1.0 Project Purpose, Need, and Objectives

1.1 Introduction

1.1.1 The High-Speed Train System

The California High-Speed Rail Authority (Authority) proposes to construct, operate, and maintain an electric-powered high-speed train (HST) system in California. When completed, the nearly 800-mile train system would provide new passenger rail service to more than 90% of the state's population. More than 200 weekday trains would serve the statewide intercity travel market.[1] The HST would be capable of operating speeds of up to 220 miles per hour (mph), with state-of-the art safety, signaling, and automated train control systems. The system would connect and serve the major metropolitan areas of California, extending from San Francisco and Sacramento in the north to San Diego in the south (Figure 1-1).

Following programmatic environmental review, the Authority and the Federal Railroad Administration (FRA) approved the HST System for intercity travel in California, and selected corridors for project-level study. Building a system of such magnitude, complexity, and cost is impractical to implement as a singular project. The Authority divided the HST System into nine project sections, allowing phased system implementation. This approach is consistent with the provisions of Proposition 1A, the Safe, Reliable, High-Speed Passenger Train Bond Act, adopted by California voters in November 2008.

1.1.2 The Fresno to Bakersfield HST Project

The Fresno to Bakersfield HST Project section would connect a Fresno station, a potential Kings/Tulare Regional station in the Hanford/Visalia/Tulare area, and a Bakersfield station. The planned HST line north of the Fresno to Bakersfield Section would extend to Merced. A planned HST line west of the Merced to Fresno Section is through the Pacheco Pass, connecting the San Francisco to San Jose HST Project to the Central Valley and the rest of the HST System. South of the Bakersfield station, the HST line would continue to Los Angeles via Palmdale.

1.1.3 The HST Environmental Review Process

The Authority and FRA have prepared program-wide (Tier 1) environmental documents for the HST System under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Specifically, the Authority and FRA prepared a Statewide Program Environmental Impact Report / Environmental Impact Statement (EIR/EIS) (Authority and FRA 2005) to evaluate the ability of the HST System to meet the existing and future capacity demands on California's intercity transportation system and prepared the Bay Area to Central Valley HST Program EIR/EIS (Authority and FRA 2008) to identify a preferred alignment and the preferred station locations for the connection between the Bay Area and the Central Valley.

[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." An intercity passenger rail service consists of a group of one or more scheduled trains (roundtrips) that provide intercity passenger rail transportation between bona fide travel markets (not constrained by state or jurisdictional boundaries), generally with similar quality and level-of-service specifications, within a common (but not necessarily exclusive or identical) set of identifiable geographic markets (FRA 2010). Similarly, "commuter rail passenger transportation" is defined at 49 U.S.C. 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."

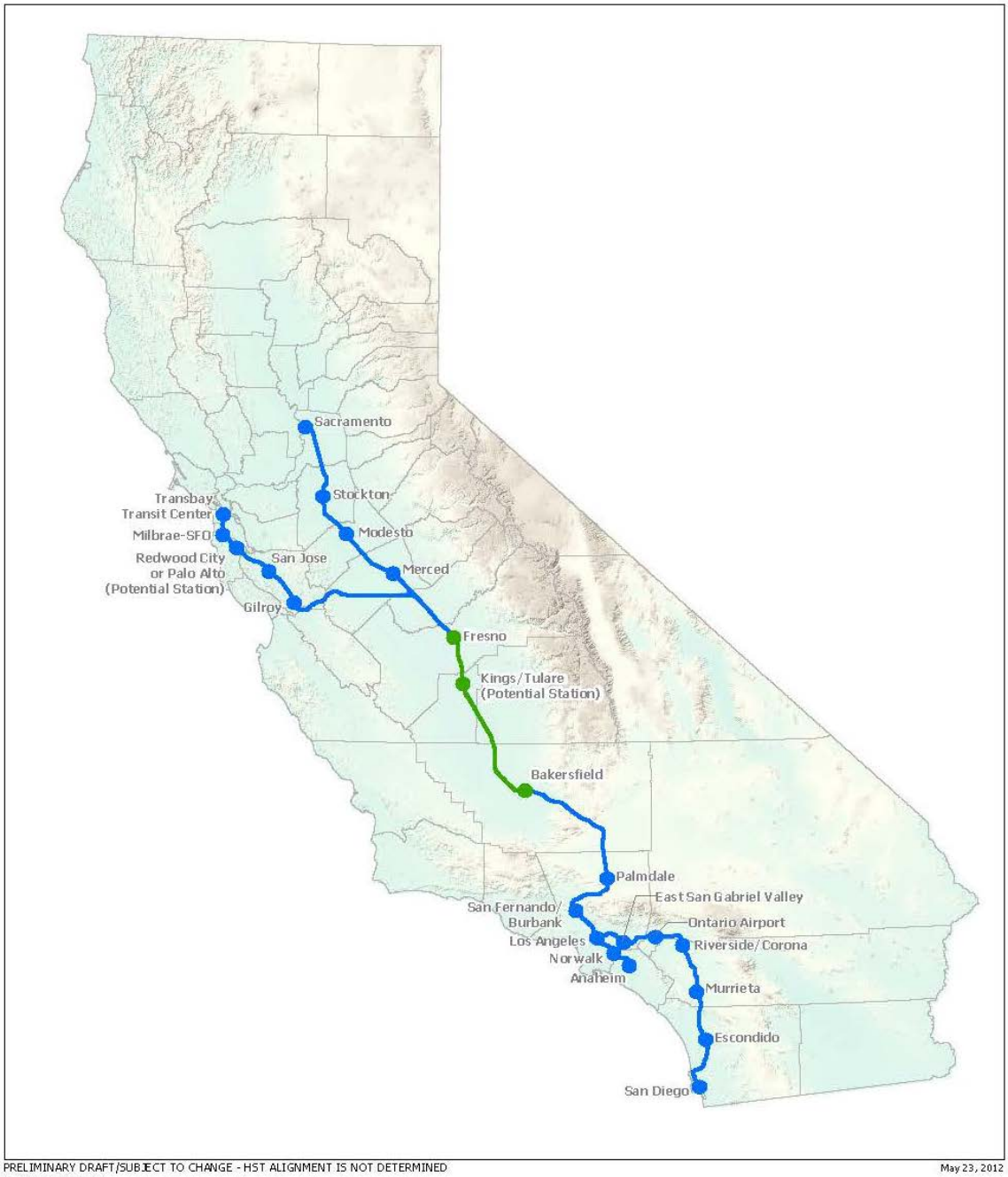


Figure 1-1
Statewide HST System

Section 1.5, Tiering of Program EIR/EIS Documents, discusses these documents and the process under which this project-level EIR/EIS tiers off of the earlier documents, which are collectively referred to as the "Program EIR/EIS documents" throughout this EIR/EIS.

The Authority and FRA prepared these program-level (Tier 1) documents in coordination with the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers' (USACE) and their determination that under the federal Clean Water Act, the Pacheco Pass Network Alternative serving San Francisco and Diridon Station in Downtown San Jose is most likely to yield the Least Environmentally Damaging Practicable Alternative (LEDPA).

Tier 2 of the HST development process includes additional engineering and design and preparation of project-level EIR/EISs for all HST project sections. This Fresno to Bakersfield Section EIR/EIS (Tier 2) evaluates proposed alignments and stations in site-specific detail to provide a complete assessment of the direct, indirect, and cumulative effects of the proposed action, considers public and agency participation in the screening process, and was developed in consultation with resource and regulatory agencies, including EPA and USACE. FRA and the Authority intend this document to be sufficient to support Section 404 permit decisions and Section 408 permit decisions (as applicable) for alteration/modification of completed federal flood risk management facilities and any associated operation and maintenance, and real estate permissions or instruments (as applicable).

For the California HST System, including the Fresno to Bakersfield Section, the FRA is the lead federal agency for compliance with NEPA and other federal laws. The USACE agreed by letter, dated December 30, 2009, to participate as a cooperating agency under NEPA. The Authority is serving as a joint-lead agency under NEPA and is the lead agency for compliance with CEQA.

1.1.4 Consistency with Federal Transportation Policy

In 2008, the Congress enacted a major reauthorization of intercity rail passenger programs, 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 high-speed and intercity rail passenger services implementation, including authority for the Secretary of Transportation to establish and implement a high-speed rail corridor development program. In the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), Congress appropriated $8 billion in capital assistance for high-speed rail corridors and intercity passenger rail service. Congress provided an additional $2.5 billion for this program in the Department of Transportation Appropriations Act of 2010 (Title I, Division A of the Consolidated Appropriations Act, 2010). Available funding was reduced by $400 million in the Full-Year Continuing Appropriations Act, 2011 (Public Law 112-110). FRA issued a Strategic Plan, *A Vision for High-Speed Rail In America* (FRA 2009), which describes 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 HST System is also consistent with recent expressions of federal multimodal transportation policy; most notably, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, the Transportation Equity Act for the 21st Century, and its predecessor the Intermodal Surface Transportation Efficiency Act, which encourage public transportation investment that increases national productivity and domestic and international competition, while improving safety and social and environmental conditions. Specifically, these policies 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.

1.2 Purpose of and Need for the HST System and the Fresno to Bakersfield HST Section

1.2.1 Purpose of HST System

The program EIR/EISs identified and evaluated alternative HST corridor alignments and stations as part of a statewide HST system, and established the purpose of the HST System. *The purpose of the statewide HST System is to provide a reliable high-speed electrified train system that links the major metropolitan areas of the state, and that delivers predictable and consistent travel times. A further objective is to provide an interface with commercial airports, mass transit and the highway network and 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* (Authority and FRA 2005).

1.2.2 Purpose of Fresno to Bakersfield HST Project

The purpose of this project is to implement the Fresno to Bakersfield Section of the California HST 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, and the highway network in the south San Joaquin Valley, and connect the northern and southern portions of the system.

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 practicable alternatives to be analyzed and is acceptable as the basis for the USACE 404(b)(1) alternatives analysis.

1.2.3 CEQA Project Objectives of the HST System in California and in the South San Joaquin Valley

The Authority's statutory mandate is to plan, build, and operate an HST system coordinated with California's existing transportation network, particularly intercity rail and bus lines, commuter rail lines, urban rail lines, highways, and airports. The Authority has responded to this mandate by adopting the following objectives and policies for the proposed HST System:

- Provide intercity travel capacity to supplement critically over-used 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 2020 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.

The approximately 114-mile-long Fresno to Bakersfield Section is an essential component of the statewide HST System. As part of the Central Valley section of the HST System, the Fresno to Bakersfield Section would provide Fresno, Visalia, Tulare, Hanford, and Bakersfield access to a new transportation mode; contribute to increased mobility throughout California; and provide a potential location for a heavy maintenance facility (HMF), where the HSTs would be assembled and maintained. The Fresno to Bakersfield Section would also provide a potential test track for the trains. Figure 1-2 shows the Fresno to Bakersfield project corridor.

1.2.4 Statewide and Regional Need for the HST System in the Fresno to Bakersfield Section

The need for an HST System exists statewide, with regional areas contributing to this need. The Fresno to Bakersfield Section is an essential component of the statewide HST System.

The capacity of California's intercity transportation system, including the south San Joaquin Valley, 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, and increased travel times. The system has not kept pace with the tremendous increase in population, economic activity, and tourism in the state, including that in the south San Joaquin Valley. The interstate highway system, commercial airports, and conventional passenger rail system serving the intercity travel market are operating at or near capacity and will require large public investments for 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, political, and other factors. The need for improvements to intercity travel in California, including intercity travel between the south San Joaquin Valley, the Bay Area, Sacramento, and Southern California, relates to the following issues.

- Future growth in demand for intercity travel, including the growth in demand within the south San Joaquin Valley.
- Capacity constraints that will result in increasing congestion and travel delays, including those in the south San Joaquin Valley, particularly along the State Route (SR) 99 corridor.
- 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 tourism in California, including the south San Joaquin Valley.
- Reduced mobility as a result of increasing demand on limited modal connections between major airports, transit systems, and passenger rail in the state, including the south San Joaquin Valley.
- Poor and deteriorating air quality and pressure on natural resources and agricultural lands as a result of expanded highways and airports and urban development pressures, including those within the south San Joaquin Valley.

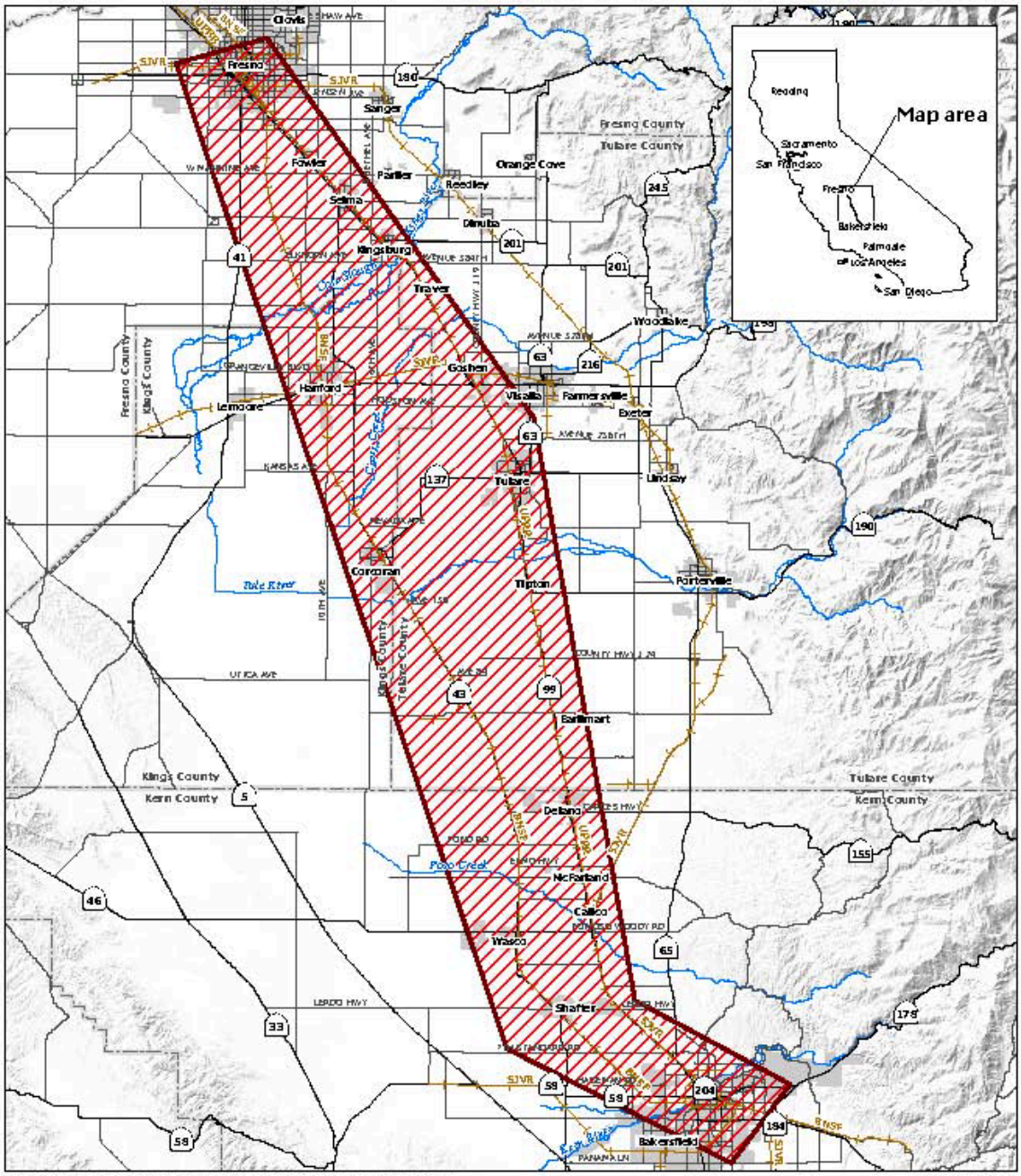


Figure 1-2
Fresno to Bakersfield HST Project Corridor

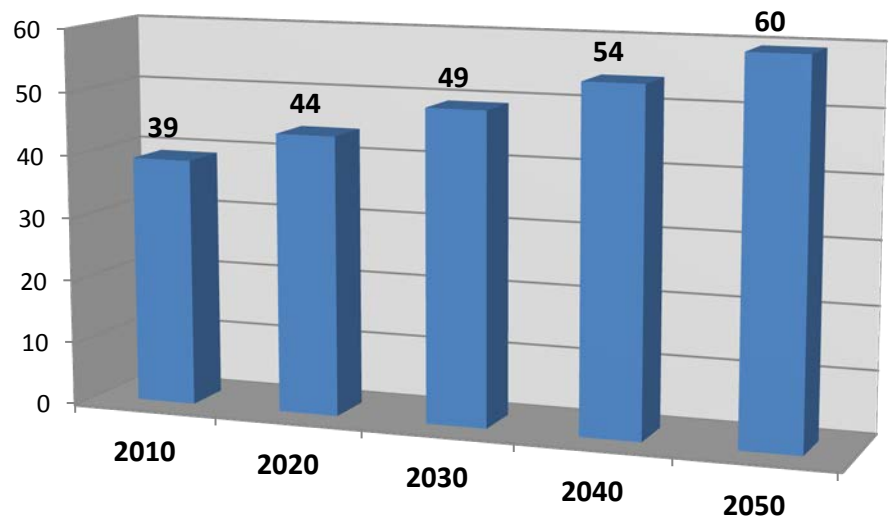
Figure 1-2 shows the central location of the Fresno to Bakersfield Section within California. This region contributes significantly to the statewide need for a new intercity transportation service that would connect it with the major population and economic centers and to other regions of the state.

1.2.4.1 Travel Demand and Capacity Constraints

Intercity travel in California, including travel within the south San Joaquin Valley, is driven primarily by increased demand for such travel. Growing population, tourism, and economic growth generate this demand.

Population and Economic Growth

According to the California Department of Finance (2010), California's population should increase by 12.5 million residents between 2010 and 2035. This means an increase from about 39 million to 51.5 million people (more than 30% growth). Figure 1-3 illustrates this growth. The population is expected to grow steadily to about 60 million people by 2050 (California Department of Finance 2010).



Source: State of California, Department of Finance, Population Projections by Race/Ethnicity for California and its Counties 2000 - 2050, March 2010.

Figure 1-3
Current and future California population (in millions)

Much of this population growth will be accommodated in the metropolitan coastal areas or in Southern California's Inland Empire. However, growth and development in these regions are increasingly challenged because of environmental and quality-of-life issues, including the high housing prices. These areas are finding it increasingly difficult to accommodate new development; and despite economic pressure to grow, the combination of rising costs and local opposition is likely to push a substantial number of people to seek homes and employment elsewhere. The San Joaquin Valley is a likely outlet for this population pressure; with a youthful population, it is also a major source of growth in its own right from both the local population, as well as immigration (Teitz et al. 2005).

During the past quarter-century, population growth rates in the San Joaquin Valley were significantly higher than those for California or the entire nation, and the valley's projected growth rate over the next 25 years is also significantly higher (Cowan 2005). The population of the San Joaquin Valley is projected to increase by 66.1% between 2010 and 2035, almost twice the population increase projected for California (38.9%) over this same time period (Table 1-1). The populations of the counties that the Fresno to Bakersfield HST Project would connect are projected to increase from 59.2% to 81.5% over this same period. This population increase is projected to stem from 1) overflow from urban coastal areas, where people are seeking affordable housing within commuting range of major metropolitan areas; 2) immigration; and 3) local population growth (Cowan 2005).

Table 1-1
Population Growth in California, the San Joaquin Valley, and the Counties of the South San Joaquin Valley

Area	Population		
	2010	2035	Percent Growth 2010 to 2035
Fresno County	953,761	1,519,325	59.2
Kings County	156,289	274,576	75.7
Tulare County	447,814	809,789	80.8
Kern County	839,587	1,523,934	81.5
San Joaquin Valley [a]	3,971,659	6,597,721	66.1
California	37,253,956	51,747,374	38.9

[a] San Joaquin Valley includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Tulare, Kings, and Kern counties.
Sources: California Department of Finance 2009, 2010.

Agriculture defines the socioeconomic structure of the San Joaquin Valley. The region is one of the most productive agricultural areas in the world. According to the 2007 Census of Agriculture's ranking of market value of agricultural products sold, nine of the nation's top 10 producing counties are in California, and the four counties that the Fresno to Bakersfield HST Project would traverse ranked first (Fresno), second (Tulare), third (Kern), and eighth (Kings) in agricultural revenues generated in California (California Department of Agriculture 2010). These four counties lead the state in dairy production, and produce a wide variety of fruits, nuts, and vegetables. The leading agricultural commodities in the south San Joaquin Valley are dairy and dairy products, almonds, and grapes and raisins.

As an economic driver and a factor in the socioeconomic structure of the San Joaquin Valley, agriculture will likely continue to play a decisive role in the future. However, lower land and labor costs in the valley compared to those of other regions have attracted businesses to the region over the past two decades. Many businesses are attracted by the low-cost labor and the relatively low land prices. In 2002, the three leading sectors of employment in the San Joaquin Valley were government (260,000 jobs), agriculture (225,000 jobs), and health services (85,000 jobs). Manufacturing, especially in smaller metropolitan areas, is also important to the region's economic growth. Manufacturing is an important stage of value-added production and its continued and expanded role in the processing of agricultural products is regarded as an important source of future economic growth (Cowan 2005).

As shown in Table 1-2, the San Joaquin Valley has greater unemployment and a lower per capita income than the state as a whole. In response to the persistent unemployment problem in the valley, local governments are making a concerted effort to help create jobs. Fresno, the largest metropolitan area in the region, has taken steps to begin improving its economic structure with the Fresno Regional Jobs Initiative (RJI) that aims to create 30,000 net new jobs that pay at least $30,000 per year. Set in motion by an executive order from Governor Schwarzenegger in June 2005 and renewed in July 2010, the California Partnership for the San Joaquin Valley is a public-private partnership focused on improving the region's economic vitality and quality of life. Six major initiatives have been established for the partnership in economic growth, transportation, sustainability, clean air, health and human services, and education.

Table 1-2
Unemployment and Income in California and the Counties of the South San Joaquin Valley

Area	Unemployment Rate (%) (2010)	Per Capita Income (2010)
California	11.4	$43,852
Fresno County	15.1	$30,997
Kings County	14.6	$26,734
Tulare County	15.3	$28,610
Kern County	14.4	$30,047
Sources: California Employment Development Department 2010; U.S. Department of Commerce 2010.		

Travel Demand

Population growth and the increasing interconnectedness of the south San Joaquin Valley's economies are creating a surge in travel along SR 99, the transportation corridor connecting the south San Joaquin Valley with the rest of California. Overall, intercity travel in California is forecast to increase by more than 58% between 2010 and 2035, from 610 million trips to about 965 million trips, as illustrated on Figure 1-4. More than 50% of the intercity travel market between the state's major metropolitan regions is expected to have a destination within the Bay Area to the central part of the San Joaquin Valley.

It was estimated that in 2010 Californians would make 610 million trips between the state's metropolitan regions in Northern and Southern California and those in between. Approximately 209 million of these trips would be journeys of at least 100 miles; by 2035, this number is expected to increase to more than 271 million trips per year. Overall, intercity travel in California is forecast to increase by more than 58% between 2010 and 2035, from 610 million trips to about 965 million trips (Figure 1-4).

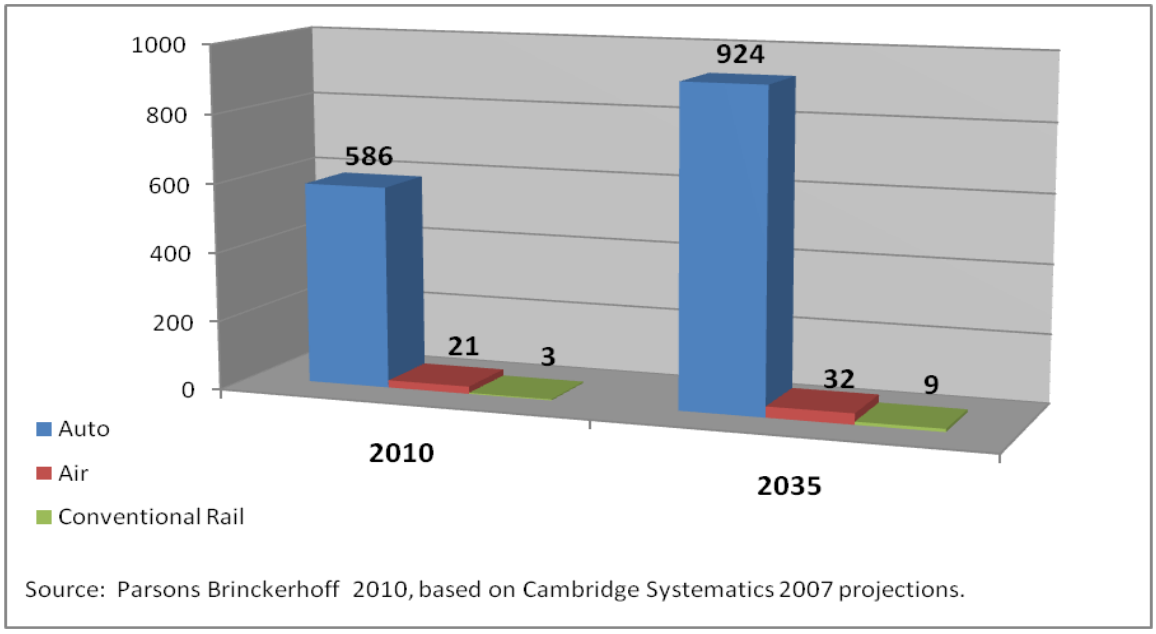


Figure 1-4
Intercity trips in California (in millions)

The automobile will continue to predominate in intercity travel, and by 2035, is expected to account for more than 95% of all intercity travel, and close to 90% of longer intercity trips. Figure 1-5 illustrates the major routes and airports used for intercity travel between the markets potentially served by the HST System.

Freeway Congestion and Travel Delays

Travel within the San Joaquin Valley in general, and the Fresno to Bakersfield area in particular, is largely dependent on SR 99 for intercity trips. SR 99 is the principal connection between the major cities in the San Joaquin Valley region, and it currently carries from 38,000 to more than 100,000 in annual daily traffic (Caltrans 2009a). However, most of SR 99 was built in the late 1950s and early 1960s to accommodate a smaller population and transportation infrastructure demands. Not only is the population increasing rapidly in the south San Joaquin Valley, but growth is also taking place in land use patterns that rely on automobiles for most trips. Currently, and over the next 10 to 15 years, depending on available funding, the California Department of Transportation (Caltrans) has begun implementing the Route 99 Corridor Business Plan, which will remove remaining at-grade intersections and improve others to higher capacity. The plans call for widening the route between Fresno and Bakersfield from four to six lanes, and sometimes six lanes with auxiliary lanes, to ease traffic flow between interchanges. This plan, however, will not reduce future congestion projected along SR 99 through 2035. According to the *Route 99 Corridor Business Plan*, only a shift in vehicle travel to alternative modes can restore better traffic flows (Caltrans 2009a).

Figure 1-5
Major intercity travel routes and airports

The vehicle miles traveled (VMT)[2] in Fresno, Kings, Tulare, and Kern counties in 2010 are provided in Table 1-3. This is expected to essentially double by 2035, as Table 1-3 shows forecast travel increases by county. In Kings and Tulare counties, approximately 50% of all VMT occurs on the state highway system, while VMT in Fresno and Kern counties on Caltrans routes are 40% and 60% of travel, respectively (Caltrans 2009b).

[2] The total miles traveled by all vehicles in a specified area during a specified time.

Table 1-3
Current and Projected Vehicle Miles Traveled in the South San Joaquin Valley

County	Vehicle Miles Traveled (millions)		
	Existing Conditions[a]	Annual Growth Rate (%)	Year 2035 Projection
Fresno County	21.70	2.0	37.11
Kings County	3.80	2.0	6.17
Tulare County	10.42	2.5	20.27
Kern County	22.65	--	32.90

[a] Existing conditions are 2008 conditions for Fresno and Tulare counties, 2006 conditions for Kern County, and 2010 conditions for Kings County.

Sources: Council of Fresno County Governments 2004, Table 2.2; Kern Council of Governments 2010a, Table 2.2; Kings County Association of Governments 2007, Table 2.2; Tulare County Association of Governments 2007, Table 2.2.

Caltrans' goal for state highway facilities is LOS B through D on a scale of A to F, where A is unencumbered travel and F is stop-and-go traffic flow. In the 2009 SR 99 Transportation Concept Report, the Caltrans stated that the highway was operating at level of service (LOS)[3] C or D through most of its length in 2003. Caltrans estimates that by 2010 and 2025, the LOS will likely deteriorate on all segments of the highway because of increased interregional and statewide travel, with operations reaching unacceptable levels of congestion (LOS of E or F) by 2025 without system improvements. The capacity improvements planned for SR 99 mentioned above often require property acquisition, reconstruction of bridges, and other infrastructure improvements requiring an expenditure of several billion dollars. Even if all of the needed structural and capacity improvements were made, Caltrans estimates that only a few segments of SR 99 would meet operating standards in 2025 because the volume of traffic would exceed practical highway capacity expansions (Caltrans 2009c).

The San Joaquin Valley region exemplifies the statewide growth patterns and trends, where much of the intercity travel in California consists of trips of intermediate distance. Table 1-4 shows the statewide forecasting model results for expected growth in traffic volumes on major highways within the next 25 years. These trips include more than 339 million annual intercity trips between the Central Valley and other metropolitan areas, or 38% of all intercity travel.

[3] LOS is an indicator of traffic conditions and ranges from LOS A to LOS F, with LOS A representing the best traffic flow conditions, and LOS F the worst congested conditions.

Table 1-4
Travel Growth for Intercity Highways

Major Highways	Average Daily Volume 2010	Average Daily Volume 2035	Percent Change
Interstate 5 (I-5) between San Diego and Los Angeles (Orange County–Los Angeles County line)	185,000	342,000	85
I-5 between Los Angeles and Bakersfield (at Santa Clarita)	222,000	332000	50
SR 99 in Central Valley (north of Bakersfield)	58,000	83,000	43
US 101 just south of San Jose	158,000	253,000	60
I-580 between Bay Area and Stockton (at Livermore)	156,000	191,000	22
Source: Parsons Brinckerhoff 2010.			

Freight Movement

Vehicle travel in and out and within the region competes with freight movement along SR 99 and other local roads. Freight deliveries by truck are an important component of the regional economy, particularly for transporting agricultural goods from farm to market. Currently, daily truck volumes range from about 9,200 to 29,000 on SR 99 representing 20% to 30% of total traffic between Fresno and Bakersfield (Caltrans 2009c). The region's growth, especially along urban segments of SR 99, threatens the ability of the highway to serve future needs. Even with significant planned improvements, such as those planned by Caltrans (discussed previously under Travel Demand), heavily congested segments will remain along SR 99.

Goods traveling between the San Joaquin Valley, Southern California, and the Bay Area are shipped almost entirely by truck. While trucking is the dominant mode for moving freight, rail accounted for 11% of the total tonnage of freight movement through the region in 2000 (Council of Fresno County Governments 2010b). Approximately 87% of outbound freight movement and 81% of inbound freight movement in Kern County in 2000 was by truck and the remainder by rail (Council of Fresno County Governments 2000).

The Union Pacific Rail Road (UPRR) and BNSF Railway (BNSF) provide Class I rail service to the south San Joaquin Valley. Both of these railroads offer rail-truck intermodal service from a number of locations in the valley. UPRR operates 25 to 30 freight trains per day, and BNSF Railway operates 35 to 40 freight trains per day through Fresno (Council of Fresno County Governments 2010a). These trains carry food products, general freight, grain, and lumber. UPRR and CSX Transportation are teaming to offer a service in the San Joaquin Valley for perishable goods. One of these services, known as "The Express Lane," offers two tiers of refrigerated service from the San Joaquin Valley to New York and Boston. The San Joaquin Valley Railroad (State Railways Incorporated) operates a regional rail freight service between Tulare, Fresno, and Kings counties on 125 miles of leased UPRR branch lines connecting outlying areas to mainline carriers (Caltrans et al. 2008).

Conventional Passenger Rail

Caltrans helps fund intercity passenger rail service by supplementing Amtrak's interstate service through capital and operational measures. Intercity rail transportation in the Fresno to Bakersfield corridor is currently provided by the Amtrak California™ San Joaquin Route, operated by Caltrans on the railroad tracks owned by the BNSF Railway. Amtrak California™ operates four trips daily in each direction between Oakland and Bakersfield, and two trips daily in each direction between Sacramento and Bakersfield, providing a total of six daily roundtrips between Fresno and Bakersfield. In fiscal year 2008, ridership between Bakersfield and Oakland/Sacramento, the sixth busiest Amtrak route in the country, grew to 949,611 passengers, which was an increase of 18% over fiscal year 2007 and an increase of 40.5% over fiscal year 2000 (Amtrak Government Affairs 2008). The scheduled travel time between Bakersfield and Oakland averages 6 hours and 9 minutes, with an average speed of 51.3 mph (the maximum speed on the route is 79 mph) (Caltrans 2008a). Travel by train can take longer than travel by car. Drivers from Bakersfield can reach Oakland in approximately 5 hours, 1 hour faster than the train's average travel time, and with the convenience of direct door-to-door travel. Passenger train service must yield to freight trains, resulting in longer travel times and less schedule predictability for train passengers. To increase ridership on the San Joaquin Route, the *California State Rail Plan 2007–2008 to 2017–2018* (Caltrans 2008a) seeks to improve the frequency of travel and on-time performance by implementing capital and operational improvements. Section 1.6, 2012 Business Plan, provides additional information on blending the HST System with existing rail systems on shared infrastructure.

Air Travel

Air travel demand has been growing steadily in California and nationwide; federal, state, and regional transportation plans forecast continued growth in air travel over the next several decades. By 2005, Los Angeles to San Francisco was the busiest air travel route in the United States, with 8.6 million trips annually, representing about 43% of the intercity trips in this market for all transportation modes (Cambridge Systematics 2008). In 2009, approximately 13 million passengers are estimated to have traveled between major Northern and Southern California airports. In addition, far fewer commercial air trips were made to and from San Joaquin Valley airports, which do not fall within the top 100 corridors in the United States. Without HSTs, more than 3% of all intercity travel statewide and approximately 10% of longer intercity trips (those in excess of 100 miles) are forecast to be air travel.

There are eight airports in the Central Valley[4] that provide commercial service to the public. With the exception of Sacramento International Airport (SMF) in Sacramento, Fresno-Yosemite International Airport (FAT) in Fresno, and Meadows Field Airport (BFL) in Bakersfield, these airports generally offer only one to three flights daily to larger airports in northern and southern California. Fresno-Yosemite International Airport is the south San Joaquin Valley's major airport, and Meadows Field Airport also offers several commercial flights daily.

Neither Fresno-Yosemite International Airport nor Meadows Field Airport provides substantial intercity commercial airline service to the population in the south San Joaquin Valley. A comparison between the populations of Sacramento, Fresno, and Kern counties and the amount of air travel activity at Sacramento International Airport, Yosemite International Airport, and Meadows Field Airport makes this point evident. The 2010 census data indicate that the populations of Sacramento, Fresno, and Kern counties are 1.4 million, 930,000, and 840,000 people, respectively. Although the population of Sacramento County is less than two times larger than the population of either Fresno County or Kern County, the estimated 2010 in-state

[4] The Sacramento and San Joaquin valleys combined are called the Central Valley.

enplanements (a visitor flying in and flying out equals one enplanement) at Sacramento International Airport are 10 times higher than at Fresno-Yosemite International Airport and 26 times higher than at Meadows Field Airport (Table 1-5). Sacramento International Airport also provides service to 11 cities in California, whereas Fresno-Yosemite International Airport and Meadows Field Airport only serve San Francisco and Los Angeles international airports.

Table 1-5
Commercial Air Traffic and Central Valley Airports

Airport	Total 2010 Forecast Enplanements [1]	Estimated 2010 In-State Enplanements	Number of Carriers Providing In-State Service	In-State Airports Served
Sacramento International Airport (SMF)	4,309,623	2,037,724	12	Arcata, Burbank, Los Angeles, Long Beach, Ontario, Palm Springs, San Diego, San Francisco, San Jose, Santa Barbara, Orange County (Santa Ana)
Fresno-Yosemite International Airport (FAT)	575,709	199,680	8	San Francisco, Los Angeles
Meadows Field – Bakersfield (BFL)	123,959	78,000	2	San Francisco, Los Angeles

[1] FAA 2010.

Air travel to and from Fresno-Yosemite International Airport and Meadows Field Airport does not competitively serve south San Joaquin Valley residents when compared with automobile travel. As shown in Table 1-5, air travel to and from these airports is restrained by the limited number of flights offered, and origin and destination airports served. For trips within California, many San Joaquin Valley travelers choose to drive to their destinations because the travel cost is lower than airfares. For example, a roundtrip airfare between San Francisco and Los Angeles can generally be purchased for $130, while the same airline for the same travel dates charges between $204 and $546 for roundtrip flights between San Francisco and Fresno (United Airlines 2010, 2012). For trips outside of California, travelers from the San Joaquin Valley frequently choose to drive to larger airports in Sacramento, San Francisco, Oakland, San Jose, or Southern California, where they can obtain more direct flights than are available from either the Fresno-Yosemite International Airport or Meadows Field Airport.

From Fresno, the driving time to San Francisco is approximately 3 hours and 40 minutes and to Los Angeles approximately 4 hours (Google Maps 2010). The driving time and flight costs from Fresno to San Francisco and Los Angeles can discourage residents of the San Joaquin Valley from considering trips to these metropolitan centers and in doing so can contribute to the economic and cultural isolation of the San Joaquin Valley. This isolation is further aggravated by delays in automotive and air travel caused by fog during winter months. The Central Valley experiences an average of 30 days of dense fog a year; the dense fog contributes to a substantial number of accidents along SR 99 and flight delays at airports (NOAA n.d.).

Despite the distance of the San Francisco, Oakland, and San Jose airports from Fresno, Kings, and Tulare counties and the distance of Los Angeles International Airport (LAX) from Kern County, many people in the south San Joaquin Valley nonetheless use these airports. Annual passenger demand at San Francisco International Airport (SFO) increased from 31 million passengers in 1990 to 37.4 million in 2009 (Airports Council International 2010). By 2035, annual passenger demand at SFO is projected to reach 64.4 million passengers, and the airport is projected to exceed capacity. However, with unconstrained airport demand, SFO could reach its capacity as early as 2020. As early as 1998, SFO undertook studies to address the capacity constraints associated with its existing runway configuration. These studies included plans for new runways to be constructed on fill placed in San Francisco Bay, because no inland expansion of the airport is feasible. Because of environmental concerns and public opposition, these plans were withdrawn, and in 2008 the San Francisco Board of Supervisors passed a resolution declaring that no additional fill should be placed in San Francisco Bay for new or reconfigured runways at SFO. Because of these capacity constraints, SFO will likely be forced to reduce air service in intercity travel markets with high levels of service (such as that between LAX and SFO) (Mays 2008).

The future level of travel demand is noteworthy because both SFO and LAX are among the most capacity-constrained airports in the nation (together with New York and Philadelphia). A federal Aviation Administration (FAA) study that examined future demand and operational capacity identified both SFO and LAX as needing additional capacity by 2015, even with the planned improvements currently proposed. The report noted that SFO will serve as an example of a capacity-constrained metropolitan area where runway construction may not be an option given environmental considerations and policy directives (e.g., the 2008 resolution of the San Francisco Board of Supervisors discussed above). Other smaller airports in the San Francisco and Los Angeles travel markets (e.g., Oakland) were also identified as needing capacity improvements. Because of existing constraints to the expansion of airports, the study concludes that other solutions, including regional sharing of air travel among local airports, market mechanisms, and consideration of high-speed ground travel modes, will be needed to alleviate the demand and capacity constraints. The HST System, including the Fresno to Bakersfield Section, would help to alleviate these capacity constraints at SFO and LAX by providing a new intercity transportation mode and improving the transportation accessibility of the south San Joaquin Valley.

The two regional airports in the San Francisco Bay Area—the Oakland International Airport and the Norman Y. Mineta San Jose International Airport—are projected to increase their annual passenger demand from 14.6 million to 20.7 million at the Oakland airport by 2035 and from 10.7 million passengers in 2007 to 16.3 million at the San Jose airport by 2035 (Regional Airport Planning Committee 2009). Although these regional airports and other airports in the larger market area (e.g., Sacramento, Stockton, Monterey airports) may absorb some of the projected future air travel demand, they do not provide viable options for a number of air travel markets (e.g., business commuters, international and national tourist travelers) (SH&E 2009).

Travel Time

Similar to the southern San Joaquin Valley, with growing demand for intercity travel and growing capacity constraints, the total automobile travel time will increase statewide. Air and rail travel time will remain basically the same. Table 1-6 shows the approximate total travel time in 2010 and the projected total travel time in 2035 for automobile, air, and rail between various city pairs. These data come from the ridership analysis completed for the HST forecasting model information from regional transportation planning agencies, Caltrans, and current air and conventional rail schedules.

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 2010	Auto 2035	Air 2010[a, b]	Air 2035[a, b]	Conventional Rail 2010 and 2035[b, c]
Downtown Los Angeles to Downtown San Francisco	8:10	9:04	4:40	4:42	9:45[d]
Downtown Fresno to Downtown Los Angeles	4:35	5:28	4:02	4:01	5:03[e]
Los Angeles downtown to San Diego downtown	4:13	5:09	3:24	3:24	3:19
Burbank (Airport) to Downtown San Jose	6:57	7:08	4:39	4:32	10:40[f]
Downtown Sacramento to Downtown San Jose	3:09	3:36	4:40	4:36	4:06

[a] Represents the same level of service observed in 2005, compiled from the Federal Aviation Administration data from the 10% ticket sample combined with wait, terminal, access, and egress times developed from the California High-Speed Rail ridership forecasting model (Cambridge Systematics 2010).

[b] Access and egress times based on transit connections.

[c] Conventional rail assumptions for travel times and wait and terminal times are the same for 2010 and 2035. Access and egress times may vary, but in practice do not vary significantly between 2010 and 2035.

[d] Based on April 23, 2010, San Joaquin schedule, which would require bus connections from Los Angeles to Bakersfield and from Emeryville to San Francisco.

[e] Based on April 23, 2010, San Joaquin schedule, which would require bus connections from Los Angeles to Bakersfield.

[f] Based on April 23, 2010, San Joaquin schedule, which would require bus connections from Burbank to Bakersfield and from Stockton to San Jose.

Source: Parsons Brinckerhoff 2010 (based on Cambridge Systematics data).

While air travel time will not change, the number of desired flights to a given destination may be limited by runway capacity, thus reducing flexibility in travel dates available. 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 future conditions. Some capacity improvements have been funded for the San Joaquin Valley and in Southern California, but these are basic enhancements intended to improve reliability rather than travel time. The Amtrak plan for the next 10 years includes adding one more roundtrip per day between Oakland and Bakersfield and reducing the travel time between these two cities to below 6 hours (Caltrans 2008b). These improvements will provide some benefit to rail passengers, but will not provide substantial passenger rail capacity to the San Joaquin Valley.

Continuing population 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 regional transportation plans for areas to be served by the proposed HST System, the highways serving key cities are operating at capacity, and plans for expansion will not keep pace with projected growth over the next 20 to 40 years (Council of Fresno County Governments

2010b; Kern Council of Governments 2010b; Kings County Association of Governments 2010; Tulare County Association of Governments 2010).

1.2.4.2 Safety and Reliability

Projected growth in California's people and goods movement by automobile, air, and rail over the next two decades also underscores the need for improved travel safety. With more vehicles on intercity highways, the potential for accidents increases. Travel demand will continue to outpace future highway capacity, resulting in increased travel delays. Roadway congestion, limited airport capacity, passenger train delays from freight train traffic, and a growing intercity travel market adversely affect the travel time reliability of air, conventional passenger rail, and automobile travel. Weather-related events are an additional source of disruption and delay that affect transportation reliability and safety. As noted previously (under Travel Demand), Caltrans expects that the projected growth and travel demand in the central part of the San Joaquin Valley will not be matched by increases in roadway capacity. Many causes of increased highway congestion rates exist all over California. For example, accidents, road work, cars stranded along the roadside, or a routine traffic violation stop can create a bottleneck, potentially delaying commuters for miles. Poor weather conditions (rain, wind, and dense fog) also adversely affect the reliability of highway travel times. Rain and wind can make the roads dangerously slick, increasing accident rates. Fog, haze, and glare at times can distract drivers or cause them to slow. As delay on the freeway increases, the overall reliability of the system tends to decrease (Cambridge Systematics, Inc. 2007).

The California Highway Patrol publishes an annual summary of accident data for state highways. According to those statistics, in 2008, 3,401 fatalities and 170,496 nonfatal injuries occurred on California highways, which corresponds to a fatality rate of 1.04 per 100 million VMT (California Highway Patrol 2008). Fatalities on state highways in the south San Joaquin Valley are lower than the statewide average at 0.62 per 100 million VMT in Fresno County, 0.83 per 100 million VMT in Kings County, 0.97 per 100 million VMT in Tulare County, and 0.89 per 100 million VMT in Kern County (California Highway Patrol 2010; Caltrans 2010). The nationwide fatality rate per 100 million VMT was 2.10 in rural areas and 0.80 in urban areas in 2008 (BTS n.d.).

The San Joaquin Valley is subject to dense fog, often called tule fog, many days during the winter months. The fog also creates a substantial safety hazard for motorists. Visibility in tule fog is often less than one-eighth of a mile (approximately 600 feet); sometimes visibility can be less than 10 feet. Visibility in tule fog can also change rapidly; within a short distance, visibility can diminish to near zero. Low and changing visibility is the cause of many chain-reaction vehicle accidents on roads and highways in the San Joaquin Valley. In February 2002, two people were killed in an 80-car pile-up on SR 99 in Fresno County. Visibility at the time of the accident was zero. In November 2007, fog caused a pile-up that involved 108 passenger vehicles on northbound SR 99, south of Fresno. Many motorists do not travel between cities in the San Joaquin Valley, or to and from the valley, during the winter because of tule fog. Most other forms of transportation are also affected by this hazard.

Weather conditions are also a key factor in airport flight delays. Some airlines adjust their schedules to achieve on-time arrivals even if departures are delayed; some airlines have increased their scheduled flight times between high-demand city pairs such as Los Angeles and San Francisco to maintain their on-time arrival statistics in the face of potentially increasing delays. Weather also results in flight cancellations. Aircraft delays cost the airlines and the traveling public time and money, and the FAA has identified the reduction of airport delays nationwide as one of its highest priorities. Data from the U.S. Department of Transportation *Air Travel Consumer Report* show San Francisco and Los Angeles international airports ranking among the worst of major airports in the country in terms of delay (U.S. Department of Transportation 2003). Approximately 14% of flights departing Fresno-Yosemite International

Airport were delayed in 2008 (BTS 2010). Airport delays are a function of capacity, weather conditions, and safety conditions. When demand at an airport exceeds the capacity on the airfield at that time, flights are delayed until they can be safely accommodated. Delayed flights sometimes compound problems for other flights and can result in cancelled flights. Because the FAA Ground Delay Program holds flights at their point of departure until the destination airport can accept the demand, and because short flights (e.g., San Francisco to Fresno) are more easily adjusted than longer flights (e.g., the East Coast or Midwest to the West Coast), short flights are more likely to experience holding delays. Consequently, intercity air travel within California can experience major delays because of the total airport demand.

1.2.4.3 Modal Connections

Currently, the San Joaquin Valley is underserved by transportation facilities connecting communities in the valley with California's major commercial and cultural hubs. Between San Francisco and Los Angeles, the San Joaquin Valley's major transportation facilities for passenger travel include SR 99, Amtrak California™, and the Fresno and Bakersfield airports. Passengers prefer transportation systems with connections that perform similarly with respect to the convenience and speed of door-to-door service by automobile. 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.

As shown on Figure 1-2, Fresno and Bakersfield are directly connected by SR 99, the fastest transportation route between them. Because I-5 is located approximately 40 and 15 miles west of Fresno and Bakersfield, respectively, it does not provide a convenient transportation route between the cities. In addition, Amtrak California™ directly connects Fresno and Bakersfield. The frequency and travel times between these cities are not adequate to meet many travel needs, as discussed above under Conventional Rail.

As discussed above, commercial airports in south San Joaquin Valley are underutilized because it is often less costly for San Joaquin Valley residents to drive than to fly between locations within California. Larger airports that are within driving distance of south San Joaquin Valley provide more variety of direct airline service for trips outside of California, often at much lower purchase price. For these reasons, the volume of air travel from south San Joaquin Valley airports is relatively constant, and correspondingly, commercial airlines have not increased service from these airports, which reduces connectivity options for the Fresno to Bakersfield area.

The options for connecting from the Central Valley to California's largest metropolitan areas include driving the full distance, driving to a regional or larger airport and then flying, or using an intercity rail and transit bus to the final destination. The limited options of direct, fast, and safe connections to the major metropolitan areas isolate the Central Valley economically, limit the area from which Central Valley businesses draw customers and employees, and reduce the accessibility of job markets for residents. High-speed train service to Fresno and Bakersfield would provide links to a number of bus, light rail, and airport services for intercity travelers to other areas in the state.

1.2.4.4 Air Quality and greenhouse gas emissions

EPA adopted the Clean Air Act (CAA), as amended, in 1977 and 1990. Under the authority of the CAA, EPA established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. The federal standards (the National Ambient Air Quality Standards [NAAQS]) 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 (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. The CAA defines nonattainment

areas as geographic regions designated as not meeting one or more of the NAAQS. The CAA requires that a state implementation plan (SIP) be prepared for each nonattainment area and a maintenance plan be prepared for each former nonattainment area that subsequently demonstrates compliance with the standards. An SIP is a compilation of a state's air quality control plans and rules that the EPA has approved.

California has multiple air basins designated as nonattainment areas (see Section 3.3, Air Quality and Global Climate Change) ranging from severe to serious status, including the Sacramento Valley Air Basin, the San Joaquin Valley Air Basin, the South Coast Air Basin, and the Southeast Desert Air Basin (Coachella Valley).

Metropolitan areas will continue to be challenged to reduce emissions to acceptable levels from a growing number of vehicles, and 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 demand for trips 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.

One statewide strategy adopted in the California SIP is the development of multi-use transportation corridors. Among them, they include designated lanes for high-occupancy vehicles (HOVs), the addition of more transit, and the inclusion of rail modal options. Meeting federal and state air quality standards over the next 20 to 40 years will also require reductions in the VMT, integration of land use and transportation planning and development, development of transportation demand strategies, implementation of operational improvements, and use of new technologies that improve transportation efficiencies and increase transportation alternatives to the single-occupant automobile. Without the HST System, auto trips are expected to account for more than 95% of all intercity travel, and close to 90% of longer intercity trips in California by 2035.

In 2005, California set statewide targets for reducing greenhouse gas (GHG) emissions. Executive Order S-3-05 requires that state agencies reduce their GHG emissions to 2000 levels by the year 2010, to 1990 levels by the year 2020, and 80% below 1990 levels by the year 2050. Shortly after the issuance of Executive Order S-3-05, the California State Legislature adopted Assembly Bill (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 the California Air Resources Board (CARB), the state agency charged with regulating air quality, to create a plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases" 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 plan was developed by CARB in 2008 as the Climate Change Scoping Plan (California Air Resources Board 2008), the state's road map to reaching the GHG reduction goals required by AB 32. The Plan supports the implementation of a High-Speed Rail System to provide more mobility choice and reduce GHG emissions. The "Approved Scoping Plan" was adopted by the CARB at its December 11, 2008 meeting. The measures in this Scoping Plan will be developed and in place by 2012.

Senate Bill (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 MPOs (including the COGS for Fresno, Tulare, Kings, and Kern counties) 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. The current provisional GHG reduction targets for the San Joaquin Valley COGs are 5% by 2020 and 10% in 2035.

The transportation sector is responsible for about 40% of California's GHG emissions (CARB 2010). Emissions of criteria pollutants (carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide) and GHG emissions from motor vehicles are directly proportional to the amount of fuel burned. The San Joaquin Valley Air Basin exceeds federal and state air quality standards for ozone, $PM_{2.5}$, and for the state's 24 hour standard for PM_{10}. The projected population growth (see Section 3.19, Regional Growth) in the San Joaquin Valley will result in an increase in VMT (see Section 3.2, Transportation) and the volume of pollutants emitted by motor vehicles. Particulate matter levels are a direct function of the amount of driving, with road dust caused by moving vehicles accounting for 60% to 80% of particulate emissions from mobile sources. Motor vehicle exhaust is a major source of fine particulates and the precursors to ozone. The continued increase in traffic will exacerbate the existing air quality problem 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.

Compared with travel by car, with its internal combustion engine, an electric-powered HST System would reduce CO_2 emissions; an HST trip from Fresno to Bakersfield would save 170 pounds of CO_2 for each car making the same trip. The HST System would also provide a more energy-efficient travel mode. A trip on the HST System would use one-third the energy of a similar trip by air, and one-fifth the energy of a trip made by car (California Office of the Governor 2007).

1.2.4.5 Protection and Preservation of Natural Resources and Agricultural Lands

California's natural resources, including wetlands and waterways, habitat areas for sensitive species of plants and animals, and wildlife migration corridors have been subject to direct and indirect impacts as the state's population has increased, and growth has occurred in the less developed areas of the state. Of California's approximately 100 million acres, only 9 million are considered to be prime, unique, or statewide important farmlands, 38% of which are located in Fresno, Kings, Tulare, and Kern counties. Development in California has been consuming approximately 40,000 acres of agricultural lands per year. Since 1990, this urbanization has converted 538,000 acres. Of this, 30% were prime, unique or statewide important farmlands and over half of this conversion occurred in the San Joaquin Valley. The rapid population growth and the draw of relatively affordable housing in the San Joaquin Valley as compared with other urbanized areas of California has led to the threat of California's most valued agricultural lands, and valued habitat lands for supporting biodiversity. Agricultural lands are a vital part of the state's environment and economy, representing over $36.6 billion in direct farm sales, and 12.8% of the nation's total agricultural value (California Department of Food and Agriculture 2009). The agricultural lands of the Central Valley, with their high quality soils, support production of a wide array of food and fiber that are exported throughout the United States and internationally (refer to Section 3.14, Agricultural Lands, for detail on San Joaquin Valley crops and value). Statewide agriculture-related jobs account for approximately 1.4 of every 100 jobs (U.S. Department of Agriculture, Economic Research Service 2002). The San Joaquin Valley accounts for over half of all direct agricultural jobs in California (California Employment Development Department 2009).

These lands, which form the underpinning of the state's agricultural industries, have been subject to a long-term trend of conversion to urbanized uses.

In California, new development has consumed an acre of land for every 9.4 people statewide, but in the San Joaquin Valley, this rate is an acre for every 8 persons (Thompson 2009). Conversion of open lands has also led to inefficient urban development patterns that have resulted in increased cost for providing public services to the newly developed areas. Population growth in the Central Valley in the coming decades is expected to continue, resulting in an ongoing pressure to use agricultural lands to accommodate growth. The HST System would ease the pressure on the state's agricultural land base and open space by reducing the need for expanding airports and freeways. By offering a new transportation option, it provides an opportunity to create transit centers in the central business districts, where mixed land uses (residential, commercial, and business uses) and urban densities are best suited. Multimodal centers draw high volumes of people to interact for pleasure, business, and commerce purposes. The presence of high volumes of people can induce economic investments within walkable distances of these centers. Worldwide and national examples demonstrate increased land values adjacent to large multimodal centers to develop more densely around stations. If the communities zone to take advantage of this increase in land values, the growth can be redirected to limit low density development, which has been consuming large amounts of land area. There is an opportunity to encourage walkable, more concentrated development patterns to meet new growth demands and reduce the rate and occurrence of low density, which erodes the valuable land resources.

1.3 Relationship to Other Agency Plans, Policies, and Programs

The objectives of the California HST System include providing an interface between the HST System and major commercial airports, mass transit, and the highway network. Plans and programs that have been considered in the development of the Fresno to Bakersfield Section alignment and station location options, or that already include recommendations for an HST project, are discussed below.

1.3.1 San Joaquin Valley Blueprint

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 Business, Transportation, and Housing Agency and the San Joaquin Valley Air Pollution Control District to develop a long-term blueprint for growth in the San Joaquin Valley. The goal was to determine if there were alternatives to current transportation investment priorities that would make improvements to the region's 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 (the Madera County Transportation Commission) on the Blueprint and took the following actions (Council of Fresno County Governments 2009):

- 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, and to provide guidance for local jurisdictions with land use authority as they update their general plans.

One of the smart growth principles adopted by the Policy Council is providing a variety of transportation choices. Transportation is the key factor that will shape urban and rural development in the San Joaquin Valley. The region's transportation investments will support the shared regional vision by providing connectivity between centers and to other regions, congestion relief, and choices for moving people and goods while fostering new development, access to key economic assets, and connectivity to global markets. As part of this smart growth principle, the Blueprint envisions high-speed train service in the San Joaquin Valley, with stations in 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 (San Joaquin Valley Regional Policy Council 2010).

1.3.2 San Joaquin Corridor Strategic Plan

The *San Joaquin Corridor Strategic Plan* (Caltrans 2008a) formalizes the short- (3 to 5 years), medium- (6 to 10 years), and long-term (11 to 25 years) vision for passenger rail service through the Central Valley. The *San Joaquin Corridor Strategic Plan* includes all San Joaquin Valley counties except Tulare County, and destination cities such as San Francisco, Oakland, Sacramento, and Los Angeles. 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 RTP agencies. The plan calls for improved communications between Amtrak and the public regarding service to riders and potential riders, and improved station safety and security over the short-term; more frequent service and more stations and stops over the medium-term; and passenger rail in the UPRR corridor, as well as direct connections to Los Angeles and the Bay Area in the long-term.

The plan recognizes that the current passenger trains, referred to as the San Joaquins, have the opportunity to interface with the HST System to serve as a collector/distributor. What will be critical to fulfilling this opportunity are joint stations at major cities such as Fresno, Bakersfield, Sacramento, and Merced. These interchange points will allow for passengers to transfer to and from the San Joaquins to the HST System. Other opportunities will arise for the San Joaquins to "bridge" the HST service while it is under construction in different regions, such as between the Bay Area and Merced, and between Los Angeles and Palmdale. The San Joaquins could act as a Central Valley corridor bridge connecting the HST corridors in the north and south (Caltrans 2008a).

1.3.3 2011 Fresno Forward Regional Transportation Plan

This plan specifies how approximately $5.88 billion in anticipated federal, state, and local transportation funds will be spent in Fresno County during the next 25 years. The RTP contains a fiscally constrained list of projects and programs that have a reasonable expectation of being funded during the life of the plan. County-level projects seeking state or federal funding, completing environmental clearances, or desiring to enter into construction must be in this section of the RTP. In turn, the RTP helps to inform the development of the STIP, which prioritizes the use of state transportation funds. The HST project is recognized in the RTP as an important state program benefiting the San Joaquin Valley by connecting it to major metropolitan areas.

The major thrust of the RTP is an interregional perspective to transportation planning within the San Joaquin Valley, by the eight valley counties that have implemented an aggressive program of coordinated valley-wide planning. In September 1992, the eight valley RTP agencies entered into a memorandum of understanding (MOU) to ensure a coordinated regional approach to transportation and air quality planning efforts. The MOU establishes a system of coordination of plans, programs, traffic, and emissions modeling, transportation planning, air quality planning,

and consistency in data analysis/forecasting. The updated MOU, signed in 2006, created the San Joaquin Valley Regional Planning Agencies' Policy Council. The Policy Council is authorized to represent the RTPAs in multiple forums, including before the California Transportation Commission and state and federal legislative bodies. The 2014 update of the RTP will be required to be consistent with the requirements of SB 375.

The *San Joaquin Valley Express Transit Study* (Merced County Association of Governments 2009) was sponsored by the RTPA to develop a valley-wide, comprehensive understanding of existing inter-and intra-valley transit services and future transit demand both within the Valley, and to Sacramento, Bay Area, and Southern California destinations. The study recommended considerations of upgrading commuter rail service to northern SR 99 corridors in Merced, Stanislaus, and San Joaquin counties, including capitalizing on the California HST Project investments.

1.3.4 Kings County Association of Governments 2011 Regional Transportation Plan

The Kings County Association of Governments (KCAG) is a state-designated regional transportation planning agency and a federally recognized metropolitan planning organization. KCAG consists of representatives from Kings County and the cities of Avenal, Corcoran, Hanford, and Lemoore. As the county's transportation planning agency, KCAG has issued an RTP providing a vision for transportation in Kings County through 2035.

The 2011 RTP indicates that the HST alignment must be within the SR 99 corridor through the San Joaquin Valley rather than the I-5 corridor or coastal alignment; and that the HST must connect the major population centers within the San Joaquin Valley with the Los Angeles Basin and the Bay Area. Most local governments in the county support HST service to existing downtowns. Outlying suburban stations may require substantial local costs to provide connecting transit service to key activity centers downtown, and may encourage premature development. The 2014 update of the RTP will be required to be consistent with the requirements of SB 375.

1.3.5 Tulare County Association of Governments 2011 Transportation Plan

The Tulare County Association of Governments (TCAG) is a state-designated regional transportation planning agency and a federally recognized metropolitan planning organization. TCAG consists of representatives from Tulare County and the cities of Dinuba, Exeter, Farmersville, Lindsay, Porterville, Tulare, Visalia, and Woodlake. The Tule River Tribal Council is also consulted as part of the transportation planning process. As the county's transportation planning agency, TCAG has issued an RTP providing a vision for transportation in Tulare County through 2035. Tulare County and the City of Visalia have passed resolutions supporting HST and a regional station stop that would serve their communities. The 2014 update of the RTP will be required to be consistent with the requirements of SB 375.

A goal of the RTP is to promote safe, economical, convenient rail systems and schedules that meet the needs of passenger and freight services. Policies of TCAG to achieve this goal include:

- Support the extension of continuous rail passenger service, cross-valley rail, high-speed rail, and light rail along select corridors.
- Support the California High-Speed Rail Commission in connecting the Bay Area and Southern California with high-speed rail.

- Support a high-speed rail alignment that would accommodate a regional station stop in Tulare or Kings County.

TCAG is concerned with the preservation and continued use of existing rail lines in the region. The San Joaquin Valley Railroad expressed interest in improving a freight rail system to serve the cities of Visalia, Hanford, Lemoore, and Huron. TCAG programmed $1 million of congestion management and air quality program funding to upgrade the existing rails, which were rated at 15 mph. A second phase could include a passenger rail service between the cities of Visalia and Hanford. This route would act as a link to the Amtrak station in Hanford, and could also serve as a link to an HST station in either Visalia or Hanford.

1.3.6 Kern Council of Governments Regional Transportation Plan

The Kern Council of Governments (Kern COG) adopted an RTP in July 2010. The plan specifies how approximately $5.3 billion in anticipated federal, state, and local transportation funds will be spent in Kern County during the next 25 years. This plan includes approximately $112 million in transit-oriented projects primarily to improve bus service in the Bakersfield Metropolitan Area and other parts of the county.

The RTP incorporates work done earlier by the Kern COG as part of its High-Speed Rail Terminal Impact Analysis. The study was done to determine a community-preferred site for a future HST station in Bakersfield, and evaluated potential sites based on mobility, access, and intermodal connectivity, cost, user convenience, impact on built environment, air quality, economic development, and environmental impacts. On July 1, 2003, the Kern County Board of Supervisors adopted Resolution 2003-290 in support of the Truxtun Avenue terminal site. On July 9, 2003, the Bakersfield City Council voted to adopt Resolution 118-03 endorsing this site as their preferred station location. In September 2003, the Kern COG adopted Resolution 03-23 to designate the Truxtun Avenue terminal site as “the preferred base system local alternative site for the Metropolitan Bakersfield high-speed rail terminal” (Kern Council of Governments 2010b).

The Truxtun site is near the current Amtrak station. This site is within walking distance of the downtown area, including two hotels, the convention center, many government office buildings, and Bakersfield’s new Ice Center and McMurtrey Aquatic Center. Connections to other modal uses from this site already exist. Amtrak and Greyhound connections have existing facilities at or near the Truxtun site, while Golden Empire Transit and Kern Regional Transit also have regular stops at the Amtrak station. This proximity would facilitate passenger transfer connections, sharing of the Amtrak feeder bus terminal, and possibly even sharing of an expanded station.

The City of Bakersfield Economic and Community Development Department is already planning intensification of land uses around the proposed Truxtun HST station site. Plans include the addition of 600 housing units, and the Mill Creek pedestrian parkway that connects shops, restaurants, offices, and housing to the HST station site (Kern Council of Governments 2010b).

In 2008, the Kern COG adopted the Kern Regional Blueprint consisting of nine growth principles, which call for densification of existing population centers in Kern County. The pattern and distribution of these centers align into linear corridors that may require future transportation improvements. These corridors can provide feeder connections to proposed HST stations in Bakersfield and Palmdale. Planning for connectivity using passenger rail and public transit to the statewide HST System is a priority for the Kern County region.

The Kern County RTP proposes that the county’s main airport, Meadows Field, be linked into the planned Los Angeles Basin reliever network of airports. The RTP indicates that this could be done through the HST System. The 2014 update of the RTP will be required to be consistent with the requirements of SB 375.

1.3.7 Fresno-Yosemite International Airport Master Plan

In 2002, the City of Fresno initiated an update of its 1997 Airport Master Plan to develop a 20-year forecast for aviation development, including plans that allow the airport to be prepared to accept service from potential low-cost carriers. The plan is to determine the projected needs of all airport users for both airside and landside facilities, and to evaluate alternatives for development of each airport function (airfield, terminal area, air cargo, access and parking, airport support area, and general aviation) (Council of Fresno County Governments 2010b).

1.3.8 Meadows Field Airport Master Plan

The Meadows Field Airport Master Plan was adopted by the Kern County Board of Supervisors in June 2006 (Kern County Board of Supervisors 2006). This plan forecasts airport development to 2025. The Kern County Department of Airports opened the new Meadows Field William M. Thomas Air Terminal northeast of the former terminal in February 2006. The building currently accommodates up to six jet-boarding gates and can be expanded to add six additional bridges. The terminal has also been designed to allow another wing to be constructed that would accommodate an additional 12 jet-boarding gates. Ground area to accommodate additional parking facilities has been reserved. The plan allows for the construction of a third runway east of the existing runways to meet potential future growth in air cargo.

1.4 Relationship to Other Transportation Projects in the Study Area

The objectives of the proposed HST System include interfaces between the HST System and major commercial airports, mass transit, and the highway network. Other key transportation projects within the Fresno to Bakersfield area that offer intercity travel benefits and could enhance intermodal connections to the proposed HST System are described below. These projects have been considered in the planning and development of the Fresno to Bakersfield HST Section and station location options.

1.4.1 State Route 99 Corridor Business Plan

SR 99 is the transportation backbone of the San Joaquin Valley. In recent years, several efforts have focused on improving this highway to meet transportation standards and serve the expected growth in the valley. The updated *Route 99 Corridor Business Plan* (Caltrans 2009c) incorporates these efforts and provides the current blueprint for the corridor. The business plan is an update of the original business plan published in 2005, which first established a comprehensive corridor management plan. That plan laid out the improvements necessary to attain the primary objective of a minimum six-lane freeway for the entire corridor. The funding provided in 2006 with statewide voter approval of Proposition 1B has allowed much of this plan to proceed.

With much of the freeway conversion underway, the business plan has now focused more on capacity-increasing projects. The four priority categories for improvements in the plan include the following:

- Priority Category 1 – Freeway Conversion: This is now deemed complete because non-freeway sections will be eliminated within 5 years.
- Priority Category 2 – Capacity-Increasing Projects: These projects will provide a minimum of six lanes throughout the corridor and eight lanes in some urban areas.

- Priority Category 3 – Major Operational Improvements: These projects will improve outdated interchanges and add auxiliary lanes.
- Priority Category 4 – New Interchanges: These include new interchanges to accommodate growth and development along SR 99.

The business plan identifies 70 projects and establishes priorities by time period, with a goal of completion in 20 years. State and local funding resources have been allocated, and local agencies hope to advance the implementation schedule.

Many of the projects in the *Route 99 Corridor Business Plan* address potential improvements along SR 99 in Fresno, Tulare, and Kern counties. These projects provide coordination opportunities for the Fresno to Bakersfield HST Project.

1.4.2 California State Rail Plan, 2007–08 to 2017–18

The California State Rail Plan (Caltrans 2008b) is implemented by Caltrans. The plan envisions capital and operational improvements that will increase annual ridership 66% from 853,000 to 1,417,000, with 90% on-time performance. One new roundtrip service will operate between Oakland and Bakersfield, and another new roundtrip service will operate between Sacramento and Bakersfield. This plan also seeks to reduce the travel time between Oakland and Bakersfield to less than 6 hours, and between Sacramento and Bakersfield to less than 5 hours. The increased Amtrak service would provide more connections between Amtrak and the HST System.

1.4.3 Fresno County Measure C Extension

In 1986, Fresno County voters approved Measure C, a half-cent sales tax earmarked for transportation purposes. The voters approved a 20-year extension to Measure C effective July 1, 2007. This measure will provide $1.7 billion in funding for a broad array of transportation improvements. The largest share (34.6%) of Measure C funds will be used for the local transportation program to improve local transportation systems in the county as a whole, and each city in the county. These funds will be used for such projects as street maintenance/rehabilitation, Americans with Disabilities Act (ADA) compliance, pedestrian access and trails, and bicycle facilities. Approximately 30% of Measure C funds will be used for regional projects, including major highway and airport improvements. Approximately 24% of Measure C funds will be used to expand public transit and improve air quality. At present, the public transit program is focused on expanding the express, local, and feeder bus services throughout the county. Expansion of bus services could improve transit to an HST station in downtown Fresno.

1.4.4 Bakersfield Thomas Roads Improvement Program

The Thomas Roads Improvement Program (TRIP) is a cooperative effort between the City of Bakersfield, the County of Kern, Caltrans, and the Kern COG to manage and expedite the completion of projects designated for funding in the 2005 federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA:LU). TRIP projects have been identified as necessary to relieve the stress on outdated transportation infrastructure caused by years of rapid growth in population, interregional travel, and freight movement. The projects will improve regional mobility, economic growth, and development, and reduce travel time through major transportation corridors.

Projects in this program consist of capacity improvements to key roadways in the Metropolitan Bakersfield area, and construction of new roads and highways. These include the extension of Mohawk Street across the Kern River to provide a north-south connection from Rosedale Highway to Truxtun Avenue, construction of a new east-west freeway (Westside Parkway)

extending from Truxtun Avenue to Heath Road on the western edge of the Metropolitan Bakersfield area, and development of a new westward highway connected to SR 99 in the downtown Bakersfield area (Centennial Corridor Project). These new roadways would improve traffic flow from outlying suburban areas into downtown Bakersfield, where the HST station would be located.

The purpose of the Centennial Corridor Project is to provide a continuous route along SR 58 through Bakersfield to I-5 via the Westside Parkway. State Route 58 lacks continuity in central Bakersfield, which results in traffic congestion and reduced levels of service on adjoining highways and local streets. This route is offset by about 1 mile at SR 43 (Enos Lane) in eastern Bakersfield, and by approximately 2 miles at SR 99. Between SR 43 and SR 99, SR 58 functions as an arterial highway and is known locally as Rosedale Highway.

The proposed Centennial Corridor would extend from I-5 at Stockdale Highway to SR 58 at Union Avenue in Bakersfield. Five alternative alignments, as well as the No Project Alternative, are being considered for the project. One of those alternatives, Alternative D, would begin at SR 58 near Union Avenue and extend north and parallel to Union Avenue for approximately 1 mile, where it would turn west and run parallel to the BNSF Railway until it joins the Westside Parkway near the new Mohawk Street interchange. The alternatives for the Fresno to Bakersfield HST Section in Bakersfield would overlap portions of Alternative D between Mohawk Street and Union Avenue.

1.5 Tiering of Program EIR/EIS Documents

Since 2000, the Authority and FRA have been using a tiered environmental review process for the proposed HST System. The “tiering” of environmental documents means addressing a broad, general program in an initial “programmatic” or first-tier environmental document, then analyzing the complete details of related projects in subsequent “project” or second-tier documents. The environmental documents for individual, second-tier projects may incorporate by reference analyses already completed in the first-tier document to address many large-scale, non-site-specific resources and issues while focusing the second-tier analysis on site-specific effects not previously considered. The tiering of environmental documents avoids repetitive evaluations of issues that were sufficiently addressed in a first-tier analysis.

The Statewide Program EIR/EIS (Authority and FRA 2005) provided a programmatic analysis of implementing the HST System across the state, from Sacramento in the north to San Diego in the south and the San Francisco Bay Area to the west. At the conclusion of that first-tier environmental process, the Authority and FRA selected preferred alignments and station locations for most of the Statewide HST System to analyze further in second-tier EIR/EIS documents; Figure 1-6 shows this preferred alignment and station locations. The 2005 decisions covered the geographic area discussed in the Fresno to Bakersfield Section project-level EIR/EIS. Neither the FRA’s nor the Authority’s 2005 decisions were subject to legal challenge.

This project-level EIR/EIS evaluates nine alignment alternatives, further refining the preferred alignment identified in the first-tier environmental process. This EIR/EIS also provides information about the locations within the Fresno to Bakersfield Section where an HMF for the HST System could be built and operated. However, a decision on the HMF location will not be made at the same time as approval of the Fresno to Bakersfield alignment. The HMF location will be selected after considering the HMF sites identified in the San Jose to Merced Section EIR/EIS, the Merced to Fresno Section EIR/EIS, and the Fresno to Bakersfield Section EIR/EIS. Section 2.3 of this EIR/EIS, Potential Alternatives Considered during Alternatives Screening Process, discusses the reasons for making this decision at a later time.

Figure 1-6
Preferred alignments and stations – State of California

After the completion of the Statewide Program EIR/EIS document in 2005, the Authority and FRA then prepared a second program EIR/EIS for the HST System to identify a preferred alignment and the preferred station locations for the connection between the Bay Area and the Central Valley. At the conclusion of the 2008 Bay Area to Central Valley HST Program EIR/EIS process, the Authority and FRA selected a Pacheco Pass connection, preferred alignments, and station locations for further second-tier evaluation. As a result of CEQA litigation, the Authority rescinded its 2008 programmatic decision, prepared a Revised Final Program EIR, and made a new decision on the Bay Area to Central Valley route in 2010. A second legal challenge resulted in the Authority preparing a Partially Revised Final Program EIR in 2012. The Authority certified the Partially Revised Final Program EIR in April 2012 and again selected a Pacheco Pass connection, preferred alignments, and station locations for second-tier evaluation.

The second-tier Fresno to Bakersfield Section HST project is consistent with the Authority and FRA's first-tier program decisions. The Fresno to Bakersfield Section would serve as the connection to Merced to the north and Palmdale and the Los Angeles Basin to the south. This Fresno to Bakersfield Section Project EIR/EIS tiers from the first-tier program EIR/EIS documents, which provide background information on the Statewide HST Project, describe how the project has evolved to date, and explain how the Fresno to Bakersfield Section fits within the Statewide HST System. Specifically, this second-tier Project EIR/EIS contains detailed analysis of the environmental impacts of implementing the Fresno to Bakersfield Section of the HST System, including the alternatives to this section's alignment; the direct and indirect impacts of the alternatives, the cumulative impacts, the secondary effects, and the mitigation measures. Chapter 3, Affected Environment, Environmental Consequences, and Mitigation Measures, examines the site-specific effects of implementing the HST System in the Fresno to Bakersfield Section for each resource area and does not rely on the prior first-tier documents to identify any environmental impact issues. In this sense, the Fresno to Bakersfield Section Project EIR/EIS is tiered, but it is also a stand-alone document because it contains all the necessary site-specific environmental analysis to support the decision to proceed with the Fresno to Bakersfield Section HST project.

1.6 Revised 2012 Business Plan

In April 2012, the Authority released the Revised 2012 Business Plan for the California HST System (Authority 2012b). This plan updated the 2012 Business Plan released for public review in November 2011. The purpose of the Business Plan is to comply with the requirements of the Public Utilities Code Section 185033. The Business Plan outlines the type of high-speed rail service the Authority plans to develop; describes the primary benefits of the system; and forecasts patronage, project funding, construction phasing, and project risks. The Business Plan is a planning document that describes a phased approach for the construction of the Statewide HST System. The Revised 2012 Business Plan depicts general routes consistent with the Statewide HST System that the Authority and FRA selected in the CEQA and NEPA compliance analyses in the first-tier documents (i.e., the Statewide Program EIR/EIS [Authority and FRA 2005], the Final Bay Area to Central Valley Program EIR/EIS [Authority and FRA 2008], the Revised Final Bay Area to Central Valley Program EIR [Authority 2010], and the Partially Revised Final Bay Area to Central Valley Program EIR [Authority 2012b]). The Revised 2012 Business Plan also includes a detailed description of the anticipated phasing of the implementation of each individual section of the HST System, including the order of construction of the second-tier projects, such as the Fresno to Bakersfield Section described in this EIR/EIS.

The Revised 2012 Business Plan discusses a blended approach to phasing that would build the Statewide HST System as envisioned for California over time. Consistent with its statutory mission, the Authority has been planning for the long-term implementation of the entire 800+ miles of the Statewide HST System. In response to feedback on the Draft 2012 Business Plan,

the Authority will prioritize early investments between San Francisco and Los Angeles and Anaheim. The Revised 2012 Business Plan describes in more detail how Phase 1 of the HST System will be implemented. Phase 1 will start in the Central Valley (the Merced to Fresno Section and the Fresno to Bakersfield Section), build incrementally toward the Los Angeles Basin (the Bakersfield to Palmdale Section, the Palmdale to Los Angeles Section, and the Los Angeles to Anaheim Section), and then connect to the San Francisco Bay Area (the San Jose to Merced Section and the San Francisco to San Jose Section). This more detailed discussion of the implementation of Phase 1 recognizes current budgetary and funding realities, which will result in both Phase 1 and Phase 2 (Phase 2 includes Los Angeles to San Diego and Merced to Sacramento as well as the Altamont Corridor being pursued in collaboration with regional agencies) being constructed over a longer period of time than originally anticipated. The details of the schedule for the phased implementation or blended approach for each project section are documented in the project-level EIR/EIS documents.

What Does "Blended" Mean?

The 2012 Revised Business Plan refers to blended systems and blended operations. These terms refer to integrating the HST System with existing intercity and commuter and regional rail systems through coordinated infrastructure (blended systems) and scheduling, ticketing, and other means (blended operations).

The Revised 2012 Business Plan describes the three key elements of the implementation strategy to provide a faster, better, cheaper HST System as follows:

- **Blend** the HST System with improvements to existing rail systems on shared infrastructure to accelerate and broaden benefits, improve efficiency, minimize community impacts, and reduce construction costs while enhancing rail service for travelers throughout the state.
- Make **early investments** in the "bookends" (i.e., the San Francisco Bay Area and the Los Angeles Basin regions) to upgrade existing facilities and services, build ridership, and lay the foundation for expansion of the HST System.
- Deliver **early benefits** to Californians by using and leveraging investments as they are made.

The Revised 2012 Business Plan describes a phased implementation strategy to accomplish these three elements. The strategy envisions the first construction of the Initial Operating Section (IOS first construction), a 130-mile segment that extends from north of Fresno to Bakersfield. The IOS will provide the track and structures to support the system spine. The IOS will involve the construction of new high-speed infrastructure in the Central Valley and will add simultaneous complementary investments to produce immediate benefits throughout the state. Working collaboratively with regional transportation partners, the Authority proposes early investments in existing rail systems in the San Francisco Bay Area and the Los Angeles Basin. These early investments will provide near-term benefits to travelers in metropolitan areas and will lay the foundation for the HST System as it expands to reach the metropolitan areas and connect service throughout the state.

The IOS first construction is the first investment toward the development of an operating system. It will allow the immediate introduction of improved service for the San Joaquin intercity line. This service will be integrated with the Altamont Commuter Express (ACE) service, Capitol Corridor service, and Caltrain service and will reach from Bakersfield to the San Francisco Bay area and to Sacramento. The IOS first construction will be accompanied by early investments in the existing regional and commuter systems and new Northern California unified passenger service. The investment of high-speed rail funds to expedite the connection of the northern and southern parts of the state by establishing new rail service in the gap between Bakersfield and Palmdale will also be an initial priority. Completion of these actions will support an IOS with HSTs

operating at 220 mph on a 300-mile segment, including trains and systems, between the Central Valley and the San Fernando Valley in 2022. By 2026, the Phase 1 Bay to Basin system will connect San Jose, the Central Valley, and Los Angeles/Anaheim on a 410-mile system through a combination of dedicated high-speed rail infrastructure blended with improvements to existing regional systems. The completed Phase 1 blended system will be operational in 2028 on 520 miles of track; the Phase 1 system will blend operations with existing commuter/intercity rail and incorporate additional improvements for a one-seat ride between Downtown San Francisco and Los Angeles/Anaheim. The Phase 2 expansion will bring high-speed rail to Sacramento, San Diego, and the Inland Empire. Phase 2 will also use a blended approach to provide HST service far earlier than identified in the Draft 2012 Business Plan.

The Revised 2012 Business Plan also does not change the "full system" for the HST in the Central Valley as defined and analyzed in the Fresno to Bakersfield Section Project EIR/EIS. The Fresno to Bakersfield Section, which is part of the spine of the HST System, will be constructed in the near term to the ultimate design of two dual-mainline tracks with four tracks at stations and will meet all performance objectives identified in Chapter 2, Alternatives. However, the Revised 2012 Business Plan lays out a new phasing strategy for initiating service and integrating service with intercity commuter rail services as an initial step for HST operations. The Fresno to Bakersfield Section EIR/EIS assumes that HST service will be operational for Phase 1, which will connect San Francisco with Los Angeles via the Central Valley by 2020, and Phase 2, which will extend service to Sacramento and San Diego beginning in 2027. The full system analysis for the EIR/EIS is based on a future year of 2035. The Revised 2012 Business Plan indicates that the IOS first construction will be completed in 2018, with initial service starting in 2022. The Phase 1 build-out will be operational in 2028, and the full system operation (Phase 2) will occur well beyond the 2035 full system operations envisioned in the Fresno to Bakersfield Section EIR/EIS.

The revised phasing assumptions for the Fresno to Bakersfield Section would not alter the construction impacts outlined in the EIR/EIS. However, the operational impacts of the HST System would be expected to be lower under the Revised 2012 Business Plan in 2020 and 2027 and for the full system build-out in 2035, than the levels presented in this EIR/EIS. Impacts would be lower than those identified in this EIR/EIS because fewer trains are expected to be operational before 2035 under the Revised 2012 Business Plan than assumed in the EIR/EIS. With fewer trains operating, the expected ridership under the Revised 2012 Business Plan would be lower and impacts, such as traffic and noise, associated with the train operations in 2035 would generally be less than the impacts presented in this EIR/EIS. Similarly, the benefits accruing to the project (e.g., reduced VMT, reduced GHG emissions, reduced energy consumption) would be less than the benefits presented in this EIR/EIS (see Appendix 1-A). As with the impacts, the benefits would continue to build and accrue over time and would eventually reach the levels discussed in this EIR/EIS for the full system. A specific time frame has not been set for the implementation of Phase 2; that time frame will depend on funding availability and direction from the Board of Directors of the California High-Speed Rail Authority.

Other features of the blended approach, as defined in the Revised 2012 Business Plan, would not have any direct implication for the analysis that was performed for the Fresno to Bakersfield Section, because this HST section will be constructed to its ultimate HST track configuration in the near term as part of the IOS. The capital costs for the Fresno to Bakersfield Section did not change with the Revised 2012 Business Plan, but the operational costs would incrementally grow over a longer period because the number of trains operating and the ridership would take longer to build to the level envisioned in the EIR/EIS.

The interim use of the IOS first construction track for upgraded Amtrak service could have environmental impacts that differ from those analyzed in this EIR/EIS. However, there are no plans for this service at this time and such plans will require future cooperative agreements between the Authority and entities associated with operation of the Amtrak San Joaquin service.

As a result, the operational characteristics of that interim use are unknown at this time and an analysis would be speculative. For that reason, interim use has not been analyzed in this EIR/EIS. Service upgrades for the Amtrak San Joaquin service and its potential for environmental impacts would be assessed, as appropriate, by the operating agency before the initiation of that service. For more detail, see Appendix 1-A, Revised 2012 Business Plan.

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