Chapter 1
Introduction

1.1 Overview

The Peninsula Corridor Electrification Project (PCEP or Proposed Project) consists of converting Caltrain from diesel-hauled to Electric Multiple Unit (EMU) trains for service between the Fourth and King Street terminus station in San Francisco and the Tamien Station in San Jose. Operating speed would be up to 79 mph, which would match the existing maximum speed.

By 2020/2021[1] ~~2019~~, approximately 75 percent of the service between San Jose and San Francisco would be electrified, with the remaining 25 percent being diesel-powered. After 2020 ~~2019~~, diesel locomotives used for San Francisco to San Jose service would be replaced with EMUs over time as they reach the end of their service life. Because the Proposed Project only involves electrification of the Caltrain right-of-way (ROW) from San Francisco to a point approximately 2 miles south of Tamien Station, Caltrain's diesel-powered locomotives would continue to provide service between the San Jose Diridon Station and Gilroy.

The Proposed Project would require the installation of 130 to 140 single-track miles of overhead contact system (OCS) for the distribution of electrical power to the new electric rolling stock. The OCS would be powered from a 25 kilovolt (kV), 60 Hertz (Hz), single-phase, alternating current (AC) traction power system consisting of two traction power substations, one switching station and seven paralleling stations. These facilities are described in more detail in Chapter 2, *Project Description*.

1.2 Project History

The Proposed Project is part of a program to modernize operation of the Caltrain rail corridor between San Jose and San Francisco. In addition to corridor electrification, modernization involves the installation of an advanced signal system which is discussed further below. The Peninsula Corridor Joint Powers Board (JPB), which operates Caltrain, previously evaluated corridor electrification in a prior EIR, for which a draft was completed in 2004 and a final was completed in 2009. The JPB did not certify the Final EIR due to the need for resolution of issues regarding joint planning for shared use of the Caltrain corridor by Caltrain and future high-speed rail (HSR) service. The Federal Transit Administration (FTA) completed the final Environmental Assessment (EA) and adopted a Finding of No Significant Impact (FONSI) in 2009.

Since 2009, JPB, the California High-Speed Rail Authority (CHSRA), the California Legislature, the Metropolitan Transportation Commission (MTC), and other parties have worked together to develop a vision of a "blended system" whereby both Caltrain and HSR would use the existing Caltrain corridor on the San Francisco Peninsula and would reach downtown San Francisco via the Downtown Extension (DTX) to the Transbay Transit Center (TTC). This vision for implementing

[1] Depending on timing for completion of construction, the first year of operations would be in 2020 or 2021. Since the first year of operations could be 2020, this EIR simply refers to 2020 as the first operational year.

Blended Service on the San Francisco Peninsula was included in the *Revised 2012 Business Plan* that the CHSRA Board adopted in April 2012 for the California High-Speed Rail System (CHSRA 2012) as well as the 2014 ~~Draft~~ Business Plan (CHSRA 2014).

JPB and CHSRA are committed to advancing a blended system concept, which was developed with stakeholders interested in the corridor. The blended system would remain substantially within the existing Caltrain ROW and would accommodate future HSR and modernize Caltrain service along the Peninsula corridor by primarily utilizing the existing track configuration. It is important to note that "accommodating" future HSR, in the context of the Proposed Project, means providing the electrical infrastructure compatible with HSR and not precluding HSR. The blended system would be primarily a two-track system shared by Caltrain, HSR and existing tenant passenger and freight rail operators.

Based on the blended system vision, the Caltrain Peninsula Corridor has been designated to receive an initial investment of Proposition 1A bond funds that would benefit Caltrain and its modernization program in the short term and HSR in the long run. JPB, CHSRA and seven other San Francisco Bay Area agencies (City and County of San Francisco, San Francisco County Transportation Authority, Transbay Joint Powers Authority, San Mateo County Transportation Authority, Santa Clara Valley Transportation Authority, City of San Jose, and MTC) have approved a Memorandum of Understanding (MOU) (*High Speed Rail Early Investment Strategy for a Blended System in the San Francisco to San Jose Segment known as the Peninsula Corridor of the Statewide High-Speed Rail System*) to pursue shared use of the corridor between San Jose and San Francisco to provide Blended Service of both Caltrain commuter rail service and HSR intercity service (JPB 2012). The MOU includes agency and funding commitments toward making an initial investment of approximately $1.5 billion in the corridor for purchasing and installing an advanced signal system, electrifying the rail line from San Jose to San Francisco, and purchasing electrified rolling stock. The MOU also conceptually outlines potential additional improvements needed beyond the first incremental investment of $1.5 billion to accommodate future HSR service in the corridor.

Corridor improvements identified in the MOU include the following:

- ***Advanced Signal System (CBOSS PTC or CBOSS)*:** CBOSS stands for Communications Based Overlay Signal System and PTC stands for Positive Train Control. This project would increase the operating performance of the current signal system, improve the efficiency of at-grade crossing warning functions, and automatically stop a train when there is violation of speed or route. This project, which includes implementation of safety improvements mandated by federal law (i.e., the Rail Safety Improvement Act of 2008), has already been cleared environmentally, installation is underway (including the fiber optics communications backbone), and CBOSS PTC is scheduled to be operational by late 2015 as mandated by the Federal Railroad Administration (FRA).
- ***Corridor Electrification*:** JPB decided to prepare this new EIR for the corridor electrification due to the changes in existing conditions since the prior EIR analyses ~~was~~ were conducted and to update cumulative impacts analysis of Blended Service and other developments along the corridor. Completion of a new EIR will also allow public agencies, stakeholders, the public and decision makers the opportunity to review the Proposed Project's environmental effects in light of current information and analyses. This EIR analyzes operation of up to six Caltrain trains per peak hour per direction (an increase from five trains per peak hour per direction at present). Electrification may be analyzed as a separate project under CEQA because it has independent

utility (providing Caltrain electrified service) and logical termini (station end points). Electrification of the rail line is scheduled to be operational by 2020 ~~late 2019~~.

- ***Blended Service*:** JPB, CHSRA, and the MOU partners have agreed on shared use of the Caltrain corridor by up to six Caltrain trains per peak hour per direction and up to four HSR trains per peak hour per direction.[2] Operation of more than two HSR trains per hour per direction would require one set of passing tracks somewhere between San Jose and San Francisco. In concept, Blended Service has been analyzed at operating speeds of 79 mph (the current maximum) to 110 mph[3]. The operational feasibility of Blended Service has been studied but remains only at the conceptual planning phase. The potential addition of HSR service to this corridor will be the subject of a separate environmental review by CHSRA that will be undertaken subsequent to the environmental process for the Proposed Project. Based on the current CHSRA *Revised 2012 Business Plan* (and the ~~Draft~~ 2014 Business Plan), Blended Service along the Caltrain corridor is scheduled to commence sometime between 2026 and 2029. Blended Service would connect with TJPA's DTX/TTC project to provide Caltrain and HSR service to the TTC, which is the mandated northern terminus of the HSR project per Proposition 1A.

1.3 Need for Project

Passenger trains have operated between San Jose and San Francisco since 1863. Caltrain is the oldest commuter rail operation in the San Francisco Bay Area and the only commuter rail service provided on the San Francisco Peninsula. It is operated by the JPB, a joint powers agency with representation from San Francisco, San Mateo, and Santa Clara Counties. Caltrain provides service between the South Bay and San Francisco including the Peninsula communities of San Jose (College Park, Diridon, and Tamien Stations), Santa Clara, Sunnyvale (Sunnyvale and Lawrence Stations), Mountain View, Palo Alto, Menlo Park, Atherton, Redwood City, San Carlos, Belmont, San Mateo (San Mateo, Hillsdale, and Hayward Park Stations), Burlingame (Burlingame and Broadway Stations), Millbrae, San Bruno, South San Francisco, and Brisbane (Bayshore Station) in Santa Clara and San Mateo Counties, and the 22nd Street and the 4th and King Stations in the City and County of San Francisco. Limited service is provided to College Park in San Jose and there is no weekday service to the Atherton or Broadway Stations. There is also special service to Stanford on football game days. In 1992, peak-period service was extended approximately 25 miles south of downtown San Jose,

[2] The CHSRA *2012 Business Plan: Ridership and Revenue Forecasting* (CHSRA 2012~~b~~) and the Draft 2014 Business Plan (CHSRA 2014) presume Phase 1 Blended Service would have up to four trains per peak hour and up to four trains per off-peak hour. As explained in Chapter 4, Section 4.1 *Cumulative Impacts,* this EIR presumes up to 40 HST daily trains in 2040 based on CHSRA's *Estimating High-Speed Train Operating and Maintenance Cost for the CHSRA 2012 Business Plan* (CHSRA 2012c). After 2040, which is the horizon for the cumulative impact analysis in this EIR, CHSRA may pursue additional daily service beyond the 40 daily trains assumed for the analysis in this EIR.

[3] As described in Section 4.1, *Cumulative Impacts*, the cumulative analysis in this EIR presumes speeds for Blended Service up to 110 mph because the blended system has been simulated by Caltrain at speeds of up to 110 mph and shown to be viable. In addition, CHSRA has confirmed that with speeds up to 110 mph, a 30-minute express travel time can be achieved between San Jose and San Francisco as required by Proposition 1A (CHSRA 2013). If it is determined to be necessary to analyze speeds greater than 110 mph in the future, additional simulations will be performed to understand the viability and implications of the 100 to 125 mph speed range identified by CHSRA in the 2012 Partially Revised Program EIR (CHSRA 2012d). If speeds beyond 110 mph are ultimately proposed by CHSRA for the Caltrain corridor, they will be evaluated in the separate environmental document for HST service on the San Francisco Peninsula.

creating a 77-mile-long Caltrain corridor, with new stops in South San Jose, Morgan Hill, San Martin, and Gilroy.

The population of the Bay Area is increasing and, with it, traffic congestion. Commute traffic between major employment centers in San Francisco, the San Francisco Peninsula, and the South Bay is growing, and there has been a substantial increase in "reverse commute" trips from San Francisco to Peninsula and South Bay locations over the past decade. Off-peak travel between San Francisco and Peninsula and South Bay locations is also on the rise. Caltrain has experienced increases in ridership as people seek alternate ways to meet these travel needs. Caltrain anticipates continued increases in demand for its rail services over time. To meet that increasing demand, JPB adopted the Rapid Rail Program and has already implemented additional three and four track sections in certain portions of the corridor and introduced the Baby Bullet Service in 2004.

Weekday Caltrain ridership in 1992 reached approximately 21,100 passengers, more than half of whom boarded or alighted at the Caltrain San Francisco terminus. By 2001, weekday Caltrain ridership had increased to approximately 34,000 passengers, with 38 percent boarding or alighting at the San Francisco terminus. Ridership dropped to approximately 27,000 daily passengers in 2003 as a result of declining economic conditions in the Bay Area, but rebounded to approximately 30,000 by 2004 following introduction of the Baby Bullet service. By 2008, average daily ridership reached 37,000 and, by 2013, average daily ridership had grown to approximately 47,000.

The following sections detail current and future transportation needs in the Caltrain corridor that would be addressed by the Proposed Project.

1.3.1 Current and Future Transportation Demand in the Caltrain Service Area

1.3.1.1 Current and Future Employment in the Caltrain Corridor

Current San Francisco Downtown Area Employment. Employment has continued to grow in San Francisco. From 1990 to 2000, employment in San Francisco increased approximately 10.6 percent; from 2000 to 2010, employment increased 3.9 percent. In 2010, the Downtown San Francisco Priority Development Area (PDA) area had 315,570 employees, 56 percent of the total San Francisco employment (Association of Bay Area Governments and MTC 2012). The Downtown San Francisco PDA contains the downtown neighborhoods of Rincon Hill, Transbay, and mid-Market. It also encompasses the Transit Center District, the Transbay Redevelopment Area, the Yerba Buena Center area, Van Ness Avenue, Japantown along Geary Boulevard, and the broad corridor around the Muni J line (Association of Bay Area Governments et al. 2013).

Anticipated Future San Francisco Employment. Based on Association of Bay Area Governments (ABAG) 2013 Projections, employment is expected to increase by approximately 34 percent between 2010 and 2040, with growth concentrated in a few areas (ABAG and MTC 2013). Between 2010 and 2040, the Downtown San Francisco PDA is projected to experience an increase in employment of approximately 17 percent. Employment in the Mission Bay area is projected to grow by almost 900 percent. Employment in the ~~Transbay terminal~~ TTC area is projected to grow by almost 400 percent. These changes will shift the balance of downtown San Francisco employment concentration somewhat southward, although the downtown area will retain its lead in all City employment. ABAG anticipates that by 2040, this area will still contain approximately 49 percent of citywide employment (ABAG and MTC 2012). The Proposed Project would terminate at the San

Francisco 4th and King Station; a substantial amount of the growth in San Francisco would occur within walking distance to this station. Under a separate project, the Transbay Joint Powers Authority will build an extension of the line from 4th and King to the TTC. Table 1-1 summarizes anticipated changes in San Francisco employment by workplace location.

Table 1-1. Anticipated Changes in San Francisco Employment 2010–2040

Jurisdiction or Area Name	2010 Employment	% of Total	2040 Employment	% of Total	% Change 2010–2040
Downtown	315,570	55.5	368,140	48.5	16.7
Mission Bay	2,770	0.5	27,200	3.6	882.0
Transbay ~~Terminal~~ Transit Center	7,950	1.4	37,660	5.0	374.0
Remainder of City	242,430	42.6	326,470	43.0	34.6
San Francisco Total	**568,720**	**100.0**	**759,470**	**100.0**	**33.5**

Source: ABAG and MTC 2012.

Current South Bay and Peninsula Employment. In both 2000 and 2010, Santa Clara County, with its fast-growing, high-technology companies, had the greatest number of jobs of all Bay Area counties. From 2010 to 2012, San Mateo and Santa Clara Counties experienced employment increases of 7 and 6 percent, respectively.

Future Peninsula Employment. Between 2010 and 2040, San Mateo County employment is expected to grow by 29 percent, while Santa Clara County employment growth is forecast at 33 percent. In 2040, Santa Clara County employment is expected to total 1.2 million jobs, 26 percent of total Bay Area employment. San Mateo County is expected to have 445,000 jobs in 2040.

The three counties of the Caltrain Peninsula Corridor are projected to have 2.4 million jobs in 2040, more than half of the employment in the Bay Area (ABAG and MTC 2013). Because of the constraining geography of the Peninsula, many of these jobs will be within a short distance of the Caltrain tracks. In addition, corridor travel demand is two-directional. In February 2013, morning peak-period Caltrain ridership (i.e., before 9:00 a.m.) was 60 percent northbound and 40 percent southbound. The reverse commute (i.e., southbound in the morning and northbound in the afternoon and evening) grew by 8.5 percent from 2012 to 2013 (Caltrain 2013).

1.3.1.2 Characteristics of Work Trips in the Peninsula Corridor

Journeys to Downtown San Francisco Employment

Year 2010 U.S. Census journey-to-work data indicate that approximately 14 percent of work trips to San Francisco come from San Mateo and Santa Clara Counties, while more than half come from San Francisco. San Francisco-originating work trips had the highest transit mode share (34 percent transit) of all Bay Area residence regions. In 2011, of the 265,164 San Francisco workers who commuted from outside of the City and County (of which 75,047 were from San Mateo County and 9,570 were from Santa Clara County), 38 percent drove alone (U.S. Census 2013).

More San Mateo and Santa Clara county residents drove alone to jobs in San Francisco than San Francisco and East Bay residents. The Proposed Project would improve commuter rail service, making it more attractive to South Bay and Peninsula workers commuting to San Francisco.

Journeys to South Bay and Peninsula Employment

According to the 2006–2010 American Community Survey (ACS), relatively high proportions of San Mateo and Santa Clara county jobs are filled by county residents. Fifty-eight percent of San Mateo County workers reside within the county, while San Francisco and Santa Clara counties each providing 12 percent of the San Mateo County workforce. Seventy-seven percent of Santa Clara County jobs are filled by county residents, with 5 percent coming from San Mateo County and 2 percent from San Francisco (MTC and ABAG 2010).

Use of transit for work trips by Peninsula residents is much lower than for San Francisco residents. According to the 2010 Census, only 2 percent of travel to work by Santa Clara County residents was on public transit, compared with 33 percent of work trips on public transit by residents of San Francisco. In San Mateo County, 8 percent of residents use public transit to get to work, a higher percentage than in Santa Clara County, but well below that of San Francisco County. The high-tech employment boom in the Caltrain corridor from San Jose to South San Francisco has, however, increased the absolute demand for transit, if not the mode share.

Caltrain boardings in Santa Clara and San Mateo Counties are continuing to grow. From 2012 to 2013, boardings grew by 9 percent in San Mateo County and 13 percent in Santa Clara County. By supporting improved Caltrain service—in concert with other transit improvements in the Corridor—the Proposed Project would better serve the Peninsula-based and reverse commuter ridership.

1.3.1.3 Other Peninsula Travel Served by Caltrain

Off-peak trips comprise approximately one-fifth of the person trips made in the region daily. Caltrain provides an important off-peak travel service. From 2012 to 2013, midday off-peak ridership increased by 24 percent. Weekend travel using Caltrain is also significant. In 2011, weekend Baby Bullet trains were added as a pilot program. Due to their success, two Baby Bullet trains run on weekends in each direction at present. In 2013, an estimated 13,846 passengers used Caltrain on Saturdays for trips within the corridor; Sunday trips averaged 10,448 passengers (Caltrain 2013).

1.3.1.4 Influence of Changes in Gas Prices

The long-term rise in gas prices has contributed to increased use of public transportation. Commuting to work by automobile has decreased approximately 4 percent in Santa Clara and San Mateo Counties from 2000 to 2010 in part due to increases in gas prices as well as traffic congestion and other factors. Regional commuter transportation systems, including Caltrain, would be the logical beneficiaries of a shift from private autos to public transportation, because these systems accommodate the home-work trip. Home-work trips constitute the largest share of person trips and they are the easiest trips to shift modes, assuming convenient origin-destination pairs. Should gasoline prices remain at high levels over the long-term or increase further, increased Caltrain ridership from this source would be reasonable to expect.

1.3.2 Current and Future Roadway Congestion in the Caltrain Corridor

Economic growth and the corresponding demand for transportation services in the San Francisco Bay Area have exceeded the region's ability to provide the needed roadway capacity. Existing demand for north-south travel along the Peninsula via U.S. Highway 101 (U.S. 101) and Interstate 280 (I-280) regularly exceeds existing highway capacities and results in congestion that is increasing in both frequency and duration. US 101 is the most severely congested freeway through the corridor (MTC 2009). Between San Francisco and San Jose, many roadway segments are at or over capacity during the peak commute hour. Caltrans travel time and speed studies indicate that major delays occur on both US 101 and I-280. The peak congestion generally results from traffic going into Silicon Valley in the morning and going out in the afternoon.

Based on Caltrans' most recent travel time and speed studies for 2008, the most congested highway segment was US 101 in Santa Clara County from Fair Oaks Avenue (Sunnyvale) to Oakland Road (San Jose) during afternoon commute hours. Motorists on this 7-mile segment experienced a daily delay of approximately 3,810 vehicle hours. The second most congested highway segment was US 101 in San Mateo County from Whipple Avenue (Redwood City) to Hillsdale Boulevard (San Mateo) during afternoon commute hours. Motorists on this 5-mile segment experienced daily delay of approximately 2,440 vehicle hours. The third most congested highway segment was on the parallel I-280 in Santa Clara County from Meridian Avenue (San Jose) to Wolfe Road (Cupertino) during morning commute hours. Motorists on this 5-mile segment experienced daily delay of approximately 2,120 vehicle hours. US 101 in San Mateo County from Hillsdale Boulevard (San Mateo) to 3rd Avenue (San Mateo) during morning commute hours was the fourth most congested segment. Motorists experienced daily delay of approximately 1,580 vehicle hours on the 2-mile segment.

Without future roadway improvements, congestion on corridor freeways is bound to worsen to the point at which travel would partially divert to surface routes and the peak periods would spread both into the midday and to later in the evening. Bottlenecks would continue to constrain movement through the corridor. ABAG Projections 2013 indicates that job growth in the Bay Area is expected to increase approximately 33 percent between 2010 and 2040 (ABAG and MTC 2013). The resultant new transportation demand will lead to high levels of congestion that will take a toll on economic development by constraining goods and people movements.

Opportunities to improve highway capacity are constrained by a number of factors, including funding availability, the need for extensive and costly ROW acquisitions, and potentially adverse environmental impacts, such as displacements of residences and businesses, and impacts on natural resources and redesign of local roadways beyond the interchanges. For these reasons, substantial capacity improvements to US 101 and I-280 cannot be relied upon to fully address long-term travel demands in the corridor. In this environment, Caltrain provides an essential and viable transportation alternative to costly highway capacity expansion. By reducing trip times and increasing transit ridership, the Caltrain Proposed Project would help to ease congestion on Peninsula and South Bay freeways.

1.3.3 Corridor Air Quality and Greenhouse Gas Emissions

High rates of auto ownership and increasing vehicle miles of travel (VMT) have contributed to air quality problems throughout California. Pollutants of concern include ozone (O_3); nitrogen oxides (NO_X) and sulfur dioxides (SO_2) (precursors of smog); carbon monoxide (CO); and particulate matter (PM). Greenhouse gases (including carbon dioxide, nitrous oxide and methane) are now a focus of environmental planning in California because of their role in global climate change. Motor vehicles are substantial contributors to the production of all of these pollutants.

The San Francisco Bay Area's air quality has improved in recent years, largely in response to technological improvements in motor vehicles and fuels that are less polluting. The project study area for air quality is within the San Francisco Bay Area Air Basin (SFBAAB), for which local air quality conditions are regulated by the Bay Area Air Quality Management District (BAAQMD). Despite this progress, the SFBAAB is still designated a nonattainment area for the 8-hour federal standards for ozone and PM2.5 (particulate matter smaller than 2.5 microns in diameter), a maintenance area for the federal CO standard, and an attainment/unclassified area for the federal PM10, NO_2, SO_2, and lead standards. With respect to the California standards, the SFBAAB is currently a serious nonattainment area for the 1-hour ozone standard, a nonattainment area for the 8-hour ozone, PM2.5, and PM10 standards, and an attainment area for all other standards.

A number of ambient air quality monitoring stations, maintained by BAAQMD, are located in the Bay Area to monitor progress toward air quality standards attainment. Six BAAQMD monitoring stations are on or near the Caltrain route. Chapter 3, Section 3.2, *Air Quality*, provides a summary of data collected at these stations and a discussion of the total number of days that state and federal ambient air quality standards were exceeded.

Because transportation is the major contributor to ozone precursors, increasing auto travel threatens the area's improvement in air quality. Growing congestion will add to the potential problems because of increased emissions of vehicles operating in stop-and-go traffic. Shifting commuters and other travelers to higher occupancy modes is highly desirable as a means to partially offset the effects on air quality produced by the growth in auto travel. Improved Caltrain service offers the greatest potential for increased high-occupancy travel along the San Francisco Peninsula, particularly in southern San Mateo County and Santa Clara County, the areas with the most severe air quality problems in the corridor. Based upon projections of potential Caltrain use in 2020, approximately 234,000 VMT would be removed from corridor roadways daily as a result of electrifying the Caltrain service (see Chapter 3, Section 3.14, *Transportation and Traffic*.)[4]

Equally important, the Proposed Project would substantially reduce diesel train emissions in the Caltrain corridor and result in a net decrease in criteria air pollutant emissions, even taking into account the indirect emissions associated with electricity consumption. The reduction of diesel emissions would help to improve regional air quality and reduce the localized emissions of toxic air contaminants associated with diesel particulate matter into the communities surrounding the Caltrain ROW and stations, which would be a substantial local health benefit.

Most of the communities in the Peninsula Corridor have adopted climate action plans to lower their community contributions of greenhouse gas emissions, with all seeking to lower transportation emissions given that transportation is usually the largest source of such emissions in most areas. As

[4] With fully electrified service and the Downtown Extension to the ~~Transbay Terminal~~ TTC~~,~~ VMT would be reduced by approximately 618,000 VMT in 2040 (see Appendix I, *Ridership Technical Memorandum*).

noted above, California has ambitious goals to reduce greenhouse gas emissions throughout the state. By reducing vehicle travel on regional roadways and replacing diesel locomotives with cleaner EMUs, the Proposed Project would also help Peninsula communities and California as a whole to meet their goals for greenhouse gas reductions.

1.3.4 Modernizing the Caltrain Service

Improving the appearance and attractiveness of Caltrain to potential consumers has long been suggested as a means of increasing ridership. Caltrain put new diesel locomotives and bi-level passenger cars into service as part of the "Baby Bullet" express service program in 2004. Rider response to this service has demonstrated the benefits of modernizing image, improving passenger comfort, and reducing travel times between major origins and destinations. The increase in ridership associated with the introduction of the Baby Bullet and new passenger cars suggests that there is an unmet demand for rapid transit along the Peninsula corridor. The existing Caltrain service cannot serve all Caltrain stations without a corresponding increase in travel time. With the Proposed Project, additional stops could be added (optimized stops) without loss of travel times and/or travel times could be reduced.

1.3.5 Accommodating Future High-Speed Rail

In June 2000, CHSRA issued its *Final Business Plan for Building a High-Speed Train System for California*. This document recommended that the governor and state legislature prepare a state-level program EIR and federal-level Environmental Impact Statement (EIS) for a statewide high-speed train network. The Final Program EIS/EIR was completed in August 2005. The Caltrain corridor is presented in the 2000 CHSRA Business Plan as an alignment for Bay Area access. In addition, Proposition 1A identified San Francisco's TTC as the northern terminus for a bullet train from Los Angeles to the Bay Area. CHSRA subsequently issued a program-level environmental analysis of the Bay Area to Central Valley alignments that identified Pacheco Pass and the Caltrain alignment as its preferred alternative.

An electrified Caltrain system would set the stage for an expanded modern regional electric train service and a statewide HSR service. The Proposed Project facilities evaluated herein would be designed to accommodate HSR service, as well as Caltrain service. The term "accommodate" is being used in this case to mean that the Caltrain Proposed Project would install the same type of power supply and distribution system proposed for the HSR system. It is important to note that PCEP is a *separate* project from the HSR project. Other improvements needed to enable high-speed trains to use the Caltrain line would be evaluated in a separate environmental process conducted by CHSRA as the lead agency for the HSR project.

Extension of Caltrain from its present 4th and King Streets terminus to the site of the ~~Transbay Terminal~~ TTC was evaluated in a separate environmental document, the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project EIS/EIR, by FTA, the City and County of San Francisco, the San Francisco Redevelopment Agency, and the JPB. The Final EIS/EIR was certified in 2004 and the Record of Decision on the EIS was issued in February 2005. The ~~Transbay Terminal~~ TTC project includes electrification of the Caltrain line from 4th and King Streets to the ~~Transbay Terminal~~ TTC. Subsequent addenda have been completed between 2005 and the present and a Supplemental EIS/EIR is presently being prepared for certain limited proposed changes to the design of the project.

1.4 Purpose of Project

The primary purposes of the Proposed Project are to improve train performance and reduce costs, reduce long-term environmental impact by reducing noise and vibration, improve regional air quality and reduce greenhouse gas emissions, and provide electrical infrastructure that would be compatible with separate later use for Blended Service. An electrified Caltrain system would address Peninsula commuters' vision of an environmentally friendly and reliable service. Electrification also is expected to help accommodate increased system ridership through improved system operations.

Electrification would modernize Caltrain and supports increased service levels and it offers several advantages in comparison with existing diesel power use. These benefits serve the primary purposes of the Proposed Project. These purposes embody the project objectives required by CEQA, as follows:

- **Provide electrical infrastructure compatible with high-speed rail:** An electrified Caltrain system would set the stage for an expanded modern regional electric express service and for future blended HSR service. While the Proposed Project would not include all infrastructure necessary to implement HSR service in the corridor (such as HSR maintenance facilities, station platform improvements, or passing tracks), the electrical infrastructure (such as overhead wire systems) would accommodate future Blended Service, and the Proposed Project would not preclude HSR.

- **Improve train performance, increase ridership and increase service:** The Proposed Project envisions the use of EMUs, which are self-propelled electric rail vehicles that can accelerate and decelerate at faster rates than diesel-powered trains, even with longer trains. With EMUs, Caltrain could run longer trains without degrading speeds, thus increasing peak-period capacity. Electrification performance would support increased peak service levels from the current five trains per peak hour per direction to six with existing trackage.

  A substantial portion of a Caltrain trip is spent accelerating and decelerating between stations because of Caltrain's close-set station stops. For the same service profile of stops, EMUs can provide travel time reductions. Alternatively, due to the time savings, additional stops could be added without increasing existing total transit time from San Jose to San Francisco. Travel time savings and/or additional stops are expected to stimulate additional Caltrain ridership. By providing electric trains, Caltrain will also be able to use the DTX to reach the TTC and serve Downtown San Francisco, which will also increase ridership.

- **Increase revenue and reduce fuel cost**: Anticipated increased ridership would increase fare revenues, and conversion from diesel to electricity would reduce fuel costs. These efforts would substantially reduce but not eliminate the need for financial subsidy.

- **Reduce environmental impact by reducing noise emanating from trains**: Noise emanating from the passage of electrified train sets is measurably less than diesel operations. With the increases in peak and off-peak Caltrain service that are either under way or planned for implementation during the next decades, electrification would be an important consideration for reducing noise of train passersby and maintaining Peninsula quality of life. Train horns would continue to be sounded at at-grade crossings, consistent with FRA and California Public Utilities Commission (CPUC) safety regulations, whether or not electrification is pursued.

- **Reduce environmental impact by improving regional air quality and reducing greenhouse gas emissions:** Electric operations would produce substantial reductions in

corridor air pollution emissions when compared with diesel locomotives, even when the indirect emissions from electrical power generation are included in the analysis. In addition, the increased ridership allowed by the Proposed Project would reduce automobile usage, thereby resulting in additional air quality benefits. Electrically powered trains are more energy efficient than diesel-electric trains. Reduced energy use also translates into reduced air emissions. Reductions in air pollutant emissions represent long-term health benefits for Caltrain riders, and for residents and employees along the Caltrain corridor. In addition, reduction of greenhouse gas emissions with electrification would help California to meet its goals under AB 32, the 2006 Global Warming Solutions Act, as well as post-2020 state greenhouse gas emission reductions goals.

1.5 Environmental Review Process

1.5.1 California Environmental Quality Act

1.5.1.1 General Requirements

CEQA applies to all discretionary activities proposed to be implemented by California public agencies, including state, regional, county, and local agencies (California Public Resources Code Section 21000 et seq.). CEQA requires agencies to estimate and evaluate the environmental impacts of their actions, avoid or reduce significant environmental impacts when feasible, and consider the environmental implications of their actions prior to making a decision. CEQA also requires agencies to inform the public and other relevant agencies and consider their comments in the evaluation and decision-making process. The State CEQA Guidelines are the primary source of rules and interpretation of CEQA. (California Public Resources Code sections 21000 et seq.; 14 California Code of Regulations (CCR) 15000 et seq.).

1.5.1.2 Independent Utility

CEQA requires an EIR to analyze "the whole of a project" (CEQA Guidelines Section 15378) and prohibits "piecemealing" or "segmentation." Piecemealing applies to artificially dividing a single, integrated project into segments so as to not reveal its full extent. Piecemealing a project could result in improper disclosure of environmental effects. There are several tests that are applied to a project in order to evaluate whether or not it is improperly piecemealing analysis.

There are several tests that are applied to a project in order to evaluate whether or not it is improperly piecemealing analysis:

- **Independent Utility**: Can the project stand on its own with all the physical improvements included in the project description or does it require additional actions that are not analyzed in the project EIR? In this case, all the necessary infrastructure and rolling stock necessary to provide Caltrain electrified service is included in the project description and analyzed in this EIR. Operating a Caltrain electrified service does not physically require operation of blended high-speed rail service. All of the project elements included in the PCEP EIR are required to provide Caltrain electrified service. If blended high-speed rail service does not occur for any reason in the future, Caltrain electrification can fully function as intended to provide Caltrain commuter electrified service. There are no unnecessary elements to the PCEP included solely to serve or facilitate high-speed rail in the future. Electrified 25 kVA systems using overhead

contact systems are one of the most common platforms for electrified service in the world and a proven technology. Long-before the 2008 Proposition 1A or any discussion of a blended system, Caltrain was already envisioning electrification using a 25 kVA overhead contact system and electrified trains (as demonstrated by the 2000 Notice of Preparation for the prior EIR, the 2004 Caltrain DEIR, and the 2009 EIR, all of which describe using a 25 kVA overhead contact system). That HSR would also use a 25 kVA OCS system only demonstrates the commonality and utility of this technology for electrified rail systems, whether for commuter or intercity purposes.

- **Logical Termini**: Does the project have logical end points in terms of fully disclosing all elements of the project and providing for an independently functioning project? Improper piece-mealing can occur if a portion of a project is included in the project description that requires completion in an undisclosed future process in order to operate. For example, this could occur if one only disclosed electrification along a portion of the intended route and someone else had to complete the rest of the electrification at some future date in order for the project to operate. That is not the case here: The PCEP project description includes a full end to end description of the infrastructure and operation of EMUs to complete the project's purposes.

- **Environmental Evaluation/Impact Disclosure:** Another consideration is whether evaluation of the current project in any way avoids environmental review of future projects or avoids disclosure of impacts of the current project. In no way does evaluation of the PCEP in the current EIR circumvent or preclude future environmental review of high speed rail service. First, and foremost, high-speed rail service will require its own separate environmental review conducted by CHSRA as the lead agency for such any project. Second, the PCEP EIR discloses the potential environmental impacts of blended service, as they can be understood at the conceptual level, in the cumulative analysis, so that the reader is fully aware that: 1) high speed rail service has been proposed by CHSRA; 2) there are distinct potential environmental impacts of high-speed rail service on the Caltrain corridor; and 3) the potential contribution of Caltrain electrification to cumulative impacts when considering high-speed rail service is disclosed. At this time, there is no actual design for high-speed rail service on the Caltrain corridor – thus the specifics necessary to fully analyze HSR impacts at this time are not available.

CEQA court decisions validate the approach taken in this EIR. For example, the 2012 decision in *Banning Ranch Conservancy v. City of Newport Beach* (2012) 211 Cal.App.4th 1209 is of particular relevance. At issue in that case was whether installing a road that would serve two different projects – one a city park, the other a private development proposal – required both projects to be considered in the same EIR. The City prepared two separate EIRs and the court upheld that approach. As stated in the court's ruling:

> "….two projects may properly undergo separate environmental review (i.e., no piecemealing) when the projects have different proponents, serve different purposes, or can be implemented independently. (Communities for a Better Environment v. City of Richmond (2010) 184 Cal.App.4th 70, 99 [108 Cal. Rptr. 3d 478] (CBE) [refinery upgrade and construction of pipeline exporting excess hydrogen from upgraded refinery were "independently justified separate projects with different project proponents"]; Planning & Conservation League v. Castaic Lake Water Agency 2009) 180 Cal.App.4th 210, 237 [103 Cal. Rptr. 3d 124] (Castaic Lake) [water transfer had "significant independent or local utility" from broader water supply agreement, and would be implemented with or without it]; Sierra Club v. West Side Irrigation Dist. (2005) 128 Cal.App.4th 690, 699 [27 Cal. Rptr. 3d 223] (West Side Irrigation) [two water rights

> assignments to city were "approved by different independent agencies" and "could be implemented independently of each other"]; Plan for Arcadia, supra, 42 Cal.App.3d at p. 724 [shopping center EIR could exclude road work the city had "long before" decided would be needed due to new freeway].)"

The two projects have different proponents (JPB for the PCEP; CHSRA for HSR).

The two projects have different purposes. The purpose of the PCEP is to upgrade an existing commuter railroad serving the San Francisco Peninsula by replacing diesel service with electrified service and expanding service between San Jose and San Francisco with multiple local stops in between. The high-speed rail project is an inter-city rail project intending to provide rapid rail service between distant cities, including between San Francisco and Los Angeles, among other destinations. Caltrain electrified service can physically be implemented without high speed rail service.

The two projects have independent utility as described above. Is electrification of the Caltrain corridor necessary in order to operate electrified high-speed rail trains? Yes. But does analysis of the PCEP in a separate EIR avoid any disclosure of potential environmental impacts of high-speed rail service or avoid any necessary separate environmental review of high-speed rail service and any necessary improvements.? No. That is the fundamental test regarding segmentation under CEQA.

Review and approval of the PCEP does not provide the improvements necessary to operate HSR on the California corridor. First, the rest of the HSR system from south of San Jose must be completed in order for HSR service from San Jose to San Francisco to fulfill its intercity purpose. With the PCEP, there is still no physical way for HSR to connect to the Caltrain corridor from the south; additional improvements are necessary. Second, the PCEP does not include any platform improvements (such as at Diridon station in San Jose or at Millbrae station) to allow for separate HSR platforms which would allow for passengers to access HSR or any improvements to platforms to allow HSR passengers to access HSR trains at existing Caltrain stations. Third, as described in the cumulative analysis in the EIR, in order to operate a blended system with 6 Caltrain trains and 4 HSR trains per peak hour per direction (which is the current conceptual plan for blended service), passing tracks would also be necessary (and the locations for passing tracks are yet to be determined). Fourth, in order to meet service goals for HSR, which envisions speeds faster than the current allowable speed of 79 mph up to 110 mph on the Caltrain corridor, system improvements to be determined later would be necessary on the route to allow for an increase in top speed.

Review and approval of the PCEP does not make HSR service on the Caltrain Corridor an inevitability. Neither does provision of approximately $600 million in funds from Proposition 1A for electrification provide the improvements described above for HSR service on the Caltrain Corridor; the funding only provides electrified infrastructure in terms of poles and wires and traction power facilities.

Further, it is premature to analyze HSR service along the Caltrain corridor at this time given the conceptual level of definition of HSR service and necessary physical improvements. There is no specific design yet for blended system improvements that could support a project level analysis and it will take a number of years of further planning and design in order to actually frame the blended system and the project details. In contrast, there is already a preliminary design for the PCEP that does allow for that project-level analysis in this EIR.

Caltrain electrification also has independent utility from HSR. Caltrain electrification is planned to be in operation starting in 2020, which can then immediately start to provide project benefits in terms of improved service, lower fuel costs, improved air quality, lower greenhouse gases, and lower operational subsidy for Caltrain compared to that of a diesel system. Current plans for HSR in the 2014 Business Plan envision the earliest date for HSR service on the Caltrain Corridor would be 2027, thus the PCEP would provide project benefits for a minimum of 8 years before HSR service occurs on the corridor. More critically, HSR is designed to provide intercity rail services between Northern California, the Central Valley, and Southern California with only a few stops on the Caltrain corridor -in San Jose, Millbrae (and possibly Redwood City) and San Francisco whereas the PCEP is intended to provide electrified commuter rail services between San Jose and San Francisco with stops at numerous locations along the statewide route. In order for Caltrain to start providing electrified service in 2020, it is necessary to complete the environmental process now to allow for the approximately four years it will take to complete the PCEP final design, construct the system, and complete testing and commission by 2020. Since it will take a number of years of a planning process to figure out a specific design for the blended system, as well as the time to complete environmental analysis of the blended system, delaying the environmental process for both the PCEP and the HSR together would delay the ability to derive project benefits from the PCEP as soon as possible.

Thus, it is completely appropriate and fully in compliance with CEQA requirements and precedent to analyze the PCEP in the current EIR, disclosing the potential future cumulative impacts with high-speed rail in the cumulative section of the current EIR based on the current conceptual understanding of that future project, and completing separate environmental review of high-speed rail service in a separate future document.

1.5.1.3 Pre-Emption of CEQA by Federal Law

The JPB is a federally-regulated rail carrier, pursuant to proceedings before the Interstate Commerce Commission (predecessor to the Surface Transportation Board) related to the acquisition of the Peninsula rail corridor in 1991. A number of court and regulatory decisions have held that the construction, improvement and operation of federally-regulated railroads are exempt from state environmental regulatory laws, including CEQA. (See *Friends of the Eel River v. North Coast Railroad Authority*, (October 17, 2014, A139222) Cal.App.4th; *City of Auburn v. U.S. Government* (9th Cir. 1998) 154 F.3d 1025, 1027-1031); the City of Encinitas, CA ((North San Diego County Transit Development Board Petition for Declaratory Order, No. FD 34111, 2002 WL 1924265 (August 19, 2002); and *City of Encinitas v. North San Diego County Transit Development Board* (2002 US Dist. LEXIS 28531, 2002 WL 34681621). These decisions have all held that state and local environmental regulation of railroad construction and operations are pre-empted by federal law.

Despite the absence of a legal obligation on the part of the JPB to prepare and certify an EIR for the Peninsula Corridor Electrification Project, the JPB has decided to complete this document and make the findings that CEQA otherwise would require when applicable. By taking this action, the JPB desires to fulfill the fundamental policies and objectives of CEQA in terms of providing the public and decision makers with detailed information about the potential effects that the project is likely to have upon the environment. By having voluntarily adhered to the strictures of CEQA, however, the JPB does not intend to waive its ability to assert that CEQA is preempted by federal law. In short, the JPB expressly preserves its ability to assert preemption if legal challenges to the EIR are initiated. Notwithstanding any position the JPB may take regarding the preemption of CEQA, the JPB will

remain fully committed to implementing the mitigation measures that will be adopted as conditions for any approval of the project.

1.5.2 Purpose of this EIR

The purpose of the EIR is to provide the information necessary for the JPB to make an informed decision about the Proposed Project, and to supply the information necessary to support related permit applications and review processes.

This Draft EIR has been prepared in compliance with CEQA to achieve the following goals.

- Identify potential direct, indirect, and cumulative environmental impacts associated with the Proposed Project.
- Describe feasible mitigation measures intended to avoid or reduce potentially significant impacts to a less-than-significant level.
- Disclose the environmental analysis, including the potential project impacts and proposed mitigation measures, for public and agency review and comment.
- Discuss potential alternatives to the Proposed Project that meet the purpose and need, are feasible, and would avoid or reduce identified significant project impacts.

One of the purposes of CEQA is to establish opportunities for the public and relevant agencies to review and comment on projects that might affect the environment. Scoping activities are discussed below. The JPB will provide a public review period for this Draft EIR of 60 days from release of the Draft EIR for comment. The JPB will also conduct public meetings to receive comment during the comment period. Once the public review period is complete, the JPB will prepare a Final EIR that includes all the comments received on the Draft EIR, responses to all comments, and any necessary revisions to the Draft EIR. CEQA requires the JPB decision-making body, the Board, to review and consider the information in the EIR before making a decision on the Proposed Project.

1.5.3 Scope and Content of the EIR

Scoping refers to the process used to assist the lead agency (for the Proposed Project, the JPB) in determining the focus and content of an EIR. Scoping solicits input on the potential topics to be addressed in an EIR, the range of project alternatives, and possible mitigation measures. Scoping is also helpful in establishing methods of assessment and in selecting the environmental effects to be considered in detail.

1.5.3.1 Notice of Preparation and Scoping Meeting

The scoping process for this EIR was formally initiated on January 31, 2013, when the JPB submitted the Notice of Preparation (NOP) to the California State Clearinghouse for distribution to state agencies and to the San Francisco, San Mateo, and Santa Clara County Clerks for public posting. The purpose of the NOP is to solicit participation from relevant agencies and from the public in determining the scope of an EIR. The scoping period ended on March 18, 2013.

Public scoping meetings were held on February 27, 2013 at the Caltrain Office, February 28, 2013, at Palo Alto City Hall, March 5, 2013 at VTA Headquarters, and March 7, 2013 at San Francisco City Hall to provide an opportunity for attendees to comment on environmental issues of concern.

Written and oral comments received during the scoping process are on file at JPB offices (1250 San Carlos Avenue, San Carlos, CA) and included in the scoping summary report in Appendix A.

1.5.3.2 Resource Topics

Consistent with Appendix G of the State CEQA Guidelines, this Draft EIR evaluates the potential impacts of the Proposed Project for the following resource areas.

- Aesthetics
- Air Quality
- Biological Resources
- Cultural and Paleontological Resources
- Electromagnetic Fields (EMF) and Electromagnetic Interference (EMI)
- Geology, Soils, and Seismicity
- Greenhouse Gas Emissions and Climate Change
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Recreation
- Noise and Vibration
- Population and Housing
- Public Services and Utilities
- Transportation and Traffic

The following topics are also analyzed in this DEIR.

- Cumulative impacts
- Significant unavoidable impacts
- Significant irreversible changes in the environment
- Growth inducement
- Alternatives to the Proposed Project

Although agricultural and mineral resources are identified in Appendix G of the State CEQA Guidelines, this EIR analysis does not include these topics because there would be no impact, as described in Chapter 3.

1.6 EIR Organization

This DEIR is organized as described in the chapters and appendices listed below.

- Chapter 1, *Introduction*, includes a brief overview of the Proposed Project; an overview of the environmental review process; and the scope, content and organization of the Draft EIR.

- Chapter 2, *Project Description*, includes a comprehensive description of the Proposed Project.
- Chapter 3, *Setting, Impacts, and Mitigation Measures*, includes an evaluation of the resource topics outlined above. Each resource-specific section discusses the environmental setting, impacts, and mitigation measures.
- Chapter 4, *Other CEQA-Required Analysis*, includes a discussion of cumulative impacts, significant environmental impacts that cannot be avoided, significant irreversible changes in the environment and growth-inducing impacts.
- Chapter 5, *Alternatives*, includes a description of the project alternatives considered, and evaluation of several alternatives to the Proposed Project.
- Chapter 6, *Report Preparation*, includes a list of staff who contributed to preparation of the Draft EIR.
- Chapter 7, *References*, includes a list of the printed references and personal communications cited in the Draft EIR.
- Appendices
  - A. *NOP and Scoping Summary Report*
  - B. *Air Quality and Greenhouse Gas Analysis Technical Data*
  - C. *Noise and Vibration Technical Report*
  - D. *Transportation Analysis*
  - E. *Cultural Resources Programmatic Agreement*
  - F. *Tree Inventory and Canopy Assessment*
  - G. *Biological Resources Information*
  - H. *Land Use Information*
  - I. *Ridership Technical Memorandum*
  - J. *Preliminary Overhead Contact System/Electrical Safety Zone/Tree Impact Maps*
  - K. *Key Assumptions for Alternative Analysis*