Project Monitoring Report (PMR)
October 2022

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

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

November 7, 2022

PMOC Contract Number: 69319519D000019
Task Order Number: 69319520F300099 (TO99)

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

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Length of Time Firm Assigned to Project: 7 Years, 3 Months
Length of Time Person Assigned to Project: 7 Years, 3 Months

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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 a 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 requested that the JPB submit a Project Recovery Plan for the PCEP. The plan was originally due by October 8, 2021; however, the FTA agreed to defer receipt of the plan until the JPB completed a planned Risk Refresh and other project reviews following a change in the PCEP's leadership in September 2021. The JPB submitted its Recovery Plan to the FTA on April 1, 2022. The FTA and the PMOC have reviewed the draft Recovery Plan and provided comments to the JPB. *The JPB submitted its final Recovery Plan to the FTA on September 30, 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 in late 2021 of a global settlement with Balfour Beatty Infrastructure, Inc. (BBII), the electrification design-build (D-B) contractor, and a contemporaneous scrub of the PCEP budget. The increased budget supports completion of the project and delivery of electrified service in 2024.

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

- Scope – The scope remains as planned.
- Schedule – *The JPB's current Integrated Master Schedule (IMS) has a data date of September 1, 2022.* This schedule reflects BBII's re-baselined schedule produced as part of the global settlement and the JPB's proposed Required Completion Date (RCD) of December 31, 2024 from its Recovery Plan. *The JPB and BBII have agreed to revise the IMS to redefine Interim Milestone 1, "Segment 4 is energized and ready for EMU testing," to include all work in Segment 3. This will provide an electrified corridor of approximately 21 miles for testing and burn-in of the new EMUs. The projected date for revised Milestone 1 is May 22, 2023.* This new concept for Interim Milestone 1 will not impact the RCD or other significant milestones in the BBII schedule. The project's critical path has shifted from completion of the signals work to completion of the OCS work as a result of lower than expected OCS productivity.

  Cost – The FFGA budget is $1.931 billion in year of expenditure (YOE) dollars. The JPB completed a "budget scrub" following its global settlement with BBII, which produced a revised PCEP budget of $2.44 billion. The JPB approved this revised budget at its Special Meeting on December 6, 2021. This new budget reflects a total increase of $509 million from the FFGA budget. The JPB's revised budget, for FTA reporting purposes (excluding pre-Project Development costs) is $2,393,109,098.

- Significant Project Activities and/or Key Milestones
  - 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 report covering the southern part of the JPB's traction power system was submitted to PG&E on June 30, 2022. The JPB and PG&E also executed the required Transmission Load Operating Agreement (TLOA). *PG&E provided 115 kV power to the JPB's Traction Power Substation (TPSS) 2 in San Jose on August 27, 2022.* The northern part of the single phase study which relates to PG&E's delivery of power to TPSS 1 in South San Francisco is underway and is expected to be complete in February 2023.
  - 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. As noted above, the JPB and BBII have re-defined this milestone to also include the completion of work in adjacent Segment 3. *Electrification of Segment 4 is now expected to be complete on November 17, 2022; completion of the Revised Interim Milestone 1 (Segments 3 and 4) is now forecast to occur on May 22, 2023.*
  - The first two (2) Stadler EMUs (TS-3 and 4) arrived at the JPB on March 20, 2022. *The second pair of trainsets (TS-2 and 5) were delivered to the JPB on August 21, 2022.*
  - The JPB's EMU consultant completed its Post-Delivery Buy America Audit of Stadler US, Inc. (Stadler), the EMU supplier, in June 2022 and submitted its Audit Report to the JPB on July 12, 2022. The audit confirmed that the EMUs have a domestic content that exceeds the required 60%. *The PMOC completed its review of the post-delivery audit report and has submitted its report to the FTA.*
  - *The PCEP's Chief Officer recently announced that Stadler will be meeting with the JPB's leadership to discuss potential contractual relief as a result of the COVID and possibly other impacts.*
  - ProVen completed work on the CEMOF modification on July 13, 2022.

- The March 10, 2022 incident that involved the collision of a southbound Caltrain passenger train with on-track construction equipment remains under investigation by the National Transportation Safety Board (NTSB).

1.3 Major Issues and/or Concerns

Summary of Issue/Concern	*Roadway Worker Protection Resources less than Requested*
Date Identified	*August 2022*
Status	*There have been occasions when there was insufficient Roadway Worker Protection (RWP) to accommodate all planned construction activities.*
Project Sponsor Action	*TASI's work schedules have been adjusted to support weekend work; additional RWP personnel are being trained; and a third-party RWP contractor is being retained.*
PMOC Recommendation	*Continue to pursue all identified alternatives.*

Summary of Issue/Concern	Timely Completion of Overhead Contact System (OCS)
Date Identified	June 2022
Status	BBII, the Electrification contractor, is not installing the remaining components of the OCS at a satisfactory rate. The JPB reports that completion of the OCS is now the critical path to completion of the PCEP.
Project Sponsor Action	BBII has brought in additional experienced management personnel from the United Kingdom (UK) to help increase productivity. BBII has also brought in additional specialized equipment from the UK and has increased the number of crews installing the OCS equipment. The PCEP has also instituted additional measure to track progress on a weekly basis.
PMOC Recommendation	Continue to closely monitor BBII's productivity, timely arrival of the promised resources, and whether the additional resources are having the desired effect. Remove operating constraints and provide additional resources to improve productivity consistent with ongoing passenger rail operations. Closely review and analyze contractor schedules, routinely identify the controlling operation and prepare shadow schedules to assess responsibility for potential or actual delays.

Summary of Issue/Concern	Theft of Copper Conductor Materials
Date Identified	June 2022
Status	There have been several instances of theft of copper conductor from completed work and work under construction. This is reducing productivity and increasing cost and could impact the proper functioning of railroad systems.
Project Sponsor Action	Work with the contractor, transit police and local law enforcement agencies to increase coverage and develop appropriate strategies. *The JPB has recently offered incentives such as sleeping bags to the homeless persons believed to be responsible for some of the thefts.*
PMOC Recommendation	Review insurance policies relative to Builder Risk coverage.

Summary of Issue/Concern	Timely Completion of Signals Design and Installation
Date Identified	2019
Status	The next two cutovers in Segment 2 have been temporarily postponed until some design revisions related to gate down time are completed and installed on previously completed 2SC crossings. Completion of signals design and installation is now on the Near Critical Path to project completion, following completion of the OCS. The pace of signals design continues to be slower than desired. Installation of the signal

	equipment, including cutovers, continues to go smoothly and generally in accordance with the current schedule.
Project Sponsor Action	*A cutover of Segment 2, Phases 1 took place October 14-16, 2022; the work took longer to complete than planned.*
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	Management Capacity and Capability
Date Identified	February 2019
Status	*A replacement for the lead scheduler position began work in early October, 2022.* The JPB has recently hired two, well-seasoned professionals for the positions of Director of PCEP Infrastructure Delivery and Rail Activation Manager. The Program Director is carrying an exceptionally heavy load and is the primary interface with BBI's management team.
Project Sponsor Action	Several experienced senior staff members have joined the team in recent months and their experience should be very beneficial. Review and clean-up of the IMS is taking longer than anticipated due to turnover in scheduling personnel. *The recent focus of the team is completion of the testing and commissioning of the OCS in Segment 4 which is making good progress.*
PMOC Recommendation	Provide additional qualified assistance for the Program Director. Continue the increased emphasis on project controls and systems integration and testing activities. Take advantage of the opportunity presented by 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.

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:	*October 20, 2022*				
Project Detail					
Oversight Frequency:	Monthly				
Element	**Status**			**Prior Status (G/Y/R)**	**Issue or Concern**
	G	**Y**	**R**		
PMP		Y		Y	The PMP requires updating to address testing and commissioning. An updated PMP has been received and is under review.
MCC	G			G	New resources are being deployed but the reconfiguration of the PCEP team is not complete, however, improvements are noted.
Cost		Y		Y	*The JPB has refined its financial plan to support the new $2.44 billion budget. The refined plan is presented in Section 7 of the Recovery Plan submitted to the FTA on September 30, 2022. The financial plan relies on several confirmed sources as well as other sources which are actively being pursued. The PMOC is currently reviewing the Recovery Plan. The recent announcement that Stadler may seek relief for COVID or other impacts adds uncertainty to the project's financial situation.*
Schedule		Y		Y	*The change in the critical path from signals to OCS due to lower than required OCS productivity also resulted in a decrease in schedule contingency, which increases schedule uncertainty. The loss of the replacement lead scheduler is significant because of his role in creating and implementing the IMS. BBII is bringing additional personnel and equipment resources to the job in an effort to increase productivity.*

KEY INDICATORS DASHBOARD (POST-GRANT STATUS)					
Quality	●			●	Some uncertainty related to Electrification contractor's Buy America compliance. Additional documentation is being provided.
Safety	●			●	The performance by the Electrification contractor has improved. The March 10, 2022 incident remains under investigation by the NTSB.
Risk	●			●	*Energization of TPSS-2 has resolved a significant risk.*
Key Indicators 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 August 31, 2022

Project Status: In Construction		**Original (FFGA)**	**Current Forecast [1]**	**PMOC Assessment of Current Forecast**
Cost	Cost Estimate	$1,930,670,934	$2,393,109,097	Forecast based on JPB's approved budget, adjusted to remove pre-PD costs.
Contingency	*Allocated Contingency*	$152,913,317	*$59,650,966*	Current contingency usage is being tracked closely and has been modest since the global settlement.
	Unallocated Contingency	$162,620,294	$26,316,020	
	Total Contingency	$315,533,611	*$85,966,986*	
Schedule	Required Completion Date	August 22, 2022	December 31, 2024	*Current forecast is based on the JPB's Recovery Plan submitted to the FTA on September 30, 2022.*

Project Progress		**Amount ($)**	**Percent of Total**
Total Expenditures [4]	Actual cost of all eligible expenditures completed to date [5]	*$1,836,508,531*	*76.46%*
Planned Value to Date [2]	Estimated value of work planned to date [3]	$1,925,397,857	80.46%
Actual Value to Date	Actual value of work completed to date [3]	*$1,836,508,531*	*76.74%*

Contracts Status		**Amount ($)**	**Percent**
Total Contracts Awarded	Value of all contracts (design, support, construction, equipment) awarded; % of total value to be awarded [6]	*$2,212,181,828,*	*95.90%*
Construction Contracts Awarded	Value of construction contracts awarded; % of total construction value to be awarded [5]	*$1,844,666,389*	*99.54%*
Physical Construction Completed	Value of physical construction (infrastructure) completed; % of total construction value completed	*$1,405,875,653*	*75.86%*

Rolling Stock Vehicle Status	**Date Awarded**	**No. Ordered**	**No. Delivered**
Electric Multiple Unit (EMU) commuter rail vehicles	08/2016 (A)	133	*28*

Next Monthly Meeting Date:	*October 4-6, 2022*
Next Quarterly Review Meeting Date:	*December 5, 2022*

[1] "Current estimate" is based on the re-baseline budget adopted by JPB Board in December 2021. FFGA Budget is currently pending approval of the FTA Remediation Plan and adoption.
[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 - August 2022	$1,886,090,130
Pre-FFGA Costs	($49,581,599)
Post-FFGA Costs	$1,836,508,531

[5] "Percentage" is calculated based on a project new estimate of $2,393,109,097
[6] "Percentage" is calculated based on Contracts as budgeted in the Re-Baseline Budget excluding remaining forecasted contingency:

Budgeted Contracts (Pre-FFGA) - Re-Baseline Budget	$2,442,690,697
Pre-FFGA Costs	($49,581,599)
Forecasted Remaining Contingency	($85,966,986)
Budgeted Contracts (Post-FFGA)	$2,307,142,112

[7] "Total construction contracts awarded to date (construction & vehicle contracts only)" includes design costs and executed change orders. Does not include Re-Baseline until executed for Contract amendment.
[8] "Percentage" is calculated based on the total of the executed contract value of construction contracts and forecasted (including Re-Baseline items) changes to the contracts:

Executed value of Construction Contracts	$1,844,081,319
Forecasted Construction Contract Changes	$8,474,605
Forecast of Value of Construction Contracts	$1,852,555,924

Grant Information

Dollars in thousands reported as of June 30, 2022; this information updated quarterly.

FAIN (Source)	Funds Committed*	Funds Disbursed	% Disbursed
Local	$1,146,521[1]	$819,034	71%
Federal	$986,565[2]	$780,680	79%
Total	***$2,133,086***	**$1,599,714**	**75%**

*Definitions from Guidelines and Standards for Assessing Local Financial Commitment, FTA, June 2007
[1]Includes $150.0 million in Measure RR Tax-Exempt Bonds
[2]Includes $52.415 million in ARPA Funds received.

2.0 PMOC Observations and Findings

This progress report covers the period from September 1, 2022 through October 20, 2022. The information contained in this report is based on the PMOC's participation in virtual status updates held on September 19 - 21, 2022 and on-site monitoring meetings held October 3 - 6, 2022, 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.

- Monitoring the progress of the PCEP team as it continues to implement the following initiatives put in place by the new CalMod Interim Chief Officer (ICO):
    - Implementing changes in the conduct of business, including routine partnering activities, with Balfour Beatty Infrastructure, Inc. (BBII), the Electrification design-build contractor and its sub-contractors and suppliers.

- Continuing changes within the PCEP organization.
- Completion of the FTA Recovery Plan. *The JPB submitted the final version of its Recovery Plan to the FTA on September 30, 2022.*

- The PMOC initiated a second Buy America review related to materials used by the JPB and its contractors for the infrastructure elements of the PCEP. *The PMOC recently held a virtual meeting with the JPB's quality team and a representative of BBII to further clarify the requested documentation. The JPB is expected to respond in the near future.*
- The PMOC will continue to closely monitor the PCEP's schedule, scheduling resources, and schedule management practices, including the current performance of BBII and its sub-contractors.
- *The PMOC is continuing its review of the JPB's documentation related to its global settlement with BBII.* The results of this effort will inform the PMOC's opinion on the reliability of the cost and schedule proposals contained in the JPB's Recovery Plan.
- *The PMOC has resumed 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.

  The completion of this review was paused because the planned electrification of Segment 4 was delayed by the lack of complete documentation and the availability of electric power. PG&E provided 115 kV power to Traction Power Substation (TPSS) #2 on August 27, 2022 and sectionalization testing of Segment 4 is scheduled for the weekend of October 21 – 23, 2022. The JPB expects to power-up the first EMU trainset in November 2022.

2.2 Oversight Triggers

The FTA, as noted in Section 1.2 above, 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 JPB submitted its final Recovery Plan to the FTA on September 30, 2022 and the PMOC is reviewing that plan.* 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 delayed updating 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) because of the change in project leadership. *The JPB provided its updated PMP in June 2022 and an updated QMP in July 2022; the PMOC is reviewing these plans.*

Mark Clendennen, formerly with Regional Transportation District in Denver, CO and Capital Metropolitan Transportation Authority (CapMetro) in Austin, TX, is now leading the PCEP's Rail Activation Committee (RAC). *The RAC prepared a Rail Activation Plan (RAP) and its activities are currently focused on the testing, documentation, and training required to complete the electrification of Segment 4 and provide power to the EMUs. The PMOC continues to monitor and support this work in conjunction with its work on a modified OP-54 Readiness for Service review as noted above.*

2.4 Management Capacity and Capability

The Chief Officer (CO) reported that the JPB has recently hired several new personnel including two (2) project engineers, two (2) office engineers, and a lead scheduler.

Other recent additions include Andy Mutz as PCEP Construction Manager, Mark Clendennen as Rail Activation lead, Russ Larson as Systems Integration Manager.

The PCEP continues to implement changes in the PCEP's document control system to address deficiencies identified in a recent report by Triunity. This independent review was commissioned by the PCEP's ICO.

- ***PMOC Comment:*** *The very recent replacement of the lead scheduler is encouraging.* The PMOC continues to encourage the PCEP team to adopt best scheduling practices such as daily identification of the controlling operation to avoid future schedule related claims.
- *The PCEP's Program Director continues to carry a very heavy workload and the PMOC encourages the JPB to consider ways to improve this situation.*

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 (PA) that governs the PCEP's related activities. The draft PA is being reviewed by the SHPO. The JPB and its contractor continue to follow the requirements and processes contained in the original agreement.

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

2.6 Project Delivery Method and Procurement

The JPB completed all major procurements 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.

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 complete on the OCS and nearly complete on the TPS elements of the project. *Design continues on the signal related work which is now on the PCEP's near-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, including testing and commissioning of installed facilities, 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. The JPB completed negotiation of a $1.04 million modification of the SCADA contract to align its completion with the new project schedule.

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 JPB has negotiated a settlement with ProVen that covers both the Tunnel Notching and CEMOF Modifications contracts. Final testing of the OCS in the tunnel will now be performed by BBII. Close-out of both ProVen contracts is in progress.

Used Electrified Locomotives

The JPB acquired and overhauled two (2) used AM-7 electrified locomotives to perform initial testing of the electrification system. The locomotives were placed in long term storage after their delivery in June 2019 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. The JPB, as noted above, has negotiated a settlement with ProVen that covers both the Tunnel Notching and CEMOF Modifications contracts. ProVen completed work on the CEMOF modification on July 13, 2022.

PG&E Interconnection Construction

The JPB executed a modification 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 Transmission Load Operating Agreement (TLOA) between PG&E and the JPB was executed following completion of the southern section of the Single Phase Study. *Energization of the PG&E interconnection and TPSS-2 occurred on August 27, 2022.*

The interconnection between PG&E's East Grand Substation in South San Francisco and the PCEP's TPSS 1 is complete and awaiting completion and testing of TPSS-1. Energization of TPSS-1 will occur following completion of the northern section of the Single Phase Study, which is underway using the southern section report as a template; this work is expected to be completed in February 2023. *The JPB recently requested that PG&E execute the TLOA required prior to energization of TPSS-1.*

Current Procurements

The JPB has begun preparing a Request for Proposal (RFP) for long-term maintenance of the TPS and OCS systems.

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 (EOR) for the electrification work. *Alstom is the EOR for the signals work including 2SC.* 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 now on the near-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 design work is scheduled for February 2023.
- *The JPB's apparent agreement with UPRR regarding protection at the UPRR's Reed Street crossing in Segment 4 has reached an impasse. The impasse resulted from the UPRR's request that the JPB construct a much longer median than previously agreed. The median is to prevent motorists from running around the crossing gates. UPRR's request was rejected by the City of Santa Clara and the issue has been escalated to the JPB's Executive for resolution.* The plans require approval by the City and a GO-88B permit from the CPUC.

  PG&E and Silicon Valley Power (SVP) 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 for the southern portion of the JPB's system is complete and PG&E has energized TPSS-2. *Work is underway on the report for the northern section; SVP is not a party to this work and only PG&E's approval is required.*

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.

Real Estate Activities

The large majority of real estate activities have been completed. The remaining challenges facing real estate are any design changes that would impact already acquired properties and design changes requiring new or re-defined acquisitions. Potholing for OCS foundations is now complete.

- 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 addressed the owner's comments and provided copies for the owner's review. The JPB will be requesting the FTA's concurrence on the transaction in the near future.
- The JPB's real estate department continues to assist Comcast in completing its remaining relocations.
- 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 status related to third-party utility work:

- JPB reports that Comcast has completed all relocations in Segments 3 and 4, and 4 locations remain in Segment 2.

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. The cost allocation process requires audited costs for PG&E's sub-station improvements. Those costs were expected to be available for inclusion in PG&E's 2023 General Rate Case which was filed in 2021. However, due to delays in construction, only approximately 95% of audited costs are available. PG&E recently petitioned the CPUC to consider including the 95% of costs that have been audited in PG&E's current rate case. That petition was positively received by the CPUC. *The JPB has recently requested that PG&E make earlier payment of the funds that are due to the JPB under the cost allocation agreement to improve the PCEP's cash flow position.*

The Transmission Load Operating Agreement (TLOA) between PG&E and the JPB has been executed for TPSS #2 in San Jose. *As noted above, a second TLOA is required prior to PG&E's energization of TPSS-1.*

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 applications for twenty (20) crossings, and the CPUC has approved all of those. The JPB has recently identified the need for additional GO88B modifications related to installing articulated crossing gates at certain grade crossings with very long gate arms. The articulated gate arms are to avoid conflicts with the OCS. 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.

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 submitted the final Project Remediation Plan for the CHSRA; the plan is a requirement of the funding agreement between the parties. The plan was reviewed by the CHSRA and appropriate portions of the plan were incorporated into the Recovery Plan submitted to the FTA on September 30, 2022.*

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 implementation 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. The FRA advertised the JPB's request for public comment in December 2021, however, no decision has yet been published.

2.11 Construction

The JPB provided the following information on infrastructure construction activity.

- *PG&E delivered 115 kV power to TPSS-2 for the first time on August 27, 2022. Testing and commissioning of high-voltage equipment continues in Segment 4 with sectionalization tests scheduled for the weekend of October 21 – 23 2022 followed by short-circuit testing during the weekend of October 28 - 30, 2022.*
- *The JPB and BBII have agreed to re-define Interim Milestone 1, "Segment 4 Ready for EMU Testing," to include the completion of all work in Segment 3.* This approach will result in a fully-electrified corridor 21 miles long when the re-defined Interim Milestone 1 is achieved. The resulting 21 miles of electrified track is much longer than the approximately five (5) miles in Segment 4 alone, and is better suited for testing and burn-in of the new EMUs. *The target for completion of combined Segments 3 and 4 is now May 2023.*

Overhead Contact System (OCS)

Completion of the OCS is now on the project's critical path. BBII has brought additional on-track equipment from the United Kingdom (UK) and has also fielded additional crews to increase productivity. Timely completion of the OCS will require sustained productivity at levels higher than previously achieved on a continuing basis. The forecast completion date for combined Segments 3 and 4 is now May 27, 2023, a loss of 27 days from the previous forecast of April 30, 2023. The JPB has requested that BBII prepare a recovery plan to achieve the previously agreed upon completion date.

OCS progress as of October 15, 2022:

- 2442 poles installed out of 2585 required; 144 remain.
- 854,098 linear feet (lf) of wire installed of 1,511,870 lf required;; 657,772 lf remain

- *The anticipated completion date for construction and component testing of the OCS system is now October 16, 2023.*
- *Grounding and bonding of fences, utility manholes and handholes in Segment 4 and at the CEMOF is now complete.*

Traction Power System (TPS)

- *PG&E provided 115 kV power to Traction Power Substation (TPSS) #2 on August 27, 2022. Sectionalization testing of Segment 4 is scheduled for the weekend of October 21 – 23, 2022. Short-circuit testing of Segment 4 is scheduled for the weekend of October 28 – 30, 2022. The JPB expects to power-up the first EMU trainset in November 2022.*

Table 1 below shows the status of the major elements of each of the individual facilities comprising the TPS. The construction of PS-3 lags because the location was changed to accommodate the future construction of the Broadway grade separation project in Burlingame.

Table 1 - Traction Power Facilities Progress as of August 11, 2022

Facility	Overall Percent Complete
TPS-1 (Segment 2)	96%
TPS-2 (Segment 4)	99%
SWS-1 (Segment 2)	*99%*
PS-1 (Segment 1)	*89%*
PS-2 (Segment 1)	*95%*
PS-3 (Segment 2)	*77%*
PS-4 (Segment 2)	*98%*
PS-5 (Segment 3)	93%
PS-6 (Segment 3)	94%
PS-7 (Segment 4)	99%
Wayside Power Cubicles	23/27

Signal System

Design and construction of the signal system is now on the near-critical path to project completion, with completion of the OCS now on the critical path. Once the new signal equipment is in place, the system must be electrically connected or "cut over" to the new equipment. *A total of ten (10) signal cutovers remain, each typically involves numerous signals and control points.* A control point (CP) is a named location where tracks merge or cross. The JPB expects to complete all remaining signal cutovers in late 2023. Early completion of the signal cutovers is incentivized in the global settlement. It now appears that BBII will not complete all of the remaining cutovers in Segment 2 until December 2022, which is later than the incentive date negotiated in the global settlement. Table 2 shows the proposed dates for completion of the remaining signal cutovers.

Table 2 – Signal Cutover Schedule

Location	Planned (P) /Actual (A)
Segment 2 Phase 1 Cutover	10-18-22 (A)
Segment 2 Phase 8 Cutover	*12-08-22 (P)*
Segment 2 Phase 7 Cutover	*12-08-22 (P)*
Segment 2 Phase 6 Cutover	*12-08-22 (P)*
Segment 3 Phase 4 Cutover	4-05-23 (P)
Segment 3 Phase 3 Cutover	4-12-23 (P)
Segment 3 Phase 2 Cutover	4-12-23 (P)
Segment 3 Phase 1 Cutover	4-12-23 (P)
Segment 1 Phase 3 Cutover	6-10-23 (P)
Segment 1 Phase 2 Cutover	8-07-23 (P)
Segment 1 Phase 1 Cutover	9-25-23 (P)

The JPB reports that the schedule for signal cutovers has been delayed due to address software issues identified during the operation of previously installed 2SC crossings. The issue involves longer than desirable gate down times. The software has been modified and the new software will be installed in all future crossings.

JPB reported the following signal activity.

- *The Segment 2, Phase 1 cutover of signals in South San Francisco and San Bruno was completed October 18, 2022.* The work includes seventeen (17) total locations, two (2) control points, three (3) intermediate signal locations, and three (3) crossings. *The work took somewhat longer than expected and a review is being conducted to avoid a reoccurrence.*
- *The next major cutover includes Segment 2, Phase 6,7 and 8 with work in Redwood City, Palo Alto, Atherton and Menlo Park. The work is scheduled for mid- December, 2022 and will involve weekend-long shutdowns of local service supported by bus bridges.*
- Installation of conduit and foundations for signal and wayside power cubicles (WPC) continues in all Segments.

Supervisory Control and Data Acquisition (SCADA)

- *The remaining open items from the Systems Acceptance Testing have been completed.*
- The SCADA software has been installed and tested and is operating in production mode.

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. The installation of additional flip-up seats in EMU bike cars, which is locally funded, will remain open until all cars are delivered.

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 has been impacted by the COVID-19 pandemic in a variety of ways, and has routinely notified the JPB of these issues. The PCEP's Chief Officer recently announced that Stadler will be meeting with the JPB's leadership to discuss potential contractual relief as a result of the COVID and possibly other impacts.

Stadler reported the following progress on the vehicles:

- *Trainset 1 (TS-1) has been returned to Stadler's Salt Lake City facility for re-conditioning prior to its delivery to the JPB. The reconditioning process will be extensive and is expected to take six (6) to eight (8) weeks to complete once it begins.*
- *TS-2 and TS-5 were delivered to the JPB on August 21, 2022 and are undergoing static testing. The next trainsets due for delivery are being held at Stadler's facility due to the lack of space at the JPB's facilities.*
- *Safety and Security certification of the EMUs is nearly complete with only delivery of signed documentation remaining.*
- The JPB reports that it has received approximately 75% of the special tools required to maintain the EMUs and approximately 60% of the required spare parts.
- The JPB conducted a Post-Delivery Buy America Audit of Stadler on June 27-28, 2022 at its Salt Lake City, UT production facility. The audit report was completed on July 11, 2022. The JPB's auditors found that the domestic content of the various vehicle types being supplied to the JPB ranged from 70%-76%, thus satisfying the 60% domestic content requirement applicable to these EMUs. The auditors also found that the issues identified during the Interim Audit performed in October 2021 had been satisfactorily addressed.
- The first two trainsets (TS-3 and TS-4) arrived at the JPB on March 20, 2022. The trainsets have been tested and made ready for live running after power is available. Live running of the first trainset for integrated testing of the electrified system in Segment is projected to take place in November 2022.
- *The car shells for TS-19 are now in production Switzerland.*
- *117/133 car shells have been shipped from Stadler – Switzerland and 111 have been received at Stadler's Salt Lake City facility.*

- Stadler reports continuing problems with material availability and supply chain logistics as well as workforce attraction and retention.

2.13 Project Cost

The FFGA budget for the PCEP is $1.931 billion in year of expenditure (YOE) dollars. The JPB adopted a revised budget of $2.44 billion ($2.39 billion for FTA reporting purposes) on December 6, 2021 and began reporting against the new budget with its December 2021 Monthly Progress Report. This new budget reflects a total increase of $462 million from the FFGA budget. The new budget has been incorporated into the JPB's Recovery Plan.

Table 3 below presents the PCEP costs as of August 31, 2022. The JPB re-forecasts the estimated cost at completion (EAC) monthly.

Table 3 – Project Cost Table at 8-31-2022 ($ millions)[1][2]

Description of Work	FFGA Baseline Budget (A)	Current Budget (B)	Cost This Month (C)	Cost To Date (D)	Estimate To Complete (E)	Estimate At Completion (F) = (D) + (E)
10 - GUIDEWAY & TRACK ELEMENTS	**$14,256,739**	**$33,031,357**	**$5,424**	**$30,771,133**	**$2,260,225**	**$33,031,357**
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	$2,500,000	$2,387,096	$5,424	$335,188	$2,051,907	$2,387,096
10.07 Guideway: Underground tunnel	$8,110,649	$30,644,262	$0	$30,435,945	$208,317	$30,644,262
10.07 Allocated Contingency	$3,646,090	$0	$0	$0	$0	$0
30 - SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	**$2,265,200**	**$11,046,714**	**$31,060**	**$9,869,781**	**$1,176,932**	**$11,046,714**
30.03 Heavy Maintenance Facility	$1,344,000	$10,846,714	$31,060	$9,869,781	$976,932	$10,846,714
30.03 Allocated Contingency	$421,200	$200,000	$0	$0	$200,000	$200,000
30.05 Yard and Yard Track	$500,000	$0	$0	$0	$0	$0
40 - SITEWORK & SPECIAL CONDITIONS	**$255,072,402**	**$439,765,977**	**$7,404,379**	**$388,776,616**	**$50,989,361**	**$439,765,977**
40.01 Demolition, Clearing, Earthwork	$3,077,685	$10,748,067	$40,000	$9,883,414	$864,653	$10,748,067
40.02 Site Utilities, Utility Relocation	$62,192,517	$103,275,822	$1,285,134	$162,082,266	($58,806,445)	$103,275,822
40.02 Allocated Contingency	$25,862,000	$2,370,765	$0	$0	$2,370,765	$2,370,765
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	$2,200,000	$12,042,192	$0	$11,453,082	$589,111	$12,042,192
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	$32,579,208	$21,889,303	$900,000	$5,294,945	$16,594,358	$21,889,303
40.05 Site structures including retaining walls, sound walls	$568,188	$0	$0	$0	$0	$0
40.06 Pedestrian / bike access and accommodation, landscaping	$804,933	$2,735,000	$26,000	$951,000	$1,784,000	$2,735,000
40.07 Automobile, bus, van accessways including roads, parking lots	$284,094	$0	$0	$0	$0	$0
40.08 Temporary Facilities and other indirect costs during construction	$107,343,777	$264,593,831	$5,153,244	$199,111,910	$65,528,342	$264,640,252
40.08 Allocated Contingency	$20,160,000	$22,110,997	$0	$0	$22,064,576	$22,064,576
50 - SYSTEMS	**$504,445,419**	**$679,851,406**	**$10,223,049**	**$524,386,224**	**$155,465,182**	**$679,851,406**
50.01 Train control and signals	$97,589,149	$112,703,675	$2,982,471	$113,582,046	($878,372)	$112,703,675
50.01 Allocated Contingency	$1,651,000	$4,706,843	$0	$0	$4,706,843	$4,706,843
50.02 Traffic signals and crossing protection	$23,879,905	$79,577,607	$1,650,410	$20,069,167	$59,508,440	$79,577,607
50.02 Allocated Contingency	$1,140,000	$397,666	$0	$0	$397,666	$397,666
50.03 Traction power supply: substations	$69,120,009	$127,642,222	$984,041	$116,749,342	$10,892,880	$127,642,222
50.03 Allocated Contingency	$31,755,013	$2,861,411	$0	$0	$2,861,411	$2,861,411
50.04 Traction power distribution: catenary and third rail	$253,683,045	$337,856,722	$4,370,952	$271,871,361	$65,995,728	$337,867,089
50.04 Allocated Contingency	$18,064,000	$5,107,992	$0	$0	$5,097,624	$5,097,624
50.05 Communications	$5,455,000	$5,679,561	$235,175	$2,114,307	$3,565,254	$5,679,561
50.05 Allocated Contingency	$0	$3,017,439	$0	$0	$3,017,439	$3,017,439
50.07 Central Control	$2,090,298	$300,269	$0	$0	$300,269	$300,269
50.07 Allocated Contingency	$18,000	$0	$0	$0	$0	$0
60 - ROW, LAND, EXISTING IMPROVEMENTS	**$35,675,084**	**$33,344,582**	**$13,245**	**$22,194,000**	**$11,150,582**	**$33,344,582**
60.01 Purchase or lease of real estate	$25,927,074	$33,160,590	$13,245	$22,060,008	$11,100,582	$33,160,590
60.01 Allocated Contingency	$8,748,010	$0	$0	$0	$0	$0
60.02 Relocation of existing households and businesses	$1,000,000	$183,992	$0	$133,992	$50,000	$183,992
70 - VEHICLES (96)	**$625,544,147**	**$694,418,557**	**$11,522,506**	**$453,951,467**	**$240,467,089**	**$694,418,557**
70.03 Commuter Rail	$589,167,291	$642,315,746	$10,398,559	$439,925,829	$202,389,917	$642,315,746
70.03 Allocated Contingency	$9,472,924	$15,555,307	$0	$0	$15,555,307	$15,555,307
70.06 Non-revenue vehicles	$8,140,000	$17,239,237	$0	$538,280	$16,700,958	$17,239,237
70.06 Allocated Contingency	$0	$379,335	$0	$0	$379,335	$379,335
70.07 Spare parts	$18,763,931	$18,928,931	$1,123,947	$13,487,359	$5,441,572	$18,928,931
80 - PROFESSIONAL SERVICES (applies to Cats. 10-50)	**$323,793,010**	**$465,435,846**	**$433,276**	**$397,584,175**	**$67,851,671**	**$465,435,846**
80.01 Project Development	$130,350	$289,233	$0	$289,233	$0	$289,233
80.02 Engineering (not applicable to Small Starts)	$180,227,311	$242,422,852	$1,163,962	$234,914,320	$7,508,532	$242,422,852
80.02 Allocated Contingency	$1,866,000	$0	$0	$0	$0	$0
80.03 Project Management for Design and Construction	$72,029,265	$151,617,659	($1,663,665)	$115,068,266	$36,549,393	$151,617,659
80.03 Allocated Contingency	$9,388,080	$0	$0	$0	$0	$0
80.04 Construction Administration & Management	$23,677,949	$50,737,213	$592,954	$35,577,201	$15,160,013	$50,737,213
80.04 Allocated Contingency	$19,537,000	$0	$0	$0	$0	$0
80.05 Professional Liability and other Non-Construction Insurance	$3,500,000	$6,581,851	$315,598	$4,897,449	$1,684,402	$6,581,851
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	$7,167,275	$10,183,908	$24,428	$6,783,216	$3,400,692	$10,183,908
80.06 Allocated Contingency	$556,000	$650,000	$0	$0	$650,000	$650,000
80.07 Surveys, Testing, Investigation, Inspection	$3,287,824	$210,957	$0	$54,490	$156,467	$210,957
80.08 Start up	$1,797,957	$392,173	$0	$0	$392,173	$392,173
80.08 Allocated Contingency	$628,000	$2,350,000	$0	$0	$2,350,000	$2,350,000
Subtotal (10 - 80)	**$1,761,052,001**	**$2,356,894,438**	**$29,632,940**	**$1,827,533,396**	**$529,361,043**	**$2,356,894,438**
90 - UNALLOCATED CONTINGENCY	**$162,620,295**	**$26,316,020**	**$0**	**$0**	**$26,316,020**	**$26,316,020**
Subtotal (10 - 90)	**$1,923,672,296**	**$2,383,210,459**	**$29,632,940**	**$1,827,533,396**	**$555,677,063**	**$2,383,210,459**
100 - FINANCE CHARGES	**$6,998,638**	**$9,898,638**	**$113,382**	**$8,975,136**	**$923,502**	**$9,898,638**
Total Project Cost (10 - 100)	**$1,930,670,934**	**$2,393,109,097**	**$29,746,321**	**$1,836,508,531**	**$556,600,565**	**$2,393,109,097**

PMOC Note: The JPB publicly reports expenditures against a total project budget of $1,980,252,533; this translates to the revised budget of $2,442,690,697. 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. The revised budget for FTA reporting purposes, if accepted by the FTA, will be $2,393,109,097.

Cost Contingency Status

Table 4 summarizes the project contingency as of August 31, 2022 for the revised project budget.

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

Contingency Category	Original Baseline Contingency (YOE)	Revised Contingency Budget (YOE)	Current Contingency (YOE)	% of Construction Complete and % Revised Contingency Remaining[3]
Allocated	$152.9	$62,1	*$59,650,966*	*75.86%*
Unallocated	$162.6	$27.9	*$26,316,020*	
TOTAL	**$315.5**	***$90.0***	*$85,966,986*	***95.51%***

[1] Totals may not add due to rounding.
[2] Estimate at Completion
[3] Data as of August 31, 2022.

The PCEP cost contingency balances have been updated based upon the $2.44 billion budget. A new cost contingency drawdown curve is being established with new hold-points.

Contingency Management – Electrification

The global settlement with BBII included the establishment of a shared risk pool of $50 million which is considered part of the PCEP contingency. Upon final acceptance of the work, any balance remaining in the pool will be shared equally between BBII and the JPB. The objective of this pool is to reduce the number of change orders and incentivize collaboration between the JPB and BBII. The pool consists of 27 identified risk items, each with a forecast risk amount, with an aggregate total of $49.95 million plus one minor unidentified item valued at $0.54 million. As changes are identified in the course of the work, they are added to an Issue Resolution Log (IRL), screened against the identified risk items, and negotiated by the parties. The cost of the change, as negotiated, is deducted from the appropriate shared risk item, or if outside the shared risk list, from project contingency. *Table 5 below provides some metrics related to the effectiveness of the IRL through October 14, 2022. The total value of changes approved through the shared risk pool is $2.864 million as on October 14, 2022.* The IRL metrics are routinely shared with the PCEP's Change Management Board.

Table 5 – Issue Resolution Log Metrics (October 14, 2022)

DESCRIPTION	QTY	%
Total Quantity of IRL Items Opened	264	-
IRL Items Closed without Commercial Implication	61	23%
IRL Items Pending Technical Resolution	62	23%
Technical Resolution Agreed, Pending Commercial Agreement	41	16%
Technical Resolution & Commercial Implications Agreed	19	7%
Technical Resolution & Commercial Implications Agreed (< $10k)	19	7%
Commercial Implication Pending L3 thru L5 Acceptance	0	0%
Total IRL Items Approved	62	23%

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 the original funding plan described below which applies to the original project cost of $1.930.7 billion. *Figure 1 below is the*

proposed funding strategy presented in the JPB's Recovery Plan submitted to the FTA on September 30, 2022.

Figure 1 – PCEP Proposed Funding Strategy to Support Budget Increase

Type	Source	Amount in Millions	Status
Federal	ARPA Supplemental CIG	52.40	CA-2022-015-00--Will not be replaced by planned funding
Local	Bond Funds	150.00	JPB Resolution 2022-07-- -- Planned funding to replace need to draw upon Bond funds
	Total Committed	**202.40**	
Local	Measure RR	60.00	JPB Resolution 2021-66 -- Planned funding to replace need to draw upon Measure RR Reserve
Local	PCEP Super Contingency	200.00	Four Party Agreement -- Planned funding to replace need to draw upon super contingency
	Total Budgeted	**260.00**	
Federal	FRA Federal-State Partnership for Intercity Passenger Rail Grant Program	90.00	Discretionary Program--NOFO to be released in Fall 2022
Federal	FTA CIG (FY23 Additional Funding)	50.00	Subject to Congressional Appropriations Process for FFY23
Federal	Community Project Funding	10.00	Subject to Congressional Appropriations Process for FFY23
State	Existing TIRCP Projects Leveraging Federal & Local Funds Reserve	260.00	Funding request to be submitted in Fall 2022
Total Planned		**410.00**	
Total Funding (Committed/Budgeted/Planned)		**872.40**	

The JPB has formed a special task force to focus on pursuing federal and local grants to close the funding gap. 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. The following are updates related to the proposed funding strategy above.

JPB Bonds Backed by Measure RR Revenues

The JPB issued revenue bonds in early 2022 secured by Measure RR; the bond issue was closed and funded on March 2, 2022. Net proceeds for the project are approximately $150.464 million. The JPB is seeking other funding to preserve the Measure RR funds for operating and capital needs.

Potential California State Legislative Funding

The FY 2023 State budget has been signed into law. It includes $4.2 billion for high-speed rail and $7.65 billion for transit. $900 million is set aside for existing Transit and Intercity Rail Capital Program projects to leverage federal and local fund reserves. The PCEP qualifies under this program. *The JPB reported that the grant guidance has recently been issued for this program, and that it plans to seek $410 million from the program.*

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 $1,599,714 as of June 30, 2022, or 75% of the combined federal and local funds of $2,133,086. This total includes recently received ARPA funds in the amount of $52.415 million.

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: No Change Order activity this period. *A total of $2,807,827 has been drawn through August 2022 from the $50 million Shared Risk Pool established in the Global Settlement between the JPB and BBII.*

EMU Contract Changes: No activity this period.

SCADA Contract: *One Change Order was issued in the amount of $1,036,122 for traction power database changes.*

Tunnel Contract Changes: No activity this period.

CEMOF Contract Changes: No activity this period.

PG&E Contract Changes: No activity this period.

2.14 Project Schedule

The FFGA was executed on May 23, 2017 with a Required Completion Date of August 22, 2022. The JPB, for reasons discussed previously, adopted the PMOC's recommended September 26, 2024 as the revised Required Completion Date (RCD) for the project. The JPB did not formally adopt a particular schedule document when it approved the revised PCEP budget of $2.44 billion at its December 6, 2021 meeting; however, the revised budget is based on completing the project by September 26, 2024. The JPB has proposed an FFGA RCD of December 31, 2024 in its Recovery Plan dated April 1, 2022. The JPB recently requested that BBII reforecast their schedule to reflect combining the completion of Segment 3 and 4 into a revised Interim Milestone 1, and make other adjustments to reflect a more realistic OCS production rate. *That information has been received and incorporated into the June 2022 IMS. This latest revision does not have any effect on the current substantial completion date or the proposed RCD.*

The JPB's Lead Scheduler left the PCEP on June 2, 2022 and a replacement was hired. *However, the new Lead Scheduler will be leaving the project in August, and a replacement has not been identified. The PCEP team is now using an Integrated Master Schedule (IMS) as recommended by the PMOC. The schedule is still being compiled and refined; the latest version is August 2022 with a September 1, 2022 data date.* This IMS incorporates BBII's updated schedule which combines Segments 3 and 4 into Interim Milestone 1. Attachment G - Project Milestones / Key Events shows the current projected dates for completion of various significant project activities.

The PCEP team received, reviewed and accepted 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 accepted 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 JPB has accepted with comments BBII's August 2022 schedule updates; the September 2022 update is under review.*

The PCEP team accepted a re-baselined schedule from Stadler for the completion of the EMU order. Stadler's re-baselined schedule was converted into P6 format and has been incorporated into the IPS. *Stadler notified the JPB in August 2022 that it was experiencing new supply chain issues which will delay the delivery of some trainsets currently in assembly. The JPB has requested that Stadler update its current schedule to reflect this most recent problem. The JPB is currently forecasting commencement of Revenue Service with its new EMUs in June 2024.*

Figure 2 - Summary Project Schedule (9-1-2022)

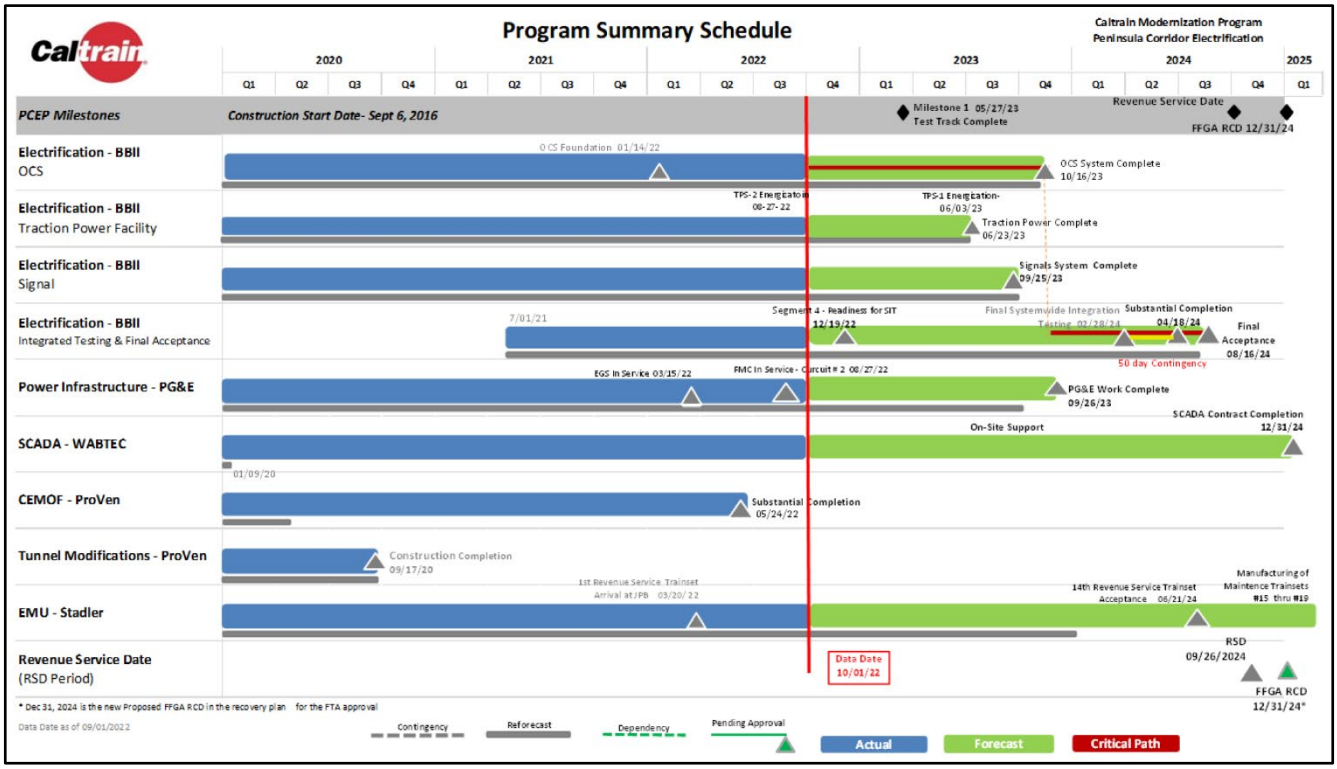
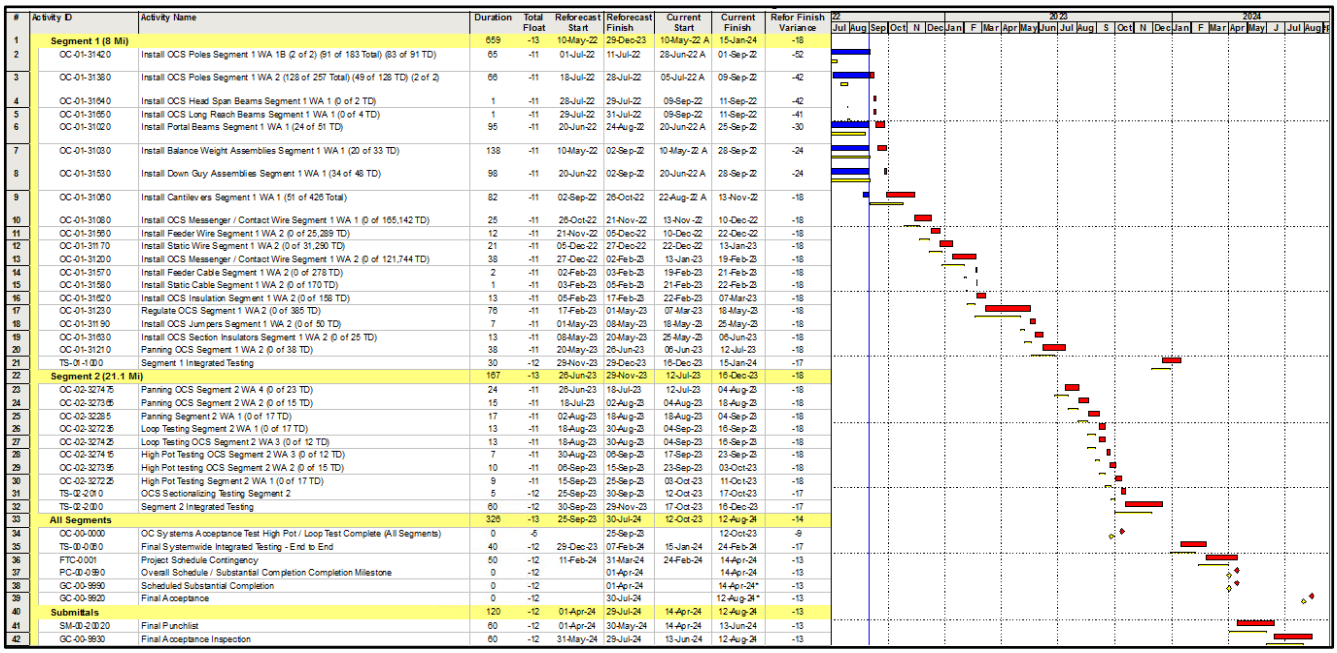


Figure 3 – Critical Path Schedule September 2022



#	Activity ID	Activity Name	Duration	Total Float	Reforecast Start	Reforecast Finish	Current Start	Current Finish	Refor Finish Variance
1	**Segment 1 (8 Mi)**		659	-13	10-May-22	29-Dec-23	10-May-22 A	15-Jan-24	-18
2	OC-01-31420	Install OCS Poles Segment 1 WA 1B (2 of 2) (91 of 183 Total) (83 of 91 TD)	65	-11	01-Jul-22	11-Jul-22	28-Jun-22 A	01-Sep-22	-52
3	OC-01-31380	Install OCS Poles Segment 1 WA 2 (128 of 257 Total) (49 of 128 TD) (2 of 2)	66	-11	18-Jul-22	28-Jul-22	05-Jul-22 A	09-Sep-22	-42
4	OC-01-31640	Install OCS Head Span Beams Segment 1 WA 1 (0 of 2 TD)	1	-11	28-Jul-22	29-Jul-22	09-Sep-22	11-Sep-22	-42
5	OC-01-31650	Install OCS Long Reach Beams Segment 1 WA 1 (0 of 4 TD)	1	-11	29-Jul-22	31-Jul-22	09-Sep-22	11-Sep-22	-41
6	OC-01-31020	Install Portal Beams Segment 1 WA 1 (24 of 51 TD)	95	-11	20-Jun-22	24-Aug-22	20-Jun-22 A	25-Sep-22	-30
7	OC-01-31030	Install Balance Weight Assemblies Segment 1 WA 1 (20 of 33 TD)	138	-11	10-May-22	02-Sep-22	10-May-22 A	28-Sep-22	-24
8	OC-01-31530	Install Down Guy Assemblies Segment 1 WA 1 (34 of 48 TD)	98	-11	20-Jun-22	02-Sep-22	20-Jun-22 A	28-Sep-22	-24
9	OC-01-31060	Install Cantilevers Segment 1 WA 1 (51 of 426 Total)	82	-11	02-Sep-22	26-Oct-22	22-Aug-22 A	13-Nov-22	-18
10	OC-01-31080	Install OCS Messenger / Contact Wire Segment 1 WA 1 (0 of 165,142 TD)	25	-11	26-Oct-22	21-Nov-22	13-Nov-22	10-Dec-22	-18
11	OC-01-31550	Install Feeder Wire Segment 1 WA 2 (0 of 25,289 TD)	12	-11	21-Nov-22	05-Dec-22	10-Dec-22	22-Dec-22	-18
12	OC-01-31170	Install Static Wire Segment 1 WA 2 (0 of 31,290 TD)	21	-11	05-Dec-22	27-Dec-22	22-Dec-22	13-Jan-23	-18
13	OC-01-31200	Install OCS Messenger / Contact Wire Segment 1 WA 2 (0 of 121,744 TD)	38	-11	27-Dec-22	02-Feb-23	13-Jan-23	19-Feb-23	-18
14	OC-01-31570	Install Feeder Cable Segment 1 WA 2 (0 of 278 TD)	2	-11	02-Feb-23	03-Feb-23	19-Feb-23	21-Feb-23	-18
15	OC-01-31580	Install Static Cable Segment 1 WA 2 (0 of 170 TD)	1	-11	03-Feb-23	05-Feb-23	21-Feb-23	22-Feb-23	-18
16	OC-01-31620	Install OCS Insulation Segment 1 WA 2 (0 of 158 TD)	13	-11	05-Feb-23	17-Feb-23	22-Feb-23	07-Mar-23	-18
17	OC-01-31230	Regulate OCS Segment 1 WA 2 (0 of 385 TD)	76	-11	17-Feb-23	01-May-23	07-Mar-23	18-May-23	-18
18	OC-01-31190	Install OCS Jumpers Segment 1 WA 2 (0 of 50 TD)	7	-11	01-May-23	08-May-23	18-May-23	25-May-23	-18
19	OC-01-31630	Install OCS Section Insulators Segment 1 WA 2 (0 of 25 TD)	13	-11	08-May-23	20-May-23	25-May-23	06-Jun-23	-18
20	OC-01-31210	Panning OCS Segment 1 WA 2 (0 of 38 TD)	38	-11	20-May-23	26-Jun-23	06-Jun-23	12-Jul-23	-18
21	TS-01-10000	Segment 1 Integrated Testing	30	-12	29-Nov-23	29-Dec-23	16-Dec-23	15-Jan-24	-17
22	**Segment 2 (21.1 Mi)**		167	-13	26-Jun-23	29-Nov-23	12-Jul-23	16-Dec-23	-18
23	OC-02-32475	Panning OCS Segment 2 WA 4 (0 of 23 TD)	24	-11	26-Jun-23	18-Jul-23	12-Jul-23	04-Aug-23	-18
24	OC-02-32365	Panning OCS Segment 2 WA 2 (0 of 15 TD)	15	-11	18-Jul-23	02-Aug-23	04-Aug-23	18-Aug-23	-18
25	OC-02-32285	Panning Segment 2 WA 1 (0 of 17 TD)	17	-11	02-Aug-23	18-Aug-23	18-Aug-23	04-Sep-23	-18
26	OC-02-32725	Loop Testing Segment 2 WA 1 (0 of 17 TD)	13	-11	18-Aug-23	30-Aug-23	04-Sep-23	16-Sep-23	-18
27	OC-02-32745	Loop Testing OCS Segment 2 WA 3 (0 of 12 TD)	13	-11	18-Aug-23	30-Aug-23	04-Sep-23	16-Sep-23	-18
28	OC-02-32745	High Pot Testing OCS Segment 2 WA 3 (0 of 12 TD)	7	-11	30-Aug-23	06-Sep-23	17-Sep-23	23-Sep-23	-18
29	OC-02-32735	High Pot testing OCS Segment 2 WA 2 (0 of 15 TD)	10	-11	06-Sep-23	15-Sep-23	23-Sep-23	03-Oct-23	-18
30	OC-02-32725	High Pot Testing Segment 2 WA 1 (0 of 17 TD)	9	-11	15-Sep-23	25-Sep-23	03-Oct-23	11-Oct-23	-18
31	TS-02-20100	OCS Sectionalizing Testing Segment 2	5	-12	25-Sep-23	30-Sep-23	12-Oct-23	17-Oct-23	-17
32	TS-02-20000	Segment 2 Integrated Testing	60	-12	30-Sep-23	29-Nov-23	17-Oct-23	16-Dec-23	-17
33	**All Segments**		326	-13	25-Sep-23	30-Jul-24	12-Oct-23	12-Aug-24	-14
34	OC-00-0000	OC Systems Acceptance Test High Pot / Loop Test Complete (All Segments)	0	-5		25-Sep-23		12-Oct-23	-9
35	TS-00-01800	Final Systemwide Integrated Testing - End to End	40	-12	29-Dec-23	07-Feb-24	15-Jan-24	24-Feb-24	-17
36	FTC-0001	Project Schedule Contingency	50	-12	11-Feb-24	31-Mar-24	24-Feb-24	14-Apr-24	-13
37	PC-00-01900	Overall Schedule / Substantial Completion Completion Milestone	0	-12		01-Apr-24		14-Apr-24	-13
38	GC-00-9990	Scheduled Substantial Completion	0	-12		01-Apr-24		14-Apr-24*	-13
39	GC-00-9920	Final Acceptance	0	-12		30-Jul-24		12-Aug-24*	-13
40	**Submittals**		120	-12	01-Apr-24	29-Jul-24	14-Apr-24	12-Aug-24	-13
41	SM-00-20020	Final Punchlist	60	-12	01-Apr-24	30-May-24	14-Apr-24	13-Jun-24	-13
42	GC-00-9930	Final Acceptance Inspection	60	-12	31-May-24	29-Jul-24	13-Jun-24	12-Aug-24	-13

Recent Significant Schedule Changes

The following are examples of the significant schedule changes mentioned in the JPB's August 2022 MPS Milestones Analysis.

BBII - Electrification

- *Milestone #1 completion of combined Segments 3 and 4 is now May 22, 2023, a slip of 22 days.*
- *BBII Substantial Completion is now April 14, 2024, a slip of 14 days.*
- *BBII Final Acceptance is now August 12, 2024, a slip of 13 days.*
- *BBI is currently working on mitigation measures to recover the negative float currently shown for Milestone No. 1 and the Substantial and Final Completion Dates.*

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 now runs through completion of the OCS as a result of lower than required productivity as noted last month. BBII has mobilized additional personnel, is adding work crews, and is bringing equipment from the UK to mitigate this problem.

The current near critical path is Milestone #1 (Segments 3 and 4) and the remaining Signal and Crossing cutovers for Segment 2, Segment 3, and Segment 1, followed by testing and Start-up and then Final Acceptance.

Schedule Contingency Status

The JPB's latest schedule dated September 1, 2022 projects a Revenue Service Date (RSD), including a 90-day risk contingency, of September 26, 2024. This forecast provides 261 days of schedule contingency prior to the proposed FFGA RCD of December 31, 2024. This is a slight reduction from the prior forecast RSD of April 1, 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. The schedule incentives are shown Table 6 below.

Table 6 – BBII Schedule Performance Incentives

Objective	Date of Completion	Amount
Achieve Electrified Revenue Service prior to the Final Acceptance Date of July 31, 2024	On or before 4/30/2024 Between 5/1 and 5/31/2024 Between 6/1 and 6/30/2024	$3,000,000 $2,000,000 $1,000,000
Achieve Overall Substantial Completion prior to April 30, 2024	On or before 3/31/2024 After 2/29 and before 3/31/2024 After 1/31 and before 2/29/2024 On or before 1/31/2024	$4,100,000 $30,000/day $40,000/day $50,000/day **Max $8,000,000**
Completion of all 2SC Cutovers in Segment 2	On or before 11/10/2022	$2,000,000
Completion of 2SC cutovers in all 4 Segments	On or before 9/30/2023	$2,000,000
Maximum Schedule Incentives Available		**$15,000,000**

Revenue Service Date

The JPB is currently forecasting commencement of revenue service with 14 new EMUs between April 14 and July 1, 2024.

- **PMOC Observations:**
  - *The JPB has had difficulty attracting and keeping a lead scheduler; a new lead scheduler joined the PCEP team in early October 2022. The reduced scheduling staff has not had enough capacity to complete the remaining integration of the various PCEP schedules. The PMOC encourages the PCEP team to complete the integration of the remaining schedules as promptly as possible.*
  - *The PMOC is pleased to see additional reporting related to schedule delays.*
  - *The lack of a complete and fully integrated master project schedule makes running a formal Monte Carlo schedule risk analysis very difficult. This creates additional uncertainty in terms of the project completion date as well as the potential for additional contractor claims for time related overhead.*
  - The PMOC continues to encourage the JPB to employ proven schedule management practices including 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.
  - 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.

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 Watch List is monitored less frequently because of the lack of activity associated with these risks. 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.

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 requested that the JPB prepare and submit a Recovery Plan for the PCEP by October 8, 2021. The JPB retained a new executive to lead the PCEP and conducted a comprehensive review of the project, including a risk refresh. The JPB requested additional time to prepare the Recovery Plan and the FTA agreed to defer receipt of the Recovery Plan. *The JPB delivered its final Recovery Plan to the FTA on September 30, 2022.*

Cost Risk Model Update – July 2022

The JPB's Risk lead ran the Monte Carlo Cost Risk model on July 15, 2022 to determine the Direct Cost of Risk based on the active risks in the risk register. The direct cost of risk in 2022 is $50.5 million at the p65 level compared to $73.8 million in 2020. The project contingency is currently approximately $86 million. A schedule risk analysis was not performed, and therefore, the schedule related cost of risk was not determined. The risk report analysis points out that the RCD for the project has been extended by two (2) years since the 2020 risk refresh was performed, which significantly reduces current schedule risk.

Current Risk Activities

The most recent Risk Assessment Committee was held on September 28, 2022. The Committee voted to retire two (2) risks, and two (2) risks were reassigned. The Committee also discussed several potential risks suggested by the PMOC during recent monitoring meetings.

The PCEP's risk lead states that he plans to update the Monte Carlo risk analysis in October 2022.

- **PMOC Observation:** *The PMOC is pleased that the JPB plans to update its risk analysis in October 2022. The PMOC suggests that the JPB conduct a fresh risk elicitation exercise in conjunction with this update because of the significant turnover in the PCEP management team. The new members of the team may recognize risks not identified previously, particularly those related to testing and commissioning and rail activation.*
- *The PMOC notes that a major component of the Global Settlement with BBII was the cost of time related overhead (TRO). The JPB has been unable to accurately assess the risk of TRO because it lacks a fully integrated master project schedule. The PMOC strongly encourages the PCEP team to complete the integration of its MPS so that it can run the Monte Carlo schedule risk analysis at the earliest possible time.*
- The PMOC is pleased that the JPB's risk lead updated the Monte Carlo Cost Model results. This information should be helpful to the JPB and its funding partners as the project moves

forward. The PMOC notes that the Global Time Resolution Change Order established Time Related Overhead (TRO) rates for delays occurring in the years 2022, 2023 and 2024 and this information can be used in assessing the indirect cost of risk.

2.16 Quality Assurance / Quality Control (QA/QC)

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

Infrastructure Projects

- There is a current focus on quality as a major element of the readiness of Segment 4 for electrified operations. The JPB continues to conduct punch-list inspections of the various constructed works in Segment 4. In some cases, these inspections have revealed that the work was not yet ready to begin testing, and the contractor is addressing the identified discrepancies.
- *Continued review of BBII, ProVen and ARINC (now Wabtec) non-domestic Material Receiving Reports (MRRs) for Buy America compliance including review of the justification and reasoning for purchase of non-domestic items. Additional guidance has been provided to the JPB and BBII to assist in completing the necessary documentation.*

EMU Quality

- *The number of open items requiring completion following a trainset's arrival at the JPB has improved for TS-2 and TS-5 but is still higher than the target of ten (10) or less.*
- There has been some improvement in the preparation of work directives for assembly work in Salt Lake City, however, additional improvement is desired. Clear work directives are particularly important due to the high turnover of personnel.
  - **PMOC Observations and Recommendations:** The PMOC supports the increased emphasis on Systems Integration, Testing and Commissioning, and quality management. *Completion of the necessary documentation continues to be a challenge.*
  - The PMOC is continuing to observe the role of the PCEP's quality management team during start-up and testing. The PCEP's leadership supports the quality program and its role in testing and start-up and has increased resources for this work. A field quality auditor was recently added to the PCEP team.

2.17 Safety and Security

The JPB contracts for safety and security consulting services to support the PCEP. The PCEP safety team also provides support as needed to the JPB and its Director Safety/Security.

There were two reportable injuries for the 70,011 hours worked for the month of August, one employee required hospitalization. The Reportable Injury Rate (RIR) for 2022 through August is 2.39, which is below the national average of 2.50. Overall, since the project's inception, the RIR is at 1.75.

The JPB's acting Executive Director announced in August 2022 that the agency has commissioned an independent review of its safety culture; a draft report has been received and is under review.

BBII reports a significant increase in the theft of copper cables used for track bonding, including cables already installed. The incidence of thefts appears to increase in proximity to homeless encampments near the ROW.

The National Transportation Safety Board (NTSB) continues its investigation of the serious accident occurred on the railroad March 10, 2022.

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 team is currently working on providing training in electrical hazard awareness for the PCEP team and contractors, and through the Fire and Life Safety Committee (FLSC), for first responders in Segment 4, in anticipation of the upcoming electrification of the OCS system in Segment 4. Information is being shared with the public outreach team who will provide appropriate messaging to the general public in advance of the electrification of the various sections of the project. *Recent safety related activities include:*

- *Developed Segment 4 energized rail isolation and protection procedure for Rail Operations and TASI's review and comments.*
- *Continued safety special task force working group including TASI, Rail Operations and PCEP to address communications, process and procedure improvements.*
- *Completed in-depth 25kV OCS awareness training for all Caltrain staff, third party contractors and trained the trainers.*
- *An electrification emergency response scenario will be part of the upcoming annual Caltrain emergency exercise in November 2022 for Santa Clara County.*
- *Segment 3 Fire Departments are scheduled for electrification safety awareness training in January 2023.*

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 completed design of the barrier, a Change Order was executed for installation of the barriers, and the barriers are being installed on all trainsets. The FRA observed the new configuration of the bike cars during its Sample Car Inspection on February 16, 2022 and expressed no concerns or objections to the arrangement.

The JPB conducted a test on October 13, 2022 of the portable ADA ramp carried on-board each EMU trainset to facilitate boarding of a passenger using a mobility device. The ramp exceeds current ADA load requirements and satisfied the test requirements.

2.19 Buy America

The PMOC continues to review the JPB's compliance with Buy America requirements related to manufactured products and rolling-stock systems. The JPB has provided documentation related to the compliance of its three (3) major contractors, and that material has been reviewed by the PMOC's Buy America experts. The PMOC conferred with the JPB and a representative of BBII in early October to provide additional details on the type of documentation expected.

The JPB's vehicle consultant conducted a Post-Delivery Buy America audit on June 28-29, 2022. The audit report was completed July 11, 2022 and has been reviewed the PMOC's sub-consultant. The auditors found that the Stadler EMUs contain an average of 74.3% domestic content per seven-car trainset, which is more than the required 60% for this contract. The auditors also found that Stadler had addressed the several issues raised in the October 2021 Intermediate Audit Report. *The PMOC recommends that the JPB continue to monitor Stadler's Buy America performance through the completion of the order.*

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 is moving ahead with the work needed to complete the electrification of Segment 4 so that EMU testing can begin. This work includes preparation and completion of test plans and testing activities, certification of test results, completion of all related documentation and training of contractor staff.*
- BBII continues to participate in the project-wide Systems Integration, Safety and Security Certification Committee, Testing and Commissioning, and Rail Activation meetings.

EMU Contract

- Stadler shipped its first two trainsets (TS-3 and TS-4) to the JPB on March 18, 2022 and the vehicles arrived on March 20, 2022. The trainsets were shipped as part of a dedicated special train and arrived without damage. Stadler's crew has made the trains ready for testing and is conducting static tests. A clearance test of the Segment 4 tracks was conducted using an unpowered EMU propelled by a diesel locomotive. Approximately one and one-half months is required before the first train will be available for powered testing of Segment 4. *TS-2 and TS-5 arrived on August 21, 2022. Electrified testing of the EMUs with 25 kV power is expected to begin in November 2022.*
- Stadler is participating in the project-wide Systems Integration and Safety and Security Certification Committee meetings.

SCADA Contract

- *Wabtec (formerly ARINC) has completed most of its contracted SCADA activities. Wabtec recently received a Change Order to extend support for the SCADA system in accordance with the current completion schedule.*

Readiness for Electrified Rail Operations

Mark Clendennen has been hired as the PCEP Rail Activation Manager. Mr. Clendennen brings past experience with Denver RTD and Capitol Metro in Austin, TX. PCEP's Rail Activation Committee (RAC) has resumed meetings after a brief hiatus and now meets weekly rather than bi-weekly. The RAC includes representatives from the PCEP's technical consultants and the JPB's Rail Operations group. *The Rail Activation lead recently led a go/no go review of preparations for the electrified sectionalization tests scheduled for October 21-23, 2022. The review concluded that the group was prepared for the tests and that final preparations should be completed.*

The Rail Activation Schedule developed by the RAC has not been integrated with other project schedules such as Testing and Commissioning and Systems Integration, and therefore, a fully integrated MPS is not yet in place.

- **PMOC Observations:** There have been a number of changes in the PCEP's management team, including new hires and reassignments. Although the team appears to be working well together, the PMOC's opinion is that it is still in the formational stage especially with respect to the various start-up, testing and rail activation activities. The PMOC expects this to improve with the passage of time and particularly following initial energization of the system.
- 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 observes that overall coordination between the JPB and BBII is improving under the PCEP's new leadership and through the renewed vigorous partnering effort*.
- Unexpected issues continue to arise as the contractors and the PCEP team begin the testing and commissioning process for Segment 4. *Completion of the integrated master schedule should provide the PCEP team with an effective tool to manage both planned and unplanned events.*

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 is in the process of verifying 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
Cal ISO	California Independent System Operator (Electrical)
Cal/OSHA	California Office of Occupational Safety and Health
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
CO	*Chief Officer (CalMod)*
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

Acronyms	List of Terms
EA	Environmental Assessment
EAC	Estimate at Completion
EE	Entry into Engineering
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
ETC	Estimate to Complete
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
IMS	Integrated Master Schedule
ITCS	Incremental Train Control System
IRL	Issue Resolution Log
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

Acronyms	List of Terms
NTSB	National Transportation Safety Board
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
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

Acronyms	List of Terms
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
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
TRO	*Time Related Overhead*
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. 21 was held August 18, 2022*
Has the project sponsor submitted its safety certification plan to the oversight agency?	Y	SSCP submitted Rev. 0 which is currently under review.

Safety and Security Checklist		
Area of Focus	**Y/N**	**Notes/Status**
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. Caltrain's Safety and Security Department is the direct contact for DHS. The JPB's Information Technology network administrators receive periodic updates on cyber-security risks from the Cybersecurity & Infrastructure Security Agency (CISA) and implement appropriate actions to respond to those risks.
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 (3/28/22) and TVA (6/28/21) 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.

Safety and Security Checklist		
Area of Focus	**Y/N**	**Notes/Status**
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 and are under review. The OHA (1/14/22) focused on Milestone 1 is under review.
Has the project sponsor ensured the development of safety design criteria?	Y	
Has the project sponsor ensured the development of security design criteria?	Y	
Has the project sponsor ensured conformance with safety and security requirements in design?	Y	Design Criteria checklists have been 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. *A revised date of 12-31-2024 has been proposed.*
Has the project sponsor issued the final safety and security verification report?	N	Project is in construction. Required Completion Date is 9-26-2024. *A revised date of 12-31-2024 has been proposed.*
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.

Safety and Security Checklist		
Area of Focus	**Y/N**	**Notes/Status**
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. An update was provided on 6/28/21.
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
How do the project sponsor's OSHA statistics compare to the national average for the same type of work?		*There were two reportable injuries for the 70,011 hours worked for the month of August 2022. The Reportable Injury Rate (RIR) for 2022 through August is 2.39, which is below the national average of 2.50. The project's overall RIR since inception is 1.75.*
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?	*Y*	*An FRA representatives attended QPRM No. 21 on August 16, 2022.*

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.	FRA is considering a combined RFA for both the 2SC solution and the Crossing Optimization Process. Because both 2SC and Crossing Optimization Projects have FRA approved Test Plans, completion of the RFA(s) is not and will not impact work for either project.	TBD. Awaiting direction from FRA.	Cocke	A draft of the2SC RFA has been submitted to FRA. However, FRA must now determine if there will be two separate RFAs or one combined RFA.

Attachment D Top Project Risks

Risks 314 and 209 remain among the top risks, but have changed ranking. Risks 010, 317, 335, and 345 have risen to be among the top risks, but are not new risks. Changes from the prior report are indicated by italics.

Risk No.	Risk Category		Risk Description	Status
	Cost	Sched.		
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.	A new schedule was adopted as part of the global settlement. *Productivity on OCS needs sustained improvement; signal cutovers delayed to address 2SC software issues.*
010		*X*	*Potential for Stadler's sub-suppliers to fall behind schedule or delays in parts supply chain result in late completion of vehicles.*	*Interior panel supplier WCI failed to deliver parts as promised. Stadler is changing suppliers. This will impact schedule for trains 7 through 19.*
209	X	X	TASI may not have sufficient field support resources (RWIC, watchmen, flaggers, signal maintainers) for testing.	*TASI work schedules revised, additional RWICs in training, RFP for third-party RWP services.*
317	*X*	*X*	*JPB may not make timely acquisition of resources to staff rail activation plan with key personnel.*	*1. Maintenance RFP for OCS and traction power; 2. Bring on consultant staff to retire diesel fleet (will inform resource needs for maintenance of equipment in the future); 3. Department of Operations and Maintenance will need to repurpose and/or hire and train staff to operate an electrified railroad; and 4. Continue to use BBI staff for maintenance of the system through revenue service (e.g., isolation protection).*
335	*X*	*X*	*Resolution of open item with UP – duct bank clearance to MT 1*	Work continues with Operation to determine the extent of the mitigation that will be required to meet UP requirements. Some locations of duct bank or trough may require relocation in order to meet the UPRR requirements. Meetings with UPRR are on-going to resolve the outstanding issue.-
345	*X*	*X*	*Funding shortfall of $410 million is not met consistent with expenditures required to complete the PCEP project. Current cashflow is sufficient through June 2023.*	*Several sources of additional federal and state funding have been identified; however, none of these funds have been committed at this time.*
Top six (6) risks as shown on Risk Register dated 10-21-2022				

Attachment E Awarded Contracts

The current list of contracts numbers over 181. Eighty-four (85) contracts have values over $50,000, and seventy-one (72) 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 August 31, 2022.*

BALFOUR BEATTY INFRASTRUCTURE, INC	$	1,097,149,881
STADLER US INC	$	555,841,582
PACIFIC GAS & ELECTRIC COMPANY - SA scopes	$	124,106,400
TRANSITAMERICA SERVICES, INC. - Other scopes	$	81,831,413
GANNETT FLEMING TRANSIT & RAIL SYSTEMS	$	67,743,400
PROVEN MANAGEMENT, INC. - Tunnel scope	$	47,059,352
LTK CONSULTING SERVICES, INC.	$	36,845,000
URS CORPORATION	$	36,361,332
JACOBS PROJECT MANAGEMENT CO.	$	35,500,000
PROVEN MANAGEMENT, INC. - CEMOF scope	$	9,476,816
JPMORGAN CHASE BANK, N.A.	$	8,853,865
RAIL SURVEYORS AND ENGINEERS, INC.	$	8,232,540
B & G TRANSPORTATION GROUP, LLC	$	7,698,565
HNTB CORPORATION	$	7,122,630
ICF JONES & STOKES, INC.	$	4,927,957
ARINC INCORPORATED	$	4,456,418
NC 2121 SEC VENTURES LLC	$	4,394,220
FIRST AMERICAN TITLE COMPANY	$	4,290,819
RREF III-P TOWER PLAZA LLC	$	3,868,440
STATE OF CALIFORNIA	$	3,629,200
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
WELLS FARGO INSURANCE SERVICES USA, INC	$	1,493,269
COMPUCOM SYSTEMS, INC.	$	1,187,887
TRANSITAMERICA SERVICES, INC. - Santa clara drill track	$	1,186,015

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 20, 2022 (Actual)
- 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:** The Post-Delivery Buy America Audit Report states that the overall average domestic content of a seven (7) car trainset is 74.3%. The domestic content was reported to vary from 70% to 77% for the four (4) different car type variants.
- Date of Pre-Award Audit: May 25-26, 2016
- Pre-award Audit Report Date: June 21, 2016
- Intermediate Buy America Audit Date: 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: June 27-28, 2022
- Post-Deliver Audit Report Date: July 11, 2022

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	4/20/2022(A)	
Final Engineering (FE) Completion:	04/2018	2/28/2023 (P)	
Systems Integration Testing Completed:	01/2019	*2/24/2024 (P)*	
Segment 4 Complete to Begin EMU Testing:	11/2019	*11/17/2022 (P)*	
Revised Milestone 1 (Segments 3 and 4) Complete	*N/A*	*5/22/2023*	
Completion of Interconnection from PG&E to TPSS 2	N/A	1/29/2021 (A)	
Design/Build Substantial Completion:	02/2019	*4/14/2024 (P)*	
Conditional Acceptance of First EMU Trainset:		*10/5/2022 (P)*	
PG&E Provides Permanent Power:	09/2021	*8/27/2022(A*)	
Pre-Revenue Operation Completed:	05/2020	03/31/2024 (P)	
Revenue Service Date (without Risk Contingency):	12/2021	*04/15/2024 (P)*	
Revenue Service Date (with Risk Contingency)	N/A	09/26/2024	
FFGA Required Completion Date (RCD):	05/2020	12/31/2024 (P)*	

Note: *JPB's proposed FFGA RCD in its Recovery Plan
Currently, the RSD with contingency is 9/26/2024, the same date that the JPB has been using as the RCD; the JPB has proposed a revised FFGA RCD of 12/31/2024 in its Recovery Plan.

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 first four EMU trainsets are undergoing static testing at the JPB's CEMOF. Traction power substation #2 (TPSS-2) was electrified on August 27, 2022 and testing of the traction power components is underway.*

The JPB has recently negotiated a change with BBII, its Electrification contractor, to redefine Milestone 1 to include all work in Segments 3 and 4. This change will create a 21 mile stretch of electrified track which will permit more efficient burn-in of the EMUs. The projected completion date for Milestone 1 is May 22, 2023.

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 April 1 and July 1, 2024.

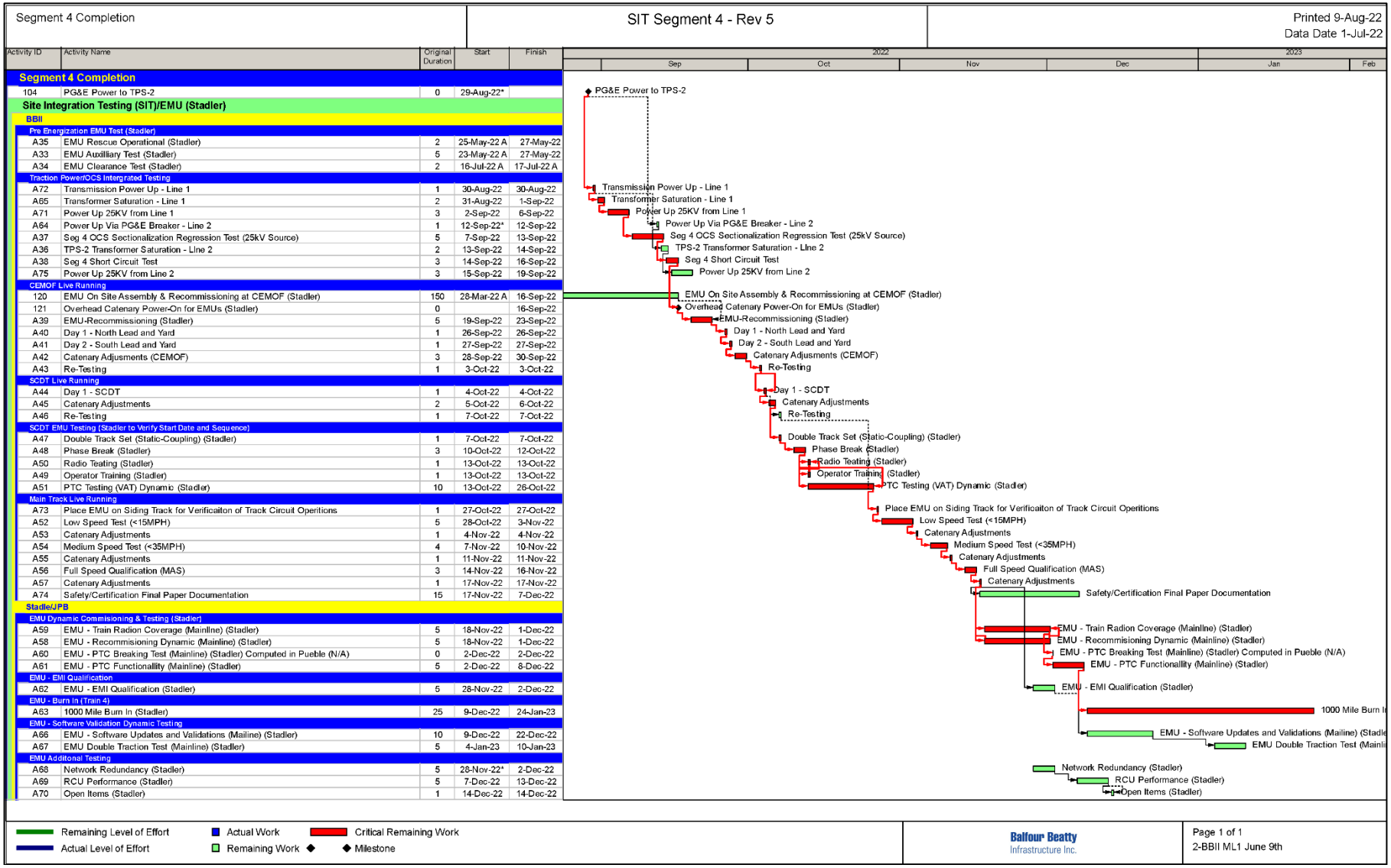
The PCEP has an active Rail Activation Committee (RAC) to coordinate the various activities needed to successfully initiate electrified rail operations. *The RAC is now being chaired by Mark Clendennen.* The RAC includes representatives from JPB employees assigned to the PCEP, PCEP's technical consultants, 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 RAC is meeting weekly on Thursday mornings, the most recent meeting was held on October 20, 2022.*

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

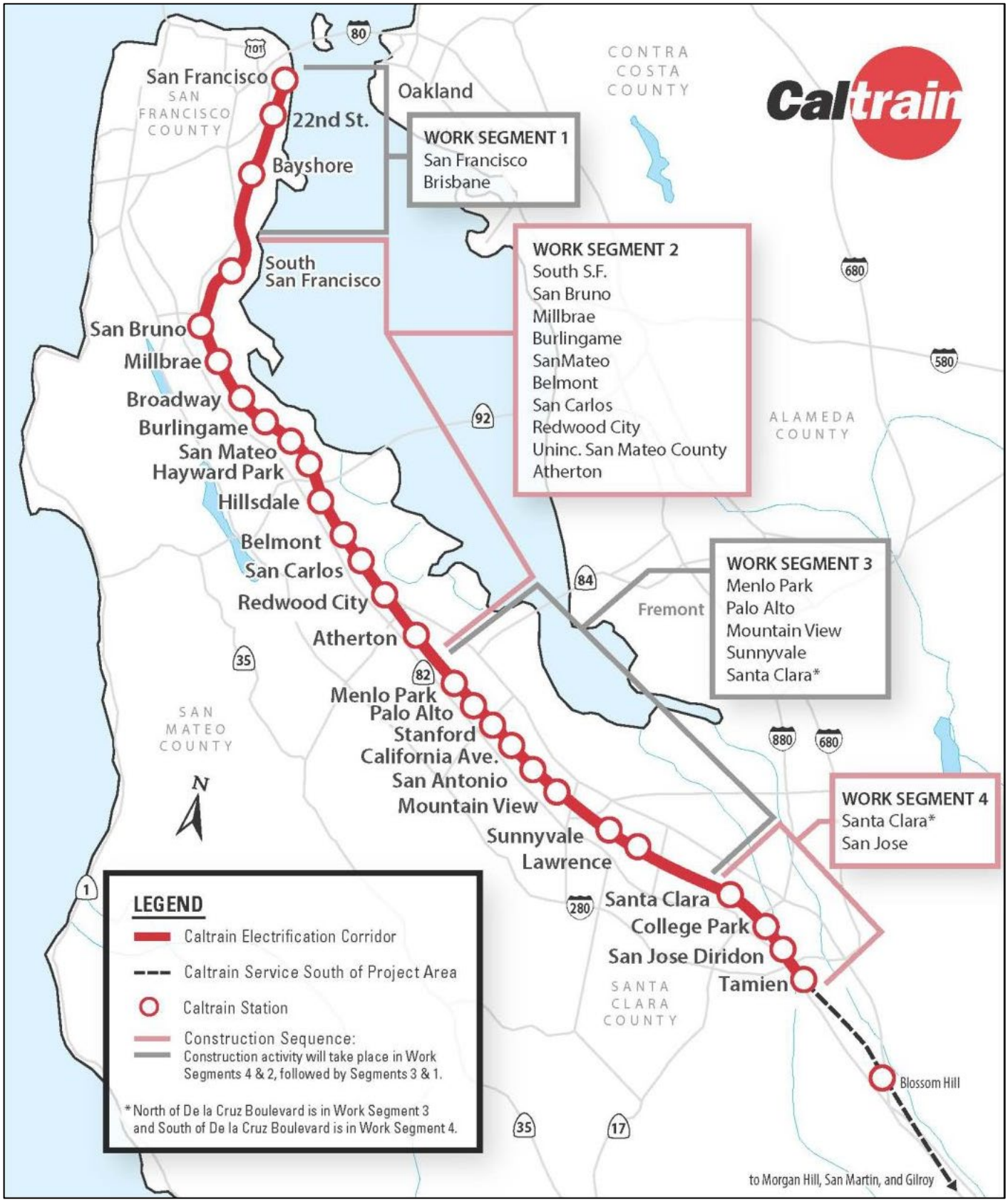
The PCEP risk lead has completed incorporating the Rail Activation risks into a consolidated risk register for the PCEP. *The RAC's Rail Activation Schedule is still in the process of being incorporated into and integrated with the body of the Integrated Master Schedule and the attributes of the rail activation activities are being refined by the RAC.* 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. 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 ID	Activity Name	Original Duration	Start	Finish
Segment 4 Completion				
104	PG&E Power to TPS-2	0	29-Aug-22*	
Site Integration Testing (SIT)/EMU (Stadler)				
BBII				
Pre Energization EMU Test (Stadler)				
A35	EMU Rescue Operational (Stadler)	2	25-May-22 A	27-May-22
A33	EMU Auxilliary Test (Stadler)	5	23-May-22 A	27-May-22
A34	EMU Clearance Test (Stadler)	2	16-Jul-22 A	17-Jul-22 A
Traction Power/OCS Intergrated Testing				
A72	Transmission Power Up - Line 1	1	30-Aug-22	30-Aug-22
A65	Transformer Saturation - Line 1	2	31-Aug-22	1-Sep-22
A71	Power Up 25KV from Line 1	3	2-Sep-22	6-Sep-22
A64	Power Up Via PG&E Breaker - Line 2	1	12-Sep-22*	12-Sep-22
A37	Seg 4 OCS Sectionalization Regression Test (25kV Source)	5	7-Sep-22	13-Sep-22
A36	TPS-2 Transformer Saturation - Line 2	2	13-Sep-22	14-Sep-22
A38	Seg 4 Short Circuit Test	3	14-Sep-22	16-Sep-22
A75	Power Up 25KV from Line 2	3	15-Sep-22	19-Sep-22
CEMOF Live Running				
120	EMU On Site Assembly & Recommissioning at CEMOF (Stadler)	150	28-Mar-22 A	16-Sep-22
121	Overhead Catenary Power-On for EMUs (Stadler)	0		16-Sep-22
A39	EMU-Recommissioning (Stadler)	5	19-Sep-22	23-Sep-22
A40	Day 1 - North Lead and Yard	1	26-Sep-22	26-Sep-22
A41	Day 2 - South Lead and Yard	1	27-Sep-22	27-Sep-22
A42	Catenary Adjusments (CEMOF)	3	28-Sep-22	30-Sep-22
A43	Re-Testing	1	3-Oct-22	3-Oct-22
SCDT Live Running				
A44	Day 1 - SCDT	1	4-Oct-22	4-Oct-22
A45	Catenary Adjustments	2	5-Oct-22	6-Oct-22
A46	Re-Testing	1	7-Oct-22	7-Oct-22
SCDT EMU Testing (Stadler to Verify Start Date and Sequence)				
A47	Double Track Set (Static-Coupling) (Stadler)	1	7-Oct-22	7-Oct-22
A48	Phase Break (Stadler)	3	10-Oct-22	12-Oct-22
A50	Radio Teating (Stadler)	1	13-Oct-22	13-Oct-22
A49	Operator Training (Stadler)	1	13-Oct-22	13-Oct-22
A51	PTC Testing (VAT) Dynamic (Stadler)	10	13-Oct-22	26-Oct-22
Main Track Live Running				
A73	Place EMU on Siding Track for Verificaiton of Track Circuit Operitions	1	27-Oct-22	27-Oct-22
A52	Low Speed Test (<15MPH)	5	28-Oct-22	3-Nov-22
A53	Catenary Adjustments	1	4-Nov-22	4-Nov-22
A54	Medium Speed Test (<35MPH)	4	7-Nov-22	10-Nov-22
A55	Catenary Adjustments	1	11-Nov-22	11-Nov-22
A56	Full Speed Qualification (MAS)	3	14-Nov-22	16-Nov-22
A57	Catenary Adjustments	1	17-Nov-22	17-Nov-22
A74	Safety/Certification Final Paper Documentation	15	17-Nov-22	7-Dec-22
Stadle/JPB				
EMU Dynamic Commisioning & Testing (Stadler)				
A59	EMU - Train Radion Coverage (Mainline) (Stadler)	5	18-Nov-22	1-Dec-22
A58	EMU - Recommisioning Dynamic (Mainline) (Stadler)	5	18-Nov-22	1-Dec-22
A60	EMU - PTC Breaking Test (Mainline) (Stadler) Computed in Pueble (N/A)	0	2-Dec-22	2-Dec-22
A61	EMU - PTC Functionallity (Mainline) (Stadler)	5	2-Dec-22	8-Dec-22
EMU - EMI Qualification				
A62	EMU - EMI Qualification (Stadler)	5	28-Nov-22	2-Dec-22
EMU - Burn In (Train 4)				
A63	1000 Mile Burn In (Stadler)	25	9-Dec-22	24-Jan-23
EMU - Software Validation Dynamic Testing				
A66	EMU - Software Updates and Validations (Mailine) (Stadler)	10	9-Dec-22	22-Dec-22
A67	EMU Double Traction Test (Mainline) (Stadler)	5	4-Jan-23	10-Jan-23
EMU Additonal Testing				
A68	Network Redundancy (Stadler)	5	28-Nov-22*	2-Dec-22
A69	RCU Performance (Stadler)	5	7-Dec-22	13-Dec-22
A70	Open Items (Stadler)	1	14-Dec-22	14-Dec-22

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.