CALIFORNIA HIGH-SPEED TRAIN

Program Environmental Impact Report/Environmental Impact Statement

Bay Area to Merced

CULTURAL RESOURCES: HISTORIC ARCHITECTURE

TECHNICAL EVALUATION

January 2004

Prepared for:

California High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

CALIFORNIA HIGH SPEED RAIL AUTHORITY

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Bay Area to Merced

Cultural Resources
Historic Architecture

Technical Evaluation

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Acronyms

APE	AREA OF POTENTIAL EFFECT
AUTHORITY	CALIFORNIA HIGH-SPEED RAIL AUTHORITY
Caltrans	CALIFORNIA DEPARTMENT OF TRANSPORTATION
CEQA	CALIFORNIA ENVIRONMENTAL QUALITY ACT
CHRIS	CALIFORNIA HISTORIC RESOURCES INFORMATION SYSTEM
CRHR	CALIFORNIA REGISTER OF HISTORICAL RESOURCES
COG	COUNCIL OF GOVERNMENTS
EIR	ENVIRONMENTAL IMPACT REPORT
EIS	ENVIRONMENTAL IMPACT STATEMENT
EPA	ENVIRONMENTAL PROTECTION AGENCY
FAA	FEDERAL AVIATION ADMINISTRATION
FHWA	FEDERAL HIGHWAY ADMINISTRATION
FRA	FEDERAL RAILROAD ADMINISTRATION
FTA	FEDERAL TRANSIT ADMINISTRATION
MTA	METROPOLITAN TRANSPORTATION AUTHORITY
NHPA	NATIONAL HISTORIC PRESERVATION ACT
NRHP	NATIONAL REGISTER OF HISTORIC PLACES
OHP	(CALIFORNIA) OFFICE OF HISTORIC PRESERVATION
RTP	REGIONAL TRANSPORTATION PLAN
SHPO	STATE HISTORIC PRESERVATION OFFICER
USGS	UNITED STATES GEOLOGICAL SURVEY

1.0 INTRODUCTION

The California High-Speed Rail Authority (Authority) was created by the Legislature in 1996 to develop a plan for the construction, operation, and financing of a statewide, intercity high-speed passenger train system.[1] After completing a number of initial studies over the past six years to assess the feasibility of a high-speed train system in California and to evaluate the potential ridership for a variety of alternative corridors and station areas, the Authority recommended the evaluation of a proposed high-speed train system as the logical next step in the development of California's transportation infrastructure. The Authority does not have responsibility for other intercity transportation systems or facilities, such as expanded highways, or improvements to airports or passenger rail or transit used for intercity trips.

The Authority adopted a *Final Business Plan* in June 2000, which reviewed the economic feasibility of a 1,127-kilometer-long (700-mile-long) high-speed train system. This system would be capable of speeds in excess of 321.8 kilometers per hour (200 miles per hour [mph]) on a dedicated, fully grade-separated track with state-of-the-art safety, signaling, and automated train control systems. The system described would connect and serve the major metropolitan areas of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego. The high-speed train system is projected to carry a minimum of 42 million passengers annually (32 million intercity trips and 10 million commuter trips) by the year 2020.

Following the adoption of the Business Plan, the appropriate next step for the Authority to take in the pursuit of a high-speed train system is to satisfy the environmental review process required by federal and state laws which will in turn enable public agencies to select and approve a high speed rail system, define mitigation strategies, obtain necessary approvals, and obtain financial assistance necessary to implement a high speed rail system. For example, the Federal Railroad Administration (FRA) may be requested by the Authority to issue a *Rule of Particular Applicability*, which establishes safety standards for the high-speed train system for speeds over 200 mph, and for the potential shared use of rail corridors.

The Authority is both the project sponsor and the lead agency for purposes of the California Environmental Quality Act (CEQA) requirements. The Authority has determined that a Program Environmental Impact Report (EIR) is the appropriate CEQA document for the project at this conceptual stage of planning and decision-making, which would include selecting a preferred corridor and station locations for future right-of-way preservation and identifying potential phasing options. No permits are being sought for this phase of environmental review. Later stages of project development would include project-specific detailed environmental documents to assess the impacts of the alternative alignments and stations in those segments of the system that are ready for implementation.

The decisions of federal agencies, particularly the Federal Railroad Administration (FRA) related to high-speed train systems, would constitute major federal actions regarding environmental review under the National Environmental Policy Act (NEPA). NEPA requires federal agencies to prepare an Environmental Impact Statement (EIS) if the proposed action has the potential to cause significant environmental impacts. The proposed action in California warrants the preparation of a Tier 1 Program-level EIS under NEPA, due to the nature and scope of the comprehensive high-speed train system proposed by the Authority, the need to narrow the range of alternatives, and the need to protect/preserve right-of-way in the future. FRA is the federal lead agency for the preparation of the Program EIS, and the Federal Highway Administration (FHWA), the U.S. Environmental Protection Agency (EPA), the U.S. Corps of Engineers (USACE), the Federal Aviation Administration (FAA), the U.S. Fish and Wildlife Service (USFWS), and the Federal Transit Administration (FTA) are cooperating federal agencies for the EIS.

A combined Program EIR/EIS is to be prepared under the supervision and direction of the FRA and the Authority in conjunction with the federal cooperating agencies. It is intended that other federal, state,

[1] Chapter 796 of the Statutes of 1996; SB 1420, Kopp and Costa.

regional, and local agencies will use the Program EIR/EIS in reviewing the proposed program and developing feasible and practicable programmatic mitigation strategies and analysis expectations for the Tier 2 detailed environmental review process which would be expected to follow any approval of a high speed train system.

The statewide high-speed train system has been divided into five regions for study: Bay Area-Merced, Sacramento-Bakersfield, Bakersfield-Los Angeles, Los Angeles-San Diego via the Inland Empire, and Los Angeles-Orange County-San Diego. This Cultural Resources Technical Evaluation for the Bay Area – Merced Region is one of five such reports being prepared for each of the regions on the topic, and it is one of fifteen technical reports for this region. This report will be summarized in the Program EIR/EIS and it will be part of the administrative record supporting the environmental review of alternatives.

1.1 Alternatives

1.1.1. No-Project Alternative

The No-Project Alternative serves as the baseline for the comparison of Modal and High-Speed Train alternatives (Figure 1). The No-Project Alternative represents the state's transportation system (highway, air, and conventional rail) as it existed in 1999-2000 and as it would be after implementation of programs or projects currently programmed for implementation and projects that are expected to be funded by 2020. The No-Project Alternative addresses the geographic area serving the same intercity travel market as the proposed high-speed train (generally from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego). The No-Project Alternative satisfies the statutory requirements under CEQA and NEPA for an alternative that does not include any new action or project beyond what is already committed.

The No-Project Alternative defines the existing and future statewide intercity transportation system based on programmed and funded (already in funded programs/financially constrained plans) improvements to the intercity transportation system through 2020, according to the following sources of information:

- State Transportation Improvement Program (STIP)
- Regional Transportation Plans (RTPs) for all modes of travel
- Airport plans
- Intercity passenger rail plans (California Rail Plan 2001-2010, Amtrak Five- and Twenty-year Plans)

As with all of the alternatives, the No-Project Alternative will be assessed against the purpose and need topics/objectives for congestion, safety, air pollution, reliability, and travel times.

Figure 1:
No-Project Alternative – California Transportation System

1.1.2 Modal Alternative

There are currently only three main options for intercity travel between the major urban areas of San Diego, Los Angeles, the Central Valley, San Jose, Oakland/San Francisco, and Sacramento: vehicles on the interstate highway system and state highways, commercial airlines serving airports between San Diego and Sacramento and the Bay Area, and conventional passenger trains (Amtrak) on freight and/or commuter rail tracks. The Modal/System Alternative consists of expansion of highways, airports, and intercity and commuter rail systems serving the markets identified for the High-Speed Train Alternative. Figure 2 shows the modal alternative for the Bay Area-to-Merced Corridor. The Modal Alternative uses the same inter-city travel demand (not capacity) assumed under the high-end sensitivity analysis completed for the high-speed train ridership in 2020. This same travel demand is assigned to the highways and airports and passenger rail described under the No-Project Alternative, and the additional improvements or expansion of facilities is assumed to meet the demand, regardless of funding potential and without high-speed train service as part of the system.

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The Modal Alternative for the Bay Area-to-Merced region consists of two major sets of proposed improvements (see Figure 2):

- Improvements to Highways: Consisting of additional highway lanes to provide sufficient highway capacity and associated interchange reconfiguration, crossing bridge widening, ramp widening, cross street and intersection widening (Figure 1.1-2). Within the region, these improvements, therefore, would occur along proposed portions of Interstate (I) 5, I-880. I-580, I-80, and State Route (SR) 152. Table 1.1-1 lists the proposed highway improvements in the Bay Area-to-Merced region.
- Improvements to Airports: Primarily consisting of improvements to terminal gates and runways to provide sufficient landside and airside capacity and associated taxiways, ground access, parking, terminal and support facilities and airports that can serve the same geographic area and demand as the proposed High-Speed Train (HST) Alternative. Within the study area corridor, these proposed improvements would occur at San José International Airport and Oakland International Airport (Figure 1.1-3). Table 1.1-2 lists the airport improvements associated with the airports.

Table 1.1-1: Proposed Modal Alternative Highway Improvements
Bay Area to Merced

Highway Corridor	Segment (From – To)	No. of Additional Lanes[1] (Total – Both Directions)	No. of Existing Lanes (Total - Both Directions)	Type of Improvement
Segment 1: Merced to San José				
SR 152	SR 99 to I-5	2	1-2	widening
SR 152	I-5 to US 101	2	1-2	widening
US 101	SR 152 to Gilroy	2	2-3	widening
US 101	Gilroy to I-880	2	2-5	widening
Segment 2: San José to San Francisco				
US 101	I-880 to Redwood City	2	4-5	widening
US 101	Redwood City to SFO	2	4-5	widening
US 101	San Francisco International Airport (SFO) to San Francisco	2	4-6	widening
Segment 3: San José to Oakland				
I-880	US 101 to Fremont/Newark	2	3-4	widening
I-880	Fremont/Newark to I-238	2	3-4	widening
I-880	I-238 to I-80	2	2-4	widening
Segment 4: I-580 to I-5 (via I-238)				
I-580	I-880 to I-5 (via I-238)	2	4-6	widening
Segment 5: San Francisco to Sacramento				
I-80	San Francisco to I-880	2	5-6	widening
I-80	I-880 to I-5 (Sacramento)	2	4-6	widening

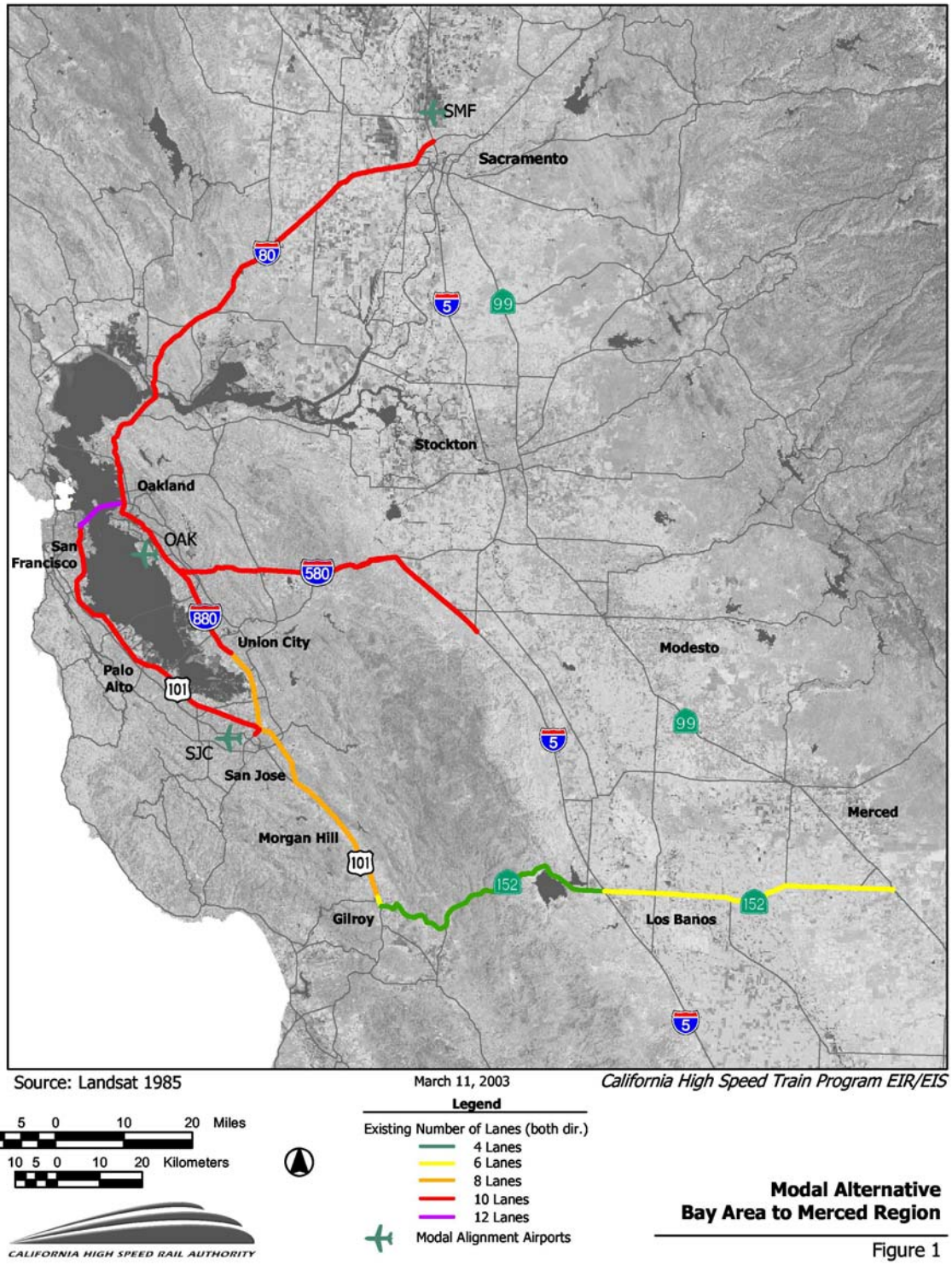
[1] Represents the number of through lanes in addition to the total number of existing lanes that approximate an equivalent level of capacity to serve the representative demand.

Table 1.1-2: Proposed Modal Alternative Airport Improvements – Year 2020
Bay Area to Merced

Airport Name	Additional Gates	Additional Runways
San José International Airport	14	one
Oakland International Airport	19	one

Source: Parsons Brinckerhoff, November 2002

Figure 2:
Modal Alternative – Bay Area-to-Merced Region



1.1.3 High Speed Train Alternative

The Authority has defined a statewide high speed train (HST) system capable of speeds in excess of 200 miles per hour (mph) (320 kilometers per hour [km/h]) on dedicated, fully grade-separated tracks, with state-of-the-art safety, signaling, and automated train control systems. State of the art high speed steel-wheel-on-steel-rail technology is being considered for the system that would serve the major metropolitan centers of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego. Figure 3 shows the High Speed Train Alternative for the Bay Area-to-Merced Corridor.

The High-Speed Train Alternative includes several corridor and station options. A steel-wheel on steel-rail, electrified train, primarily on exclusive right-of-way with small portions of the route on shared track with other rail is planned. Conventional "non-electric" improvements are also being considered along the existing LOSSAN rail corridor from Los Angeles to San Diego. The train track would be either at-grade, in an open trench or tunnel, or on an elevated guideway, depending on terrain and physical constraints.

For purposes of comparative analysis, the HST corridors will be described from station-to-station within each region, except where a by-pass option is considered when the point of departure from the corridor will define the end of the corridor segment.

The Bay Area-to-Merced corridor can be broadly divided into three regional segments. Each segment has several alternative alignments for all or a portion of the length of the segment. Each segment may be further subdivided for analyzing and reporting potential impacts. The various segment options, along with station locations, are described below.

1.1.3.1 Segment 1 – Merced to San José

In this segment, all alignments would be on an exclusive guideway with separate tracks for high-speed trains and would connect to the Sacramento-to-Bakersfield high-speed train corridor. Two separate corridors are being studied:

Corridor 1A. This corridor would run between Merced and San José, via Pacheco Pass and Gilroy. Two options for the alignment are being considered:

- Gilroy Option: This alignment would extend from Merced through the San Joaquin Valley and Pacheco Pass, through Gilroy, and then north along the Caltrain/Union Pacific Railroad (UPRR) rail corridor. Within this option, two suboptions are under consideration – the alignment of each is a reflection of the design speed.

  Stations would include Los Baños (near I-5) in the San Joaquin Valley, Gilroy (near the existing Caltrain Station), and the existing San José (Diridon) Station.

- Gilroy Bypass Option: This alignment would extend from Merced through the San Joaquin Valley and Pacheco Pass and then north along the Caltrain/UPRR rail corridor.

  Stations would include Los Baños (near I-5) in the San Joaquin Valley, Morgan Hill (near the existing Caltrain Station), and the existing San José (Diridon) Station.

Figure 3a:
High Speed Rail Alternative – Bay Area-to-Merced Region

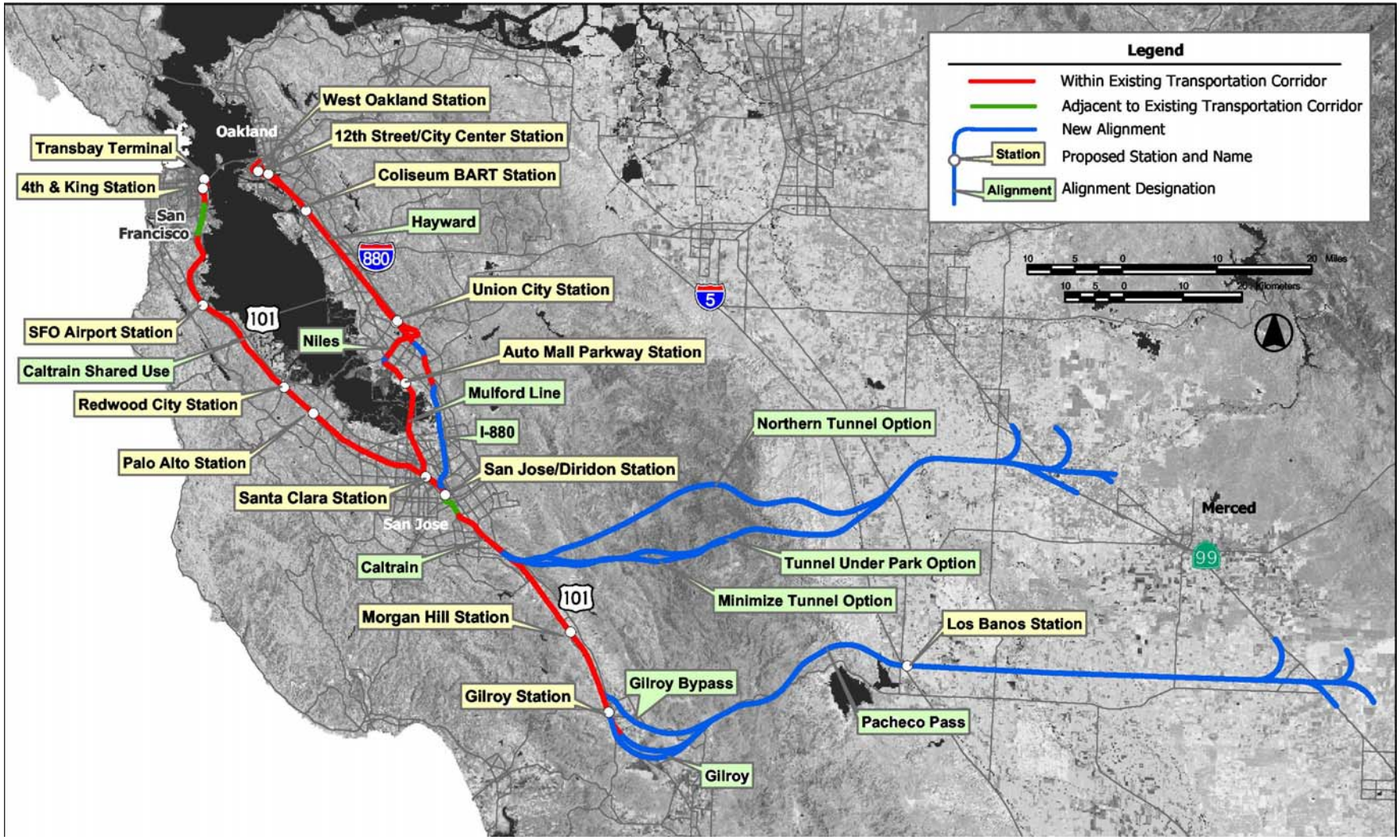
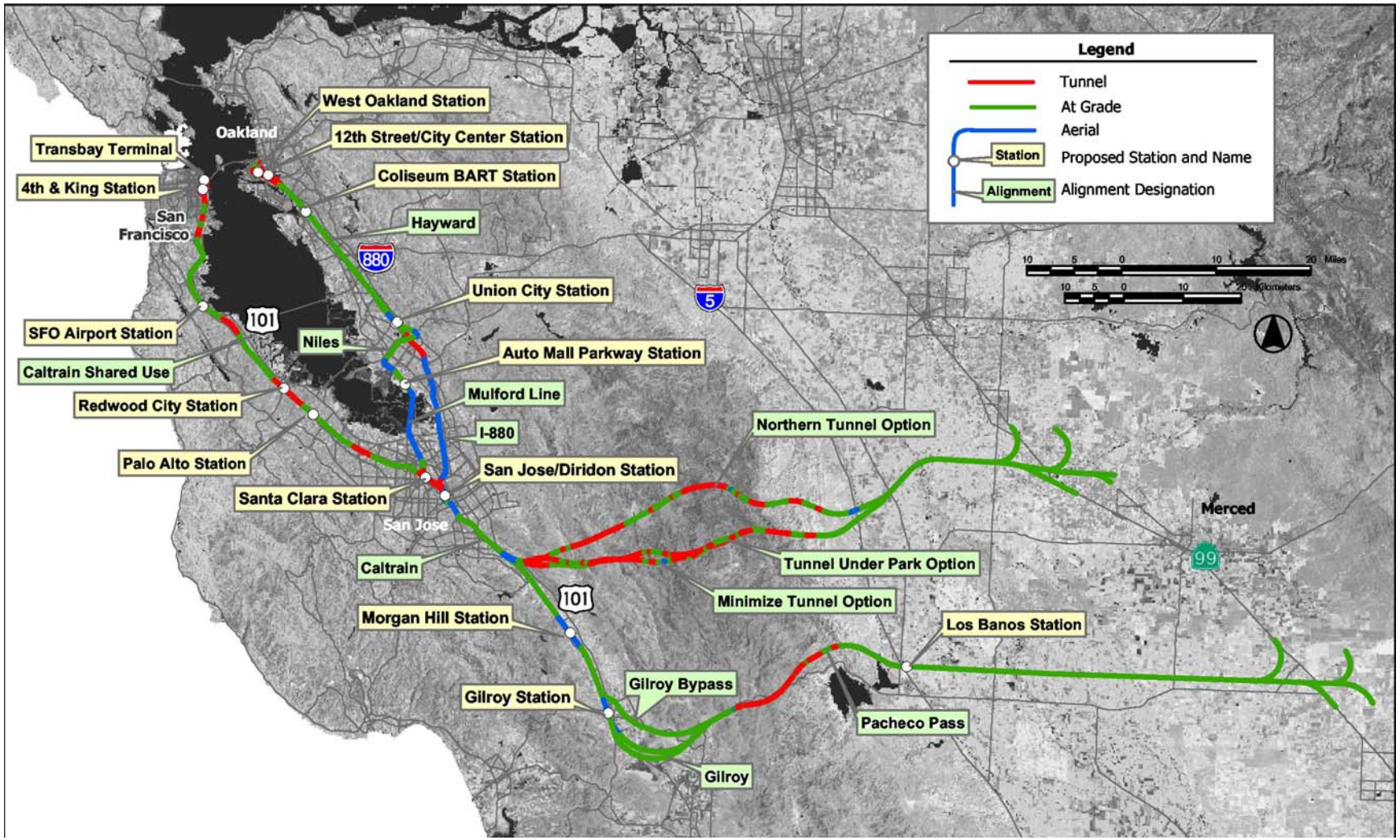


Figure 3b:
High Speed Rail Alternative – Bay Area-to-Merced



Corridor 1B. This corridor would run between Merced and San José, via Atwater and across the Diablo Mountain Range and would include one station – at the existing San José (Diridon) Caltrain Station. Three options for the alignment are being considered:

- Northern Tunnel Option: This alignment would emanate from the BNSF rail corridor or the UPRR corridor near the town of Atwater, north of Merced. The alignment would extend west across the San Joaquin Valley passing north of the town of Newman. The tracks would cross the Diablo Mountain Range in a series of tunnels, passing north of Henry Coe State Park. The alignment then would connect with the Caltrain/UPRR rail corridor north of SR 85.
- Tunnel Under Park Option: This alignment is similar to the Northern Tunnel Option except that the segment through the Diablo Mountain Range would cross Henry W. Coe State Park primarily in tunnel. The alignment then would connect with the Caltrain/UPRR rail corridor north of SR 85.
- Minimize Tunnel Option: This alignment is similar to the Tunnel Under Park Option except that the segment through the Diablo Mountain Range would cross Henry W. Coe State Park primarily at-grade. The alignment then would connect with the Caltrain/UPRR rail corridor north of SR 85.

1.1.3.2 Segment 2 –San José to San Francisco

There is one alignment being considered in this segment; it would provide for high-speed trains sharing tracks with Caltrain commuter trains. The entire alignment would be grade-separated, and all Caltrain stations would have four tracks or by-pass tracks.

Stations would include an optional station at Santa Clara; a station in either Palo Alto or Redwood City; a station in Millbrae near the San Francisco International Airport; and in San Francisco, a station at Fourth and King streets and at the lower level of the proposed new Transbay Terminal.

1.1.3.3 Segment 3 –San José to Oakland

There are two options under consideration for the alignment in this segment.

- I-880 Option: From San José, this alignment would follow north along I-880 and then transition to UPRR's Hayward rail line.

  Stations would include the planned Warm Springs Bay Area Rapid Transit (BART) Station in Fremont or the Union City BART Station; the Oakland Airport/Coliseum BART Station; and either the West Oakland Station or the 12th Street/City Center Station in Oakland.
- Mulford Line Option: From San José, this alignment would travel north along UPRR's Mulford rail line to the UPRR's Niles Line and then onto UPRR's Hayward line.

  Stations would include the Auto Mall Parkway Station or the Union City BART Station; the Oakland Airport/Coliseum BART Station; and in Oakland, either the West Oakland Station or the 12th Street/City Center Station.

2.0 BASELINE/AFFECTED ENVIRONMENT

2.1 STUDY AREA (AREA OF POTENTIAL EFFECT) DEFINED

The study area for cultural resources at the programmatic Tier 1 level of analysis is the Area of Potential Effect (APE) that was defined in consultation with the SHPO. At this level of analysis, the APE for historic architectural resources is the same as that for archaeological sites, which was based on information obtained from the Information Centers of the California Historical Resources Information System (CHRIS).

The APE for this undertaking is defined as 500 feet on each side of the centerline of proposed rail routes in non-urban areas and 100 feet from the centerline in urban areas. The APE for freeway routes and around airports is defined as 100 feet beyond the existing freeway right-of-way and 100 feet beyond the existing airport property boundary. The reason for using 100 feet for urban rail corridors, freeways, and airports is that very little additional right-of-way would be affected in these areas. The 500 feet on each side of the railroad centerline in non-urban areas provides information on wider corridors where additional right-of-way could be affected.

Further identification of historic architectural resources during the Tier 2 phase will depend upon a specifically defined APE to be approved by SHPO, the FRA, and the Authority. The Tier 2 APE should include both the area where direct impacts from construction could occur (including property takes, locations of easements and construction-related facilities, such as equipment staging areas, borrow and disposal areas, access roads, and utilities) and the area where the settings of eligible or potentially eligible historic buildings and structures could be significantly altered. The APE for historic architectural resources is usually based on the boundaries of legal parcels adjacent to the work, often referred to as "one parcel deep" from the project. For this reason, the Tier 2 APE for historic architectural resources may vary in width along the various project segments.

Locations of easements and construction-related facilities, such as equipment staging areas, borrow and disposal areas, access roads, and utilities, have not been yet been identified. Locations for these will be identified as part of the construction design program for the alternatives selected for more detailed analysis in the next phase of the project. Thus, these items are not considered in the program level Tier 1 analysis, but this information will be available for Tier 2 site-specific EIR/EIS documents. The APE will be modified to include these items as part of the Tier 2 analysis.

2.2 BRIEF CULTURAL BACKGROUND OF REGION

The Bay Area – Merced Region Prior To 1900

The region under study in this Technical Evaluation encompasses portions of the Sacramento and San Joaquin valleys (collectively known as the Central Valley), the Santa Clara Valley, the San Francisco Bay Area, and the Coastal Ranges between the Santa Clara Valley and the San Joaquin Valley. The first Euro-American settlement of this portion of California occurred when the Spanish established camps and forts near San Francisco in 1775. The following year Spain established the Presidio of San Francisco as its northernmost outpost in western North America. In the years that followed, struggling agricultural settlements, ranchos, and missions were established in the Santa Clara Valley and the East Bay. The

Spanish also entered and explored the Central Valley, but explorers and other immigrants did not settle the interior until the Mexican period.[2]

After successfully throwing off Spanish rule by about 1821, the Mexican government continued the general pattern of settlement in California established by Spain, slowly branching outward from the early settlement regions. Mexican settlers did not initially establish holdings in the Central Valley, and only late in Mexico's rule did the government grant ranchos in that area. By contrast, Spanish and Mexican settlers established ranchos and missions throughout the southern and central Coastal Ranges. Often, these settlements later formed the foundation for towns and cities, such as Mission Santa Clara and Pueblo San Jose.[3]

The settlements were connected by trails that became thoroughfares for overland travelers, and often served as the basis for future transportation routes. Most important among these was the El Camino Real that connected the 21 missions established from San Diego in the south to Sonoma in the north. Eventually, the rail line that became Caltrain and the roadway that became the Bayshore Freeway (US101) were created along the same general alignment along the San Francisco peninsula. The oldest north-south trail to traverse the entire length of the San Joaquin Valley was the El Camino Viejo, connecting what became Los Angeles and East Oakland. This route later became popular as a cattle and sheep trail between southern California to San Francisco from 1849 to the 1880s.[4]

Close on the heels of the Mexican-US war (1846-1847), the discovery of gold on the American River in 1848 increased what had been a trickle of immigration to a torrent, initiating an explosive period of growth and development in the Bay Area, the Santa Clara Valley, and the Sacramento region, as well as the gold country in the Sierra Nevada foothills. Some of the new arrivals started farms or went into business, and many were able to make these agricultural or commercial pursuits more dependable, even more profitable, than mining. The infusion of investment in both land and the local economy transformed towns like San Jose from small farming communities to bustling urban centers, and saw the start of prosperous farms on the fertile plains skirting the southern end of San Francisco Bay. The Sacramento area also benefited enormously from the Gold Rush, prospering well after the mining era as the primary trade center on the Sacramento River and as a link to the interior of the state. The gold rush and new immigrants created a demand for transportation development and the cosmopolitan population multiplied many times over, accelerating California's bid for statehood, which was achieved in 1850. San Jose served as the first state capital. This flood of new development and the advent of statehood transformed settlements around former outposts, pueblos, missions, and ranchos, giving their post-statehood development a distinctly American character.[5]

Development progressed more slowly in the Central Valley, particularly in the dry expanses of the southern San Joaquin Valley. Nevertheless, demand for agricultural products resulted in the steady establishment of farms, ranches, and small towns along navigable waterways and their tributaries into the lower San Joaquin and Sacramento valleys. Cattle raising, as well as the cultivation of small grains,

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[2] Walton Bean and James J. Rawls, *California: An Interpretive History,* 4th edition (New York: McGraw Hill Book Co., 1983), 25, 31-34, 40-41; Richard B. Rice, William Bullough, and Richard Orsi, *The Elusive Eden: A New History of California* (New York: Alfred A. Knopf Rice, 1988), 46, 87-95.

[3] Bean and Rawls, *California: An Interpretive History*, 53, 76-82; Robert W. Durrenberger and Robert B. Johnson, *California: Patterns on the Land,* 5th edition (Palo Alto, CA.: Mayfield Publishing Co., 1976), 53; Lawrence J. Jelinek, *Harvest Empire: A History of California Agriculture,* 2nd edition (San Francisco, CA: Boyd & Fraser Publishing Company, 1982), 11-22; Mildred Brooke Hoover, Hero Eugene Rensch, and Ethel Grace Rensch, *Historic Spots in California,* 3rd edition (Stanford, CA: Stanford University Press, 1966), 14-15; Mel Scott, *The San Francisco Bay Area: A Metropolis in Perspective,* 2nd edition 1985 (Berkeley, Los Angeles, London: University of California Press, 1959), 1-22; Warren Beck and Ynez Haase, *Historical Atlas of California* (Norman, OK: University of Oklahoma Press, 1974), map 17 and 19; Clyde Arbuckle, *Santa Clara County Ranchos* (San Jose, CA: Rosicrucian Press, 1968), passim.

[4] F.F. Latta, "El Camino Viejo," *Tulare Daily Times*, 1932; Robert Glass Cleland, *The Cattle on a Thousand Hills: Southern California 1850-1880* (San Marino, CA: The Huntington Library, 1941); Bean and Rawls, *California: An Interpretive History*, 84-96.

[5] Bean and Rawls, *California: An Interpretive History*, 84-96; Hoover, Rensch, and Rensch, *Historic Spots in California*,14-15; Clyde Arbuckle, *Clyde Arbuckle's History of San Jose* (San Jose, CA: Memorabilia of San Jose, 1986), 55, 79-80; Stephen M. Payne, *Santa Clara County: Harvest of Change* (Northridge, CA: Windsor Publications, 1987), 69-73.

rapidly expanded to meet the new opportunities. The San Joaquin Valley became the center of California's wheat belt in the 1870s, a business that reached its peak in the early 1890s. Agriculture also became important to the economy of the Santa Clara and Livermore valleys, which also served as wheat and grain centers, as well as hosting burgeoning wine industries. Vineyards and wineries continue to be a part of each valley's agricultural heritage, but by the turn of the century wheat and barley had been almost totally abandoned in favor of orchard crops. Deciduous fruits, particularly apricots, plums, and cherries grew well in these areas and soon blanketed thousands of acres.[6]

The success of agriculture in California rested on the ability of farmers to bring their crops to market, and so was intimately tied to the development of transportation. In most areas, such as the Sacramento, Santa Clara, and San Joaquin valleys, overland travel via horse carts, wagons, and coaches gradually improved through the construction of bridges and ferries, providing the main means of transportation until the appearance of railroads. The first railroads revolutionized transportation in California. Regular rail service between San Francisco and San Jose began in 1864, ushering in a new era of land-based shipping for the Bay Area and providing a crucial early catalyst for development in this part of California. This peninsula line, offering both freight and passenger services, encouraged suburban development all along the San Francisco peninsula and the southern Bay Area where the commuter population and general growth increased steadily from the 1880s through the World War II era.[7]

The railroad network in the Central Valley and the Bay Area exploded following completion of the first transcontinental railroad in 1869. The first line came through Donner Pass in the Sierra Nevada and then west into Sacramento. Within a few years rail companies built lines running north and south through the Central Valley, as well as west into the Bay Area. This new network sparked the establishment of new towns throughout California that were centered around stations at convenient shipping points. For regions such as the San Joaquin Valley, through which the Southern Pacific Railroad (SPRR) built a line in the 1870s to reach southern California, the railways stimulated development that resulted in the rise of large-scale commercial production, first in wheat and then in perishable specialty crops after the introduction of efficient refrigerator cars.[8]

By the end of the nineteenth century, the world of the Spanish and Mexican ranchos and missions had all but disappeared, replaced by bustling urban centers such as San Jose and Oakland that served as commercial and social hubs for the surrounding agricultural areas, which increasingly relied on orchard and specialty crops rather than wheat or cattle. San Francisco had also evolved from a small Spanish outpost to a sprawling urban port city. With the establishment of lumber mills and the arrival of trained building professionals, architectural styles popular throughout much of America began to spread throughout California, and the adobe traditions of the Hispanic culture slowly disappeared. In contrast to the Bay Area, much of the land in the Sacramento, San Joaquin, and Santa Clara valleys remained rural well into the twentieth century where development was more modest.[9]

The Bay Area – Merced Region Between 1900 and 1929

By the turn of the century, the Santa Clara Valley and the gentle slopes of the southeastern shores of San Francisco Bay were well-proven productive agricultural areas. Orchard crops dominated the industry and spawned major packing and processing businesses throughout the valley. In the San Joaquin Valley irrigation transformed the region into another center of orchard and specialty crop production, with increasing prominence of fruits, vineyards, alfalfa, cotton, and specialized row crops such as tomatoes, corn,

6 Jelinek, *Harvest Empire*, 23-38; Payne, *Santa Clara County: Harvest of Change*, 69-96.

7 John R. Signor, *Southern Pacific's Coast Line* (Wilton: Signature Press, 1994), 3; Alan Hynding, *From Frontier to Suburb: The Story of the San Mateo Peninsula* (Star Publishing Company: 1982), 62.

8 Jelinek, *Harvest Empire*, 57-58, 61-78; William L. Preston, *Vanishing Landscapes: Land and Life in the Tulare Lake Basin* (Berkeley, CA: University of California Press, 1981), 121-163.

9 Arbuckle, *History of San Jose*, 65; and Sally Woodbridge, ed., *Bay Area Houses* (New York: Oxford University Press, 1976).

and other vegetables.[10] Cattle ranching still dominated the eastern foothills of the Coast Range in areas of poorer soil and steeper terrain, such as the vicinity of Vallejo and in the mountains of the Stanislaus – Santa Clara county line region near what is now the Henry W. Coe State Park, in the Coast (or Diablo) Range. Typical of prominent California ranchers, Henry W. Coe and his brother purchased land in this area in the late nineteenth century. Coe and his wife and children moved to the ranch by 1905 and ran the cattle ranching business for many years. In 1953, Henry's daughter Sada Coe donated the property, which had grown to 12,230 acres and many ranch buildings (some of which remain standing today east of Morgan Hill), for use as parkland.[11]

The cities around San Francisco Bay also expanded steadily during this period, transforming themselves into industrial and commercial centers in their own right. Their growth was supported by the rail systems, seaports, and river shipping networks established in the nineteenth century. The only major change to the railway network in the Bay Area during the early twentieth century was the addition of the Western Pacific Railroad (WPRR) in 1909. WPRR provided another transcontinental connection to California by linking Ogden, Utah, with the Sacramento and San Joaquin valleys, its route running west into the Livermore area, then through Niles Canyon into the Bay Area where it terminated in Oakland. WPRR expanded this system over the years, extending down the San Joaquin Valley and completing a San Jose Branch line in 1922.

Other transportation developments included the rise of the automobile, which affected virtually every aspect of California's commercial, agricultural, industrial, and social fabric. The advent and increased use of the automobile emphasized the need for a paved road system in California. The Bureau of Highways was created in 1895 and after surveying the situation, the State Constitution was amended in 1902 to allow for establishment of a state highway system. The legislature authorized additional funds in 1909 for land acquisition and construction of a connected highway system. The state's first paved highway and county roads were in use by 1915.[12]

The main features of the road system planned by the state were two great north-south highways that would pass through the Central Valley (roughly along modern SR99) and the western slope of the Coast Range from the Oregon Border to Mexico (US1 and US101). Both highways were planned to pass through as many county seats and existing population centers as possible. The route through the Bay Area followed historic transportation lines and began to transform the El Camino Real into a modern two-lane state highway. By the end of 1915 an East Bay highway had also been completed from Oakland to San Jose and small sections of paved roadway connected Richmond to Pinole, Benicia to Vacaville, and Livermore to the eastern boundary of Alameda County. By the close of the decade the framework for a metropolitan regional highway system was in place.[13] The original paved roads were narrow, only about 15 feet wide, but they were widened the late 1920s and early 1930s. This early system also included upgraded infrastructure, such as grade separations and concrete bridges.

Improved surface transportation further encouraged the growth of urban centers and their outlying areas. During the 1920s, for instance, the Bay Area enjoyed in the heady prosperity that spawned low-density suburban development on the Peninsula and in the East Bay. This "decentralization" of the metropolis reflected both the subdivision of large estates and improvements in road access to more remote areas. Small, relatively isolated communities, like Livermore, Fremont, and Concord, began to be viewed as being within commuting range of San Francisco and other large Bay Area cities. Towns such as Livermore

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10 Jelinek, *Harvest Empire*, 47-60; Preston, *Vanishing Landscapes*, 136-137.

11 Henry W. Coe State Park, online information accessed on February 2, 3003 at www.coepark.parks.ca.gov .

12 The Bureau of Highways was replaced by the Department of Highways in 1897 and later changed to an appointed Highway Commission. James J. Flink, *America Adopts the Automobile, 1895-1900* (Massachusetts and London, Eng: MIT Press, 1970), 202-203.; Raymond Forsyth and Joseph Hagwood, *One Hundred Years of Progress: A Photographic Essay on the Development of the California Transportation System* (Sacramento, CA: Signature Press, 1996), 11-13.

13 California Department of Public Works, *Report of the California Highway Commission* (Sacramento: California State Printing Office, 1922); Annie R. Mitchell, *A Modern History of Tulare County* (Visalia, CA: Limited Editions of Visalia, Inc., 1974), 24-25; Kenneth C. Adams, ed., *California Highways & Public Works: Centennial Edition* (n.p., 1950), 103-104.

experienced steady growth during the 1920s and 1930s, and a trend away from farming began throughout the Bay Area and Santa Clara Valley. This decline in agricultural land use and expansion of suburban areas would slowly continue over the next two decades, gaining significant momentum after World War II. [14]

The Bay Area – Merced Region Between 1930 and 1958

Commercial and residential development in the Bay Area expanded as the century progressed. Important even before the 1940s, towns located around the bay grew rapidly during and after the World War II years as war-related activities generated further industrial growth. Rapid urbanization, and the incorporation of small towns such as Milpitas, Fremont, and Union City, forever changed the agricultural character of much of the region. Before and directly after the war, the southern Bay Area was largely open land, with a clear division between the small city of San Jose, the little town of Santa Clara, and communities that were little more than crossroads at Milpitas or Saratoga, surrounded by open fields, pastures, and orchards. By the end of the 1950s residential tracts and commercial development has consumed much of the farm land. Today only a small fraction of open agricultural land exists in the area, which is now dominated by modern residential, commercial, and industrial complexes transected by modern freeway corridors.[15]

Dramatic changes also took place in the Central Valley, but these changes were reflected more in modernization of infrastructure, rather than in dense urban development. Much of this type of development is related to agriculture, and specifically to irrigation. The State of California and the federal government played a major role in the development and distribution of water resources to agricultural, industrial and municipal users throughout the state. The southern and western areas of the San Joaquin Valley were irrigated and settled largely because of the efforts of these agencies to transfer water to otherwise water deficient regions. With at least three major railroads to choose from for shipping, in addition to shipping through the Sacramento-San Joaquin Delta and increasingly improved roadways, the Central Valley steadily grew in population, although never reaching the density of Bay Area development.[16]

During the 1950s and 1960s, relatively low-density growth in the Bay Area simply leapfrogged over farmland where owners refused to sell. The growth that occurred between 1946 and 1960 created an urban fabric that spread outward in largely single-story construction, with much of the agricultural land converted to residential suburbs.[17] This process has continued to the present day, with industrial development centered in part (and perhaps most famously) on computer technologies centered in the South Bay ("Silicon Valley") and San Francisco Peninsula. Similar trends appeared in nearby areas such as Livermore, where, during this post-war period, housing construction replaced farming and agriculture as an important part of the area's economic strength. Orchards and ranches that once dominated the region shrank in size or disappeared altogether as farmers divided their land for sale to developers. Post-war subdivisions in communities such as Dublin, Pleasanton, and Livermore reflected national trends, with the use of mass-produced, standard-plan housing increasing dramatically in the decades following World War II.[18]

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14 Joseph A. McGowan, *History of the Sacramento Valley* (New York: Lewis Historical Publishing Company, 1961), 84-94; California Department of Public Works, *Report of the California Highway Commission*, 7-8.

15 Payne, *Santa Clara County: Harvest of Change*, 69-96; Glenna Matthews, "The Los Angeles of the North: "San Jose's Transition from Fruit Capital to High-Tech Metropolis," *Journal of Urban History* 25, no. 4 (May 1999): 459-461.

16 Norris Hundley, Jr., *The Great Thirst: Californians And Water, 1770s-1990s* (Berkeley, CA: University of California Press, 1992), 232-272.

17 Philip Parsons and C. McCorkle, "A Statistical Picture of California's Agriculture," *California Agricultural Experiment Station Extension Service Circular 459.* University of California, 1963, 59-61; Glenna Matthews, "The Los Angeles of the North," 459-461.

18 Rice, Bullough, and Orsi, *The Elusive Eden,* 443-447, 459-468; Bean and Rawls, *California: An Interpretive History*, 364-368; Douglas A. Greenberg, "Growth and Conflict at the Suburban Fringe: The Case of the Livermore-Amador Valley," Ph.D. diss.,

The increase in population, residential development, and commercial and industrial growth in this region of California necessitated even more changes to the state's transportation system, and resulted in the modern system of freeways, bridges, grade separations, and expressways present today. In fact, California is well known as the birthplace of the modern freeway, work that was aided by the passage of the Federal Aid Highways Act in 1944 and the Collier-Burns Act in 1945. By the 1950s, the goal of a continuous four-lane expressway through the Central Valley (with four to six lane freeway sections through urban areas) become a reality with the completion of SR99 between Sacramento and Los Angeles. Interstate 5, the other major north-south route through the Central Valley, was completed in the 1970s. California Department of Transportation bridge logs indicate that all but two of the 93 bridges on I-80 between US 101 in San Francisco and I-5 just west of Sacramento, were constructed in the period between 1930 and 1960. Similar statistics hold true with other routes in the area. This continued expansion of the highway system was just one aspect of the post-war economic boom that brought unprecedented increases in commercial, industrial, and residential construction throughout the Bay Area to Merced region. Many of the historic architectural resources that built throughout the decades from the mid nineteenth to the mid twentieth centuries still exist within the project study area today.[19]

2.3 DATA SOURCES

The historic architectural context, property type characterization, and sensitivity analysis for this Tier 1 technical survey report was based on several types of historical data. The broadest single source for information on the historic development of the Bay Area to Merced Region, for all three periods of development, is the topographic map series produced by the United States Geological Survey (USGS) and its predecessor agencies. Every edition of the USGS maps available for the region was consulted as part of this study, as well as maps by the Army Corps of Engineers, California Department of Water Resources, and other agencies. Mapping for more remote areas was available in the form of official county and town plats obtained from university and governmental libraries, as well as previous cultural resources surveys conducted by JRP Historical Consulting.

For the purposes of this Tier 1 analysis, information about known historical resources was collected from databases maintained by OHP, California Information Centers, Caltrans Structures Maintenance Division, and the National Register of Historic Places (NRHP).[20] Historic resource inventories maintained by local governments were also consulted. JRP reviewed the listings for each of the fourteen counties within the Bay Area to Merced Region for historic resources in or near the project alternatives. JRP staff also contacted the incorporated and unincorporated communities within the region to obtain local historic resource inventories. For a more detailed description of sources consulted, please refer to Section 3.1.

2.4 ARCHAEOLOGICAL SITES

For Tier 1 analysis of archeological resources, see the draft Cultural Resources Technical Evaluation prepared by Far Western Anthropological Research Group for this project (February 2003).

University of California, Berkeley, 1986, 55, 107, 137; W.H. Parness, "Scientific Invasion of Livermore, California," *Western City Magazine* 37, no. 2 (February 1961).

[19] E. E. Wallace, "The Golden State Highway," *California Highways and Public Works* 8 (July-August 1930): 10-12, 28-29; Adams, ed., *California Highways & Public Works: Centennial Edition,* 103-104; California Department of Transportation, Bridge Logs, Districts 3 and 4, June 2002; George T. McCoy, "Thirty-nine Grade Crossings on California Highways Being Eliminated with $7,500,000 Federal Funds," *California Highway and Public Works* (October 1935): 1-6; *Biennial Report of the California Highway Commission*, 1936, 76;

[20] JRP Historical Consulting researched and collected information from each of these sources directly except for records searches at the Information Centers, which were conducted by Far Western Anthropological Research Group. The results of the Information Center record searches provided both historic resources records and the locations of archaeological sites within the APE. See the draft Cultural Resources Technical Evaluation prepared by Far Western Anthropological Research Group for this project (February 2003).

2.5 HISTORIC ARCHITECTURAL RESOURCES

Buildings, Structures, and Objects from the Historic Period

Buildings, structures, and objects from the historic period consist of many architectural and functional types, including dwellings, stores, offices, factories, barns, mines, dams, bridges, roads, and other facilities that served residential, commercial, industrial, agricultural, transportation, and other functions during the historic period (more than 50 years ago). The following discussion is organized by basic functional type and includes a general characterization of commercial and industrial buildings, dwellings (both urban and rural), military complexes, and infrastructure elements. These resource types reflect the various historic periods discussed in Section 2.2 above (the period prior to 1900, the period between 1900 and 1929, and the period between 1930 and 1958), as well as the major themes of the history of the region outlined that section.

By far the largest concentration of historic era buildings, structures, and objects is in the San Francisco Bay Area in urban centers such as San Jose, San Francisco, and Oakland. Resources of all the functional types appear in this portion of the Bay Area to Merced region. A certain number of historic architectural resources also appear in the town centers, and to a lesser extent the rural countryside, of the Santa Clara and Central valleys. Towns that were important local trade centers in the late nineteenth century, like Gilroy, have concentrations of historic resources along the transportation alignments that the segments of the proposed project would follow. In addition to commercial buildings and residences, rural historic resources include infrastructure elements (like water conveyance systems, bridges, or transmission lines), as well as farm and ranch complexes.

Commercial / Industrial Buildings

Most commercial and industrial resources within the APE will probably be found within urban centers. The largest percentage of these buildings is expected to date to the twentieth century, with a smaller number of nineteenth century resources concentrated in the downtown areas of the larger and older urban centers of San Jose, Oakland, and San Francisco. Nineteenth century commercial buildings are typically arranged in an orderly fashion that reflects the gridiron street pattern common to most mid-nineteenth century American towns. The urban nucleus generally had a rich variety of businesses and industries during this period that were usually housed in brick or wood frame buildings that one to two stories tall. Taller brick or masonry buildings appeared in the downtown core of Oakland and San Francisco, some reaching five or six stories. Usually set close to the street, and often near rail lines or spurs, the main façades of nineteenth century buildings of this type presented stylistic elements from the Italianate, Romanesque, and Neo-Classical architectural styles.[21]

As urban centers expanded during the early twentieth century, land uses became more segregated to reflect shifting attitudes regarding city planning. Simpler and less elaborate architectural designs for commercial buildings gained favor during this period. Traditional masonry construction gave way to a host of new architectural technologies and materials, such as steel skeletons, reinforced concrete, clay tile, and exterior veneers. Resources dating to later in the twentieth century, such as the 1930s and 1940s, visually reflect the popularity of these new materials, as they appeared in new façades applied to older building stock to create an "updated look" in the Art Deco or Streamline Moderne styles. High property values in densely developed Oakland and San Francisco continued to encourage vertical development during the early twentieth century, but in other cities, expansion occurred horizontally, or outward from the city center, as was the case in San Jose. San Jose's downtown area grew in

[21] Spiro Kostof, *The City Shaped: Urban Patterns and Meanings through History* (Boston, MA: Bulfinch Press, April 1999); Richard Longstreth, *Buildings of Main Street: A Guide to Commercial American Architecture* (Walnut Creek, CA: Altamira Press, 2000), 31.

geographic size in the early 1900s, a trend that continued through the World War II era. These buildings generally illustrated the trend towards simpler building designs and the use of wood frame or reinforced concrete construction with veneer materials.[22]

In the mid-twentieth century, generally after World War II, many American cities experienced an outward flow of business from the city center and a subsequent phenomenal growth of suburban commercial strips, as well as the use of new architectural forms in commercial construction. The resulting inverse relationship of suburban expansion and urban decline sparked an "urban renewal" movement amongst downtown property owners. Downtown façades were "modernized," and older buildings demolished in favor of new construction meant to attract customers, while shopping malls and suburban commercial areas expanded at the same time. Construction of both types – urban and suburban commercial buildings – occur within the survey area for this Tier 1 analysis and date to 1958 or before. In addition, outlying areas were often annexed into adjacent cities, and infill construction within established urban areas continued, adding a layer of density to many urban centers.

Twentieth century industrial properties typically appear at the periphery of downtown centers, near transportation routes such as the Western Pacific and Southern Pacific railroad lines that served the Bay Area and the Central Valley. In some cases, commercial and light industrial buildings replaced residential development on the fringes of the cities. Most of the industrial buildings of this period exhibit simple utilitarian characteristics with little or no architectural detail. These buildings were constructed for their functionality, without great concern for their aesthetic value and most employ wood framing, concrete block, or brick construction. Resources built for heavier industrial resources, such as food processing, metal plants, and automobile manufacturers, appear outside the city centers throughout the Bay Area, but are virtually non-existent elsewhere in the study area.

Residential Properties

Like commercial and industrial buildings, the older residential resources in the Bay Area to Merced region typically appear within or near city centers and did not appear at the city fringes until the early and mid twentieth century when populations expanded. Some residences in the study area appear in rural areas, in the form of farm complexes that include dwellings. Urban residential neighborhoods generally feature single-family homes with few associated outbuildings like a detached garage, while rural farms usually included barns, sheds, and water towers. Dwellings of the nineteenth century are one or two stories in height, of wood frame or sometimes brick construction, and located on small lots arranged in symmetrical blocks within a grid pattern street system. These buildings were owner or architect designed in Victorian styles such as Queen Anne, Stick, or Italianate. Even the simplest residences often exhibit architectural ornamentation suggesting one of these styles.

In the early twentieth century, construction of architecturally homogenous subdivisions, with large numbers of homes built at the same time by land developers and then sold to individual buyers, became common. Residential density remained low in land surrounding Bay Area cities until the early 1900s, when subdivisions experienced a rapid growth of small houses executed in the Bungalow and Period Revival styles. Bungalow style houses were an especially popular choice for small house design throughout California from the early 1900s to the 1930s, and are commonly seen in residential suburbs in the San Francisco Bay Area as well as in rural areas such as the Santa Clara and Central valleys. Period Revival styles such as Spanish or Mission Revival gained popularity in small house design starting in the 1920s and were also common throughout the Bay Area to Merced region. [23]

[22] Longstreth, *Buildings of Main Street*, 54, 76.

[23] Virginia and Lee McAlester, *A Field Guide to American Houses* (New York: Alfred A. Knopf, 1992), 318-434; Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York and Oxford: Oxford University Press, 1985), 20.

After World War II, the Bungalow and Period Revival styles quickly gave way to a simpler style of architecture, influenced by the Modernist movement. This movement appeared in domestic architecture as a simplification of housing styles, specifically in the form of the Minimal Traditional dwelling and the influence of the Ranch Style. These styles appeared just before World War II and continued to be popular for several decades. Often described as a "compromise style," the Minimal Traditional building often reflects the form of earlier housing designs, but lacks their decorative detailing. Minimal Traditional style homes were built in great numbers, commonly in large tract developments of one story wood frame buildings with attached garages.[24]

Military Properties

There are many current and former Department of Defense installations in the Bay Area to Merced region, but most appear to be outside the APE for this project. Some alternative segments, however, do pass near military facilities such as the Oakland Army Base, Naval Station Treasure Island, Naval Engineering Field Activity West, San Bruno, and Naval Air Station, Moffett Field, as well as reserve property such as Parks Reserve Forces Training Area near Dublin in Alameda County. The history of military installations in California dates to the Spanish era, when military presidios were established to support settlement activities, but most of the military installations in and near the APE for this project date to the twentieth century, specifically the World War II era. Prior to World War I, most military installations in California were concentrated around the Bay Area. As the various branches of the military grew in size and diversified in function during the inter-war period between 1919 and 1938, the military started to spread into new regions of the state, such as the interior valleys and southern California. This trend was accelerated by competition between cities and towns anxious to attract new military installations in order to reap the social and economic benefits inherent in such construction activities. Military construction peaked during the World War II era, between 1939 and 1945.

A tremendous diversity of buildings, structures, and objects can be found on military installations throughout California. Residential buildings (the highest percentage of resources), public works, ordinance-related resources, storage, research and development, personnel services, defensive structures, landscape features, administration properties, airfield facilities, manufacturing and industrial resources, waterfront structures, and training facilities all appear in California's Department of Defense installations. Most of these facilities were constructed in the twentieth century. The period of buildup and mobilization just prior to World War II, as well as the years of the conflict itself, feature the highest level of military construction in California, although the years following World War I, from about 1919 until circa 1938, also saw a large amount of military construction in the state. The buildings in these installations, especially those related to residential use, often reflect architectural styles popular at the time of their construction, but utilitarian buildings such as warehouses and sheds are the most typical and common.[25]

Infrastructure

Infrastructure elements dating to the historic period appear throughout the APE for alternatives of the Bay Area to Merced region. These elements, which include roads, railroads, water conveyance systems, and utility-related structures, are generally characterized below.

Roads

Road development began in this region with the advent of Spanish and Mexican settlement in the late eighteenth and early nineteenth centuries, when travel and commerce between settlements carved

[24] Andres Duany, Elizabeth Plater-Zyberk, and Jeff Speck, *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream* (New York: North Point Press, 2000), 18-19; Jackson, *Crabgrass Frontier*, 238-242.

[25] JRP Historical Consulting Services for Foster Wheeler Environmental Corporation, *California Historic Military Buildings and Structures Inventory* (Sacramento, CA: Prepared for US Army Corps of Engineers, Sacramento District, March 2000).

wagon trails into the landscape. Future roads and highways throughout the Bay Area, the Santa Clara Valley, the Coastal Ranges, and the Central Valley often paralleled these early trails, although it is highly unlikely that portions of these pre-1900 trails survive within the APE. Instead, most road resources within the Bay Area to Merced region date to twentieth century, the product of a "good roads movement" in the late nineteenth century that encouraged state and local governments to improve the road system (see Section 2.2, above). Bridges, and later grade separations and interchanges, largely of reinforced concrete, or steel frame construction were erected throughout the survey area on each of the road and freeway systems. Roadways and road-related structures have been altered and replaced often over the last century. Although some of the structures within the region do date to the 1910s and 1920s, most bridges and grade separations extant today date to the decades after 1920, and most of those to the post-World War II period when funding was available for such projects.[26]

Railroads

The railroad network in and around the Bay Area to Merced region started to appear in the early 1860s on the San Francisco peninsula, followed soon thereafter by the completion of the first transcontinental line in 1869. The subsequent explosion of railway construction in the region eventually resulted in the modern railway network that services the area today. Railroads passing through the region include the lines of the former Southern Pacific Railroad and the Western Pacific Railroad, both now owned by Union Pacific Railroad, and the former Atchison, Topeka & Santa Fe Railroad now owned by the Burlington Northern and Santa Fe Railway Company. Railroad resources include stations, rail yards, bridges, grade separations, and other engineering structures that date from the late-nineteenth century to the mid-twentieth century. Most railroad resources in this region date to the late 1920s and later, and alterations to the resources over time have resulted in highly modernized systems that bear little resemblance to the railroads of earlier years. For instance, the SPRR system-wide modernization program of the 1920s and 1930s led to a bypass of the congested area in downtown San Jose and resulted in the construction of several grade separations and the Cahill (Diridon) Station. Although this station, and several others in the Bay Area, are listed on the National Register of Historic Places, most other types of railroad engineering features – rails, ballast, ties, switches, signals, movable buildings, electricity poles, and grade crossing arms and signals – have been continually upgraded through routine maintenance and advances in rail technology, and date to the modern period.

In the early twentieth century, the catastrophic combination of both automobile traffic and railroad traffic resulted in a grade separation movement that was very active between the 1910s and 1930s, continuing into the 1940s. In the years between 1935 and 1941, for instance, 65 at-grade separations were built or upgraded in California, with help from federal funding. Many of these grade separations are still extant today within the APE for this project. Furthermore, as the commercial and industrial character of the Bay Area to Merced region increased, rail spur lines were added to service industries such as automotive plants and food processing centers, especially during the increase in development stimulated by World War II and the increased prosperity of the post-war period.[27]

Transmission Lines

The development of California's long distance transmission lines was an evolutionary process that dates to 1879, the year in which the San Francisco-based California Electric Light Company began generating electricity and distributing it to local subscribers from a central station. During the 1880s the use of

[26] JRP Historical Consulting, "Survey and Evaluation of Metal Truss and Steel Arch Bridges in California," prepared for Caltrans Headquarters, project on-going; JRP Historical Consulting, "Caltrans District 10 Rural Roads Inventory," prepared for Far Western Anthropological Research Group, project on-going; JRP Historical Consulting, "Historical Resources Evaluation Report: Silicon Valley Rapid Transit Corridor EIS/EIR, Alameda and Santa Clara Counties, California," prepared for Santa Clara Valley Transportation Authority (draft, January 2003).

[27] JRP Historical Consulting, "Inventory and Evaluation of Historic Resources, Caltrain Electrification Program, San Francisco to Gilroy, California," prepared for Parsons Transportation Group (draft, July 2002); JRP Historical Consulting, "HRER: Silicon Valley Rapid Transit Corridor EIS/EIR, Alameda and Santa Clara Counties, California," prepared for Santa Clara Valley Transportation Authority (draft, January 2003).

electricity in California became increasingly widespread, and local electric companies began to spring up in cities throughout the state. These early power plants could only transmit electricity about three miles, but the development of an alternating current (A.C.) system allowed the transmission of electricity over greater distances, a pioneering technology that was in use in four California cities by 1890. Over the next decade, technological and engineering advancements made it possible for power companies to transport electricity in increasing amounts over ever-longer distances. The first decade of the twentieth century marked a period of rapid growth in the hydroelectric power industry and dozens of hydroelectric companies formed throughout California, each building networks of long-distance transmission lines to service new and growing markets. By the spring of 1909, the major hydroelectric companies of Northern California had a network of long-distance transmission lines in place that criss-crossed the state, including the Bay Area to Merced Region. During the following two decades, Pacific Gas and Electric (PG&E) purchased many of these smaller companies, and eventually grew to own most transmission lines and power plants in Northern California. [28]

The resources associated with the electric utilities of California include electrical power transmission lines, substations, and power generation plants. Transmission lines and substations are the most likely to exist within the APE for this project, although it is possible that the APE will include generation plants, as well. Transmission lines are typically carried by towers that made of galvanized steel members, with the main legs connected and stabilized by horizontal members and diagonal braces. Insulators suspend wires between the towers. Many of these transmission lines were constructed in the early twentieth century, although, as with the roads and railroads, routine maintenance and modernization have led to the alteration and replacement of many of the lines, towers, and substations, as well as the replacement of outmoded equipment.

Water Conveyance Systems

Water has shaped many aspects of California's history. Drought or flood cycles are common, and settlement patterns often established urban, agricultural, residential, and industrial land uses in areas that either lacked a natural water supply, or were subject to periods of flooding. As a result, water conveyance systems have become commonplace elements of the California landscape. Hydraulic engineering emerged as a profession, and larger, more complex systems were designed and built, culminating in the mid-twentieth century with the construction of state-wide systems like the Central Valley Project (CVP) and the State Water Project, which traverse large portions of the state, specifically along the western edge of the Central Valley. Other vast water conveyance systems such as irrigation districts, reclamation districts, local water agencies, and private water companies have also contributed to the water conveyance systems of California with canals, dams, reservoirs, water delivery and drainage systems, and channelization projects of natural waterways. Small-scale water systems, designed to serve individual properties, might consist of water towers or windmills next to a residence.

All water delivery systems have a diversion structure, a conduit, and a functional association with an activity such as agriculture, mining, domestic water consumption, hydroelectric power generation, or other uses. Typical components and features of water conveyance systems include diversion structures (weirs and dams) and conduits, such as open canals, flumes, tunnels, or pipelines. Other system components include flow control devices like gates, gauges, valves, distribution boxes, fore bays, intake structures, waste outlets and spillways, drops and chutes, as well as cleansing devices like trash grates and sand traps. The materials and techniques used for each system vary with the date of construction. Nineteenth century canals, for example, were often lined with earth or cobblestones, while those of the twentieth century were lined with cement, later with shotcrete, and later still some were placed in under ground pipes. Changes have been made to many water systems over time, as is the case with most

[28] William A. Myers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company* (Glendale, California: Trans-Anglo Books, 1983), 11, 23; Fredrick Hall Fowler, *Hydroelectric Power Systems of California and Their Extensions into Oregon and Nevada* (Washington DC: Government Printing Office, 1923), 1-2; Charles M. Coleman, *PG&E of California: The Centennial Story of Pacific Gas and Electric Company, 1852-1952* (New York: McGraw-Hill, 1952), 257.

infrastructure elements. Some old systems have been abandoned in favor of newer technological advancements, and other systems have been improved and upgraded to reflect more modern technologies. Water conveyance systems are found throughout the APE for all alternatives, including drainage and channelized water courses in the Bay Area, and the Delta Mendota Canal (CVP) and California Aqueduct (State Water Project) in the San Joaquin Valley.[29]

2.6 TRADITIONAL CULTURAL PROPERTIES

Please refer to the draft Cultural Resources Technical Evaluation prepared by Far Western Anthropological Research Group for this project (February 2003) for discussion of this property type.

[29] JRP Historical Consulting Services and California Department of Transportation, *Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures* (Sacramento, CA: California Department of Transportation, December 2000).

3.0 METHODS FOR CULTURAL RESOURCES ANALYSIS

The cultural resources analysis for this program-level EIR/EIS is focused on a broad comparison of potential impacts to cultural resources along corridors for each of the alternatives (high-speed train and modal alternatives) and around stations. The potential impacts for each of these alternatives are compared with the No-Project Alternative.

3.1 DATA COLLECTION

The methodology for data collection conducted as part of the Tier 1 analysis of historic architectural resources was based on the APE defined for the project and described in Section 2.1. In order to assess potential impacts to structures from the historic period, the percentage, based on miles, of each alternative route that passes through areas that originally developed in specific, pre-defined historical time periods (before 1900, 1900 to 1929, and 1930 to 1958) was determined by using historical maps and knowledge of local history. The single best source for information on the historic development of the Bay Area to Merced Region, for all three periods of development, are topographic maps produced by the United States Geological Survey (USGS) and its predecessor agencies. These maps show not only areas of urban and suburban development, they also record other cultural features such as farm and industrial complexes, roadways, canals, reservoirs, military reservations, and utility lines, as well as rancho, corporate, and state and federal land boundaries. The Army Corps of Engineers and California Department of Water Resources also produced a limited number of similar maps, and where available, these were consulted for this project as well.

Although the USGS surveyed and mapped the Bay Area to Merced region from the late nineteenth century through the 1990s, not all of the region was mapped during the early decades. The more remote areas, especially southeastern Santa Clara County, the Diablo Range, and other unpopulated or isolated areas were not included in the USGS topographic series until the 1910s and 1920s. Official county maps from the 1890s through the 1910s recorded some cultural information, such as locations of communities, roads and railroads, schools, and other landmarks. This information was collected and included in the analysis of historic resources for this time period. Maps were collected from the California State Library, Sacramento, from Shields Library, University of California, Davis, and from the project files of other historic resource evaluation reports prepared by JRP Historical Consulting.

Known historic resources were identified by consultation of state and local historic inventories, as well as review of previous projects conducted by JRP. For the purposes of this Tier 1 analysis, known resources were considered to be those resources listed in the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR), resources recognized as significant by local governments, or historic resources that are potentially eligible for any of the three levels of recognition. JRP collected data from the Historic Property Data File, part of the California Historic Resources Information System (CHRIS), maintained by the California Office of Historic Preservation. [30] This data file contains the status and basic locational information for historic properties throughout the state. Review of state inventories also included the main bridge log and historic bridge logs maintained by Caltrans Structures Maintenance Division. JRP also reviewed the CHRIS listings for each of the fourteen counties within the Bay Area to Merced Region for historic resources in or near the project alternatives.

JRP staff also contacted each of the county governments, as well as forty-eight incorporated and unincorporated communities within the region to obtain local historic resource inventories. These

[30] Records searches for this project were obtained from the appropriate Information Centers of the California Historic Resources Information System by Far Western Anthropological Research Group. The records searches provided both historic resources records and the locations of archaeological sites within the APE. For Tier 1 analysis of archeological resources, see the draft Cultural Resources Technical Evaluation prepared by Far Western Anthropological Research Group for this project (February 2003).

inventories were used to identify known historic resources for each alternative that passed through a given local government jurisdiction (see table 3.1-1, below). Finally, JRP reviewed its own project files for historic resource inventories conducted previously in the survey area now being considered for this project. The known resources from each of these inventories and previous surveys were recorded on the historic period maps and tallied by segment within each alternative.

Table 3.1-1: Bay Area to Merced: Historic Resources Inventory (HRI) Inquiries

Local Government	Result of HRI Inquiry
Counties	
Alameda	County does not maintain HRI
Contra Costa	Unknown / not available at time of inquiry
Madera	HRI Received
Merced	HRI Received
Napa	County does not maintain HRI
Sacramento	County does not maintain HRI
San Benito	HRI Received
San Francisco	HRI Received
San Joaquin	HRI Received
San Mateo	HRI Received
Santa Clara	HRI Received
Solano	HRI not available at time of inquiry
Stanislaus	County does not maintain HRI
Yolo	HRI Received

Local Government		Result of HRI Inquiry
Cities		
City	County	
Albany	Alameda	HRI Received
Berkeley		HRI Received
Dublin		City does not maintain HRI
Fremont		HRI Received
Hayward		HRI Received
Livermore		HRI Received
Newark		City has only an informal list of historic resources
Oakland		HRI Received
Pleasanton		HRI Received
San Leandro		HRI Received
Union City		HRI Received
Hercules	Contra Costa	HRI Received
Pinole		HRI Received
Richmond		HRI Received
San Pablo		HRI Received
Chowchilla	Madera	City has only an informal list of historic resources
Atwater	Merced	City has only an informal list of historic resources
Gustine		City does not maintain HRI
Los Banos		City does not maintain HRI
Sacramento	Sacramento	HRI Received
San Francisco	San Francisco	HRI Received
Tracy	San Joaquin	Unknown
Atherton	San Mateo	City has only an informal list of historic resources

Local Government		Result of HRI Inquiry
Belmont		HRI Received
Brisbane		HRI Received
Burlingame		City has only an informal list of historic resources
Menlo Park		City has only an informal list of historic resources
Millbrae		City has only an informal list of historic resources
Redwood City		HRI Received
San Bruno		City has only an informal list of historic resources
San Carlos		HRI Received
San Mateo		HRI Received
South San Francisco		HRI Received
Gilroy	Santa Clara	HRI Received
Los Altos		HRI Received
Milpitas		HRI Received
Morgan Hill		HRI Received
Mountain View		HRI Received
Palo Alto		HRI Received
San Jose		HRI Received
Santa Clara		HRI Received
Sunnyvale		HRI Received
Dixon	Solano	HRI Received
Fairfield		City does not maintain HRI
Vacaville		HRI Received
Vallejo		HRI Received
Newman	Stanislaus	Unknown / not available at time of survey
Davis	Yolo	HRI Received

3.2 CEQA AND NHPA SIGNIFICANCE CRITERIA FOR CULTURAL RESOURCES

Under both state and federal guidelines for cultural resources, impacts are potentially significant only if the resource being impacted has been determined to be significant. Under federal guidelines (36 CFR 800.4) implementing Section 106 of the National Historic Preservation Act (NHPA), significant cultural resources are those that are eligible for the National Register of Historic Places (NRHP). The NRHP eligibility criteria (36 CFR 60.4) state that the quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, association, and:

(a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) That are associated with the lives of persons significant in our past; or
(c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) That have yielded, or may be likely to yield, information important to prehistory or history.

In addition, the cultural resource must be over 50 years old unless it is exceptionally important.

In CEQA, significant cultural resources are called "Historical Resources." Historical resources are resources that are eligible for listing in the California Register of Historical Resources (CRHR) or that are

listed in the historical register of a local jurisdiction (county or city). Generally, a resource shall be considered by a lead agency to be "historically significant" if the resource has integrity and meets the criteria for listing on the California Register of Historical Resources, as follows [Title 14, California Code of Regulations, Section 15064.5(a)(3)]:

(A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
(B) Is associated with the lives of persons important in our past;
(C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
(D) Has yielded, or may be likely to yield, information important in prehistory or history.

As can be seen, the NRHP and CRHR criteria are almost identical. Any resource determined eligible for the NRHP is also automatically eligible for the CRHR. However, the CEQA definition of an Historical Resource also includes resources listed on local historical registers.

CEQA also contains a section addressing "unique" archeological resources and provides a definition of such resources (Public Resources Code, Section 21083.2). This section establishes limitations on the cost of mitigation and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of a Historical Resource [Title 14, California Code of Regulations, Section 15064.5©(2)].

Impacts to NRHP eligible resources are adverse "when an undertaking may alter, directly, or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" [36 CFR 800.5(1)]. Examples of adverse effects include physical destruction or damage to all or part of the property, alteration that is not consistent with the Secretary of the Interior's standards for the treatment of historic properties, removal of the property from its historic location, change in the type of use or of the physical characteristics of the setting, introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features, and neglect resulting in deterioration [36 CFR 800.5(2)]. Note that historic properties include prehistoric archaeological sites. Archaeological sites are usually adversely affected only by physical destruction or damage, whereas all of the examples can apply to historic buildings and structures.

Impacts to CRHR eligible resources, or resources listed on local registers, constitute a significant effect on the environment (significant impacts that must be disclosed in a CEQA environmental document) if the project may cause a substantial adverse change in the significance of a historical resource. "Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" [Title 14, California Code of Regulations, Section 15064.5(b)(1)]. Materially impaired means that the historical resource will be demolished or the physical characteristics of the resource that made the resource eligible will be adversely altered such that the resource would no longer be eligible for the CRHR nor listed in a local historical register [Title 14, California Code of Regulations, Section 15064.5(b)(2)].

3.3 RANKING POTENTIAL IMPACTS TO CULTURAL RESOURCES BY ALTERNATIVE

At this Tier 1 programmatic level of analysis, individual historic architectural resources were not enumerated or evaluated for eligibility. Instead, the percentage, based on miles, of each alternative route that passed through areas that originally developed in specific, pre-defined historical time periods (before 1900, 1900 to 1929, and 1930 to 1958) was determined from historical maps, state and local historic resource inventories, and knowledge of the history of the region. The percentages of historic

development were used as an indicator of historic period resources that would require survey under the next phase of work for this project, should a specific alternative be selected for construction. The percentages of historic development were also used as an indicator of the potential for a particular alternative to impact or affect potentially eligible resources that date to 1958 or before. The percentages of historic development along each alternative segment were calculated based on a number of factors:

- The overall length of the route (for roadway segments, the mileage is based on Caltrans post miles, while the length of the proposed HST segments were based on project mapping and measurement of the segments on USGS base maps).
- The length of each occurrence of dense development, cities and towns, clusters of buildings, or any tightly arranged group of buildings and structures, was measured in miles according to the scale of each base map.
- Scattered development consisting of about ten buildings, structures, or objects per mile were added to the overall measurement of historic development at the rate of 0.1 mile per 1.0 mile of scattered development.
- Buildings, structures, and objects that appeared on historic mapping (and that were measured as either dense or scattered development as described above) included such property types as public buildings, farm complexes, out buildings, roadways, railroads, canals, bridges, transmission lines, tunnels, and cemeteries.
- Known resources (those known to be listed, eligible, or potentially eligible for the NRHP or CRHR) were not measured, but were tallied separately and used to inform the overall sensitivity ranking of alternatives. The number of known historic resources that would require identification, evaluation and effects analysis will depend greatly upon the final APE approved for the selected route. Once approved, the APE for historic architectural resources for the next phase of evaluation can reasonably be expected to be set to between 100 feet and 500 feet from centerline. This estimate assumes the possibility of the widest APE, or 500 feet from centerline for each alternative.

The rankings developed by JRP Historical Consulting were translated into qualitative rankings of Low, Medium, and High, as follows:

- Those segments that showed less than 10% developed during the historic period (1958 or before) resulted in a “Low” sensitivity ranking before consideration of the number of known historic resources for each segment.
- Those segments that showed between 10% and 30% developed during the historic period (1958 or before) resulted in a “Medium” sensitivity ranking before consideration of the number of known historic resources for each segment. A “High” sensitivity ranking was applied to those routes that were more than 30% developed [Please note: nearly all the alternative segments had percentages well below 10% or well above 30%, even when considered by a single period – such as the HST Oakland to San Jose/I-880 option, which measured over 30% historic development for all three historic periods, and the Modal San Jose to Merced (US101-SR152) segment, which is under 10% for all three periods.]
- Once the sensitivity rankings had been assigned to the percentage of historic development, these rankings were compared to the number of known resources within the APE for each alternative, as well as the preparer’s knowledge and familiarity with the nature of historic architectural resources in that area. A segment that was ranked as “Low” after calculation of its percentage of historic development, such as the HST Caltrain/Gilroy/Pacheco Pass option, could be upgraded to “High” because its APE includes many known historic resources where it passes through the center of several towns and small cities in the Santa Clara Valley.

In this last step for assigning sensitivity ranking, the preparer's knowledge of regional history was used to supplement the data from historic mapping and state and local government inventories. For example, JRP conducted an inventory and evaluation of the approximately 75 miles of Caltrain right of way between San Francisco and Gilroy between 2000 and 2002.[31] This survey resulted in the identification of 24 historic resources that are listed on, eligible for, or potentially eligible for listing on the NRHP and/or CRHR. These known resources appear in the estimate of known resources for the appropriate HST segment options. Where possible, known resources were identified and their presence or absence along a given route supported the overall sensitivity ranking of the route segments. The sensitivity ranking, therefore, is based on the percentages of route lengths that developed in the three historic periods, as well as the estimated number of historic properties known to exist along the routes.

[31] JRP Historical Consulting, "Inventory and Evaluation of Historic Resources, Caltrain Electrification Program, San Francisco to Gilroy, California," prepared for Parsons Transportation Group (Draft, July 2002).

4.0 CULTURAL IMPACTS

4.1 NO-PROJECT ALTERNATIVE

Under the No-Project Alternative, future approved projects would change the character of the existing conditions by 2020 and would have the potential to impact cultural resources. The highways, rail corridors, and airports scheduled for programmed and funded improvements under the No-Project Alternative would be similar to the expansion and construction proposed under the Modal Alternative (see Table 4-1 and Section 4.2).[32] For comparative purposes, the percentage of historic development and number of known resources within the potential APEs for projects under the No-Project Alternative is based on the historic development information and historic resources inventory data collected for the same routes within the Modal Alternative. Because of the similarity between the two alternatives, the No-Project Alternative has an overall sensitivity ranking of "Medium," as does the northern portion of the alternative segments of the Modal Alternative (that portion of the Modal Alternative between San Francisco/Oakland and San Jose).

Table 4-1: Detailed Analysis/Comparison Table Impacts to Cultural Resources

Bay Area to Merced Region

	Percentage of Route Developed During Historic Periods	Estimate of Known Historical Resources in APE*	Historic Districts or Specific High Sensitivity Resources	Overall Ranking (High, Medium, Low)**
NO-PROJECT Estimated as equivalent to Modal Alternative for historic architectural resources	See corridors listed under "Modal" alternative, below.			**Medium**
MODAL				
Modal - San Francisco/Oakland to San Jose (approx. Diridon Station)				**Medium**
Modal Corridor San Francisco/Oakland to San Jose includes: • **US-101** segments (SF to SFO, SFO to Redwood City, Redwood City to I-880)	To 1899: 12.43% 1900-29: 29.06% 1930-58: 70.04%	To 1899: 1 1900-29: 2 1930-58: 2	US Naval Air Station Sunnyvale Historic District (Moffett Field)	
• **I-80** segments (SF to I-880, I-880 to I-5)	To 1899: 4.70% 1900-29: 13.46% 1930-58: 20.69%	To 1899: 0 1900-29: 2 1930-58: 4		
• **I-880** segments (I-80 to I-238, I-238 to Fremont/Newark, Fremont/Newark to U.S. 101, U.S. 101 to San Jose [approximately Stockton Crossing]),	To 1899: 15.80% 1900-29: 20.07% 1930-58: 49.03%	To 1899: 2 1900-29: 2 1930-58: 3		
• **I-580** segments (I-880 to I-5 via I-238)	To 1899: 2.07% 1900-29: 4.32% 1930-58: 9.96%	To 1899: 1 1900-29: 2 1930-58: 3		
Modal Corridor Bridges: San Francisco/Oakland to San Jose segment includes bridge structures (e.g. overpasses, interchanges, etc.) that date to the	n/a	To 1899: 0 1900-29: 4	Carquinez Bridge and Oakland-SF Bay Bridge listed on NRHP***	

[32] "The No-Project Alternative represents the state's transportation system (highway, air, and conventional rail) as it exists and as it would be after implementation of programs or projects currently programmed and funded for implementation and expected to be in place by 2020" based on the State Transportation Improvement Program (STIP), Regional Transportation Plans (RTPs), airport plans, and intercity passenger rail plans (Amtrak Five- and Twenty-year Plans). [Parsons-Brinckerhoff, "Deliberative Draft Systems Alternatives Definition," prepared for California High-Speed Rail Authority (November 7, 2002), Section 2].

	Percentage of Route Developed During Historic Periods	Estimate of Known Historical Resources in APE*	Historic Districts or Specific High Sensitivity Resources	Overall Ranking (High, Medium, Low)**
historic period. These 271 structures date to between 1900 and 1958.		1930-58: 267		
Modal Airports –San Francisco/Oakland to San Jose includes: San Jose, Oakland, San Francisco, and Santa Rosa Airports. Mileage historically developed is based on approximate length of property developed by end of historic period – 1958.	Mileage historically developed (not %) San Jose: .41 mi Oakland: .27 mi San Francisco: .12 mi Santa Rosa: .11 mi	San Jose: 0 Oakland: 0 San Francisco: 6 Santa Rosa: 0		
Modal - San Jose to Merced				**Low**
Modal Corridor San Jose to Merced includes **US-101** segments (San Jose to Gilroy, Gilroy to S.R. 152) and **SR-152** segments (US 101 to I-5, I-5 to S-99)	To 1899: 3.96% 1900-29: 3.12% 1930-58: 9.41%	To 1899: 5 1900-29: 5 1930-58: 11		
Modal Corridor Bridges: San Jose to Merced segment includes bridge structures (e.g. overpasses, interchanges, etc.) that date to the historic period. These 26 structures date to between 1900 and 1958.	n/a	To 1899: 0 1900-29: 4 1930-58: 22	No NRHP or CRHR listed bridges in this segment	
Modal Airports = None				
HST CORRIDOR & STATION OPTIONS				
San Francisco/Oakland to San Jose (to existing Diridon [Cahill] Station#)	**SF to SJ** To 1899: 35.53% 1900-29: 46.34% 1930-58: 99.55%	To 1899: 10 1900-29: 125 1930-58: 150	See below	**High**
Historic districts and specific high sensitivity resources, SF and Oakland to San Jose:	Many NRHP/CRHR eligible resources in historic downtown areas between and including San Francisco and San Jose. Former Southern Pacific Railroad stations on San Francisco peninsula (including Cahill [Diridon] Station Historic District# and Santa Clara Station Historic District); Redwood City Historic District. Four tunnels on Caltrain alignment appear to be eligible for the NRHP.			
Sub-options include Oakland to San Jose via I-880 route and Oakland to San Jose via Milford route	**Oak to SJ I-880** To 1899: 32.09% 1900-29: 37.66% 1930-58: 38.20% **Oak to SJ Milford** To 1899: 34.52% 1900-29: 40.70% 1930-58: 43.73%	**Oak to SJ I-880** To 1899: 20 1900-29: 98 1930-58: 112 **Oak to SJ Milford** To 1899: 30 1900-29: 102 1930-58: 117	Downtown Oakland Historic District; Oakland Waterfront Warehouse District; Cahill [Diridon] Station Historic District. Milford route -- Alviso Historic District and Agnews Insane Asylum Historic District.#	**High**
San Jose to Merced: Diablo Range Direct Rt. 130 Alignment	To 1899: 2.83% 1900-29: 3.17% 1930-58: 3.01%	To 1899: 1 1900-29: 4 1930-58: 5	Cahill (Diridon) Station Historic District	**Low**
San Jose to Merced: Diablo Range Direct Minimum Tunnel Alignment	To 1899: 2.65% 1900-29: 3.14% 1930-58: 2.99%	To 1899: 1 1900-29: 4 1930-58: 7	Cahill (Diridon) Station Historic District	**Low**
San Jose to Merced: Diablo Range Direct Increased Tunnel Alignment	To 1899: 2.69% 1900-29: 3.22% 1930-58: 3.07%	To 1899: 1 1900-29: 4 1930-58: 7	Cahill (Diridon) Station Historic District	**Low**
San Jose to Merced: Caltrain/Morgan Hill/ Pacheco Pass	To 1899: 3.14% 1900-29: 4.34% 1930-58: 5.70%	To 1899: 8 1900-29: 49 1930-58: 51	Historic resources in small towns of Santa Clara Valley, including Morgan Hill.#	**High**

	Percentage of Route Developed During Historic Periods	Estimate of Known Historical Resources in APE*	Historic Districts or Specific High Sensitivity Resources	Overall Ranking (High, Medium, Low)**
San Jose to Merced: Caltrain/Gilroy/Pacheco Pass	To 1899: 4.07% 1900-29: 4.75% 1930-58: 6.38%	To 1899: 42 1900-29: 151 1930-58: 161	Historic resources in small towns of Santa Clara Valley, including Morgan Hill & Gilroy. #	**High**

* The total number of historic resources that would require identification, evaluation, and effects analysis would depend greatly upon the final APE approved for the selected route. Once approved, the APE for historic architectural resources can reasonably be expected to be set to between 100 feet and 500 feet from centerline. This estimate assumes the possibility of the widest APE, or 500 feet from centerline for each alternative.
** The overall ranking was derived from the relative percentage of historic development for each alternative segment and consideration of the number of known historical resources, as well as the preparer's knowledge of the area. The ranking methodology is described in further detail in Section 3.3.
***The Carquinez Bridge and Oakland-San Francisco Bay Bridge are both listed on the National Register and both structures were undergoing replacement or seismic retrofit projects at the time of this Tier 1 analysis (February 2003).
The Cahill (Diridon) Station Historic District is located with the APE for all HST alternative options.

4.2 MODAL ALTERNATIVE

The description of impacts on historic architectural resources that would occur under the Modal Alternative are presented as modal route segments north of San Jose in comparison to those segments south of San Jose. The northern segment consists of I-80 (from I-5 near Sacramento to San Francisco), I-880 (from Oakland to San Jose), US101 (from San Francisco to San Jose), and I-580 (from I-5 to I-880 via SR238). The southern segment consists of US101 from San Jose south to Gilroy, in combination with SR152 from Gilroy east to SR99. The northern segment routes have a combined length of more than 220 miles and the southern segments total more than 110 miles. The percentage of historic development varies greatly between the northern and southern modal segments, with the north growing from nearly eight percent of its total length developed by 1899, doubling to almost 16% by 1929, and again to about 34% by 1958. Conversely, the southern segments hovered between three and four percent for both the nineteenth century and through 1929, reaching only 9.41% historic development by 1958.

Few known historic resources exist immediately adjacent to these relatively modern highway corridors and airports – twelve in the north and five in the south. Despite this low estimated number of known resources, the northern modal segments received a "Medium" sensitivity ranking because up to a third of their combined length was developed by 1958 and would require survey for potentially eligible historic architectural resources. The northern modal segments are known to pass through historically sensitive areas in both San Francisco and Oakland, and long portions of many of the modal freeways have not been recently surveyed for historic architectural resources. The southern modal segments received a "Low" sensitivity ranking because they had not reached ten percent historic development by 1958 and few known historic resources exist with this APE.

4.3 HIGH SPEED TRAIN ALTERNATIVE

This discussion of the potential impacts (or potential to affect historic architectural resources) of the various HST alternatives compares the northern segments, those between San Francisco and Oakland at the north and San Jose on the south, to the southern segments, those between San Jose on the north and the vicinity of Merced to the southeast.

The northern (San Francisco/Oakland to San Jose) segments encompass about 132 miles, including the Caltrain corridor from San Francisco to San Jose, and two options for the Oakland to San Jose segment (the I-880 option and the Niles/Milford option). By the end of the nineteenth century, these areas

included several well-established cities and large towns, many of which included development along railroad lines established in the 1860s and 1870s. This pattern of early urban development is reflected in the fact that over one third (about 34%) of the total length of the northern HST segments were historically developed by 1899. The San Francisco Bay Area continued to grow during the next two historic periods, with 43% of their length developed by 1929 and nearly 84% by 1958. One segment, the San Francisco to San Jose HST segment that parallels the current Caltrain alignment, was very close to 100% developed by 1958. All three northern HST segments pass through areas that have been developed for commercial, industrial, and residential uses since at least the 1850s. The San Francisco to San Jose segment follows one of the earliest railroads established in the western United States – the San Francisco & San Jose Railroad (1864) – and station stops, towns and cities have grown up along its route since that time. The oldest of the rail lines in the East Bay, between Oakland and San Jose, dates to the 1870s and was also a catalyst for urban development in that area. All three northern HST segments under consideration received a "High" sensitivity ranking based on the percentages of historic development and the apparent potential to impact/affect historic architectural resources.

The HST alternative includes five options for the southern segment from San Jose to Merced. These five options range in length from about 100 miles to about 138 miles long, for a combined length of about 560 miles for all southern HST segments. Because the area south, and especially southeast, of San Jose was not heavily settled during the historic period, the percentage of historic development is much lower than that of the northern HST segments in the San Francisco Bay Area. In fact, the percentage of historic development along these five southern segments never reached more than five percent of the combined length during any of the three historic periods – 3.15% by 1899, 3.83% by 1929, and 4.45% by 1958.

The two major sub-options within the southern HST segments consist of the three Diablo Range Direct options and the two Pacheco Pass options. The Diablo Range Direct options pass through remote mountainous terrain that was not developed during the historic period, nor is it currently developed. Historic development along these options occurred in the Santa Clara and San Joaquin valleys, but even there was not extensive and the percentages for each Diablo Range Direct option only reached about three percent by 1958. The two Pacheco Pass options extend further down the Santa Clara Valley and also cross a longer portion of the San Joaquin valley, so their percentages were somewhat higher by 1958 (5.7% for Morgan Hill/Pacheco Pass and 6.38% for Gilroy/Pacheco Pass), but none of the five southern HST segments surpassed seven percent historic development through the end of the historic period.

Based on the low incidence of historic development, the southern HST alternative segments would receive a "low" sensitivity ranking, however, the estimate of known resources varies considerably between the two major sub-options of the southern HST segments. The most distinguishing characteristic for estimating potential impacts to historic architectural resources along the five southern HST segments is the comparison of the estimated number of known historic resources (Table 4-1). The three Diablo Range Direct options pass through southern San Jose, but then avoid most other settlement centers in the Santa Clara Valley before turning east through the Diablo Range. These alignments also do not pass by many known historic resources in the San Joaquin Valley (other than the canals of the Central Valley Project and State Water Project). In fact, there are only four known historic resources along the Diablo Range Direct options.

The two Pacheco Pass options extend further south into the Santa Clara Valley along the Caltrain right of way, which is a rail route established in the 1870s. Because several towns were established along the rail line immediately adjacent to both sides of the tracks, there are many more known resources that would fall within the survey area for the project if either of these options were selected.[33] The Morgan

[33] The total number of historic resources that would require identification, evaluation, and effects analysis would depend greatly upon the final APE approved for the selected route. Once approved, the APE for historic architectural resources can reasonably be expected to be set to between 100 feet and 500 feet from centerline. This estimate assumes the possibility of the widest APE, or 500 feet from centerline.

Hill/Pacheco Pass option would require evaluation of potential impacts to about 50 known historic resources, while the Gilroy/Pacheco Pass option survey area would require evaluation of potential impacts to more than 150 known historic resources. Neither of these Pacheco Pass options encounter many known resources at their eastern ends in the San Joaquin Valley. Of the five southern HST segments under consideration, therefore, the two Pacheco Pass options receive a "High" sensitivity ranking for potential to impact/affect historic architectural resources, while the three Diablo Range Direct options receive a "Low" sensitivity ranking.

4.4 COMBINED CULTURAL RESOURCES TABLE

Table 4-2 shows the combined sensitivity rankings for all cultural resources including both architectural and archeological resources. See also *"Draft Bay Area-to-Merced Region Cultural Resources: Archeology, Technical Evaluation,"* April 2003.

Table 4-2: Detailed Analysis/Comparison Table/ Impacts to Cultural Resources

Bay Area-to-Merced Region

	Number of Arch. Sites	Percentage of Route Developed During Historic Periods	Estimate of Known Historical Resources in APE*	Historic Districts or Specific High Sensitivity Resources	Traditional Cultural Properties (Yes/No)	Overall Ranking (High, Medium, Low)**	
						Hist.	Arch.
NO-PROJECT Estimated as equivalent to Modal Alternative for historic architectural resources	47	See corridors listed under "Modal" alternative, below.	n/a	n/a	**no**	**Medium**	**Medium** (1.50)
MODAL							
Modal - San Francisco/Oakland to San Jose (approx. Diridon Station)	**32**				**no**	**Medium**	**Medium** (1.52)
Modal Corridor San Francisco/Oakland to San Jose includes: • **US-101** segments (SF to SFO, SFO to Redwood City, Redwood City to I-880)	13	To 1899: 12.43% 1900-29: 29.06% 1930-58: 70.04%	To 1899: 1 1900-29: 2 1930-58: 2	US Naval Air Station Sunnyvale Historic District (Moffett Field)	no		
• **I-80** segments (SF to I-880, I-880 to I-5)	8	To 1899: 4.70% 1900-29: 13.46% 1930-58: 20.69%	To 1899: 0 1900-29: 2 1930-58: 4		no		
• **I-880** segments (I-80 to I-238, I-238 to Fremont/Newark, Fremont/Newark to U.S. 101, U.S. 101 to San Jose [approximately Stockton Crossing]),	6	To 1899: 15.80% 1900-29: 20.07% 1930-58: 49.03%	To 1899: 2 1900-29: 2 1930-58: 3		no		
• **I-580** segments (I-880 to I-5 via I-238)	3	To 1899: 2.07% 1900-29: 4.32% 1930-58: 9.96%	To 1899: 1 1900-29: 2 1930-58: 3		no		
Modal Corridor Bridges: San Francisco/Oakland to San Jose segment includes bridge structures (e.g. overpasses, interchanges, etc.) that date to the historic period. These 271 structures date to between 1900 and 1958.	0	n/a	To 1899: 0 1900-29: 4 1930-58: 267	Carquinez Bridge and Oakland-SF Bay Bridge listed on NRHP***			
Modal Airports –San Francisco/Oakland to San Jose includes: San Jose, Oakland, San Francisco, and Santa Rosa Airports. Mileage historically developed is based on approximate length of property developed by end of historic period – 1958.	2	Mileage historically developed (not %) San Jose: .41 mi Oakland: .27 mi San Francisco: .12 mi Santa Rosa: .11 mi	San Jose: 0 Oakland: 0 San Francisco: 6 Santa Rosa: 0		no		
Modal - San Jose to Merced	**15**				**no**	**Low**	**Low** (1.46)
Modal Corridor San Jose to Merced includes **US-101** segments (San Jose to	15	To 1899: 3.96% 1900-29: 3.12% 1930-58: 9.41%	To 1899: 5 1900-29: 5 1930-58: 11		no		

	Number of Arch. Sites	Percentage of Route Developed During Historic Periods	Estimate of Known Historical Resources in APE*	Historic Districts or Specific High Sensitivity Resources	Traditional Cultural Properties (Yes/No)	Overall Ranking (High, Medium, Low)** Hist.	Arch.
Gilroy, Gilroy to S.R. 152) and **SR-152** segments (US 101 to I-5, I-5 to S-99)							
Modal Corridor Bridges: San Jose to Merced segment includes bridge structures (e.g. overpasses, interchanges, etc.) that date to the historic period. These 26 structures date to between 1900 and 1958.	0	n/a	To 1899: 0 1900-29: 4 1930-58: 22	No NRHP or CRHR listed bridges in this segment			
Modal Airports = None	0				no		
HST CORRIDOR & STATION OPTIONS							
San Francisco/Oakland to San Jose (to existing Diridon [Cahill] Station#)	**23 to 22**	**SF to SJ** To 1899: 35.53% 1900-29: 46.34% 1930-58: 99.55%	To 1899: 10 1900-29: 125 1930-58: 150	See below	**no**	**High**	**Medium** (2.03)
Historic districts and specific high sensitivity resources, SF and Oakland to San Jose:	Many NRHP/CRHR eligible resources in historic downtown areas between and including San Francisco and San Jose. Former Southern Pacific Railroad stations on San Francisco peninsula (including Cahill [Diridon] Station Historic District# and Santa Clara Station Historic District); Redwood City Historic District. Four tunnels on Caltrain alignment appear to be eligible for the NRHP.						
Sub-options include Oakland to San Jose via I-880 route and Oakland to San Jose via Mulford route	23 to 22	**Oak to SJ I-880** To 1899: 32.09% 1900-29: 37.66% 1930-58: 38.20% **Oak to SJ Mulford** To 1899: 34.52% 1900-29: 40.70% 1930-58: 43.73%	**Oak to SJ I-880** To 1899: 20 1900-29: 98 1930-58: 112 **Oak to SJ Mulford** To 1899: 30 1900-29: 102 1930-58: 117	Downtown Oakland Historic District; Oakland Waterfront Warehouse District; Cahill [Diridon] Station Historic District. Mulford route -- Alviso Historic District and Agnews Insane Asylum Historic District.#	no	**High**	**Medium** (2.03)
San Jose to Merced: Diablo Range Direct Rt. 130 Alignment	**7**	To 1899: 2.83% 1900-29: 3.17% 1930-58: 3.01%	To 1899: 1 1900-29: 4 1930-58: 5	Cahill (Diridon) Station Historic District	**no**	**Low**	**Medium** (1.52)
San Jose to Merced: Diablo Range Direct Minimum Tunnel Alignment	**21**	To 1899: 2.65% 1900-29: 3.14% 1930-58: 2.99%	To 1899: 1 1900-29: 4 1930-58: 7	Cahill (Diridon) Station Historic District	**no**	**Low**	**Medium** (1.58)
San Jose to Merced: Diablo Range Direct Increased Tunnel Alignment	**22**	To 1899: 2.69% 1900-29: 3.22% 1930-58: 3.07%	To 1899: 1 1900-29: 4 1930-58: 7	Cahill (Diridon) Station Historic District	**no**	**Low**	**Medium** (1.54)
San Jose to Merced: Caltrain/Morgan Hill/ Pacheco Pass	**15**	To 1899: 3.14% 1900-29: 4.34% 1930-58: 5.70%	To 1899: 8 1900-29: 49 1930-58: 51	Historic resources in small towns of Santa Clara Valley, including Morgan Hill.#	**no**	**High**	**Low** (1.48)
San Jose to Merced: Caltrain/Gilroy/Pacheco Pass	**13**	To 1899: 4.07% 1900-29: 4.75% 1930-58: 6.38%	To 1899: 42 1900-29: 151 1930-58: 161	Historic resources in small towns of Santa Clara Valley, including Morgan Hill & Gilroy.#	**no**	**High**	**Low** (1.41)

* The total number of historic resources that would require identification, evaluation, and effects analysis would depend greatly upon the final APE approved for the selected route. Once approved, the APE for historic architectural resources can reasonably be expected to be set to between 100 feet and 500 feet from centerline. This estimate assumes the possibility of the widest APE, or 500 feet from centerline for each alternative.

	Number of Arch. Sites	Percentage of Route Developed During Historic Periods	Estimate of Known Historical Resources in APE*	Historic Districts or Specific High Sensitivity Resources	Traditional Cultural Properties (Yes/No)	Overall Ranking (High, Medium, Low)**	
						Hist.	Arch.
** The overall ranking was derived from the relative percentage of historic development for each alternative segment and consideration of the number of known historical resources, as well as the preparer's knowledge of the area. The ranking methodology is described in further detail in Section 3.3. ***The Carquinez Bridge and Oakland-San Francisco Bay Bridge are both listed on the National Register and both structures were undergoing replacement or seismic retrofit projects at the time of this Tier 1 analysis (February 2003). # The Cahill (Diridon) Station Historic District is located with the APE for all HST alternative options.							

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6.0 PREPARERS

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