Caltrain Modernization Program
Peninsula Corridor Electrification Project (PCEP)

February 2022
Monthly Progress Report

February 28, 2022

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The PCEP scope of work includes installation of an overhead contact system, construction of traction power facilities, modification of the existing signaling and grade crossing protection system to make it compatible with the electrified railroad, substation improvements at Pacific Gas and Electric (PG&E) substations, and modifications at existing tunnels and Caltrain's maintenance facility. It also includes the design, manufacturing, assembly, testing, and delivery of the EMUs.

Caltrain has reset the program in December of 2021. We brought in experts and task forces to assess the program and made necessary changes organizationally. Caltrain is committed to delivery PCEP and achieve revenue service in September of 2024.

1.2 Program Cost and Budget

On December 6th, 2021, the JPB adopted a new program budget of $2,442,690,697. As of February 2022, the project is on budget:

- The current project total cost at completion (EAC) is the same as Board adopted budget of $2.44 billion.
- As of February 2022, $46,586 drawdown occurred to the Shared Risk Pool of $50 million.
- As of February 2022, $0 was drawn from project contingency of $40 million.
- No new award of Project incentive pool of $18.5 million.

1.3 Program Progress and Schedule

As of February 28, 2022, the overall completion is 63.34%. The current program schedule is still on track with PCEP's substantial completion date of April 2024 and Revenue Service by September 2024.

1.4 Change Management Board (CMB)

In February 2022, no change orders were submitted for CMB approval.

1.5 Recent Accomplishments

The project team has completed the following notable activities (additional activities can be found in the individual sections which follow):

- Continued to bring on experienced, qualified resources to fill key management positions for PCEP delivery.
- Continued progressing the Signal Phase Study for TPS 2.
- Continued finalizing test documents that comply with PG&E interconnect handbook for PG&E review.
- Continued weekly project status meetings with CMB members.
- Provided Recovery/Remediation Plan comment review responses to FTA PMOC.
- Commenced segment 4 Milestone 1 completion joint walk-through and punchlist.
- Performed Segment 2 phase 3&4 major signal and grade crossing system cutover readiness review and made "go" decision for March cutover.

1.6 Upcoming work

For the next six months, the PCEP team has set additional goals as described below:

- Submit final Recovery/Remediation Plan to FTA and California High Speed Rail by April 1, 2022.
- Arrival of EMU Trainsets 3 and 4 by March 30, 2022.
- Complete EMU production schedule rebaseline effort by March 30, 2022.
- Complete Signal Phase Study for TPS 2 by April 30, 2022.
- Complete Segment 2 first major signal system cutover by May 23, 2022.
- Update Program Management Plan (PMP) by June 30, 2022.
- Energize Segment 4 and start testing EMU Trainset 3 by June 30, 2022.
- Continue pursuing federal and local grants to close the funding gap.

The PCEP Project is currently on budget and on time for achieving Revenue Service in the fall of 2024.

1.7 Critical Items

As of February 2022, Project top critical items and related actions are highlighted below:

Critical Issues	Actions
• Timely completion of Signal Phase Study impact to OCS/TPS Commissioning and EMUTesting	• The technical team meet with PG&E weekly to finalize the number of cases required to complete the Single-Phase Study. • Additional resources are brought to expedite the effort.
• Execution of PG&E Transmission Operating Load Agreement will impact Segment 4 energization	• Caltrain leadership met with PG&E representatives to outline the path forward. • TOLA agreement will be shared with Caltrain for review in March.
• Completion of Segment 2 Signal/2SC cutover	• Perform comprehensive cutover planning; develop and track dashboard for each cutover including design submittal, duct bank completion, flagger needs. • Work closely with Rail Operations to maximize track access.
• Funding of $410 million program gap	• Special task force is in place to identify federal and state grant opportunities to pursue. • Targeted advocacy is on-going.
• Project skilled resources (Contractor and Caltrain) availability	• Design-builder brought construction manager; systems lead from UK to the project. • Caltrain continue reach out to the industry to interview and secure key resources for testing and project acceptance • Develop specialized staff plan for operations and maintenance.

2.0 SAFETY

Safety consists of activities and reports conducted by the Safety team and the pursuit of Safety Certification.

2.1 Construction Safety

2.1.1 Introduction

Safety and Security requirements and plans are necessary to comply with applicable laws and regulations related to safety, security, and emergency response activities. The safety staff coordinates with contractors to review and plan the implementation of contract program safety requirements. In addition, safety project coordination meetings continue to be conducted monthly to promote a clear understanding of project safety requirements as defined in contract provisions and program safety documents.

There were no reportable injuries for February, so the Reportable Injury Rate (RIR) is at 0 for 2022. The Project Reportable Injury Rate (RIR) from the inception of construction activities to date continues well below industry average (approximately 1.65 vs. 2.5 National Industry Average).

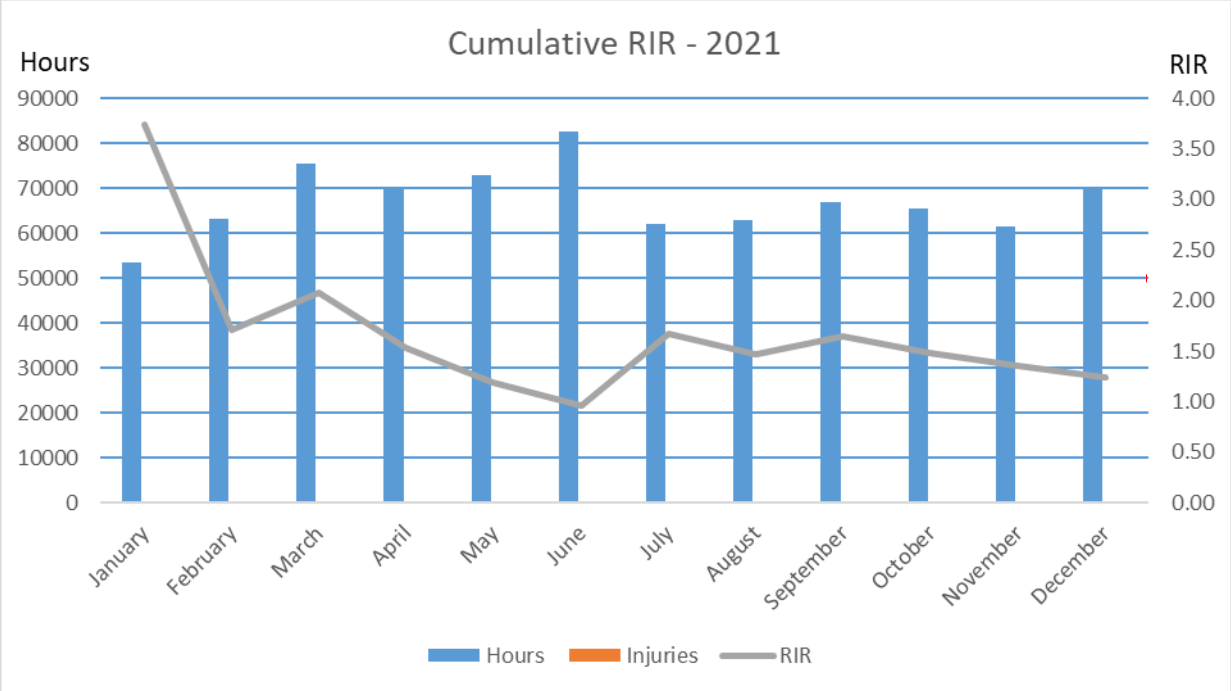
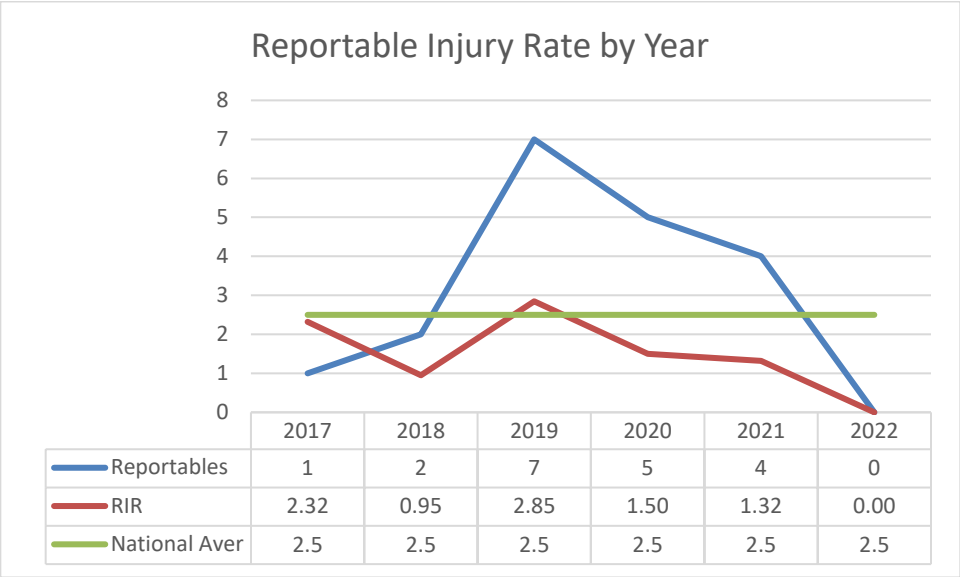


Figure 2-1 Cumulative project Reportable Injury Rate (RIR) for 2021



	2017	2018	2019	2020	2021	2022
Reportables	1	2	7	5	4	0
RIR	2.32	0.95	2.85	1.50	1.32	0.00
National Aver	2.5	2.5	2.5	2.5	2.5	2.5

Figure 2-2 Project Reportable Injury Rate (RIR) by Year (No Reportable Injuries in 2022)

2.1.2 Completed Work

Safety staff coordinate with contractors to review and plan the implementation of contract program safety requirements. Safety project coordination meetings continue to be conducted monthly to promote a clear understanding of project safety requirements as defined in contract provisions and program safety documents.

Project Safety continues to work with TASI representatives to develop the Segment-4 Operating Hazard Analysis (OHA). The OHA sessions include reviewing the electrification system's potential hazards and recommended mitigations with Operations and Maintenance discipline leads.

Traction Power, OCS, Grounding/Bonding and Bridge Attachment Design Criteria Checklists (DCCCs) were forwarded to design leads for their review. Completed reviews of the DCCCs are due in mid-March.

Safety awareness training is ongoing, and all employees will have received training prior to the energization of Segment 4. BBII completed the OCS safety awareness training course, Look Up and Live, for all its employees and subcontractors on February 8 and 9, 2022, with 248 employees receiving the training.

OCS Safety Awareness Training was conducted in February for Caltrain employees (Rail Operations, Engineering, etc.) and for PCEP project employees with multiple dates made to ensure everyone had an opportunity to attend the training session virtually. A total of 1294 employees, contractors, and emergency response personnel have received the training.

2.1.3 Upcoming Work

The Fire/Life Safety Committee continues to work with the San Jose and Santa Clara Fire Departments on Emergency Preparedness in preparation for the energization of Segment 4. Tabletop emergency response exercises are being planned for March 24, 2022, with the San Jose Fire and Police Departments.

All contractors and subcontractors have COVID-19 plans in place that meet federal, state, and local requirements.

2.1.4 Issues

Table 2-1. Safety Team issues identified and actions taken for February 2022

Issues	Actions
N/A	N/A

2.2 Safety Certification

2.2.1 Introduction

Safety and Security Certification continues as packages for Segment 4 are being assembled by the BBII team and the PCEP Safety team. The latest Certification Element Items List (CEIL) update shows 10 packages completed (Design and Construction/ Testing), with 7 awaiting construction verification by the BBII QA/QC team.

2.2.2 Completed Work

Signal cutovers 1, 2A, 2B, 3, and 4 have been completed and necessary paperwork has been submitted and granted a Temporary Use Notice (TUN). There are 4 Design Criteria Certification Checklists (DCCCs) packages currently under review by the JPB Design Leads.

2.2.3 Upcoming Work

Although there will not be any formal Safety Certification of Segment 4, the effort involved for Segment 4 Certification of temporary includes:

- All Design Criteria Conformance Checklists (DCCC) and Construction Specification Checklists (CSCC) will be completed and reviewed by the Safety and Security Certification Review Committee (SSCRC) and other technical experts as needed.
- BBII will issue a Certificate of Operational Conformance to the Project for Segment 4 prior to energization. Packages for Operational Conformance will include Traction Power Systems (TPS), Overhead Contact System (OCS), Bridge attachments, Grounding/bonding, Highway crossings, Communications, Train control/signals and SCADA.
- Review the completed Design Criteria Certification Checklists and the cross referencing to the Construction Specification Criteria checklists and Test reports.

Formal certification will come after the completion and testing/commissioning of the entire alignment and prior to the start of revenue service.

2.2.4 Issues

Table 2-2. Safety Certification issues identified and actions taken for February 2022

Issues	Actions
N/A	N/A

3.0 PROGRAM MANAGEMENT

Program management covers schedule, document control, cost, risk, and changemanagement.

3.1 Schedule

3.1.1 Introduction

PCEP has a Master Program Schedule (MPS) which illustrates the timeline of major elements of the PCEP program depicted in Figure 3.1.

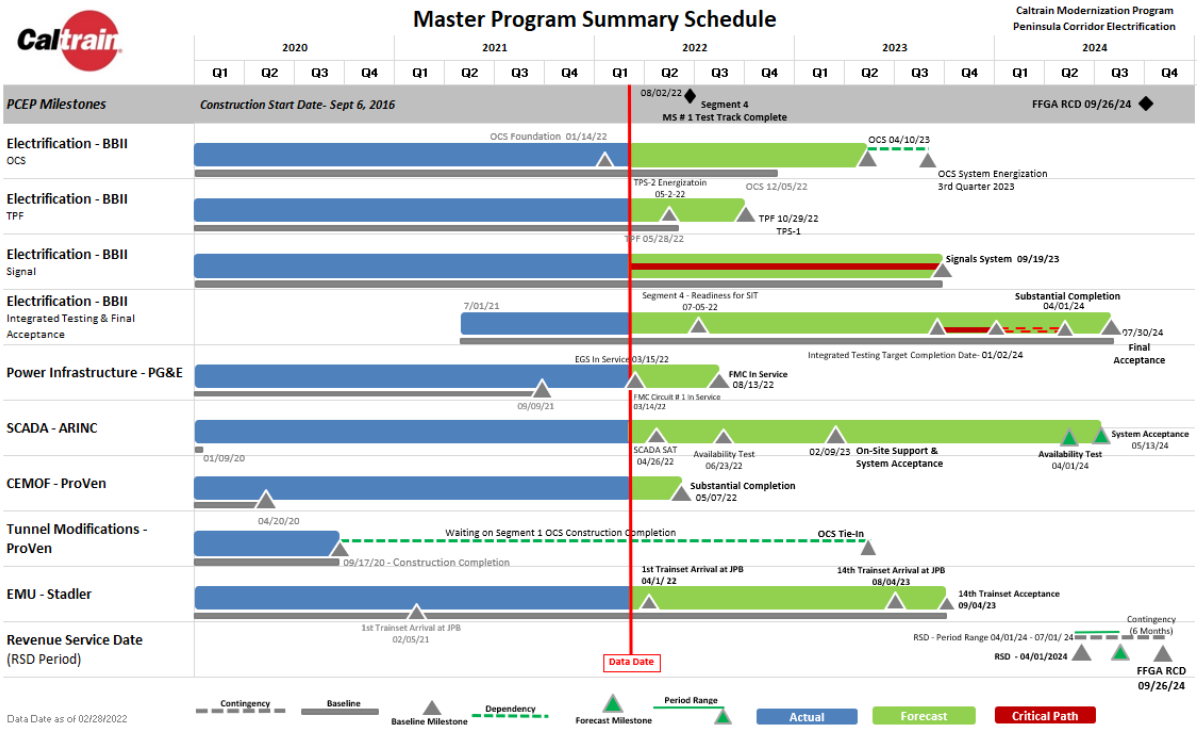


Figure 3-1. Master Program Summary Schedule

3.1.2 Completed Work

The JPB has approved BBII's re-baseline schedule as part of the global settlement with a substantial completion date of April 1, 2024, and Final Acceptance of July 31, 2024.

The master program schedule (MPS) was updated to reflect February 2022 contractor's progress schedule.

As of February 28, 2022, the overall delay to the critical path is 0 days.

3.1.3 Upcoming Work

The Electrification Substantial Completion Date is targeted to occur between January 1, 2024, and March 31, 2024, based on BBII progress schedule. The new proposed revised RSD date is September 26, 2024.

Stadler is working on revising the baseline schedule, as a result of change order No. 036 to adjust the schedule to account for excusable delays associated with COVID.

We are developing an Integrated Master Schedule (IMS) to represent the contractor's schedules and schedule interfaces.

The current critical path for PCEP continues to run through the design, installation, and testing of the signal and crossing modifications required to make the signal system compatible withthe electrified railroad, followed by the integrated testing and cutover.

3.1.4 Issues

Table 3-1. Schedule issues identified and actions taken for February 2022

Issues	Actions
COVID-19 and supply chain challenges impacted Stadler's production schedule, resulting in schedule delay on the first trainset arrival at the JPB site.	- The new forecast shipping date is March 18, 2022. - The revised 14th trainset delivery date is forecasted for August 4,2023. Conditional acceptance of the 14th trainset on September 4,2023 will support electrification Revenue Service Date. - JPB is in the process of reviewing Stadler's re-baseline production schedule as per the contract requirements.
Traction power SCADA availability test currently does not support the Revenue Service date.	- JPB is re-negotiating with ARINC the testing requirements to support with the revenue service date.
Segment 1 OCS System Tunnels wire Tie-In work under Proven.	- JPB will transfer the OCS Tie-In scope to BBII.

3.2 Cost and Budget

3.2.1 Introduction

This section presents an update on program cost and budget. On December 6th, 2021,the JPB adopted a new Program budget of $2,442,690,697. Table 3-2 depicts program costs through February of 2022, and current program cost at completion is the same as the newly adopted budget.

Table 3-3 provides status of two major types of program contingency drawdown:

1. As part of global settlement, a shared risk contingency pool of $50 million was established to manage risks and mitigation proactively and collaboratively with design-build contractor.

2. Program contingency of $40 million is established to cover non-BBII potential changes and unknowns.

Table 3-2. Budget Summary/Estimates at Completion (EAC)

Description of Work	Re-Baseline Current Budget (A)[1]	Cost This Month (B)[2]	Cost To Date (C)[3]	Estimate To Complete (D)	Estimate At Completion (E) = (C) + (D)	Variance at Completion (F) = (A) – (E)
Electrification	$1,749,139,438	$96,222,702	$1,268,777,686	$480,361,752	$1,749,139,438	$0
EMU	$693,551,258	$5,721,249	$339,358,475	$354,192,783	$693,551,258	$0
PCEP TOTAL	**$2,442,690,697**	**$101,943,951**	**$1,608,136,161**	**$834,554,535**	**$2,442,690,697**	**$0**

1. Column A "Current Budget" includes executed change orders and awarded contracts.
2. Column B "Cost This Month" represents the cost of work performed this month.
3. Column C "Cost To Date" includes actuals (amount paid) and accruals (amount of work performed) to date.

Caltrain and Balfour Beatty Infrastructure, Inc. (BBII) continue implementing new mechanisms to ensure a collaborative approach to Project delivery. The management team meets every week to review the issues log focusing on risk mitigation and issues resolutions.

Table 3-3 Shared Risk and Project Contingency Drawdown Balance

Transfer[1]	Description	Contingency
BBII Shared Risk Pool	Previously Reported Balance	**$50,000,000**
BBI-053-SRO-0022	Foundation Anchor Bolt Availability	$28,923
BBI-053-SRO-0102	Protection of OTE at Gated Crossing (January 2022)	$17,663
	BBII RISK POOL REMAINING BALANCE	**$49,953,414**
Transfer	**Description**	**Contingency**
Project Contingency	Previously Reported Balance	**$40,000,089**
	No Changes This Month	$0
	PROJECT CONTINGENCY REMAINING BALANCE	**$40,000,089**

1. Transfers include executed and pending changes through February month-end.

Table 3-4 provides a detailed status of Design-Build Contractor incentives due to the global settlement.

Table 3-4. BBII Incentives

Incentives	Budgeted	Awarded	Balance
Contract Incentive:			
Quality	$1,250,000	$1,000,000	$250,000
Safety	$2,500,000	$875,000	$1,625,000
Community Outreach	$2,500,000	$1,750,000	$750,000
DBE	$900,000	$0	$900,000
Total Contract Incentive	**$7,150,000**	**$3,625,000**	**$3,525,000**
Milestone Incentive:			
Early Signal and Crossing Cutover	$4,000,000	$0	$4,000,000
Early Project Substantial Completion (NTE)	$8,000,000	$0	$8,000,000
Early Revenue Service	$3,000,000	$0	$3,000,000
Total Milestone Incentive	**$15,000,000**		**$15,000,000**

Table 3-5. Monthly – MPR Table 8-1 to 8-3 Budget & Expenditure Status **Per 81 – 2022-02**

	(B)	(C)	(D)	(E)	(F) = (D) + (E)
Description of Work	Re-Baseline Budget	Cost This Month	Cost To Date	Estimate To Complete	Estimate At Completion
Electrification	$1,097,149,881	$81,536,273	$731,661,742	$365,488,139	$1,097,149,881
EMU Procurement	$556,072,601	$4,753,440	$268,148,445	$287,924,156	$556,072,601
Minor Construction Contracts (SSF, 25th Grade, Tunnel, CEMOF, SCADA, Non-BBI OCS)	$67,055,072	$162,835	$56,623,455	$10,431,617	$67,055,072
Real Estate Acquisition & Support	$34,914,177	$44,475	$23,578,527	$11,335,650	$34,914,177
PG&E, Utilities	$132,088,995	$8,300,773	$191,226,398	-$59,137,404	$132,088,995
Management Oversight & Support	$312,699,697	$2,113,908	$231,674,042	$81,025,655	$312,699,697
TASI Support	$114,488,767	$1,612,645	$73,170,962	$41,317,805	$114,488,767
Finance Charges	$9,898,638	$17,550	$7,850,977	$2,047,661	$9,898,638
Insurance	$6,581,851	$0	$4,581,851	$2,000,000	$6,581,851
Other Required Projects & Services	$9,084,176	$0	$2,454,860	$6,629,316	$9,084,176
Environmental Mitigation	$14,438,866	$25,427	$1,140,580	$13,298,286	$14,438,866
Caltrain Capital Overhead (ICAP)	$48,217,887	$3,376,625	$16,024,322	$32,193,565	$48,217,887
Contingency (allocated and unallocated)	$40,000,089	$0	$0	$40,000,089	$40,000,089
Total	**$2,442,690,697**	**$101,943,951**	**$1,608,136,161**	**$834,554,535**	**$2,442,690,697**

3.2.2 Issues

Table 3-6. Cost and Funding issues identified and actions taken for February 2022

Issues	Actions
Additional funding setup for $410M Funding Gap.	- Actively pursuing additional State and Federal funding sources. Dedicated task force has been established at the executive level.

3.3 Risk

3.3.1 Introduction

The risk management process is conducted in an iterative fashion throughout the life of the project. This process identifies new risks, resolves or manages other risks, modifies any potential impacts and severity these risks have based on the current situation. The Risk Management team's progress report includes a summary of the effectiveness of the Risk Management Plan, any unanticipated effects, and any corrections needed tohandle the risk appropriately. All risks are graded from 1 to 50.

3.3.2 Completed Work

Table 3-6. Top five risk items and mitigation actions as of February 2022

ID	RISK DESCRIPTION	Grade
010	**Risk:** Stadler's sub-suppliers fall behind schedule or delays in parts supply chain results in late completion of vehicles. **Mitigation:** Stadler is expediting parts and developing secondary sources to address problematic suppliers. In addition, Stadler focused on keeping the supply chain flowing.	20
241	**Risk:** Segment 4 may not be fully installed and tested prior to EMU delivery on-site. **Mitigations**: 1. Expedite BBII Segment 4 OCS design process (e.g., fast-track design through concurrent design and review of various phases). 2. Execute an agreement with PG&E for timely completion of design and construction andfunded agreement. 3. Reconcile conflict between underground alignment for BART/VTA tunnel extension, currently in conflict with the presently designed location of 115kV Transmission Poles that service TPS-2. The slightly revised location needs to be confirmed by VTA. Is this item completed? 4. Issue Change Order to purchase long-lead materials. 5. Negotiate and execute Construction Change Order for the TPS-2 Interconnection. 6. Have BBII complete testing and submit documentation on-time. 7. Develop a testing sequence to occur in preparation for EMUs (based on the “needs”list from the EMU supplier).	20
267	**Risk:** Additional property acquisition is necessitated by a change in design. **Mitigations:** 1. Project delivery team works with the contractor to ID new parcels well before they are needed for construction. 2. Expedite development of plats and legals. 3. Enter into work directives for appraisal and acquisition before parcels are identified. 4. Work with the project team to integrate property acquisition schedule into the overall project schedule.	18
314	**Risk:** The contractor may not complete signal and communication design, installation, testing, and cutover for the Two-speed Check (2SC) modifications on time. **Mitigations:** 1. Streamline design reviews (in process). 2. Initiate construction prior to IFC (in process). 3. Consolidate locations for cutover, where possible (in process). 4. Add an additional cutover team through Balfour/MRS (in process). 5. Reduce service and three-week single track during cutover period to maximize access and cutover work windows — to be conducted by railroad. 6. Submit timely cutover planning documents and SSWPs— to be conducted by the Contractor.	18
333	**Risk:** Remediation of issues associated with the CEMOF pit may result in additional costs and additional time to issue the charge order and implement the work.	16

ID	RISK DESCRIPTION	Grade
	Mitigations: 1. Obtain outcome of independent engineer – completed 2. Get the contractor to implement – in process 3. Issue change order – in process	

3.3.3 Upcoming work

Efforts to incorporate the Rail Activation Committee risks into the PCEP risk register have continued and will require Risk Assessment Committee approval. In addition, the shared risk pool will also be incorporated into the risk register. Finally, the next risk refresh will be scheduled.

3.3.4 Issues

Table 3-7. Risk issues identified and actions taken for the month of February 2022

Issues	Actions
Contractor-owned risk updating is lagging.	- Continued inquiries to JPB staff and consultants as "proxy risk owners."
All risks should be contained in a single risk register.	- Continued to incorporate Rail Activation Committee risks into the PCEP risk register. Queried relevant risk owners to harmonize risk descriptions, mitigations, and grading between two risk registers.

3.4 Change Management

3.4.1 Introduction

The change management process establishes a formal administrative work process associated with the initiation, documentation, coordination, review, approval, and implementation of changes during the design, construction, or manufacturingof the PCEP. The change management process accounts for the impacts of the changes and ensures prudent use of contingency.

3.4.2 Completed Work

- The following change orders were issued in January 2022:

1/19/2022	STA-056-CCO-035	Door Operation (No Cost Change)	$0	0.00 %	$21,620,165
1/19/2022	STA-056-CCO-037	Buy America Interim Audit	$49,300	0.18 %	$21,570,865

3.4.3 Upcoming Work

- CMB Approval of Proven Contract Change Orders for Tunnel and CMEOF in March 2022.
- Negotiation of ARINC Office SCADA Change Order for time extension and additional field points change.

3.4.4 Issues

Table 3-8. Change Management issues identified and actions taken for February 2022

Issues	Actions
Proven Claims Negotiation.	- A dedicated negotiation team is assigned to settle with Tunnel and CEMOF Contractor, including resolving outstanding change orders and contract completion.
ARINC Contract Time Extension.	- Discussions were held with ARINC management team to confirm the site support period to align the new baselines schedule, including a 1,000-hour availability test to be performed when the system is in production for the entire alignment. Team has finalized the scope of work, and the proposal request has been sent to ARINC.
Segment 4 Maintenance Option in the existing BBII Contract was never exercised. Maintenance of OCS/TPS for segment 4 will be needed post segment 4 substantial completion once Caltrain is using for EMU testing under 25kV.	- Prepare Scope of work and define segment 4 maintenance needs. - Define EMU testing and burn in work schedule. - Seek a proposal from BBII for the maintenance option as existed in the current Contract. - Evaluate the resource and price proposal. - Execute segment 4 maintenance option.

4.0 CONSTRUCTION

This section covers the various elements of construction.

4.1 Infrastructure

4.1.1 Introduction

The Electrification component of the PCEP includes the installation of 138 miles of wire and an overhead catenary system (OCS) to distribute electrical power to the EMUs. The OCS will be powered from a 25 kilovolt (kV), 60-Hertz, single phase, alternating current supply system consisting of two traction power substations (TPS), one switching station (SWS), and seven paralleling stations (PS). Electrification infrastructure will be constructed using a DB delivery method.

4.1.2 Completed Work

Table 4-1. OCS / Electrification

- **All OCS foundations have been completed.**

Segment	Status
OCS Foundations	
Segment 1	Complete
Segments 2, 3 and 4	Complete
OCS Poles	
Segments 1 and 2	621 poles remaining
CEMOF, Segments 3 and 4	Complete
OCS Wire	
Segments 1 and 2	Anticipated to be complete by 8/20/22, 36, 827 LF complete to date
Segments 3 and 4	Complete

- **OCS:**
  - Segment 4 acceptance measurements and visual inspections are underway.
- **Traction power facilities:**
  - Approximately 88% of traction power facilities work is complete.
  - Approximately 52% of fiber splicing is complete.
  - Approximately 63% of communication installations for Traction Power are complete.
  - Work remaining includes energizations, commissioning, and testing.
  - All work is anticipated to be completed by the 3rd Quarter of 2022.
  - TPS-2 commissioning of 115kV #2 Circuit Breaker is complete.
- **Grounding and bonding:**
  - Continue installation of bonding and grounding fences in S4.
  - Continue installation of bonding and grounding in CEMOF.
  - Test bonding and grounding in S4.
- **CEMOF:** The CEMOF Modifications project will provide work areas to perform maintenance on new EMUs.
  - North pit elevation repairs are complete.
  - Begin work on remaining electrical work.

4.1.3 Upcoming Work

- **Traction power facilities:** All traction power facility work is anticipated to be completed by the third quarter of 2022.

- **Grounding and bonding:**
  - Continuation of bonding and grounding fences in S4.
  - Continuation of testing of bonding and grounding in S4.
  - Continuation of bonding and grounding in CEMOF.
  - Bonding and grounding of utility handholes and manholes.
- **CEMOF:**
  - Complete installation of electrical work at North pit.
  - Achieve substantial completion on CEMOF.

4.1.4 Issues

Table 4-2. Infrastructure issues identified and actions taken for February 2022

Issues	Actions
OCS / Electrification	
Coordination of wire stringing over YT-5 in CEMOF.	- Coordination with Proven for access to YT-5 to complete wire stringing. Work is in progress.
TPS-2 overdue test reports required for PG&E energization.	- Discuss timing of deliverables with PG&E and expedite the work and deliver reports to PG&E.
Grounding and bonding	
Bonding and grounding of 3rd party utility handholes and holes. Need agreement from 3rd parties to proceed.	- Work with 3rd party to review technical solutions and implement mitigation of covering the holes with insulated material if necessary for the short term.
CEMOF	
None	- None

4.2 Communications, Signaling, and Grade Crossings

4.2.1 Introduction

The existing railroad signal system is incompatible with an electrified rail system. Therefore, PCEP requires modification to existing signal locations and the addition of new signal locations and associated infrastructure. Once all required signal and communications modifications are completed, the signal locations are cutover and put into operational service.

This aspect of PCEP includes furnishing a complete and integrated communications system for both signals and traction power subsystems, utilizing existing fiber optic backbone infrastructure. In addition, it comprises modifications to the fiber optics backbone as wellas additional communications networking equipment on the wayside and data center locations at Menlo Park and San Jose.

It also covers the final kit installations and testing of the replacement, upgraded, or modified signaling and grade crossing equipment along the alignment to be compatible with the electrification system and fully capable with PTC and other rail operations system interfaces.

4.2.2 Completed Work

Segment 4 cutovers have been completed and are in beneficial use, including 21 locations. Milestone 1 joint punch walks have started in January, and the final list is to be submitted in February. All teams are continuing finalization and readiness for the next major cutover between MP 14.65 and 20.20, affecting the cities of Burlingame and San Mateo. This includes final cabling and pre-testing of 41 total locations, 3 control points, 7 intermediate signal locations, and 17 crossings. A tentative completion date for Phases 3 and 4 of Segment 2 is slated for April 2, 2022. Also, a Final Go/No-Go discussion was conducted in February 2022, and all parties discussed their readiness for the March cutover and agreed that planned work would remain on track.

4.2.3 Upcoming Work

Final pre-testing between MP 14.65 and 20.20 for Segment 2, Phase 3 & 4 cutover is anticipated. PTC integrated testing of the wayside application changes scheduled for March 7th prior to the MRS cutover. Installation crews will mostly complete Segment 2, Phase 1 locations between MP 8.56 and 11.84 in March. This cutover is anticipated for May 13, 2022, and will include 17 total locations, 2 control points, 3 intermediate signal locations, and 3 crossings.

Communications networking equipment installation and testing are ongoing. All communications in Segment 4 are functioning for sub-system testing prior to Milestone #1 completion. A few locations still require permanent power from PG&E.

4.2.4 Issues

Table 4-3. Infrastructure issues identified and actions taken for the month of February 2022

Issues	Actions
Minor in-field condition changes have arisen.	- We are working through the issues resolution process.
Fiber break identified on buffer tubes 11 and 12.	- MRS has tested and identified design and infrastructure mitigations. Investigations are to start in March.
Continued fiber and communications network issues.	- Work closely with Caltrain systems, Rail Operations, and BBII/MRS collaboratively to ensure no impact to Signal and Crossing cutovers.
Crossing gate conflicts with OCS at various crossings.	- BBII is providing alternative solutions to address including OCS relocation and gate arm replacement with articulated functionality.

4.3 EMU (Rolling Stock)

4.3.1 Introduction

The procurement of EMUs, or trainsets, from Stadler, consists of a Base Order of 96 railcars, plus an Option Order of an additional 37 railcars, for a total of 133 railcars. The cars from these two orders will be combined and delivered as 19 seven-car Trainsets. The Base Order is funded by PCEP, and Option Order funded by a Transit and Intercity Rail Capital Program (TIRCP) grant. In addition, one more Option for additional cars is available.

4.3.2 Completed Work

With the completion of the 4,000-mile simulated service test, dynamic type testing was completed at Transportation Technology Center, Inc. (TTCI) in Pueblo, CO. Production continued for Trains 3 through 16.

Additional completed work includes:

- Continued routine testing on Trains 3 through 7.
- Shipment of 107 car shells from Stadler Switzerland, with 95 arriving at Stadler's Salt Lake City facility. 12 additional car shells are in transit/holding.
- The Factory Authorization Test (i.e., final inspection) was performed on Trainset 4. Findings from both Stadler and Caltrain inspectors are being worked off by Stadler production, and a follow up inspection will take place in March.

4.3.3 Upcoming Work

The following tasks remain:

- Complete and approve rebaseline schedule.
- Prepare to receive EMU trainsets 3 and 4 on-site.
- Continue EMU operators' training the trainer to support EMU testing.
- Buy America post-delivery audit (Q2 2022).

4.3.4 Issues

Table 4-4. EMU (Rolling Stock) issues identified and actions taken for February 2022

Issues	Actions
Stadler/global supply chain issues.	- Stadler is sourcing additional suppliers for redundancy.
Stadler/global labor shortage/turnover issues.	- Stadler is looking for new ways to recruit labor.
The local substation that supplies power to Stadler's test track is down. Dynamic testing on trainsets is delayed while Stadler awaits parts to repair the substation.	- Parts arrived and substation was repaired. Issue closed.

4.4 PG&E / Interconnection

4.4.1 Introduction

The PCEP will require a 115-kV interconnection to supply power from the PG&E substations to the Caltrain substations in San Jose and South San Francisco. PG&E will perform the construction of the interconnections under an amendment to Supplemental Agreement No. 2.

4.4.2 Completed Work

The following work for the Single-Phase Study was completed:

- Adjusted generator settings to match new sets of loads.
- Calculate selected power and regeneration cases.
- Run select fault cases for San Jose B.
- Continued model validation work for East Grand/TPS-1.
- Gathered vehicle data information for PG&E's review and approval.

4.4.3 Upcoming Work

The following work is planned for the Single-Phase Study:

- Get PG&E concurrence on vehicle model data.
- Continue fault study for FMC/TPS-2.
- Complete model validation for East Grand/TPS-1.

4.4.4 Issues

Table 4-5. PG&E / Interconnection issues identified and actions taken for February 2022

Issues	Actions
PG&E's continued request for more modeling work and more fault cases will result in a schedule delay to the completion of the Single-Phase Study. This will then delay the ability to draw an EMU load to test the EMUs and complete integrated testing.	- Continue to meet with PG&E both at the technical and executive level to resolve open issues related to the Single-Phase Study.
Late PG&E review of OCS/TPS Test report.	- Develop a master tracking sheet to ensure PG&E receivesall the reports needed for energization. OCS test reports are being tracked through Aconex. Traction power tracker indevelopment in late January and February. - Management escalation to ensure sufficient resources are applied to this activity-additional resource expected in Feb.

4.5 Systems Integration

4.5.1 Introduction

System Integration is an essential element of the PCEP delivery; a successful system integration requires thorough and comprehensive planning, coordination, and adequate testing.

The PCEP system integration program is highlighted below:

- **Sequencing:** The team has collaborated across various entities to build up a strong testing and commissioning sequence that describes dependencies from the contractor and any other third-party stakeholders. This has been instrumentalin allowing the team to plan the work, resourcing requirements, and, most importantly, deliverables. A milestone 1 schedule has been developed by the Contractor and updated weekly to reflect ongoing testing and integration activities.
- **On-site Inspection:** As part of Construction, on-site inspectors have been deployed to validate the work done and complete punch-list walks. From construction, the contractor is now transitioning to testing systems, and resources with systems knowledge plan to be deployed for the testing phase.
- **PCEP System Integration meetings:** These are held to identify, monitor, and determine appropriate resolution(s) for systems integration issues and are chaired by the Systems Integration Director. Due to the importance of integration going forward as the PCEP project enters the testing and commissioning phase, these meetings have been made weekly. There is an emphasis on surfacing and resolving technical issues amongst sub-systems. Issues are tracked and followed-up in individual meetings through the course of the week.

4.5.2 Work Completed

- Commenced testing planning for tests that will be conducted with and without power using EMUs.
- Integrated testing planning initiated and ongoing:
    - Dead Car Pull test planning and reviews ongoing.
    - Live wire testing.
    - EMU PTC testing with Wayside and Office.

4.5.3 Upcoming Work

- SCADA Network troubleshooting – identifying the cause of the networking issues across the various disciplines and finding a path to resolution.
- EMU Regeneration interaction with Traction Power – confirmation that the Traction power can accept regeneration from the trains.
- Phase Break locations for onboard PTC – location coordinates to be shared with the PTC system so that the PTC system knows which pantograph is to be used on the train at the phase break locations.
- Vehicle dimension comparison between EMUs and AEM7 (Pantograph clearance, Dead Car Pull testing) – provide vehicle dimensions to the Contractor to understand which vehicle to use to perform pantograph clearance and dead car pull tests.

4.5.4 Issues

Table 4-6. Systems issues identified and actions taken for the month of February 2022

Issues	Actions
CDRLs are not delivered on-time / prior btesting.	- Sub-system workshops are set up to address these items, and peer review themprior to formal submission. Several peer reviews have occurred, and more tocontinue in the coming weeks. - Additional focus on planning.
Lack of System Integration resources.	- Contractor has brought additional resources on site in February, and integration deliverables are now being discussed. - Requirements are being defined by 3rd parties to ensure clarity in expectations.

4.6 Testing and Commissioning

4.6.1 Introduction

The Testing and Commissioning is a smaller group to determine and track testing and resources that will need to be coordinated among the various contracts and suppliers. This meeting is the primary interface for the PCEP Design-Build team at this time.

4.6.2 Completed Work

Further details are shown in Section 4.7.2

4.6.3 Upcoming Work

Testing and Commissioning are coordinated through meetings held every two weeks with the contractor to monitor and gauge testing progress. One of the major challenges faced was ensuring proper planning and sequencing. This has been remedied through various group meetings held to clarify the “what” and the “when.” In addition, given systems integration testing to start in Q2 2022, the same diligence is now being applied to the integrated testing side so it can be fully developed for integrated testing.

Other work that remains to be completed includes the following:

- PG&E Power: Continued focus on document deliverables to facilitate energization.
- OCS and Power Integrated Test Procedures and Testing, including TPS-2 testing and SCADA integrated tests.
- Network Switch upgrades to support on-site Signals and Comms testing
- Signals preparatory and pre-testing work for mid-March cutover at Segment 2, Phase 3,and 4.
- Integrated Testing**:** Test procedures and planning to continue.

Further details are shown in Section 4.7.3

4.6.4 Issues

Table 4-7. Testing and Commissioning issues identified and actions taken for February 2022

Issues	Actions
Lack of planning plans and procedures.	- The readiness Workshop was requested and held on December 14, 2021. Subsequentassessment to be conducted. - Face-to-face meeting requested in February to drive completion of the traction powertest plan – this has occurred, and a detailed tracking list has been developed for SAT test procedures. - A detailed gap analysis is being conducted to ensure all requirements are met and tested, so that Milestone 1 can be delivered successfully.
Delays in TPS 2 Testing.	- Recovery plans are being discussed to assess how some of the delays can be mitigated during TPS 2 testing. - Parallel testing to support and accelerate testing dates. - Additional track access is being provided. - Flexibility in lead times for reviews and document submission.
Detailed schedule – lack of details to track on a weekly basis.	- The testing and commissioning meetings have been progressing towards a more detailed status of ongoing testing for Segment 4 completion. - A detailed tracker has been established, and further detail is being added to it every week.

4.7 Intermediate Milestone #1

4.7.1 Introduction

Milestone #1 is the milestone tied to allowing EMUs to start testing onsite within the limits of Segment 4. In order to achieve this, 115kV power must be activated for a substantial portion of the integrated testing to be performed.

4.7.2 Completed Work

- Readiness review workshop**:** The first workshop was held on December 14, 2021. The purpose of this workshop was to understand the state of readiness (based on FTA's Oversight Procedure 54 – Readiness for Service) for Milestone 1. This benefited both the Agency and the Contractor through collaboration and alignment on goals. In addition, because a workshop has already occurred, ongoing activities are being monitored very closely leading up to Energization.

- Completed punch list walks in Segment 4 for:
    - ROW Completion and Clean Up.
    - OCS Foundation Completion, Bonding and Grounding.
    - Fence Completion, Bonding, and Grounding.
    - Station Platform Grounding, and Bonding.
    - Grade Crossing Grounding and Bonding.
    - Bridge Protection Barrier Grounding and Bonding.

- Systems elements
    - PG&E deliverables for 115kV energization progressing well. A majority of them for Line 1 have been received and are under review.
    - Traction Power and SCADA troubleshooting and pre-testing is ongoing and progressing towards completion.
    - OCS visual inspections and acceptance testing started at the end of February.
    - VOIP phones handed over for installation and testing.
    - Network switch upgrades completed to support this project.
    - SCADA cutover testing completed.

4.7.3 Upcoming Work

Energization for Milestone 1 is a key target, and work is being completed to prepare for this. The work is divided into two areas: Infrastructure Completion and System Completion.

4.7.3.1 Infrastructure Completion

- Commencement of joint Segment 4 Infrastructure walk-through.
- Completion of the bonding and grounding walk-through for Segment 4.

4.7.3.2 Systems work completion, including Energization

SUB-SYSTEM	MARCH	APRIL
TRACTION POWER	Testing on secondary line – breakers, relays, transformers Design Criteria Checklists Final Site Walk	Site Acceptance Tests Construction Conformance Specification Checklists
OCS	Address punch list items Visual Inspection Test Pantograph Clearance Test Dead Car Pull Test Loop Resistance Hi-Pot tests Design Criteria Checklists Final Grounding / Bonding Walk	Sectionalization Test for OCS activation (using a simulated voltage) Construction Conformance Specification Checklists
SCADA	SCADA Troubleshooting & pre-testing Interlock Tests	Site Acceptance Tests (Integrated Tests)
SIGNALS	Segment 2, Phase 3 & 4 cutover	Segment 2, Phase 3 & 4 cutover
COMMUNICATIONS	Network troubleshooting Design Criteria Checklists	Construction Conformance Specification Checklists
GROUNDING & BONDING	Grounding Tests at remaining locations Design Criteria Checklists	Construction Conformance Specification Checklists
BRIDGE ATTACHMENTS	Design Criteria Checklists	Construction Conformance Specification Checklists
EMUS	Static Testing Design Criteria Checklists	Static Testing Construction Conformance Specification Checklists
INTEGRATED TESTING	Planning & confirmation of sequence of tests	Review/approve test procedures

The following are high-level activities planned for future months:

- Utility Feed Energization for TPS2.
- Segment 4 TPS/OCS energization.
- Short Circuit Test.
- EMU Dynamic Testing.
- EMU PTC Testing.
- Live wire Tests.
- Live run with EMU.

4.7.4 Issues

Intermediate Milestone #1 issues identified and actions taken for February 2022

Issues are described above in Section 4.6.

5.0 QUALITY ASSURANCE

5.1 Introduction

The Quality Assurance (QA) staff performs technical reviews for planning, implementing, evaluating, and maintaining an effective program to spot verify that equipment, structures, components, systems, and facilities are designed, procured, constructed, installed, and maintained in accordance with established criteria and applicable codes and standards throughout the design, construction, startup, and commissioning of the project.

5.2 Completed Work

- **Non Conformance Reports:** A total of Five (5) Non-conformance reports (NCR) are under review by Caltrain and BBI for closure. BBI issued NCR 84 and is currently under review by JPB. Follow up on NCR 16 awaiting response from BBI.
- **QA Audit Findings Status:** Review and follow-up on JPB Audit 2021-003, awaiting BBI response.
- Currently reviewing data from recent field surveillance TPS 2 Cabinet replacement and temporary power.
- BBI performed an audit at the Texas MFG for OCS poles. Results currently under review.
- **Buy America Status:**
  - A meeting with PMOC and Buy America consultants was held on November 15, 2021 to respond to BA questions. PMOC/BA consultants commented that the BBII cost report provided to the Project did not validate compliance to BA based on current FTA BA reporting requirements. The end products must be categorized by components, subcomponent and percentage of domestic/non-domestic materials shown.
  - JPB consulted with external legal counsel pertaining to Buy America and is working with the Contractor to provide breakdown that is in compliance with FTA reporting requirements.
- Review and update QMP
- BBII Quality Plan Review
- JPB Construction Oversight Manual Review
- JPB QMP Review / CHSR QMP Review

5.3 Upcoming Work

There are ongoing quality assurance activities around technical reviews for planning, implementing, evaluating, and maintaining an effective program to spot verify that equipment, structures, components, systems, and facilities are designed, procured, constructed, installed, and maintained in accordance with established criteria and applicable codes and standards throughout the design, construction, startup, and commissioning of the PCEP. Continue review of Plan(s).

5.4 Issues

Table 5-1. Quality Assurance issues identified and actions taken for February 2022

Issues	Actions
UPRR has identified switch machine isolation concerns and system duct bank trough clearanceissues for the track that they maintain.	- JPB Operations to resolve.
BBII BA Compliance Report	- JPB external legal counsel provided language outlining FTA reporting requirements. PCEP issued a letter to BBII on 1/5/21, outlining reporting requirements to validate BBII BA compliance. JPB has issued a formal letter to BBII and is currently awaiting a formal response. JPB and BBI Management to meet and discuss further.
Closure of JPB NCRs	- JPB Engineering and Special Projects Manager to facilitate closure of NCRs.
Punch List Notification and Process	- Contractor to submit formally via Aconex. Agency currently drafting a procedure for all team members to follow.

6.0 PUBLIC RELATIONS

6.1 Introduction

The Community Relations and Outreach team coordinates all issues with all jurisdictions, partner agencies, government organizations, businesses, labor organizations, local agencies, residents, community members, other interested parties, and the media. In addition, the team oversees the BBII's effectiveness in implementing its Public Involvement Program.

6.2 Completed Work

The following public relations actions were taken in February 2022:

- The Project team held various outreach meetings with key local, state, and federal elected officials regarding budget need.
- The Project team gave presentations to:
    - Local Policy Makers Group
    - City/County Coordinating Group
    - San Mateo County Transportation Authority
    - San Mateo County Transportation Authority Citizen Advisory Committee
- The Project team sent out the following notices about construction activities:
    - Whipple Avenue Closure
    - Oyster Point Blvd Closure
    - Oyster Point US 101 Ramp Closure
    - San Francisco/Brisbane Paralleling Station Gantry Installation
    - Redwood City Station Parking Closure
    - SR 87 Lane Closure
    - Brewster Avenue Closure
    - Maple Street Closure
    - Redwood City Station Pedestrian Detour

6.3 Upcoming Work

The Community Relations and Outreach team is supporting the Signal System cutover work schedule for March 2022 in Burlingame and San Mateo. The team is also planning for the delivery and arrival of the first electric train in March 2022.

6.4 Issues

Table 6-1. Public Relations issues identified and actions taken for February 2022

Issues	Actions
N/A	N/A