

# Peninsula Corridor Electrification

Frequently Asked Questions | December 2014



## ABOUT THE PROGRAM

### Q: What is the Caltrain Modernization Program?

**A:** The Caltrain Modernization (CalMod) Program will electrify and upgrade the performance, operating efficiency, capacity, safety, and reliability of Caltrain's commuter rail service by 2020 or 2021. The components of the CalMod program include the advanced signal system project (Communications Based Overlay Signal System Positive Train Control or CBOSS PTC) and the Peninsula Corridor Electrification Project (PCEP). These improvements will help Caltrain address the increasing demand for Caltrain service. These projects are discussed in more detail below.

### Q: What is the Communications Based Overlay Signal System Positive Train Control (CBOSS PTC) Project?

**A:** The CBOSS PTC project is a communications based overlay signal system that will equip the corridor with federally-mandated safety technology to monitor and control train movements and improve system performance. Caltrain has already begun installing conduit and fiber optic cable needed for the system. CBOSS PTC is scheduled to be operational by the end of 2015 as mandated by the federal regulator.

### Q: What is the Peninsula Corridor Electrification Project (PCEP)?

**A:** The PCEP is a key component of the CalMod Program and consists of converting Caltrain from diesel-hauled to Electric Multiple Unit (EMU) trains for service between San Francisco and Tamien Station in San Jose. The project includes installation of an overhead contact system (OCS) to connect electric trains to the electricity source and supporting infrastructure (e.g. two electrical substations, a switching station, and seven paralleling stations). Approximately 75 percent of service between San Jose and San Francisco will use EMUs. The remainder will use diesel locomotives. Full conversion to EMUs for the San Jose to San Francisco service will occur at a future time when funding is secured and the remaining diesel trains reach the end of their service life. Electrified revenue service is scheduled to commence in 2020 or 2021.

### Q: Why electrify Caltrain?

**A:** Electrification will modernize Caltrain and make it possible to increase service while offering several advantages in comparison with existing diesel power use, including:

- **Improved Train Performance, Increased Ridership Capacity and Increased Service:** Electrified trains can accelerate and decelerate more quickly than diesel-powered trains, allowing Caltrain to run more efficiently. In addition, because of their performance advantages, electrified trains will enable more frequent and/or faster train service to more riders.
- **Increased Revenue and Reduced Fuel Cost:** An electrified Caltrain will increase ridership and fare revenues while decreasing fuel costs.
- **Reduced Engine Noise Emanating from Trains:** Noise from electrified train engines is measurably less than diesel train engines. Train horns will continue to be required at grade crossings, consistent with safety regulations.
- **Improved Regional Air Quality and Reduced Greenhouse Gas Emissions.** Electrified trains will produce substantially less corridor air pollution compared with diesel trains, even when the indirect emissions from electrical power generation are included. Increased ridership will reduce automobile usage, resulting in additional air quality benefits. In addition, the reduction of greenhouse gas emissions is not only good for our regional air quality, but will also help meet the State's emission reduction goals.

### Q: What will happen to service to Gilroy?

**A:** The PCEP project only includes electrification to a point approximately two miles south of Tamien Station. Caltrain will continue to provide diesel service to Gilroy.

### Q: Why not electrify south of Tamien Station?

**A:** Caltrain does not own the southbound right-of-way beginning two miles south of Tamien Station. Union Pacific Railroad owns this section of the corridor.

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## ABOUT THE PENINSULA CORRIDOR ELECTRIFICATION PROJECT (PCEP)

### Q: When will this project start and finish?

A: The environmental review process is scheduled to conclude at the beginning of 2015. If Caltrain adopts the Electrification project and funding remains available, construction of electrical infrastructure could start as early as 2016. The first electrically-powered trains are scheduled to be in service by 2020 or 2021.

### Q: How will EMUs be different from the current diesel fleet?

A: The term "EMU" refers to the ability to couple multiple electric units into a single train and have them controlled from a cab at either end of the train. Caltrain's current fleet of trains are "push-pull" and rely on power from a diesel engine. EMUs are electrically powered and will have significantly lower greenhouse gases and air pollution than the current fleet. EMUs are able to accelerate and decelerate faster than diesel trains. The improved performance of these trains will allow Caltrain to provide shorter trip times and/or more stops within the same amount of time.

### Q: Will the project reduce the need to use horns?

A: No. The use of horns is dictated by federal safety regulations for at-grade crossings. The project does not include changes in at-grade crossings and will not change the requirements for, or the use of, horns at these crossings.

## PCEP FUNDING

### Q: What is the project cost?

A: An updated capital cost estimate was released in November 2014 including \$950 to \$958 million for infrastructure costs and \$524 to \$573 million for the EMUs, for a total of \$1.474 to \$1.531 billion.

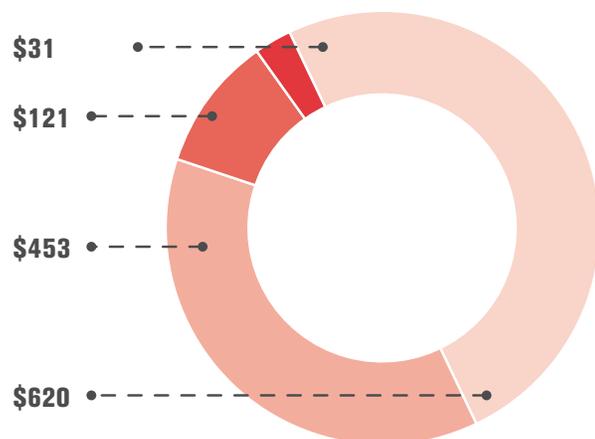
### Q: Who's providing the funding?

A: The project will be funded through a combination of local, regional, state, and federal sources.

### Q: How can this project be funded by Prop 1A "High-Speed Rail Bond" funds? What happens if the high-speed rail funding is not available for this project?

A: The capital costs of the electrification infrastructure can be funded by Prop 1A because the infrastructure will be compatible with high-speed rail (blended service would be approved after separate environmental review). If high-speed rail funding is not available for this project, then alternative sources of funding will need to be secured.

## FUNDING: MILLIONS (\$, YEAR OF EXPENDITURE)



## CURRENT CAPITAL COST ESTIMATE: \$1,474 TO \$1,531

- REGIONAL**  
Bay Area Air Quality Management District, Bridge Tolls
- LOCAL**  
Peninsula Corridor Joint Powers Board
- FEDERAL**  
Federal Transit Administration
- STATE**  
Prop 1A, Prop 1B

(Other funding may be substituted for these sources.)

**TOTAL SECURED FUNDING: \$1,225** → **FUNDING NEEDED: \$249 TO \$306**

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

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## PCEP ENVIRONMENTAL REVIEW

### Q: What is evaluated in the EIR?

A: The Environmental Impact Report (EIR) has evaluated the environmental impacts of the project including the following: Aesthetics; Air Quality; Biological Resources; Cultural Resources; Electromagnetic Fields/Electromagnetic Interference (EMF/EMI); Energy, Geology, Soils, and Seismicity; Greenhouse Gas Emissions and Climate Change; Hazards and Hazardous Waste; Hydrology and Water Quality; Land Use and Recreation; Noise and Vibration; Population and Housing; Public Services and Utilities; and Transportation and Traffic. The Final EIR provides responses to comments on the DEIR and any necessary revisions to the DEIR.

### Q: Does CEQA allow Caltrain Electrification and the HSR Blended System Project to be analyzed separately?

A: Yes. CEQA allows for analysis of related projects in separate documents provided the projects each have independent utility and environmental review to fully reveal all significant environmental impacts. Caltrain electrification has independent utility separate from HSR because it would provide improved electrified commuter rail service between San Jose and San Francisco that would lower air pollution and greenhouse gas emissions while improving train service and lowering Caltrain's operating costs. Caltrain electrification does not require full implementation of HSR in order to provide these independent benefits. HSR is a separate project and CHSRA will take the lead on evaluating the blended service including alternatives, impacts and mitigation in order to implement HSR. All impacts of both projects will be disclosed in accordance with the requirements of CEQA.

### Q: What are the forecasted levels of ridership?

A: New ridership projections were completed for the EIR. Ridership is anticipated to increase with or without the project, but will increase more with the project. By 2020, with the project, daily ridership would increase to 69,000. By 2040, with full electrification between San Jose and San Francisco (and including service to the Transbay Transit Center), ridership is forecasted to increase to 111,000.

### Q: What will the visual impacts be?

A: In addition to tree removal, described below, the PCEP will include a new overhead contact system (OCS) consisting of poles and wires along the Caltrain ROW. Additionally, the new traction power facilities will be within the Caltrain ROW and/or outside the ROW in commercial/industrial areas. Mitigation is proposed in the EIR for aesthetic considerations to be included in OCS design, for aesthetic surface treatments for traction power facilities (TPFs), and to provide screening vegetation or other screening of TPFs at sensitive locations.

### Q: Will the service or schedule change under electrification?

A: The project includes an increase of peak hour service from five trains per peak hour per direction to six trains per peak hour per direction. In addition, electrically-powered trains can accelerate and decelerate faster than diesel locomotive trains, providing the flexibility to increase the frequency of service without adding travel time and/or reduce the overall travel time from one end of the corridor to the other.

Caltrain has not yet developed a specific schedule for when EMUs would first be placed into service. In the EIR a "prototypical" or example schedule is used as part of the analysis. In the coming years, there will be robust public outreach to help determine the schedule that best balances the demands for more frequency and faster trip times.

### Q: What are the construction impacts?

A: The EIR evaluates the temporary environmental impacts associated with possible construction strategies for the PCEP. Most construction impacts will occur within the Caltrain right-of-way (ROW), with additional construction at limited areas outside the current right-of-way for portions of the overhead contact system, tree removal in certain locations, for some of the traction power facilities and for some access and staging. Primary construction impacts include temporary construction noise, equipment and vehicle emissions, tree removal and minor disturbance of biological resources, soil disturbance and runoff, potential traffic diversions or delay and potential disruption of passenger and freight service. Construction will also require several staging areas for storage of equipment, materials, and vehicles that could be within the Caltrain ROW or outside the ROW. The specific construction plan will be prepared in the next phase of design.

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**Q: What are the impacts to private property?**

**A:** The project encroachment on private property is limited in extent, given the length of the 51-mile corridor. In most places, the electrification infrastructure will be placed on JPB or Samtrans-owned property. In South San Francisco and San Jose, some of the traction power substation options are on private land. Along the corridor, the project will encroach in some areas for placement of the overhead contact system poles and wires, but in most cases, the area of encroachment is limited to a number of feet beyond the existing right of way. Along the corridor, the project will also require electrical safety zone easements within 10 feet of the overhead contact system which will limit vegetation and structures within the easements but most easements will only be a number of feet beyond the existing right of way. Potentially affected property owners are being notified.

**Q: Will trees need to be cut down for this project?**

**A:** Yes. An Electrical Safety Zone is necessary to provide a vegetation free zone for electrical safety within 10 feet of the energized portions of the overhead contact system, resulting in tree removal or pruning as described in the EIR. Caltrain conducted a tree canopy assessment of the entire corridor using multiple methods including aerial photography, video photography, and an assessment from the railroad tracks. A tree survey was also conducted in parts of the corridor with a higher density of tree canopy. Mitigation is proposed in the EIR to limit the number of trees removed and will include consideration of alternative pole alignments to reduce tree impacts (such as alternative side pole designs, center poles and two-track cantilever poles) where feasible and consistent with construction, operations and maintenance considerations.

**Q: Is Caltrain downplaying potential impacts to trees in the EIR?**

**A:** No. Caltrain's EIR includes an extensive tree study that identified potential tree impacts using a worst-case-scenario set of assumptions and discloses potential tree removals and tree pruning by jurisdiction. The EIR includes proposed mitigation to limit the number of trees removed and will include consideration of alternative pole alignments (such as alternative side pole designs, center poles and two-track cantilever poles) where feasible and consistent with construction, operations and maintenance considerations. The Final EIR includes maps showing potential tree effects along the project corridor.

**Q: Does Caltrain discuss the effect of removing trees on air pollution?**

**A:** Yes. The project will reduce diesel emissions by up to 80% or more along the project right of way, which is the dominant effect of the project on air quality. Trees can have some ameliorating effect on localized air quality by trapping particulate matter, depending on specific vegetation, wind, and pollutant conditions. Even taking into account the loss of trees, the project is expected to still have a substantial net benefit on both local and regional air quality. The Final EIR discusses the effect of tree removal and the net project effect overall in greater detail.

**Q: Does Caltrain consider Greenhouse Gas (GHG) emissions from tree removal, the use of electricity to run the trains, or project construction?**

**A:** Yes. The EIR analyzes all three of these issues. Taking all of these into account combined with the reduction in diesel combustion, the project would result in substantial reductions of GHG emissions by approximately 79,000 metric tons of carbon dioxide equivalent per year compared to No Project conditions in 2020. This is roughly the equivalent of removing over 16,000 cars from the road.

**Q: Did Caltrain consider the need for new power transmission lines?**

**A:** Yes. The EIR explains that Caltrain previously consulted with PG&E about transmission lines and determined that apart from the transmission lines from PG&E local substations to the Caltrain substations, PG&E facilities would be adequate to serve the project.

**Q: What are the anticipated noise impacts along the corridor?**

**A:** EMUs are quieter than diesel locomotives, but increased service will mean more train horns being used at the at-grade crossings. The EIR evaluated noise impacts along the project corridor due to the change from diesel locomotives to EMUs and increased overall service and found that the project would lower noise levels at many locations, would not change levels at some locations and would result in small increases in noise at a few locations but the increases would be less than Federal Transit Administration (FTA) noise thresholds. Noise impacts at one potential substation location in South San Francisco and one potential paralleling station in Palo Alto would require mitigation that would reduce impacts to less than significant levels.

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**Q: Did Caltrain analyze noise impacts from increased number of trains?**

**A:** Yes. The EIR analyzes project-level noise and cumulative noise due to the change from diesel locomotives to EMUs and increased overall service. Noise associated with horns was included in the analysis. The cumulative noise analysis specifically analyzed the effect of cumulative train service increases, including High-Speed Rail.

**Q: What are the anticipated traffic impacts of the project?**

**A:** The EIR analyzes the potential traffic benefits and adverse effects of the project. In 2020, the project would reduce regional vehicle miles travelled (VMT) per day by 235,000 miles and would reduce VMT in every city along the corridor between San Jose and San Francisco. In 2040, with full electrification, VMT reductions would be even greater with a reduction of 619,000 daily vehicle miles.

Despite the overall traffic reduction benefits, the project would result in localized traffic impacts at certain intersections near at-grade crossings and around Caltrain stations. The impact at the at-grade crossings is a combination of more gate-down time due to more train service and less gate-down time due to faster acceleration and deceleration of the EMUs compared to diesel locomotives. With increased ridership, there will also be increased traffic around Caltrain stations.

**Q: Does the project make local traffic much worse and should grade separations be required?**

**A:** The EIR specifically analyzes the project's impact on localized traffic along the Caltrain corridor. Overall the project will improve regional traffic by removing a substantial number of cars from regional roadways and will also lower vehicle miles travelled in every one of the cities along the Caltrain corridor. However, there are localized traffic impacts at certain crossings and near certain stations. That information is disclosed in the EIR. Where localized traffic impacts are significant, mitigation strategies are identified in the EIR including signalization and minor roadway improvements.

As discussed in the EIR, grade separations are not part of the project. They are expensive and thus found to not be feasible as mitigation for the Caltrain electrification project. Caltrain supports grade separations where sufficient local, state, and federal funding can be identified as shown by the recent implementation of the San Bruno grade separation project.

**Q: Has Caltrain considered non-electrified alternatives?**

**A:** The EIR analyzes three non-electrified alternatives in some detail including a Diesel Multiple Unit (DMU) Alternative, a Dual-Mode Multiple Unit Alternative, and a Tier 4 Diesel Locomotive Alternative. It also looked at a number of other alternatives suggested during the Scoping. Any diesel-based alternative (including DMUs, Dual-Mode Multiple Units, or new diesel locomotives) compared to EMUs would have higher air pollutant and greenhouse gas emissions, as well as higher engine noise and fuel costs. In addition, these alternatives would not provide the performance improvements achievable with EMUs.

**Q: Has Caltrain considered alternatives such as third rail (like BART) that don't need an overhead contact system?**

**A:** Yes. The EIR considered a third rail alternative, but determined it is infeasible for Caltrain as it is not compatible with current Caltrain service. Due to the much higher cost of a grade-separated third-rail alternative, a fully grade separated system would cost much more than modernizing the existing infrastructure. Self-powered electric trains (such as trains powered from fuel cells or rechargeable batteries) are experimental technologies at this time and not proven for use in a commuter rail system on a corridor like the Caltrain corridor.

**Q: Could Caltrain meet all of its needs by using new diesel locomotives?**

**A:** No. Compared to modern (Tier 4) diesel locomotives, electrical multiple units (EMUs) have superior performance in accelerating which allows for improved service along the corridor. With EMUs, Caltrain can achieve the same performance while adding train cars, thereby increasing available seats to accommodate more riders. With diesel locomotives, adding cars will decrease performance. Modern diesel locomotives pollute less than older diesel locomotives, but EMUs have no diesel-related emissions and would have even lower greenhouse gas emissions. Diesel locomotives are also noisier than EMUs. Fuel costs are lower using electricity than by using diesel. Finally, diesel locomotives are incompatible with the Downtown Extension and the Transbay Terminal, both of which are being designed for electrified operations.

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**Q: Are there other technologies (such as self-powered electric trains, third-rail electrification, new diesel locomotives or DMUs) that can provide the same benefits without an overhead contact system?**

**A:** Third-rail electrified systems (like BART) do not have an overhead contact system. However, that technology would require Caltrain to build a whole new grade-separated system versus modernizing its existing infrastructure. BART-like technology is also not compatible with the planned high-speed rail service. There are self-powered electric trains (such as trains powered from fuel cells or rechargeable batteries or inductive charging trains) but these technologies are experimental at this time and not a proven technology for commuter rail use.

There are diesel-multiple units (DMUs) and dual mode multiple unit trains that would be an improvement over existing diesel locomotives. However, neither of these technologies would provide the performance improvements achievable with EMUs. Compared to EMUs, any diesel-based alternative (including DMUs, dual-mode multiple units, or new diesel locomotives) would each have higher air pollutant and greenhouse gas emissions, as well as higher engine noise and higher fuel costs than EMUs.

**Q: Does the project analyses effects on freight operations due to vertical clearances, operational windows, and electromagnetic interference with freight signals?**

**A:** Yes. The EIR analyses all three of these issues. The project would accommodate existing freight equipment in terms of heights. Restrictions on use of future freight equipment taller than existing freight equipment would be limited. The project would not substantially change operational windows for freight because the current understanding is that it would not require temporal separation. Freight railroad and electrified railroads operate side by side on the Northeast Corridor in the U.S. and in Europe. There are proven solutions to providing for electromagnetic compatibility and Caltrain will work with Union Pacific during final design to ensure the project does not affect the freight signal system.

**Q. Does Union Pacific holds the rights to passenger operations?**

**A:** No. The Peninsula Corridor Joint Powers Board holds the rights for commuter rail passenger service on the Caltrain Corridor. Union Pacific holds the rights for intercity passenger rail service but the Caltrain service is commuter rail, not intercity rail.

**Q: Is the project subject to pre-emption of CEQA due to Surface Transportation Board jurisdiction?**

**A:** The JPB is a federally-regulated rail carrier, subject to the authority of the Surface Transportation Board (STB). Court rulings (past and recent) support argument that rail projects subject to STB jurisdiction are exempt from state environmental law, including CEQA. If the EIR is legally challenged, JPB reserves the right to assert STB pre-emption of CEQA. Regardless, JPB proposes to adhere to the mitigation identified in the EIR.

**Q: Is Caltrain only considering electrification because of High-Speed Rail (HSR)?**

**A:** No. Caltrain has been considering electrification for decades, long before the 2008 voter approval of the HSR Prop 1A Bonds. Both the 1999 and 2004 Caltrain Strategic Plans referenced a desire for electrification. The proposed 25 kVA/60 Hz overhead contact system design is a logical choice for Caltrain electrification because it is a standard proven design that has been used on the U.S. east coast (Northeast Corridor) and in many locations in Europe.

**Q: Will the EIR for the Electrification Project allow high-speed rail trains to use the Caltrain Corridor?**

**A:** No. Caltrain is the lead agency for environmentally clearing the PCEP. This EIR will not environmentally clear high-speed rail service in the Peninsula corridor. The California High-Speed Rail Authority (CHSRA) will be the lead agency for a subsequent and separate environmental process at a future time to clear high-speed rail service in the Peninsula corridor.

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