



June 8, 2015

Surface Transportation Board
395 E Street, S.W.
Washington, DC 20423-0001

**Re: REQUEST TO EXTEND DEADLINE AND REJECT PENINSULA CORRIDOR
JOINT POWERS BOARD - PETITION FOR DECLARATORY ORDER
Finance Docket No. 35929**

Dear Board Members:

The Surface Transportation Board has received a request from the Peninsula Corridor Joint Powers Board (operators of the Caltrain commuter rail, formerly called the Peninsula Commute Service) for expedited consideration to be declared a rail carrier subject to federal jurisdiction. The board agreed on May 29, 2015 to the request for expedited consideration and gave the public until June 8, 2015 to submit substantive comments. That notice was published in the *Federal Register* on June 3, 2015, giving the public about three working days to respond.

The Alliance for a Cleaner Tomorrow urges the Surface Transportation Board to extend the deadline for comments so that more parties can take the time to understand the issue and respond constructively. In addition, this letter urges the Surface Transportation Board to look closely at the content of the Final Environmental Impact Report under the California Environmental Quality Act and then reject the petition on the basis of what is revealed in that report.

The Peninsula Corridor Joint Powers Board wants this declaration so that federal law (the National Environmental Policy Act) for environmental review would preempt state law (the California Environmental Protection Act) for environmental review of the Peninsula Corridor Electrification Project. As acknowledged in the petition, such a decision would allow the Peninsula Corridor Joint Powers Board to evade a lawsuit claiming that the agency failed to fulfill requirements of the California Environmental Quality Act (CEQA) in its review of the Peninsula Corridor Electrification Project. The Peninsula Corridor Joint Powers Board is the lead agency for the Peninsula Corridor Electrification Project Final Environmental Impact Report.

This petition portrays the Peninsula Corridor Electrification Project of the Peninsula Corridor Joint Powers Board as analogous to the Fresno to Bakersfield project segment of the California High-Speed Rail Authority. That segment of California High-Speed Rail was determined by the Surface Transportation Board to be a matter of interstate commerce.

Because electrification of the Peninsula Corridor is compatible with a vision for California High-Speed Rail trains to run on the track, the Peninsula Corridor Joint Powers Board contends the Corridor Electrification is therefore related to interstate commerce. In addition, the Peninsula Corridor Joint Powers Board claims that it allows Union Pacific Railroad Company to operate some freight trains on Caltrain track, thus making the Corridor Electrification project a matter of interstate commerce. Finally, the Peninsula Corridor Joint Powers Board uses its keen powers of intuition to conclude that the lawsuit is an attempt to interfere with interstate commerce.

Why Is a Commute Between Burlingame and San Carlos Interstate Commerce?

In reality, the Peninsula Corridor Electrification Project is simply a means to provide a different energy source for existing transport of commuters via Caltrain on the Peninsula between San Francisco and San Jose. This project will allow Caltrain commuter trains on existing lines to be propelled by electricity instead of diesel engines. Any claims about the project that extend to intercity high-speed rail service are based on theoretical visions and concepts that may or may not happen. The Executive Summary and Project Description of the Final Environmental Impact Report (see Attachment A) shows the Peninsula Corridor Electrification Project is not part of the California High-Speed Train system.

Caltrain Commuter Service Will Be the Only Certain Beneficiary of the Electrification

Section 2.2 (Project Description - Background) specifically describes “Corridor Electrification” without any references to use of the electric wires for anything other than Caltrain service. It also says that “future proposed action to expand service beyond 114 trains per day may require additional environmental review” but notably does not mention expanding service to include high-speed rail:

Corridor Electrification: The JPB decided to prepare this new EIR for the corridor electrification due to the changes in existing conditions that have occurred along the corridor since the prior EIR analyses was conducted, to update the environmental analysis, and to update the cumulative analysis of Blended Service and other cumulative developments along the corridor. Completion of a new EIR will also allow public agencies, stakeholders, the public and decision-makers the opportunity to review and comment on the Proposed Project’s environmental effects in light of current information and analyses. This Proposed Project would provide for 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 can be analyzed as a separate project under the California Environmental Quality Act (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 2020/2021. The Proposed Project includes 114 trains per day between San Jose and San Francisco and

six trains per day between Gilroy and San Jose. Future proposed actions to expand service beyond 114 trains per day may require additional environmental review.

How would the Surface Transportation Board conclude from this description that corridor electrification includes high-speed rail? Likewise, Section 2.3.7.1 (Caltrain Operating Scenario(s) Under Electrification) and Section 2.3.7.2 (Ridership) only discuss Caltrain service.

High-Speed Rail Between San Francisco and San Jose Is Nowhere Near Reality

How does the Peninsula Corridor Joint Powers Board try to inject California High-Speed Rail into “Corridor Electrification” for Caltrain service? It declares the following in Section ES.3 (Purposes and Objectives of Project):

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 Blended 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.

Notice this project “sets the stage” and installs electrical infrastructure that “would accommodate” high-speed rail. It does not assert that there will actually be high-speed rail service on the corridor.

Section ES.4.14 (Relation to the High-Speed Rail Project) is even more explicit in stating that much more would need to be done on the corridor before high-speed rail could ever operate there, even with the electrification infrastructure in place. Environmental review can only include a “conceptual analysis” of impacts.

The electrification system envisioned for the corridor would be configured in such a way that it would support the future operation of California HSR. The power supply system of choice for a steel-wheel-on-steel-rail high-speed train operation is 25-kV, 60-Hz, single-phase AC electrification. The Caltrain corridor is currently only rated for a maximum of 79 mph and, thus, there may be need for track and other system upgrades in order to support higher speeds than at present. The Proposed Project includes electrification infrastructure that would first be used by Caltrain and can later be used for high-speed trains. However, the Proposed Project does not include other improvements necessary for high-speed trains such as platform improvements, high-speed rail maintenance facilities, passing tracks or other Core Capacity projects. The Proposed Project does not include improvements to support speeds greater than 79 mph or high-speed rail operations on the Caltrain corridor at speeds up to 110 mph. High-speed rail construction and operations would be the subject of a later, separate

environmental analysis to be conducted by CHSRA and FRA. The cumulative impact analysis in this document does address cumulative impacts of Blended Service (see Chapter 4, Section 4.1, Cumulative Impacts) but only provides a conceptual analysis of those impacts given that HSR design for Blended Service has not been completed.

It mentions “visions” of high-speed rail service in Section 2.2 (Project Description - Background) that are found in three Memorandums of Understanding (MOUs) and the 2012 California High-Speed Rail Business Plan.

Since 2009, the 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 utilize the existing Caltrain Peninsula Corridor. This **vision** for implementing Blended Service was included in the Revised 2012 Business Plan that the CHSRA Board adopted in April 2012 for the California High-Speed Rail System (CHSRA 2012a).

The JPB and CHSRA are committed to advancing a blended system concept. In 2013, the JPB and CHSRA signed a Memorandum of Understanding (MOU) to this effect. This local **vision** was developed with stakeholders interested in the corridor. The blended system would remain substantially within the existing Caltrain ROW and accommodate future high-speed rail and modernized Caltrain service by primarily utilizing the existing track configuration.

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’s modernization program and HSR. The 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 an 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 Francisco to San Jose, and purchasing electrified rolling stock for Caltrain. The MOU also conceptually outlines potential additional improvements

Is a “vision” sufficient to claim that the Final Environmental Impact Report for Corridor Electrification is about California High-Speed Rail as well as Caltrain? Of course not. Using the

electrification infrastructure for high-speed rail is a “vision” that may or may not occur in 2029, the current year that the California High-Speed Rail Authority cites as the start of operations for Phase 1 service between San Francisco and Los Angeles.

The Project Description states the following about the history of developing an Environmental Impact Report for corridor electrification:

The JPB 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 for Caltrain service and for future high-speed rail (HSR) service.

There is no evidence that there has been “resolution of issues regarding joint planning for shared use of the Caltrain corridor for Caltrain service and for future high-speed rail (HSR) service.” For example, there is no resolution of how many high-speed rail trains will run on Caltrain track or how fast they will travel along the corridor. Nor is there any resolution of how Union Pacific Railroad freight trains will share track with high-speed rail trains on the corridor. Instead, the Final Environmental Impact Report appears to have been approved so the Peninsula Corridor Joint Powers Board can spend Prop 1A state grants and other government grants on corridor electrification for Caltrain service.

Anyone Can Speculate on Motivation for a CEQA Lawsuit, So Here’s Another Guess

The Peninsula Corridor Joint Powers Board ascribes motivations to the plaintiffs in the lawsuit challenging the environmental review under CEQA. It charges that the lawsuit is meant “to block the implementation of projects that will benefit rail carriers that are subject to the Board’s jurisdiction.” This accusation overlooks the outrage of many Californians about how certain politically-favored projects such as urban professional sports facilities have recently obtained exemptions from aspects of the California Environmental Quality Act.

A common characteristic of these sports facilities that receive special breaks from CEQA is the commitment of the developers to sign and implement a Project Labor Agreement with construction trade unions. Likewise, efforts to circumvent environmental review of proposed rail transportation projects seem to coincide with Project Labor Agreements.

Construction unions signed a Project Labor Agreement on California High-Speed Rail in August 2013, and in September 2013 the California High-Speed Rail Authority sought a decision from the Surface Transportation Board for federal preemption from CEQA on the Fresno to Bakersfield project segment. The State Building and Construction Trades Council of California even submitted a letter to the Surface Transportation Board in support of preemption. Now construction unions are negotiating a Project Labor Agreement with the Peninsula Corridor Joint Powers Board as it seeks a decision from the State Allocation Board for federal preemption. (See

Attachment B.) It will not be surprising if construction unions submit a letter in support of the Peninsula Corridor Electrification Project preemption.

Note that construction unions have a substantial record of objecting to proposed projects under the California Environmental Quality Act, but their objections seem to be settled, withdrawn, or become dormant right around the time that a developer agrees to a Project Labor Agreement. For some projects, construction unions suddenly convert from being a leading opponent to being a leading supporter. This practice is often called “greenmail” because it insinuates that unions threaten to use environmental “green” laws to block permitting for a project until there is an economic payoff.

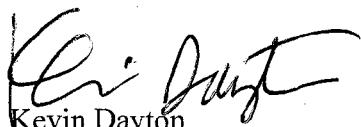
Some would claim that CEQA is more often a labor issue than an environmental issue nowadays. Rather than being seen as an attempt to interfere with interstate commerce, perhaps the CEQA lawsuit against the Peninsula Corridor Electrification Project can be seen as an attempt to protect the California Environmental Quality Act from inappropriate manipulation by groups seeking economic concessions from developers through Project Labor Agreements. In such a case, the Surface Transportation Board should not preempt efforts of California citizens to prevent politically powerful organizations from undermining environmental protections in state law.

This So-Called Vision Is Actually a Desperation Maneuver That Caltrain and the California High-Speed Rail Authority Would Abandon If It Could Get More Funding

Realize that the “blended system” for California High-Speed Rail sharing track with Caltrain is a development outlined in the 2012 California High-Speed Rail Authority Business Plan as a scheme to reduce the 2011 estimated cost of Phase 1 from \$98 billion to \$68 billion. It isn’t a vision; it’s a less desirable alternative to the original plan for California High-Speed Rail to run on dedicated track. If a private investor suddenly emerges with billions of dollars or the federal or state governments suddenly have a windfall to spend on the ideal alignment for California High-Speed Rail, the vision of the Peninsula Corridor Electrification as a matter of interstate commerce goes away.

Again, please extend the deadline for comments and reject the petition.

Sincerely,



Kevin Dayton
on behalf of Alliance for a Cleaner Tomorrow
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Roseville, CA 95661
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kdayton@laborissuessolutions.com

DECLARATION OF SERVICE

I, Kevin Dayton, declare as follows:

I am a resident of the State of California, residing or employed in Roseville, California.

I am over the age of 18 years. My business address is 3017 Douglas Boulevard, Suite 300, Roseville, California 95661.

On June 12, 2015 a true copy of REQUEST TO EXTEND DEADLINE AND REJECT PENINSULA CORRIDOR JOINT POWERS BOARD'S PETITION FOR DECLARATORY ORDER (Docket # FD 35929) was placed in an envelope addressed to:

Gayla L. Thal
Union Pacific Railroad Company
1400 Douglas Street, Stop 1580
Omaha, NE 68179

which envelope, with postage thereon fully prepaid, was then sealed and deposited in a mailbox regularly maintained by the United States Postal Service in Monterey, California,

and true copies were transmitted to the following parties by electronic mail, as agreed to in writing by the parties, addressed to:

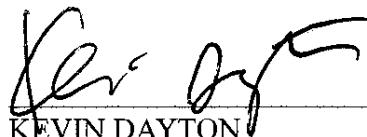
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I declare under penalty of perjury that the foregoing is true and correct and that this declaration was executed this 12th day of June, 2015, at Monterey, California.



KEVIN DAYTON

ATTACHMENT A

Executive Summary

This section summarizes the key findings of this Environmental Impact Report (EIR) for the Caltrain Peninsula Corridor Electrification Project (Proposed Project or PCEP). This section summarizes the Proposed Project's background, purpose and need and objectives, description, costs and funding, environmental impacts and mitigation, alternatives, areas of controversy and areas to be resolved.

ES.1 Project Background

Caltrain trains presently consist of diesel locomotive-hauled, bi-level passenger cars. As of mid-2013, Caltrain operates 46 northbound and 46 southbound (for a total of 92) trains per day between San Jose and San Francisco during the week. Three of these trains start in Gilroy during the morning commute period, and three terminate in Gilroy during the evening commute period. Eleven trains in each direction are "Baby Bullet" express service trains that make the trip between San Francisco and San Jose in less than 1 hour. Service is frequent during the peak periods (five trains per peak hour per direction [pphpds]) and is provided every hour in both directions during the midday. Caltrain provides hourly service in both directions on Saturdays and Sundays (36 trains on Saturdays and 32 trains on Sundays) between San Jose Diridon and San Francisco 4th and King Stations only. Weekend service includes two "Baby Bullet" express service trains per day in each direction. Caltrain also provides extra service for special events such as San Jose Sharks and San Francisco Giants games.

In addition to Caltrain commuter rail service, Union Pacific Rail Road (UPRR) operates approximately six daily freight trains between Santa Clara and San Francisco under a "Trackage Rights Agreement" with Caltrain. From Santa Clara to San Jose, on a joint use corridor, UPRR operates approximately 9 daily freight trains. Three passenger train services also operate on the Santa Clara to San Jose segment: the Capitol Corridor (14 daily trains), the Altamont Commuter Express (ACE, eight daily trains during weekdays only), and the Amtrak Coast Starlight (two daily trains).

The Proposed Project is part of a program to modernize operation of the Caltrain rail corridor between San Jose and San Francisco. There is a lengthy history of planning for modernization of the Caltrain Peninsula Corridor. Modernization projects include the installation of an advanced signal system and the electrification of the rail line. The advanced signal project (Caltrain Communications Based Overlay Signal System Positive Train Control (commonly referred to as CBOSS PTC or CBOSS)), and corridor electrification are discussed below. The Peninsula Corridor Joint Powers Board (JPB) 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 because of the need for resolution of issues regarding joint planning for shared use of the Caltrain corridor for Caltrain service and for 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 in 2009.

Since 2009, the 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 utilize the existing

1 Caltrain Peninsula Corridor to reach the 4th and King area in San Francisco and then be able to reach
2 downtown San Francisco via the Downtown Extension (DTX) to the Transbay Transit Center (TTC).

3 This vision for implementing Blended Service was included in the *Revised 2012 Business Plan* that
4 the CHSRA Board adopted in April 2012 for the California High-Speed Rail System (CHSRA 2012a).

5 The JPB and CHSRA are committed to advancing a blended system concept. In 2013, the JPB and
6 CHSRA signed a Memorandum of Understanding (MOU) to this effect. This local vision was
7 developed with stakeholders interested in the corridor. The blended system would remain
8 substantially within the existing Caltrain right-of-way (ROW) and accommodate future high-speed
9 rail and modernized Caltrain service by primarily utilizing the existing track configuration. It is
10 important to note that “accommodating” future HSR means in the context of the Proposed Project
11 providing the electrical infrastructure compatible with HSR and not precluding HSR.

12 Based on the blended system vision, the Caltrain Peninsula Corridor has been designated to receive
13 an initial investment of Proposition 1A bond funds that would benefit Caltrain's modernization
14 program and HSR. The JPB, CHSRA and seven other San Francisco Bay Area agencies (City and
15 County of San Francisco, San Francisco County Transportation Authority, Transbay Joint Powers
16 Authority, San Mateo County Transportation Authority, Santa Clara Valley Transportation Authority,
17 City of San Jose, and MTC) have approved an MOU (*High Speed Rail Early Investment Strategy for a*
18 *Blended System in the San Francisco to San Jose Segment known as the Peninsula Corridor of the*
19 *Statewide High-Speed Rail System*) to pursue shared use of the corridor between San Jose and San
20 Francisco to provide Blended Service of both Caltrain commuter rail service and HSR intercity
21 service (JPB 2012). The MOU includes agency and funding commitments toward making an initial
22 investment of approximately \$1.5 billion in the corridor for purchasing and installing an advanced
23 signal system, electrifying the rail line from San Francisco to San Jose, and purchasing electrified
24 rolling stock for Caltrain. The MOU also conceptually outlines potential additional improvements
25 (i.e., “Core Capacity” projects¹) needed beyond the first incremental investment to accommodate
26 Blended Service in the corridor.

27 Corridor improvements identified in the MOU include the following:

- 28 • **Advanced Signal System (commonly referred to as CBOSS PTC or CBOSS):** This project
29 (currently being installed, including a new fiber optic backbone) will increase the operating
30 performance of the current signal system, improve the efficiency of at-grade crossing warning
31 functions, and automatically stop a train when there is violation of safe operating parameters.
32 This project, which includes implementation of safety improvements mandated by federal law,
33 is scheduled to be operational by 2015 as mandated by the Federal Railroad Administration
34 (FRA).

¹ “Core Capacity” projects (as described in the nine-party MOU) consist of needed upgrades to stations, tunnel, bridges, potential passing tracks, other track modifications, and rail crossing improvements, including selected grade separations, and will be required to accommodate the mixed traffic capacity requirements of high-speed rail service and commuter services on the Caltrain corridor. The specific Core Capacity projects have not been identified or defined at this time. These projects will be identified in future discussions and evaluations between CHSRA and the JPB. Core Capacity projects would be subject to separate, project-level environmental evaluation by the implementing agency. Core Capacity projects do not include the TJPA Downtown Extension/Transbay Transit Center project, which is an approved and environmentally cleared independent project.

- 1 ● **Corridor Electrification:** The JPB decided to prepare this new EIR for the corridor
2 electrification due to the changes in existing conditions² that have occurred along the corridor
3 since the prior EIR analyses were was conducted, to update the environmental analysis, and to
4 update the cumulative analysis of Blended Service and other cumulative developments along the
5 corridor. Completion of a new EIR will also allow public agencies, stakeholders, the public and
6 decision-makers the opportunity to review and comment on the Proposed Project's
7 environmental effects in light of current information and analyses. This project will provide for
8 operation of up to 6 Caltrain trains per peak hour per direction (an increase from 5 trains per
9 peak hour per direction at present). Electrification can be analyzed as a separate project under
10 the California Environmental Quality Act (CEQA) because it has independent utility (providing
11 Caltrain electrified service) and logical termini (station end points). Electrification of the rail line
12 is scheduled to be operational by 2020/2021³ 2019. The Proposed Project includes 114 trains
13 per day between San Jose and San Francisco and six trains per day between Gilroy and San Jose.
14 Future proposed actions to expand service beyond 114 trains per day may require additional
15 environmental review.
- 16 ● **Blended Service:** The JPB, CHSRA, and the MOU partners have agreed on shared use of the
17 Caltrain corridor for use of up to six Caltrain trains per peak hour per direction and up to four
18 HSR trains per peak hour per direction.⁴ The operational feasibility of Blended Service has been
19 studied, but this project is presently only at the conceptual planning phase. The potential
20 addition of HSR service to this corridor will be the subject of a separate environmental review
21 process that will be undertaken by CHSRA as the lead agency subsequent to the environmental
22 process for the Proposed Project. Based on the current CHSRA *Revised 2012 Business Plan* and
23 the *Draft 2014 Business Plan* (CHSRA 2014), Blended Service along the Corridor is scheduled to
24 commence sometime between 2026 and 2029. Blended Service would connect with the DTX
25 near the Fourth and King Station allowing Caltrain and HSR service to downtown San Francisco
26 at the TTC.

² For example, there have been changes in existing development adjacent to the Caltrain ROW and stations, in levels of traffic, and in adopted land use plans around stations.

³ The first year of project operation would be 2020/2021 depending on the timing of construction completion. For the sake of simplicity and in recognition that the first year of operations could be in 2020, this EIR refers to the operational year as 2020.

⁴ The CHSRA 2012 Revised Business Plan *Ridership and Revenue Forecasting* (CHSRA 2012b) and the 2014 Business Plan (CHSRA 2014) both presumes 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 to 53 daily round-trip high-speed trains in 2040 based on the CHSRA 2012 Business Plan, *Estimating High-Speed Train Operating and Maintenance Cost for the CHSRA 2012 Business Plan* (CHSRA 2012c), which presumed 40 HSR daily round-trips per day and, the Draft 2014 Business Plan *Service Planning Methodology* document (CHSRA 2014b) which includes an assumption of 53 daily round trip trains starting in 2029 and continuing beyond 2040. The 2014 Business Plan does not make an explicit statement about the level of service on the Caltrain corridor. Thus, the exact amount of daily HSR service is unknown. Caltrain's Blended Service planning to date has not studied the 2014 Business Plan estimates because the plan was released on February 7, 2014 and conceptual Blended Service studies were completed in 2012 and 2013. Thus, the cumulative analysis in this EIR is based on the 40 daily round trip high speed trains consistent with Blended Service studies by Caltrain completed to date. The subsequent CHSRA project-level environmental evaluation will address proposed high-speed train service levels along the San Francisco Peninsula.

1 **ES.2 Purpose and Need**

2 The Proposed Project's purpose and need and project objectives are summarized below.

3 **ES.2.1 Need for the Project**

4 The needs addressed by the Proposed Project consist of the following: meeting current and future
5 transportation demand between San Jose and San Francisco; offsetting existing and future
6 worsening roadway congestion; addressing continuing regional air quality issues; reducing
7 greenhouse gas emissions because of their effect on climate change; modernizing the Caltrain
8 service; and providing electrical infrastructure compatible with future high-speed rail service.

9 **Current and Future Transportation Demand in the Caltrain Service Area**

10 The population of the Bay Area is increasing and, with it, traffic congestion. Commute traffic
11 between major employment centers in San Francisco, the San Francisco Peninsula, and the South
12 Bay is growing, and there has been a substantial increase in "reverse commute" trips from San
13 Francisco to Peninsula and South Bay locations over the past decade. Off-peak travel between San
14 Francisco and Peninsula and South Bay locations is also on the rise. Caltrain has experienced
15 increases in ridership as people seek alternate ways to meet these travel needs. Caltrain anticipates
16 continued increases in demand for its rail services over time.

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

26 **ES.2.2 Current and Future Roadway Congestion in the 27 Caltrain Corridor**

28 Economic growth and the corresponding demand for transportation services in the San Francisco
29 Bay Area have exceeded the region's ability to provide the needed roadway capacity. Existing
30 demand for north-south travel along the Peninsula via U.S. Highway 101 (US 101) and Interstate
31 280 (I-280) regularly exceeds existing highway capacities and results in congestion that is
32 increasing in both frequency and duration. US 101 is the most severely congested freeway through
33 the corridor (MTC 2009). Between San Francisco and San Jose, many roadway segments are at or
34 over capacity during the peak commute hour.

35 Without future roadway improvements, congestion on corridor freeways is bound to worsen to the
36 point at which travel would partially divert to surface routes and the peak periods would spread
37 both into the midday and to later in the evening. Bottlenecks would continue to constrain movement
38 through the corridor. Job growth in the Bay Area is expected to increase approximately 33 percent
39 between 2010 and 2040 (ABAG and MTC 2013). The resultant new transportation demand will lead

1 to high levels of congestion that will take a toll on economic development by constraining goods and
2 people movements.

3 Opportunities to improve highway capacity are constrained by a number of factors, including
4 funding availability, the need for extensive and costly ROW acquisitions, and potentially adverse
5 environmental impacts, such as displacements of residences and businesses, and impacts on natural
6 resources and redesign of local roadways beyond the interchanges. For these reasons, substantial
7 capacity improvements to US 101 and I-280 cannot be relied upon to fully address long-term travel
8 demands in the corridor.

9 **ES.2.3 Corridor Air Quality and Greenhouse Gas Emissions**

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

16 The San Francisco Bay Area's air quality has improved in recent years, largely in response to
17 technological improvements in motor vehicles and fuels that are less polluting but is still designated
18 as in nonattainment area under state and federal standards for certain pollutants. Because
19 transportation is the major contributor to ozone precursors, increasing auto travel threatens the
20 area's improvement in air quality. Growing congestion will add to the potential problems because of
21 increased emissions of vehicles operating in stop-and-go traffic.

22 California also has ambitious goals to reduce greenhouse gas emissions throughout the state in or
23 der to help face the challenge posed by climate change. Most of the communities in the Peninsula
24 Corridor have also adopted climate action plans to lower their community contributions of
25 greenhouse gas emissions, with all seeking to lower transportation emissions given that
26 transportation is usually the largest source of such emissions in most areas.

27 **ES.2.4 Modernizing the Caltrain Service**

28 Improving the appearance and attractiveness of Caltrain to potential consumers has long been
29 suggested as a means of increasing ridership. Caltrain put new diesel locomotives and bi-level
30 passenger cars into service as part of the "Baby Bullet" express service program in 2004. Rider
31 response to this service has demonstrated the benefits of modernizing image, improving passenger
32 comfort, and reducing travel times between major origins and destinations. The increase in
33 ridership associated with the introduction of the Baby Bullet and new passenger cars suggests that
34 there is an unmet demand for rapid transit along the Peninsula corridor. With the Proposed Project,
35 additional stops could be added (optimized stops) without loss of travel times or travel times could
36 be reduced.

37 **ES.2.5 Accommodating Future High-Speed Rail**

38 An electrified Caltrain system would set the stage for an expanded modern regional electric train
39 service and a statewide HSR service. The Proposed Project facilities evaluated herein would be
40 designed to accommodate HSR service, as well as Caltrain service. The term "accommodate" is being

1 used in this case to mean that the Caltrain Proposed Project would install the same type of power
2 supply and distribution system proposed for the HSR system. It is important to note that PCEP is a
3 separate project from the HSR project. Other improvements needed to enable high-speed trains to
4 use the Caltrain line would be evaluated in a separate environmental process led by the CHSRA as
5 the lead agency for HSR.

6 Extension of Caltrain from its present 4th and King Street terminus to the site of the Transbay
7 Terminal Transit Center (TTC) was evaluated in a separate environmental document, the Transbay
8 Terminal/Caltrain Downtown Extension (DTX)/Redevelopment Project EIS/EIR, by FTA, the City
9 and County of San Francisco, the San Francisco Redevelopment Agency, and the JPB. The Final
10 EIS/EIR was certified in 2004 and the Record of Decision on the EIS was issued in February 2005.
11 The Transbay Terminal DTX/TTC project includes construction of an underground rail line
12 extension electrification of the Caltrain line from 4th and King Streets to the Transbay Terminal TTC
13 and construction of the TTC. The DTX/TTC project would provide for both Caltrain and HSR service
14 to the TTC as well as consolidation of many transit service linkages at the TTC as well as
15 development surrounding the TTC. Subsequent addenda have been completed, and a Supplemental
16 EIS/EIR is presently being prepared for certain limited proposed changes to the design of the
17 project.

18 **ES.3 Purpose and Objectives of Project**

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

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

- 29 ● **Provide electrical infrastructure compatible with high-speed rail:** An electrified Caltrain
30 system would set the stage for an expanded modern regional electric express service and for
31 Blended Service. While the Proposed Project would not include all infrastructure necessary to
32 implement HSR service in the corridor (such as HSR maintenance facilities, station platform
33 improvements, or passing tracks), the electrical infrastructure (such as overhead wire systems)
34 would accommodate future Blended Service and the Proposed Project would not preclude HSR.
- 35 ● **Improve train performance, increase ridership and increase service:** The Proposed Project
36 envisions the use of electric multiple unit (EMU) trains, which are self-propelled electric rail
37 vehicles that can accelerate and decelerate at faster rates than diesel-powered trains, even with
38 longer trains. With EMUs, Caltrain could run longer trains without degrading speeds, thus
39 increasing peak-period capacity. Electrification performance would support increased peak
40 service levels from the current five trains per peak hour per direction to six with existing
41 trackage.

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

- 8 • **Increase revenue and reduce fuel costs:** Anticipated increased ridership would increase fare
9 revenues, and conversion from diesel to electricity would reduce fuel costs. ~~These efforts would~~
10 ~~substantially reduce but not eliminate the need for financial subsidy.~~
- 11 • **Reduce environmental impact by reducing noise emanating from trains:** Noise emanating
12 from the passage of electrified train sets is measurably less than diesel operations. With the
13 increases in peak and off-peak Caltrain service that are either under way or planned for
14 implementation during the next decades, electrification would be an important consideration
15 for reducing noise of train passersby and maintaining Peninsula quality of life. Train horns
16 would continue to be sounded at at-grade crossings, consistent with FRA and California Public
17 Utilities Commission safety regulations, whether or not electrification is pursued.
- 18 • **Reduce environmental impact by improving regional air quality and reducing
19 greenhouse gas emissions:** Electric operations would produce substantial reductions in
20 corridor air pollution emissions when compared with diesel locomotives, even when the
21 indirect emissions from electrical power generation are included in the analysis. In addition, the
22 increased ridership allowed by the Proposed Project would reduce automobile usage, thereby
23 resulting in additional air quality benefits. Electrically powered trains are more energy efficient
24 than diesel-electric trains. Reduced energy use also translates into reduced air emissions.
25 Reductions in air pollutant emissions represent long-term health benefits for Caltrain riders,
26 and for residents and employees along the Caltrain corridor. In addition, reduction of
27 greenhouse gas emissions with electrification would help California to meet its goals under AB
28 32, the 2006 Global Warming Solutions Act, as well as post-2020 state greenhouse gas emission
29 reductions goals.

30 **ES.4 Project Description**

31 The Proposed Project consists of converting Caltrain from diesel-hauled to EMU trains for service
32 between the 4th and King Street Station terminus station in San Francisco and the Tamien Station in
33 San Jose. Operating speed would be up to 79 mph, which would match the existing maximum speed.

34 By 2020 2019, approximately 75 percent of the service fleet between San Jose and San Francisco
35 would be electrified, with the remaining 25 percent being diesel-powered. After 2020 2019, diesel
36 locomotives used for San Francisco to San Jose service would be replaced with EMUs over time as
37 diesel locomotives reach the end of their service life. Because the Proposed Project only involves
38 electrification of the Caltrain ROW from San Francisco to a point approximately 2 miles south of
39 Tamien Station, Caltrain's diesel-powered locomotives would continue to provide service between
40 the San Jose Diridon Station and Gilroy.

41 The Proposed Project would require the installation of 130 to 140 single-track miles of overhead
42 contact system (OCS) for the distribution of electrical power to the new electric rolling stock. The

1 OCS would be powered from a 25 kilovolt (kV), 60 Hertz (Hz), single-phase, alternating current (AC)
2 traction power system consisting of two traction power substations (TPSs), one switching station
3 and seven paralleling stations. These facilities are described in more detail in Chapter 2, *Project*
4 *Description*.

5 The Proposed Project is the electrification of the Caltrain line from its current northern terminus at
6 4th and King Street in the City of San Francisco to 2 miles south of the Tamien Station in San Jose, a
7 total distance of approximately 51 miles. The Proposed Project location is shown in Figure ES-1, and
8 a project vicinity map showing each of the stations on the line is provided in Figure ES-2.

9 **ES.4.1 Project Elements**

10 **ES.4.2 Overhead Contact System**

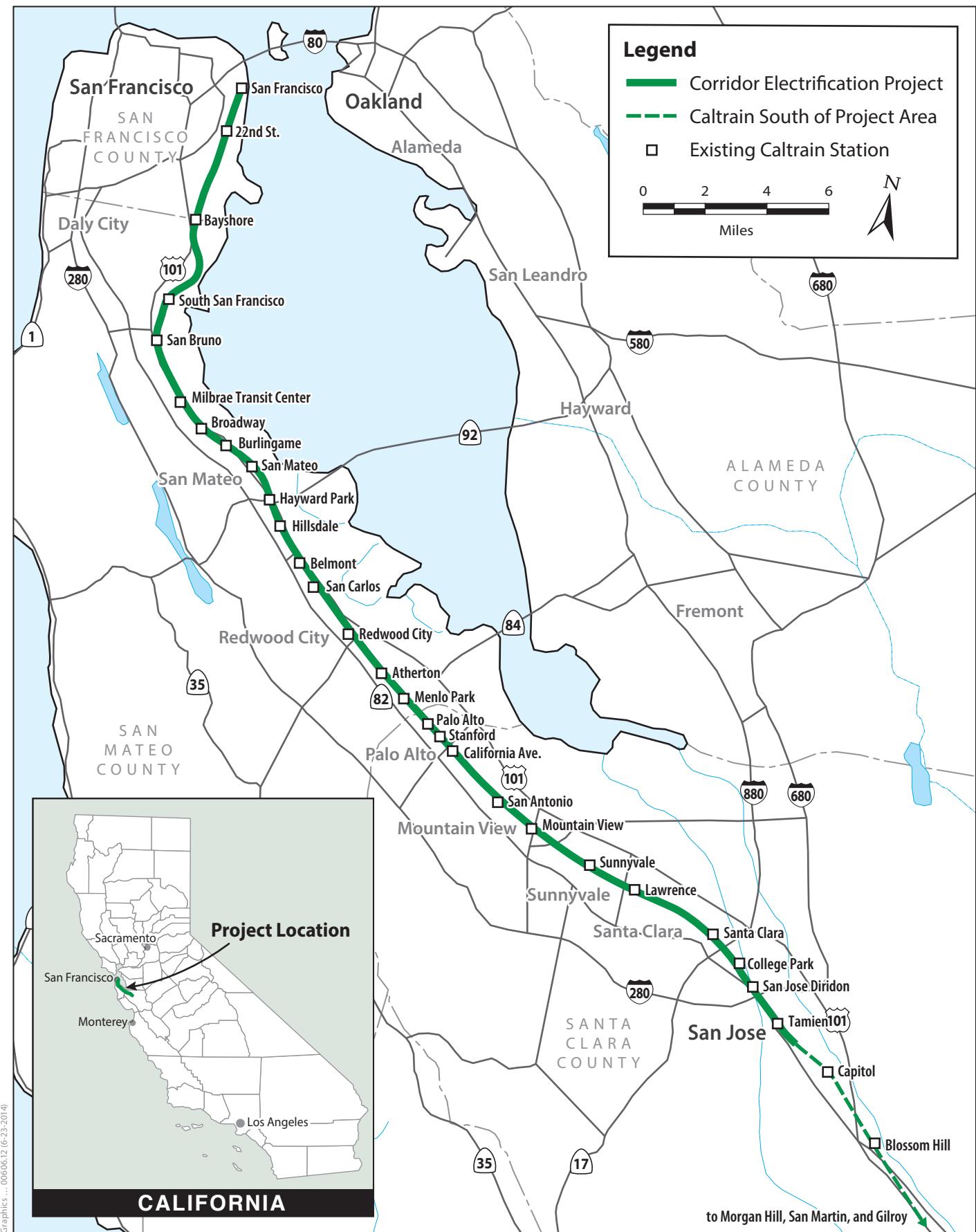
11 This Proposed Project would utilize a 25 kV AC OCS operating at 60 Hz. A mainline OCS typically
12 consists of two conductors above each track in what is known as a catenary configuration: A
13 messenger wire (much like a utility transmission line) sags between support points, below which a
14 near-level contact wire is suspended. Both main wires are energized and are part of the same circuit.
15 The pantograph, mounted on top of the electric vehicles, slides along the underside of the contact
16 wire and collects the traction current from it.

17 The messenger wire is typically supported by means of cantilevered, hinged bracket arms that
18 extend horizontally over the track from vertical steel poles mounted clear of the dynamic envelope
19 (i.e., the range of motion of the train on the track) of the vehicles. These poles are placed
20 approximately 9 to 11 ~~10 to 12~~ feet of the centerline of the tracks they serve. Multi-track support
21 structures, such as multi-wire headspans attached to taller steel poles, are also employed where
22 necessary. Depending upon the clearance requirements of particular sections of the route, the
23 contact wire height would vary from approximately 16 feet to 23 feet. Pole heights would range
24 from 30 to 50 feet although in most locations the heights would be between 30 to 40 feet. The 50-
25 foot maximum includes the potential height for headspans, which are only proposed for use in
26 certain areas such as CEMOF and the San Jose Diridon Station.

27 Clearances for maintenance and operation of the OCS would be designed to allow for existing freight
28 railroad and tenant passenger rail clearances and operations. Normal design clearances up to 23 feet
29 would be provided in all open, unconstrained areas. Special designs could be employed in close
30 clearance tunnels or under bridges in order to provide sufficient clearances to existing freight and
31 diesel passenger trains.

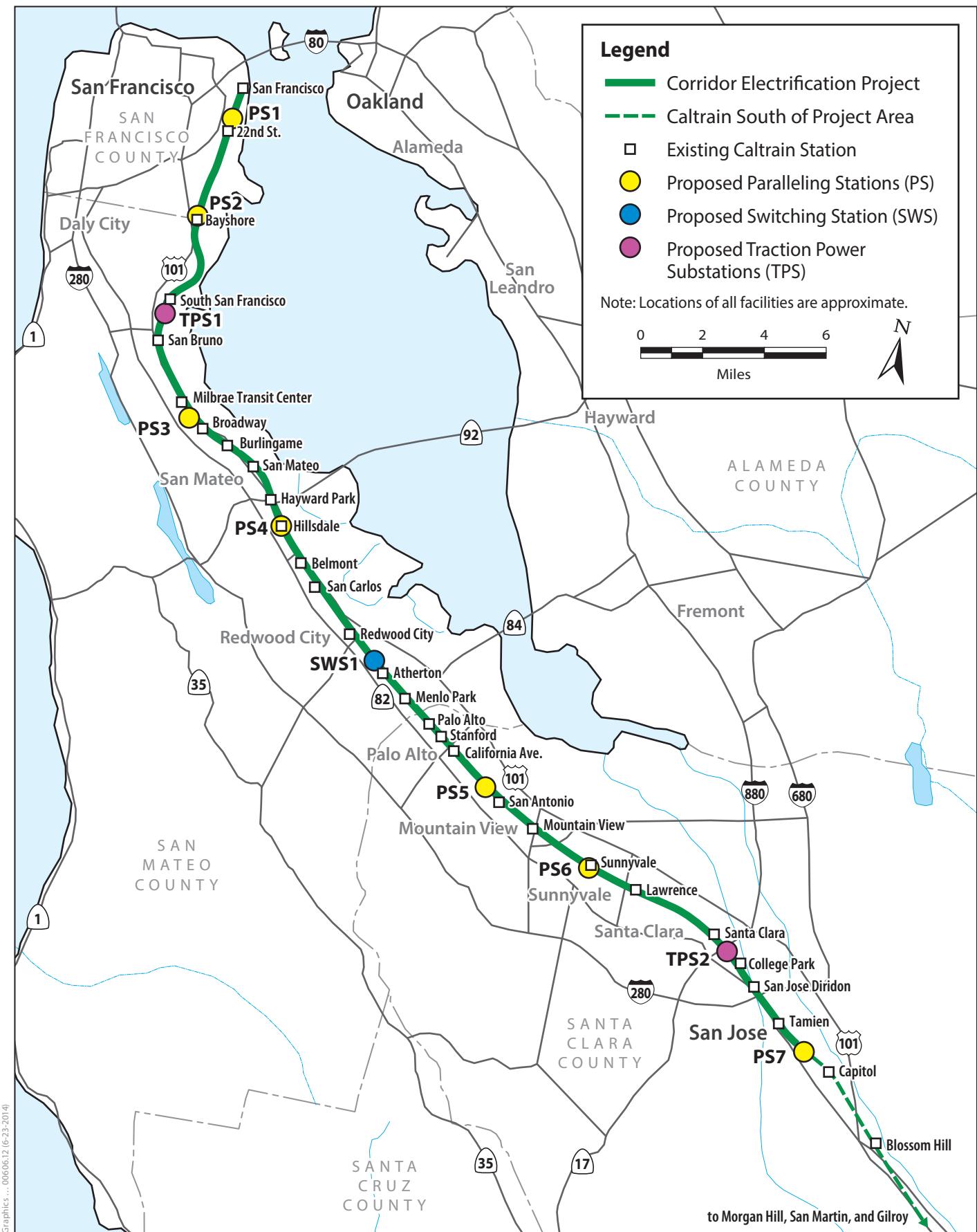
32 On tangent, or straight, sections of track, the OCS supports can be spaced up to 230 feet apart,
33 though they would typically be about 180 to 200 feet apart. On curved track sections, the span
34 lengths between supports must be reduced.

35 As noted above, the OCS poles nominally need to be approximately 10 to 12 ~~9 to 11~~ feet from the
36 centerline of the railway tracks. In addition, there needs to be clearance of vegetation within
37 approximately 10 feet of the OCS poles and catenary system for the electrical safety zone (ESZ). The
38 ESZ would be approximately 21 feet from the centerline of the outer electrified track in two-track
39 areas and approximately 18 feet from the centerline of the outer electrified track in multi-track
40 areas. Trimming or removal of trees would be required along the tracks and electrical facilities



Note: This figure replaces Figure ES-1 from the Draft EIR.

Figure ES-1
Project Location
Peninsula Corridor Electrification Project



Graphics...0060612 (6-23-2014)

Note: This figure replaces Figure ES-2 from the Draft EIR.

Figure ES-2
Project Vicinity
Peninsula Corridor Electrification Project

1 where they would otherwise pose a maintenance or safety concern. In addition, structures cannot be
2 closer than 6 feet to the OCS pole alignment (the 6 feet is within the 10-foot ESZ).

3 The MT-1 track owned by Union Pacific will not be electrified from Santa Clara (MP 44.6) to the
4 southern end of the JPB-owned ROW (MP 52.0).

5 At three tunnel locations and four bridge overcrossings where vertical height is constrained, the
6 Proposed Project also would involve minor tunnel modifications and/or track lowering to
7 accommodate existing and future passenger vehicles as well as existing freight equipment.

8 **ES.4.3 Auto-Transformer Power Feed Arrangement**

9 The autotransformer (ATF) power feed system arrangement reduces the need for traction power
10 substations and would require the installation of only two traction power substations spaced 36
11 miles apart. The ATF is the overall power feed system and includes the traction power substations,
12 switching station, paralleling stations and the OCS

13 ~~There are three potential locations for the site of each of the traction power substations analyzed in~~
14 ~~this EIR.~~

15 There are four potential locations for the site of the traction power substation in South San
16 Francisco (TPS1) and three potential locations for the site of the traction power substation in San
17 Jose (TPS2) analyzed in this EIR. In addition, there would be one switching station (SWS1) and
18 seven paralleling stations (PS1 through PS7) at a spacing of approximately 5 miles. Two potential
19 locations have been identified for the PS4, SWS1, PS3, PS5, and PS6 sites. Three potential locations
20 have been identified for the PS4 and PS5 sites.

21 The paralleling stations provide additional power support to the power distribution system and
22 permit increased spacing of the primary traction power substations. In addition to reducing the
23 number of traction power substations—and thereby minimizing the introduction of new, large
24 equipment installations into the corridor—the auto-transformer feed arrangement for
25 implementation along the Caltrain corridor would help reduce electromagnetic fields (EMF) and
26 electromagnetic interference (EMI) because the arrangement includes two parallel aerial feeders,
27 one on each side of the alignment. The currents in the parallel feeders flow in the opposite direction
28 to that in the main catenary conductors, reducing the EMF/EMI effects created by current flow in the
29 OCS.

30 Figure ES-2 shows the proposed general locations for potential TPFs.

31 **ES.4.4 Overbridge Protection Structures**

32 Electrification of the corridor would require the construction or enhancement of overbridge
33 protection barriers on 47 roadway or pedestrian bridges across the Caltrain alignment. These
34 barriers are necessary to prohibit access to the rail corridor and prevent objects from being thrown
35 off the bridges in a manner that would damage or interfere with the electrical facilities.

36 **ES.4.5 Grade Crossing Warning Devices**

37 The Proposed Project would also require a change in the warning devices for at-grade crossings. As
38 part of the Proposed Project, the existing warning devices would be removed because they operate

on a DC circuit and the proposed EMUs would operate on an AC circuit. Caltrain trains equipped with onboard CBOSS PTC equipment will communicate with the grade crossings wirelessly, allowing the grade crossing gates to function safely. CBOSS PTC will be in place by 2015. For non-Caltrain trains (which will not have onboard CBOSS PTC equipment), Audio Frequency Overlays (AFOs), also known as track circuits, will be installed at fixed locations along the Caltrain ROW, allowing the grade crossing gates to function safely. An AFO is a sensor that activates the grade crossings when the train is approaching.

ES.4.6 Rolling Stock

New EMUs are the preferred rolling stock option for the Proposed Project. New EMUs would replace the portion of Caltrain's existing diesel locomotives and passenger cars that will reach the end of its useful life by 2020 2019. Caltrain would operate electric service between San Francisco and San Jose with EMUs. With EMUs, each car, or set of cars (unit), can have its own pantograph mounted on the roof and separate electric motor drives to each axle. EMUs can be operated in a variety of train consists, dependent upon the requirements of the rail system operator. Options include single motor cars (where each car is fitted with a driving cab at both ends) and paired cars (where there is a driving cab at only one end of each car). A pair can comprise two motor-cab cars, or a motor-cab plus a non-motored trailer-cab car. Another option would be two motorized cab cars with multiple non-motored trailer cab-cars in between. There is currently no United States-based prototype for the EMU proposed for the Proposed Project. The EMU vehicle for the Proposed Project would be a multi-level car of comparable dimensions to the existing Caltrain gallery car. Caltrain has received a waiver from the FRA that would allow modern European EMU equipment to operate on the Caltrain Peninsula Corridor provided that temporal separation is provided between the light-weight EMUs and heavy freight trains (this is referred to as the FRA waiver) but Caltrain now presumes that temporal separation will not ultimately be required for the Proposed Project.⁵

ES.4.7 Operations and Maintenance

ES.4.8 Caltrain Operating Scenario(s) Under Electrification

Caltrain's existing schedule includes five trains per peak hour during the a.m. and p.m. peaks, as well as mid-day service, for a total of 92 trains per day between San Jose and San Francisco. In addition to local service (stopping at every station), existing weekday Caltrain service consists of six baby bullet trains and ten limited-stop trains in the a.m. northbound and p.m. southbound and five baby bullet trains and 11 limited-stop trains in the a.m. southbound and p.m. northbound. There is approximately one train per hour per direction from 10 a.m. until 2 p.m. and after 7 p.m.

The proposed level of Caltrain operations consists of six trains per peak hour during the a.m. and p.m. peaks, as well as mid-day service, for a total of 114 trains per day between San Jose and San Francisco. Based on a prototypical schedule, with Proposed Project implementation there would be

⁵ It should be noted that the FRA is currently in a rulemaking process for "Alternative Compliant Vehicles" that is relevant to the EMUs in the Proposed Project. It is Caltrain's understanding that when the rule is in place, the FRA waiver can be modified and/or the temporal separation requirement will may no longer be necessary when rule-making is in place. There is prior precedent of approval of alternative compliant vehicles without requiring temporal separation (for Denton County Transportation Authority) and the proposed EMU's can provide equivalent safety to the FRA's Tier 1 passenger safety requirement. For the purposes of this EIR, it is assumed that temporal separation will not be required. the current FRA waiver requirement would be in force.

1 approximately six a.m. and p.m. baby bullet trains per direction. There would be approximately two
 2 trains per hour per direction from 9 a.m. until 4 p.m. and after 7 p.m.

3 **ES.4.9 Ridership**

4 Implementation of the Proposed Project is anticipated to result in increased ridership by 2020 and
 5 by 2040. Table ES-1 shows the existing Caltrain ridership and the projected Caltrain ridership from
 6 2020 and 2040, with and without the Proposed Project.

7 **Table ES-1. Estimated Ridership with the Proposed Project**

	2013	2020 ^a	2040
Existing/No Project ^b	47,000	57,000	84,000
With Project ^{c, d}	N/A	69,000	111,000

Source: Appendix I, *Ridership Technical Memorandum*. Ridership above is based on boardings, not boardings and alightings.

^a 2020 was used for ridership analysis to ensure full operation of the new electrified service.

^b No Project analysis assumes the same schedule as at present (5 trains per peak hour; 1 train per off-peak hour per direction; total of 92 trains per day) for both 2020 and 2040

^c For 2020, analysis assumed 75% electrified and 25% diesel service from San Jose to San Francisco.

^d For 2040, analysis presumes fully electrified service between San Jose and San Francisco. As described above, the Proposed Project only has sufficient funding at present to provide 75% electrified service between San Jose and San Francisco. It is presumed that additional funding will be obtained to allow full electrified service between San Jose and San Francisco to occur by 2040.

9 **ES.4.10 Energy Consumption**

10 With the Proposed Project, the primary energy source would be electricity. Through conversion of
 11 trains from diesel motor propulsion to EMUs, the Proposed Project would substantially decrease
 12 diesel fuel use and substantially increase annual electricity use. Existing fuel consumption is
 13 approximately 4.5 million gallons per year (mid-2012 to mid-2013). With the Proposed Project, in
 14 2020 2019 diesel trains would provide approximately 25 percent of service from San Francisco to
 15 San Jose and all of the service from San Jose to Gilroy. These diesel trains would require 1.1 million
 16 gallons of fuel per year, a reduction of approximately 3.4 million gallons per year from current
 17 conditions. Proposed Project operation would require approximately 88 83 million kWh of
 18 electricity in 2020 2019. This includes energy expended during both train travel and idling.

19 **ES.4.11 Maintenance**

20 Trimming or removal of trees will be required along the tracks and electrical facilities where they
 21 would otherwise pose a maintenance or safety concern. One maintenance item that is unique to
 22 electric vehicles is the need to inspect the pantograph carbon collector strips for wear and damage.
 23 Carbon is a relatively soft material, even when mixed with copper particles to create "metalized"
 24 strips. However, carbon, rather than the contact wire, is designed to be the sacrificial element in the
 25 sliding current collection interface. As a result, the pantograph would need to be frequently
 26 inspected to ensure that there is sufficient carbon interface.

1 **ES.4.12 Construction Schedule/Durations**

2 The preliminary project schedule (subject to change) is provided below.

- 3 • Environmental review/design/permitting: 1–2 years.
- 4 • Construction: 3–4 years.
- 5 • Testing: 1–2 years.

6 The goal is to commence electric revenue service in 2020 2019.

7 The construction activities described above are not sequential; construction could occur
8 simultaneously at several locations.

9 **ES.4.13 Right-of-Way and Easement Needs**

10 Based on the current system design, and assuming a worst-case-pole-placement scenario, there
11 would be a need for acquisition of new ROW for one TPS (and possibly a second TPS, depending on
12 location) as well as for some areas where OCS poles and wires would need to be placed outside the
13 current ROW.

14 For the two TPSs, the JPB is considering several different sites for each traction power substation.
15 Sites for intermediate paralleling and switching station facilities have also been identified, but all of
16 the locations are within the Caltrain ROW. The total estimated area needed for the two substations is
17 up to 1.4 acres.

18 In most cases, the OCS poles would be placed within the Caltrain ROW. However, in certain
19 locations, there may be insufficient clearance from the railway track centerlines and the JPB may
20 need to acquire ROW for placement of poles and wires. At this time, based on 35 percent design
21 preliminary engineering and worst-case pole placements (i.e., side poles in two-track areas and
22 portals in multi-track areas) in terms of ROW need, it is estimated that new easements on adjacent
23 public roads and on rail ROW is estimated as 0.6 would be up to 0.9 acres and ROW acquisition on
24 private property is estimated as 0.2 acres, for a total of 0.9 1.1 acres.⁶ These calculations presume
25 placement of OCS poles on the outside of the outermost track. If alternative pole alignments are used
26 in some locations, these estimates may change.

27 In addition, in some locations there is insufficient ROW width to provide for the necessary 10 feet of
28 electrical safety clearance within the current ROW to adjacent vegetation and structures. Where
29 electrical clearance is necessary outside the Caltrain ROW, the JPB will need to obtain an electrical
30 safety easement from property owners to permit the trimming and removal of vegetation and to
31 maintain structures outside a 6-foot safety zone from the OCS alignment. At this time The Draft EIR
32 presumed a worst-case electrical safety zone up to 24 feet from the outer track centerline. The Final
33 EIR describes that the electrical safety zone is more likely to be 21 feet in most two-track areas and
34 18 feet in most multi-track areas. Using a range between the Draft EIR and Final EIR safety zone
35 assumptions, it is estimated that approximately 5 to 8 acres of new easement would be required on
36 adjacent public road and rail ROW, 2 to 10 acres on private residential, commercial, or industrial
37 property, and 0.1 to 0.3 acres on parklands for a total of approximately 7 to 18 acres. These

⁶ Total does not add because of rounding.

1 calculations presume placement of OCS poles on the outside of the outermost track. If alternative
2 pole alignments are used in some locations, these estimates may change.

3 Maps in Appendix J of this Final EIR show the ROW encroachments based on preliminary
4 engineering.

5 The JPB is presently examining the design for Proposed Project facilities and the amount of needed
6 ROW may be more or less than that discussed above.

7 **ES.4.14 Relation to the High-Speed Rail Project**

8 The electrification system envisioned for the corridor would be configured in such a way that it
9 would support the future operation of California HSR. The power supply system of choice for a steel-
10 wheel-on-steel-rail high-speed train operation is 25-kV, 60-Hz, single-phase AC electrification. The
11 Caltrain corridor is currently only rated for a maximum of 79 mph⁷ and, thus, there may be need for
12 track and other system upgrades in order to support higher speeds than at present. The Proposed
13 Project includes electrification infrastructure that would first be used by Caltrain and can later be
14 used for high-speed trains. However, the Proposed Project does not include other improvements
15 necessary for high-speed trains such as platform improvements, high-speed rail maintenance
16 facilities, passing tracks or other Core Capacity projects. The Proposed Project does not include
17 improvements to support speeds greater than 79 mph or high-speed rail operations on the Caltrain
18 corridor at speeds up to 110 mph.⁸ High-speed rail construction and operations would be the
19 subject of a later, separate environmental analysis to be conducted by CHSRA and FRA. The
20 cumulative impact analysis in this document does address cumulative impacts of Blended Service
21 (see Chapter 4, Section 4.1, *Cumulative Impacts*) but only provides a conceptual analysis of those
22 impacts given that HSR design for Blended Service has not been completed.

23 **ES.5 Costs and Funding**

24 **ES.5.1 Capital Costs**

25 An updated estimate of the capital costs associated with the Proposed Project including rolling stock
26 and the fixed facilities was completed in 2014 for the 2009 EA/EIR (FTA and JPB 2009). The cost of
27 the fixed facilities (e.g., OCS, traction power facilities) is was estimated at approximately \$950 to 958
28 \$785 million and the cost of rolling stock is was estimated to be \$524 to \$573 \$440 million for a total

⁷ The Federal Railway Administration (FRA) regulates track safety through its track safety standards. Speed restrictions are based on a number of factors including curvature, signaling, track conditions, the physical condition of trains, and the presence of grade crossings.

⁸ 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 faster than 110 mph are ultimately proposed by CHSRA for the Caltrain corridor, they will be evaluated in the separate environmental document for high-speed train service on the San Francisco Peninsula.

1 of \$1,474 to \$1,531 \$1,225 million. (FTA and JPB 2009). The JPB is presently developing updated
 2 capital costs that will be presented in the Final EIR.

3 **ES.5.2 Capital Funding Sources and Programming**

4 The Proposed Project's capital costs are proposed to be funded from the sources shown in Table
 5 As noted in Table ES-2, additional sources of funding need to be identified in order for the
 6 project to be fully funded.

7 **Table ES-2. Funding Sources for Corridor Electrification Project (Millions of Dollars)**

Source	Amount (YOE\$)
Estimated Capital Costs	\$1,474 to \$1,531
State Proposition 1A ^a , Proposition 1B ^b	\$620
JPB	\$121
Regional (Bay Area Air Quality Management District, Tolls)	\$31
Federal (Federal Transit Administration)	\$453
Total Secured Funding	\$1,225
Funding Needed	\$249 to 306
<i>Potential Additional Sources of Funding: JPB Financing / Transportation Infrastructure Finance and Innovation Act (TIFIA) Loan; JPB; Fare; Regional Measure 2 State Cap & Trade FTA Core Capacity; FTA Vehicle Replacement</i>	

^a Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century of 2008.
^b The Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006.
 YOE = year of expenditure.

8 **ES.5.3 Operating and Maintenance Costs and Revenues**

9 The prior 2009 EA/EIR (FTA and JPB 2009) presented estimates of operating and maintenance costs and revenues for the Proposed Project. The JPB is presently developing new estimates that reflect current assumptions and the recent ridership estimates. The updated operations and maintenance costs will be presented in the Final EIR.

13 A total operation and maintenance (O&M) estimate for the PCEP is in progress. The specific costs associated with operating and maintaining the rail services and infrastructure analyzed in the PCEP EIR will be influenced by organization and management structure to be further examined and refined through the design-build contractor and vehicle procurement and contract approvals targeted for late 2015.

18 Operating fuel costs have been estimated for the PCEP and the analyzed alternatives and are presented in Chapter 5, *Alternatives*.

20 **ES.6 Project Variants**

21 Caltrain has identified a number of variants that may be implementing to lower project costs including the following:

- 1 • *Project Variant 1 - Electrification to just south of the Tamien Station:* This variant would include
2 only electrifying the Caltrain corridor to Milepost (MP) 49.9 (approximately 0.5 miles south of
3 the Tamien Station just south of the railyard near CP Michael) instead of MP 51.1 (a subvariant
4 would defer electrification of the railyard temporarily or permanently). This variant would
5 require moving paralleling station PS7 from the Proposed Project location near MP 51.1
6 adjacent to Kurte Park to one of two locations adjacent to Alma Street.
 - 7 • *Project Variant 2 - Deferral of electrification of storage tracks at the San Francisco 4th and King*
8 *Station.* Under this variant, the storage tracks would not be electrified temporarily or
9 permanently.
 - 10 • *Project Variant 3 - Electric locomotives may be used instead of EMUs for backup train sets.* This
11 variant would only affect temporary replacement of individual EMUs at discrete times.
 - 12 • *Project Variant 4 - Combining guy wire and OCS pole foundations.* This variant would result in
13 slightly less construction by combining foundations for the guy wires and for the OCS pole
14 foundations.
- 15 One or more of these variants may be implemented as means to lower infrastructure costs.

16 **ES.7 Summary of Environmental Impacts and** 17 **Mitigation**

18 The potential impacts of the Proposed Project are presented in Chapter 3, *Settings, Impacts, and*
19 *Mitigation Measures*, and cumulative impacts are presented in Chapter 4, *Other CEQA-Required*
20 *Analysis*, and are summarized in Table ES-3. Mitigation measures were also identified, where
21 available, for significant impacts identified in this EIR. These mitigation measures are also listed in
22 Table ES-3. Please note that in Table ES-3, the term "significant" refers to the level of impact and the
23 term "considerable" refers to Proposed Project contribution to a cumulative impact.

24 The Draft EIR analyzes the construction impacts, operational impacts, and cumulative impacts for
25 each separate subject area. The following summary describes the key conclusions in this Draft EIR.
26 This list is not a comprehensive list of impact conclusions; for a comprehensive review, please refer
27 to Table ES-3, Chapter 3, and Chapter 4.

- 28 • Key Project Construction Impact Summary
 - 29 ○ *Aesthetics:* The Proposed Project would temporarily change aesthetic conditions and light
30 and glare adjacent to residential areas and a number of parks. Project mitigation would
31 minimize the duration and extent of these temporary impacts.
 - 32 ○ *Air Quality:* Proposed Project construction impacts regarding criteria pollutants and toxic air
33 contaminants can be reduced to less-than-significant levels with routine project mitigation
34 measures.
 - 35 ○ *Biological Resources:* The Caltrain ROW is primarily a disturbed urban rail corridor with
36 only limited biological resources. The Proposed Project would impact limited areas of
37 habitat for special-status species as well as riparian vegetation, wetlands and sensitive
38 natural communities during construction but routine project mitigation would reduce these
39 impacts to a less-than-significant level. Project construction would also require removal of

- 1 up to 1,000 2,200 trees⁹ and pruning of an addition 3,200 3,600 trees for the OCS alignment
2 and ESZ under worst-case assumptions. Project mitigation would require tree avoidance,
3 minimization, and/or replacement. While the biological impacts of tree removal can be
4 mitigated, this is considered a significant and unavoidable aesthetic impact (see discussion
5 under operational impacts below).
- 6 ○ *Cultural Resources:* Construction of the Proposed Project's OCS has the potential to affect
7 certain historic resources, specifically the Caltrain San Francisco tunnels, historic Caltrain
8 stations, certain bridges and underpasses, and several other potential historic resources.
9 Mitigation would require specific design treatments to reduce and avoid impacts where
10 feasible. Tunnel modifications necessary to provide heights for Caltrain and freight rail cars,
11 such as tunnel notching, the removal of decorative stone portals, and OCS infrastructure
12 attachment to tunnels, may result in significant and unavoidable impacts on the San
13 Francisco Tunnel 4 portal even with mitigation. Potential impacts on archaeological
14 resources can be reduced to a less-than-significant level with routine project mitigation.
- 15 ○ *Geology, Soils and Seismicity:* Proposed Project construction impacts related to erosion,
16 geological conditions, and soils can be reduced to less-than-significant levels with routine
17 project mitigation measures.
- 18 ○ *Greenhouse Gas Emissions:* Proposed Project construction would result in greenhouse gas
19 (GHG) emissions, but, as discussed below, those emissions would be offset by operational
20 reductions within a matter of months.
- 21 ○ *Hazards and Hazardous Materials:* Some parts of the Caltrain ROW are contaminated
22 because of prior activities. Project mitigation would control exposure of workers and the
23 public to contamination where encountered. Project mitigation would also control potential
24 spills of hazardous materials during construction, as well as potential effects on emergency
25 plans.
- 26 ○ *Hydrology and Water Quality:* Proposed Project construction impacts on water quality can
27 be reduced to less-than-significant levels with routine project mitigation measures.
- 28 ○ *Land Use and Recreation:* Temporary disruption of land use and recreation resulting from
29 Proposed Project construction can be reduced to less-than-significant levels with routine
30 project mitigation measures.
- 31 ○ *Noise and Vibration:* Construction would be required during the day and night in order to
32 maintain Caltrain passenger service during construction. Although project mitigation would
33 reduce noise in many locations, mitigation might not always reduce noise impacts during
34 nighttime construction to a less-than-significant level. Project mitigation would reduce
35 construction vibration impacts to a less-than-significant level.
- 36 ○ *Population and Housing:* The Proposed Project would not displace any housing and would
37 not result in substantial changes in population during construction.
- 38 ○ *Public Services and Utilities:* The Proposed Project would require relocation of certain
39 utilities and Caltrain would coordinate with all utility owners to conduct relocation activities
40 in a way that minimizes potential disruption.

⁹ Estimated tree removals based on the current tree survey and assessment. It was previously estimated that there are approximately 19,250 trees located within and immediately adjacent to Caltrain's ROW. See Appendix F, *Tree Inventory and Canopy Assessment*.

- 1 ○ *Transportation and Traffic:* The Proposed Project could result in temporary disruption of
2 traffic as well as passenger and rail service during construction. Project controls would
3 include coordination with local roadway agencies and other passenger and freight rail
4 service operators to minimize disruption.
- 5 ● Key Project Operational Impact Summary
- 6 ○ *Aesthetics:* The Proposed Project would change local visual character through addition of the
7 OCS, TPFs and tree removal along the existing Caltrain ROW. While the effect of the OCS and
8 the TPFs can be mitigated to a less-than-significant level, the change in aesthetics with tree
9 removal is identified as a significant and unavoidable impact, even with tree avoidance,
10 minimization, and replacement mitigation.
- 11 ○ *Air Quality:* The Proposed Project would substantially improve both local and regional air
12 quality. Reductions in Caltrain system criteria pollutant emissions compared with existing
13 (2013) conditions would range from 66 to 86 ~~56 to 84~~ percent in 2020 and more for 2040
14 with full electrification. Toxic air contaminant health risks along the Caltrain corridor
15 between San Jose and San Francisco due to train emissions would be reduced by 87 ~~74~~
16 percent in 2020 and by 100 percent in 2040 with full electrification compared to existing
17 conditions.
- 18 ○ *Biological Resources:* Operationally, the Proposed Project would have limited impacts on
19 biological resources except on nesting birds and bats during vegetation maintenance. These
20 impacts would be less than significant with mitigation to control the timing of maintenance.
21 The Proposed Project would have benefits for local and regional natural habitats by
22 reducing diesel emissions and their effects on terrestrial and aquatic habitats.
- 23 ○ *Cultural Resources:* The Proposed Project would have no impact on cultural resources during
24 operations.
- 25 ○ *Electromagnetic Fields/Electromagnetic Interference (EMF/EMI):* EMF levels associated with
26 EMU and OCS operation and traction power facilities would be less than health guidelines
27 and, thus, the impacts would be less than significant concerning public health. EMU and OCS
28 operation could result in interference with sensitive equipment at discrete facilities, such as
29 hospitals with imaging equipment and freight and passenger rail signal systems, but design
30 mitigation controls can address this potential similar to measures applied for prior
31 electrified railroads including the Northeast Corridor.
- 32 ○ *Geology, Soils and Seismicity:* With mitigation, the Proposed Project would have a less-than-
33 significant impact on geology, soils, or seismicity during operation.
- 34 ○ *Greenhouse Gas Emissions:* The Proposed Project would substantially reduce GHG emissions
35 compared with existing conditions and future No Project conditions. Reductions in Caltrain
36 system GHG emissions compared with existing (2013) conditions would be 24,000 metric
37 tons (MT) of carbon dioxide equivalent (CO₂e) in 2020 and 30,000 ~~31,000~~ MT CO₂e for 2040
38 with full electrification. When taking into account the reduction in regional vehicle miles
39 traveled with increased Caltrain ridership, the Proposed Project would reduce GHG
40 emissions compared with No Project conditions by 79,000 ~~68,000~~ MT CO₂e in 2020 and
41 189,000 ~~177,000~~ MT CO₂e for 2040 with full electrification. Construction GHG emissions
42 would be offset within a matter of months of operation.

- 1 ○ *Hazards and Hazardous Materials:* With mitigation, the Proposed Project would have a less-
2 than-significant impact on hazards and hazardous materials during operation.
- 3 ○ *Hydrology and Water Quality:* Some of the new project facilities would be located within the
4 100-year floodplain, but project mitigation would reduce impacts to a less-than-significant
5 level. Minor increases in impervious spaces would occur, but runoff impacts would be
6 controlled with implementation of stormwater regulation requirements. Portions of the
7 Caltrain ROW and some of the new project facilities are at risk of future coastal flooding due
8 to the projected sea level rise with climate change. Existing trackbed elevations along the
9 alignment were compared to the future state projections of sea level rise elevations for 2050
10 and 2100(CO-CAT 2013). Given that effective coastal flooding mitigation requires the
11 involvement of multiple parties beyond Caltrain, at this time it cannot be concluded that
12 future flooding impacts on the Caltrain system would be fully avoided. Mitigation to develop
13 and implement a ~~sea~~ sea level rise adaptation plan is proposed in the Draft EIR. Given the
14 Ballona Wetlands court decision, it is unknown whether or not the impacts of sea level rise
15 on a project are properly considered significant impacts under CEQA and, thus, this EIR
16 explains this impact for disclosure purposes.
- 17 ○ *Land Use and Recreation:* The Proposed Project would be located along an existing rail
18 corridor. Traction power substations constructed separate from the Caltrain ROW would be
19 allowable compatible uses in the proposed commercial/industrial locations. The Proposed
20 Project would not divide existing communities. Aesthetic impact mitigation would help
21 reduce potential operational impacts at ~~one two~~ park locations where a paralleling station is
22 proposed and where paralleling stations are adjacent to current or future residential areas.
23 Tree mitigation would also help to reduce impacts on park amenities where tree removal in
24 parks is required.
- 25 ○ *Noise and Vibration:* EMUs are quieter than the current diesel locomotives, but increased
26 service will mean more train horn events at the at-grade crossings. The Draft EIR evaluated
27 noise impacts with the Proposed Project at 49 locations along the project corridor and found
28 that the Proposed Project would lower noise levels compared to existing conditions at ~~37~~ ~~33~~
29 locations, would not change levels at eight locations and would result in small increases in
30 noise at ~~four~~ ~~eight~~ other locations. However, the increases would be less than FTA noise
31 thresholds. Noise associated with the traction power facilities was also evaluated and
32 significant impacts were only identified at one potential location for a traction power
33 substation in South San Francisco and one potential location for a paralleling station in Palo
34 Alto; noise design treatments proposed as mitigation would reduce impacts at this location
35 to a less-than-significant level. Vibration effects were also analyzed in the Draft EIR and
36 found to be less than significant for the Proposed Project.
- 37 ○ *Population and Housing:* The Proposed Project would not result in substantial changes in
38 population or housing demand during operation.
- 39 ○ *Public Services and Utilities:* The Proposed Project would have less-than-significant impact
40 on public services and utilities during operations.
- 41 ○ *Transportation and Traffic:*
- 42 ● The Draft EIR analyzes the potential traffic benefits and adverse effects of the Proposed
43 Project. In 2020, the Proposed Project would reduce daily regional VMT by 235,000
44 miles and would reduce daily VMT in every city along the corridor from San Jose to San

1 Francisco. In 2040, with full electrification, daily VMT reductions would be even greater
2 (619,000 miles).

- 3 ● Despite the overall traffic reduction benefits, the Proposed Project would result in
4 localized traffic impacts at certain intersections near at-grade crossings and around
5 Caltrain stations. The impact at the at-grade crossings is a combination of more gate-
6 down time due to more train service and less gate-down time due to faster acceleration
7 and deceleration of the EMUS. Compared to No Project conditions, at the at-grade
8 crossings with gates, the net effect of the Proposed Project would be to have longer gate-
9 down times at about 45 50 percent, shorter gate-down times at about 23 25 percent,
10 and mixed results at the remaining 32 25 percent (shorter gate-down times in one peak
11 period and longer in the other). With increased ridership, there will also be increased
12 traffic around Caltrain stations.
- 13 ● The Draft EIR studied a total of 82 intersections along the Caltrain corridor that were
14 selected as the most likely locations of potential project impact. Of those intersections,
15 the Proposed Project in 2020 would have significant impacts at 21 intersections.
16 Project-level mitigation would reduce these impacts to a less-than-significant at all but
17 seven nine intersections. An additional nine intersections were evaluated in the FEIR,
18 but no additional significant impacts were identified in this additional analysis.
- 19 ● The Proposed Project would have less-than-significant impacts on other transit services
20 and station access and parking and less-than-significant impacts with mitigation on
21 pedestrian and bicycle facilities.
- 22 ● The Proposed Project would have less-than-significant impacts on freight rail service
23 and operations as existing freight heights would be accommodated by the Proposed
24 Project, the project would not electrify the Union Pacific owned "MT-1" track south of
25 Santa Clara and the limited amount of existing freight service can continue to function
26 with the reduction in project would not result in any substantial change in freight
27 operational windows due to the temporal separation requirements of the FRA waiver. If
28 current FRA rule-making for alternative compliant vehicles results in elimination of the
29 temporal separation requirement, then impacts on freight service would be less than
30 disclosed in this EIR.
- 31 ● Key Cumulative Impacts, Including those Related to Blended Service
- 32 ○ *Aesthetics:* Blended service with more than two high-speed trains would require a set of
33 passing tracks. Depending on location, this may result in a significant change in local visual
34 character in combination with the Proposed Project's impacts related to tree removal and
35 OCS installation. Because the Proposed Project would result in changes in visual character at
36 some locations due to tree removal where tree replacement is not possible on-site, the
37 Proposed Project may contribute considerably to localized changes in visual character.
- 38 ○ *Air Quality:* Since the Proposed Project would improve air quality, it would not contribute
39 adversely to cumulative air quality impacts.
- 40 ○ *Biological Resources:* Blended Service improvements and other cumulative projects may
41 affect some of the same biological resources affected by the Proposed Project but these
42 impacts can likely be mitigated to a less than significant level with mitigation similar to the
43 Proposed Project. With mitigation, the Proposed Project would not contribute to any
44 cumulatively significant impacts.

- 1 ○ *Cultural Resources*: Cultural resource impacts usually result from construction; therefore, no
2 significant cumulative impacts on cultural resources were identified.
- 3 ○ *Electromagnetic Fields/Electromagnetic Interference (EMF/EMI)*: Combined Proposed
4 Project and HSR EMF levels are expected to be less than EMF threshold levels. HSR
5 operations could also result in EMI impacts on facilities with sensitive equipment like the
6 Proposed Project. Design level treatments could address potential contributions of the
7 Proposed Project to EMI impacts.
- 8 ○ *Geology, Soils and Seismicity*: Proposed Project contributions to cumulative impacts related
9 to geology, soils and seismicity can be reduced to less than significant levels with routine
10 project mitigation measures.
- 11 ○ *Greenhouse Gas Emissions*: As noted above, the Proposed Project would reduce GHG
12 emissions and thus would not contribute to cumulative impacts related to GHG emissions.
- 13 ○ *Hazards and Hazardous Materials*: Proposed Project contributions to cumulative impacts
14 related to hazards and hazardous materials can be reduced to less-than-significant levels
15 with routine project mitigation measures.
- 16 ○ *Hydrology and Water Quality*: Proposed Project contributions to cumulative impacts related
17 to hydrology and water quality can be reduced to less than significant levels with routine
18 project mitigation measures except potentially related to flooding associated with sea level
19 rise, which may be considerable and unavoidable.
- 20 ○ *Land Use and Recreation*: Proposed Project contributions to cumulative impacts related to
21 land use and recreation can be reduced to less-than-significant levels with project mitigation
22 related to tree avoidance and replacement, and with aesthetic mitigation addressing new
23 infrastructure.
- 24 ○ *Noise and Vibration*:
- 25 ● Cumulative noise impacts were evaluated for 2040 with the combined effect of the
26 Proposed Project, HSR trains, increases in freight service, and increases in other tenant
27 passenger rail services (ACE, Capitol Corridor, AMTRAK, and Dumbarton Rail Corridor).
28 Cumulative noise increases were found to increase noise levels in excess of FTA noise
29 thresholds in 2040 at nearly all study locations if all rail increases come to fruition.
30 Cumulative noise mitigation is proposed to consider a long-term program of noise
31 reductions including multiple approaches such as ~~wayside horns~~, building sound
32 insulation and quiet zones¹⁰. Long-term grade separations and road closures are also
33 considered, where acceptable to local jurisdictions and where funding is available.
- 34 ● Cumulative vibration impacts were evaluated with cumulative rail service increases and
35 were found to be significant due to the cumulative number of increases trains and
36 potentially due to the increase in vibration associated with potential increased speeds
37 for the Blended Service 110 mph scenario. Cumulative vibration mitigation is proposed
38 that includes track treatments and design that would address potential cumulative
39 effects.

¹⁰ Quiet zones may be adopted only by local jurisdictions (i.e., cities and counties), not by rail operators like Caltrain. As discussed in Section 4.1, *Cumulative Impacts*, in this EIR, this mitigation strategy would only apply where a local jurisdiction is willing to approve a quiet zone and where feasible at-grade crossing improvements are identified that meet the FRA requirements for quiet zones.

- 1 ○ *Population and Housing:* The Proposed Project would not contribute considerably to any
2 cumulative impacts related to population and housing.
- 3 ○ *Public Services and Utilities:* The Proposed Project would not contribute considerably to any
4 cumulative impacts related to public services and utilities.
- 5 ○ *Transportation and Traffic:*
- 6 ● Since the Proposed Project would reduce regional VMT, it would not contribute
7 adversely to cumulative regional traffic.
- 8 ● The Draft EIR studied cumulative impacts with and without the Proposed Project at 82
9 intersections along the Caltrain corridor. Of those intersections, there would be 39
10 locations where the Proposed Project would contribute considerably to significant
11 localized cumulative traffic impacts. Cumulative mitigation includes signalization and
12 minor roadway improvements. Proposed mitigation would reduce the Proposed
13 Project's cumulative contribution to less than significant at all but 17 intersections.
14 While grade separations are a technically feasible mitigation, as noted above it is
15 financially infeasible for Caltrain to adopt a comprehensive program of grade
16 separations as mitigation. However, in the long-term where funding becomes available
17 and it is acceptable to local jurisdictions, Caltrain would support grade separations in
18 the long run.
- 19 ● The Proposed Project would have less-than-considerable contributions or less-than-
20 considerable contributions with mitigation to cumulative impacts on other transit
21 services, pedestrian and bike facilities, and station access and parking.
- 22 ● ~~Blended Service operations could further limit the freight operational window
23 depending on the specific HSR operational windows. Future freight increases may also
24 be challenged with the narrowing of operational windows.~~ Lowering of existing
25 overhead heights at certain locations may limit the ability of freight operators to use
26 freight train equipment with higher heights than at present. While it is likely that freight
27 operators can adapt to these changed conditions with scheduling and equipment
28 selection options, it is possible that a limited amount of future freight service might not
29 be accommodated on the Caltrain corridor and could be diverted to other locations or to
30 other modes (such as trucks) that may result in secondary impacts on localized traffic
31 and localized noise¹¹. ~~Limiting of passenger rail service to avoid narrowing of freight
32 operational windows would be counterproductive to Proposed Project and Blended
33 Service purposes and would only decrease project benefits to regional traffic, air quality,
34 and noise.~~ However, mitigation is identified to provide for restoration of existing
35 effective vertical clearances where needed and feasible.

¹¹ As described in Section 4.1, *Cumulative Impacts*, due to the Proposed Project's substantial regional traffic, air quality, and greenhouse gas emission benefits, a limited amount of freight diversion from rail to truck would not result in significant cumulative regional traffic, air quality, or greenhouse gas impacts. The impact identified associated with limited diversion, if it occurs, would be confined to potential localized traffic and noise along truck haul routes.

ES.8 Other Alternatives Studied

The JPB considered a wide range of alternatives suggested during the scoping process and then conducted a three-part screening evaluation to select the alternatives to be analyzed in this EIR. Alternatives determined to be infeasible, to not avoid or substantially reduce one or more significant impacts of the Proposed Project, or to not meet all or most of the project's objectives purpose and need were dismissed from further analysis. Based on the screening process results, ~~this EIR the JPB~~ selected the following alternatives for further analysis: the No Project Alternative and ~~four~~^{three} other alternatives: a Diesel Multiple Unit (DMU) Alternative, a Dual-Mode Multiple Unit Alternative, a Tier 4 Diesel Locomotive Alternative, and an Electrification with OCS Installation by Factory Train Alternative.

A key feature of different train alternatives that is critical to providing train service along a commute corridor with many potential stops is acceleration and deceleration. Table ES-4 compares the initial acceleration rates and time to accelerate to 79 mph of the alternatives analyzed in this EIR:

Table ES-4. Estimated Initial Acceleration Rates of Different Alternatives

Operator	Diesel Locomotives (No Project)	Dual-Mode Multiple Units	Diesel Multiple Units	Tier 4 Diesel Locomotive Alternative	Electric Multiple Units (Proposed Project)
Initial Acceleration Rate (mph/second)	0.5 <u>(Existing)</u> 1.1 (New)	1.1 (Diesel) 4.5 (Electric) 1.7 (both modes)	1.4 1.8	1.1 (Single-head) 2.1 (Double-head)	2.1
<u>Time to Accelerate to 79 mph</u>	<u>2'33"</u>	<u>2'44"</u>	<u>1'45"</u>	<u>1'24" (Double-head)</u> <u>2'33" (Single-Head)</u>	<u>1'06"</u>

Sources provided in Chapter 5, *Alternatives*

ES.8.1 The No Project Alternative

Section 15126.6(e) of the State CEQA Guidelines requires the analysis of a No Project Alternative.

The No Project Alternative would include no electrification of the Caltrain ROW between San Jose and San Francisco, no purchase of EMUs, and no increase in train service. The current train service is assumed to continue unchanged to 2020 and 2040. As noted above, this service consists of five trains per peak hour, 92 trains per day, through use of diesel engine-hauled locomotive trains. Locomotives and passenger carriages would be replaced when they reach the end of their service life, meaning that approximately 75 percent of the existing fleet would be replaced by 2020. If new equipment is purchased, then new locomotives would need to meet the U.S. Environmental Protection Agency (USEPA) Tier 4 emissions standards.

While this alternative would not increase train service, ridership would still increase, similar to how ridership has been increasing in recent years, meaning that trains would have a higher occupancy average in the future.

1 ES.8.2 Diesel Multiple Unit Alternative

2 Diesel Multiple Units (DMUs) are self-propelled diesel-mechanical vehicles with engines located
3 below the passenger compartment. The key DMU characteristic related to desired service
4 improvements is the reduction of running times due to faster acceleration than traditional diesel
5 locomotive push-pull service. DMUs require less time to accelerate up to full speed from stations
6 stops and slow areas (compared to existing single-head diesel locomotive trains), reducing overall
7 travel times, particularly on a corridor featuring frequent stops.

8 A DMU Alternative is considered feasible, would avoid or substantially reduce one or more
9 significant impacts of the Proposed Project and would meet some, but not all of the project's
10 objectives purpose and need. Specifically, a A DMU Alternative would not meet the project's purpose
11 to provide electrical infrastructure compatible with high-speed rail. In addition, while the increased
12 train service under this alternative would increase revenue, this alternative would also increase
13 diesel fuel consumption compared with existing conditions¹² which would increase operating costs
14 and would have lower ridership than the Proposed Project. Because this alternative fails to meet the
15 project's fundamental purposes, the JPB could decide not to analyze it in this EIR. However, there
16 has been community interest, expressed most recently in scoping comments, in the analysis of a
17 DMU Alternative and, thus, the JPB decided to provide this alternative analysis for informational
18 purposes.

19 For the purposes of this EIR, this alternative assumed the following:

- 20 • An eight-car single-level DMU train, with a capacity of 78 passengers per car (624 passengers
21 per train) was analyzed in order to analyze an alternative that would roughly match the
22 approximate number of seats ridership per train capacity of the Proposed Project. Only a single-
23 level is being evaluated because a the currently available double-deck DMU designs would not fit
24 in the Caltrain system tunnels and because there are a number of other constraints to a double-
25 deck design including that there is no existing market for double-deck DMUs (see further
26 discussion in Chapter 5, Alternatives).
- 27 • Caltrain service schedule for the DMU Alternative would be the same as the Proposed Project
28 but with lower ridership. DMUs do not accelerate or decelerate as fast as EMUs and thus the
29 number of station stops steps would likely have to be reduced to maintain the same trip time as
30 the Proposed Project EMUs or travel times would be longer less.
- 31 • The eight-car single-level DMU train length of 680 feet would exceed the length of Caltrain
32 platforms at most Caltrain stations and would require platform extension construction.
- 33 • The DMU Alternative is assumed to terminate at the San Francisco 4th and King Station and
34 would not proceed to the Transbay Terminal Center {TTC} because the Downtown Extension
35 (DTX) tunnel and the TTC are designed only for electric trains.

¹² In general, DMUs are more fuel efficient than diesel locomotives for consists of five cars or fewer but less fuel efficient for consists longer than five cars. The Proposed Project includes six-car consists to accommodate approximately 600 passenger seats per train to meet ridership demands. Thus, an eight-car DMU was assumed to accommodate a similar level of passengers. Among many other considerations described in Chapter 5, *Alternatives*, train length and fuel efficiency are two reasons that a DMU option is not as favorable for the Caltrain service as EMUs would be.

1 **ES.8.3 Dual-Mode Multiple Unit (Dual-Mode MU) Alternative**

2 Dual-mode MUs are self-propelled vehicles that can operate in both a diesel mode and in an
3 electrified mode. While there are dual-mode locomotives in operation on the East Coast, there are no
4 known dual-mode MUs in operation in the United States at present. However, there are dual-mode
5 MUs in operation in Europe and others in construction that can operate in both a diesel mode in
6 non-electrified territory and in an electrified mode using an overhead 25 kVA OCS.

7 A Dual-Mode MU Alternative is considered feasible, would avoid or substantially reduce one or more
8 significant impacts of the Proposed Project and would meet some, but not all of the project's
9 objectives purpose and need. The Dual-Mode MU Alternative would not meet the project's purpose
10 to provide electrical infrastructure compatible with high-speed rail. In addition, while the increased
11 train service under this alternative would increase revenue, this alternative would also increase
12 diesel fuel consumption compared with existing conditions¹³ which would increase operating costs
13 and would have lower ridership than the Proposed Project. Because this alternative fails to meet the
14 project's fundamental purposes, the JPB could decide not to analyze it in this EIR. However, there
15 has been community interest, expressed most recently in scoping comments, in the analysis of a
16 Dual-Mode MU Alternative and, thus, the JPB decided to provide this alternative analysis for
17 informational purposes.

18 For the purposes of this alternative analysis, existing European train designs were used to derive
19 alternative assumptions.

- 20 • A 10-car single-level dual-mode MU train, consisting of two coupled five-car trainsets, with an
21 approximate capacity of 600 passenger seats per train was analyzed in order to analyze an
22 alternative that would roughly match the per train capacity of the Proposed Project.
- 23 • The 10-car single-level dual-mode MU train length would be 600 feet which would require
24 lengthening at some of the Caltrain platforms including the platforms at 22nd Street, Broadway,
25 California Street, Sunnyvale, and Santa Clara.
- 26 • Caltrain service schedule for the Dual-Mode MU Alternative would be the same as the Proposed
27 Project but with lower ridership. Dual-mode MUs do not accelerate or decelerate as fast as EMUs
28 and thus the number of station stops would likely have to be reduced to maintain the same trip
29 time as the Proposed Project EMUs or travel times would be less.
- 30 • This alternative does not include electrification between San Jose and the 4th and King Station in
31 San Francisco. However, this alternative would need to include traction power facilities to link
32 the electrified lines in the DTX to power from PG&E. This electrification would involve
33 connecting overhead or underground transmission wires from PG&E to a new traction power
34 substation, and connecting transmission lines from the new traction power substation to the
35 OCS for the DTX.
- 36 • This Alternative is assumed to operate in a diesel mode from San Jose to San Francisco and then
37 either terminate at the San Francisco 4th and King Station or proceed in an electric mode to the
38 TTC. In 2020, this alternative, like the Proposed Project, would terminate at the 4th and King
39 Station. In 2040, this alternative is presumed to operate with split service with 4 trains
40 terminating at the 4th and King Station and two trains proceeding to TTC.

¹³ A Dual-Mode MU Alternative would have similar, but likely somewhat greater, fuel consumption than the DMU Alternative would have because the multiple units are often heavier (due to dual-mode equipment) and the train consist would likely be longer, as assumed in this EIR.

1 **ES.8.4 Tier 4 Diesel Locomotive Alternative (T4DL)**

2 A Tier 4 Diesel Locomotive (T4DL) Alternative is feasible, as new diesel locomotives are under
 3 construction in the U.S. that can meet the USEPA's Tier 4 emissions standards.

4 The T4DL Alternative would not meet the project's objective of providing electrical infrastructure
 5 compatible with high-speed rail. In addition, while the increase train service under this alternative
 6 would increase revenue, this alternative would also increase diesel fuel consumption compared with
 7 existing conditions which would increase operating costs. Therefore, this alternative would only
 8 partially meet the project's objective to increase operating revenue and would not meet the project
 9 objective to reduce operating fuel costs. In addition, as discussed below, this alternative would not
 10 lower engine noise compared to the No Project Alternative.

11 The new Tier 4 diesel locomotives under construction by Siemens can reach up to 125 mph top
 12 speed and have a maximum deceleration of approximately 1.8 mphps (Siemens 2013), but the
 13 deceleration profile would be somewhat less than that of the EMUs as the passenger coaches would
 14 not have independent braking like the EMUs.

15 This alternative includes two variants: 1) a single-head (SH) scenario which includes operation of
 16 train consists with only one locomotive; and 2) a double-head (DH) scenario in which trains are
 17 operated with two locomotives in order to match the Proposed Project schedule.¹⁴

18 For the purposes of this alternative analysis in order to make "apples to apples" comparisons to the
 19 Proposed Project to contrast the consequences of using a different train technology, the following
 20 assumptions were made.

- 21 • Train consists would be the same as today with a single or double locomotive hauling 5 bi-level
 22 passenger coaches with a nominal capacity of 600 passenger seats per train order to analyze an
 23 alternative that would roughly match the ridership per train capacity of the Proposed Project.
- 24 • It was assumed that the Caltrain service levels (6 trains per peak hour, 114 trains/weekday)
 25 would be the same as the Proposed Project.
- 26 • For 2040, the T4DL Alternative is assumed to terminate at the San Francisco 4th and King
 27 Station and would not proceed to the TTC because the DTX and the TTC are designed only for
 28 electric trains.

29 **ES.8.5 Electrification with OCS Installation by Factory Train 30 Alternative**

31 This alternative consists of the same operational elements as the Proposed Project (electrified
 32 service with EMUs) but with a different method for construction of the OCS.

33 An alternative method of installing the OCS could be through the use of a so-called "Factory Train"
 34 (also called an "Electrification Train" and a "High Output Plant System" or the HOPS train), which is a
 35 moveable assembly line system, mounted on rails. One of the prime advantages of a Factory Train is
 36 the rate of progress in OCS installation. Rates of progress up to 1 mile/night have been reported, and

¹⁴ In order to provide an "apples to apples" comparison, the Tier 4 Diesel Locomotive Alternative presumes replacement of approximately 75 percent of the existing diesel locomotives in 2020 with Tier 4 Diesel Locomotives and the use of the other remnant Caltrain diesel locomotives until they reach the end of their service life, which is the same assumption made about the use of EMUs for the Proposed Project.

1 the system can reportedly be used while allowing for adjacent rail lines to be used by existing trains
2 although there may be speed restrictions for the use of adjacent lines.

3 This alternative is only a construction methodology alternative to conventional construction of the
4 OCS. Thus, analysis is limited to differences between the Proposed Project and this alternative
5 relative to OCS construction. As noted above, about 80 percent of the OCS is presumed to be
6 installed using a Factory Train with the remaining 20 percent assumed to be installed using
7 conventional construction. Thus, the discussion below is only relevant to the 80 percent installed by
8 a Factory Train. Construction impacts for the other 20 percent would be the same as for the
9 Proposed Project.

10 **ES.9 Comparison of Alternatives and the 11 Environmentally Superior Alternative**

12 The State CEQA Guidelines require a comparison of alternatives analyzed in an EIR and
13 identification of an environmentally superior alternative. The environmentally superior alternative
14 is the alternative that would avoid or substantially lessen, to the greatest extent, the environmental
15 impacts associated with the project while feasibly obtaining most of the major project objectives. If
16 the alternative with the least environmental impact is determined to be the No Project Alternative,
17 the EIR must also identify an environmentally superior alternative among the other alternatives.

18 For construction, the No Project Alternative and the Tier 4 Diesel Locomotive Alternative would
19 both be the environmentally superior alternative because neither it would require any ~~have no~~
20 ~~electrification infrastructure (OCS or TPFs)~~ construction. ~~Excluding the No Project Alternative,~~ The
21 Dual-Mode MU Alternative would ~~be the environmentally superior construction alternative because~~
22 ~~it would~~ result in a lower level of construction than the DMU Alternative, the Proposed Project and
23 the Electrification with OCS Installation by Factory Train Alternative. Given what is known about the
24 Factory Train construction at this time,¹⁵ it is considered environmentally superior to the Proposed
25 Project for construction.

26 For operations, the No Project Alternative would be environmentally inferior to the DMU
27 Alternative, the Dual-Mode MU Alternative, the Tier 4 Diesel Locomotive Alternative and the
28 Proposed Project because it would result in substantially lower ridership and, thus, higher criteria
29 pollutant and GHG emissions, ~~higher noise levels at a majority of locations~~, and worse regional
30 traffic conditions. However, the No Project Alternative would have lower noise levels than the DMU
31 Alternative, the Dual-Mode MU Alternative and the Tier 4 Diesel Locomotive Alternative. The Dual-
32 Mode MU Alternative would have higher 2020 operational impacts than the DMU Alternative for
33 2020 (due to a heavier train set and likely more fuel consumption), but due to likely higher ridership
34 in the long run with DTX/TTC, the Dual Mode MU Alternative is likely to result in long-term better
35 air quality, lower GHG emissions and better regional traffic conditions than the DMU Alternative and

¹⁵ As noted above, this is a new technology, and the first OCS installation using it starts in early 2014, so there is no in-practice data by which to judge the impacts of that project, only the one single Environmental Statement completed for the Great Western Main Line Electrification Project. Despite that project lacking certain data, such as quantification of construction air quality or GHG emissions, the evidence in the Environmental Statement appears to support a conclusion that taking into account all construction subjects, a Factory Train alternative would be environmentally superior.

1 the Tier 4 Diesel Locomotive Alternative. Thus, for operations of the alternatives to the Proposed
2 Project, the Dual-Mode MU Alternative would be the environmentally superior alternative.

3 However, compared with the Proposed Project, the non-electrification alternatives Dual-Mode MU
4 Alternative and the DMU Alternative would result in higher criteria pollutant and GHG emissions,
5 higher noise levels, and likely worse regional traffic in the long run, but would avoid the long-term
6 impacts of the OCS infrastructure and tree removal.¹⁶ The tradeoffs between aesthetics impacts
7 versus air quality, GHG emissions, noise, and traffic impacts are is not easily evaluated given the
8 dissimilar nature of these different impacts.

9 The following summarizes the key differentiators between the Dual-Mode Alternative, the DMU
10 Alternative and the Proposed Project.

- 11 ● Residents, park users, and other sensitive receptors along the Caltrain ROW would have less
12 aesthetic impacts, slightly higher TAC emission health risks, and higher noise impacts with the
13 non-electrification alternatives Dual-Mode Alternative and the DMU Alternative.
- 14 ● Bay Area residents would be more affected relative to air quality and regional traffic by the non-
15 electrification alternatives Dual-Mode Alternative and the DMU Alternative than by the
16 Proposed Project.
- 17 ● Contributions to GHG emissions, which cumulatively affect the entire planet, would be higher
18 with the non-electrification alternatives Dual-Mode Alternative and the DMU Alternative than
19 with the Proposed Project

20 While respecting the negative aesthetic impacts that would be experienced by individual receptors,
21 on balance, the Proposed Project is considered environmentally superior to the non-electrification
22 alternatives Dual-Mode Alternative and the DMU Alternative for operations because the air quality,
23 TAC emission, GHG emissions, noise levels, and regional traffic all affect the physical health or safety
24 of receptors along the Caltrain ROW, in the San Francisco Bay Area, and on the planet as a whole.
25 Comparison of different impact subjects requires one to make value judgments; on balance, the JPB
26 places a greater value on overall public health and safety in making this judgment.

27 When considering construction and operations together, a similar reasoning is applied. Given the
28 long-term benefits to public health and safety and the temporary nature of construction, the
29 Proposed Project is considered environmentally superior to the No Project Alternative, the Dual-
30 Mode Alternative and the DMU Alternative and the Tier 4 Diesel Locomotive Alternative. Inclusion of
31 the Factory Train Alternative as part of the Proposed Project would be environmentally superior to
32 the Proposed Project only using conventional OCS construction methods. Excluding the Factory
33 Train Alternative, which is only a partial alternative, the Dual-Mode MU Alternative would be the
34 environmentally superior alternative among the full alternatives because it would result in better
35 long-term benefits to public health and safety by having lower criteria pollutant emissions, lower
36 GHG emissions, and lower regional traffic than the DMU Alternative and the No Project Alternative.

¹⁶ As described in Section 3.3, *Biological Resources*, the Proposed Project's biological impacts relative to tree removal can be mitigated to less-than-significant levels, but as noted in Section 3.1, *Aesthetics*, the visual aesthetic impacts of tree removal may not always be mitigable to a less-than-significant level; thus, the comparison herein focuses on the visual aesthetic impacts of tree removal.

ES.10 Issues of Controversy and Issues to be Resolved

There are a number of notable areas of controversy for the Proposed Project including, but not limited to, the following:

- *Relation of the Project to the California High-Speed Rail Project:* This EIR describes the relation of the Proposed Project both in terms of funding, electrical infrastructure compatibility, as well as separate environmental review of the electrification project by Caltrain and of Blended Service by CHSRA. Some individuals may oppose high-speed rail or may oppose the electrification project because of its relation to the high-speed rail project. Some individuals may prefer to delay project analysis of the electrification project until a project analysis of Blended Service is conducted connected.
- *Aesthetic Impacts of the Overhead Contact System and Tree Removal¹⁷:* This EIR discloses the impacts of new overhead infrastructure and tree removal on local visual character and proposes feasible mitigation to minimize the change in visual aesthetics. Affected parties may object to these impacts and may advocate for non-electrification alternatives or rejection of the Proposed Project to avoid the potential for these impacts to occur.
- *Noise Impacts of Existing and Future Trains:* As noted above, project-level train noise impacts would be less than significant but cumulative train noise impacts would be significant at many locations along the Caltrain corridor. Given funding limitations, Caltrain alone cannot commit to a comprehensive set of improvements to avoid all cumulative noise impacts. Affected parties may advocate that the Proposed Project should commit to these improvements, despite the financial limitations, think that the Proposed Project should be delayed until funding is obtained to make such a commitment, or that the Proposed Project should not go forward with these impacts. When Caltrain obtains sufficient funding for all EMU service between San Jose and San Francisco, then the Caltrain service would not contribute to cumulative noise increases compared to existing conditions.
- *Traffic Impacts of Future Train Service Increases:* As noted above, project-level and cumulative localized traffic impacts would be reduced to a less than significant level at some, but not all locations with proposed mitigation. Given funding limitations, Caltrain alone cannot commit to a comprehensive set of improvements to avoid all project or cumulative traffic impacts. Affected parties may advocate that the Proposed Project should commit to these improvements, despite the financial limitations, think that the Proposed Project should be delayed until funding is obtained to make such a commitment, or that the Proposed Project should not go forward with these impacts.
- *Project Impacts on Freight Service:* As described above, the Proposed Project could affect freight service because of changes in freight operational hours, which would be of concern to Union Pacific Railroad and freight users. The Proposed Project would provide adequate vertical clearances to accommodate existing freight equipment, and the Draft EIR identifies mitigation to restore existing effective vertical clearances where feasible, but there would be a slight (1-foot) reduction in effective vertical clearances between the Butterhouse Spur and Bayshore and any

¹⁷ The EIR addresses tree removal as both a biological resource impact and an aesthetic impact. A key controversy is the aesthetic impact on local visual character due to tree removal, but individuals may also be highly concerned about the biological resource impacts of tree removal.

1 ~~necessary and appropriate.~~ Still, changes in vertical clearance would be of concern to the
2 affected parties.

- 3 • *Consideration of Alternatives:* The Draft EIR analyzes several alternatives to the Proposed Project
4 at a lesser level of detail as allowed by CEQA. Some individuals may desire that Caltrain consider
5 alternatives to electrification at an equal level to the Proposed Project and that the JPB Board
6 would select one of such alternatives instead of the Proposed Project.

7 The following issues remain to be resolved:

- 8 • *Consideration of Comments on this Draft EIR:* Caltrain will consider and respond to substantive
9 comments on the Draft EIR in the Final EIR scheduled for completion later in 2014.
- 10 • *Certification of the EIR and Adoption of the Project:* The JPB will need to consider the Final EIR,
11 once prepared, and decide whether to certify the document. If certified, then the Board would
12 need to decide whether to adopt the Proposed Project.
- 13 • *Design of the Proposed Project and Procurement of Rolling Stock:* The final design of the Proposed
14 Project needs to be completed following the environmental process as does the procurement
15 process for EMU rolling stock.
- 16 • *FRA Rule-Making on Alternative Compliant Vehicles:* The FRA is currently engaged in rule-making
17 that may influence Proposed Project operations, ~~including whether or not the current FRA~~
18 ~~waver requirements concerning temporal separation need to be retained.~~
- 19 • *California Public Utility Commission (CPUC) Draft General Order:* The CPUC initiated rule-making
20 (13-03-009) in 2013 pursuant to Petition 12-10-011 concerning a new General Order governing
21 safety standards for the use of 25 kVA electrical lines to power high-speed trains. Because the
22 OCS for the Proposed Project would be used in the future by both Caltrain and high-speed rail,
23 some of the issues addressed in the draft General Order may apply to the Proposed Project OCS.
24 It also appears additional CPUC rule-making proceedings would be needed for the Proposed
25 Project because it would not be a fully grade-separated shared system.
- 26 • *Resolution of Legal Challenges to the Use of Proposition 1A Funds by CHSRA:* There are existing
27 challenges to the current proposed use of Proposition 1A bond funds for the high-speed rail
28 project. Depending on the resolution of these legal challenges, there might be ~~affects to effects~~
29 ~~on the proposed use of Proposition 1A funds to fund a significant portion of the capital costs of~~
30 the Proposed Project.
- 31 • *Planning and Design of the Blended Service Improvements:* Blended Service needs further
32 evaluation and design in order to define specific improvements necessary along the Caltrain
33 corridor, including station design, track improvements, passing track location and design,
34 maintenance facility design and location, as well as other details.
- 35 • *Project-Level Evaluation of Blended Service Improvements by CHSRA:* Following further design,
36 CHSRA will need to conduct project-level environmental evaluation of Blended Service in
37 accordance with federal and state environmental regulations.
- 38 • *Preemption of CEQA by Federal Law:* ~~As discussed in Section 1.5.1, there is considerable legal~~
39 ~~authority for the proposition that CEQA does not apply to the construction, improvement and~~
40 ~~operation of rail lines that are subject to federal jurisdiction. Consequently, as a federally-~~
41 ~~regulated rail carrier, in the event of litigation, the JPB reserves the right to assert that federal~~
42 ~~law may preempt aspects of CEQA as applied to the Proposed Project.~~

1 **Table ES-3. Summary of Project Impacts and Required Mitigation Measures**

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
Aesthetics				
AES-1: Have a substantial adverse effect on a scenic vista	Both	Less than significant	--	--
AES-2: Substantially degrade the existing visual character or quality of the site and its surroundings	Construction	Significant	AES-2a: Minimize OCS construction activity on residential and park areas outside the Caltrain ROW	Less than significant
	Operations	Significant	AES-2b: <u>Apply aesthetic surface treatments to new infrastructure to and provide screening vegetation at TPFs in sensitive visual locations</u> <u>Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers</u> BIO-5: Tree Avoidance, Minimization, and Replacement Plan CUL-1d: Implement design commitments at historic railroad stations	Significant and unavoidable (tree removal/pruning); Less than significant (TPFs, OCS, and overbridge protection structures)
AES-3: Substantially damage scenic resources, including trees, rock outcroppings, and historic buildings, along a scenic roadway	Both	Less than significant	--	--
AES-4: Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area	Construction	Significant	AES-4a: Minimize spill over light during nighttime construction	Less than significant
	Operations	Significant	AES-2b: <u>Apply aesthetic surface treatments to new infrastructure to and provide screening vegetation at TPFs in sensitive visual locations</u> <u>Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers</u> AES-4b: Minimize light spillover at TPFs	Less than significant

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
CUMUL-1-AES: Cumulative impacts on visual aesthetics	Construction	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
	Operation	Considerable (significant)	Project-level mitigation noted above	Considerable and unavoidable (significant)
Air Quality				
AQ-1: Conflict with or obstruct implementation of the applicable air quality plan	Operations	Less than significant	--	--
AQ-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation	Construction	Significant	AQ-2a: Implement BAAQMD basic and additional construction mitigation measures to reduce construction-related dust AQ-2b: Implement BAAQMD basic and additional construction mitigation measures to control construction-related ROG and NOx emissions AQ-2c: Utilize clean diesel-powered equipment during construction to control construction-related ROG and NOx emissions	Less than significant
	Operations	Less than significant (Beneficial)	--	--
AQ-3: Cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard	Construction	Significant	AQ-2a: Implement BAAQMD basic and additional construction mitigation measures to reduce construction-related dust AQ-2b: Implement BAAQMD basic and additional construction mitigation measures to control construction-related ROG and NOx emissions AQ-2c: Utilize clean diesel-powered equipment during construction to control construction-related ROG and NOx emissions	Less than significant
	Operations	Less than significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
AQ-4: Expose sensitive receptors to substantial pollutant concentrations	Construction	Less than Significant	--	--
	Operations	Less than Significant	--	--
AQ-5: Creation of objectionable odors affecting a substantial number of people.	Both	Less than significant	--	--
CUMUL-2-AQ: Cumulative effects on air quality	Construction	Considerable (significant)	Project-level mitigation noted above.	Less than considerable (less than significant)
	Operations	Beneficial	--	--
Biological Resources				
BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service	Construction	Significant	BIO-1a: Implement general biological impact avoidance measures BIO-1b: Implement special-status plant species avoidance and revegetation measures BIO-1c: Implement California red-legged frog and San Francisco garter snake avoidance measures BIO-1d: Implement western pond turtle avoidance measures BIO-1e: Implement Townsend's big-eared bat, pallid bat, hoary bat, and fringed myotis avoidance measures BIO-1f: Implement western burrowing owl avoidance measures BIO-1g: Implement northern harrier, white-tailed kite, American peregrine falcon, saltmarsh common yellowthroat, purple martin, and other nesting bird avoidance measures BIO-1h: Conduct biological resource survey of future contractor-determined staging areas BIO-1i: Minimize impacts on Monarch butterfly overwintering sites	Less than significant

Impact	Phase	Significance	Mitigation	Significance after
		before Mitigation		Mitigation
BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations	Operations	Significant	BIO-1j: Avoid nesting birds and bats during vegetation maintenance	Less than significant
	Construction	Significant	BIO-1a: Implement general biological impact avoidance measures BIO-1b: Implement special-status plant species avoidance and revegetation measures BIO-2: Implement serpentine bunchgrass avoidance and revegetation measures BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan	Less than significant
BIO-3: Have a substantial adverse effect on federally protected waters or wetlands as defined by Section 404 of the Clean Water Act or state waters or wetlands through direct removal, filling, hydrological interruption, or other means	Operation	Less than significant	--	--
	Construction	Significant	BIO-1a: Implement general biological impact avoidance measures BIO-1h: Conduct biological resource survey of future contractor-determined staging areas BIO-3: Avoid or compensate for impacts on wetlands and waters HYD-1: Implement construction dewatering treatment	Less than significant
BIO-4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	Operation	Less than significant	--	--
	Both	Less than significant	--	--
BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	Construction	Significant	BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan	Less than significant
	Operation	Less than significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
BIO-6: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan	Construction	Significant	BIO-6: Pay <i>Santa Clara Valley Habitat Plan</i> land cover fee (if necessary)	Less than significant
	Operation	Less than significant	--	--
CUMUL-3-BIO: Cumulative effects on biological resources	Construction	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
	Operation	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
Cultural Resources				
CUL-1: Cause a substantial adverse change in the significance of historic built resources pursuant to Section 15064.5	Both	Significant	CUL-1a: Evaluate and minimize impacts on structural integrity of historic tunnels CUL-1b: Minimize impacts on historic decorative tunnel material CUL 1-c: Install project facilities in a way that minimizes impacts on historic tunnel interiors CUL-1d: Implement design commitments at historic railroad stations CUL-1e: Implement specific tree mitigation considerations at two potentially historic properties and landscape recordation, as necessary CUL-1f: Implement historic bridge and underpass design requirements BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan	Less than significant for all resources except possibly significant and unavoidable at Tunnel 4 and possibly for several potential historic resources affected by tree removal

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
CUL-2: Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5	Both	Significant	<p>CUL-2a: Conduct an archaeological resource survey and/or monitoring of the removal of pavement or other obstructions to determine if historical resources under CEQA or unique archaeological resources under PRC 21083.2 are present</p> <p>CUL-2b: Conduct exploratory trenching or coring of areas where subsurface project disturbance is planned in those areas with "high" or "very high" potential for buried site</p> <p>CUL-2c: Conduct limited subsurface testing before performing ground-disturbing work within 50 meters of a known archaeological site</p> <p>CUL-2d: Conduct exploratory trenching or coring of areas within the three zones of special sensitivity where subsurface project disturbance is planned</p> <p>CUL-2e: Stop work if cultural resources are encountered during ground-disturbing activities</p> <p>CUL-2f: Conduct archaeological monitoring of ground-disturbing activities in areas as determined by JPB and SHPO</p>	Less than significant
CUL-3: Disturb any human remains, including those interred outside of formal cemeteries	Both	Significant	CUL-3: Comply with state and county procedures for the treatment of human remains discoveries	Less than significant
CUMUL-4-CUL: Cumulative effects on cultural resources	Construction	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
	Operation	No impacts	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
Electromagnetic Fields and Electromagnetic Interference				
EMF-1: Substantially increase electromagnetic fields along the Caltrain corridor	Operation	Less than significant	--	--
EMF-2: Substantially increase electromagnetic interference along the Corridor	Operation	Significant	EMF-2: Minimize EMI effects during final design, <u>Monitor EMI effects during testing, commission and operations, and Remediate Substantial Disruption of Sensitive Electrical Equipment</u>	Less than significant
CUMUL-5-EMF: Cumulative increase in electromagnetic fields or electromagnetic interference	Construction	Less than Considerable	--	--
	Operation	Less than considerable (less than significant) (EMF)	--	--
		Considerable (significant) (EMI)	Project-level mitigation noted above	Less than considerable (less than significant)
Geology and Soils				
GEO-1: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides.	Both	Significant	GEO-1: Perform a site-specific geotechnical study for traction power facilities	Less than significant
GEO-2: Result in substantial soil erosion or the loss of topsoil.	Both	Less than Significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
GEO-3: Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.	Both	Significant	GEO-1: Perform a site-specific geotechnical study for traction power facilities	Less than significant
GEO-4: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.	Both	Significant	GEO-4a: Identification of expansive soils GEO-4b: Mitigation of expansive soils	Less than significant
GEO-5: Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater.	Both	No Impact	--	--
GEO-6: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	Both	No Impact	--	--
CUMUL-6-GEO: Cumulative exposure of people or structures to geologic or seismic hazards or destruction of unique paleontological/geologic resources	Construction	Less than considerable (less than significant)	--	--
	Operation	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
Greenhouse Gas Emissions and Climate Change				
GHG-1: Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	Both	Less than significant (beneficial)	--	--
GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.	Both	Less than significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
GHG-3: Place people or structures at substantial risk of harm due to predicted climate change effects (other than sea level rise)	Both	Less than significant	--	--
CUMUL-7-GHG: Cumulative greenhouse gas emissions or exposure of people or structures to reasonably foreseeable impacts of climate change	Both	Less than considerable (less than significant)	--	--
Hazards and Hazardous Materials				
HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Both	Less than significant	--	--
HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	Both	Significant	HAZ-2a: Conduct a Phase II Environmental Site Assessment prior to construction HAZ-2b: Implement engineering controls and best management practices during construction	Less than significant
HAZ-3: Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	Both	Less than significant	--	--
HAZ-4: Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.	Both	Significant	HAZ-2a: Conduct a Phase II Environmental Site Assessment prior to construction HAZ-2b: Implement engineering controls and best management practices during construction	Less than significant
HAZ-5: Result in an airport-related safety hazard for people residing or working in the project area.	Both	Less than significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
HAZ-6: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Both	Significant	TRA-1a: Implement construction road Traffic Control Plan	Less than significant
HAZ-7: Expose people or structures to a significant risk of loss, injury or death involving wildland fires.	Both	Less than significant	--	--
CUMUL-8-HAZ: Cumulative effects related to hazards and hazardous materials	Construction	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
	Operation	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
Hydrology and Water Quality				
HYD-1: Violate any water quality standards or WDRs, or otherwise substantially degrade water quality	Construction	Significant	HYD-1: Implement construction dewatering treatment, if necessary	Less than significant
	Operation	Less than Significant	--	--
HYD-2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level	Construction	Significant	HYD-1: Implement construction dewatering treatment, if necessary	Less than significant
	Operation	Less than significant	--	--
HYD-3: Substantially alter the existing drainage pattern of the site or area, or substantially increase the rate or amount of surface runoff, in a manner that would cause substantial erosion or siltation onsite or offsite, exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff	Both	Less than significant	--	--
HYD-4: Place housing within a 100-year flood hazard area, or place structures that	Construction	Less than significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
would impede or redirect flood flows within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or FIRM or other flood hazard delineation map	Operation	Significant	HYD-4: Minimize floodplain impacts by minimizing new impervious areas for new TPFs or relocating these facilities	Less than significant
HYD-5: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam	Construction	Less than significant	--	--
	Operation	Significant	HYD-5: Provide for electrical safety for all new TPFs subject to periodic or potential flooding	Less than significant
HYD-6: Contribute to inundation by seiche, tsunami, or mudflow	Both	Less than significant	--	--
HYD-7: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of SLR	Operation	Significant	HYD-7: Implement a sea level rise vulnerability assessment and adaptation plan	Potentially significant and unavoidable
CUMUL-9-HYD: Cumulative impacts related to hydrology and water quality (including flooding due to sea level rise)	Construction	Considerable (significant)	Project-level mitigation noted above	Less than considerable
	Operation	Considerable (significant)	Project-level mitigation noted above	Potentially considerable and unavoidable (flooding associated with sea level rise) (significant)
Land Use and Recreation				
LUR-1: Physically divide an established community	Both	Less than significant	--	--
LUR-2: Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Proposed Project adopted for the purpose of avoiding or mitigating an environmental effect and compatibility with existing surrounding land uses.	Both	Less than significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
LUR-3: Conflict with any applicable habitat conservation plan or natural community conservation plan.	Both	Less than significant	--	--
LUR-4: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	Construction	Significant	BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan	Less than significant
	Operation	Significant	AES-2b: Apply aesthetic surface treatments to new infrastructure to and provide screening vegetation at TPFs in sensitive visual locations <u>Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers</u>	Less than significant
LUR-5: Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	Both	No impact	--	--
CUMUL-10-LUR: Cumulative effects related to land use and recreation	Construction	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
	Operation	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
Noise and Vibration				
NOI-1: Expose sensitive receptors to substantial increase in noise levels	Construction	Significant	NOI-1a: Implement Construction Noise Control Plan	Significant and unavoidable (certain locations)
	Operation	Significant	NOI-1b: Conduct site-specific acoustical analysis of ancillary facilities based on the final mechanical equipment and site design and implement noise control treatments where required.	Less than significant
NOI-2: Expose sensitive receptors to substantial increase in ground-borne vibration levels from proposed operations	Construction	Significant	NOI-2a: Implement Construction Vibration Control Plan	Less than significant
	Operation	Less than significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
CUMUL-11-NOI: Cumulative increase in noise or vibration	Construction	Considerable (significant)	NOI-1a: Implement Construction Noise Control Plan NOI-2a: Implement Construction Vibration Control Plan	Less than considerable (less than significant)
	Operation	Considerable (significant)	Project-level mitigation noted above NOI-CUMUL-1: Implement a phased program to reduce cumulative train noise along the Caltrain corridor, as necessary to address future cumulative noise increases over FTA thresholds. NOI-CUMUL-2: Conduct project-level vibration analysis for Blended System operations and implement vibration reduction measures as necessary and appropriate for the Caltrain corridor.	Considerable and unavoidable for noise (significant); Less than considerable for vibration (less than significant)
Population and Housing				
POP-1: Induce substantial population growth, either directly or indirectly	Both	Less than significant	--	--
POP-2: Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere	Both	No impact	--	--
POP-3: Displace a substantial number of people, necessitating the construction of replacement housing elsewhere	Both	No impact	--	--
CUMUL-12-POP: Cumulative impact to population and housing	Both	No impact	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
Public Services and Utilities				
PSU-1: Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services: fire protection, police protection, schools, or other public facilities	Both	Less than significant	--	--
PSU-2: Exceed wastewater treatment requirements of the applicable Regional Water Board	Construction	Significant	HYD-1: Implement construction dewatering treatment, if necessary	Less than significant
	Operations	Less than significant	--	--
PSU-3: Require or result in the construction of new water, wastewater, or stormwater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	Both	No impact	--	--
PSU-4: Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed	Both	Less than significant	--	--
PSU-5: Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments	Both	Less than significant	--	--

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
PSU-6: Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs	Both	Less than significant	--	--
PSU-7: Comply with federal, state, and local statutes and regulations related to solid waste	Both	Less than significant	--	--
PSU-8: Construction activities would result in a substantial disruption to utility service systems	Construction	Significant	PSU-8a: Provide continuous coordination with all utility providers PSU-8b: Adjust OCS pole foundation locations PSU-8c: Schedule and notify users about potential service interruptions	Less than significant
PSU-9: Construction activities would result in the construction of new utility facilities or expansion of existing utility facilities, the construction of which could cause significant environmental effects	Construction	Significant	PSU-9: Require application of relevant construction mitigation measures to utility relocation and transmission line construction by others	Less than significant
CUMUL-13-PSU: Cumulative impacts related to public services and utilities	Both	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
Transportation and Traffic				
TRA-1a: Substantially disrupts existing or future traffic operations during construction	Construction	Significant	TRA-1a: Implement construction Road Traffic Control Plan	Less than significant
TRA-1b: Conflicts or creates inconsistencies with regional traffic plans or substantially disrupts future regional traffic operations from Proposed Project operation	Operation	Less than significant	--	--
TRA-1c: Conflicts or creates inconsistencies with local traffic plans or substantially disrupts future local traffic operations from Proposed Project operation in 2020	Operation	Significant	TRA-1c: Implement signal optimization and roadway geometry improvements at impacted intersections for the 2020 Project Condition	Significant and unavoidable

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
TRA-2a: Disrupts existing or planned transit services or facilities during construction	Construction	Significant	TRA-1a: Implement construction road Traffic Control Plan TRA-2a: Implement railway disruption control plan	Less than significant
TRA-2b: Creates demand for public transit services above the capacity which is provided or planned; interferes with existing or planned transit services or facilities; or conflicts or creates inconsistencies with adopted transit system plans, guidelines, policies, or standards from Proposed Project operations	Operations	Beneficial (Caltrain); Less than significant (other transit services)	--	--
TRA-2c: Substantially increase hazards for transit system operations because of a design feature or otherwise substantially compromise the safety of transit facilities	Operations	Less than significant	--	--
TRA-3a: Disrupts existing or planned pedestrian facilities during construction	Construction	Significant	TRA-1a: Implement construction road Traffic Control Plan	Less than significant
TRA-3b: Disrupts existing pedestrian facilities, interferes with planned pedestrian facilities, or conflicts or creates inconsistencies with adopted pedestrian system plans, guidelines, policies, or standards from Proposed Project operations	Operations	Significant	TRA-3b: In cooperation with the City and County of San Francisco, implement surface pedestrian facility improvements to address the Proposed Project's additional pedestrian movements at and immediately adjacent to the San Francisco 4th and King Station	Less than significant
TRA-4a: Substantially disrupts existing bicycle facilities or interferes with planned bicycle facilities during construction	Construction	Significant	TRA-1a: Implement construction road Traffic Control Plan	Less than significant

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
Substantially disrupts existing bicycle facilities or interferes with planned bicycle facilities; or conflicts or creates substantial inconsistencies with adopted bicycle system plans from Proposed Project operations	Operations	Significant	TRA-4b: Continue to improve bicycle facilities at Caltrain stations and partner with bike share programs where available, using the guidance in the Caltrain's Bicycle Access and Parking Plan	Less than significant
TRA-5: Results in inadequate emergency vehicle circulation and/or access.	Construction	Significant	TRA-1a: Implement construction road Traffic Control Plan	Less than significant
	Operations	Less than significant	--	--
TRA-6a: Provide inadequate parking supply during construction	Construction	Less than significant	--	--
TRA-6b: Does not meet Caltrain's <i>Comprehensive Access Program Policy Statement or Bicycle Access and Parking Plan</i> or would result in the construction of off-site parking facilities that would have secondary physical impacts on the environment from Proposed Project operations	Operations	Less than significant	--	--
TRA-7: Results in a change in freight rail service such that resultant diversions to truck or other freight modes would result in significant secondary impacts during operations	Construction	Significant	TRA-2a: Implement railway disruption control plan	Less than significant
	Operations	Less than significant	--	--
CUMUL-14-TRA: Cumulative effects to transportation and traffic	Construction	Considerable (significant)	Project-level mitigation noted above	Less than considerable (less than significant)
	<i>Regional Traffic Operation</i>	Beneficial	--	--
	<i>Localized Traffic Operation</i>	Considerable (significant)	TRA-CUMUL-1: Implement a phased program to provide traffic improvements to reduce traffic delays near at-grade crossings and Caltrain stations	Considerable and unavoidable

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
<i>Transit Systems</i>	Operation	Considerable (significant)	TRA-CUMUL-2: Implement technical solution to allow electric trolley bus transit across 16 th Street without OCS conflicts in cooperation with SFMTA	Less than considerable (less than significant)
<i>Pedestrian and Bicycle Facilities</i>	Operation	Considerable (significant)	Project level mitigation noted above	Less than considerable (less than significant)
<i>Station Access and Parking</i>	Operation	Less than considerable (less than significant)	--	--
<i>Freight Service</i>	Operation	Considerable (significant)	TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide <u>Plate H clearance as feasible between San Jose and Bayshore site improvements to restore existing effective vertical height clearances along the Caltrain corridor.</u>	Considerable and unavoidable for operational window change potential localized noise and traffic if freight diversion to trucks occur (significant); Less than considerable for vertical height clearance (less than significant)

Impact	Phase	Significance before Mitigation	Mitigation	Significance after Mitigation
-- = not applicable				
BAAQMD = Bay Area Air Quality Management District				
EMF = electromagnetic field				
EMI = electromagnetic interference				
FTA = Federal Transit Administration				
GHG = greenhouse gas				
JPB = Peninsula Corridor Joint Powers Board				
NO _x = oxides of nitrogen				
OCS = overhead contact system				
ROG = reactive organic gases				
ROW = right-of-way				
PRC = Public Resources Code				
SFMTA = San Francisco Municipal Transportation Agency				
SHPO = State Historic Preservation Officer				
TPFs = traction power facilities				

Chapter 2

Project Description

The Proposed Project is the electrification of the Caltrain line from its current northern terminus at 4th and King Streets in the City of San Francisco to 2 miles south of the Tamien Station in San Jose, a total distance of approximately 51 miles. The project location is shown in Figure 2-1; a project vicinity map showing each of the stations on the line is provided in Figure 2-2.

2.1 Location and Limits

The Peninsula Corridor Joint Powers Board (JPB) owns and operates approximately 51 miles of primarily two-track mainline railroad right-of-way (ROW) between the 4th and King Street Station in San Francisco and south of the Tamien Station in San Jose, Santa Clara County. The JPB purchased this ROW from the Southern Pacific Transportation Company in 1991. Between Tamien Station and Gilroy, the mainly single-track ROW is owned by the Union Pacific Rail Road (UPRR). Caltrain has trackage rights with UPRR to provide commuter service in this approximately 25-mile segment between Tamien Station and Gilroy. This project area consists of the Caltrain ROW, immediately adjacent areas where certain project facilities or project actions are proposed, several areas separate from the ROW proposed for project traction power substations, and other nearby areas that may be used for construction staging or access.

2.2 Background

Caltrain trains presently consist of diesel locomotive-hauled, bi-level passenger cars. As of mid-2013, Caltrain operates 46 northbound and 46 southbound (for a total of 92) trains per day between San Jose and San Francisco during the week. Three of these trains start in Gilroy during the morning commute period, and three terminate in Gilroy during the evening commute period. Eleven trains in each direction are “Baby Bullet” express service trains that make the trip between San Francisco and San Jose in less than 1 hour. Service is frequent during the peak periods (five trains per peak hour per direction [pphpdi]) and is provided every hour in both directions during the midday. Caltrain provides hourly service in both directions on Saturdays and Sundays (36 trains on Saturdays and 32 trains on Sundays) between San Jose Diridon and San Francisco 4th and King Stations only. Weekend service includes two “Baby Bullet” express service trains per day in each direction. Caltrain also provides extra service for special events such as San Jose Sharks and San Francisco Giants games.

In addition to Caltrain commuter rail service, UPRR operates approximately six daily freight trains (three round-trips) between Santa Clara and San Francisco under a Trackage Rights Agreement with Caltrain. From Santa Clara to San Jose, on a joint use corridor, UPRR operates approximately nine daily freight trains. Three passenger train services also operate on the Santa Clara to San Jose segment: the Capitol Corridor (14 daily trains), the Altamont Commuter Express (ACE, eight daily trains during weekdays only), and the Amtrak Coast Starlight (two daily trains).

1 The Proposed Project is part of a program to modernize operation of the Caltrain rail corridor
2 between San Jose and San Francisco.¹ There is a lengthy history of planning for modernization of
3 the Caltrain Peninsula Corridor. Modernization projects include the installation of an advanced
4 signal system and the electrification of the rail line. The advanced signal project (Caltrain
5 Communications Based Overlay Signal System (CBOSS) Positive Train Control (PTC) commonly
6 referred to as CBOSS PTC or CBOSS), and corridor electrification are discussed below. The JPB
7 previously evaluated corridor electrification in a prior EIR, for which a draft was completed in 2004
8 and a final was completed in 2009. The JPB did not certify the Final EIR due to the need for
9 resolution of issues regarding joint planning for shared use of the Caltrain corridor for Caltrain
10 service and for future high-speed rail (HSR) service. The Federal Transit Administration (FTA)
11 completed the final EA and adopted a Finding of No Significant Impact in 2009.

12 Since 2009, the JPB, the California High-Speed Rail Authority (CHSRA), the California Legislature, the
13 Metropolitan Transportation Commission (MTC) and other parties have worked together to develop
14 a vision of a “blended system” whereby both Caltrain and HSR would utilize the existing Caltrain
15 Peninsula Corridor. This vision for implementing Blended Service was included in the *Revised 2012*
16 *Business Plan* that the CHSRA Board adopted in April 2012 for the California High-Speed Rail System
17 (CHSRA 2012a).

18 The JPB and CHSRA are committed to advancing a blended system concept. In 2013, the JPB and
19 CHSRA signed a Memorandum of Understanding (MOU) to this effect. This local vision was
20 developed with stakeholders interested in the corridor. The blended system would remain
21 substantially within the existing Caltrain ROW and accommodate future high-speed rail and
22 modernized Caltrain service by primarily utilizing the existing track configuration.

23 Based on the blended system vision, the Caltrain Peninsula Corridor has been designated to receive
24 an initial investment of Proposition 1A bond funds that would benefit Caltrain’s modernization
25 program and HSR. The JPB, CHSRA and seven other San Francisco Bay Area agencies (City and
26 County of San Francisco, San Francisco County Transportation Authority, Transbay Joint Powers
27 Authority, San Mateo County Transportation Authority, Santa Clara Valley Transportation Authority,
28 City of San Jose, and MTC) have approved an MOU (*High Speed Rail Early Investment Strategy for a*
29 *Blended System in the San Francisco to San Jose Segment known as the Peninsula Corridor of the*
30 *Statewide High-Speed Rail System*) to pursue shared use of the corridor between San Jose and San
31 Francisco to provide Blended Service of both Caltrain commuter rail service and HSR intercity
32 service (JPB 2012). The MOU includes agency and funding commitments toward making an ~~initial~~
33 investment of approximately \$1.5 billion in the corridor for purchasing and installing an advanced
34 signal system, electrifying the rail line from San Francisco to San Jose, and purchasing electrified
35 rolling stock for Caltrain. The MOU also conceptually outlines potential additional improvements

¹ JPB is currently updating its Strategic Plan to account for recent policy commitments (Caltrain Modernization [CalMod], Blended Service, and High-Speed Rail).

(i.e., "Core Capacity" projects²) needed beyond the first incremental investment to accommodate Blended Service in the corridor.

Corridor improvements identified in the MOU include the following:

- **Advanced Signal System (commonly referred to as CBOSS PTC or CBOSS):** CBOSS stands for Communications Based Overlay Signal System and PTC stands for Positive Train Control. This project (currently being installed, including a new fiber optic backbone) will 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 safe operating parameters. This project, which includes implementation of safety improvements mandated by federal law, is scheduled to be operational by 2015 as mandated by the Federal Railroad Administration (FRA).
- **Corridor Electrification:** The JPB decided to prepare this new EIR for the corridor electrification due to the changes in existing conditions³ that have occurred along the corridor since the prior EIR analyses was conducted, to update the environmental analysis, and to update the cumulative analysis of Blended Service and other cumulative developments along the corridor. Completion of a new EIR will also allow public agencies, stakeholders, the public and decision-makers the opportunity to review and comment on the Proposed Project's environmental effects in light of current information and analyses. This Proposed Project would provide for 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 can be analyzed as a separate project under the California Environmental Quality Act (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 2020/2021⁴ 2019. The Proposed Project includes 114 trains per day between San Jose and San Francisco and six trains per day between Gilroy and San Jose. Future proposed actions to expand service beyond 114 trains per day may require additional environmental review.
- **Blended Service:** The JPB, CHSRA, and the MOU partners have agreed on shared use of the Caltrain corridor for use of up to six Caltrain trains per peak hour per direction and up to four

² Core Capacity projects (as described in the nine-party MOU) consist of needed upgrades to stations, tunnels, bridges, potential passing tracks, other track modifications, and rail crossing improvements, including selected grade separations, and will be required to accommodate the mixed traffic capacity requirements of high-speed rail service and commuter services on the Caltrain corridor. The specific Core Capacity projects have not been identified or defined at this time. These projects will be identified in future discussions and evaluations between CHSRA and the JPB. Core Capacity projects would be subject to separate, project-level environmental evaluation by the implementing agency. The TIPPA DTX/TTC project is a separate project from the Core Capacity projects that has already been environmentally cleared.

³ For example, there have been changes in existing development adjacent to the Caltrain ROW and stations, in levels of traffic, and in adopted land use plans around stations.

⁴ Operations may commence as early as 2020 or in 2021. Since 2020 is the first potential operational year, this EIR refers to 2020 as the first operational year instead of always referencing 2020/2021.

1 HSR trains per peak hour per direction.⁵ The operational feasibility of Blended Service has been
2 studied, but this project is presently only at the conceptual planning phase. The potential
3 addition of HSR service to this corridor will be the subject of a separate environmental review
4 process that will be undertaken by CHSRA as the lead agency subsequent to the environmental
5 process for the Peninsula Corridor Electrification Project (PCEP or Proposed Project). Based on
6 the current *CHSRA Revised 2012 Business Plan* (and the *Draft 2014 Business Plan*), Blended
7 Service along the corridor is scheduled to commence sometime between 2026 and 2029.
8 Blended Service would connect with the DTX near the Fourth and King Station allowing Caltrain
9 and HSR service to downtown San Francisco at the TTC.

10 **2.3 Project Description**

11 The Proposed Project consists of converting Caltrain from diesel-hauled to Electric Multiple Unit
12 (EMU) trains for service between the 4th and King Street Station in San Francisco and the Tamien
13 Station in San Jose. Operating speed would be up to 79 miles per hour (mph), which is what it is
14 today.

15 In 2019-2020, service between San Jose and San Francisco would use a mixed fleet of EMUs and
16 diesel locomotives, with approximately 75% of the service being electric and 25% being diesel in
17 2019-2020.⁶ After 2020-2019, diesel locomotives would be replaced with EMUs over time as they
18 reach the end of their service life. Caltrain's diesel-powered locomotive service would continue to be
19 used to provide service between the San Jose Diridon Station and Gilroy.⁷ Fleet requirements under
20 the Proposed Project are presented in Table 2-1.

⁵ The CHSRA 2012 Revised Business Plan *Ridership and Revenue Forecasting* (CHSRA 2012b) and the Draft 2014 Business Plan (CHSRA 2014a) presumes 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 Section 4.1 *Cumulative Impacts*, this EIR presumes up to 40 to 53 HST daily round-trip trains in 2040 based on the CHSRA 2012 Business Plan, *Estimating High-Speed Train Operating and Maintenance Cost for the CHSRA 2012 Business Plan* (CHSRA 2012c), which estimates 40 round trip trains and the The Draft 2014 Business Plan *Service Planning Methodology* document (CHSRA 2014b) which includes an assumption of 53 daily round trip trains starting in 2029 and continuing beyond 2040 (although the 2014 Business Plan does not specifically state what the daily service would be). Caltrain's Blended Service planning to date has not studied the 2014 Business Plan estimates because the plan was released on February 7, 2014 and conceptual Blended Service studies were completed in 2013. Thus, this EIR is based on a service level of 40 daily round-trip trains that has been studied by Caltrain to date. The exact amount of HSR service along the corridor is unknown. The subsequent CHSRA project-level environmental evaluation will address proposed HST service levels along the San Francisco Peninsula.

⁶ This project only includes funding for EMUs representing approximately 75 percent of the operational fleet between San Jose and San Francisco. In 2020-2019, some peak period service (e.g., bullet/Gilroy-SF trains) would be diesel on weekdays. All other service, including off-peak, would be EMU-based in 2020-2019. Funding for replacement of the remainder of the diesel fleet between San Jose and San Francisco would have to come from future funding sources. It is expected that 100 percent of the San Jose to San Francisco fleet would be EMUs by 2026 to 2029, because the fleet would need to be fully electrified to operate in a Blended Service environment with HSR. Fully electrified service between San Jose and San Francisco is included in the cumulative impact analysis contained in Chapter 4, *Other CEQA-Required Analysis*, but is not part of the Proposed Project.

⁷ The Proposed Project only includes electrification to a point approximately 2 miles south of Tamien Station (MP 51.1) the JPB-owned ROW). The Union Pacific Corridor south of this point would not be electrified by this Project. Between Santa Clara MP 44.6 and the southern end of the JPB-owned corridor, the MT-1 track is owned by Union Pacific and will not be electrified.

1 **Table 2-1. Fleet Requirements of the Electrification Program**

Year	Diesel Locomotives	Diesel-Hauled Coaches/Cabs	Electric Multiple Units	Total Passenger Vehicles
2020 ^a (six trains per peak hour/direction)	9	45	96	150
2040 ^b (six trains per peak hour/direction)	6	31	138 to 150	175 to 187

Source: Callen pers. comm.

^a The majority of vehicles would be replaced in 2019 by 2020 as they reach the end of their design life. Additional vehicles would be replaced after 2019 2020 as they reach the end of their design life.

^b Diesel operation limited to San Jose – Gilroy shuttle service in 2040. 2040 operations assume fully electrified operations between San Jose and San Francisco and that the San Francisco Downtown Extension (DTX) has been completed. However, the Proposed Project only includes funding for 75 percent of the rolling stock for this service at this time. The fleet estimates for 2040 are only conceptual at this time.

The level of Caltrain operations and, therefore, fleet requirements under the Proposed Project are based on six trains per peak hour per direction (pphpD) from Tamien Station in San Jose to San Francisco, with a mixed EMU and diesel locomotive fleet. Caltrain service would also include six diesel-powered trains per day in the San Jose to Gilroy segment in 2020 2019.

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 electric rolling stock. The OCS would be powered from a 25 kilovolt (kV), 60 Hertz (Hz), single-phase, alternating current (AC) supply system consisting of traction power substations (TPSs), one switching station (SWS), and paralleling stations (PSs). These traction power facilities (TPFs) are described in more detail in the following pages. Figure 2-2 shows the general location of TPF sites.

13 **2.3.1 Overhead Contact System**

To permit electric vehicles to run along a railroad track, two types of electrical power distribution system are in general use. The first type is a low-voltage direct current (DC) third rail system, as employed in the 1,000-volt DC BART system. The second type is an overhead contact wire system, used for both light and heavy rail transit. Light rail applications typically use low-voltage OCS, such as the Muni in San Francisco at 600 volts, or the Santa Clara Valley Transportation Authority light rail service at 750 volts. For high-speed, intercity passenger or commuter rail lines, the OCS is usually a high-voltage AC system, as used by Amtrak, Maryland Regional Commute trains (MARC), Southeastern Pennsylvania Transportation Authority (SEPTA), New Jersey Transit (NJT), and Metro-North Railroad (MNRR) at 11.5 to 12.5 kV, and at 25 kV on Amtrak's Northeast Corridor and portions of the NJT. This project would have an AC OCS. The typical voltage used for regional and intercity rail throughout Europe and the rest of the world is 25 kV at commercial frequencies (50 to 60 Hz). As noted above, this project would have a 25 kV AC OCS at 60 Hz.

This power supply and distribution system and voltage would be compatible with the requirements of HSR and would accommodate future development of HSR in the Caltrain Peninsula Corridor. The OCS conductors and traction power equipment would be sized and located based on a computerized analysis of traction power load flow requirements using the probable maximum capacity of the Peninsula corridor alignment of Caltrain.

1 A mainline OCS typically consists of two conductors above each track in what is known as a catenary
2 configuration: a messenger wire (much like a utility transmission line) sags between support points,
3 below which a near-level contact wire is suspended. Both main wires are energized and are part of
4 the same circuit. The pantograph, mounted on top of the electric vehicles, slides along the underside
5 of the contact wire and collects the traction current from it.

6 The messenger wire is typically supported by means of cantilevered, hinged bracket arms that
7 extend horizontally over the track from vertical steel poles mounted clear of the dynamic envelope
8 (i.e., the range of motion of the train on the track) of the vehicles. The OCS also includes negative
9 feeder and static wires. The autotransformer system is described further below. These are also
10 supported on the OCS poles. These poles are placed approximately 10 to 12 9 to 11 feet ~~ef~~ from the
11 centerline of the tracks they serve. Multi-track support structures, such as multi-wire headspans
12 attached to taller steel poles, are also employed where necessary. The poles themselves are
13 supported by cast-in-place concrete foundations or driven pile footings, which are typically set back
14 approximately 10 to 12 9 to 11 feet from the track centerline. Depending upon the clearance
15 requirements of particular sections of the route, the contact wire height would vary from
16 approximately 16.0 feet to 23.0 feet. Pole heights range from 30 to 50 feet. Also, depending on along-
17 track span length and other requirements, the messenger wire would typically be positioned
18 between 2 feet and 5 feet directly above the contact wire.

19 Clearances for maintenance and operation of the OCS would be designed to allow for existing freight
20 railroad and tenant passenger rail clearances and operations. Normal design clearances up to 23 feet
21 would be provided in all open, unconstrained areas. Special designs could be employed in close
22 clearance tunnels or under bridges in order to provide sufficient clearances to existing freight and
23 diesel passenger trains.

24 On tangent, or straight, sections of track, the OCS supports can be spaced up to 230 feet apart,
25 though they would typically be about 180 to 200 feet apart. On curved track sections, the span
26 lengths between supports must be reduced. The Caltrain ROW has two small radius curves, one just
27 south of the San Francisco terminus and one north of the San Jose Diridon Station, where the
28 support spacing would be reduced to approximately 75 feet. For the larger radius curves along the
29 route, pole spacing would range from 120 to 150 feet.

30 The particular type of OCS support on a given segment is dependent upon the track segment's exact
31 configuration (e.g., number of tracks) and other site-specific requirements and constraints. Figure
32 2-3 shows typical side cantilever bracket arms and poles for two-track sections. Figure 2-4 shows a
33 portal arrangement, where the central wires are supported over multiple tracks by means of a solid
34 steel beam and cantilever brackets. Figure 2-5 shows typical center cantilever bracket arms and
35 poles for two track sections. Figure 2-6 shows typical multi-track arrangement with headspan
36 construction. Figure 2-7 shows a typical two track cantilever and bracket arms. Visual impacts of the
37 proposed OCS facilities and treatments in different corridor locations are evaluated in Section 3.1,
38 *Aesthetics*.

39 Power would be supplied to the OCS at each of the TPFs, either by means of non-insulated aerial
40 connections or by insulated underground connections. Power would generally be delivered to the
41 OCS through a pole-mounted disconnect switch, which permits energization or de-energization of a
42 particular section of the OCS conductors. The overhead electrical system would include an
43 integrated bonding and grounding system to protect the public during all system operations.

As noted above, the OCS poles nominally need to be approximately ~~10 to 12~~ ~~9 to 11~~ feet from the centerline of the railway tracks. In addition, there needs to be clearance of vegetation within approximately 10 feet of the OCS poles and catenary system for electrical safety. Pruning or removal of trees would be required along the tracks and electrical facilities where they would otherwise pose a maintenance or safety concern. The distance from the railway outside track centerlines to the outer edge of the vegetation clearance zone (called the electrical safety zone or ESZ) would be up to ~~24~~ ~~21~~ feet (~~up to 12~~ ~~11~~ feet to the OCS pole alignment + ~~2 feet for the width of the pole~~ + 10 feet for the vegetation clearance). In areas of multi-track (i.e., more than 2 tracks), the ESZ would be up to 18 feet from the centerline of the outer electrified track. In certain areas with site-specific concerns such as curves, signal equipment, access or other concerns, the ESZ may need to be up to 24 feet in width from the centerline of the outer track. In addition, structures cannot be closer than 6 feet to the OCS pole alignment (the 6 feet is within the 10-foot ESZ). Figure 2-8 shows the structural and vegetation clearance zones relative to the track and OCS pole alignment. The system is being designed to be resilient to high winds.

The MT-1 track owned by Union Pacific will not be electrified from Santa Clara (MP 44.6) to the southern end of the JPB-owned ROW (MP 52.0).

At three tunnel locations, all within San Francisco, the Proposed Project includes potential tunnel and track modifications necessary to provide adequate vertical clearances for the OCS for both passenger and existing freight operations. The amount of additional clearance, depending on location, varies from 0.25 to 1.75 feet. These improvements could include potential "notching" (i.e., minor excavation of the tunnel wall) of the tunnel, horizontal realignment of tracks to maximize vertical clearance, and potential lowering of the track grade. If lowering of the track grade is necessary, construction would involve temporary removal of the track and track ballast, excavation, and then replacement of track ballast and tracks. At four bridge overcrossings where vertical height is constrained, the Proposed Project also would involve lowering the track by 0.25 foot to 1 foot to provide adequate vertical clearance for existing passenger and freight vehicles. Track lowering would be coordinated with the jurisdictional agency for the overcrossing, including Caltrans, if necessary. Existing clearances and clearances with the project are presented in Section 3.14, Transportation and Traffic.

At San Francisquito Creek Bridge, the standard OCS pole design has been modified to avoid impacts on the historic bridge and to avoid using side poles near the landmark tree El Palo Alto. The OCS cables would be suspended from the San Francisquito Creek Bridge truss in a manner that would not alter the existing structure. The power cables, fasteners and support brackets would be attached to the existing structure, but no part of the existing structure would be removed as a part of the Proposed Project. Installation of the main support brackets would require no permanent modification to the bridge structure and would be completely removable. To avoid impacts on neighboring trees, no poles would be set on the bridge itself or on the side of the bridge superstructure.

Between 1st and 3rd Avenues in San Mateo, the project design would be modified, such as using an alternative pole arrangement (likely to be either a center pole or a two-track cantilever from the east side of the tracks), to avoid affecting buildings on the west side that are very close to the Caltrain ROW.

2.3.2 Auto-Transformer Power Feed Arrangement

The auto-transformer power feed system arrangement reduces the need for substations and would require the installation of only two TPSs spaced 36 miles apart. The ATF is the overall power feed system and includes the traction power substations, switching station, paralleling stations and the OCS. There are four options for the site of the northern TPS and three options for the site of each of the southern TPSs. In addition, there would be one switching station (SWS1) (with two site location options) and seven paralleling stations (PS1 through PS7) at a spacing of approximately 5 miles. Two options have been identified for the PS3, PS4, PS5, and PS6 sites. Three options have been identified for the PS4 and PS5 site.

The paralleling stations provide additional power support to the power distribution system and permit increased spacing of the primary substations. In addition to reducing the number of substations—and thereby minimizing the introduction of new, large equipment installations into the corridor—the auto-transformer feed arrangement for implementation along the Caltrain corridor would help reduce electromagnetic fields (EMF) and electromagnetic interference (EMI) because the arrangement includes two parallel aerial feeders, one on each side of the alignment. The currents in the parallel feeders flow in the opposite direction to that in the main catenary conductors, reducing the EMF/EMI effects created by current flow in the OCS.⁸

The Proposed Project would protect the existing railroad signal system, the at-grade crossing system, and the PTC system from EMI created by the 25kv AC system the following ways.

- Designing the catenary system using proven solutions that minimize the effect of EMI.
- Providing sufficient shielding for electronic equipment.
- Installing specialized components, such as filters, capacitors, and inductors.
- Ensuring that the electric vehicles are designed with a frequency that does not interfere with the frequency of the at-grade crossing warning system.

See Chapter 3, Section 3.5, *Electromagnetic Field and Electromagnetic Interference*, for the evaluation of the EMF/EMI effects of this power feed arrangement.

Figure 2-2 shows the proposed general locations for potential TPFs and Figures 2-9 to 2-18 show their specific location, including different options for certain facilities.

2.3.3 Traction Power Substations, Switching Stations, and Paralleling Stations

The two traction power substations would each include two 60MVA (million Volt-amperes) oil-filled transformers that would step down the power utility supplied voltage of 115 kV to the 2 by 25 kV distribution voltage needed for the OCS. The source power utility would be requested to provide two incoming feeds, which would tap two phases of each three-phase transmission line. The traction

⁸ As explained in Section 3.5, Exponent (2001) studied the EMF associated with a direct center feed (DCF) configuration and the ATF configuration. As described in this study, the ATF system generally reduces magnetic fields compared to a DCF configuration by (1) minimizing current flow necessary to operate the Caltrain commuter system and (2) optimal phasing of the catenary and feeder circuits results in partial magnetic field cancellation relative to direct center feed power delivery systems. Exponent modelled DCF and ATF EMF fields and determined that EMF levels along the ROW were lower with the ATF configuration.

power substation compound would include circuit breakers and switching equipment that would feed power from the high-voltage lines to each line section of track. The line-side equipment would be designed to provide alternate switching arrangements in the event of a traction power substation equipment outage. A traction power substation compound would typically be approximately 150 feet by 200 feet in size.

Figure 2-19 shows an example TPS compound installation. Figure 2-20 shows a typical 115-kV to 50-kV primary transformer. Figure 2-21 shows a typical 10-MVA auto-transformer.

At approximately the midpoint between traction power substations, a switching station would be installed. At the switching station, a phase break would be required to ensure the power supplies from each traction power substation are isolated from each other in order to avoid a fault condition. In addition, switching would be installed to provide operating flexibility during equipment outages. Between the traction power substations and the switching station, paralleling stations would be installed to maintain the autotransformer system and system operating voltages. The switching station would be equipped with two 10-MVA oil-filled auto-transformer units and the paralleling stations with either one or two 10-MVA oil-filled auto-transformer units. These facilities would contain a variety of circuit breakers and switching equipment but would be typically as shown in the proposed location drawings above. Switching station compound dimensions are typically 80 feet wide by 160 feet long; paralleling station compound dimensions are typically 40 feet wide by 80 feet long. A typical switching station is shown in Figure 2-22.

2.3.4 Overbridge Protection Structures

Electrification of the corridor would require the construction or enhancement of overbridge protection barriers on 47 roadway or pedestrian bridges across the Caltrain alignment. These barriers are necessary to prohibit access to the rail corridor and prevent objects from being thrown off the bridges in a manner that would damage or interfere with the electrical facilities. As shown in Table 2-2, ~~15~~ ¹⁶ of the existing bridges already have such barriers on both the north and south bridge face, six bridges have a barrier on only one bridge face, and ~~26~~ ²⁵ have no overbridge protection barriers. Overbridge protection barriers would be 6.5 feet high above sidewalk or pavement level, and placed along the parapet of the bridge at least 10 feet from the closest energized conductors crossing underneath. The existing barriers would be enhanced to meet these requirements. The overbridge protection barriers would have black, red, and white signage that says, "Danger, Live Wire."

For two-track segments, the length of the overbridge protection barrier would be about 35 to 40 feet long. For three- and four-track segments, the overbridge protection barrier would be from 65 to 80 feet long. Overbridge protection barriers may be constructed from a variety of materials, including timber, sheet metal, small mesh wire fabric, plastic, concrete, or other solid material.

1 **Table 2-2. Overhead Bridge Protection Barriers**

Number	Mile Post	Bridge Location
Bridges with Barriers on Both Sides – Barriers may be Enhanced		
1	1.90	23rd Street, San Francisco
2	3.14	Oakdale Avenue, San Francisco
<u>3</u>	<u>6.64</u>	<u>Tunnel Avenue, Brisbane</u>
<u>3</u> <u>4</u>	8.67	Oyster Point Boulevard, South San Francisco
<u>4</u> <u>5</u>	9.22	Grand Avenue Westbound, South San Francisco
<u>5</u> <u>6</u>	9.23	Grand Avenue Eastbound, South San Francisco
<u>6</u> <u>7</u>	13.63	Pedestrian Crossing (Millbrae Station), Millbrae
<u>7</u> <u>8</u>	13.70	Millbrae Avenue, Millbrae
<u>10</u> <u>9</u>	35.60	Shoreline Boulevard, Mountain View
<u>11</u> <u>10</u>	36.49	Stevens Creek Pedestrian Crossing, Mountain View
<u>12</u> <u>11</u>	39.32	Pedestrian Crossing, Sunnyvale
<u>13</u> <u>12</u>	39.71	Wolfe Road, Sunnyvale
<u>14</u> <u>13</u>	40.70	Pedestrian Crossing, Sunnyvale
<u>15</u> <u>14</u>	40.75	Lawrence Expressway, Sunnyvale
<u>16</u> <u>15</u>	43.65	Lafayette Pedestrian Crossing, Santa Clara
<u>17</u> <u>16</u>	45.60	Hedding Avenue, San Jose
Bridges with One Barrier – Construct One New Barrier; Existing Barrier May be Enhanced		
1	1.72	22nd Street, San Francisco ^a
2	19.16	Highway 92 Eastbound, San Mateo ^b
3	26.15	Woodside Road / Highway 84, Redwood City ^a
4	36.80	Whisman Road, Mountain View ^a
5	38.60	Mathilda Avenue, Sunnyvale ^b
6	42.90	Scott Boulevard, Santa Clara ^b
Bridges with No Barriers – Construct Two New Barriers		
1	0.48	6th Street Off-Ramp, San Francisco
2	0.85	Interstate 280, San Francisco
3	1.27	Mariposa Street, San Francisco
4	2.10	Interstate 280 Southbound, San Francisco
5	2.16	Interstate 280 Northbound, San Francisco
6	2.70	Cesar Chavez Street Off-Ramp, San Francisco
7	3.66	Williams Avenue, San Francisco
8	4.15	Paul Avenue, San Francisco
<u>9</u>	<u>6.64</u>	<u>Tunnel Avenue, Brisbane</u>
<u>10</u> <u>9</u>	7.69	U.S. Highway 101, Brisbane
<u>11</u> <u>10</u>	7.80	Sierra Point Parkway, Brisbane
<u>12</u> <u>11</u>	9.40	U.S. Highway 101 Northbound, South San Francisco
<u>13</u> <u>12</u>	9.41	U.S. Highway 101 Southbound, South San Francisco
<u>14</u> <u>13</u>	10.82	Interstate 380, San Bruno
<u>15</u> <u>14</u>	19.12	State Route 92 Westbound, San Mateo
<u>16</u> <u>15</u>	34.00	San Antonio Avenue, Palo Alto
<u>17</u> <u>16</u>	36.50	State Route 85, Mountain View
<u>18</u> <u>17</u>	37.10	State Route 237 Westbound, Mountain View
<u>19</u> <u>18</u>	37.11	State Route 237 Eastbound, Mountain View
<u>20</u> <u>19</u>	39.31	Fair Oaks Avenue, Sunnyvale

Number	Mile Post	Bridge Location
21_20	42.50	San Tomas Expressway, Santa Clara
22_21	43.99	De La Cruz Boulevard, Santa Clara
23_22	45.30	Interstate 880, San Jose
24_23	47.29	San Carlos Street, San Jose
25_24	50.10	Almaden Expressway, San Jose
26_25	50.49	Curtner Avenue, San Jose
TOTALS		
Bridges with Two Existing Barriers: Barriers May Be Enhanced		15-16
Bridges with One Existing Barrier: Construct One/May Enhance One		6
Total Bridges with No Existing Barriers: Construct Two New Barriers		26-25
TOTAL NUMBER OF BRIDGES		47

Source: FTA and JPB 2009.

^a For bridges with one barrier, the existing barrier is on the north face.

^b For bridges with one barrier, the existing barrier is on the south face

1
2 Figure 2-23 shows a typical overbridge protection barrier treatment as installed on the Northeast
3 Corridor. A fine mesh wire fabric would be used for the Proposed Project. This fabric would provide
4 safety protection and maintainability while affording a measure of transparency for both
5 pedestrians and motorists. See Chapter 3, Section 3.1, *Aesthetics*, for a visual simulation of the
6 overbridge protection barrier type that would be used for the Proposed Project and an evaluation of
7 visual impacts.

8 2.3.5 At-Grade Crossing Warning Devices

9 The Proposed Project would also require a change in the warning devices for at-grade crossings. At
10 present, at-grade crossings are operating with Harmon Crossing Predictors and Grade Crossing
11 Predictors as warning devices. As part of the Proposed Project, those warning devices would be
12 removed because they operate on a DC circuit and the proposed EMUs would operate on an AC
13 circuit.

14 Caltrain trains equipped with onboard CBOSS PTC equipment will communicate with the at-grade
15 crossings wirelessly, allowing the at-grade crossing gates to function safely. CBOSS PTC will be in
16 place by 2015.

17 For non-Caltrain trains (which will not have onboard CBOSS PTC equipment), Audio Frequency
18 Overlays (AFOs), also known as track circuits, will be installed at fixed locations along the Caltrain
19 ROW, allowing the at-grade crossing gates to function safely. An AFO is a sensor that activates the at-
20 grade crossings when the train is approaching. New cables and wires are required for the AFOs.
21 Cable and wire installation will be within the Caltrain ROW and construction will involve these
22 specified activities:

- 23 ● Trenching and excavating
- 24 ● Installation of conduits
- 25 ● Installation of cables and wires
- 26 ● Installation of AFO equipment
- 27 ● Connections at at-grade crossings

1 In the next phase of design, additional engineering will be conducted on the performance of AFOs
2 and alternative design options.

3 **2.3.6 Rolling Stock**

4 New EMUs are the preferred rolling stock option for the Proposed Project. New EMUs would replace
5 the portion of Caltrain's existing diesel locomotives and passenger cars that will reach the end of its
6 useful life by 2020 2019. In 2020 2019, Caltrain would operate a mixed fleet that would have
7 approximately 75 percent electric service between San Francisco and San Jose with EMUs, and
8 diesel service for the remaining 25 percent. With EMUs, each car, or set of cars (unit), can have its
9 own pantograph mounted on the roof and separate electric motor drives to each axle. EMUs can be
10 operated in a variety of train consists, dependent upon the requirements of the rail system operator.
11 Options include single motor cars (where each car is fitted with a driving cab at both ends) and
12 paired cars (where there is a driving cab at only one end of each car). A pair can comprise two
13 motor-cab cars, or a motor-cab plus a non-motored trailer-cab car. Another option would be two
14 motorized cab cars with multiple non-motored trailer cab-cars in between.

15 EMUs currently in use include the 1,500-volt DC gallery cars now being operated by Metra in
16 Chicago. These cars closely resemble the Caltrain double-level gallery cars. Northern Indiana
17 Commuter Transportation District also operates the new 1,500-volt DC multi-level Nippon Sharyo
18 cars in northern Indiana and Illinois. Twenty-five kV AC single-level EMUs are in service on the Deux
19 Montagnes Commuter Railroad in Montreal. Typical modern European EMU vehicles are shown in
20 Figure 2-24. In addition, Metro-North Railroad, NJT, and SEPTA operate single-level EMUs powered
21 from an 11.5- to 12.5-kV and 25-kV AC OCS. There is currently no United States-based prototype for
22 the EMU proposed for the Proposed Project. The EMU vehicle for the Proposed Project would be a
23 multi-level car of comparable dimensions to the existing Caltrain gallery car.

24 Caltrain has received a waiver from the FRA that would allow modern European EMU equipment to
25 operate on the Caltrain Peninsula Corridor provided that temporal separation is provided between
26 the light-weight EMUs and heavy freight trains (this is referred to as the FRA waiver).⁹ However, as
27 discussed in the next section, Caltrain assumes that temporal separation will not be required for the
28 Proposed Project.

29 Power for the electric vehicles would be drawn from the OCS through a roof-mounted pantograph
30 on the power car(s) or locomotive. The pantograph is a hinged, mechanical device that can extend
31 vertically to follow variations in the OCS contact wire height, with a typical extension from as low as
32 14 feet up to 24 or 25 feet. A typical pantograph is depicted in Figure 2-25.

33 **2.3.7 Operations and Maintenance**

34 **2.3.7.1 Caltrain Operating Scenario(s) Under Electrification**

35 Caltrain's existing service includes five trains per peak hour during the a.m. and p.m. peaks, as well
36 as mid-day service, for a total of 92 trains per day. In addition to local service (stopping at every
37 station), existing weekday Caltrain service consists of six baby bullet trains and ten limited-stop

⁹ It should be noted that the FRA is currently in a rulemaking process for "Alternative Compliant Vehicles" that is relevant to the EMUs in the Proposed Project. It is Caltrain's understanding that when the rule is in place, the FRA waiver and the temporal separation requirement will may no longer be necessary. For the purposes of this EIR, it is assumed that the current FRA waiver requirement would be in force.

1 trains in the a.m. northbound and p.m. southbound and five baby bullet trains and 11 limited-stop
2 trains in the a.m. southbound and p.m. northbound. There is approximately one train per hour per
3 direction from 10 a.m. until 2 p.m. and after 7 p.m.

4 The proposed level of Caltrain operations includes six trains per peak hour during the a.m. and p.m.
5 peaks, as well as mid-day service, for a total of 114 trains per day. Based on a prototypical schedule,
6 with project implementation, there would be approximately six a.m. and p.m. baby bullet trains per
7 direction. There would be approximately two trains per hour per direction from 9 a.m. until 4 p.m.
8 and after 7 p.m. An example prototypical schedule of proposed Caltrain service is provided in
9 Appendix I, *Ridership Technical Memorandum*. This prototypical schedule was developed to derive
10 ridership estimates and for use in the analysis in this EIR. The actual schedule may vary.

11 Caltrain assumes that the Proposed Project will not utilize temporal separation for the following
12 reasons:

- 13 • Waiver of current FRA Tier 1 passenger vehicle requirement (49 CFR 238 et seq.) requires that
14 the waiver demonstrate an equivalent level of safety. That can be demonstrated through vehicle
15 design criteria, track improvements, signal improvements, operational limitations or other
16 means. Thus, there is no specific regulatory requirement that mandates temporal separation for
17 mixed use operation of EMUs and FRA Compliant equipment.
- 18 • Caltrain's petition submittals (Caltrain 2009) demonstrated that the individual EMU design
19 features, using European rail safety standards, combined with PTC, alone would provide an
20 equivalent level of safety to current FRA Tier 1 Standards.
- 21 • The Engineering Task Force (ETF) 2011 report to the FRA's Railroad Safety Advisory Committee
22 (RSAC) (FRA 2011) concerning alternative compliant equipment demonstrates that design
23 criteria for such equipment can provide an equivalent level of safety to current Tier 1 Standards
24 and that temporal separation would only be an option in the event that a rail operator could not
25 demonstrate the equivalent level of safety through design features. Caltrain would not be the
26 first commuter rail authority to obtain approval to operate non-standard passenger equipment
27 without temporal separation. The Denton County Transportation Authority received a FRA
28 Waiver to operate alternative compliant Stadler GTW 2/6 Diesel Multiple Units (DMUs) without
29 temporal separation.
- 30 • FRA rule-making concerning alternative compliant equipment, expected to be released for
31 public comment in early 2015, is expected to draw heavily on the recommendations in the 2011
32 ETF report. A March 2013 discussion draft of the proposed rule text does not include temporal
33 separation as a requirement for mixed use operation. Therefore, the FRA will not likely mandate
34 temporal separation as a requirement for mixed use operation of Alternative Compliant
35 Equipment and FRA Compliant equipment.
- 36 • Caltrain EMUs will meet current European safety standards and will be able to meet the
37 equivalent level of safety criteria in the ETF report and those likely to be included in the future
38 FRA rule-making.
- 39 • With adoption of the forthcoming FRA rule-making and Caltrain EMU design compliance with
40 the new design criteria, the current FRA Waiver requirements, including temporal separation
41 would no longer be required. Should the subject FRA rule-making not proceed for any reason,
42 Caltrain will apply for a revision of the FRA Waiver prior to mixed use operations to request a
43 removal of temporal separation.

- 1 ● Thus, the reasonably foreseeable project condition for the PCEP in 2020 is that temporal
2 separation will not be required and this condition is therefore the basis of the EIR analysis.
- 3 ● Should Caltrain's expectations about FRA rule-making (or the fall-back provision of amending
4 the FRA Waiver) prove incorrect, then Caltrain will conduct supplemental environmental
5 analysis, as necessary under CEQA, to examine potential environmental effects of requiring
6 temporal separation, including, but not necessarily limited to, analysis of impacts on freight
7 operations.

8 **2.3.7.2 Ridership**

9 Implementation of the Proposed Project is anticipated to result in increased ridership by 2020 and
10 by 2040. Table 2-3 shows the existing Caltrain ridership and the projected Caltrain ridership from
11 2020 and 2040, with and without the Proposed Project.

12 **Table 2-3. Estimated Caltrain System Ridership with the Proposed Project**

	2013	2020 ^a	2040
Existing/No Project ^b	47,000	57,000	84,000
With Project ^{c, d}	N/A	69,000	111,000

Note: ridership is reported on a boardings basis, not boardings plus alightings.

Source: Appendix I, *Ridership Technical Memorandum*

- a 2020 was used for ridership analysis to ensure full operation of the new electrified service.
- b No Project analysis assumes the same schedule as at present (5 trains per peak hour; 1 train per off-peak hour per direction; total of 92 trains per day) for both 2020 and 2040
- c For 2020, analysis assumed 75% electrified and 25% diesel service from San Jose to San Francisco.
- d For 2040, analysis presumes fully electrified service between San Jose and San Francisco. As described above, the Proposed Project only has sufficient funding at present to provide 75% electrified service between San Jose and San Francisco. It is presumed that additional funding will be obtained to allow full electrified service between San Jose and San Francisco to occur by 2040.

14 **2.3.7.3 Energy Consumption**

15 The Proposed Project's primary energy source would be electricity. Through conversion of trains
16 from diesel motor propulsion to EMUs, the Proposed Project would substantially decrease diesel
17 fuel use and substantially increase annual electricity use.

18 Existing fuel consumption is approximately 4.5 million gallons per year (mid-2012 to mid-2013).
19 With the Proposed Project, in 2020 2019 diesel trains would provide approximately 25 percent of
20 service from San Francisco to San Jose and all of the service from San Jose to Gilroy. These diesel
21 trains would require an estimated 1.1 million gallons of fuel per year¹⁰, a reduction of approximately
22 3.4 million gallons per year from current conditions.

23 Proposed Project operation would require approximately 83 88 million kWh of electricity in 2020
24 2019. This includes energy expended during both train travel and idling.

¹⁰ Fuel consumption estimates are preliminary. Further project planning may take into account additional factors in estimating potential project fuel consumption. However, the methodology for estimating fuel consumption was consistent for the No Project Alternative, the Proposed Project, and the other analyzed alternatives and thus conclusions in this EIR related to energy consumption, air quality, GHG emissions are done on a reasonable basis based on available information at the time of preparation of the EIR.

1 **2.3.7.4 Maintenance**

2 Pruning or removal of trees would be required along the tracks and electrical facilities where trees
3 would otherwise pose a maintenance or safety concern. These impacts are addressed within this
4 document; refer to Chapter 3, Section 3.1, *Aesthetics*, and Section 3.3, *Biological Resources* for
5 analysis of the impacts of tree pruning and removal on aesthetics and biological resources.

6 One maintenance item that is unique to electric vehicles is the need to inspect the pantograph
7 carbon collector strips for wear and damage. Carbon is a relatively soft material, even when mixed
8 with copper particles to create “metalized” strips. However, carbon, rather than the contact wire, is
9 designed to be the sacrificial element in the sliding current collection interface. As a result, the
10 pantograph would need to be frequently inspected to ensure that there is sufficient carbon interface.

11 **2.3.7.5 Emergency Procedures**

12 The system is designed to protect employees and the public from voltages caused by faults (i.e.,
13 energized wires coming into contact with earth/ground) and to remove power in the affected area.
14 Under design conditions, it is estimated that clearing of the faulted area (e.g., the shutoff of power)
15 should not exceed 10 cycles (0.167 seconds). In the unlikely probability the protection devices fail to
16 detect abnormalities and energized wires come into contact with the earth, there would be arcing
17 and the earth potential is raised and a potential for fire and other damage. This probability is very
18 small and consistent with what one would expect from overhead electrical distribution lines already
19 in service in the area.

20 Requirements and standard procedures for emergency response will be developed as part of the
21 PCEP. Current Caltrain rules and regulations will be modified to include procedures like those
22 contained in AMTRAK's AMT-2 Electrical Operating Instructions. This document will outline, in
23 detail, how all abnormal situations are handled with the electrification system. Once these
24 instructions and rules have been developed, extensive training will be deployed to employees, first
25 responders (e.g., Police, Fire, EMT etc.) adjacent transit agencies (i.e., BART, VTA, ACE, CCJPA,
26 SamTrans AMTRAK, UPRR), other agencies and the public.

27 **2.3.8 Construction**

28 Construction activities for PECP would consist of the installation of OCS poles and wires; the
29 construction of TPFs; the installation of pantograph inspection platforms; and the erection of
30 overbridge protection barriers on roadway bridges that cross the Caltrain alignment. Installation of
31 wiring and storage tracks within the Central Equipment Maintenance Operations Facility (CEMOF)
32 and at the Lenzen Yard in San Jose are also included. Construction of the electrification
33 infrastructure from San Francisco to San Jose would take approximately 3 to 4 years, including
34 commissioning and testing.

35 **2.3.8.1 Construction Methods**

36 **Overhead Contact System Installation**

37 Under normal conditions, pole foundations would be excavated by means of 3-foot-diameter augers,
38 and the soil would be removed to a depth of approximately 15 feet. In areas that are close to
39 drainages paralleling the rail corridor or in areas where there is potential for encountering
40 contaminated soils or groundwater, an alternate process would be used. In order to reduce impacts

1 to the drainage banks and vegetation, a steel casing would be vibrated into place by ultrasonic
2 vibrators. The casing would be sunk to the full 15-foot depth, and soil would be excavated to a depth
3 of only 5 to 7 feet to place the pole foundation.

4 Spoils resulting from the excavations for OCS pole foundations would be relatively small in quantity.
5 These spoils would be disposed of by spreading them along the railroad ROW in the vicinity of the
6 excavation. Any spoils found to be contaminated with hazardous waste would not be spread within
7 the ROW; the disposal of such material is addressed in Section 3.8, *Hazards and Hazardous Materials*.

8 Construction would typically occur along 1- to 2-mile sections of the corridor and would involve
9 several "passes" per track. One pass would install the foundations, a second would place the poles,
10 and another would install the feeder wires and support arms; these would then be followed by
11 additional passes for installation of the messenger and contact wires. The final pass would involve a
12 system check to ensure proper installation. This sequence is consecutive; however, construction
13 could occur in several segments simultaneously, with different activities occurring at any or all of
14 those locations.

15 The construction equipment required for these operations may include flatbed trucks, on which
16 various items of construction equipment would be mounted. These may include auger drill rigs,
17 directional bore machines, cranes, and telescoping boom bucket trucks. There would be other
18 support vehicles, many of which would be fitted with hi-rail equipment, because the primary access
19 to the construction sites for the catenary system would be from the tracks.

20 The track windows required for the installation of the OCS poles and foundations would be different
21 from those required for other tasks, depending upon whether there is access for the contractor to
22 perform the construction adjacent to the tracks, or whether there are constraints to access due to
23 natural resources or the potential for archaeological resources in the immediate vicinity. Work
24 adjacent to the tracks is best for minimizing impacts on train operations, but work on the tracks may
25 be preferable where feasible to avoid impacts on sensitive resources.

26 Based upon the current and planned track alignment, there would be approximately 3,200 poles and
27 3,800 foundations. Approximately 20 to 30 percent of the poles and foundations could be installed
28 with off-track equipment and with minimal impact on train operations. Nominal timeframes for
29 installing OCS pole foundations and poles with off-track access would be between 10:00 a.m. and
30 3:00 p.m., but installations may be outside these hours if needed to meet the overall construction
31 schedule. The remaining 70 to 80 percent of the poles and foundations would be installed with on-
32 track equipment, requiring single-track access work windows. This work would need to be
33 performed during off-peak operations, with single-tracking, such as:

- 34 • 8:00 p.m. to 6:00 a.m., Monday through Thursday
- 35 • 8:00 p.m. Friday to 6:00 a.m. Monday

36 The windows for the installation of the OCS conductors, such as static wires, parallel feeders, and
37 messenger and contact wires, would use on-track equipment and require nighttime and weekend
38 track occupancies, including weekend outages that would require total suspension of passenger
39 revenue service. These track windows would primarily use single-tracking but would require some
40 multiple track shutdowns to install the OCS conductors at the complex interlockings. The majority of
41 such OCS wirework would need to be accomplished during the nighttime using single-track
42 windows, but some portions of the work could only be installed by using complete weekend outages,

1 requiring suspension of passenger service to increase working efficiency and reduce public safety
2 risks. Typical work windows for on-track equipment would be:

- 3 ● 8:00 p.m. to 6:00 a.m., Monday through Friday (night and multiple tracking)
4 ● 8:00 p.m. Friday to 6:00 a.m. Monday (with single-tracking)

5 **Overbridge Protection Barriers**

6 Bridge barrier installation would consist generally of installing prefabricated components onto the
7 existing parapets of the overhead bridges that traverse the project corridor. Work crews would
8 install anchor bolts into the existing bridge structure and then mount the bridge barrier. Equipment
9 used would typically be pneumatic drills, flatbed trucks, utility trucks, boom trucks, generators, and
10 light towers. The JPB would coordinate with Caltrans or city departments of public works to obtain
11 the required permit approvals for barriers on state or city roadways, respectively.

12 The installation of overbridge protection barriers would occur almost entirely with the use of off-
13 track equipment. Installation of overbridge protection barriers would occur from 7:00 a.m. to 7:00
14 p.m. Monday through Sunday. Any work requiring the use of on-track equipment would be minimal
15 and would be coordinated with the on-track window requirements for OCS wire installation.

16 **Traction Power Substation, Switching, and Paralleling Stations and Lay-Down Area**

17 The sites proposed for the location of the traction power substations, switching stations, and
18 paralleling stations are mostly in industrial areas or transportation rights of way, or are proximate
19 to existing high-voltage facilities; see Chapter 3, Section 3.10, *Land Use and Planning*, for evaluation
20 of the use of these sites. Site preparation would include clearing, grubbing, and grading with
21 bulldozers and dump trucks. Site access would be prepared concurrently with the site operations.

22 A ground grid composed of copper wire and driven ground rods, which is necessary for the
23 protection of personnel and equipment during operation of the electrical systems, would be placed
24 below each TPF at a depth of approximately 3 feet and then covered by fill.

25 Interconnections between electrical equipment would be accomplished in part by raceways
26 contained in concrete encased conduits (duct banks). These duct banks would be installed as
27 explained below.

- 28 ● Dig a 4-foot-deep trench with backhoe.
29 ● Construct forms as necessary (plywood and 2x4s).
30 ● Arrange conduits per design plans.
31 ● Place encasement concrete.
32 ● Remove forms and backfill with soil.

33 Concrete foundations would be required for the mounting of freestanding electrical transformers,
34 circuit breakers, and disconnect switches, as well as for the prefabricated control and medium
35 voltage switchgear building. Foundations would generally be constructed as explained below.

- 36 ● With bulldozer and backhoe, dig to bottom grade per design plan.
37 ● Construct forms as necessary (plywood and 2x4s).

- 1 ● Arrange reinforcing steel, anchor bolts, grounding connections, and conduits (extensions of duct
2 banks) as required per design plans.
3 ● Place concrete.
4 ● Strip forms and backfill.

5 Electrical equipment to be installed would include outdoor high-voltage switches, transformers, and
6 cables, as well as the prefabricated control and switchgear room. Some of the equipment would be
7 mounted on small steel structures. Equipment weights range from several hundred pounds to
8 100,000 pounds; therefore, the installation rigs would range from small truck-mounted cranes to
9 larger track-mounted units. The equipment would be electrically connected together by cable or by
10 buss (open air copper or aluminum tubes). Small truck-mounted cranes would be used to move and
11 arrange the reels of cable and to support buss work during installation.

12 The primary service from the local utility network would be via either underground or overhead
13 transmission lines. The installation would be either through duct banks or via direct connections to
14 the transmission lines. Station sites would typically be finished with fencing along the entire
15 periphery. Ground surfaces would be covered with clean crushed rock.

16 The electrical system would be tested prior to initiation of electrified train operations. Testing
17 would be in two main phases. The first phase would involve testing with no power to verify that the
18 installation complies with the design. In the second phase, the system would be energized to verify
19 performance and to adjust system protective devices.

20 The traction power substations, switching station, and paralleling stations would be installed with
21 off-track equipment. The work window requirements for constructing the interface facilities to the
22 OCS conductors would be coordinated with the installation of the OCS wires.

23 **2.3.8.2 Potential Construction Staging and Access Areas**

24 The JPB has preliminarily identified potential construction track access and staging locations within
25 the Caltrain ROW, on other property owned by the JPB or the San Mateo County Transit District
26 (SamTrans), and at the TPF sites. There could be staging locations outside the Caltrain ROW or
27 additional staging and access areas within the ROW that are not listed below that may be used for
28 construction. This information is provided for the purposes of analysis in the EIR to give an idea of
29 where staging may occur.

30 The following requirements will be followed for identification and use of any staging areas:

- 31 ● The JPB and/or its construction contractor shall prepare a construction staging plan that
32 identifies all potential staging areas, truck routes from the work area to the staging area, and
33 access routes and shall coordinate with local jurisdictions during development of the plan prior
34 to use of staging areas in the jurisdiction. All necessary permits for temporary use of areas
35 outside the JPB ROW shall be obtained from local jurisdictions prior to use of the staging areas.
- 36 ● Staging areas not identified below within the JPB ROW shall be evaluated for potential biological
37 and cultural resources prior to use by a qualified biologist and a qualified archaeologist.
38 Disturbance of sensitive biological resources and cultural resources will be avoided. No removal
39 of mature trees will be allowed for staging areas.
- 40 ● All applicable mitigation identified for construction aesthetics, air quality, biological resources,
41 cultural resources, geology and soils, hazards and hazardous materials, hydrology and water

1 quality, noise and vibration, public services and utilities, and traffic shall apply to all staging
2 areas, whether in the JPB ROW or not.

- 3 ● Construction deliveries shall be made during daytime hours wherever feasible.
4 ● Adjacent residents and businesses shall be notified in advance of any construction activities.

5 The following primary track access points have been identified along the corridor.

- 6 ● San Francisco, CP Common set out tracks (MP 0.9).
- 7 ● Brisbane, Visitation lead (MP 6.0).
- 8 ● South San Francisco, Drill track (MP 9.5).
- 9 ● Burlingame, Set out track (MP 16.0).
- 10 ● San Mateo, Former Bay Meadows set out track (MP 19.9).
- 11 ● San Carlos, Set out track (MP 23.4).
- 12 ● Redwood City, Redwood Junction (MP 26.5).
- 13 ● Menlo Park, Alma set out track (MP 29.6).
- 14 ● Palo Alto, Set out track (MP 32.2).
- 15 ● Mountain View, Set out track (MP 35.3).
- 16 ● Santa Clara, Calstone lead (MP 40.8).
- 17 ● Santa Clara/San Jose, Santa Clara Drill track (MP 45.5).
- 18 ● San Jose, Tamien siding (MP 49.2).
- 19 ● San Jose, Lick set out track (MP 51.6).

20 The following potential staging areas within the Caltrain ROW or on JPB or SamTrans property have
21 been identified.

- 22 ● San Francisco, East side of San Francisco 4th and King Yard, (MP 0.4).
- 23 ● San Francisco, Northeast corner of 16th street (MP 1.1).
- 24 ● Brisbane, Under Tunnel Avenue West and East side of ROW (MP 6.7).
- 25 ● San Bruno, Caltrain ROW Scott Street (MP 10.6).
- 26 ● San Bruno, East of San Bruno Grade Separation (MP 11.6).
- 27 ● Millbrae, Caltrain ROW Center Street (MP 12.7).
- 28 ● Burlingame, Caltrain ROW South of Oxford Road (MP 14.8).
- 29 ● Burlingame, Caltrain ROW, East of MT-1 (MP 15.5).
- 30 ● Burlingame, Southeast of Oak Grove Avenue (MP 16.0).
- 31 ● Burlingame, Northeast corner of Peninsula Avenue (MP 16.8).
- 32 ● San Mateo, East side of ROW at Villa Terrace (MP 17.0).
- 33 ● San Mateo, West side of ROW between 9th and 16th Avenues (MP 18.3).
- 34 ● San Mateo, West side of ROW past 25th Avenue (MP 19.8).

- 1 ● Belmont, Belmont Station Parking Lot North (MP 22.0).
2 ● Redwood City, East of Redwood Sidings (MP 26.5).
3 ● Atherton, South of Atherton Station (MP 27.8).
4 ● Atherton, Northwest of Encinal and Glenwood Avenues (MP 28.3).
5 ● Palo Alto, Southside of Alma Crossing (MP 29.8).
6 ● Palo Alto, South of California Avenue Station (MP 32.1).
7 ● Palo Alto, Along ROW from Meadow to Charleston (MP 33.0).
8 ● Mountain View, East side of ROW (MP 35.2).
9 ● Sunnyvale, South of Sunnyvale Avenue (MP 38.9).
10 ● Sunnyvale, West side of ROW (MP 42.9).
11 ● Sunnyvale, West side of ROW (MP 44.0).
12 ● Sunnyvale, South of De la Cruz Boulevard, West of ROW (MP 44.6).
13 ● Santa Clara, Santa Clara Station parking lot (MP 45.0).
14 ● San Jose, College Park Station (MP 46.3).
15 ● San Jose, CEMOF (MP 46.6).
16 ● San Jose, North of Diridon Station, corner of Alameda Street (MP 47.4).¹¹
17 ● San Jose, Southwest corner of Virginia Street (MP 48.2).

18 In addition to the potential staging areas noted above, the TPF sites could also be used for staging.
19 ● TPS1 Options 1 and 2: Off Gateway Boulevard, South San Francisco.
20 ● TPS1 Option 3: Off Harbor Way, South San Francisco.
21 ● TPS1, Option 4: South San Francisco Caltrain Station, South San Francisco
22 ● TPS2 Option 1: Off Newhall Street, San Jose.
23 ● TPS2 Option 2: Off Stockton Avenue, San Jose.
24 ● TPS2 Option 3: At CEMOF¹², San Jose.
25 ● PS1: Pennsylvania Avenue and Mariposa Street, San Francisco (MP 1.3).
26 ● PS2: Blanken and Tunnel Avenues, San Francisco (MP 5.0).
27 ● PS3 Option 1: California & Lincoln Avenues, Burlingame (MP 15.0)
28 ● PS3 Option 2: Off Star Way, Burlingame (MP 15.0)

¹¹ JPB would coordinate with stakeholders for the SAP center to address vehicular parking, transit and pedestrian access, delivery route and location of staging areas.

¹² TPS2 Option 3 would affect the Caltrain parking lot at the Central Control Facility. A high level assessment shows that if TPS2 is located at the Option 3 site, it would require relocation of approximately 75 Caltrain parking spaces (an approximately 150-foot-by-200-foot area) and two Caltrain storage containers (approximately 40 feet by 20 feet). If Option 3 site is selected, the parking spaces and containers would be relocated within Caltrain's ROW in non-sensitive environmental areas.

- PS4 Option 1: Hillsdale, San Mateo (MP 20.1).
- PS4 Option 2: Hillsdale, San Mateo (MP 20.3).
- PS4 Option 3: Hillsdale, San Mateo (MP 20.4).
- SWS1: Redwood Junction, Unincorporated San Mateo County near Redwood City (MP 26.7).
- SWS2: West of Redwood Junction near SR 84, Redwood City (MP 26.2).
- PS5 Option 1: Alma ~~Boulevard Street~~ and Green Meadow ~~Greenmeadow~~ Way, Palo Alto (MP 33.6).
- PS5 Option 1B: Alma Street and just south of Ferne Avenue, Palo Alto (MP 33.85).
- PS5 Option 2: Near Page Mill Road at Caltrain ROW (MP 32.0).¹³
- PS6 Option 1: West Hendy and North Murphy Avenues, Sunnyvale (MP 38.9).
- PS6 Option 2: Sunnyvale Train Station parking lot (MP 38.7).
- PS7: End of Communication Hill Boulevard, San Jose (MP 51.0).

2.3.8.3 Construction Schedule/Durations

The preliminary project schedule (subject to change) is provided below.

- Environmental review/design/permitting: 1–2 years.
- Construction: 3–4 years.
- Testing: 1–2 years (testing and commissioning would overlap with the later part of construction)

The goal is to commence electric revenue service in 2020 2019.

The construction activities described above are not sequential; construction could occur simultaneously at several locations. Figure 2-26 shows estimated durations for construction of the Proposed Project.

2.3.8.4 Potential Construction Strategies to Accelerate Construction Completion

Although the preliminary schedule shown in Figure 2-26 shows completion of construction to allow revenue service to commence in 2020 2019, achieving this goal will be challenging given the scale and complexity of construction. The JPB has identified a number of construction strategies (see Table 2-4) that could be used to accelerate completion of construction. These strategies may be employed on different elements of construction, different segments of construction, or construction as a whole. Construction strategies need to balance construction efficiency with minimizing construction impacts.

¹³ Note that several alternative locations for PS5, Option 2 are included as potential mitigation for noise effects in Section 3.11. See Section 3.11 for discussion of these potential alternative locations.

1 **Table 2-4. Potential Construction Strategies to Accelerate Project Completion**

Potential Strategies (Not Exhaustive)	Past Caltrain Projects
<u>Design-Build Contract</u>	<u>None</u>
Flexibility for construction work permitted during the day on weekdays	San Bruno, Jerrold
Single tracking during the midday (10 a.m.–3 p.m.) on weekdays	None
Revise Caltrain schedule	San Bruno, Jerrold
Reduce the span of Caltrain service day	None
Reduce number of trains (including special trains)	None
Shut down service through specific track segments for specific weekends	South Terminal, Jerrold
Shut down service through specific track segments for extended periods	None
Close a station temporarily during construction	South Terminal, San Bruno

- 2
- 3 Some of these strategies have been used on other rail projects, including those listed below.
- 4 • The Gladstone Line OCS Pole Replacement Project for New Jersey Transit used full weekend
5 outages throughout the summer.
- 6 • The Track Testing Program for the Long Island Railroad removed early morning train service
7 during construction.
- 8 • The Tie Installation and Track Resurfacing Project for the Long Island Railroad eliminated
9 midday service for 1 month during construction.
- 10 • The Catenary System Replacement Project for the North Indiana Commuter Transportation
11 District used single tracking throughout construction.
- 12 The JPB has not selected specific strategies for project delivery at this time, especially in advance of
13 selection of contractors for design and construction of the Proposed Project. The JPB will work with
14 its staff and future contractors to best minimize impacts on Caltrain customers and follow all
15 applicable federal policies such as Title VI and the Americans with Disabilities Act (ADA).

16 **2.3.9 Right-of-Way and Easement Needs**

- 17 Based on the current system design, and assuming a worst-case-pole-placement scenario, there
18 would be a need for acquisition of new ROW for one TPS (and possibly a second TPS, depending on
19 location) as well as for some areas where OCS poles and wires would need to be placed outside the
20 current ROW.
- 21 For the two TPSs, the JPB is considering several different sites for each substation. Sites for
22 intermediate paralleling and switching station facilities have also been identified, but all of the
23 locations are within the Caltrain ROW. The nominal size of the traction power substations would be
24 150 feet by 200 feet, which is approximately 0.7 acre. Thus, the total estimated area needed for the
25 two traction power substations is up to 1.4 acres.
- 26 In most cases, the OCS poles would be placed within the Caltrain ROW. However, in certain
27 locations, there may be insufficient clearance from the railway track centerlines and the JPB may

need to acquire ROW for placement of poles and wires. At this time, based on 35 percent design preliminary engineering and worst-case pole placement (i.e., side poles in two-track areas and portals in multi-track areas) in terms of ROW need, it is estimated that approximately 10,200 9,000 linear feet of the OCS alignment would be slightly outside the existing ROW, of which 8,800 7,000 linear feet would be on adjacent public road and rail ROWs (requiring easement acquisition) and 1,400 2,000 feet would be on private commercial or industrial property (requiring ROW acquisition in fee). Assuming an average encroachment of 4 feet, new easements on adjacent public roads and on rail ROW is estimated as 0.9 0.6 acres and ROW acquisition on private property is estimated as 0.2 acres, for a total of 1.1 0.9 acres.¹⁴ These calculations presume placement of OCS poles on the outside of the outermost track. If alternative pole alignments are used in some locations, these estimates may change.

In addition, in some locations there is insufficient ROW width to provide for the necessary 10 feet of electrical safety clearance to adjacent vegetation and structures. Where electrical clearance is necessary outside the Caltrain ROW, the JPB would need to obtain an electrical safety easement from property owners to permit the pruning and removal of vegetation and to maintain structures outside a 6-foot safety zone from the OCS alignment. The Draft EIR presumed a worst-case electrical safety zone up to 24 feet from the outer track centerline. The Final EIR describes that the electrical safety zone is more likely to be 21 feet in most two-track areas and 18 feet in most multi-track areas. At this time Using a range between the Draft EIR and Final EIR safety zone assumptions, it is estimated that approximately 5 to 8 acres of new easement would be required on adjacent public road and rail ROW, 2 to 10 acres on private residential, commercial, or industrial property, and 0.1 to 0.3 acres on parklands for a total of approximately 7 to 18 acres. These calculations presume placement of OCS poles on the outside of the outermost track. If alternative pole alignments are used in some locations, these estimates may change.

The JPB is presently examining the design for project facilities and the amount of needed ROW may be more or less than that discussed above.

Appendix J shows the areas of ROW encroachment for the OCS and for the ESZ.

2.3.10 Relation to the High-Speed Rail Project

The electrification system envisioned for the corridor would be configured in such a way that it would support the future operation of California HSR. Twenty-five-kV, 60-Hz single-phase AC electrification would be the power supply system of choice for a steel-wheel-on-steel-rail high-speed train operation. The Caltrain corridor is currently only rated for a maximum of 79 mph and, thus, there may be a need for track and other system upgrades in order to support higher speeds than at present. The Proposed Project includes electrification infrastructure that would first be used by Caltrain and can later be used for high-speed trains. However, the Proposed Project does not include other improvements necessary for high-speed trains such as platform improvements, high-speed rail maintenance facilities, passing tracks or other Core Capacity projects. The Proposed Project does not include improvements to support speeds greater than 79 mph or high-speed rail operations on

¹⁴Total does not add due to rounding.

the Caltrain corridor at speeds up to 110 mph.¹⁵ High-speed rail construction and operations would be the subject of a later, separate environmental analysis to be conducted by CHSRA and FRA. The cumulative impact analysis in this document does address cumulative impacts of Blended Service (see Chapter 4, Section 4.1, *Cumulative Impacts*) but only provides a conceptual analysis of those impacts given that HSR design for Blended Service has not been completed.

2.4 Costs and Funding

2.4.1 Capital Costs

An updated estimate of the capital costs associated with the Proposed Project including rolling stock and the fixed facilities was completed in 2014 for the 2009 Environmental Assessment (EA)/EIR (FTA and JPB 2009). The cost of the fixed facilities (e.g., OCS, traction power facilities) is/was estimated at approximately \$950 million to \$958 \$785 million and the cost of rolling stock is/was estimated to be \$524 million to \$573 \$440 million for a total of \$1,474 million to \$1,531 \$1,225 million. (FTA and JPB 2009). The JPB is presently developing updated capital costs that will be presented in the Final EIR.

2.4.2 Capital Funding Sources and Programming

The Proposed Project's capital costs are proposed to be funded from the sources shown in Table 2-5. As noted in Table 2-5, additional sources of funding need to be identified in order for the project to be fully funded.

Table 2-5. Funding Sources for Corridor Electrification Project (Millions of Dollars)

Source	Amount (YOE\$)
<u>Estimated Capital Costs</u>	<u>\$1,474 to 1,531</u>
State Proposition 1A ^a , Proposition 1B ^b	\$620
JPB	\$121
Regional (Bay Area Air Quality Management District, Tolls)	\$31
Federal (Federal Transit Administration)	\$453
Total Secured Funding	\$1,225
Funding Needed	\$249 to \$306
<i>Potential Additional Sources of Funding: JPB Financing / Transportation Infrastructure Finance and Innovation Act (TIFIA) Loan; JPB; Fare; Regional Measure 2, State Cap & Trade FTA Core Capacity; FTA Vehicle Replacement</i>	

^a Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century of 2008.
^b The Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006.
 YOE = year of expenditure.

15 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 Prop 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.

2.4.3 Operating and Maintenance Costs and Revenues

The prior 2009 EA/EIR (FTA and JPB 2009) presented estimates of operating and maintenance costs and revenues for the electrification project. The JPB is presently developing new estimates that reflect current assumptions and the recent ridership estimates. The updated operations and maintenance costs will be presented in the Final EIR.

A total operating and maintenance (O&M) estimate for the PCEP is in progress. The specific costs associated with operating and maintaining the rail services and infrastructure analyzed in the PCEP EIR will be influenced by an organization and management structure to be further examined and refined through the design-build contractor and vehicle procurement and contract approvals targeted for late 2015.

Operating fuel costs have been estimated for the PCEP and the analyzed alternatives and are presented in Chapter 5, Alternatives.

2.5 Project Variants

Caltrain has identified a number of variants that may be implemented to lower project costs including the following:

- *Project Variant 1 - Electrification to just south of the Tamien Station:* This variant would include only electrifying the Caltrain corridor to Milepost (MP) 49.9 (approximately 0.5 miles south of the Tamien Station just south of the railyard near CP Michael) instead of MP 51.1 (a subvariant would defer electrification of the railyard temporarily or permanently). This variant would require moving parallel station PS7 from the Proposed Project location near MP 51.1 adjacent to Kurte Park to one of two locations adjacent to Alma Avenue (see Figure 2-18b). PS7 Variant A would be on vacant land owned by Caltrans. Variant B would be on vacant land partially within the JPB ROW and partially on land owned by Caltrans. This variant would result in less construction due to elimination of 1.2 miles of electrified track (and not electrifying the railyard in the subvariant). Service to the Tamien Station would be the same as the Proposed Project and operations would be the same as the Proposed Project.
- *Project Variant 2 - Deferral of electrification of storage tracks at the San Francisco 4th and King Station:* Under this variant, the storage tracks would not be electrified temporarily or permanently. During the period when the tracks were not electrified, there would be no change in normal commuter operations at the station. However, if there is a need for maintenance of EMUs that needs to take place at the storage tracks at the 4th and King yard, then a diesel yard hauler would be needed to pull or push the EMUs onto the non-electrified tracks and to return the EMUs from the storage tracks to the electrified tracks.
- *Project Variant 3 - Electric locomotives may be used instead of EMUs for backup train sets (protect or ready-reserve sets):* This variant would result in no change to normal commuter rail service. This would only affect temporary replacement of individual EMUs at discrete times.
- *Project Variant 4 - Combining guy wire and OCS pole foundations:* This variant would result in slightly less construction by combining foundations for the guy wires and for the OCS pole foundations. There would be no other changes to the Proposed Project.

1 One or more of these variants may be implemented as means to lower the costs below the estimates
 2 provided in Section 2.4, Costs and Funding. Thus, for the purposes of CEQA, the environmental
 3 effects of these variants have also been analyzed in this EIR.

4 **2.6 Required Permits and Approvals**

5 Pursuant to SamTrans' enabling legislation (Public Utilities Code Section 103200 et seq.) which is
 6 applicable to the JPB under the terms of its formation document and federal law governing the
 7 operations of rail carriers (which is applicable to the JPB as a result of the 1991 Interstate
 8 Commerce Commission approval of the JPB acquisition of the Caltrain line), JPB activities within the
 9 Caltrain ROW are exempt from local building and zoning codes and other land use ordinances.
 10 Nonetheless, the JPB will cooperate with local government agencies in performing improvements
 11 within its ROW and will comply with local regulations, as appropriate, affecting any of its activities
 12 within other jurisdictions.

13 Table 2-6 lists anticipated permits and approvals that would be required for this project; the JPB will
 14 continue to coordinate with all local, regional and state agencies to ensure that all permits and
 15 approvals are received to support the project schedule.

16 **Table 2-6. Permits, Funding, and Other Approvals Anticipated to be Required**

Agency	Funding, Approval, or Permit
Federal Agencies	
Federal Aviation Administration	<u>Notification of Proposed Construction or Alteration on Airport (Part 77) – San Jose International Airport (for elevated structures near airport)</u>
Federal Railway Administration	<u>Modification of existing FRA waiver on temporal separation or approval of alternative compliance for new EMUs per new FRA rule-making.</u>
Federal Transit Administration	NEPA review and approval (completed). Federal funding.
U.S. Army Corps of Engineers	Approval of nationwide permit for effects to wetlands and other waters of the United States under Section 404 of the Clean Water Act (CWA).
State Agencies	
California High Speed Rail Authority	Approval of funding and other agreements/documents.
California Department of Fish and Wildlife (CDFW)	Review and approval of 1602 Streambed Alteration Agreement for placement of power pole foundations affecting waterways.
California Department of Toxic Substances Control (DTSC)	Review of Worker Health and Safety Plan.
California Department of Transportation (Caltrans)	Review and approval of revised JPB Soil Management Plan.
California Public Utilities Commission (CPUC)	Encroachment Permit and Traffic Control Plan for overbridge barriers on State roadways.
San Francisco Bay Regional Water Quality Control Board (RWQCB)	Approvals required for public safety considerations of Caltrain electrification facilities.
State Water Resources Control Board	CWA Section 401 Water quality certification/waste discharge requirements for placement of power pole foundations affecting waterways. <u>Compliance with dewatering requirements, if necessary.</u>
	General Construction Activity Stormwater Permit or Section 402 National Pollutant Discharge Elimination System (NPDES) permit.

Agency	Funding, Approval, or Permit
Regional Agencies and Transportation Agencies	
Peninsula Corridor Joint Powers Board (JPB)	Certification of CEQA environmental document; project proponent; project funding.
Bay Area Air Quality Management District	Funding approvals.
Metropolitan Transportation Commission	Funding coordination and approvals.
San Francisco Bay Area Rapid Transit District (BART)	Encroachment Permit. <u>Amend Use, Operating and Maintenance Agreement (UOM) for Millbrae/SFO Extension facilities.</u>
San Francisco Bay Conservation and Development Commission (BCDC)	Permit for construction of facilities within 100-foot shoreline band (at Brisbane Lagoon).
San Francisco Municipal Transportation Agency (SFMTA)	Coordination regarding Muni service during Proposed Project construction and coordination regarding the 22-Fillmore rerouting project.
San Mateo County Transportation Authority (SMCTA)	Funding approvals.
Santa Clara Valley Transportation Authority (VTA)	Access permit for work adjacent to VTA light rail operations in Mountain View.
Santa Clara Valley Water District (SCVWD)	NPDES general permit for construction-related activities. Includes developing and implementing a Storm Water Pollution Prevention Plan (SWPPP). SCVWD encroachment permit if need to access any district lands or if any construction comes within 50 feet of the top of bank of any Santa Clara County stream.
Transbay Joint Powers Authority (TJPA)	Coordination regarding the Downtown Extension Project and the Transbay Terminal Transit Center Project.
Local Agencies (in geographic order from North to South)^a	
San Francisco Bureau of Environmental Health	Permit for drilling or other subsurface exploration.
San Francisco Department of Public Works	Approval required for construction in public rights-of-way. <u>If necessary, City and County of San Francisco (CCSF) Industrial Waste Ordinance 199-77 Batch Industrial Wastewater Discharge Permit for de-watering effluent discharge to the combined sewer system providing the quality of the effluent meets the NPDES General Permit discharge standards.</u> <u>CCSF Soil Boring and Well Regulation Ordinance, adopted as Article 12B of the San Francisco Health Code, if dewatering is necessary.</u> Article 20 of San Francisco Municipal Code requires preparation of a Site Mitigation Plan if soil sampling and analysis indicate presence of hazardous waste in soil subject to construction disturbance.
San Francisco Planning Department/Commission	Certificate of Appropriateness for modification of historic resources (if necessary).
San Francisco Public Utilities Commission	<u>Permit for construction discharge and dewatering per CCSF ordinances (see San Francisco Department of Public Works above)</u>
San Mateo County	Encroachment Permit.
City of Brisbane	Encroachment Permit, Haul Permit for transport of spoils in excess of 6 cubic yards and Traffic Control Permit for detours or traffic control measures.
City of South San Francisco	Encroachment Permit.
City of San Bruno	Department of Public Works may issue a permit in order to monitor impacts to city sewer lines and storm drains.

Agency	Funding, Approval, or Permit
City of Millbrae	Encroachment Permit for overbridge barrier. A Haul Permit if spoils are hauled off-site in Millbrae.
City of Burlingame	Encroachment Permit.
City of San Mateo	Encroachment Permit.
City of Belmont	Encroachment Permit. A Haul Permit if more than 50 cubic yards of spoils are removed via Belmont streets.
City of Redwood City	Encroachment Permit for traction power substation and overbridge protection barrier.
Town of Atherton	Encroachment Permit.
City of Menlo Park	Encroachment Permit for construction in the city ROW.
Santa Clara County	Encroachment permit for construction affecting Lawrence Expressway.
City of Palo Alto	Encroachment Permit for construction in the city ROW.
City of Mountain View	Encroachment Permit <u>and Excavation Permit</u> for construction in the city ROW.
City of Sunnyvale	General Encroachment Permit for construction in the city ROW.
City of Santa Clara	Street Opening Permit for construction in the city ROW.
City of San Jose	Encroachment Permit for construction in city ROW.
Other Parties	
Pacific Gas & Electric Company (PG&E)	Power supply and equipment installation for traction power; Fee or Easement Title for use of PG&E Property for traction power equipment and facilities. <u>Utility Agreement</u> .
Union Pacific Railroad (UPRR)	Encroachment Permit for work conducted with UPRR right-of-way; design and installation permits for electrification equipment and facilities.

^a Activities within the Caltrain ROW are not subject to the land use jurisdiction of local governments.

ATTACHMENT B

Peninsula Corridor Joint Powers Board
June 4, 2015 Agenda

- | | |
|--|--------------------------------------|
| 7. Report of the Executive Director | PROCLAMATION |
| a) Proclamation Declaring June 18 th as Dump the Pump Day | INFORMATIONAL |
| b) Caltrain Modernization Update | |
| i. <u>Real Estate Update</u> | <u>INFORMATIONAL</u> |
| ii. <u>Electric Multiple Unit Procurement – Seats/Standees/Bathrooms/Bikes Balance</u> | <u>INFORMATIONAL</u> |
| 8. Peninsula Corridor Electrification Project Labor Agreement | <u>INFORMATIONAL</u> |
| 9. Key Caltrain Performance Statistics April 2015 | INFORMATIONAL |
| 10. Authorize Adoption of the Fiscal Year 2016 Operating Budget in the Amount of \$139,156,066 | RESOLUTION |
| 11. Authorize Adoption of the Fiscal Year 2016 Capital Budget in the Amount of \$200,792,150 | RESOLUTION |
| 12. Authorize Entering into a Funding Agreement with Caltrans for a Transportation Planning Grant in the Amount of \$134,123 for the Caltrain Bicycle Parking Management Plan | RESOLUTION |
| 13. Authorize to Cast Ballots to Approve the Establishment of the Dogpatch/Northwest Potrero Hill Green Benefits District and Associated Assessment for a 10-Year Period | RESOLUTION |
| 14. Authorize Award of Contracts to LTK Engineering Services for \$3,995,607 for Subsystem Support Services and Karen Antion Consulting for \$894,536 for Project Management Oversight for the Communications-Based Overlay Signal System Positive Train Control for a 15-Month Term | RESOLUTION |
| 15. Caltrain Short-Range Transit Plan – Draft Elements Presentation | INFORMATIONAL |
| 16. Legislative Update | INFORMATIONAL |
| 17. Capital Projects Quarterly Status Report – 3 rd Quarter Fiscal Year 2015 | INFORMATIONAL |
| 18. Correspondence | |
| 19. Board Member Requests | |
| 20. Date/Time of Next Regular Meeting: Thursday, July 2, 2015, 10 a.m. at San Mateo County Transit District Administrative Building, Bacciocco Auditorium, 2 nd Floor, 1250 San Carlos Avenue, San Carlos, CA 94070 | |

Note: All items appearing on the agenda are subject to action by the Board. Staff recommendations are subject to change by the Board.

AGENDA ITEM # 8

PENINSULA CORRIDOR JOINT POWERS BOARD STAFF REPORT

TO: Joint Powers Board

THROUGH: Jim Hartnett
Executive Director

FROM: Joan Cassman Pat Glenn
Legal Counsel Legal Counsel

SUBJECT: Peninsula Corridor Electrification Project Labor Agreement

ACTION

This is an information item only. No Board action is required.

SIGNIFICANCE

Legal Counsel is engaged in ongoing negotiations of a Project Labor Agreement (PLA) with the three county Building Trades Councils and the International Brotherhood of Electrical Workers (IBEW) Local 1245 for the Peninsula Corridor Electrification Project (PCEP). If negotiations are successful, the PLA will be presented to the Board of Directors for approval at the July 2, 2015 meeting.

Negotiations will be considered successful if all required parties agree to terms that ensure that (1) there will be sufficient skilled labor to perform the PCEP work, (2) there will be no work stoppages during the project construction, and (3) there will be labor peace, stability and a mechanism for resolving disputes between the Design-Build contractors and the skilled crafts unions who will perform the work.

BUDGET IMPACT

There is no budget impact at this time.

BACKGROUND

Legal Counsel is engaged in ongoing negotiations with the Building Trades Councils for Santa Clara County, San Mateo County and the city and county of San Francisco to establish the terms of their member unions' working conditions, wages and dispute resolution mechanisms for the PCEP site preparation and construction work. The Building Trades Councils do not represent IBEW Local 1245, which represents the overhead electrical workers whose specialized skills are needed for completion of the PCEP. As a result, the Building Trades Council and IBEW Local 1245 are negotiating their own agreement to manage division of work between their members, and to establish a mechanism for resolving potential disputes that may arise regarding what labor groups will perform what work during PCEP construction. Upon completion of an agreement between the Building Trades Councils and IBEW Local 1245, which would further ensure that cross-union disputes would not interrupt PCEP construction, legal counsel will

finalize the terms of the PLA, thereby ensuring that all skilled craft laborers needed for PCEP completion are represented by signatories to the final PLA or companion agreements.

The multi-party negotiation process is expected to last into June. Board approval of the PLA, if any, will be required in July in order to keep the design-build RFP process on-schedule for contract award in fall 2015.

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