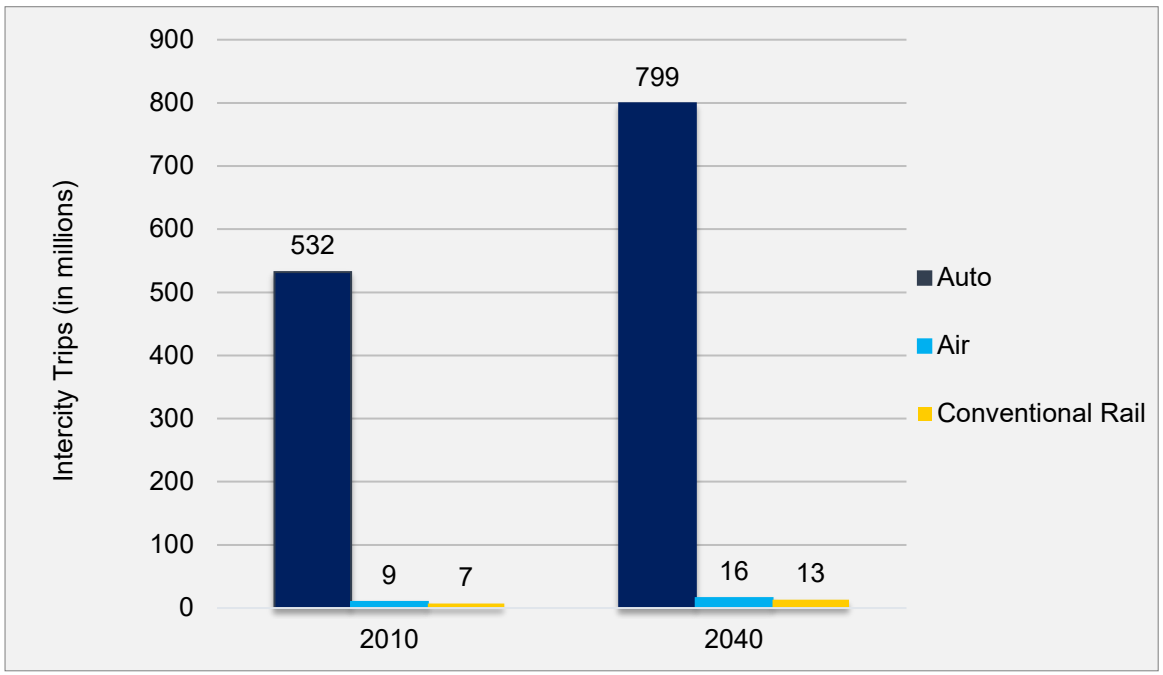


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Figure 1-5 Long Distance Intercity Trips in California (in millions)

Note: Train lines in the project extent are described in Section 3.2, Transportation

APRIL 2016

Figure 1-6 Major Intercity Travel Routes and Airports

The jobs-to-housing ratio is an indicator of the balance between employment and housing in a geographical area and can serve as a rough indicator of the amount of commuter travel demand to or from that geographical area. A low jobs/housing ratio (less than 1.0) suggests that relatively few job opportunities exist for community residents, requiring commuting elsewhere for work; while a high ratio (greater than 1.5) suggests a surplus of jobs, with employees needing to commute from surrounding areas to fill the available jobs. Table 1-3 shows the 2010 jobs/housing ratio and projected 2040 jobs/housing ratio for the Project Section region. As the data indicate, San Benito and Merced Counties have a low jobs/housing ratio, suggesting that there are not enough jobs within the two counties and workers who reside in these areas may need to commute into adjacent counties for employment. The low jobs/housing in San Benito and Merced Counties is projected to remain approximately the same through 2040 (Caltrans 2015).

Table 1-3 Jobs/Housing Ratio 2010 and 2040

Area	2010			2040 (projected)		
	Jobs	Households	Ratio	Jobs	Households	Ratio
Cities[1]						
San Jose[2]	377,140	301,370	1.3	524,510	432,030	1.2
Morgan Hill[2]	17,520	12,330	1.4	22,080	16,150	1.4
Gilroy[2]	17,600	14,180	1.2	21,900	17,040	1.3
Los Banos[3]	17,130	10,152	1.7	35,200[4]	27,200[4]	1.3
Merced[3]	25,800	27,167	1.0	—	50,700[4]	—
Counties						
Santa Clara	926,260	604,200	1.5	1,229,530	818,390	1.5
San Benito	14,220	16,800	0.8	20,190	22,600	0.9
Merced	68,600	75,600	0.9	93,700	97,600	0.9
Madera	42,855	43,304	1.0	79,877	80,626	1.0

Sources: ABAG and MTC 2017; City of Los Banos 2009; Caltrans 2015; Madera County Transportation Commission 2014
[1] The table selectively presents information to include cities to be served by the San Jose to Merced Project Section.
[2] City in Santa Clara County
[3] City in Merced County
[4] Figures from latest General Plan update, which projected through 2030

The projected 2040 population increases throughout Santa Clara, San Benito, Merced, and Madera Counties and the Central Valley would increase the number of commuters on freeways, commuter rail systems, and regional and local bus systems. The jobs/housing ratio projections provide another indication that economic growth in Santa Clara and Merced Counties will continue to increase demand for intercity travel services. The widening gap between population and employment growth and roadway capacity expansion, particularly in Santa Clara County, means that a growing number of the region's residents will face congested travel conditions that will persist for longer periods of time, as more drivers adjust their time of travel to avoid the most heavily congested peak period commute hours.

Freeway Congestion and Travel Delays

To meet the growing demands of Santa Clara County and adjacent areas, the (Santa Clara) Valley Transportation Authority (VTA) has prioritized transit expansions such as the Bay Area Rapid Transit (BART) extensions to Berryessa and Santa Clara, Caltrain electrification, express lane expansions in the SR 85/US 101 and SR 237 corridors, and major improvements to the SR 152 corridor between SR 156 and US 101. Additionally, the Merced County Association of Governments (MCAG) has prioritized plans to increase the capacity of SR 99 and SR 140 in

the Central Valley. These improvements, however, will not fully meet the ideal operating standards set forth in VTA's *Valley Transportation Plan 2040: The Long-Range Transportation Plan for Santa Clara County* (VTP 2040 [VTA 2014a]) and MCAG's *2018 Regional Transportation Plan/Sustainable Communities Strategy Amendment No. 1* (RTP/SCS) for Merced County (MCAG 2018) because of the projected increase in population, jobs and, consequently, traffic congestion.

US 101, SR 152, and SR 99 are the major roadways that parallel the Project Section (Figure 1-7). Daily freeway congestion is highest in Santa Clara County, primarily on US 101 and routes traveling into San Jose in the morning and out in the afternoon. According to the MTC Vital Signs data (MTC 2015), several of the Bay Area's most congested roadway segments are along roadways entering or exiting San Jose, including the following (ranked in descending order of congestion):

1. I-680 southbound (morning) between King Road and North Wolfe Road (20th)
2. US 101 northbound (morning) between Silver Creek Valley Road and Tully Road (30th)
3. SR 85 northbound (morning) between SR 87 and Winchester Boulevard (33rd)
4. SR 87 northbound (morning) between SR 85 and Almaden Expressway (45th)
5. US 101 southbound (evening) between Coyote Creek Golf Drive and Cochrane Road (88th)

Note: Major roadways in the project extent are described in Section 3.2, Transportation

Source: Authority and FRA 2016

APRIL 2016

Figure 1-7 Major Roadways

Intercity travel within the larger San Joaquin Valley[9] and specifically in Merced and Madera Counties occurs primarily on SR 152 and SR 99. SR 99 is the principal north/south highway connection between the region's major cities, currently carrying annual daily traffic volumes of 38,000 to more than 100,000 vehicles (Caltrans 2013b). Most of SR 99 was built in the late 1950s and early 1960s to accommodate a smaller population and correspondingly smaller transportation infrastructure demands. The increased San Joaquin Valley population and the resulting land use patterns have generated a reliance on automobiles for most trips, placing additional demand on existing highways. Table 1-4 shows the 2015 and 2040 daily vehicle miles traveled (VMT) in all three counties (Santa Clara, San Benito, and Merced) through which the project extends, the full Project Section extends into Madera County. VMT in these counties is expected to increase at an average annual growth rate of between 1.1 and 1.9 percent over the 2015–2040 period. This increase in VMT will further exacerbate the traffic congestion in the region.

What is VMT?

Vehicle miles traveled, or VMT, is a measurement of miles traveled by vehicles within a specific region over a specific period of time.

Table 1-4 Current and Projected Vehicle Miles Traveled

County	Daily Vehicle Miles Traveled (million)		
	Existing Conditions (2015)	Year 2040 Projection	Annual Growth Rate (%)
Santa Clara	28.3	36.2	1.1%
San Benito	1.7	2.3	1.5%
Merced	3.4	5.0	1.9%
Madera	2.0	3.0	1.3%

Source: Authority 2016

Improvements to several major highways are being planned, with completion anticipated in the next 10 to 15 years. SR 237 express lanes and Central, Montague, and San Tomas Expressway improvements are planned in Santa Clara County. The improvements in Santa Clara County primarily entail construction of a highway express lane system—individual interchange upgrades, conversion of high-occupancy vehicle lanes to express lanes, and construction of new express lanes. These improvements would not cumulatively add substantial capacity to the existing highway system but rather would enhance the efficiency of existing highways. The SR 152 Trade Corridor Project proposes infrastructure improvements to enhance safety on SR 152 between US 101 and the Santa Clara/Merced county line to accommodate long-term commercial, commuter, and recreational traffic needs (VTA 2014a). Other proposed improvements in *VTP 2040* (VTA 2014a) and the 2018 Merced County RTP/SCS (MCAG 2018) would increase capacity by widening existing roadways within the project area—for example, Merced County improvements would provide additional capacity in the Los Banos area. Although these plans propose additional travel and auxiliary lanes on freeways or reclassifying existing facilities, the added capacity would not be sufficient to ease traffic flow within the region or offset the projected increase in population and jobs. Transit projects and other more efficient and sustainable modes of travel are heavily encouraged by both VTP 2040 (VTA 2014a) and the 2018 Merced County RTP/SCS (MCAG 2018), which together cover the entire Project Section corridor.

[9] The San Joaquin Valley is a north-south area, the southern half of the Central Valley, approximately 250 miles long and bordered on the west by the coastal mountain ranges. Its eastern boundary joins the southern two-thirds of the Sierra bioregion, which features Yosemite, Kings Canyon, and Sequoia National Parks. Merced County falls within the San Joaquin Valley (Valley Clean Air Now 2015).

Caltrans has begun implementing the *Route 99 Corridor Updated Business Plan* (Caltrans 2013b). The plan proposes removal of remaining at-grade intersections and improvement of others to higher capacity. This work will continue over the next 10 years, depending on available funding. The plan proposes widening the route between Merced and Fresno from four to six lanes to ease traffic flow between interchanges. The lane expansions, however, will not reduce projected congestion along SR 99 through 2040. According to the *Route 99 Corridor Updated Business Plan* (Caltrans 2013b), only a shift in vehicle travel to alternative modes can restore better traffic flows.

The Project Section reflects the statewide growth patterns and trends, where much of the intercity travel in California consists of trips of intermediate distance (i.e., trips at least 150 miles long). Table 1-5 shows the statewide expected growth in traffic volumes on major highways in California over the period 2010–2040.

Table 1-5 Travel Growth for Intercity Highways

Major Highways	Average Daily Volume 2010	Average Daily Volume 2040 Projection	Percent Change 2010 to 2040
US 101 (between San Francisco and San Jose)	211,000	306,000	46
I-280 (between San Jose and San Francisco)	87,000	133,000	53
US 101 (between San Jose and Madera)	78,000	114,000	46
SR-152 (between San Jose and Madera)	27,000	48,000	78
SR-99 (between Modesto and Sacramento)	57,000	81,000	42
SR-99 (between Bakersfield and Modesto)	110,000	174,000	58
SR-99 (between Bakersfield and Merced)	24,000	43,000	79
I-5 (between Bakersfield and Modesto)	41,000	60,000	46
I-5 (between Modesto and Sacramento)	47,000	79,000	68
I-5 (between San Diego and Los Angeles)	229,000	284,000	24
I-5 (between Los Angeles and Bakersfield at Santa Clarita)	182,000	271,000	49
I-5 (between Lancaster and Los Angeles)	324,000	384,000	19

Source: Caltrans 2014
Average daily volume represents average weekday traffic over a 24-hour period
I = Interstate
SR = State Route
US 101 = U.S. Highway 101

Freight Movement

Freight movement in the Bay Area is associated with international trade, domestic trade, and urban goods movement (Caltrans 2014). The region is an important international trade gateway—the Port of Oakland is the fifth busiest port in the U.S. based on cargo volume, the Port of San Francisco specializes in noncontainerized cargo and has a thriving cruise industry, and the Port of Redwood City is the fasted growing “small” bulk port in California (Caltrans 2011, 2012a, 2013c). The Bay Area is also a major consumption center that relies on its domestic trade links to population-serving industries across the country; for instance, the region relies on the San Joaquin Valley for much of the warehouse and distribution infrastructure. The region also relies heavily on a local urban goods movement to provide basic consumer products, foods, and packages to residents and businesses within the region. Unlike passenger trains, freight rail traffic is expected to increase at a compound annual growth rate of 3.5 percent to 2040 because of increased intermodal rail shipments (e.g., shipping containers that can be single- or double-

stacked on railcars, stacked in a container ship, or placed on a truck trailer chassis) coming from the Port of Oakland (Caltrans 2014).

Passenger vehicle travel in the region competes with freight movement along US 101, SR 152, SR 99, and other local roads. Most freight in the region is transported by trucks, with more than 72 percent of the tonnage in the Bay Area transported by trucks in 2012 (MTC 2016). US 101 carries most of the truck traffic in Santa Clara County, and it will continue to be one of the two most significant intraregional goods movement corridors in the San Francisco and South Bay areas. The *MTC San Francisco Bay Area Goods Movement Plan* forecasts increasing conflicts between truck and commuter traffic patterns in this corridor (MTC 2016).

Trucks also transport most of the freight in Merced County. Rail accounts for approximately 6 percent of the total, air transport for less than 0.1 percent (MCAG 2018). Merced County has both agricultural and light industrial demands for trucking. Truck traffic along the major highway corridors makes up between 20 and 30 percent of the vehicular traffic, with SR 99 and I-5 the primary north-south interregional routes. SR 99 is a significant interregional route, carrying most of the truck-transported agricultural goods. Other state highways and county roads also play major roles in distribution.

UPRR operates the freight rail system in the Santa Clara to Madera corridor (via Niles Canyon and Altamont Pass), while the BNSF Railway (BNSF) provides freight movement in and through Merced County. In Santa Clara County, freight trains operate daily on the UPRR Coast Line between San Jose and Gilroy; Caltrain, Amtrak, and Altamont Corridor Express passenger services also use the Coast Line. The current combined freight and passenger train volume along this shared corridor is 11–25 trains per day, predominantly Caltrain passenger service. In Merced County, rail freight service is used by several industrial/manufacturing and agricultural companies, with the largest users in the cities of Merced, Atwater, and Los Banos (Caltrans 2018).

Conventional Passenger Rail

Several conventional passenger rail systems serve portions of the Project Section. BART does not currently serve Santa Clara County, but it plans a Phase 1 extension of service from Warm Springs in Fremont to Berryessa Station in San Jose, anticipated to open for passenger service in 2019, and a Phase 2 extension through downtown San Jose to Santa Clara with an anticipated opening date for passenger service in 2026 (VTA 2019). A stop would be provided at the San Jose Diridon Station (VTA 2018a). The existing passenger train services in the study corridor are provided primarily by Amtrak, Caltrain, San Joaquin Joint Powers Authority (SJJPA), and the VTA (Caltrans 2018).

- **Amtrak—**Amtrak provides intercity passenger rail service in California on four principal corridors covering more than 1,300 linear route miles and spanning the length and breadth of the state. The existing passenger rail network in the project vicinity includes portions of three of these corridors: the Coast Starlight follows the UPRR coast route between San Jose and Gilroy; the San Joaquin route follows the BNSF corridor in Madera and Merced Counties; and the Capitol Corridor, which terminates in San Jose, provides service north to Oakland and eventually to Sacramento and Auburn.

  Plans are in development for a 68-mile service expansion of the Capitol Corridor to Santa Cruz and Monterey Counties, stopping at Watsonville, Castroville, and Salinas in addition to Gilroy, San Martin, Morgan Hill, Blossom Hill, Capitol, and Tamien Stations (Capitol Corridor Joint Powers Authority 2015). The expanded service would operate on Caltrain and UPRR track. The service expansion is under study by the Capitol Corridor Joint Powers Authority and the Transportation Agency of Monterey County (Capitol Corridor Joint Powers Authority 2014b).

- **Caltrain—**Caltrain is managed by SamTrans and operates under the jurisdiction of the PCJPB. The PCJPB's Caltrain service provides regional service between San Francisco and San Jose, with three peak hour/peak direction weekday trips extending to Gilroy, stopping at the Tamien, Capitol, Blossom Hill, Morgan Hill, and San Martin Stations in the evening peak hour. The same stations are served in the northbound direction during the morning peak hours.

- **Altamont Commuter Express (ACE)—**The ACE, operated by the SJJPA, provides passenger service between the San Jose Diridon Station and Stockton (San Joaquin Regional Rail Commission [SJRRC] 2016a). The SJJPA is evaluating the potential environmental impacts of extending the commuter service to Merced (SJRRC 2016b).
- **VTA—**The VTA provides bus, light rail, and paratransit service within Santa Clara County. VTA operates a light rail system serving San Jose and surrounding suburban areas south and east of Diridon Station. The Mountain View–Winchester line serves the San Jose Diridon Station. The VTA also manages the BART Silicon Valley project, which will extend from Fremont through the cities of Milpitas, San Jose, and Santa Clara (VTA 2016a). The program's first phase would connect the Warm Springs BART Station in Fremont to the Berryessa BART Station in San Jose. The second phase would construct a subway tunnel from the Berryessa Station through downtown San Jose and the Diridon Station, terminating service at the Santa Clara Caltrain Station and continuing to a maintenance facility at the Newhall Maintenance Yard (VTA 2016b). The Project Section would connect with BART at the San Jose Diridon Station.

Air Travel

The demand for air travel has been growing steadily in California, and RTPs forecast continued growth in air travel over the coming decades. Between November 2014 and October 2015, Los Angeles to San Francisco was the second busiest air travel route in the United States, with 3.68 million passengers (U.S. Department of Transportation [USDOT] 2016a). Far fewer trips are made to and from the smaller airports in the eastern portion of the project vicinity.

Commercial air service for Santa Clara, San Benito, and Merced Counties is provided primarily by Norman Y. Mineta San Jose International Airport (SJC) and Fresno Yosemite International Airport. Other airports serving the project vicinity include Merced Regional, San Martin Airport, South County Municipal Airport, Frazier Lake Airpark, and Los Banos Municipal Airport; however, these airports do not provide significant intercity commercial airline service to populations in the Central Valley. The HSR system would provide an intercity travel option with frequent, reliable service and competitive fares for the growing populations in the project area.

The Bay Area's two primary medium hub airports—SJC and Oakland International Airport (OAK)—are projected to increase their annual passenger demand from 9.4 million passengers in 2014 to 17.6 million by 2027 at SJC, an 87 percent increase (City of San Jose 2015), and from 18 million passengers in 2010 to 30 million at OAK by 2025, a 67 percent increase (Port of Oakland 2006). Some projected air travel demand may be absorbed by these medium hub airports and by external airports in the larger market area, such as Sacramento, Stockton, and Monterey airports. However, the external airports offer fewer flights and destination locations than the medium hub airports. Consequently, the external airports are not as attractive to the business commuter or international and national tourist travelers as the medium hub airports.

The HSR system would provide a new intercity travel option for air passengers from the San Francisco Bay Area and Central Valley airports, serving passengers who would normally fly between the Bay Area and Los Angeles, Burbank, and Orange County. The California cities that would be served by HSR include 5 of the top 15 Bay Area domestic air passenger markets and 26 percent of all domestic passengers served from the three Bay Area airports (Regional Airport Planning Committee 2011). Because of existing constraints to expanding San Francisco International Airport (SFO) and the large hub airports in southern California, regional sharing of air travel among local airports, market mechanisms, and high-speed ground travel modes will be needed to alleviate the demand and capacity constraints.

The HSR system would help to alleviate capacity constraints at Bay Area airports by providing a new mode of intercity transportation. Air passengers would be diverted to HSR by a combination of factors, such as frequent, reliable service, competitive fares, and arriving closer to their final destinations in the commercial centers of cities (rather than in airports situated in outlying areas of these commercial centers).

Travel Time

With growing demand for intercity travel and growing capacity constraints, the total automobile travel time will increase statewide. Table 1-6 shows the approximate total travel time in 2010 and the projected total travel time in 2040 for automobile, air, and rail between various city pairs. These data come from the *San Jose to Merced Project Section Checkpoint A, Project Purpose, Need, and Objectives*, which includes a ridership analysis completed for HSR, using information from regional transportation planning agencies, Caltrans, and current air and conventional rail schedules (Authority and FRA 2016).

Table 1-6 Estimated Total Travel Times (Door-to-Door in Hours and Minutes) between City Pairs by Auto, Air, and Rail (Peak Conditions)

City Pair	Auto[1]		Air[2,3]		Conventional Rail[3]	
	2010	2040	2010	2040	2010[4]	2040[5]
Los Angeles downtown to San Francisco downtown	6:27	6:53	4:37	4:32	11:40	11:29
Fresno downtown to Los Angeles downtown	3:37	3:51	4:03	4:23	5:49	5:55
Los Angeles downtown to San Diego downtown	2:24	2:28	4:11	3:55	3:02	3:24
Burbank (Airport) to San Jose downtown	5:22	5:43	3:43	3:43	10:31	10:40
Sacramento downtown to San Jose downtown	2:22	2:18	4:12	4:25	4:04	3:32

Source: Authority and FRA 2016

[1] Travel times come from California Statewide Travel Demand Model.

[2] Main-mode level-of-service assumptions are the same for 2010 and 2040, and are based on 2009 levels-of-service conditions from U.S. Department of Transportation and Bureau of Transportation Statistics' origin and destination survey airline data. Total travel time differences based on changes in access/egress over time.

[3] Air and conventional rail times include access to main mode via transit, egress to main mode via transit, and terminal and wait time at station/airport. When transit is unavailable, auto is used for access/egress.

[4] Developed from online published San Joaquin schedule.

[5] Year 2040 San Joaquin operating plan developed from the 2013 State Rail Plan (Caltrans 2013a).

Air and rail travel time are not projected to change between 2010 and 2040. While increases in air travel times are not forecast, the number of desired flights to a given destination may be limited by runway capacity, thus reducing flexibility in available travel dates and times.

Projected increases in automobile travel time will be caused largely by growing travel demand and resulting congestion on highways used for intercity travel. Programmed and funded highway improvements will not measurably change these future conditions, and vehicle delays and congestion levels will continue to outpace the network's ability to serve the demand (ABAG and MTC 2017). Some capacity improvements funded for the San Francisco Bay Area, Central Valley, and Southern California are only basic enhancements that will do more to improve reliability than travel time.

Continuing population growth and increasing tourism in California place severe demands on the already congested transportation system serving the state's major metropolitan areas. As described in the RTPs and acknowledged in the original Tier 1 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the Tier 1 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008) for areas that would be served by the proposed HSR system, the highways and airports serving key cities are currently operating at capacity, and plans for expansion will not keep pace with projected growth over the next 20 to 40 years.

1.2.4.2 Unreliability of Travel

The project vicinity is served primarily by the US 101, SR 152, SR 99, and I-5 freeways. In 2014, freeway travel time during the peak period in the San Francisco–Oakland urban areas took about 1.5 times as long as during low-volume conditions (Urban Mobility Scorecard 2015). This is the second worst performance in California (behind the Los Angeles–Long Beach–Anaheim area) and the fourth worst nationally. In the San Jose area, freeway travel during the peak period took 1.43 times as long as during low-volume conditions. On another index measuring freeway commuter stress, the San Francisco–Oakland urban area ranked worst in the nation (Urban Mobility Scorecard 2015). As congestion worsens, daily peak travel periods will lengthen.

The California Highway Patrol (CHP) publishes an annual summary of accident data for state highways. In 2016, the CHP reported that 3,704 fatalities and 275,813 nonfatal injuries occurred on California's highways (CHP 2018). With more vehicles on the intercity highways, the potential for accidents will continue to increase, resulting in increased travel delays as incidents are cleared. As delays on the freeways increase, overall system reliability tends to decrease. Implementation of HSR in the Project Section would offer a reliable and predictable alternative transportation option to highway travel.

Weather conditions can adversely affect highway travel time reliability. Rain and wind can make the roads dangerously slick, increasing accident rates, while fog and glare can reduce visibility and distract drivers, increasing accident rates. The San Joaquin Valley is subject to dense tule fog during the winter months. The fog creates a substantial safety hazard for motorists and is the leading cause of weather-related accidents in California (USDOT 2016b). Visibility in tule fog is often less than one-eighth of a mile (approximately 600 feet); sometimes visibility can be less than 10 feet, resulting in hazardous driving conditions.

These weather conditions are also a key factor in flight delays, which adversely affect air travel reliability. In 2015, weather caused more than 57 percent of flight delays at SFO, the highest nationally among major airports (USDOT 2016b). SFO capacity is highly dependent on weather conditions and whether aircraft pilots are allowed to follow visual flight rules (in good weather) or instrument flight rules (in poor weather). While fog can also affect rail travel reliability by reducing visibility, HSR trains would be equipped with positive train control to reduce reliance on trackside signaling. Implementing HSR in the Project Section would offer a transportation option that is less affected by weather conditions than driving or flying and, therefore, a more reliable and predictable option.

The reliability of rail travel along the San Jose to Merced corridor is adversely affected by collisions and fatalities primarily associated with the joint use of the rail corridor by passenger and freight rail services, as well as with the proximity of pedestrians and motor vehicles to trains at and along grade crossings. In 2014, California ranked first in pedestrian rail trespass fatalities (with 93 fatalities) (Operation Lifesaver, Inc. 2015a, 2015b, 2015c). In 2015, California ranked second for highway-rail grade crossing collisions in the nation and first for highway-rail grade crossing fatalities (FRA 2016). A total of 50 highway-rail grade crossing collisions occurred in Santa Clara, San Benito, and Merced Counties from January 2011 to December 2015. Between January 2011 and December 2016, 65 at-grade crossing accidents occurred in Santa Clara, San Benito, and Merced Counties. None of these accidents occurred within the Project Section (FRA 2016). Through November 2016, the FRA reported one highway-rail crossing fatality in San Benito County; two highway-rail crossing fatalities and four pedestrian rail trespass fatalities in Merced County; and one highway-rail crossing fatality and four pedestrian rail trespass fatalities in Santa Clara County (FRA 2017a, 2017b, 2017c). Grade crossing safety is a high priority for the FRA, the Authority, and the California Public Utilities Commission. Dedicated rail facilities from San Jose Diridon Station through the project extent would improve safety by reducing pedestrian, rail, and vehicle conflicts, thereby increasing the reliability of travel along this corridor.

1.2.4.3 Limited Modal Connections

Statewide, modal connections among intercity travel facilities (primarily airports) and the extensive network of urban and commuter transit systems are often limited or cumbersome, involving multiple transfers and long waits, though improvement has been made in recent years. Moreover, the automobile is still the primary mode of transportation in the San Jose to Merced corridor. Passengers prefer transportation systems with connections that perform similarly to the convenience and speed of door-to-door service by auto. If multiple mode changes (e.g., from car to shuttle to plane to train) are needed to reach a destination, travelers might prefer to travel by car, even if travel times are comparable.

In San Jose, the Diridon Station provides transit connectivity among Caltrain, VTA buses and light rail routes, the Capitol Corridor (intercity passenger rail service between Sacramento and San Jose), ACE trains (commuter rail service between Stockton in the Central Valley and San Jose), and Amtrak service (connecting the Bay Area with Southern California). In addition, the planned BART extension to Diridon Station will provide transit connectivity around the San Francisco Bay Area. Gilroy Transit Center provides transit connectivity among VTA bus lines, San Benito County Transit shuttles, Monterey-Salinas Transit buses, Amtrak Thruway buses, and Caltrain commuter trains. Providing HSR service at the Diridon Station and Gilroy Transit Center would expand intercity modal connections to the Central Valley and Southern California.

Presently, there are no direct transit connections linking Merced to Gilroy or San Jose. Traveling from Merced to San Jose currently requires a combination of transit modes: the Amtrak San Joaquin line, BART, bus, and Caltrain, taking approximately 5 hours. By comparison, auto travel time between San Jose and Merced is nearly 2 hours. The SJRRC is currently planning improvement and expansion of existing rail service between Stockton and San Jose, with later extension to Modesto by early 2019 and ultimately downtown Merced (SJRRC 2016b). HSR service from San Jose to the Central Valley would provide a direct transit linkage from Merced to San Jose, with a projected travel time of approximately 40 minutes.

The limited options for direct, fast, and safe connections to the major metropolitan areas isolate the Central Valley economically, limit the area from which the Central Valley economy can draw consumers and employees, and reduce the accessibility of job markets for residents. HSR service between San Jose, Gilroy, and Merced would provide an effective mobility option at these locations by providing linkages to a number of bus, light rail, and airport services for intercity travelers to other areas in the state.

1.2.4.4 Deterioration of Air Quality and Impact on Greenhouse Gas Emissions

Under the authority of the Clean Air Act, the USEPA established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. The federal standards (National Ambient Air Quality Standards) represent the maximum allowable atmospheric concentrations for ozone (O_3), particulate matter (particulate matter smaller than or equal to 10 microns in diameter [PM_{10}] and particulate matter smaller than or equal to 2.5 microns in diameter [$PM_{2.5}$]), carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. The Clean Air Act defines nonattainment areas as geographic regions designated as not meeting one or more of the National Ambient Air Quality Standards. The Clean Air Act requires that a state implementation plan be prepared for each nonattainment area and a maintenance plan be prepared for each former nonattainment area that subsequently demonstrates compliance with the standards. A state implementation plan is a compilation of a state's air quality control plans and rules that the USEPA has approved.

California has multiple air basins that contain nonattainment areas due to one or more violation of the state's ambient air quality standards (see Section 3.3, Air Quality and Global Climate Change), including the Great Basin Valleys, Lake Tahoe, Mojave Desert, Mountain Counties, North Central Coast, North Coast, Northeast Plateau, Sacramento Valley, Salton Sea, San Diego, San Francisco Bay Area, San Joaquin Valley, South Central Coast, and South Coast Air Basins (California Environmental Protection Agency 2016).

Metropolitan areas will continue to be challenged by the growing number of vehicles to reduce emissions to acceptable levels. Jurisdictions will attempt to maintain air quality standards by encouraging more efficient use of land resources, improving mobility, and providing alternative transportation facilities and services. Policies aimed at reducing the trip demand in single-occupant vehicles are integral to all transportation plans and programs to help areas currently in nonattainment status to conform to federal air quality standards. The Bay Area exceeds federal and state air quality standards for O_3 and fine particulate matter ($PM_{2.5}$) and the state standard for particulate matter (PM_{10}) (Bay Area Air Quality Management District 2017). San Benito County, which is within the North Central Coast Air Basin (managed by the Monterey Bay Unified Air Pollution Control District), exceeds state standards for O_3 and PM_{10} (Monterey Bay Unified Air Pollution Control District 2008). Merced and Madera Counties, which are within the San Joaquin Valley Air Pollution Control District, exceed federal and state standards for O_3 and $PM_{2.5}$ and the state air quality standard for PM_{10} (San Joaquin Valley Air Pollution Control District 2015). The projected population growth in the Bay Area and Central Valley will result in an increase in VMT and thus in the volume of pollutants emitted by motor vehicles.

One statewide strategy adopted in the CARB's State Implementation Plan is the development of multiuse transportation corridors. These corridors include designated high-occupancy vehicle lanes, the addition of more transit, and the inclusion of rail modal options. To meet federal and state air quality standards over the next 20 to 40 years, the Bay Area and Central Valley will need to require VMT reductions, integrated land use and transportation planning and development, transportation demand strategies, operational improvements, and new technologies that improve transportation efficiencies and increase transportation alternatives to the single-occupant automobile. The electric-powered HSR system offers an additional transportation option to the single-occupant vehicle and would reduce VMT in support of the California State Implementation Plan.

In 2005, California's governor set statewide targets for reducing GHG emissions. Executive Order S-3-05 requires that state agencies reduce their GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and 80 percent below 1990 levels by 2050. Shortly after the issuance of Executive Order S-3-05, the California State Legislature adopted AB 32, the Global Warming Solutions Act of 2006. AB 32 recognizes that California is the source of substantial amounts of GHG emissions. Legislative findings in the law state the following:

> *The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to the marine ecosystems and that natural environment, and an increase in the incidences of infectious diseases, asthma, and other health-related problems.*

To avoid these consequences, AB 32 requires CARB, the state agency charged with regulating air quality, to create a plan and implement rules to achieve real, quantifiable, cost-effective reductions of GHGs in California. AB 32 requires CARB to design and implement emissions limits, regulations, and other measures to reduce statewide GHG emissions to 1990 levels by 2020. This requirement is the same 2020 target as in Executive Order S-3-05. The Legislature has not enacted targets beyond 2020. In response to this legislation, CARB developed the 2008 Climate Change Scoping Plan, the state's road map to reaching the GHG reduction goals required by AB 32 (CARB 2008). The original 2008 Scoping Plan supported the implementation of an HSR system to provide more mobility choice and reduce GHG emissions. A 2017 Final Scoping Plan furthers support for HSR implementation by calling for investment in the cleanest, most advanced systems and infrastructure to move people and goods statewide to meet California's long-term air quality and climate objectives (CARB 2017).

In April 2015, Governor Brown issued Executive Order B-30-15, setting an interim 2030 target of 40 percent below 1990 levels for GHG reductions. On August 24, 2016, SB 32 (Pavley) mandated reduction of GHG emissions to 40 percent below 1990 levels by 2030 for the state of California. The new bill sets a cap on emissions for 2030 without actually shifting the final reduction goals in 2050. It provides an intermediate goal to hasten GHG reduction efforts. The

2017 Scoping Plan (adopted in December 2017) includes plans to achieve goals set forth by SB 32 (CARB 2017). HSR is a component of the statewide approach to GHG reductions from California's transportation system (CARB 2017).

SB 100, the 100 Percent Clean Energy Act of 2018, makes it a policy of the state that eligible renewable energy resources and zero carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045 (CARB 2018).

SB 375, which became law in September 2008, provides a new planning process to coordinate the community development and land use planning process with RTPs. SB 375 sets priorities to help California meet GHG reduction goals and requires the RTPs prepared by metropolitan planning organizations (MPO) to include a "sustainable communities strategy" or, if infeasible, an "alternative planning strategy" that would support the GHG emission reduction targets for automobiles and light trucks set by CARB. On July 26, 2017, MTC adopted the latest RTP for the area: *Plan Bay Area 2040—Final* (ABAG and MTC 2017), which specifies how approximately $303 billion in anticipated federal, state, and local transportation funds will be spent in the nine-county Bay Area during the next 25 years.

Metropolitan planning organizations (MPO)

MPOs are federally mandated and funded transportation policy–making organizations made up of representatives from local government and governmental transportation authorities. Comprising representatives from nine counties, the MPO for the San Francisco Bay Area is the Metropolitan Transportation Commission (MTC). The portion of the San Jose to Merced Project Section located in Santa Clara County is within the MTC's planning area.

Carbon dioxide (CO_2) is the transportation sector's primary contribution to climate change, accounting for 37 percent of California's GHG emissions from 2000 to 2013 (CARB 2015). CO_2 emissions from motor vehicles are essentially proportional to the amount of fuel consumed—each 1 percent increase in fuel consumption results in a corresponding 1 percent increase in CO_2 emissions (USEPA 2008). The projected population growth in Santa Clara, San Benito, and Merced Counties will result in an increase in VMT and the volume of GHGs emitted by motor vehicles. Particulate emission levels are a direct function of the amount of driving, with road dust caused by moving vehicles accounting for 60 to 80 percent of particulate emissions from mobile sources. Motor vehicle exhaust is a major source of fine particulates and the precursors to O_3. Continued increases in vehicle traffic will exacerbate existing air quality problems and impede the region's ability to attain state and federal ambient air quality standards. Because emissions are directly proportional to the amount of fuel burned, offering effective transportation choices that can reduce driving will be critical for reducing these emissions.

An electric-powered HSR system would reduce CO_2 emissions relative to travel by car. Emissions reductions are projected to start at almost 120,000 metric tons of carbon dioxide equivalent (CO_2e) with operation of the initial Silicon Valley to Central Valley line. With buildout of the Phase 1 system through 2040, average annual emissions reductions are projected to be over 1 million metric tons of CO_2e (Authority 2016). The HSR system would also provide a more energy-efficient mode of travel.

1.2.4.5 Deterioration of Natural Resources and Agricultural Lands

In addition to improving or maintaining the state's air quality, the protection and preservation of natural resources by limiting potential impacts related to expanding freeway and airport facilities is also a critical need. Key resources affected by expanded transportation corridors include wetlands and waterways, habitat areas for sensitive species of plants and animals, wildlife migration corridors, and agricultural lands. These natural resources have been subject to both direct and indirect impacts as the population has increased and growth has occurred in the state's less developed areas. Avoiding and minimizing impacts on sensitive natural resources is a guiding criterion in the environmental review process of the HSR system. The HSR system would provide intercity travel capacity to supplement overused interstate and state highways and commercial airports, thereby limiting the need for constructing new freeway and airport facilities.

In California, new development has consumed an acre of agricultural land for every 9.4 people statewide. In the Bay Area, due to higher density development, this rate is an acre for every 9.7 persons (Thompson et al. 2008). The projected population growth and transportation demands in Santa Clara, San Benito, Merced, and Madera Counties will generate ongoing pressure to convert undeveloped lands to urban uses. The project would ease the pressure to develop open space, and thereby preserve natural resources, by emphasizing the use of existing transportation rights-of-way and focusing new development around stations to foster the creation of compact, walkable, mixed-use communities at these stations. The Project Section would expand rail capacity at the San Jose Diridon Station to accommodate HSR. Station area planning by the local communities to increase development densities is already underway for the areas adjacent to the San Jose Diridon and Gilroy Stations. Increasing densities through transit-oriented development would reduce the pressure to consume open space, potential habitat for special-status species, and prime and important farmland. Station area development planning at San Jose Diridon and Gilroy Stations would provide housing, employment, and entertainment opportunities, while minimizing impacts on sensitive natural resources.

1.2.4.6 Public Benefits of the High-Speed Rail System to the Region

The HSR system would provide numerous benefits to the entire region, including environmental, economic, and social benefits. Among the public benefits that the HSR system would provide are the following:

- **Increasing mobility options**—Presently, there are no direct transit connections linking Merced to Gilroy or San Jose. Traveling from Merced to San Jose currently requires a combination of transit modes: the Amtrak San Joaquin line, BART, bus, and Caltrain, taking approximately 5 hours. By comparison, auto travel time between San Jose and Merced is nearly 2 hours. As described in Section 1.2.4.3, Limited Modal Connections, HSR service from San Jose to the Central Valley would provide a direct transit linkage from Merced to San Jose, with a projected travel time of approximately 40 minutes.
- **Contributing to a cleaner environment**—The projected population growth in the region will result in an increase in VMT, and thus in the volume of pollutants emitted by motor vehicles. As described in Section 1.2.4.4, Deterioration of Air Quality and Impact on Greenhouse Gas Emissions, the electric-powered HSR system would reduce VMT in support of the California SIP, thereby contributing to a decrease in the emissions of harmful air pollutants, such as particulate matter, carbon monoxide, and nitrogen oxide. The average annual GHG emissions savings provided by the HSR system, which would equate to over 1 million metric tons of CO_2e (Authority 2016), is equal to taking 322,000 passenger vehicles off the road every year.
- **Stimulating economic activity and creating jobs**—The investment in the HSR system has, over an 11-year period from 2006 to 2017, generated between $5 billion and $6 billion in total economic activity in the state (Authority 2018a). Over the last 2 years, the Authority, working with partner agencies, was allocated and received authorization from the CDOF to use nearly $700 million in Prop 1A bond funds for improvements to existing rail lines within certain sections of the system to allow HSR to “blend” operations with other users.
- **Minimizing open space conversion**—The HSR system would increase intercity travel capacity, which is presently stressed by heavy use of the interstate and state highway systems and commercial airports. As described in Section 1.2.4.5, Deterioration of Natural Resources, this increased capacity would reduce the need for new freeways and airport facilities, thereby reducing impacts on ecologically important areas that would be associated with the development of new infrastructure.
- **Improving safety and security**—The Project Section would be built according to international safety guidelines and would include several key safety mechanisms, such as positive train control (PTC), safety improvements at existing Caltrain stations, perimeter fencing, and four-quadrant gates at at-grade crossings. These improvements are expected to alleviate a number of safety concerns related to the existing Caltrain tracks.

1.3 Relationship to Other Agency Plans, Policies, and Programs

The objectives of the California HSR System include providing an interface between the HSR system and major commercial airports, mass transit, and the highway network. This section describes plans and programs that have been considered in the development of the Project Section alignment and station location options, or that already include recommendations for an HSR project.

1.3.1 California Transportation Plan 2040

The *California Transportation Plan 2040* (CTP 2040) (Caltrans 2016b) provides a long-range policy framework for guiding transportation decisions and investments by all levels of government and the private sector. CTP 2040 (Caltrans 2016b) defines goals, performance-based policies, and strategies to achieve the collective vision for California's future statewide, integrated, multimodal transportation system, envisioning a sustainable system that improves mobility and enhances quality of life. Federal and state laws require developing and preparing a state transportation plan and an update to the plan every 5 years.

The CTP 2040 was adopted in June 2016, and was originally initiated in early 2010 with the development of the California Interregional Blueprint (Caltrans 2012b) in response to SB 391, which requires Caltrans to update the California Transportation Plan every 5 years. The California Interregional Blueprint is a state-level transportation blueprint that articulates the state's vision for an integrated multimodal transportation system that complements RTPs and land use visions and provides the foundation for the CTP 2040 (Caltrans 2016b), which concluded with the plan's approval by the secretary of the California State Transportation Agency.

The CTP 2040 update focuses on meeting new trends and challenges, such as economic and job growth, climate change, freight movement, and public health. The HSR system would support CTP 2040 goals, policies, and strategies by providing an efficient and reliable means of transportation that facilitates economic and job growth by providing electric-powered transportation that reduces GHG and air pollutants that contribute to climate change, and by providing some relief to California's strained highway and rail systems.

1.3.2 Plan Bay Area 2040

Plan Bay Area 2040 (ABAG and MTC 2017), adopted in July 2017, is the Bay Area's response to SB 375, which requires the state's MPOs to develop an SCS to reduce GHG emissions from passenger vehicles. *Plan Bay Area 2040*, developed by the MTC and ABAG, serves as the region's joint RTP/SCS, integrating transportation and land use strategies to manage GHG emissions and plan for future population growth. This plan identifies climate protection and transportation system effectiveness as two key goals. The climate protection goal is to reduce per-capita CO_2 emissions, and the transportation system effectiveness goal is to increase non-auto mode share, reduce vehicle operating and maintenance costs due to pavement conditions, and reduce per-rider transit delay due to aged infrastructure. The electric-powered HSR system would reduce GHG emissions and provide a more energy-efficient transportation mode in support of SB 375 and *Plan Bay Area 2040* climate and transportation system effectiveness initiatives.

The BART extension to San Jose/Santa Clara, Caltrain Electrification, and the Salesforce Transit Center and Downtown Extension are three of the major transit projects included in *Plan Bay Area 2040* (ABAG and MTC 2017). These transit projects are supported by the HSR system, which would provide connections to BART service in San Jose and along the Caltrain corridor, contribute funding to electrification of the corridor, share corridor use with Caltrain, and provide connections to other local and regional transit services at the Salesforce Transit Center.

1.3.3 San Francisco Bay Area Regional Rail Plan

The *San Francisco Bay Area Regional Rail Plan* (MTC 2007), adopted by MTC in September 2007, presents a long-term vision for improving the passenger rail system to serve future Bay Area travel demand. MTC joined with BART, Caltrain, and the Authority to develop the plan. The Regional Rail Plan examines ways to incorporate passenger trains into existing rail systems,

improve connections to other trains and transit, expand the regional rapid transit network, increase rail capacity, and coordinate rail investment around transit-friendly communities and businesses. Prepared prior to the Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the Regional Rail Plan explores three possible regional rail scenarios, including regional rail without HSR, regional rail with HSR entering from the east (Altamont Pass), and regional rail with HSR entering from the south (Pacheco Pass). Overall, the plan looks at improvements and extensions of railroad, rapid transit, and HSR services for the near-term (5 to 10 years), intermediate (10 to 25 years), and long-term (beyond 25 years) time frames.

The Regional Rail Plan specifically acknowledges the opportunity for HSR to enhance and accelerate regional rail improvements, noting that "a statewide high-speed train network would enable the operation of fast, frequent regional services along the high-speed lines and should provide additional and accelerated funding where high-speed and regional lines are present in the same corridor." The plan also acknowledges that limited-stop high-speed trains could operate along the San Francisco Peninsula Corridor along with continued operation of local services. The project would help satisfy multiple objectives of the Regional Rail Plan by incorporating HSR passenger trains into existing rail systems, improving transit connections, expanding the transit network, and increasing rail capacity.

1.3.4 MTC Resolution No. 4056 Memorandum of Understanding

MTC Resolution No. 4056 (MTC 2012), adopted in March 2012, approves a MOU summarizing the agreement among the MTC, the Authority, the PCJPB, the San Francisco County Transportation Authority, the San Mateo County Transportation Authority, the VTA, the City of San Jose, the City and County of San Francisco, and the Transbay Joint Powers Authority to:

- Jointly support and pursue the implementation of a statewide HSR system that utilizes a blended system and operational model on the San Francisco Peninsula Corridor with its northern terminus at the Transbay Transit Center in San Francisco and its southern limit at Mile Post 51.4 at the Caltrain Tamien Station in San Jose (in the San Jose to Central Valley Wye Project Extent study area).
- Jointly recognize a defined set of interrelated projects consistent with the Authority's phased implementation plan, consistent with blended-system operation of the corridor, that achieve objectives including system capacity and connectivity for Caltrain, HSR, and freight; public safety; and operational efficiency, effectiveness, and connectivity.
- Generally describe, identify, and work to fully fund an interrelated program of projects, including the Caltrain corridor electrification project; advanced signal system (positive train control); the downtown extension to Transbay Transit Center; and a core capacity project of needed upgrades to stations, tunnels, bridges, potential passing tracks, and other track modifications and rail crossing improvements.

1.3.5 Valley Transportation Plan 2040

The VTP 2040 (VTA 2014a) is the countywide long-range transportation plan for Santa Clara County prepared by VTA, which also acts as the congestion management agency for the county. VTP 2040 provides location-specific improvements in three major program areas: highways, local system, and transit. The highways program includes major freeway improvements, local freeway interchanges, and express lanes. The local system includes local roadway improvements, expressway improvements, pedestrian and bicycle projects, and technology-related projects. The transit program includes projects related to transit efficiency and new transit improvements. The VTP 2040 capital investment program includes Caltrain and HSR station improvements at San Jose Diridon Station to accommodate HSR. Additional investments in the Peninsula Corridor were established through MTC Resolution No. 4056 and the associated MOU to prepare the corridor for implementation of blended Caltrain and HSR operations in the future. VTA was one of the agencies involved in establishing the investment framework for modernizing the Peninsula Corridor that was formalized in the MTC Resolution No. 4056 MOU.

Implementing HSR along the Peninsula Corridor is anticipated in VTP 2040 through funding allocations and VTA participation in MTC Resolution No. 4056. HSR would support the vision of VTP 2040 by increasing multimodal transportation infrastructure and services and providing benefits to air quality, while reinforcing the link between transportation and land use planning. Providing HSR at the San Jose Diridon Station would enhance the utility and connectivity of VTP 2040's planned transit investments, connecting HSR service to regional rail services such as Caltrain, ACE, Capitol Corridor, and Amtrak Coast Starlight; VTA light rail; eight VTA bus routes; and Greyhound and Santa Cruz Metro bus lines.

1.3.6 Caltrain Strategic Plan 2015–2024

Train headways

Headways are the time between arrivals of trains moving in the same direction.

Caltrain provides inter- and intra-county commuter rail service along the Peninsula, including San Francisco, San Mateo, and Santa Clara Counties. The PCJPB operates Caltrain 365 days a year, with reduced schedules on weekends and major U.S. holidays. The current weekday Caltrain operating schedule comprises a mix of 92 express (Baby Bullet), limited, and local trains. Scheduled headways vary by time of day, station, and service type. Overall, service is frequent during the peak periods and is provided every hour in both directions during midday periods. Caltrain now carries an average weekday ridership of more than 58,000 (Caltrain 2015: page 3). In 2012, the MTC, the Authority, Caltrain, and six other San Francisco Bay Area funding partners entered into an agreement, MTC Resolution No. 4056 (MTC 2012), to support the blended system and to invest in the Caltrain Modernization Program.

The *Caltrain Strategic Plan—FY 2015–2024* (Caltrain 2014a) was developed in the context of the Caltrain Modernization Program. Over the coming decade, the Caltrain Modernization Program will electrify and upgrade the performance, operating efficiency, capacity, safety, and reliability of Caltrain's commuter rail service through the delivery of several key projects. This effort includes replacement of most of Caltrain's diesel trains with high-performance electric trains and the implementation of an advanced signal system that includes federally mandated safety improvements.

1.3.7 On the Move—San Benito Regional Transportation Plan (2018–2040)

The *San Benito Regional Transportation Plan* (Council of San Benito County Governments [CSBCG] 2018) presents a blueprint for addressing countywide transportation issues in San Benito County. The plan identifies the existing transportation conditions and identifies future needs based on growth, previously approved plans, public input, and prior Council of Governments Board action. The goal of the San Benito RTP (CSBCG 2018) is to identify a clear direction for maintaining the transportation network in San Benito County and expanding the network to include more roadway capacity and improved access for all users, including pedestrians and bicyclists, other modes of transportation, and public transit.

Although no direct commuter rail service from San Benito County to Santa Clara County exists, County Express provides intercounty shuttle service to connect commuters to Caltrain services in Gilroy. The San Benito RTP (CSBCG 2018) acknowledges the HSR route that would go through northern San Benito County and notes that no stop is planned in San Benito County. The San Benito RTP (CSBCG 2018) also proposes placing a priority on investing in public transit, with a potential bus rapid transit or shuttle project providing linkage to the proposed HSR station in Gilroy.

1.3.8 San Joaquin Valley Blueprint Roadmap Summary

In January 2006, the councils of government from the eight San Joaquin Valley counties (San Joaquin, Stanislaus, Merced, Madera, Fresno, Tulare, Kings, and Kern) jointly received a grant from the California Department of Business, Transportation, and Housing and the San Joaquin Valley Air Pollution Control District to develop a long-term blueprint for growth in the San Joaquin Valley. This effort resulted in the San Joaquin Valley Blueprint Roadmap Summary (Blueprint). The goal was to identify alternatives to current transportation improvement priorities that would improve regional travel patterns and air quality, while being consistent with local attitudes and values.

On April 1, 2009, the San Joaquin Valley Regional Policy Council reviewed the collaborative work of seven councils of government (San Joaquin, Stanislaus, Merced, Fresno, Tulare, Kings, and Kern) and one regional transportation planning agency (Madera County Transportation Commission) on the Blueprint and took the following actions:

- Adopted a list of smart growth principles to be used as the basis of blueprint planning in the San Joaquin Valley.
- Adopted a preferred blueprint growth scenario (Scenario B+) for the San Joaquin Valley to the year 2050. The preferred scenario will provide guidance for local jurisdictions with land use authorities as they update their general plans.

One of the smart growth principles adopted by the Policy Council is to provide a variety of transportation choices. As part of this smart growth principle, the Blueprint envisions HSR service in the San Joaquin Valley, with stations in Merced, Fresno, the Kings/Tulare region, and Bakersfield. The Blueprint is expected to be implemented through collaborative local and regional programs and planning processes and through projects built by private sector developers.

1.3.9 San Joaquin Corridor Strategic Plan

The *San Joaquin Corridor Strategic Plan* (Caltrans 2008) formalized the short-term (3 to 5 years), medium-term (6 to 10 years), and long-term (11 to 25 years) vision for passenger rail service in the Central Valley. The San Joaquin Rail Committee, established in 1987, includes representatives from 13 counties along the San Joaquin train route: Alameda, Contra Costa, Fresno, Kern, Kings, Los Angeles, Madera, Mariposa, Merced, Sacramento, San Joaquin, Stanislaus, and Tulare. The Committee's focus is on possible service improvements, tracking progress, acting as an advisory council, and maintaining cooperative relationships with stakeholders and interested parties. The purpose of the plan is to develop a program of improvements that will increase rail ridership, revenue capacity, reliability, and safety within the corridor. Key stakeholders involved in the development of the plan included Amtrak, BNSF, UPRR, and the San Joaquin Valley regional transportation planning agencies. Public input on the plan suggested: (1) improving communications regarding passenger services and ensuring station safety and security in the short term, (2) adding more frequent service and more stations in the medium term, and (3) providing passenger rail in the UPRR corridor and direct connections to Los Angeles and the Bay Area in the long term.

1.3.10 Regional Transportation Plan and Sustainable Communities Strategy for Merced County

Following passage of SB 375 in 2008, MPOs must develop an SCS for meeting GHG emissions targets as part of their RTPs or, if the target cannot be met, they must adopt an alternative planning strategy separately from the RTP. The SCS demonstrates an ambitious yet achievable approach to how land use development and transportation can work together to meet GHG emissions reduction targets for cars and light trucks. These targets, which the CARB set in 2010, call for the region to reduce per capita emissions by 5 percent by 2020 and 10 percent by 2035.

On May 23, 2018, the MCAG released the *Draft Regional Transportation Plan and Sustainable Communities Strategy for Merced County* (Merced County RTP) and in August 2018, the Final Draft of the Merced County RTP was released (MCAG 2018). Implementation of the Merced County RTP would result in transit projects in the county, such as bus and rail, receiving approximately $624 million in funding through 2040, of which approximately $376 million would be spent on active transportation (bicycle and pedestrian) projects (MCAG 2018). The Merced County RTP contains a fiscally constrained list of projects and programs that have a reasonable expectation of being funded during the life of the plan. Projects seeking state or federal funding, completing environmental clearances, or hoping to begin construction must be included on the RTP list. In turn, the RTP helps inform the development of the State Transportation Improvement Program, which prioritizes the use of state transportation funds. The RTP notes that Merced County is participating in the HSR planning process.

The Merced County RTP supports growth that enhances multimodal transportation and connectivity. Other major goals include developing a safe and efficient regional road system that accommodates the demand for movement of people and goods, developing a rail system that provides safe and reliable service for passengers, and providing economical and long-term solutions to transportation problems by encouraging community designs that encourage walking, transit, and bicycling (MCAG 2018). Major projects on the RTP list that would coordinate with the California HSR System include widening SR 99 and other associated interchange improvements. With implementation of the 2018 Merced County RTP, the region can meet or even exceed the GHG emissions reduction target set by SB 375 for Merced.

The transportation analysis included in this Draft EIR/EIS is based on the 2018 Merced County RTP (MCAG 2018). The 2018 Merced County RTP is the current version available at the time of the analysis.

1.3.11 Madera County Transportation Commission 2018 Regional Transportation Plan

On March 20, 2019, the Madera County Transportation Commission adopted the *2018 Regional Transportation Plan/Sustainable Communities Strategy Amendment No. 1* (Madera County RTP) (Madera County Transportation Commission 2019), which states that the revenue available for funding proposed transportation projects through 2042 is approximately $1.6 billion. The Madera County RTP contains a fiscally constrained list of projects and programs that have a reasonable expectation of being funded during the life of the plan. Projects seeking state or federal funding, completing environmental clearances, or hoping to begin construction must be included in the RTP list. In turn, the RTP helps inform the development of the State Transportation Improvement Program. The Madera County RTP notes that Madera County is participating in the HSR planning process.

The Madera County RTP envisions an integrated multimodal transportation system that considers land resource management strategies and air quality and GHG emissions reduction goals or targets to address SB 375 SCS requirements. The Madera County RTP notes that, with the 2018 improvements to the plan, the region can meet and even exceed the GHG emissions reduction target for Madera County. Major goals of the Madera County RTP include promoting fully accessible and intermodal transportation systems that encourage quality growth and development and foster economic competitiveness; identifying reliable transportation choices that support a diverse population; improving the quality of the environment through regional cooperation of planning activities; and protecting the health of residents by improving air quality and encouraging active transportation (Madera County Transportation Commission 2019). Major projects on the RTP list that would coordinate with the HSR system include widening SR 99 from four to six lanes through Madera County and other associated interchange improvements.

The transportation analysis included in this Draft EIR/EIS is based on the 2018 Madera County RTP (Madera County Transportation Commission 2019). The 2018 Madera County RTP is the current version available at the time of this analysis.

1.3.12 ACE Extension Lathrop to Ceres/Merced

The ACE trains connect the Central Valley to the Santa Clara Valley via the Altamont Pass and Alameda County. The ACE operates on an 86-mile UPRR corridor and provides four round-trip trains per day between Stockton and San Jose. Two stations—Santa Clara and Diridon—overlap service with Caltrain.

The SJRRC proposed expanding ACE service to Ceres and Merced. The focus of the ACE Extension Lathrop to Ceres/Merced (referred to as the ACE Extension) is to enhance intercity and commuter rail service and to promote greater transit connectivity between the Central Valley and the San Francisco Bay Area. ACE will serve an important role as feeder service to the HSR system. SJRRC proposes the ACE Extension system improvements in two phases. During Phase I of the ACE Extension, ACE would be extended between Lathrop and Ceres and commuters would be able to transfer to one of the round-trip trains between Stockton and San Jose. During Phase II, ACE would be extended between Lathrop and Merced and commuters

would be able to transfer to one of the round-trip trains between Stockton and San Jose. The Notice of Determination was released in August 2018, approving the proposed project.

1.3.13 Valley Link

No direct rail connection currently exists between ACE and BART. The Tri-Valley–San Joaquin Valley Regional Rail Authority is proposing the Valley Link Project, which would bridge this gap and establish rail service from the existing Dublin/Pleasanton BART station to the proposed ACE North Lathrop Station.[10] The purpose of this project is to improve rail connectivity between BART and ACE; improve connection within the Bay Area megaregion[11]; and support the vision of the California State Rail Plan to connect the Northern California megaregion to the state rail system.

1.3.14 Capitol Corridor 2014 Vision Plan Update

The Capitol Corridor operates 15 daily round-trip trains between Sacramento and the Bay Area; all trains provide service to Jack London Square in Oakland and seven of the trains continue service south to San Jose. Two stations—Santa Clara and Diridon—overlap service with Caltrain. The Capitol Corridor currently carries approximately 1.4 million annual passengers.

The *Capitol Corridor 2014 Vision Plan Update* (Capitol Corridor Joint Powers Authority 2014a) maps out a strategy and identifies system improvements to provide a modern railroad built to international standards and capable of operating at speeds of up to 150 miles per hour. This rate of speed could reduce travel times between Sacramento and San Jose to 90 minutes. The Capitol Corridor would be part of an intercity rail passenger coalition that would provide complementary service in corridors in which HSR operates and would branch off HSR to extend rail service to smaller cities in the state.

Capitol Corridor short-term improvements would focus on increasing the number of trains between Oakland and San Jose from 7 to 11 daily round-trip trains. Mid-term improvements would expand service from 11 to 15 daily round trips between Oakland and San Jose. Long-term improvements are focused on options for greater separation of freight and passenger service. Several options have been identified for further consideration, including a potential shift of passenger service to the east as it passes from the Diridon Station north to Fremont and Union City. Long-term improvements would also include additional infrastructure improvements, such as automatic train control, signal improvements, tilting rolling stock, electrification, and express train service.

1.3.15 Bay Area Rapid Transit Vision Update

BART connects San Francisco to Alameda and Contra Costa Counties in the East Bay and the peninsula cities in San Mateo County. The 104-mile heavy-rail rapid transit system operates on 5 routes with 45 stations. The BART Silicon Valley Extension, managed by the VTA, is a program of improvements in the Silicon Valley Rapid Transit Corridor that will extend BART service into Santa Clara County. The first phase of the 16-mile extension, the Berryessa Extension, will provide service to Berryessa Station in San Jose in 2019. The second phase of the extension will provide service to Diridon and Santa Clara Stations, where it will overlap with Caltrain service (VTA 2018a).

The *BART Vision Update* (BART 2014) focuses on BART's longer-term future to determine where BART should focus investments. In service since 1972, BART developed the Vision Update (BART 2014) in the context of the aging BART system. The *BART Vision Update* identifies railcar replacement; train control system modernization; and construction of a new, state-of-the-art maintenance and storage facility in Hayward as its immediate priorities. Other priority investments are "state of good repair" maintenance needs and station modernization. The *BART Vision*

[10] The proposed North Lathrop Station is a component of the ACE Extension Project.

[11] The Northern California Megaregion is composed of 21 counties grouped into four regions: Bay Area, Sacramento Area, Northern San Joaquin Valley, and Monterey Bay Area.

Update also identifies expansion as an investment priority and describes potential new corridors and infill stations to increase capacity (BART 2014).

1.3.16 San Jose International Airport Master Plan

SJC is one of the three primary airports that serve the San Francisco Bay Area. The airport is classified as a medium hub airport by the Federal Aviation Administration and ranked as the 44th busiest airport in terms of total passengers in 2013 (City of San Jose 2014). SJC is owned and operated by the City of San Jose on 1,050 acres at the southern end of San Francisco Bay. The airport is generally bounded by US 101 on the north, the Guadalupe River and SR 87 on the east, I-880 on the south, and Coleman Avenue and De la Cruz Boulevard on the west. The *Airport Master Plan for Norman Y. Mineta San Jose International Airport* (Airport Master Plan) (City of San Jose Airport Department 2011) was approved in 1997 and updated in 2011. It identifies a range of improvements to airside and landside facilities to accommodate the forecasted 2027 air passenger, air cargo, and general aviation demand. Passenger demand fluctuated between 2006 and 2012, largely because of the nationwide recession and associated airline capacity cuts. During this period, the Airport Master Plan was revised to more closely align project implementation to air passenger and facility demands (City of San Jose Airport Department 2011). The airport served 9.1 million passengers in 2014, a 6.8 percent increase from 2013 passenger volumes (City of San Jose 2014).

Ground transportation services at the airport include shuttles, taxis, rental cars, and limousines/ charters. VTA Route #10 (the VTA Airport Flyer) provides connections from the airport to BART, VTA light rail, Caltrain, Amtrak, and ACE rail services. A new transit link to the airport from the VTA's Guadalupe light rail transit line, and from Caltrain and future BART in Santa Clara, using automated people mover technology is part of the VTP 2040 (VTA 2014a) capital investment program. Implementing the project would provide HSR service at Diridon Station, which is close to the airport and offers a connection point for HSR and air travelers, increasing modal connectivity at this airport.

1.3.17 Oakland International Airport

Built in 1927, OAK is one of the three primary airports that serve the Bay Area's shipping and passenger travel needs. It is owned and operated by the Port of Oakland and is located on the east side of the San Francisco Bay and south of Oakland in Alameda County. The *Oakland International Master Plan* was prepared between June 2004 and December 2005 and finalized in March 2006 (Port of Oakland 2006). It forecasts future aviation activity and presents potential development areas. The airport served 13 million passengers in 2017, a 26 percent increase from 2010 passenger volumes (Caltrans 2018). The master plan forecasts an increase to 30 million annual passengers by 2025.

Ground transportation services at the airport include shuttles, taxis, rental cars, and limousines/ charters. Line 73 of AC Transit connects OAK with the Coliseum/Oakland Airport BART station. From there, passengers can travel to Oakland, downtown San Francisco, Berkeley, and other major cities in the Bay Area. Amtrak is also available from this station.

1.4 Relationship to Other Transportation Projects in the Study Area

The objectives of the proposed HSR system include providing an interface with major commercial airports, mass transit, and the highway network. Other key transportation projects in the project vicinity that offer intercity travel benefits and could enhance intermodal connections to the proposed HSR system are described in this section. These projects have been considered in the planning and development of the Project Section and station location alternatives.

1.4.1 Caltrain Modernization Program

The Caltrain Modernization Program will electrify and upgrade the performance, operating efficiency, capacity, safety, and reliability of Caltrain's commuter rail service through the delivery of several key projects. These include the electrification of the existing Caltrain corridor from San Francisco to San Jose; the installation of a Communications Based Overlay Signal System

Positive Train Control, which is an advanced signal system that includes federally mandated safety improvements; upgrades to the signal system; and the replacement of Caltrain's diesel trains with high-performance electric trains or Electric Multiple Units (Caltrain 2018). The environmental process on the Peninsula Corridor Electrification Project (electrification and new electric trains) was completed in January 2015. Upgrades to the signal system have been completed and are now undergoing testing. The next steps involve community engagement and education and setting up project teams. The Caltrain electrification is scheduled to be completed in 2022 (Caltrain 2018).

1.4.2 Caltrain South Terminal Phases II and III

Phase II of Caltrain's proposed South Terminal Project, construction of which is anticipated to occur between 2018 and 2020, would make track improvements along the existing right-of-way from San Jose Diridon Station to the Centralized Equipment Maintenance and Operation Facility (CEMOF) located north of the station, along Stockton Avenue in San Jose. The project involves installing a fourth track and signal controls between the station's north end and the maintenance facility. The proposed fourth track would extend approximately 2,000 feet from CEMOF to the northern end of the San Jose Diridon Station, on the east side of the existing tracks (Caltrain 2016). Caltrain's proposed improvements and the ability to move trains to and from the maintenance facility without interrupting passenger service will help maintain flexibility, minimize delays, and improve operations at CEMOF and the San Jose Diridon Station (Caltrain 2016).

South Terminal Phase III will replace the railroad bridge crossing at Los Gatos Creek in San Jose to address the bridge's failure to meet seismic safety standards. The project will also include installation of a tail track south of Diridon Station. The tail track will provide improved operations at the station, minimize systemwide delays, and facilitate Caltrain modernization, including electrification of the corridor (Caltrain 2014b).

1.4.3 Caltrain Grade Separations in Santa Clara County

Caltrain intends to improve safety in the railway corridor with grade separation between trains and vehicles/pedestrians/bicyclists. Two projects are planned in Santa Clara County[12]:
(1) Reconstruction of the Branham Lane intersection with Monterey Road below the Caltrain and UPRR corridor; and (2) Caltrain grade separation at Skyway Drive, including significant safety and multimodal access improvements (VTA 2015).

1.4.4 Bay Area Rapid Transit Silicon Valley Extension

The BART Silicon Valley Extension involves various transportation improvements in the Silicon Valley Rapid Transit Corridor. This corridor extends from the southern boundary of Alameda County in Fremont through Milpitas, San Jose, and Santa Clara. The planned improvements include a 16-mile, six-station extension of the existing BART system into Silicon Valley (VTA 2018a). The BART Silicon Valley program also includes other related projects and activities required to prepare the rail corridor for BART, such as relocation of existing UPRR tracks and utilities, drainage improvements, and grade separation projects within the alignment that are funded through other sources. BART Silicon Valley is being managed by the VTA in cooperation with BART. BART Silicon Valley will be constructed in phases. Phase I is the Berryessa Extension, extending 10 miles from the future Warm Springs Station in Fremont and creating two new stations: (1) Milpitas Station at the intersection of Montague Expressway and Capitol Avenue, and (2) Berryessa Station between Berryessa and Mabury roads adjacent to the San Jose Flea Market (VTA 2018b, 2018c, 2018d). Phase II will extend BART from the planned Berryessa Extension for approximately 6 miles, ending at-grade in Santa Clara adjacent to the Santa Clara Caltrain Station and Santa Clara University, with three additional stations with below-ground concourses and boarding platforms.

[12] Caltrain Grade Separation projects planned in San Mateo County are included in the San Francisco to San Jose Project Section Draft EIR/EIS.

1.4.5 Silicon Valley Express Lanes

The VTA Silicon Valley Express Lanes program is expanding the network of express lanes used by carpoolers, motorcyclists, and clean-air vehicles for free, as well as single-occupant vehicles that pay a toll with a FasTrak transponder. The program would be implemented over four phases across the SR 237 and SR 85/US 101 freeways. Operation of Phase 1 of Santa Clara County's first express lanes on the SR 237/I-880 corridor began in March 2012. Phase 2 is currently under construction, while Phases 3 and 4 are pending funding but anticipated to be built between 2019 and 2021 (VTA 2018e).

1.4.6 ACE Extension Lathrop to Ceres/Merced

ACE Extension is a phased improvement plan proposed by the SJRRC to enhance intercity service and transit connectivity in the Central Valley; reduce traffic congestion, improve regional air quality, and reduce GHG emissions; and promote local and regional land use and transportation sustainability goals. The ACE Extension would extend ACE service to Ceres and Merced. Specifically, SJRRC plans to extend ACE service to Manteca, Ripon, Modesto, Ceres, Turlock, Livingston, Atwater, and Merced.[13]

1.4.7 Valley Link

ACE Extension is a phased improvement plan proposed by the Tri-Valley–San Joaquin Valley Regional Rail Authority to enhance rail connection between BART and ACE in the tri-valley. Valley Link would establish rail service in the tri-valley and would include the following stations between the Dublin Pleasanton BART and the proposed North Lathrop Station: Isabel Station, Greenville ACE Intermodal Station, Mountain House Station, Downtown Tracy Station, and River Islands Station. Three additional stations are currently being considered: South Front Station, Grant Line Road Station, and Ellis Station.

1.4.8 San Jose International Airport Automated People Mover Connector

The Automated People Mover project will provide a dedicated guideway connection from the Airport to the Caltrain, Bus Rapid Transit (BRT), and future BART stations at the Santa Clara Transit Center and to the VTA light rail station on North First Street (City of San Jose 2018).

1.4.9 Bus Rapid Transit

In accordance with VTA's *Bus Rapid Transit Strategic Plan*, the agency has initiated BRT projects for Alum Rock Avenue and Stevens Creek Boulevard corridors (VTA 2009). A brief description of these projects follows:

- The Alum Rock–Santa Clara BRT Project provides 7 miles of limited-stop rapid transit service between the Eastridge Transit Center to the Arena Station in downtown San Jose using Capitol Expressway, Alum Rock Avenue, and Santa Clara Street. Construction was completed in May 2017.
- The Stevens Creek BRT Project would provide a rapid transit service for 8.5 miles from DeAnza College to the Transit Mall in downtown San Jose using San Carlos Avenue and Stevens Creek Boulevard. The Stevens Creek project would add BRT service in addition to the local service, which would provide fast, frequent service with limited stops and enhanced amenities for passengers (VTA 2014b). Based on ridership demand along the Stevens Creek corridor, VTA implemented Rapid 523 bus service in 2019 as a near-term improvement and early deliverable of the Stevens Creek BRT Project. It will provide a connection from the Berryessa BART Station to West San Carlos/Stevens Creek via downtown San Jose, providing fast, frequent, and reliable service to Santa Clara and Cupertino. It will increase

[13] Only one station would be implemented in either Livingston or Atwater. At this time, SJRRC is considering them both as a possible station. SJRRC would identify the preferred station in the subsequent project-level environmental documentation for Phase II improvements, which would complete the detailed analysis of the impacts and benefits of these two options.

service frequency, improve passenger waiting areas, and speed up the service with coordinated traffic signals (VTA 2018f).

1.4.10 Double-Track Segments of the Caltrain Line between San Jose and Gilroy

Approximately 8 miles of double tracking on the existing UPRR corridor between San Jose and Gilroy is planned to increase Caltrain capacity with an estimated completion year of 2022 (VTA 2018g). Caltrain will continue to operate six daily diesel trains serving the Gilroy Extension (three northbound trains during the AM peak and three southbound trains during the PM peak) (Caltrain 2015); double-track segments may result in fewer conflicts with UPRR operations.

1.4.11 Monterey County Rail Extension

Previously called the Capitol Corridor Extension to Salinas, the Monterey County Rail Extension will extend passenger rail service from Santa Clara County south to Salinas, approximately 68 miles. Three phases are proposed, starting with the Kick Start Phase and followed by two phases for construction of the Pajaro/Watsonville Multimodal Transit Hub (a connection point for Santa Cruz County) and the Castroville Multimodal Station (a connection point for Monterey Peninsula). Implementation of the Kick Start Phase is underway with construction scheduled to start in 2019. This phase involves improvements to the existing Salinas train station, construction of a new train layover facility, and track improvements in Gilroy (Transportation Agency for Monterey County 2018a, 2018b).