Project Monitoring Report (PMR)
December 2021

Peninsula Corridor Electrification Project (PCEP)
San Francisco to San Jose, CA

Peninsula Corridor Joint Powers Board (JPB)/Caltrain
San Mateo, CA

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OPs Referenced: 01 - Administrative Conditions and Requirements
25 - Recurring Oversight and Related Reports

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1.0 Executive Summary

Kal Krishnan Consulting Services, Inc. (KKCS) is the Federal Transit Administration's (FTA) Project Management Oversight Contractor (PMOC) for the Peninsula Corridor Electrification Project (PCEP). The Peninsula Corridor Joint Powers Board (JPB) is the grantee which operates commuter rail service as Caltrain. The FTA awarded a $647 million Full Funding Grant Agreement (FFGA) to the JPB on May 23, 2017.

1.1 Project Description

The PCEP corridor is approximately 51 miles in length. This Core Capacity Improvement Project (CC) includes two (2) components: infrastructure and rolling stock. The infrastructure component is comprised of the construction of Traction Power Substations (TPSS), the connection of those substations to the local utility system, and the installation of the Overhead Contact System (OCS) over the tracks beginning at the 4th and King Caltrain Station in San Francisco and ending at Tamien Station in San Jose. The infrastructure work also includes modifications to the wayside signal system and grade crossing signals to accommodate the new electrified rail system. In addition, four (4) existing rail tunnels have been enlarged to accommodate the expanded clearance envelope of the electrified vehicles. An alignment map is provided as information in Attachment I.

The rolling stock component includes the procurement of ninety-six (96) Electric Multiple Unit (EMU) rail vehicles to replace approximately 75% of Caltrain's existing diesel rolling stock. The initial EMU order was supplemented in December 2018 when the JPB exercised an option to purchase an additional thirty-seven (37) EMUs; the resulting electrified fleet will consist of nineteen (19) seven-car trainsets. The additional thirty-seven (37) EMUs are not part of the JPB's Core Capacity grant. Caltrain's Central Equipment Maintenance and Operation Facility (CEMOF) is being modified to service the electrified vehicles.

The PCEP is part of a larger JPB initiative known as the Caltrain Modernization Program (CalMod). The CalMod program separately installed a Positive Train Control (PTC) system, which is an advanced signal system that includes federally mandated safety improvements. The PTC system is in operation and received final Federal Railroad Administration (FRA) approval on December 17, 2020.

1.2 Project Status

The FTA, based on the results of the December 2020 Risk Refresh effort, designated the PCEP an "At-Risk" project in a letter dated June 30, 2021. The FTA took this action because the PCEP has experienced significant cost overruns and schedule delays. The FTA has requested that the JPB submit a Project Recovery Plan for the PCEP. The plan was originally due by October 8, 2021; however, the FTA has agreed to defer receipt of the plan until the JPB completes a planned Risk Refresh and other project reviews following a change in the PCEP's leadership in September 2021. The JPB plans to submit its Recovery Plan to the FTA on January 21, 2022.

The JPB's Board approved an increased budget of $2.44 billion for the PCEP at a Special Board Meeting held on December 6, 2021. The increased budget is based on the successful negotiation of a global settlement with Balfour Beatty Infrastructure, Inc. (BBII), the electrification design-build (D-B) contractor, and a recently completed scrub of the PCEP budget. The increased budget supports completion of the project and delivery of electrified service in 2024. The JPB plans to begin reporting against the revised budget beginning with its December 2021 Monthly Progress Report.

The PCEP is currently in construction and progress can be summarized as follows:

- Scope – The scope remains as planned.

- Schedule – *The JPB revised its Master Project Schedule in June 2021 to reflect a Required Completion Date (RCD) of September 26, 2024, based on the results of the FTA's December 2020 Risk Refresh. The PCEP team, in the course of negotiating the global settlement with BBII, received, reviewed, and accepted BBII's re-baselined schedule for the remaining Electrification contract work. The JPB is revising its Master Project Schedule (MPS), as part of its schedule scrub, to incorporate information from BBII's re-baselined schedule and other project schedule details, and is expected to present this updated MPS as part of its Recovery Plan. The JPB did not formally adopt a re-baselined schedule for project completion at its December 6 Special Meeting; however, the $2.44 billion budget adopted by the board is premised on completing the project by September 2024. JPB is currently forecasting commencement of Revenue Service with its new EMUs between January 1 and April 1, 2024.*

  Cost – The FFGA budget is $1.931 billion in year of expenditure (YOE) dollars. *The JPB revised its budget for the PCEP to $2.264 billion in June 2021 based on the results of the FTA's December 2020 Risk Refresh. This represented an increase of $333 million from the FFGA budget. The JPB completed a "budget scrub" in conjunction with the conclusion of global settlement negotiations with BBII. Based on the results of the global settlement with BBII and its budget scrub, the JPB, developed a revised budget of $2.44 billion. The JPB approved this revised budget at its Special Meeting on December 6, 2021. This new budget reflects an additional increase of $176 million from the post-risk refresh budget and a total increase of $509 million from the FFGA budget.*

- Significant Project Activities and/or Key Milestones
  - *The JPB/PCEP team successfully negotiated a "global settlement" with BBII and its subcontractors and suppliers for the design-build electrification contract. The settlement resolves all outstanding changes, including prior claims related to the two speed check (2SC) grade crossing warning system, through October 31, 2021, and establishes a new completion schedule for the contract. The JPB approved the three (3) change orders that implement the global settlement at its Special Meeting on December 6, 2021.*
  - *The PCEP and BBII teams are moving forward with renewed partnering activities following the conclusion of the global settlement.*
  - *The PCEP, based on the global settlement with BBII and its own scrubbing of the project budget and schedule, produced a re-baselined budget of $2.44 billion for the PCEP. The JPB approved this budget on December 6, 2021.*
  - *The details of this work will be incorporated into the JPB's Recovery Plan and its Remediation Plan for the California High Speed Rail Authority (CHSRA).*
  - The first major milestone in the Electrification contract is the completion of Segment 4, "Ready for EMU Testing;" this intermediate milestone is not on the PCEP's critical path. *The date for completion of this work has continued to slip for a variety of reasons. The global settlement with BBII extended the completion date for this milestone to April 15, 2022.*
  - PG&E and Silicon Valley Power have required the PCEP to conduct a Single Phase Study to demonstrate that the electrified rail operations will not degrade service for existing customers. The study has been in progress for over a year but has failed to produce a result that satisfies the power companies. The issue was elevated in early 2021 to senior management at PG&E, however, the utilities continue to ask for additional modelling and a completion schedule remains elusive. PG&E now takes the position that no load may

be placed on the system, other than that load inherent in the TPS/OCS components, until the Single-Phase Study is completed. The Acting Executive Director of the JPB is now meeting regularly with her counterpart at PG&E in an effort to resolve this impasse. *Some recent progress has been made in defining the number of test cases, and limiting the testing to a location in San Jose.*

- *The first EMU trainset (TS-1) completed its acceptance and qualification tests at the Association of American Railroads' (AAR) Transportation Technology Center, Inc. (TTCI) in Pueblo, Colorado on December 6, 2021 and is being readied for shipment back to Stadler's Salt Lake Center facility. TS-1 will be reconditioned prior to delivery to the JPB. Stadler has revised its delivery plans and will now ship the first two (2) EMUs (TS-3 and 4) to the JPB as part of a special train with arrival on March 25, 2022.*

1.3 Major Issues and/or Concerns

Summary of Issue/Concern	Electrification Design-Build Contractor Claims
Date Identified	June 2019
Status	The Electrification contractor has submitted a total of four (4) claims; the most significant claim is associated with its efforts to provide Consistent Warning Time (CWT), now known as two speed check (2SC), at grade crossings. Other claims include denial of a Design Variance Request for alternate feeder and contact wire; percent of payment for CWT under Allowance Item #10; and costs for an alternate designer for Segment 1A.
Project Sponsor Action	*The JPB has achieved a global settlement with BBII.* The settlement resolves all claims or other issues through October 31, 2021 and establishes a new schedule for completion of the contract work. *The JPB approved an increase in the PCEP budget and the three (3) change orders that implement the global settlement during its Special Meeting on December 6, 2021.*
PMOC Recommendation	*Proceed with the actions discussed in the Draft Recovery Plan, including a renewed partnering process to resolve issues promptly as they arise. Put in place a robust project controls group to closely track progress, monitor contractor resources, and elevate issues for early resolution.*

Summary of Issue/Concern	Timely Completion of Signals Design and Installation
Date Identified	2019
Status	The pace of signals design continues to be slower than required to achieve a satisfactory completion date for the project. Installation of the signal equipment, including cutovers, continues to go smoothly although somewhat slower than anticipated.
Project Sponsor Action	*The global settlement has established a new schedule for completion of the signals and signals related work. Incentives are in place to encourage earlier than planned completion of all cutovers.* A major cutover of 17 locations is proposed over a three (3) week period in March and April 2022, supported by single-tracking of Caltrain. The JPB is working closely with the signals team to improve production of the design documents. Planning and implementation of the cutovers has been effective and up to eight crews (8) are engaged in various aspects signals construction including ductbank and power drop construction.
PMOC Recommendation	Continue to work closely with the design teams to increase productivity and continue to look for ways to efficiently group cutovers to reduce the time required.

Summary of Issue/Concern	Unresolved Schedule Impacts
Date Identified	November 2018
Status	*Significant schedule delays and unresolved schedule issues led to the FTA designating the PCEP as an at-risk project. Slower than desired delivery of the EMUs is a concern, but not currently on the critical path.*
Project Sponsor Action	*A global settlement has been negotiated with BBII that resolves the delays, time related costs and other commercial issue as of a date certain. BBII has submitted a re-baselined schedule that supports the global settlement and that schedule has been accepted by the JPB.* The JPB is also re-baselining its Master Project Schedule as part of the work required to produce the FTA requested Recovery Plan. The proposed Required Completion Date for the PCEP is September 26, 2024, as proposed by the PMOC in its December 2020 Risk Refresh.
PMOC Recommendation	*Maintain strong schedule discipline with respect to the electrification contract. Increased resources in the project controls group should support proactive schedule management including use of "what-if" scenarios as appropriate. Defense against potential future claims remains imperative. Contract incentives may help encourage improved contractor performance.* *Similar attention should be directed to the EMU contractor's schedule, however, the factors affecting the EMU production rate are very different.*

Summary of Issue/Concern	Management Capacity and Capability
Date Identified	February 2019
Status	The System Integration Lead is only part-time and needs assistance. Scheduling capacity continues to be insufficient to meet the routine demands of the project. Rail Activation Planning is currently being managed by a member of the safety team with rail activation experience until a permanent Rail Activation Manager is hired.
Project Sponsor Action	*A new dedicated Systems Integration lead is now in place. A new dedicated Project Controls lead will start in the near future. The newly approved budget includes funding for additional resources to support the successful completion of the project. A complete staffing plan will be submitted as part of the FTA Recovery Plan.*
PMOC Recommendation	*Continue the increased emphasis on project controls and systems integration and testing activities, Add scheduling support and assign technical staff to assist in Systems Integration and testing and commissioning coordination and oversight. Take advantage of the opportunity presented by apparent delays in the schedule for achieving Interim Milestone 1 to clarify roles and responsibilities as between the JPB and BBII and within the JPB/PCEP organization, and catch-up required paperwork.*

Summary of Issue/Concern	Regulatory Acceptance of the Two (2) Speed Check (2SC) Solution
Date Identified	February 2018
Status	The Electrification contractor is moving forward with design using a two (2) speed check (2SC) solution which apparently will satisfy FRA and California Public Utilities Commission (CPUC) requirements.
Project Sponsor Action	JPB to submit a Request for Amendment (RFA) to Caltrain's Positive Train Control Safety Plan (PTCSP) under 49 CFR Sec. 236, Subpart I; the RFA will document the design and performance of its 2SC grade crossing warning system. The FRA and CPUC have observed the installation of 2SC at a location in Segment 4, and the test data has been supplied to the FRA. The FRA has suggested that PCEP complete a few more tests before submitting its RFA. The JPB now expects to submit its

	Request for Amendment (RFA) in spring 2022, following completion of a portion of the major cutovers described above.
PMOC Recommendation	Continue close coordination with FRA and CPUC. Resume preparation of GO 88B applications for upcoming jurisdictions.

Summary of Issue/Concern	PG&E – Silicon Valley Power Single Phase Study
Date Identified	September 2021
Status	PG&E and Silicon Valley Power have required the PCEP to conduct a Single Phase Study to demonstrate that the electrified rail operations will not degrade service for existing customers. The study has been in progress for over a year but has failed to produce a result that satisfies the power companies. The issue was elevated earlier in 2021 to senior management at PG&E; however, the utilities continue to ask for additional modelling and a completion schedule remains elusive. PG&E now takes the position that no load may be placed on the system, other than that load inherent in the TPS/OCS components, until the Single-Phase Study is completed.
Project Sponsor Action	*Some progress has been made in defining the number of test cases, and limiting the testing to a location in San Jose.* The Acting Executive Director of the JPB is now meeting regularly with her counterpart at PG&E in an effort to resolve this impasse.
PMOC Recommendation	Use all available resources to achieve a timely resolution of this difficult issue.

1.4 Status of Key Indicators Dashboard

KEY INDICATORS DASHBOARD (POST-GRANT STATUS)					
Project Sponsor:				Peninsula Corridor Joint Powers Board (JPB)	
Project Name:				Peninsula Corridor Electrification Project (PCEP)	
Date:				*December 30, 2021*	
Project Detail					
Oversight Frequency:				Monthly	
Element	**Status**			**Prior Status (G/Y/R)**	**Issue or Concern**
	G	**Y**	**R**		
PMP		Y		G	The PMP requires updating to address testing and commissioning.
MCC		Y		Y	*New resources are being deployed but the reconfiguration of the PCEP team is not complete, however, improvements are noted.*
Cost		Y		Y	*The JPB approved an increase in the PCEP budget to $2.44 billion at its Special Meeting on December 6, 2021. The new budget includes the cost of the recent global settlement with BBII and the budget scrub completed by the PCEP team. The JPB has developed a financial plan to support the new budget, and this plan is being further refined for presentation to the FTA in the Recovery Plan expected to be delivered on January 21, 2022.*
Schedule		Y		Y	*The increased budget approved by the JPB on December 6, 2021 is based on completing the project by the September 26, 2024 date recommended by the PMOC in the December 2020 Risk Refresh. The global settlement concluded with BBII is based on achieving substantial completion by April 1, 2024 and final completion by July 31, 2024. The global settlement includes incentives for earlier initiation of revenue service, earlier completion of signal cutovers and earlier completion of contract work.*
Quality	G			G	Some uncertainty related to Electrification contractor's Buy America compliance.
Safety	G			G	Safety performance by the Electrification contractor has improved.
Risk	G			Y	*The global settlement with BBII has significantly reduced uncertainty related to that contract.* Lack of agreement by PG&E that the electrified

					rail system will not produce problems for its network and customers. EMU delays, workforce retention and supplier problems.
Legend					
Green	Satisfactory: No Corrective Action necessary.				
Yellow	Caution: Risk/Issues exist. Corrective Action may be necessary.				
Red	Elevated for immediate Corrective Action: Significant risk to the health of the project.				

1.5 Core Accountability Items through October 2021

Project Status: In Construction		**Original (FFGA)**	**Current Forecast [1]**	**PMOC Assessment of Current Forecast**
Cost	Cost Estimate	$1,930,670,934	*$2.39 billion*	*Current forecast based on the JPB's approved re-baselined budget, adjusted to remove pre-PD costs.*
Contingency	*Allocated Contingency*	$152,913,317	*$10,206,947*	The reduction in contingency is consistent with observed trends.
	Unallocated Contingency	$162,620,294	*-$24,240,206*	
	Total Contingency	$315,533,611	*-$14,033,259*	
Schedule	Final Completion Date	August 22, 2022	September 26, 2024	*Current forecast is based on the JPB's recent re-baselining of the MPS, including its global settlement with BBII.*

Project Progress		**Amount ($)**	**Percent of Total**
Total Expenditures [4]	Actual cost of all eligible expenditures completed to date [5]	*$1,307,193,087*	*67.71%*
Planned Value to Date [2]	Estimated value of work planned to date [3]	$1,925,397,857	99.73%
Actual Value to Date	Actual value of work completed to date [3]	*$1,254,654,458*	*64.99%*

Contracts Status		**Amount ($)**	**Percent**
Total Contracts Awarded	Value of all contracts (design, support, construction, equipment) awarded; % of total value to be awarded [6]	*$1,781,445,234*	*91.60%*
Construction Contracts Awarded	Value of construction contracts awarded; % of total construction value to be awarded [5]	*$1,467,901,882*	*96.04%*
Physical Construction Completed	Value of physical construction (infrastructure) completed; % of total construction value completed	*$916,324,824*	*59.95%*

Rolling Stock Vehicle Status	**Date Awarded**	**No. Ordered**	**No. Delivered**
Electric Multiple Unit (EMU) commuter rail vehicles	08/2016 (A)	133	0

Next Monthly Meeting Date:	*February 21-23, 2022*
Next Quarterly Review Meeting Date:	January 25, 2022

[1] "Current estimate" is the remaining balance which includes known change orders that will draw from Contingency funds, both in Allocated and Unallocated.

[2] "Planned Value to Date" is based upon the Program Schedule and Estimate (Rev. 4B) that

was updated in October 2017 to reflect the FFGA delay.
[3] "Work" is defined as all construction as well as non-construction scopes (all project costs).
Excludes unbudgeted upfront cost for PG&E's share of substation improvements prior to PG&E reimbursement.
[4] "Actual Cost" is determined as follows:
Costs: Inception - October 2021 $1,356,774,686
Pre-FFGA Costs ($49,581,599)
Post-FFGA Costs $1,307,193,087
[5] "Percentage" is calculated based on a project estimate of $1,930,670,934.
[6] "Percentage" is calculated based on Contracts as budgeted in the Baseline Rev. 4B excluding remaining forecasted contingency:
Budgeted Contracts (Pre-FFGA) $1,980,252,533
Pre-FFGA Costs ($49,581,599)
Forecasted Remaining Contingency $14,033,259 [9]
Budgeted Contracts (Post-FFGA) $1,944,704,192
[7] "Total construction contracts awarded to date (construction & vehicle contracts only)" includes design costs and executed change orders.
[8] "Percentage" is calculated based on the total of the executed contract value of construction contracts and forecasted changes to the contrac
Executed value of Construction Contracts $1,467,901,882
Forecasted Construction Contract Changes $60,590,873
Forecast of Value of Construction Contracts $1,528,492,755
[9] Remaining contingency does not include any additional contingency as shown in $333M EAC Refresh

Grant Information

Dollars in thousands reported as of September 30, 2021; this information updated quarterly.

FAIN (Source)	Funds Committed*	Funds Disbursed	% Disbursed
Local	$996,521	*$606,122*	*61%*
Federal	$934,150	*$561,464*	*60%*
Total	**$1,930,671**	***$1,167,586***	***60%***

*Definitions from Guidelines and Standards for Assessing Local Financial Commitment, FTA, June 2007

2.0 PMOC Observations and Findings

This progress report covers the period from December 1, 2021 through December 31, 2021. The information contained in this report is based on the PMOC's participation in the virtual monitoring meetings held on December 20-22, 2021, virtual project meeting attendance, document reviews, telephone conversations, and general interaction with the project sponsor's personnel.

2.1 Summary of Monitoring Activities

The PMOC continues to monitor the PCEP on a regular basis through the activities described above and prepare routine monitoring reports on the project. The FTA designated the PCEP an at-risk project and the PMOC is monitoring the project on a monthly basis; quarterly oversight will resume once the JPB has satisfied the FTA's concerns related to the risk factors that led to the at-risk designation.

The PMOC's oversight will also address the following activities.

- The JPB's new CalMod Interim Chief Officer (ICO) and his team continue to move forward with the following initiatives:
    - *Implementing changes following the execution of the "global settlement" with Balfour Beatty Infrastructure, Inc. (BBII), the Electrification design-build contractor and its sub-contractors and suppliers.*
    - *Implementing changes within the PCEP organization.*
    - *Completing the documentation associated with the budget "scrub" and schedule reviews following the global settlement with BBII and the JPB's approval of the increased PCEP budget. Some of this material will be incorporated into the FTA Recovery Plan.*
    - Working on the FTA Recovery Plan and a similar Remediation Plan for the California High Speed Rail Authority (CHSRA). Both plans will include a finance plan to address the increased project cost.

- The PMOC expects to continue to monitor and report on these efforts and their results.

- The PMOC is reviewing the JPB's FTA Recovery Plan as it is developed and will also review the completed plan.
- The PMOC is conducting two (2) Buy America reviews; one is related to materials used by the JPB and its contractors for the infrastructure elements of the PCEP, and the second is an oversight review of the Interim Buy America Audit that was conducted in November 2021 by the EMU Management consultant.
- The PMOC will continue to closely monitor the PCEP's schedule and schedule management practices, including changes in the performance of BBII and its sub-contractors subsequent to the global settlement.
- The PMOC plans to review the details of the JPB's global settlement with BBII now that the resulting Change Orders have been executed.
- The PMOC continues its preparation of a modified Readiness for Service Review focused on the initial electrification of Segment 4 and the start of testing and commissioning of the first EMU trainset. This review is being performed under a Programmatic Task Order.

2.2 Oversight Triggers

The FTA, as noted in Section 1.2 above, has designated the PCEP an At-Risk project because of cost overruns and schedule delays. As a result of the FTA's at-risk designation, the PCEP is now on a monthly oversight schedule until such time as the uncertainties are resolved to the satisfaction of the FTA. *The JPB, as noted above, formally adopted a revised budget for the PCEP at its meeting on December 6, 2021; the revised budget is based on project completion and the initiation of electrified rail service in 2024.* The PMOC will continue to monitor and report on the JPB's progress relative to its adopted plans and schedule.

2.3 Project Management Plan (PMP) and Sub-Plans

The JPB had planned to update its PMP for the testing and commissioning phase of the project, as well as its Rail Fleet Management Plan (RFMP) and Quality Management Plan (QMP) beginning in late 2021. *These updates have been delayed by the change in the PCEP's leadership in September 2021, the completion of the settlement with BBII, and the re-baselining of the project budget and schedule. The PMOC has discussed this issue with the new leadership of the PCEP, which is aware of the importance of updating these plans, and plans to initiate the updates in early 2022.* The PMOC will review these materials as they become available.

The JPB's Rail Activation Committee (RAC) continues to work on its Rail Activation Plan (RAP). The RAP must be in place before testing of the new EMUs can begin. The PMOC continues to monitor and support this work. The PMOC also continues its work on a modified OP-54 Readiness for Service review prior to the electrification of Segment 4 and the commencement of EMU testing; these activities are now projected to occur in early 2022.

2.4 Management Capacity and Capability

The Interim Chief Officer (ICO) has made several changes to the PCEP organization following the completion of his review and has expressed the need for additional resources. Beginning in early 2022, the PCEP leadership will focus on defining and clarifying roles and responsibilities for the re-defined organization. One of the challenges facing the PCEP organization is competing demands for technically qualified personnel by the substantial number of transit mega-projects currently underway on the west coast of the U.S., and in the San Francisco Bay Area.

The PCEP team relocated to the JPB's headquarters building in San Carlos in mid-October 2021, and the ICO notified the PCEP staff and its consultants that they were expected to return to full-time work at the project offices beginning December 1, 2021. *That transition is underway although somewhat delayed by the December holidays. The ICO reports that approximately 90% of the team has returned to the office.* The workplace and field operations continue to be governed by local and state health department directives.

- ***PMOC Recommendation:*** The PMOC continues to recommend that the JPB fully integrate the Rail Activation and Testing and Commissioning activities and increase the resources assigned to systems integration and scheduling. *The PMOC is monitoring the effectiveness of the recent changes in management of these activities.*

2.5 NEPA Process and Environmental Mitigation

The JPB continues to work with the FTA and the State Historic Preservation Office (SHPO) to extend the Programmatic Agreement that governs the PCEP's related activities. The JPB and its contractor continue to follow the requirements and processes contained in the original agreement.

The PCEP Final Environmental Impact Report (FEIR) forecasts Caltrain ridership of 69,151 daily boardings in the year 2020 and 111,427 daily boardings in 2040, including service in 2040 to the Transbay Transit Center. This ridership represents an increase of 21.1% and 32.1% respectively, over the projected Caltrain ridership in those years without the core capacity improvements.

The JPB also continues to monitor the compliance of its construction contractors with the requirements of its FFGA and the supporting environmental documents. The PCEP reports that tree pruning and removal is approximately 75% complete. Annual surveys are being conducted as required.

2.6 Project Delivery Method and Procurement

JPB reports all major procurements have been completed as of September 2019.

Consultant Contracts

The JPB awarded contracts in early 2014 for Program Management Consultant Services; EMU Vehicle Consultant Services; and Electrification Services. The JPB awarded a five-year contract to Jacobs Project Management Company (Jacobs) of Oakland, CA in 2019 to support electrification construction, the tunnel notching contract, modifications to the CEMOF, reconstruction of the Santa Clara Drill Track, installation of mini-high block platforms, and other work, as needed. *The JPB, as one of its actions at the December 6, 2021 Special Meeting, approved an $18.5 million increase in contract authority for Jacobs, for a total of $35.5 million, and an eight (8) month extension of the contract to December 31, 2024,*

Electrification Design-Build Contract

JPB is using the Design-Build (D-B) project delivery method for the electrification and related facilities. BBII was selected as the D-B Contractor and was provided NTP in June 2017. Design work is either compete or nearly complete on the OCS and TPS elements of the project. *Design continues on the signal related work which is on the PCEP's critical path. The BBII global settlement and its re-baselined schedule prioritizes completion of the signals and supporting work and includes incentives for early completion.* Construction activities are underway in all disciplines and all segments of the corridor.

Supervisory Control and Data Acquisition (SCADA) Equipment

The JPB executed a sole-source contract with ARINC, Inc., for the supply of SCADA equipment in September 2017. The SCADA contract is being managed by the Electrification consultant and installation of the SCADA equipment is being performed by BBII under the Electrification contract. The equipment will be used to control the traction power system including the traction power substations (TPS), wayside power cubicles (WPC), and the OCS. SCADA will be integrated with the base operating system for Caltrain Operations and Control, which is the Rail Operations Center System (ROCS). A separate control console will be established for the Power Director. The hardware has been installed in the Central Control Facility (CCF) and the back-up CCF (BCCF) and testing and training activities are in progress.

Tunnel Notching, OCS Installation and Drainage Improvements

A contract was awarded to ProVen Management, Inc. of Oakland, California, for Tunnel Notching and Drainage Improvements on the tunnels in Segment 1 of the PCEP corridor. The contract consists of two (2) main elements: notching of the four (4) tunnels to increase clearance for the new EMU vehicles; and drainage improvements in tunnels 1 and 4 for the benefit of Caltrain operations. The drainage improvements were performed as a Concurrent Non-Project Activity (CNPA) and the work was paid for by Caltrain. The JPB issued a Notice to Proceed to the contractor on October 6, 2018. Installation of the Overhead Contact System (OCS) in the tunnel bores was later added by Change Order. Inspection of the OCS in the tunnel bores has been completed and the contractor has demobilized. The contractor will return for final integrated testing and acceptance once the OCS is electrified.

Used Electrified Locomotives

The JPB, at its June 7, 2018 meeting, approved contracts to acquire and overhaul two (2) used AM-7 electrified locomotives to perform initial testing of the electrification system. The locomotives arrived at Amtrak's yard in Oakland, CA, on June 6, 2019, and have been in long term storage until needed for testing of the electrified system. The JPB continues to prepare the electric locomotive for use in the initial testing of the electrified OCS in Segment 4. It remains unclear what role the electric locomotive will play in the start-up and testing of the electrified system.

CEMOF Modifications

The JPB awarded a contract to ProVen Management, Inc. in the amount of $6,550,777 to modify the Central Equipment Maintenance and Operations Facility (CEMOF) to accommodate the new EMUs. ProVen was issued a full Notice to Proceed (NTP) on September 16, 2019. The CEMOF contract was the last of the PCEP's major construction contracts. ProVen's management came under criminal investigation in mid-2021 which delayed completion of the work. Installation of OCS poles and wires at the CEMOF is complete and grounding and bonding of required objects and structures is underway and expected to be complete in early January 2022. An elevation discrepancy has been identified on a portion of the newly extended service pit. *An independent review was conducted and the contractor has been directed to complete the work required to correct the problem.*

PG&E Interconnection Construction

The JPB executed Modification 2 to Supplement 2 of its Master Agreement with PG&E to construct the interconnections between PG&E's two (2) substations and the JPB's two (2) corresponding TPSS. Construction of the interconnection between PG&E's FMC substation in San Jose and the PCEP's TPSS 2 was completed on January 18, 2021. The energization of this interconnection has been delayed due to due to the failure of batteries installed in TPSS-2, the time needed to replace the batteries, and the clearance period required by PG&E.

The alignment of the interconnection between PG&E's East Grand Substation in South San Francisco and the PCEP's TPSS 1 was redesigned to underground a greater portion of the service and thereby avoid impacts to an adjacent property owner. Construction of the interconnection is underway, delivery of the specialty underground cable is expected in December 2021, and work is expected to be complete in late February 2022.

Recent Procurements

None currently scheduled.

2.7 Design

BBII is responsible for the Final Design (FD) of the electrification and related facilities under the terms of its D-B contract with the JPB. PGH Wong Engineering, Inc., is the Engineer of Record for the work. All OCS and TPS design work is complete. The following issues remain active at this time:

- The design of the signal system remains active and is on the critical path to project completion. As noted earlier, significant effort was focused on the scheduling of the remaining signal design, signal cutovers, and related civil work during settlement negotiations with BBII. Completion of the signal work is scheduled for September 2023. *Significant planning and design efforts are focused on a major cutover of seventeen (17) locations in Segment 2, Work Areas 3 and 4, during a three-week period in late March through early April 2022. Caltrain Operations has agreed to single track rail operations over the seven-mile stretch of track for the three-weeks necessary to complete the cutovers.*
- The JPB is continuing discussions and negotiations with the UPRR regarding protection at the Reed Street crossing in Segment 4 which is controlled by the UPRR. UPRR has requested a complete design for the crossing before they will review it.
- PG&E and Silicon Valley Power have required the PCEP to conduct a Single Phase Study to demonstrate that the electrified rail operations will not degrade service for existing customers. The study has been in progress for over a year but has failed to produce a result that satisfies the power companies. The issue was elevated earlier in 2021 to senior management at PG&E, which led to an independent consultant being hired to try to forge consensus. However, the utilities continue to ask for additional modelling and a completion schedule remains elusive. PG&E's position is that no load may be placed on the system, other than that load inherent in the TPS/OCS components, until the Single-Phase Study is completed. The Acting Executive Director of the JPB is now meeting regularly with her counterpart at PG&E in an effort to resolve this impasse.

  The JPB reports that its contractor has completed a series of ten (10) test cases for the selected San Jose location. That information will be used by the utilities to determine the number of additional test cases that must be run to reach a satisfactory conclusion. The number of additional test cases ranges from approximately 400 to 800, and the completion date for the additional cases ranges from the end of January to mid-February 2022. The JPB reports that PG&E's primary concern relates to the regeneration of power by the EMUs that feeds back into the grid because they have no experience with this situation.

2.8 Value Engineering and Constructability Reviews

The project sponsor did not undertake a formal VE effort. However, the PCEP team undertook a significant cost reduction effort in late 2014 which identified an estimated $84.3M in potential cost savings achieved by eliminating or deferring certain tasks previously included in the baseline program. In addition, the procurement process for the Electrification D-B contract included the

submission of alternate technical proposals (ATPs) to reduce cost or improve schedule. In addition to those ATPs that were incorporated into the Electrification contract, that contract contains a Value Engineering Change Proposal (VECP) clause whereby any savings that result from an accepted VECP are shared by the contractor and the JPB.

2.9 Real Estate Acquisition and Relocation

The project is being constructed primarily in the existing Caltrain corridor on rights-of-way (ROW) controlled by JPB/Caltrain. The PCEP is acquiring real estate for three (3) primary purposes: (1) for placement of Overhead Contact System (OCS) poles; (2) for the two (2) primary Traction Power Substations (TPSS); and (3) to provide electrical clearance and safety zones for the OCS wires. The corridor has been sub-divided into four (4) segments numbered from north to south to manage the electrification and other related work more effectively.

The corridor spans three (3) counties and the JPB must collaborate with Santa Clara County on the south, its home county of San Mateo, and the City and County of San Francisco on the north to exercise eminent domain power as necessary during the ROW acquisition process. The JPB executed an agreement with the Santa Clara Valley Transportation Authority (VTA) to exercise eminent domain on behalf of the JPB for property acquired in Santa Clara County, which includes all of Segment 4 and some portions of Segment 3. The JPB also executed an agreement with the San Mateo County Transit District (SamTrans) to act as the condemning agency for all property in San Mateo County. San Mateo County includes all properties in Segment 2 and some properties in Segments 1 and 3. The JPB was unsuccessful in reaching an agreement with the City Supervisor for the City of San Francisco related to the City's exercise of eminent domain powers on behalf of the JPB for properties located within the City and County of San Francisco (CCSF).

Real Estate Activities

The large majority of real estate activities have been completed, The remaining challenges facing real estate are design changes that are impacting already acquired properties and design changes requiring new or re-defined acquisitions. Potholing for OCS foundations, and follow-on construction work located outside of JPB owned right-of-way (ROW), require that the JPB acquire the property or an appropriate property right. In some cases, the relocation of poles has resulted in wires crossing parcels previously identified as only needing an electrical safety zone (ESZ); in these cases, a fee acquisition is deemed necessary.

- Bayshore Property (Segment 1 South of tunnels) – The parties have reached final agreement on price and construction is underway using permits issued by the owner, pending completion of the transaction. *The JPB reports that it has received only minor comments and will be requesting the FTA's concurrence on the transaction in the near future.*
- Santa Clara Valley Transportation Authority (VTA) (Segment 4 near TPSS 2) – *The JPB reports that the easement allowing PG&E access on VTA property has been executed.*
- *The JPB's real estate department has notified Comcast that it will initiate legal action to remove Comcast's facilities from the JPB's rights-of-way if Comcast does not accelerate the relocation of its remaining facilities.*
- Staff continues to review electrical safety zones (ESZs) for potential changes due to OCS pole relocations.
- Staff continues to work with PCEP's internal signal team and BBII signal team to determine potential Real Estate interests.

2.10 Third-Party Agreements and Utilities

A significant number of third-party agreements were required to support the PCEP. These agreements are grouped into the following general categories, with status comments as appropriate to each:

Jurisdictional Agreements for Construction and Maintenance

The JPB has executed all agreements except the one with the Town of Atherton (Segment 2), which is no longer being pursued. The Town of Atherton must issue traffic control permits to the contractor, and the Town staff has been cooperative to date.

Jurisdictional Agreements for Exercise of Eminent Domain Powers

The JPB has executed agreements with the Santa Clara Valley Transportation Authority (VTA) and the San Mateo County Transportation District (SamTrans) under which the VTA and SamTrans will exercise eminent domain authority on behalf of the JPB, when such action is required, to acquire the real property rights located in the respective counties for the PCEP. The City and County of San Francisco (CCSF) declined to approve an agreement for use of its eminent domain powers on behalf of the PCEP.

Utility Relocation Agreements

The JPB's right to relocate utilities that exist within its PCEP corridor exists by virtue of the property rights it acquired when it purchased the corridor from the Southern Pacific Transportation Company (SP) in November 1991. The JPB has the right to cause the relocation of both overhead and underground utilities to accommodate its railroad activities upon thirty (30) days' notice to the utilities at the utilities expense. The JPB reports the following activities related to third-party utility work:

- JPB continues to work with Comcast, AT&T, and the fiber optic cable carriers to relocate the approximately 33 remaining conflicts. *All AT&T conflicts have been resolved in Segment 4, however, two (2) conflicts with Comcast remain that could delay energization.* Discussions with Comcast management have been escalated in an effort to clear Comcast's approximately 25 remaining conflicts *(see Real Estate in Section 2.9 above)*.
    - **PMOC Observation:** Despite starting very early in the project development process, the process of clearing the third-party utilities located in the corridor has been difficult and remains incomplete, The JPB continues to coordinate closely with the various utility companies, especially on near term conflicts with construction activities.

The JPB also has in place or is negotiating specialized agreements with the following entities:

Pacific Gas & Electric (PG&E)

PG&E will supply power from two (2) existing substations to the new PCEP Traction Power System. Both substations must be modified to provide the required power. The JPB has executed a Master Agreement with PG&E as well as Supplements 1 through 5 to that agreement. Supplement 4, which includes the cost of constructing the substation modifications, was fully executed on October 18, 2018. The parties disagreed on the allocation of costs for the work, and following discussions between the parties, PG&E filed an application with the CPUC for a cost allocation plan. The CPUC's Administrative Law Judge announced a decision on May 7, 2020 that adopted a modified order affirming the cost allocation principles agreed to by the JPB and PG&E.

Two agreements between PG&E and the JPB remain to be executed. The first is what the JPB has previously referred to as the Interconnect Agreement but is now called the Transmission Load

Operating Agreement (TLOA). This agreement includes provisions limiting the load available at the FMC substation for testing purposes until full permanent power is in place. The second agreement is a retail power agreement. The JPB did not execute the TLOA in September 2021 as expected, and a continuing delay could jeopardize a timely initial energization of TPSS-2 for testing of Segment 4.

Construction of the temporary power feed at PG&E's "FMC" substation in San Jose is complete. Construction of the interconnection to TPSS #2 was completed on January 18, 2021. *The replacement battery for TPSS-2, which must be installed and tested before the TPSS can be energized, finally arrived on December 27, 2021. Based on that arrival date, and the time required for testing by both BBII and PG&E, the TPSS could be energized as currently scheduled on January 15, 2022.*

Construction of the interconnection between PG&E's East Grand substation and TPSS #1 is underway with completion projected on February 28, 2022. PG&E continues with the permanent modifications to both its FMC and East Grand Avenue Substations. Work at PG&E's East Grand Avenue substation is expected to be complete in January 2022.

The date for PG&E's supply of permanent power to the PCEP has slipped from April 15, 2022 to August 13, 2022 as a result of delays in completing modifications to its substations.

California Public Utilities Commission (CPUC)

The CPUC is the FTA's Certified State Safety Oversight Agency (SSOA) for the State of California, and also has responsibility for grade crossing safety in the state. The JPB has worked with both CPUC and the FRA to develop the 2SC solution to provide the required grade crossing warning time after the system is electrified. CPUC and the FRA have been observing the initial cutovers at the signal locations in Segment 4 and have been satisfied with the results to date.

The JPB must file General Order (GO) 88B forms for each modified crossing for approval by the CPUC; these plans are developed in conjunction with the local jurisdictions. The JPB has thus far submitted six (6) crossings, and the CPUC has approved all six (6). The JPB expects to resume preparation of the GO 88B forms for the remaining jurisdictions in the near future. The FRA does not approve the crossings, but has both regulatory and enforcement authority if the crossings do not perform as required by its regulations. *The CPUC has recently raised questions related to the clearance under windy conditions between the OCS conductors and wayside devices such as gate arms and antennas. Caltrain operations has conducted an inventory of the problem locations and solutions are being developed.*

Union Pacific Railroad (UPRR)

The JPB has a continuing relationship with the UPRR, which is a tenant and operates service on tracks owned by Caltrain in the PCEP corridor; Caltrain operates service on tracks owned by the UPRR south of the PCEP corridor.

California High Speed Rail Authority (CHSRA)

The California High-Speed Rail Authority (CHSRA) is a funding partner for the PCEP and proposes to operate in blended service with Caltrain in the PCEP corridor in the future. The JPB has relocated some OCS poles to permit future curve-straightening by the CHSRA without impacting the electrification system. Straightening of some curves will allow the CHSRA to achieve higher operating speeds. All costs associated with the pole relocation work will be paid for by the CHSRA. Representatives of the CHSRA are now participating regularly in a variety of PCEP meetings. The JPB has prepared a Project Remediation Plan for the CHSRA; the plan is a requirement of the funding agreement between the parties. *The plan has been reviewed by the CHSRA and appropriate portions*

of the plan are being incorporated into the FTA requested Recovery Plan which will be submitted on January 31, 2022.

The CHSRA's 2020 Draft Business Plan was first presented in February 2020, but was delayed by the impacts of the COVID-19 pandemic. A Revised 2020 Business Plan was adopted by the Authority Board of Directors on Thursday, March 25, and submitted to the state legislature on Monday, April 12, 2021. This new plan calls for completion of an initial operating segment between Merced and Bakersfield, followed by extensions northwest to the Bay Area and south to Los Angeles.

Federal Railroad Administration (FRA)

The FRA has authority over the JPB's rail operations. As noted above and elsewhere in this report, the JPB is coordinating with the FRA on several issues, including technical issues related to the EMUs and resolution of the 2SC issue. The JPB's PTC program has received FRA approval. Issues related to the EMU's are discussed in Section 2.12 of this report. The JPB continues to hold monthly conference calls with the FRA to discuss EMU issues, and another call to discuss any open questions related to the 2SC implementation.

Independent of the PCEP, the JPB filed a test request with the FRA on November 29, 2021 for installation of a Crossing Optimization Project. The project proposes to modify grade crossing controls to improve gate down-time performance. If the test request is approved, the modification of the initial crossings will be performed following the installation and cutover of the 2SC equipment by BBII.

2.11 Construction

The JPB provided the following report on infrastructure construction activity.

Overhead Contact System (OCS)

- OCS foundations are complete in Segment 2, 3, and 4 and at the CEMOF.
- Foundation and utility potholing continues in Segment 1.
- Foundation installation is underway in Segment 1 with separate crews working on off-track and on-track foundations.
- *Pole and wire work is continuing in Segments 3 and 4. Completion of the wire work in Segment 4 has been extended because of the complex hand work required at the Diridon station and at the CEMOF.*

Table 1 – *Overhead Contact System Progress as of November 30, 2021*

Segment	Work Area	Foundations		Poles	
		Required[a,b,c]	Completed	Required[a,b]	Completed
1	Tunnels	32	32	32	32
	A	*299*	*223*	259	0
	B	*228*	*227*	183	0
2	5	246	246	212	160
	4	317	317	253	*253*
	3	177	177	140	*125*
	2	238	238	205	*73*
	1	201	201	161	*44*
3	2	509	509	445	445
	1	392	392	310	310

Segment	Work Area	Foundations		Poles	
		Required[a,b,c]	Completed	Required[a,b]	Completed
4	A	242	242	180	179
	B	128	128	124	*123*
	CEMOF	85	85	83	*83*
Total		***3,092***	***3,015***	**2,587**	***1,827***

[a] Foundations required do not match poles required because guy foundations are needed in some locations for extra support.

[b] Reported number of required poles and foundations fluctuate due to design changes.

[c] 30 foundations in S2WA5 were installed by the South San Francisco Station project; 65 foundations in S2WA3 were installed by the 25th Avenue Grade Separation project.

Traction Power System (TPS)

- The backup battery supply for TPSS-2 did not pass the test required by PG&E. A satisfactory battery back-up is a prerequisite for energizing TPSS-2. *A new battery was ordered and finally arrived on December 27, 2021. The PMOC understands that BBII has approximately eight (8) days of installation and testing of the batteries prior to PG&E beginning the necessary tests prior to energizing TPSS-2; PG&E activities are expected to take approximately two (2) weeks.*

Table 2 below shows the status of the major elements of each of the individual facilities comprising the TPS.

Table 2 - Traction Power Facilities Progress as of December 15, 2021

Facility	Sitework	Substation Building	Low / High Voltage Equipment	Transformer	Gantry	Overall Percent Complete
TPS-1	95%	*80%*	*98%*	*100%*	*94%*	*93%*
TPS-2	*99%*	*100%*	*100%*	100%	*100%*	*99%*
SWS-1	93%	89%	*96%*	100%	*89%*	*93%*
PS-1	*71%*	*80%*	*96%*	100%	*86%*	*87%*
PS-2	*87%*	*80%*	*89%*	100%	*77%*	*87%*
PS-3	*34%*	*70%*	*5%*	*90%*	15%	*43%*
PS-4	*90%*	*80%*	*98%*	100%	*82%*	*90%*
PS-5	*85%*	*94%*	*98%*	100%	*89%*	*93%*
PS-6	93%	*94%*	91%	100%	*87%*	*93%*
PS-7	96%	*100%*	*98%*	100%	*100%*	*99%*
Wayside Power Cubicles		Required 27; Installed 23				

Notes:
Sitework: Mobilize, Clear and grub, Lighting/Equip Cast in Drilled Hole (CIDH) Foundations, Duct Bank, Drainage, Subgrade, Fence/Concrete Masonry Unit (CMU), Finished Grade;
Substation Building: Earthwork (Excavation/Bedding), Foundation (form, rebar, pour), Set House, Pull Wire;
Low/High Voltage Equipment: Yard Equipment, ATS & AUX, Power Drop;
Transformer: Earthwork (Excavation/Bedding), Foundation (form, rebar, pour), Set Transformer, ABB Fit Up; and
Gantry: Foundations (pothole, drill, pour), Set Gantry, Cables/Pipes/Wires, Gantry Equipment.

Signal System

Design and construction of the signal system is on the critical path to project completion. Once the new signal equipment is in place, the system must be electrically connected or "cut over" to the new equipment. A total of twenty-one (21) cutovers are planned; these involve numerous signals and control points. A control point (CP) is a named location where tracks merge or cross. Thus far only four (4) of the twenty-one (21) cutovers are complete. The JPB expects to complete the final cutover in late 2023. JPB reported the following signal activity.

- A major cutover in Segment 2, involving 17 locations, is being planned by the PCEP/BBII team. This cutover is expected to require three (3) weeks to complete, and Caltrain Operations has agreed to single track service through the cutover area to allow this work to proceed. A go/no go decision will be made in early January with BBII.
- *BBII's re-baselined schedule for the remaining signal work shows a total of fifteen (15) cutover phases remaining; the cutovers are scheduled into eleven (11) discrete periods, which indicates that in three cases more than one cutover phase is occurring at the same time*
- The JPB revised the contractual requirements for completion of Interim Milestone 1 in the Electrification contract to exclude one crossing which is under UPRR control and still incomplete. This will allow the Milestone to be accomplished while the UPRR issue is being resolved. Completion of Interim Milestone 1 will allow the JPB to proceed with the testing of EMUs in Segment 4 and allow the Electrification contractor to satisfy that contractual requirement.
- Installation of conduit and foundations for signal and wayside power cubicles (WPC) continues in all Segments.
- Design work continues for specific grade crossings.

Supervisory Control and Data Acquisition (SCADA)

- *Point-to-point testing of the SCADA system in Segment 4 began in early December 2021 but was incomplete at the year-end; work will resume in January 2022.*

Concurrent Non-Project Activities:

The JPB has an on-going capital construction program that includes several projects that will share some common elements with the PCEP. These projects have been designated as Concurrent Non-Project Activities (CNPAs), and the project elements that will be constructed for the benefit of the PCEP will be appropriately segregated for cost purposes. Some CNPAs have been completed; the following are still active:

- Installation of additional flip-up seats in EMU bike cars. This work will be funded locally.

2.12 Vehicle Technology and Procurement

The JPB placed an order for ninety-six (96) new bi-level EMU vehicles to be produced by Stadler US, Inc. and delivered in six-car trainsets. The JPB ordered an additional thirty-seven (37) EMUs in December 2018 using an option in the Stadler contract. The JPB has now ordered an electrified fleet of one hundred thirty-three (133) EMUs configured as nineteen (19) seven-car trainsets. The JPB has remaining options to purchase up to fifty-nine (59) more EMUs at prices based on the date when the option is exercised.

The EMU contract contained an option for Stadler to maintain the vehicles; the JPB did not exercise this option and the vehicles will be maintained by TASI, the JPB's current rail operator. The JPB states that Stadler will provide on-site training and assistance for TASI's personnel for two (2) years following vehicle acceptance.

The EMUs were ordered with two (2) sets of doors, one set at approximately 22" above top of rail, and one at approximately 50.5" above top of rail. Initially, only the lower set of doors will be activated, and a small step will automatically deploy outside the vehicle to reduce the boarding height to the current platforms. The PCEP's Change Management Board, at its September 2019 meeting, approved the JPB's request for a change order to install temporary panels in place of the high-level doors until the trains operate in blended service with the CHSRA. The high-level doors will be placed in storage until they are installed for blended service with the CHSRA. When the EMUs operate in blended service with the CHSRA vehicles, the high-level doors will be operated to provide level boarding at the higher CHSRA platforms at those stations served by both systems. See additional discussion under Regulatory Issues below.

Stadler reported the following progress on the vehicles:

- *The first EMU trainset (TS-1) completed its prescribed acceptance and qualification tests at the TTCI in Pueblo, Colorado on December 6, 2021. TS-1 will be returned to Stadler's Salt Lake City facility for reconditioning prior to its delivery to the JPB; reconditioning is expected to take approximately eight (8) weeks.* TS-1 has been tested in both a seven-car and eight-car configuration to demonstrate compliance with the JPB's specifications.
- *Stadler received FRA approval to ship the first two (2) EMUs (TS-3 and 4) to the JPB as part of a special train.*
- *The JPB conducted an Intermediate Buy America Audit of Stadler on October 25 - 27, 2021 and the audit report is complete. Stadler is currently reporting domestic content percentages ranging from 69.40% to 81.54% for the various car types which is greater than the required 60% for this contract. The auditor was unable to verify these percentages because Stadler did not provide the necessary documentation. The auditor provided a series of five (5) recommendations and encouraged Stadler to carefully comply with each, so that a satisfactory post-delivery audit can be accomplished on the first delivered vehicle to verify that it satisfies the required domestic content. The post-delivery audit is expected to be conducted in late-March or early-April 2022 following the delivery of the first trainset to the JPB*
- *Stadler reports continuing problems with material availability and supply chain logistics as well as workforce attraction and retention. Utah's unemployment rate is reported to be 2.9%, the lowest in the U.S.*
- All final design reviews have been completed.
- Trainsets 3 – 6 are undergoing routine testing.
- *Stadler continues producing ceiling panels, light fixtures, and luggage racks in Salt Lake City because the original supplier was unable to meet its obligations. Production of the luggage racks is slower than desired.*
- Stadler will complete climate room testing in February 2022 in Salt Lake City. The test session in Elmira, NY was shorter than planned, therefore, Stadler is completing the remaining tests.
- *93/133 car shells have been shipped from Stadler – Switzerland and 89 have been received at Stadler's Salt Lake City facility. Production continues on trainsets 3-16.*

Regulatory Issues

- The last FRA on-site design review in Salt Lake City took place July 8-9, 2020, after being re-scheduled due to COVID-19. FRA identified the need for barriers between stored bikes and wheelchair parking areas in the Bike cars and that change is being incorporated into the production units. The FRA is expected to review this issue during its sample car inspection,

which is now scheduled for January 2021 in Salt Lake City, prior to shipment of the first trainsets to the JPB.

- Test Plan: The Pre-Revenue Service Test Plan was submitted to the FRA for approval on January 20, 2021. The FRA provided comments on the plan, which the JPB addressed and resubmitted the plan to FRA. No formal response has been received from the FRA.

2.13 Project Cost

The FFGA budget for the PCEP is $1.931 billion in year of expenditure (YOE) dollars. *The JPB revised its budget for the PCEP to $2.264 billion in June 2021 based on the results of the FTA's December 2020 Risk Refresh. This represented an increase of $333 million from the FFGA budget. The JPB completed a "budget scrub" in conjunction with the conclusion of global settlement negotiations with BBII. The JPB, based on the results of the global settlement with BBII and its budget scrub, developed a revised budget of $2.44 billion. The JPB approved this revised budget at its Special Meeting on December 6, 2021. This new budget reflects an additional increase of $176 million from the previous budget and a total increase of $509 million from the FFGA budget. The new budget will be incorporated into the JPB's Recovery Plan. The JPB expects to begin reporting against the new budget with its December 2021 Monthly Progress Report.*

Table 3 below presents the PCEP costs as of October 31, 2021. The JPB re-forecasts the estimated cost at completion (EAC) monthly. *The JPB has added a single line to the Project Cost Table to show the $462.4 million in additional budget following its global settlement with BBII and completion of its internal budget scrub.*

Table 3 – Project Cost Table at 10-31-2021 ($ millions)[1]

SCC Category	Original Budget	Current Budget	Expenditures to Date	Earned Value [2]	Estimate to Complete	Estimate at Completion
10 Guideway & Track	$14.3	*$28.3*	$26.2	N/A	$2.2	$28.4
30 Support Facilities	$2.3	$8.2	*$7.2*	N/A	*$1.2*	$8.4
40 Sitework & Special Cond.	$255.1	*$267.5*	*$276.5*	N/A	$10.2	$278.4
50 Systems	$504.4	$516.1	*$363.0*	N/A	*$196.5*	$559.6
Construction Subtotal	**$776.0**	***$820.1***	***$672.9***	N/A	***$208.1***	***$873.8***
60 ROW	$35.7	$35.7	*$21.8*	N/A	*$14.7*	$36.5
70 Vehicles	$625.5	$619.3	*$298.0*	N/A	*$323.7*	*$621.8*
80 Prof. Services	$323.8	*$377.3*	*$351.9*	N/A	*$60.2*	*$412.1*
90 Unallocated Contingency	$162.6	*$68.4*	$0.0	N/A	*($24.3)*	*($24.3)*
Capital Cost Subtotal	**$1,923.7**	***$1,920.8***	***$1,344.7***	N/A	***$600.4***	***$1,945.1***
100 Finance Cost	$7.0	$9.9	*$7.75*	N/A	$2.1	$9.9
TOTAL	**$1,930.7**	**$1,930.7**	***$1,3522.5***	***N/A***	***$578.2***	**$1,930.7**
Additional Budget Need[2]	*N/A*	*N/A*	*N/A*	*N/A*	*$$462.4*	*$462.4*
Total Project Cost w/Additional					***$1,009.0***	***$2,263.7***

[1] Totals may not add due to rounding.
[2] Caltrain Capital Overhead includes actuals to date using new ICAP method as reported in Budget Scrub.

PMOC Note: The JPB publicly reports expenditures against a total project budget of $1,980,252,533. This higher amount includes expenditures prior to the project's entry into the Project Development (PD) phase, which is excluded from the FTA's project budget. Costs incurred

prior to the project's entry into the PD phase were removed from the estimate at the FTA's request during its review of the FFGA materials.

Cost Contingency Status

Table 4 summarizes the project contingency as of July 31, 2021 for the project, without the additional monies recommended by the December 2021 Risk Refresh.

Table 4 – Contingency Status ($ millions) [1]

Contingency Category	Baseline Contingency (YOE)	Current Contingency (YOE)	% of Construction Complete and % Contingency Remaining[3]
Allocated	$152.9	*$10.2*	*65%*
Unallocated	$162.6	*-$24.2*	
TOTAL	**$315.5**	*-$14.0*[2]	**5.6%**

[1] Totals may not add due to rounding.
[2] Estimate at Completion
[3] Data as of October 31, 2021.

The PCEP cost contingency balances will need to be established based upon the $2.44 billion budget approved by the JPB at its December 6, 2021 Special Meeting and a new cost contingency curve must be established with appropriate hold-points.

Project Funding

The JPB approved a new budget of $2.44 billion for the PCEP at its Special Meeting on December 6, 2021. That budget must be supported by additional funding beyond that described in the following paragraphs which applies to the original project cost of $1.930.7 billion. The proposed funding strategy presented to the JPB to support the budget increase is shown in Figure 1 below.

Figure 1 – PCEP Proposed Funding Strategy to Support Budget Increase

FTA / CHSRA Recovery Plan	Additional Funding Sources for Project Cost Increase*
- $52.4 ARP - $150M credit financing - $60M Measure RR capital reserve - $200M super contingency	STATE - State Budget FY22, FY23 - Transit and Intercity Rail Capital Program - CTC: Solutions for Congested Corridors Program, Local Partnership Program, Trade Corridor Enhancement Program FEDERAL - Appropriations FY22, FY23 - RAISE, CRISI, INFRA, Railroad Crossing, National Infrastructure Project Assistance, Railcar Replacement Program

***Notes:** Remaining $200M funds may include federal, state or other funding. Caltrain and partners will seek federal and state grants to fund remaining project costs. Should those grants or funds not be sufficient, then JPB commits to identifying "own source funding" that would provide the $200M including member agencies' funding, RR revenues or proceeds from bonds secured by measure RR or low carbon fuel standards credits revenue.*

The proposed funding strategy is incomplete at this time and additional details are expected by the time the funding plan is presented to the FTA in the Recovery Plan and to the CHSRA in its Remediation Plan.

Original PCEP Funding Plan

The PCEP is relying on several sources of funding to complete the project. The Table in the Executive Summary summarizes the JPB's funding plan, as updated through June 23, 2017. The updated funding plan shows total funding of $1,930.7 billion, including $647 million in Section 5309 funds. The plan also includes federal funding from the Section 5307 Urbanized Area Formula program of $287 million. *The JPB has drawn down a total of $1,167,586 as of September 30, 2021, or 60% of the combined federal and local funds.*

The JPB has in-place an interim financing agreement for up to $150 million to provide additional cash flow flexibility to address differences in the timing of contractor invoices and the availability of drawdowns from funding sources.

The State of California awarded the JPB a $164.5 million grant in 2018 under its Transportation and Intercity Rail Capital Program (TIRCP). The grant will fund the purchase of additional EMUs using options included in the base contract with Stadler. The grant also includes targeted funding for 8-car platforms, improves wayside bicycle facilities (bike sharing and bike parking), and installs a broadband communications system that expands onboard Wi-Fi and enhances reliability by creating the capability to conduct remote diagnostics and optimize ongoing operations and maintenance.

Change Orders

Electrification Contract Changes: *The JPB reported issuing a single Change Order in November 2021 in the amount of $2.6 million for a price increase for handling of contaminated materials.*

EMU Contract Changes: No activity this period.

SCADA Contract: *SCADA Database Change - $170,000*

Tunnel Contract Changes: *Procure Surge Arrestors - $3.99 million; and Cantilever Drop Tubes - $3.96 million.*

CEMOF Contract Changes: No activity this period.

PG&E Contract Changes: No activity this period.

Contractor Claims

The JPB/PCEP team successfully negotiated a "global settlement" with BBII and its subcontractors and suppliers for the design-build electrification contract. The settlement resolves all outstanding changes, including prior claims related to the two speed check (2SC) grade crossing warning system, through October 31, 2021, and establishes a new completion schedule for the contract. The global settlement was approved by the Change Management Board (CMB) on December 3, 2021. The JPB approved the three (3) change orders that implement the global settlement at its Special Meeting on December 6, 2021.

2.14 Project Schedule

The FFGA was executed on May 23, 2017. Attachment G - Project Milestones / Key Events shows the current projected dates for completion of various significant project activities. The JPB updates its Master Project Schedule (MPS) monthly. *The most recent version is the November 30, 2021 update with a status date of December 1, 2021 and is referred to as MPS C21.10.*

The PCEP team received, reviewed and approved BBII's re-baselined schedule for the remaining Electrification contract work as part of the Global Settlement process. The PMOC received a copy of an updated P6 schedule titled" PCEP July 2021 RB Schedule Rev 1 (11.23.21)" on December 1, 2021. The transmittal indicates that the file is for the approved revised baseline schedule for the global settlement. The PCEP team states that the July 2021 version of the BBII schedule was used for re-baselining because that was the version that had been most closely examined by the parties during their negotiation of the signals and other related activities. The PCEP's scheduler noted in the transmittal that BBII is working on moving the data date to Nov 1, 2021, reflecting schedule progress until Oct 31, 2021, the date agreed to in the Global Settlement. The JPB is expected to formally adopt a re-baselined schedule for completion of the electrification contract as part of the Global settlement with BBII at its December 6, 2021 meeting. The PMOC has not yet reviewed this schedule.

The PCEP team has also received and reviewed a re-baselined schedule from Stadler for the completion of the EMU order. The PCEP team plans to develop a re-baselined Master Project Schedule (MPS) which incorporates changes to the BBII and Stadler schedules and other project activities as part of its schedule scrub. That schedule is expected to become part of the JPB's Recovery Plan and CHSRA Remediation Plan. JPB is currently forecasting commencement of Revenue Service with its new EMUs between January 1 and March 31, 2024 and a Required Completion Date (RCD) of September 26, 2024.

Recent Significant Schedule Changes

The following are examples of the significant schedule changes mentioned in the JPB's November 31, 2021 MPS update.

Electrification

As a result of the global settlement, the electrification baseline schedule has been revised. JPB incorporated BBII's electrification re-baseline schedule into the MPS November update.

The new forecast construction completion date for the OCS system has slipped from July 15 to December 5, 2022. Completion of the traction power system has advanced from June 10 to May 28, 2022.

Due to the schedule delay and readiness of the first trainset arrival at the JPB site, which will be available for EMU testing in Segment 4 on April 14, 2022. This schedule delay has pushed back the integrated testing 39-calendar days with a new forecast completion date of May 12, 2022.

Stadler

Covid impact on sub-contractor schedules and the supply chain challenges resulted in further 25-calendar days schedule delay to the first trainset arrival at the JPB site. The new forecast completion date is March 25, 2022.

Stadler proposes revising the EMU baseline schedule due to the continuous Covid and supply chain challenges schedule impact in joint efforts with JPB.

SCADA

There was a 10-day schedule delay in the SCADA / Rail Operations Center System (ROCS) software installation and equipment cutover due to delay in point-to-point testing. The new forecast completion date is now January 11, 2021.

Critical Path

The PCEP is a core capacity project. The core capacity completion objective will be satisfied when the JPB operates a total of fourteen (14) seven-car trainsets in electrified service. The critical path

of the project currently runs through the design, installation, and integrated testing of the signal system.

Schedule Contingency Status

The PCEP had exhausted its schedule contingency at the time of the December 2020 Risk Refresh. The JPB's adoption of the PMOC's recommended September 26, 2024 Required Completion Date (RCD) has resulted in an increase in schedule contingency to approximately six (6) months, based on the JPB's forecast of achieving full revenue service by March 31, 2024. *The JPB's global settlement with BBII includes incentives for early completion of signal cutovers, early substantial completion, and early achievement of revenue service.*

Revenue Service Date

The JPB recently accepted the PMOC's recommended RCD of September 26, 2024, which is based on the results of the December 2020 Risk Refresh. The JPB is currently forecasting commencement of revenue service with its new EMUs between January 1 and March 31, 2024. The PMOC's understanding is that the JPB will initiate revenue service with the EMUs when it has the fourteen (14) trainsets required to satisfy the FFGA.

- **PMOC Observations:**
  - *The PMOC observes that the renewed emphasis on partnering between owner and contractor to promptly identify problems and collaborate to find and implement fair and effective solutions appears to be producing positive results. The successful accomplishment of Interim Milestone 1 can be a strong demonstration of the teams' ability to work together.*
  - The JPB has achieved a global settlement with BBII, its electrification contractor. The settlement includes agreed upon dates for various schedule milestones, as well as incentives for early completion of the work. The PMOC is pleased that the JPB has achieved a settlement of its lengthy dispute with BBII including an accepted schedule. However, the PMOC has not yet reviewed the details of BBII's re-baselined schedule or the PCEP's plan for proactive schedule management to avoid a recurrence of the prior schedule issues. Two years of complex work remain to complete the PCEP. The PMOC strongly encourages the PCEP and its new leadership to increase scheduling resources, develop a fully integrated MPS, implement best schedule management practices such as enforcing timely receipt of required updates, prompt review and resolution of contractor schedule issues, regular identification of the controlling operation(s), and the timely development of workarounds and Plan Bs to avoid unpleasant surprises.

2.15 Project Risk

The PCEP has been implementing its RIMP (Risk Identification and Mitigation Plan) since its development in 2014. The PCEP's Risk Management Lead conducts weekly updates of a sub-set of the Risk Register and the project's Risk Management Committee generally meets monthly to review those risks proposed for retirement, risks with a major change in severity, and proposed additions to the Risk Register. The JPB has also created a "Watch List" of possible occurrences such as currency fluctuations or labor shortages to better understand the PCEP's risk position. The Top Risks, with risk number, are shown in Attachment D. **PMOC Note:** Risks graded 12 or higher are now considered Top Risks. Prior to the recent regrading of the Risk Register, risks graded 18 or higher were considered Top Risks.

The JPB/PCEP leadership team conducted several risk workshops with BBII during the course of negotiating the global settlement. An internal PCEP risk refresh was conducted on September 28, 2021; the quantitative results of that effort have not been released. The ICO also initiated an external peer review of project risk that was conducted on October 26-27, 2021. The PMOC participated in both events. The JPB's most recent internal Risk Refresh Workshop was held on April 1, 2020.

The following are other current risk related activities:

- *The Rail Activation risk register and the risks identified by the outside experts during the recent external risk review are being incorporated into the PCEP risk register.*

FTA Risk Refresh

The PMOC conducted an FTA-led virtual Risk Refresh workshop on December 8, 10, 15, and 17, 2020. The objective of the Risk Refresh was to confirm the likelihood of the project completing within budget and in accordance with the FFGA schedule. As noted elsewhere in this report, the JPB accepted the PMOC's recommendations for a revised project budget and new Recommended Completion Date for the project. The FTA, as a consequence of the results from the Risk Refresh and the project's history of schedule delays and cost overruns, has designated the PCEP as an "At Risk" project. The FTA has requested that the JPB prepare and submit a Recovery Plan for the PCEP by October 8, 2021. The JPB, as noted above, has hired a new executive to lead the PCEP and a comprehensive review of the project, including a risk refresh, is underway. The JPB, in light of the leadership change, has requested additional time to prepare the Recovery Plan. The FTA has agreed to defer receipt of the Recovery Plan until the results of the risk refresh are known and can be incorporated into the plan. *The JPB now plans to deliver its Recovery Plan to the FTA on January 31, 2022.*

- **PMOC Observations:**
  - *The PMOC has suggested that the JPB consider holding its next internal risk refresh in early spring 2022. This would allow time for the global settlement to take effect and the parties to demonstrate their mutual commitments. It would also allow the JPB to gauge the effectiveness of the shared risk pool as a deterrent to change orders.*
  - The PCEP's approval of a re-baselined schedule for the electrification contract should allow both parties to proceed with a common understanding of the actions needed to effectively complete the project as agreed to in the global settlement.

2.16 Quality Assurance / Quality Control (QA/QC)

The following specific quality management activities were reported for the PCEP:

Infrastructure Projects

- Continued review of BBII non-domestic Material Receiving Reports (MRRs) for Buy America compliance including review of the justification and reasoning for purchase of non-domestic items.

EMU Quality

- First Article Inspections (FAIs) continue to be finalized and closed out. The FAIs for the individual cars remain open.
- The JPB's EMU Manager reports that Stadler's quality staff is insufficient to support the intended production rate.

- Discussions are underway with Stadler related to the re-start of supplier audits and a list of planned audits has been provided by Stadler. Audits will resume when the suppliers re-open and travel restrictions are lifted.

  - **PMOC Observations and Recommendations:** The PMOC is continuing to observe the role of the PCEP's quality management team during start-up and testing. The PCEP's new Interim Chief Officer has expressed support for the quality program and its role in testing and start-up and stated that he will be looking for additional resources amongst the JPB's current staff.

2.17 Safety and Security

The JPB contracts for safety and security consulting services to support the PCEP. The PCEP safety team also supports the JPB, which now has an Acting Director Safety/Security.

No significant incidents or accidents occurred during the current reporting period. However, a number of minor incidents continue to occur. The PCEP safety team continues to monitor the safety performance of the various contractors and subcontractors working on the project, including their compliance with Site Specific Work Plans. The safety team continues to monitor public health advisories related to COVID-19 and its new Omicron Variant.

The safety performance of BBII, the Electrification contractor, has improved and its Recordable Incident Rate is now below industry average.

2.18 Americans with Disabilities Act (ADA)

Early in the development of the project, the PMOC raised a question regarding the need for the PCEP to demonstrate Equivalent Facilitation under the Americans with Disabilities Act (ADA) with respect to either the new EMU vehicles or the infrastructure. A conference call was held on November 6, 2015 between members of the PCEP team, FTA Region IX staff and the PMOC, and the FTA's Office of Civil Rights to discuss the issue. The representative of the Office of Civil Rights stated that based on information presented by PCEP's representatives, the project will not need to demonstrate Equivalent Facilitation because the current access to the vehicles will remain unchanged. This is in compliance with the requirements of the ADA.

The new EMU vehicles will be equipped with powered on-board lifts to aid passengers using mobility devices. The JPB requested the FTA's concurrence to reduce the number of on-board lifts from 32 per train set to 16 per train set, and to phase the installation of the lifts. The JPB's proposal calls for initial installation of two (2) lifts per train set, one (1) each in the northernmost car and one (1) in the following car, which will be equipped with an accessible restroom. The remaining four (4) lifts per train set are to be installed prior to the start of blended service with the CHSRA trains. The FTA, following its review of the JPB's proposal and further clarification provided by a conference call, concurred with the JPB's proposed reduction in the total number of passenger lifts per train set. The phased installation of the lifts was also discussed and associated grant timing considerations. Caltrain's Rail Operations Department recently requested the interim removal of the two (2) on-board lifts until such time as the EMUs operate in blended service with the CHSRA trains. The justification for this request is that the space occupied by the on-board lifts will interfere with the movement of passengers using the stairs where the lifts are installed. Further, the accommodation of passengers using mobility devices and wishing to use the restroom can be accomplished by de-boarding the passenger and repositioning the train at any station, a procedure currently in use. The change was approved by the Change Management Board at its September 2019 meeting.

The new EMU vehicles must comply with the FTA's current ADA requirements and the guidance in FTA Circular 4710.1.

The FRA conducted an on-site design review of EMU TS1 at Stadler's assembly facility in Salt Lake City, Utah in July 2020. During the review, the FRA expressed concerns related to possible interference between stored bicycles, passengers seated in the bike cars and access to the emergency egress points in the bike cars. Stadler has completed design of the barrier, a Change Order has been executed for installation of the barriers, and installation is underway. The FRA will have an opportunity to review the installation during the sample car inspection, which is planned for early in 2022.

2.19 Buy America

The JPB provided documentation showing that BBII, the Electrification contractor, is complying with the Buy America Act, and the Action Item related to this issue is closed. The documentation provided by BBII indicates that some foreign materials have been purchased. BBII is of the opinion that this purchase is permitted because the materials are considered sub-components of the traction power system, or if not, compliance is waived because of the small quantities involved. The PMOC has questioned this interpretation and asked the JPB to pursue the matter. The PMOC's Buy America experts have provided additional information and guidance to the JPB's quality team to assist it in its inquiry, and the JPB's leadership has elevated the issue with BBII's management.

The JPB's vehicle consultant conducted a formal Intermediate Buy America audit on October 25-27, 2021 and the PMOC had several opportunities to audit progress during the audit. *The audit report is complete and has been reviewed by the PMOC. The auditor was unable to verify the domestic content of the vehicles because Stadler did not provide the commercial information necessary to perform that analysis. The auditor provided several recommendations that should be followed to clearly demonstrate that the vehicles meet Buy America requirements.*

2.20 Start-Up, Commissioning, Testing

The JPB and PCEP team have several activities focused on start-up and testing of both the infrastructure elements of the project as well as the EMU vehicles. Each of the three (3) primary contractors is responsible for developing and conducting test and commissioning plans for its work elements. The PCEP team is responsible for the integration of the major elements and the overall start-up of electrified rail operations.

Electrification Contract (OCS, Traction Power, Signals and Communications)

- BBII continues to conduct tests on the completed elements of the OCS, TPS, and Communication systems in Segment 4 in preparation for achieving Interim Milestone 1 which is now scheduled for spring 2022. The signal equipment in Segment 4 was installed and tested in accordance with FRA regulations, as each location was cutover and placed back in operation.
- BBII continues with preparation of test plans and schedules for its work elements, Operations and Maintenance (O&M) manuals, and is participating in the project-wide Systems Integration, Safety and Security Certification Committee, Testing and Commissioning, and Rail Activation meetings.
- BBII has a sub-contracted Safety Certification consultant who is now assisting with completion of the required documentation.

EMU Contract

- The JPB has submitted a revised Pre-Revenue Service Test Plan for the EMUs to the FRA after addressing the agency's comments on the draft plan. No further action by the FRA is expected.

- One of the Type B coaches from TS-2 has completed climate testing in Elmira, NY, and has been returned to Salt Lake City. The final test results have not been received. As noted above, Stadler will complete the remaining climate room tests in Salt Lake City in early 2022.
- *Dynamic type testing of TS-1 has been complete at TTCI in Pueblo, CO, and the train is being readied for its return to Salt Lake City for reconditioning prior to its delivery to the JPB.* Routine static and dynamic testing continued on Trainsets 3, 4, and 5 in Salt Lake City.
- Stadler is participating in the project-wide Systems Integration and Safety and Security Certification Committee meetings.

SCADA Contract

- ARINC is finalizing its Operations and Maintenance manuals and training plans for submission to the JPB. A "train the trainer" activity was scheduled for early October 2021, but was postponed when ARINC reported a Covid outbreak among its staff.

Readiness for Electrified Rail Operations

The PCEP's Rail Activation Committee (RAC) meets bi-weekly. The RAC is currently chaired by Sal Gilardi, one of the two principals of the safety contractor, until a permanent chair is named. The RAC includes representatives from the PCEP's technical consultants and the JPB's Rail Operations group. *The Rail Activation Schedule developed by the RAC is being integrated with other project schedules such as Testing and Commissioning and Systems Integration.*

- **PMOC Observations:** *There appears to be a lack of sufficient resources on the contractor's team to produce all of the required documentation in a timely manner.*
- The PMOC is conducting a modified Readiness for Service Review related to initial electrification of Segment 4 and testing of the EMUs. This work is being performed under a programmatic Task Order.
- The PMOC continues to monitor the activities of the RAC as well as the other project activities related to start-up and testing and safety certification. The PMOC continues to encourage all parties to communicate openly to avoid confusion. *The PMOC has observed that the overall coordination is improving under the PCEP's new leadership and following the conclusion of the global settlement between the parties.*
- Unexpected issues continue to arise as the contractors and the PCEP team move closer to Interim Milestone 1. The lack of a mechanically integrated schedule with full details of each party's responsibilities for testing and commissioning activities hampers early identification and mitigation of these issues.

2.21 Before-and-After Study Reporting

The PMOC verified that the JPB had prepared a Before and After (B&A) Study Plan during its evaluation of the PCEP's readiness to receive an FFGA. The B&A Plan was reviewed by FTA headquarters staff as part of the FFGA preparation process. The PMOC verified that the JPB has archived Before and After Documentation as of the Entry into Engineering (August 12, 2016). The materials were assembled according to the specifications in Appendix A of the Plan for the Before-and-After Study. The PMOC will verify that the JPB has archived the required materials for Milestone 2, FFGA award. The PMOC will also follow-up with the JPB to encourage early planning to address the After requirements of the plan.

2.22 Lessons Learned

The PMOC routinely encourages the PCEP team to identify and document lessons learned during the course of the PCEP. The PMOC discovered, during a routine review using ACONEX, the project's document control system, that a Draft Lessons Learned Log and two (2) examples of elaborated lessons learned had already been produced. Further inquiry produced the following information.

The PCEP Risk Manager conducted a series of interviews (not for attribution) with members of the PCEP team in 2018, with the objective of developing a list of Lessons Learned. The interviews produced a log of 35 issues which was distilled into two (2) for elaboration as an example of how the material could be further developed. The two topics that were further developed were Contractor Construction Work Windows and Land Acquisition Lesson Learned.

The Lessons Learned materials described above were reproduced as an attachment to the PMOC's Final Monitoring Report under Task Order 005; the report was submitted in June 2020.

The PCEP team, with encouragement from the PMOC, has undertaken a second round of lessons learned interviews. The interviews are complete and the material has been compiled in the form of a summary table which was shared with the PMOC at QPRM #17 in July 2021. The JPB's Risk Manager reports there is currently no plan to elaborate on the various Lessons.

Attachment A List of Acronyms

Acronyms	List of Terms
2SC	Two Speed Check Grade Crossing Approach Warning System
AAR	Association of American Railroads
ADA	Americans with Disabilities Act
AFTAC	Audio Frequency Train Activated Circuit
APTA	American Public Transportation Association
ARINC	Aeronautical Radio, Incorporated
ATF	Autotransformer Feeder
ATP	Alternate Technical Proposal
BAAQMD	Bay Area Air Quality Management District
BAFO	Best and Final Offer
BART	Bay Area Rapid Transit District
BBII	Balfour-Beatty Infrastructure, Inc.
BCCF	Back-up Central Control Facility
BGSP	Broadway Grade Separation Project
Caltrans	California Department of Transportation
CAR	Corrective Action Request
CBOSS	Communications Based Overlay Signal System
CC	FTA's Core Capacity Improvement Program
CCB	Change Control Board
CCF	Central Control Facility
CCIP	Contractor Controlled Insurance Program
CCSF	City and County of San Francisco
CDR	Construction Discrepancy Report
CDRL	Contract Data Requirements List
CEL	Certified Elements List
CEMOF	Central Equipment Maintenance and Operations Facility
CEQA	California Environmental Quality Act
CGA	Construction Grant Agreement
CHSRA	California High-Speed Rail Authority
CIG	FTA's Capital Investment Grant Process
CIL	Certifiable Items List
CMB	Change Management Board
CM/GC	Construction Manager/General Contractor
CNPA	Concurrent Non-Project Activity
CO	Change Order
CP	Control Point
CPUC	California Public Utilities Commission
CSCG	City/County Staff Coordinating Group
CWT	Constant Warning Time
D-B	Design-Build
DBB	Design-Bid-Build
DBE	Disadvantaged Business Enterprise
DEIR	Draft Environmental Impact Report
DQP	Design Quality Plan
DRB	Disputes Review Board
DSC	Differing Site Condition
DSDC	Design Support During Construction
DVR	Design Variance Request
EA	Environmental Assessment
EAC	Estimate at Completion
EE	Entry into Engineering

Acronyms	List of Terms
EIR	Environmental Impact Report
EIS	Environmental Impact Study
EMI	Electromagnetic Interference
EMU	Electric Multiple Unit Rail Vehicle
ESZ	Electrical Safety Zone
ETB	Electrified Trolley Buses
FAI	First Article Inspection
FAT	Factory Acceptance Test
FD	Final Design
FEIR	Final Environmental Impact Report
FERC	Federal Energy Regulatory Commission
FFGA	Full Funding Grant Agreement
FLSC	Fire Life Safety Committee
FMOC	Financial Management Oversight Consultant
FMP	Fleet Management Plan
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FWO	First Written Offer
FY	Fiscal Year
GO	General Order (issued by the CPUC)
HSR	High-Speed Rail
HVAC	Heating, Ventilation, and Air Conditioning
ICE	Independent Cost Estimate
ICO	*Interim Chief Officer*
I-ETMS	Interoperable Electronic Train Management System
IFB	Invitation for Bids
IFC	Issued for Construction
IGA	Inter-Governmental Agreement
IJ	Insulated Joints
Cal ISO	California Independent System Operator
ITCS	Incremental Train Control System
JPB or PCJPB	Peninsula Corridor Joint Powers Board
Jacobs	Jacobs Project Management Company
KKCS	Kal Krishnan Consulting Services, Inc.
LNTP	Limited Notice to Proceed
LONP	Letter of No Prejudice
LPMG	Local Policy Makers Group
MCC	Management Capacity and Capability
MRR	Material Receiving Report
MOU	Memorandum of Understanding
MPS	Master Project Schedule
MRS	Modern Railway Systems
MTC	Metropolitan Transportation Commission
NCR	Non-conformance Report
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NTO	Notice to Owner (for Utility Relocation)
NTP	Notice to Proceed
OCS	Overhead Contact System/Overhead Catenary System
PAP	Palo Alto Power
PCEP	Peninsula Corridor Electrification Program
PCWG	Peninsula Corridor Working Group
PD	Project Development Phase

Acronyms	List of Terms
PG&E	Pacific Gas and Electric
PHA	Preliminary Hazard Assessment
PMOC	Project Management Oversight Contractor
PMP	Project Management Plan
PPE	Personal Protective Equipment
ProVen	ProVen Management, Inc.
PS	Paralleling Station for Traction Power Supply
PTC	Positive Train Control
PTCSP	Positive Train Control Safety Plan (FRA)
PTG	Parsons Transportation Group
QA	Quality Assurance
QAP	Quality Assurance Plan
QC	Quality Control
QMP	Quality Management Plan
QPRM	Quarterly Progress Review Meeting
RAC	Rail Activation Committee
RAMP	Real Estate Acquisition and Management Plan
RAP	Rail Activation Plan
RAS	Rail Activation Schedule
RCD	FFGA Required Completion Date
RE	Resident Engineer
RFA	Request for Amendment
RFI	Request for Information
RFMP	Rail Fleet Management Plan
RFP	Request for Proposal
RIMP	Risk Identification and Mitigation Plan
RON	Resolution of Necessity (for Eminent Domain purposes)
ROCS	Rail Operations Center System
ROW	Right of Way
RSD	Revenue Service Date or Revenue Service Demonstration
RWIC	Roadway Worker in Charge
RWP	Roadway Worker Protection
RWQCB	Regional Water Quality Control Board
SamTrans	San Mateo County Transit District
SAR	Secure Authentication Resolution
SAV	Secure Authentication Version
SCADA	Supervisory Control and Data Acquisition
SCC	Standard Cost Category
SCVTA/VTA	Santa Clara Valley Transportation Authority
SCVWD	Santa Clara Valley Water District
SF	City of San Francisco
SFCTA	San Francisco County Transportation Authority
SFMTA	San Francisco Municipal Transportation Agency
SHPO	State Historic Preservation Office
SJ	City of San Jose
SLC	Salt Lake City
SMCTA	San Mateo County Transportation Authority
SME	Subject Matter Expert
SOGR	State of Good Repair
SONO	Statement of No Objection
SOO	Statement of Objection
SP	Southern Pacific Transportation Company
SSCP	Safety and Security Certification Plan
SSI	Sensitive Security Information

Acronyms	List of Terms
SSMP	Safety and Security Management Plan
SSOA	State Safety Oversight Agency
SSWP	Site Specific Work Plan
SVP	Silicon Valley Power
TAD	Track Access Delay
TASI	Transit America Services, Inc.
TEAM	Transportation Electronic Award Management System
TIA	Time Impact Analysis
TIRCP	Transportation and Intercity Rail Capital Program
TJPA	Transbay Joint Powers Authority
TLOA	Transmission Load Operating Agreement
TPF	Traction Power Facility
TPS	Traction Power System
TPSS	Traction Power Substation
TrAMS	Transportation Award Management System
TTCI	Transportation Technology Center, Inc.
TVA	Threat and Vulnerability Analysis
TVM	Transit Vehicle Manufacturer
UPRR	Union Pacific Railroad
USDOT	U. S. Department of Transportation
USFWS	United States Fish and Wildlife Service
VE	Value Engineering
VECP	Value Engineering Change Proposal
VTA	Santa Clara Valley Transportation Authority
WPC	Wayside Power Cubicle
YOE	Year of Expenditure

Attachment B Safety and Security Checklist

Safety and Security Checklist			
Project Overview			
Project Mode	Commuter Rail		
Project Phase	FFGA – Construction		
Project Delivery Methods	Design-Build, Design-Bid-Build		
Project Plans	**Version**	**Review by FTA**	**Status**
Safety and Security Management Plan (SSMP)	Rev 7	Y	Rev. 6 reviewed June 2020; Rev 7 was approved by PCEP on 6/11/2021 and provided to the PMOC for review.
Safety and Security Certification Plan (SSCP)	Rev 0	N	Under Review
System Safety Program Plan (SSPP)	Rev 7	N	Under Review
System Security Plan or Security and Emergency Preparedness Plan (SEPP)	Rev 0	N	SSP was audited by CPUC in March 2021 with no findings
Construction Safety and Security Plan (CSSP)	V3 Part C of SPs		In Contract Documents

Safety and Security Checklist		
Area of Focus	**Y/N**	**Notes/Status**
Safety and Security Authority		
Is the project sponsor subject to 49 CFR Part 659 state safety oversight requirements?	Y	
Has the state designated an oversight agency as per 49 CFR Part 659.9?	Y	California Public Utilities Commission is SSOA; the FTA certified California's SSOA program on October 23, 2018.
Has the oversight agency reviewed and approved the project sponsor's Security Plan or SSPP as per 49 CFR Part 659.17?	Y	CPUC audited the System Security Plan during March 2021; there were no findings.
Did the oversight agency participate in the last Quarterly Review Meeting?	*Y*	*QPRM No. 18 was held October 28, 2021*
Has the project sponsor submitted its safety certification plan to the oversight agency?	Y	SSCP submitted Rev. 0 which is currently under review.
Has the project sponsor implemented security directives issued by the Department of Homeland Security and/or Transportation Security Administration?	Y	No directives have been received at this time; Transit Police is the liaison between DHS and Caltrain.

Safety and Security Checklist		
Area of Focus	**Y/N**	**Notes/Status**
SSMP Monitoring		
Is the SSMP project-specific, clearly demonstrating the scope of safety and security activities for this	Y	Rev 7 was approved by PCEP on 6/11/2021 and provided to the PMOC for review.
Does the project sponsor review the SSMP and related project plans to determine if updates are necessary?	Y	
Does the project sponsor implement a process through which the Designated Function (DF) for Safety and DF for Security are integrated into the overall project management team? Please specify.	Y	In the SSMP and Section 11.0 of the PMP.
Does the project sponsor maintain a regularly scheduled report on the status of safety and security activities?	Y	Safety & Security activities are reported in the monthly PCEP report.
Has the project sponsor established staffing requirements, procedures and authority for safety and security activities throughout all project phases?	Y	Section 3.0 of SSMP
Does the project sponsor update the safety and security responsibility matrix/organizational chart as necessary?	Y	
Has the project sponsor allocated sufficient resources to oversee or carry out safety and security activities?	Y	
Has the project sponsor developed hazard and vulnerability analysis techniques, including specific types of analysis to be performed during different project phases?	Y	Updated PHA and TVA have been prepared and are under review.
Does the project sponsor implement regularly scheduled meetings to track to resolution any identified hazards and/or vulnerabilities?	Y	Yes, in Safety and Certification Committee meetings which started in December 2016 on a project level and through our "Capital Safety Committee" which meets quarterly. In addition, meetings are conducted with the contractor monthly to review project incidents, lessons learned, hazards, vulnerabilities, and mitigations. IndustrySafe is also being used to track safety activities.
Does the project sponsor monitor the progress of safety and security activities throughout all project phases? Please describe briefly.	Y	Yes, through the Safety & Security Certification Committee and the Fire/Life Safety Committee which are ongoing committees throughout the life of the project.
Does the project sponsor ensure the conduct of preliminary hazard and vulnerability analyses? Please specify the analyses conducted.	Y	Updated PHA and TVA documents were submitted by the D-B contractor in June 2021 and are under review. The OHA is currently being developed.
Has the project sponsor ensured the development of safety design criteria?	Y	
Has the project sponsor ensured the development of security design criteria?	Y	

Safety and Security Checklist		
Area of Focus	**Y/N**	**Notes/Status**
Has the project sponsor ensured conformance with safety and security requirements in design?	Y	Design Criteria checklists are currently being developed and reviewed by the Safety & Security Certification Review Committee.
Has the project sponsor verified construction specifications conformance?	Y	All facets of the Electrification construction are underway, OCS, TPS, Signals and Communication.
Has the project sponsor identified safety and security critical tests to be performed prior to passenger operations?	Y	Addressed in SSMP as required by D/B Contractor during construction.
Has the project sponsor verified conformance with safety and security requirements during testing, inspection, and start-up phases?	Y	Addressed in SSMP and SSCP.
Has the project sponsor evaluated change orders, design waivers, or test variances for potential hazards and/or vulnerabilities?	Y	Through the Change Management Board.
Has the project sponsor ensured the performance of safety and security analyses for proposed workarounds?	Y	This is included in the Rail Activation Committee scope during testing/startup activities. BBII's Safety & Security Certification flow chart identifies the process.
Has the project sponsor demonstrated through meetings or other methods the integration of safety and security in the following? • Activation Plan and Procedures • Integrated Test Plan and Procedures • Operations and Maintenance Plan • Emergency Operations Plan	 Y Y N N	A Rail Activation Plan has been prepared and is being refined for initial testing and operation of the new EMUs. The Rail Activation Committee has been meeting regularly since May 2019 and a Rail Activation Schedule has been prepared and an Integrated Test Plan and Procedures developed.
Has the project sponsor issued final safety and security certification?	N	Project is in construction. Required Completion Date is 9-26-2024.
Has the project sponsor issued the final safety and security verification report?	N	Project is in construction. Required Completion Date is 9-26-2024.
Construction Safety		
Does the project sponsor have a documented/implemented Contractor Safety Program with which it expects to comply?	Y	The Design/Build contractors "Construction Safety Program" and "Health and Safety Plan" have been accepted.
Does the project sponsor's contractor(s) have a documented company-wide safety and security program plan?	Y	System Safety Plan submitted and Approved 2/1/2017
Does the project sponsor's contractor(s) have a site-specific safety and security program plan?	Y	Rev. 2 submitted and Approved 12/9/2016

Safety and Security Checklist		
Area of Focus	**Y/N**	**Notes/Status**
How do the project sponsor's OSHA statistics compare to the national average for the same type of work?		The review of the Design-Build contractor's reported OSHA statistics revealed that some incidents had been miss-classified; this raised the Incident Rate above 3.0 for the period. The project showed a Total Recordable Incident Rate of 1.5 for the year 2020 compared to the most recent (2019) BLS rate of 1.8 for Heavy and Civil Engineering construction.
If the comparison is not favorable, what actions are being taken by the project sponsor to improve its safety record?		The D-B contractor reviews all incidents with its employees at its monthly safety meetings.
Federal Railroad Administration		
If a shared track, has the project sponsor submitted its waiver request application to FRA? (Please identify specific regulations for which waivers are being requested.)	Y	Waivers approved 1/13/2016 for 49 CFR: 49 CFR 238.203, Static end strength; 238.205, Anti- climbing mechanism; and 238.207, link between coupling mechanism and car body.
If a shared corridor, has the project sponsor specified specific measures to address safety concerns?	Y	In Caltrain/TA Services/UP Passenger Train Emergency Preparedness Plan and Caltrain System Safety Program Plan
Is the Collision Hazard Analysis underway?	Y	Car body testing and Collision Analysis has been completed and report sent to FRA.
Other FRA required Hazard Analysis – Fencing, etc.?	TBD	This is an operating ROW, and no service change is expected. Additional right of way fencing is being installed.
Does the project have Quiet Zones?	TBD	This is an operating ROW, and no service change is expected.
Does FRA attend the Quarterly Review Meetings?	*N*	*FRA did not attend QPRM No. 18 on October 28, 2021.*

Attachment C Action Items

The following table presents the open Action Items as of the date this report was prepared. New items are indicated by colored text, items whose status has changed from the prior listing are italicized and completed items have been shaded.

No.	Action Item	Discussion	Agreed Due Date	Responsibility Agency/Name	Status
13.02	JPB to submit a Request for Amendment (RFA) to Caltrain's Positive Train Control Safety Plan (PTCSP) under 49 CFR Sec. 236, Subpart I; the RFA will document the design and performance of its 2SC grade crossing warning system.	The FRA suggested a new strategy to satisfy its requirements related to implementation of the 2SC solution.	This item to be closed following FRA approval of the RFA related to implementation of the 2SC solution. Submission of the RFA will follow the Segment 2 Phase 2 cutover of 17 locations from CP Center to CP Trousdale that is scheduled for mid-March – early April 2022.	Shrestha/Cocke	Caltrain's PTCSP was approved by the FRA on December 17, 2020 FRA approved the JPB's Field Test Request for 2SC on January 6, 2021 and test reports from cutover 2A testing have been submitted to the FRA. FRA has requested that test results from the Center Street crossing cutover be included in the RFA.

Attachment D Top 5 Project Risks

There were no changes in the ranking of the top risks since the previous report. Changes from the prior report are indicated by italics.

Risk No.	Risk Category		Risk Description	Status
	Cost	Sched.		
240	X	X	Property not acquired in time for contractor to do work.	A limited number of problem parcels remain; however, shifting of foundation locations may result in new or altered acquisitions.
267	X	X	Additional property acquisition is necessitated by change in design.	Sponsor meets regularly with contractor and design team to pursue alternatives that would avoid new ROW acquisition.
314	X	X	The contractor may not complete signal and communication design, installation and testing for the Two-speed check (2SC) modifications within budget and schedule.	Design progress is slower than required. Sponsor is engaged in mediation and related actions to improve production.
333	X	X	Remediation of issues associated with the CEMOF pit may result in additional costs and additional time to issue the charge order and implement the work.	The JPB is considering how to resolve the issue and may procure a third-party contractor to perform the work.
303	X	X	Extent of differing site conditions and delays in resolving differing site conditions delays completion of electrification increases program costs.	This problem continues to impact design and construction of OCS foundations. Approximately 371 of the planned 3,102 foundations, remain to be constructed as of 8/31/2021.
318	X	X	Change of vehicle sub-suppliers results in additional first article inspections at cost to JPB (i.e., COVID, bankruptcy).	*The JPB is using its on-site inspector where possible to conduct FAIs. Stadler has not identified additional concerns.*
Top six (6) risks as shown on Risk Register dated 12-23-2021				

Attachment E Awarded Contracts

The current list of contracts numbers over 160. Eighty (80) contracts have values over $50,000, and sixty-eight (68) have values over $100,000. The total value of awarded contracts is provided in the Core Accountability Table of this report. The following tabulation is all contracts with current values of $1 million or higher as of July 30, 2021.

Contractor Name	Current Value
BALFOUR BEATTY INFRASTRUCTURE, INC	$ 750,190,907
STADLER US INC	$ 555,247,601
PACIFIC GAS & ELECTRIC COMPANY - SA scopes	$ 87,400,000
TRANSITAMERICA SERVICES, INC. - Other scopes	$ 81,045,643
GANNETT FLEMING TRANSIT & RAIL SYSTEMS	$ 67,743,400
PROVEN MANAGEMENT, INC. - Tunnel scope	$ 41,934,841
LTK CONSULTING SERVICES, INC.	$ 36,845,000
URS CORPORATION	$ 36,361,332
JACOBS PROJECT MANAGEMENT CO.	$ 17,000,000
JPMORGAN CHASE BANK, N.A.	$ 8,853,865
RAIL SURVEYORS AND ENGINEERS, INC.	$ 7,509,348
PROVEN MANAGEMENT, INC. - CEMOF scope	$ 7,404,023
B & G TRANSPORTATION GROUP, LLC	$ 6,949,280
ICF JONES & STOKES, INC.	$ 5,168,581
NC 2121 SEC VENTURES LLC	$ 4,394,220
FIRST AMERICAN TITLE COMPANY	$ 4,290,819
ARINC INCORPORATED	$ 4,017,371
STATE OF CALIFORNIA	$ 3,629,200
RREF III-P TOWER PLAZA LLC	$ 2,718,440
DCONSULT, LLC.	$ 2,542,143
SHIMMICK/DISNEY JOINT VENTURE	$ 2,400,000
PRICE FORBES & PARTNERS, LTD	$ 2,125,000
NORMAN E. MATTEONI ATTORNEY BAR TRUST	$ 2,016,000
PROVEN MANAGEMENT, INC. - SSF Scope	$ 1,866,575
ASSOCIATED RIGHT OF WAY	$ 1,599,586
BENDER ROSETHAL, INC.	$ 1,547,915
HNTB CORPORATION	$ 1,529,040
WELLS FARGO INSURANCE SERVICES USA, INC	$ 1,493,269
TRANSITAMERICA SERVICES, INC. - Santa Clara Drill Track	$ 1,186,015
COMPUCOM SYSTEMS, INC.	$ 1,108,837

Attachment F Rolling Stock Vehicle Status Report

- **Manufacturer/Model Year/Vehicle Model or Type/Propulsion:** Stadler Bi-level Electric Multiple Unit (EMU) Commuter Rail vehicles (a variant of Stadler's "KISS" product line. The JPB plans to operate the vehicles initially in 7-car trainsets and later expand to 8-car trainsets.
- **Piggyback or Option:** Contract contains an option for up to 96 additional EMUs, with the price varying depending on the date the option is exercised. Option vehicles ordered prior to December 31, 2018 are purchased at the original price.
- **Number of Vehicles:** Initial Order of 96 EMUs to be delivered as 6-car trainsets; current order is 133 EMUs delivered as 7-car trainsets.
- Contract Advertisement Date: August 21, 2015
- Contract Award Date: August 15, 2016
- Price per Vehicle (Initial Order): $26,408,000 per 6-car trainset
- Planned Date of First Vehicle Delivery /Actual: *March 25, 2022 (Planned)*
- Initial Vehicle Order (Number of Vehicles and Configuration): 96 EMUs delivered as 6-car trainsets
- Number of Option Vehicles Included in Contract: 96
- Buy America Domestic Content Percentage Required: 60%
- Domestic Content Percentage per Pre-award Audit: 79.38%
- **Latest Domestic Content Percentage Reported and Date:** *Domestic content was reported to vary from 69.40% to 81.54% for the four (4) different car type variants as of October 2021.*
- Date of Pre-Award Audit: May 25-26, 2016
- Pre-award Audit Report Date: June 21, 2016
- Intermediate Buy America Audit Date (If Planned): An intermediate review was conducted March 19-21, 2018. Stadler provided a virtual Buy America status update to the JPB's Buy America team on June 22, 2020. *The JPB conducted an Intermediate Buy America Audit on October 25-27, 2021; however, the auditors were unable to verify the domestic content because the required information was not provided by Stadler.*
- Date of Post-Delivery Audit: *TBD early 2022*
- Post-Deliver Audit Report Date: TBD

Attachment G Project Milestones / Key Events

Milestone	Baseline	Grantee Forecast	Summary of Milestone / Event
New Starts/Core Capacity Grant Agreement:	Not in MPS	05/2017 (A)	
Design/Build Notice to Proceed:	12/2015	06/2017 (A)	
Arrival of first EMU in Pueblo, CO	N/A	2/27/2021 (A)	
Arrival of First EMU at JPB	07/2019	*3/25/2022(P)*	
Final Engineering (FE) Completion:	04/2018	*1/31/2023 (P)*	
Systems Integration Testing Completed:	01/2019	*1/1/2024* (P)	
Segment 4 Complete to Begin EMU Testing:	11/2019	*5/15/2022 (P)*	
Completion of Interconnection from PG&E to TPSS 2	N/A	1/29/2021 (A)	
Design/Build Substantial Completion:	02/2019	*4/30/2024 (P)*	
Conditional Acceptance of First EMU Trainset:		*6/1/2022 (P)*	
PG&E Provides Permanent Power:	09/2021	8/13/2022 (P)	
Pre-Revenue Operation Completed:	05/2020	03/31/2024 (P)	
Revenue Service Date (without Risk Contingency):	12/2021	3/31/2024 (P)	
FFGA Required Completion Date (RCD):	05/2020	9/26/2024 (P)	

Attachment H Roadmap to Electrified Rail Service

Electrified operations on the Caltrain system will occur in stages. The first stage will be electrification of Segment 4 of the PCEP, including a designated test track. For clarity, Segment 4 is the southerly most segment of the PCEP. Initial electrification will require completion of TPSS 2; completion of the interconnection between PG&E's FMC substation in San Jose and TPSS 2; completion of the OCS system in Segment 4; completion of the signals, communications and SCADA systems in Segment 4; and testing and commissioning of the above components as well as safety certification of the relevant components. Completion of work in Segment 4 is designated as Interim Milestone 1 in the BBII Electrification Design-Build contract. Following electrification of Segment 4 and the test track, local testing of the EMU vehicles will commence following their delivery to the JPB.

The second stage of electrification will include completion of remaining Segments 1, 2 and 3, and the individual elements of each plus the integrated testing, commissioning, and safety certification of the entire project. Final Completion for purposes of the JPB's Core Capacity FFGA requires fourteen (14) seven-car trainsets in weekday revenue service. The FFGA has a Required Completion Date (RCD) of August 22, 2022; the JPB recently accepted the PMOC's recommended RCD of September 26, 2024, which is based on the results of the December 2020 Risk Refresh. The JPB is currently forecasting commencement of Revenue service with its new EMUs between January 1 and March 31, 2024.

The PCEP has an active Rail Activation Committee (RAC) to coordinate the various activities needed to successfully initiate electrified rail operations. The RAC is currently chaired by Sal Gilardi, one of the two principals of the PCEP's safety contractor. The RAC includes representatives from JPB employees assigned to the PCEP, PCEP's technical consultants, the JPB's Rail Operations group, and more recently from BBII, the Electrification contractor. The RAC continues to refine coordination between the rail activation, systems integration, and testing and commissioning meetings to make the resulting RAC meetings more productive.

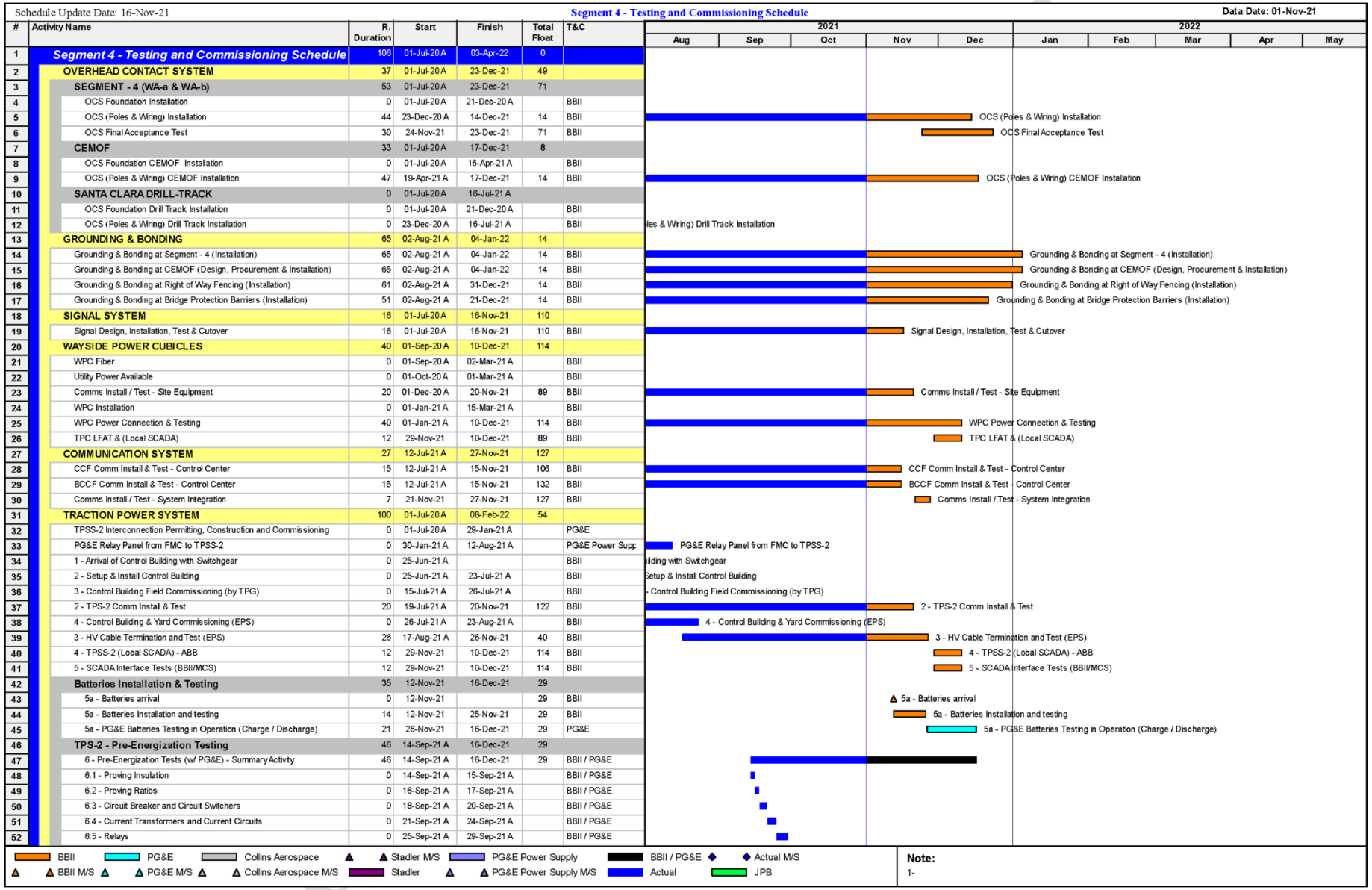
The JPB held a Testing and Commissioning Workshop on December 14, 2021 for all of the electrification and related contractors. The objective of the workshop was to assess the readiness of the project to achieve Interim Milestone 1, Segment 4 Ready for EMU Testing. The workshop was generally regarded as beneficial by the PCEP team.

The RAC meets on a bi-weekly basis to review assigned action items, upcoming activities, and the current schedule; the most recent meeting was held January 6, 2022.

The RAC recently completed a revised and updated Rail Activation Plan with new material focused on the initial electrification of Segment 4. The PMOC recently received an advance copy of the updated plan for use in its modified OP 54 Readiness for Service Review.

The RAC continues to maintain its Rail Activation Risk Register which has a total of 34 risks. Twenty-five (25) risks are currently active in the version dated 9/15/2021. The RAC also maintains a Rail Activation Schedule which is updated regularly; the most recent schedule is dated November 1, 2021. The RAC uses a Segment 4 Testing and Commissioning Schedule to focus on the Electrification contractor's Milestone 1, Segment 4 Ready for EMU Testing. The objective of this schedule is to capture the key activities required to achieve Milestone 1 and to update the status of those activities to reflect real time circumstances. The schedule is updated at least biweekly. A copy of the most recent Segment 4 Testing and Commissioning schedule is shown in Figure H-1.

Figure H-1 Segment 4 Testing and Commissioning Schedule



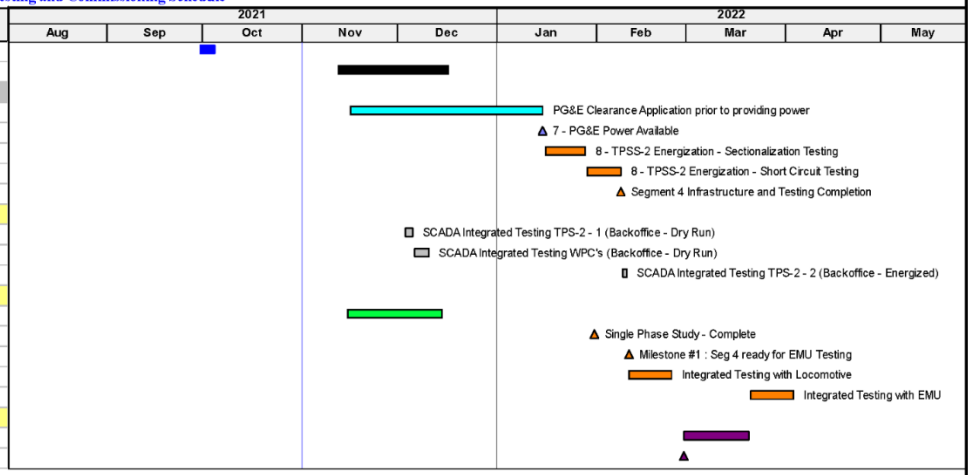
#	Activity Name	R. Duration	Start	Finish	Total Float	T&C
1	Segment 4 - Testing and Commissioning Schedule	106	01-Jul-20 A	03-Apr-22	0	
2	OVERHEAD CONTACT SYSTEM	37	01-Jul-20 A	23-Dec-21	49	
3	SEGMENT - 4 (WA-a & WA-b)	53	01-Jul-20 A	23-Dec-21	71	
4	OCS Foundation Installation	0	01-Jul-20 A	21-Dec-20 A		BBII
5	OCS (Poles & Wiring) Installation	44	23-Dec-20 A	14-Dec-21	14	BBII
6	OCS Final Acceptance Test	30	24-Nov-21	23-Dec-21	71	BBII
7	CEMOF	33	01-Jul-20 A	17-Dec-21	8	
8	OCS Foundation CEMOF Installation	0	01-Jul-20 A	16-Apr-21 A		BBII
9	OCS (Poles & Wiring) CEMOF Installation	47	19-Apr-21 A	17-Dec-21	14	BBII
10	SANTA CLARA DRILL-TRACK	0	01-Jul-20 A	16-Jul-21 A		
11	OCS Foundation Drill Track Installation	0	01-Jul-20 A	21-Dec-20 A		BBII
12	OCS (Poles & Wiring) Drill Track Installation	0	23-Dec-20 A	16-Jul-21 A		BBII
13	GROUNDING & BONDING	65	02-Aug-21 A	04-Jan-22	14	
14	Grounding & Bonding at Segment - 4 (Installation)	65	02-Aug-21 A	04-Jan-22	14	BBII
15	Grounding & Bonding at CEMOF (Design, Procurement & Installation)	65	02-Aug-21 A	04-Jan-22	14	BBII
16	Grounding & Bonding at Right of Way Fencing (Installation)	61	02-Aug-21 A	31-Dec-21	14	BBII
17	Grounding & Bonding at Bridge Protection Barriers (Installation)	51	02-Aug-21 A	21-Dec-21	14	BBII
18	SIGNAL SYSTEM	16	01-Jul-20 A	16-Nov-21	110	
19	Signal Design, Installation, Test & Cutover	16	01-Jul-20 A	16-Nov-21	110	BBII
20	WAYSIDE POWER CUBICLES	40	01-Sep-20 A	10-Dec-21	114	
21	WPC Fiber	0	01-Sep-20 A	02-Mar-21 A		BBII
22	Utility Power Available	0	01-Oct-20 A	01-Mar-21 A		BBII
23	Comms Install / Test - Site Equipment	20	01-Dec-20 A	20-Nov-21	89	BBII
24	WPC Installation	0	01-Jan-21 A	15-Mar-21 A		BBII
25	WPC Power Connection & Testing	40	01-Jan-21 A	10-Dec-21	114	BBII
26	TPC LFAT & (Local SCADA)	12	29-Nov-21	10-Dec-21	89	BBII
27	COMMUNICATION SYSTEM	27	12-Jul-21 A	27-Nov-21	127	
28	CCF Comm Install & Test - Control Center	15	12-Jul-21 A	15-Nov-21	106	BBII
29	BCCF Comm Install & Test - Control Center	15	12-Jul-21 A	15-Nov-21	132	BBII
30	Comms Install / Test - System Integration	7	21-Nov-21	27-Nov-21	127	BBII
31	TRACTION POWER SYSTEM	100	01-Jul-20 A	08-Feb-22	54	
32	TPSS-2 Interconnection Permitting, Construction and Commissioning	0	01-Jul-20 A	29-Jan-21 A		PG&E
33	PG&E Relay Panel from FMC to TPSS-2	0	30-Jan-21 A	12-Aug-21 A		PG&E Power Supp
34	1 - Arrival of Control Building with Switchgear	0	25-Jun-21 A			BBII
35	2 - Setup & Install Control Building	0	25-Jun-21 A	23-Jul-21 A		BBII
36	3 - Control Building Field Commissioning (by TPG)	0	15-Jul-21 A	26-Jul-21 A		BBII
37	2 - TPS-2 Comm Install & Test	20	19-Jul-21 A	20-Nov-21	122	BBII
38	4 - Control Building & Yard Commissioning (EPS)	0	26-Jul-21 A	23-Aug-21 A		BBII
39	3 - HV Cable Termination and Test (EPS)	26	17-Aug-21 A	26-Nov-21	40	BBII
40	4 - TPSS-2 (Local SCADA) - ABB	12	29-Nov-21	10-Dec-21	114	BBII
41	5 - SCADA Interface Tests (BBII/MCS)	12	29-Nov-21	10-Dec-21	114	BBII
42	Batteries Installation & Testing	35	12-Nov-21	16-Dec-21	29	
43	5a - Batteries arrival	0	12-Nov-21		29	BBII
44	5a - Batteries Installation and testing	14	12-Nov-21	25-Nov-21	29	BBII
45	5a - PG&E Batteries Testing in Operation (Charge / Discharge)	21	26-Nov-21	16-Dec-21	29	PG&E
46	TPS-2 - Pre-Energization Testing	46	14-Sep-21 A	16-Dec-21	29	
47	6 - Pre-Energization Tests (w/ PG&E) - Summary Activity	46	14-Sep-21 A	16-Dec-21	29	BBII / PG&E
48	6.1 - Proving Insulation	0	14-Sep-21 A	15-Sep-21 A		BBII / PG&E
49	6.2 - Proving Ratios	0	16-Sep-21 A	17-Sep-21 A		BBII / PG&E
50	6.3 - Circuit Breaker and Circuit Switchers	0	18-Sep-21 A	20-Sep-21 A		BBII / PG&E
51	6.4 - Current Transformers and Current Circuits	0	21-Sep-21 A	24-Sep-21 A		BBII / PG&E
52	6.5 - Relays	0	25-Sep-21 A	29-Sep-21 A		BBII / PG&E

Schedule Update Date: 16-Nov-21

Segment 4 - Testing and Commissioning Schedule

Data Date: 01-Nov-21

#	Activity Name	R. Duration	Start	Finish	Total Float	T&C
53	6.6 - Primary Disconnect Switch	0	30-Sep-21 A	04-Oct-21 A		BBII / PG&E
54	6.6 - Station Battery	35	12-Nov-21	16-Dec-21	29	BBII / PG&E
55	**TPS-2 - Energization Testing**	85	16-Nov-21	08-Feb-22	26	
56	PG&E Clearance Application prior to providing power	60	16-Nov-21	15-Jan-22	25	PG&E
57	7 - PG&E Power Available	0	15-Jan-22*		0	PG&E Power Supp
58	8 - TPSS-2 Energization - Sectionalization Testing	13	16-Jan-22	28-Jan-22	24	BBII
59	8 - TPSS-2 Energization - Short Circuit Testing	11	29-Jan-22	08-Feb-22	24	BBII
60	Segment 4 Infrastructure and Testing Completion	0		08-Feb-22	26	BBII
61	**SCADA**	70	03-Dec-21	10-Feb-22	52	
62	SCADA Integrated Testing TPS-2 - 1 (Backoffice - Dry Run)	3	03-Dec-21	05-Dec-21	89	Collins Aerospace
63	SCADA Integrated Testing WPC's (Backoffice - Dry Run)	5	06-Dec-21	10-Dec-21	114	Collins Aerospace
64	SCADA Integrated Testing TPS-2 - 2 (Backoffice - Energized)	2	09-Feb-22	10-Feb-22	24	Collins Aerospace
65	**INTEGRATED TESTING**	140	15-Nov-21	03-Apr-22	0	
66	ELECTRIC LOCOMOTIVE Readiness For Testing	30	15-Nov-21	14-Dec-21	82	JPB
67	Single Phase Study - Complete	0	31-Jan-22*		0	BBII
68	Milestone #1 : Seg 4 ready for EMU Testing	0	11-Feb-22		24	BBII
69	Integrated Testing with Locomotive	14	11-Feb-22	24-Feb-22	24	BBII
70	Integrated Testing with EMU	14	21-Mar-22	03-Apr-22*	0	BBII
71	**EMU**	21	28-Feb-22	20-Mar-22	0	
72	EMU Preparation for Testing	21	28-Feb-22	20-Mar-22	0	Stadler
73	First Trainset Arrival at JPB	0	28-Feb-22		0	Stadler

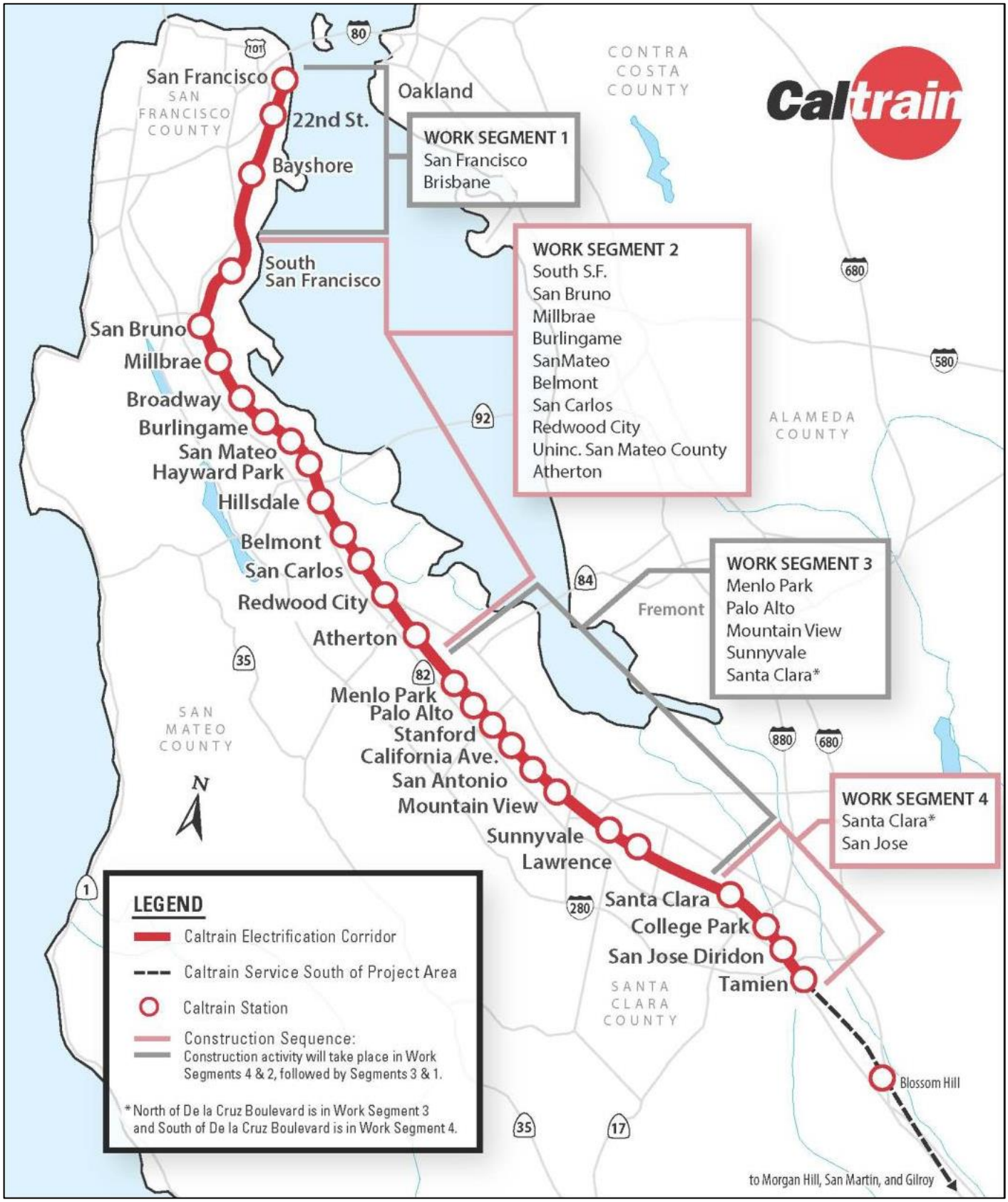


BBII | PG&E | Collins Aerospace | Stadler M/S | PG&E Power Supply | BBII / PG&E | Actual M/S

BBII M/S | PG&E M/S | Collins Aerospace M/S | Stadler | PG&E Power Supply M/S | Actual | JPB

Note:
1-

Attachment I Project Map



Attachment J PMOC Team

The report was prepared by the Task Order Manager, **Mike Eidlin**, J.D. (KKCS) who has more than 40 years of complex project management experience including over 28 years in transit. Mr. Eidlin possesses a B.S. degree, a graduate Degree of Engineer, and a Juris Doctor degree. He is a licensed attorney in the State of Oregon. He has been working as a PMOC for 17 years.

Brett L. Rekola, **P.E. (KKCS)** contributed to the preparation of the report and provided the Quality Assurance of the report. Mr. Rekola is the Program Manager for KKCS' FTA PMOC prime contract. He is a California professional civil engineer with more than thirty (30) years of experience managing railroad maintenance, planning, and design, construction, and rail operations. He has served as a program manager delivering port/rail/public works projects and programs.

Nancy Voltura (KKCS) assisted with the report. Ms. Voltura has over forty (40) years of Quality Assurance (QA) experience working as a QA Engineer, QA Auditor and QA Manager on large design and construction projects. Ms. Voltura is a trained Apparent Cause Analyst evaluating heavy construction quality issues, is a trained professional QA Auditor and has been a certified Lead QA Auditor per ASME/NQA-1 and N45.2.23 standards.

Kevin Byers, P.S.P. (KKCS) assisted with the report. He is KKCS' Project Scheduling Manager, holds a B.S. degree in Construction Management, and has 29 years' experience in scheduling and claims analysis for railroad and rail transit projects.

Dan Holzman, P.E., (KKCS) assisted with the report and is KKCS' Cost Estimation Manager. Mr. Holzman has a B.S. degree in Environmental Engineering and M.S. degree in Civil Engineering and holds a license as a Professional Engineer in Massachusetts. He has over thirty-eight (38) years of experience in construction and engineering and is a Certified Cost Professional.

The administrative Quality Control review of this report was done by **Janice Johnson, (KKCS)**, who also serves as the Contracts & Terms Manager. Ms. Johnson has a background in English Studies and over twenty (20) years of experience providing quality review checks of PMOC work products.