Caltrain Modernization Program
Peninsula Corridor Electrification Project (PCEP)

May 2021
Monthly Progress Report

May 31, 2021

Funding Partners

Federal Transit Administration (FTA) Core Capacity

FTA Section 5307 (Environmental / Pre Development only)

FTA Section 5307 (Electric Multiple Unit (EMU) only)

Prop 1B (Public Transportation Modernization & Improvement Account)

Caltrain Low Carbon Transit Operations Cap and Trade

Proposition 1A

California High Speed Rail Authority (CHSRA) Cap and Trade

Carl Moyer Fund

Bridge Tolls (Funds Regional Measure (RM) 1/RM2)

San Francisco County Transportation Authority (SFCTA)/San Francisco Municipal Transportation Agency (SFMTA)

San Mateo County Transportation Authority (SMCTA) Contribution

SMCTA Measure A

Santa Clara Valley Transportation Authority (VTA) Measure A

VTA Contribution

City and County of San Francisco (CCSF) Contribution

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1.0 BACKGROUND

Over the last decade, Caltrain has experienced a substantial increase in ridership and anticipates further increases in ridership demand as the San Francisco Bay Area's population grows. The Caltrain Modernization (CalMod) Program, scheduled to be implemented by 2022, will electrify and upgrade the performance, operating efficiency, capacity, safety, and reliability of Caltrain's commuter rail service.

The PCEP is a key component of the CalMod Program and consists of converting Caltrain from diesel-hauled to Electric Multiple Unit (EMU) trains for service between the San Francisco Station (at the intersection of Fourth and King Streets in San Francisco) and the Tamien Station in San Jose. Caltrain will continue Gilroy service and support existing tenants.

An electrified Caltrain will better address Peninsula commuters' vision of environmentally friendly, fast and reliable service. Electrification will modernize Caltrain and make it possible to increase service while offering several advantages in comparison with existing diesel power use, including:

- **Improved Train Performance, Increased Ridership Capacity and Increased Service:** Electrified trains can accelerate and decelerate more quickly than diesel-powered trains, allowing Caltrain to run more efficiently. In addition, because of their performance advantages, electrified trains will enable more frequent and/or faster train service to more riders.
- **Increased Revenue and Reduced Fuel Cost:** An electrified Caltrain will increase ridership and fare revenues while decreasing fuel costs.
- **Reduced Engine Noise Emanating from Trains:** Noise from electrified train engines is measurably less than noise from diesel train engines. Train horns will continue to be required at grade crossings, adhering to current safety regulations.
- **Improved Regional Air Quality and Reduced Greenhouse Gas Emissions:** Electrified trains will produce substantially less corridor air pollution compared with diesel trains even when the indirect emissions from electrical power generation are included. Increased ridership will reduce automobile usage, resulting in additional air quality benefits. In addition, the reduction of greenhouse gas emissions will improve our regional air quality, and will also help meet the state's emission reduction goals.

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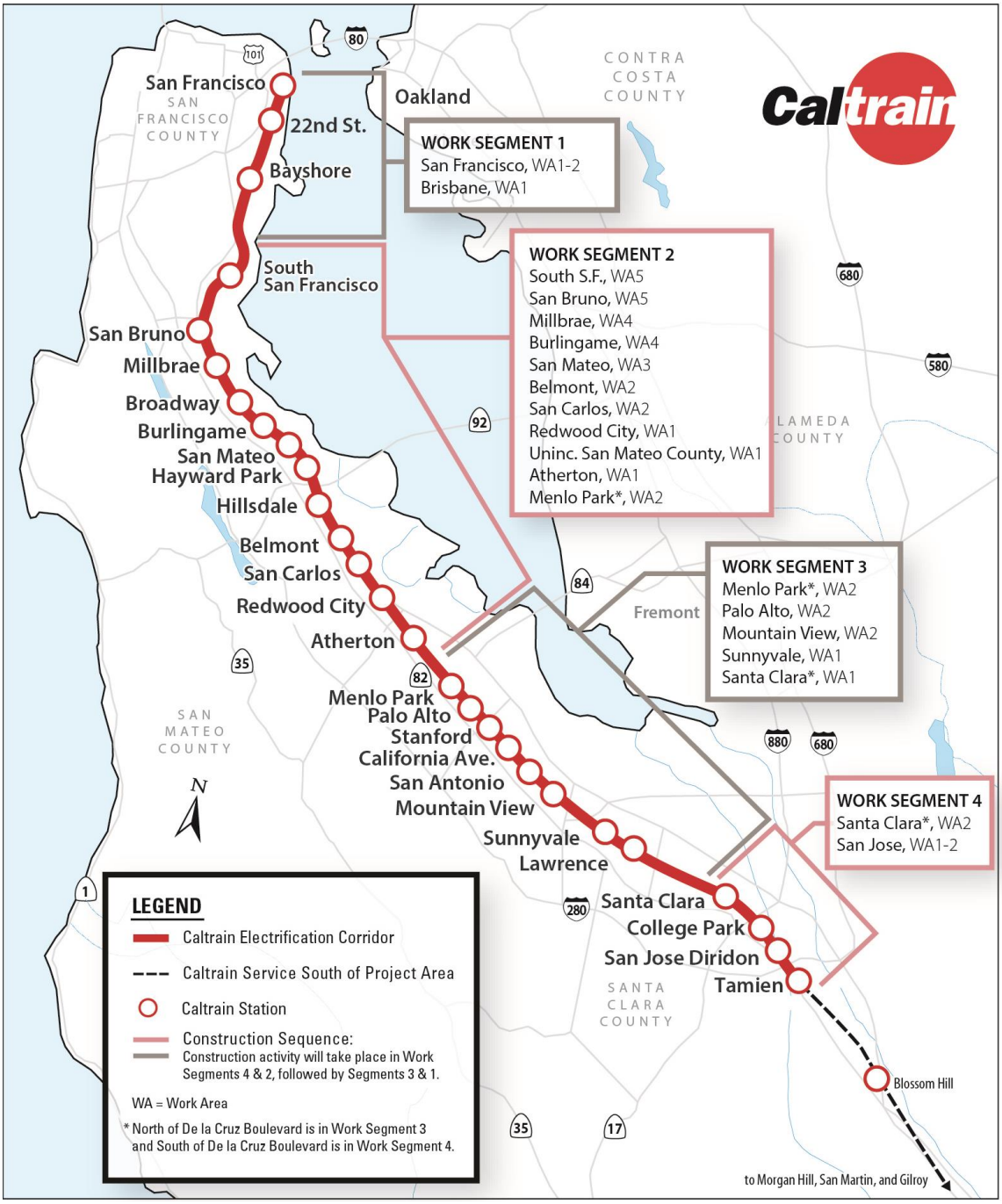
2.0 EXECUTIVE SUMMARY

The Monthly Progress Report is intended to provide an overview of the PCEP and provide funding partners, stakeholders, and the public an overall update on the progress of the project. This document provides information on the scope, cost, funding, schedule, and project implementation. Work along the Caltrain Electrification Corridor has been divided into four work segments and respective work areas (WA) as shown in Figure 2-1. PCEP activities are described and summarized by segments and work areas.

Figure 2-1 PCEP Work Segments



Crews continued foundation installation in Segment 2 between Belmont and Atherton, as well as off-track foundations in Segment 1. Installation of gantry foundations was completed at Paralleling Station (PS) PS-1 in San Francisco. Other PS work included ductbank, low voltage wire, drainage, access ramp, and light pole installations.

Punch list work continued at the Centralized Equipment Maintenance and Operations Facility (CEMOF), and the CEMOF Modifications Contract is expected to be complete by July 2021.

PG&E completed the low voltage gantry terminations at the East Grand and FMC Substations.

Trainset 1 is still undergoing dynamic type testing in Pueblo, CO. This month, brake testing, propulsion testing, and wheel spin/slide protection testing was conducted. The Train Control Final Design Review was completed leaving only two software-based FDRs left to complete, which are anticipated mid-2021.

2.1. Monthly Dashboards

Dashboard progress charts are included below to summarize construction progress.

Figure 2-2 Expenditure – Planned vs. Actual

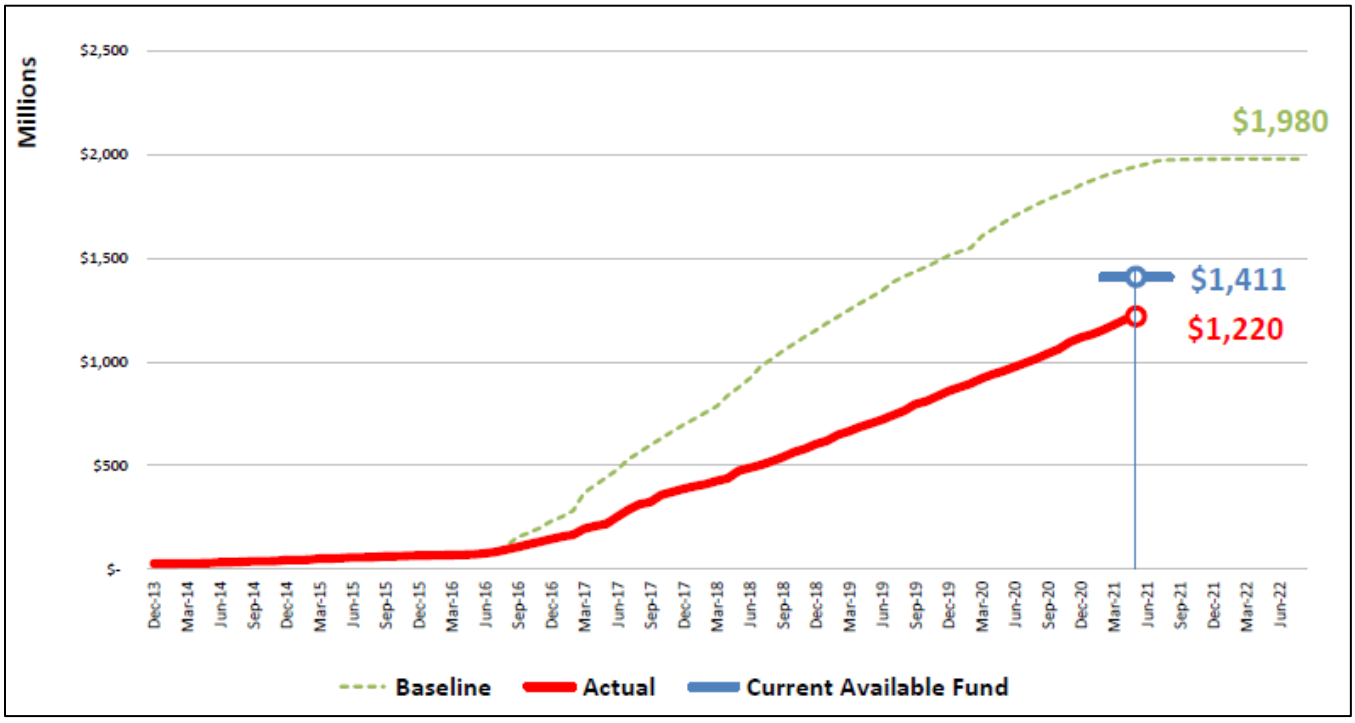


Figure 2-3 Spending Rate vs. Required

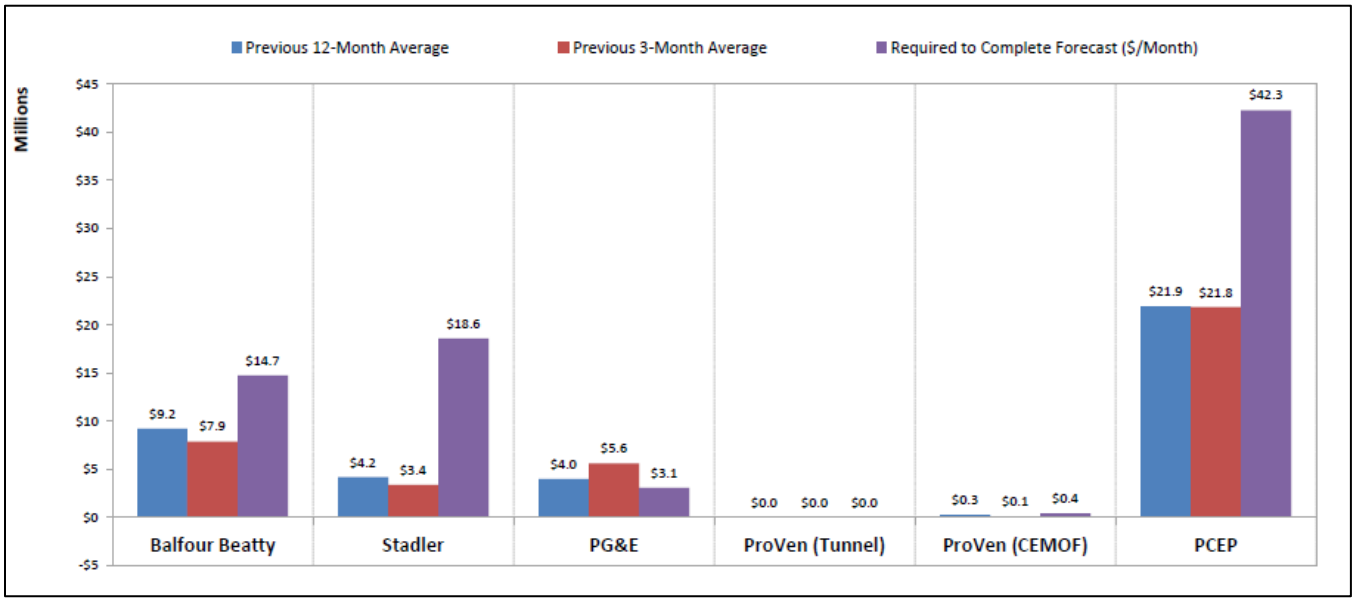


Figure 2-4 Construction Contract Budgets

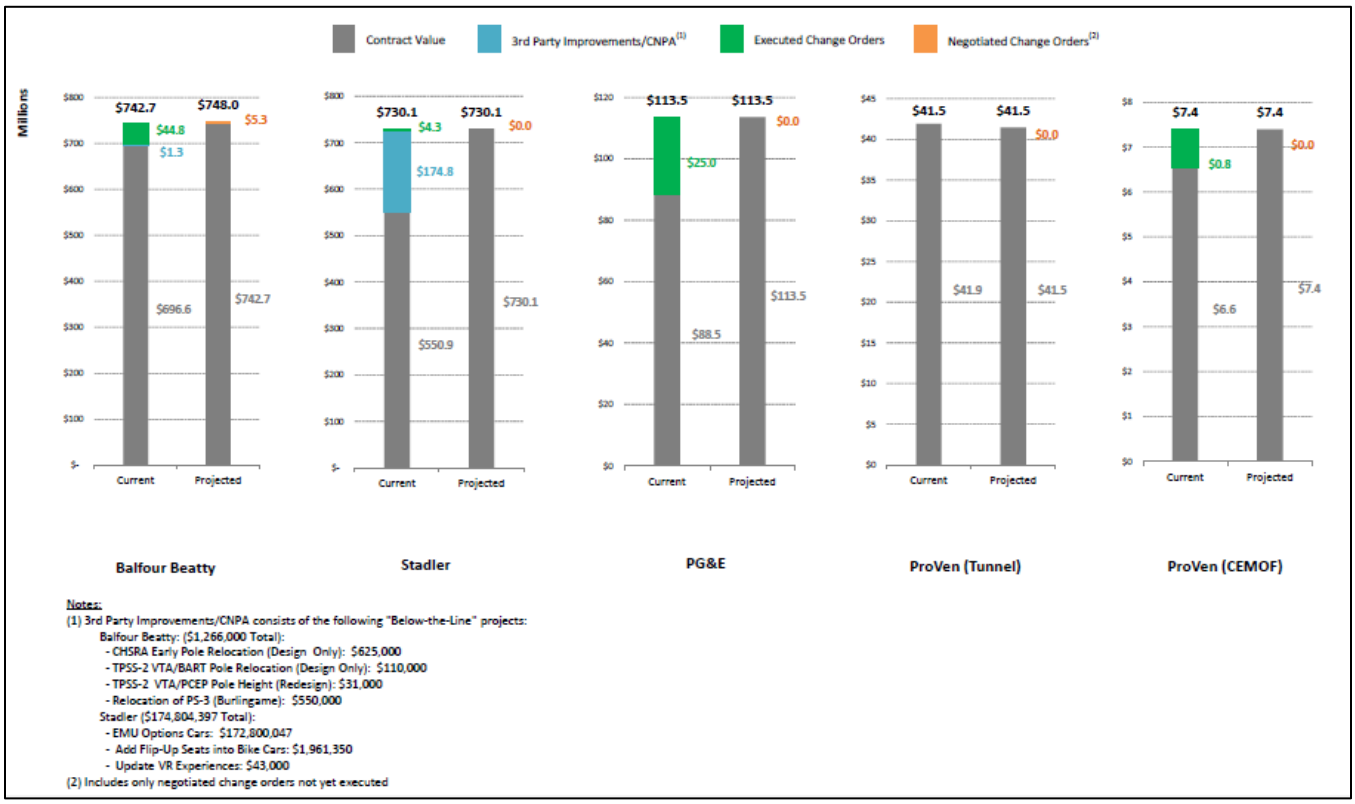
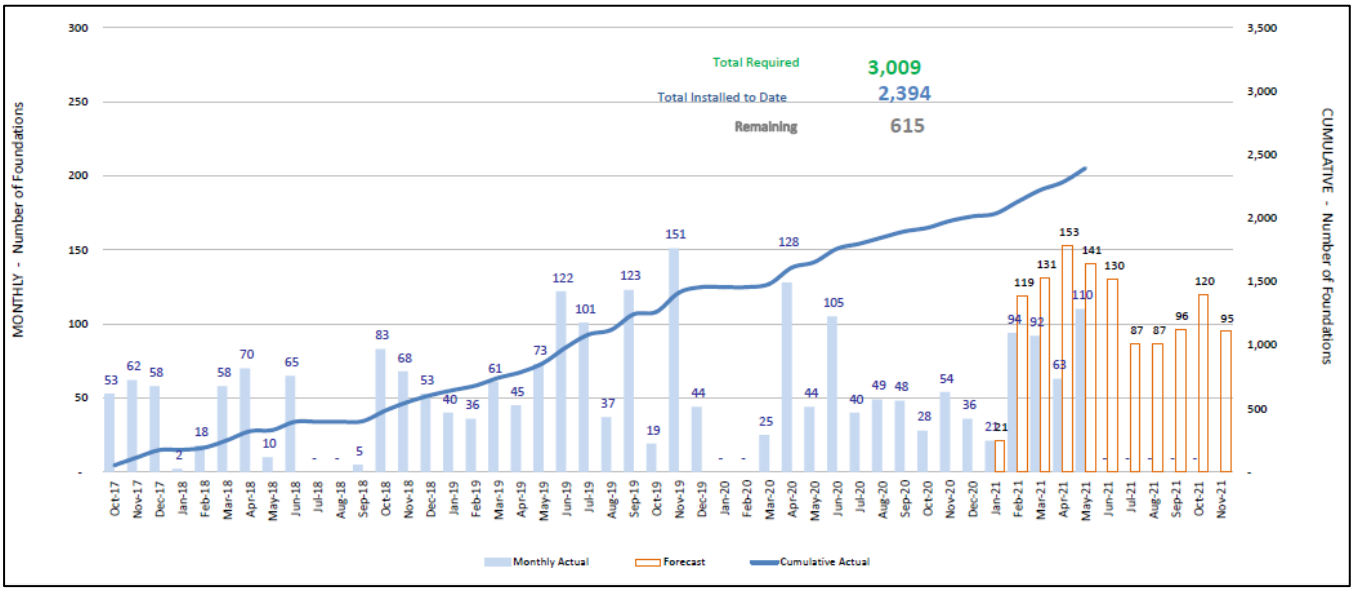


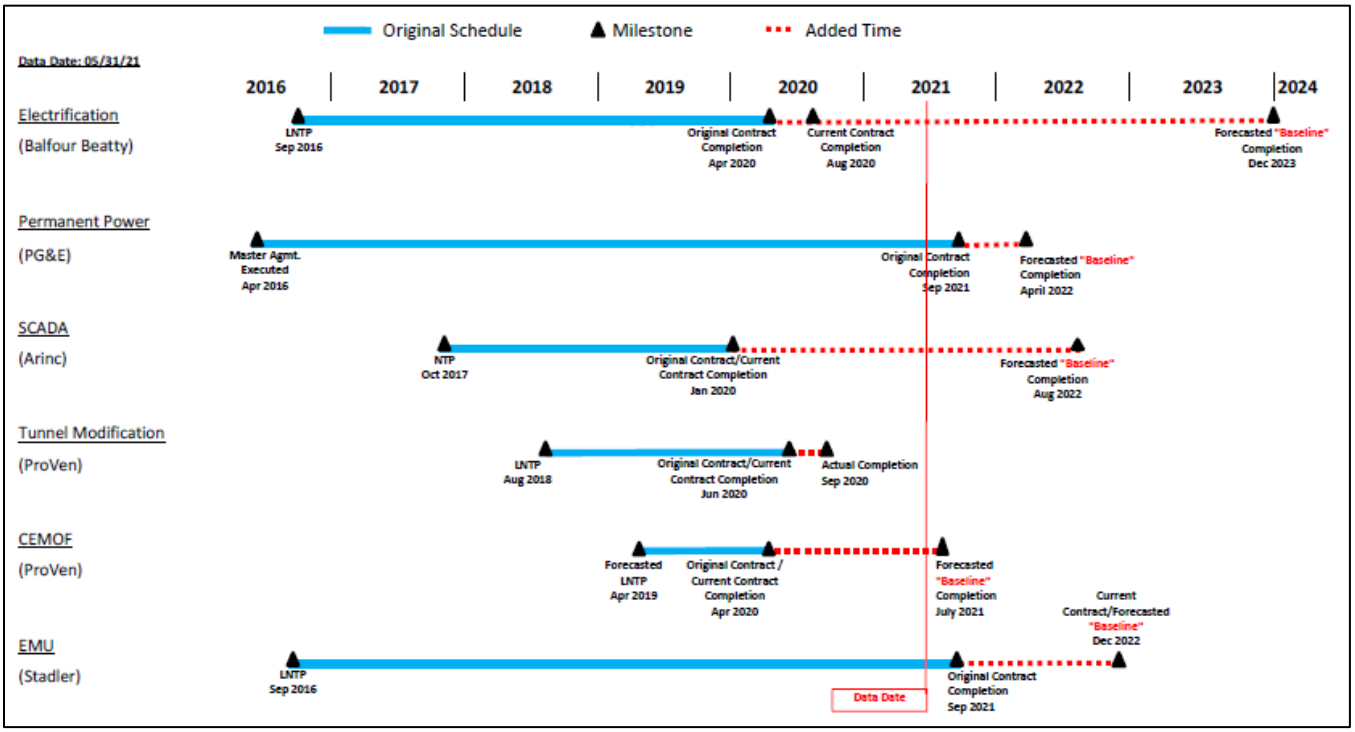
Figure 2-5 OCS Foundation Production



Notes regarding tables above:

1. BBII is reporting a delay in the completion date for the OCS foundations from May 2021 to July 2021. PCEP's own projection of BBII's productivity estimates the completion date to be in November, reflected in Figure 2-5. The monthly forecast is revised at the end of ongoing OCS foundation workshops, which are held to determine the level of effort necessary for each of the activities prior to foundation installation. The delay to the OCS foundation completion date does not change the substantial completion date of the BBII contract.

Figure 2-6 Contractor Completion Schedule



2.2. Funding Partners Participation in PCEP

The PCEP has a series of weekly, biweekly, monthly and quarterly meetings to coordinate all aspects of the program. The meetings are attended by project staff with participation by our funding partners in accordance with the Funding Partners Oversight Protocol. A summary of funding partner meetings and invitees can be found in Appendix B.

This section of the report provides a summary of the discussions and decisions made at the meetings and a list of funding partners who attended the meetings.

Electrification – Weekly Discipline-Specific Meetings

Purpose: To replace the previous weekly Engineering Meeting with three discipline-specific meetings for the three major categories of work under the Electrification Design Build (DB) contract: Overhead Contact System (OCS) Foundation, Traction Power Facilities (TPF), and Signals. Each meeting will focus on the status, resolution and tracking of Balfour Beatty Infrastructure, Inc. (BBII) and Electrification design- and construction-related issues.

Activity this Month

OCS Foundation Meeting

Funding Partners: None

- Review of upcoming foundation design and installation schedule
- Discussion of open issues impacting foundations design and installation
- Discussion of outstanding Requests for Information (RFI)
- Review of foundation designs that potentially impact Right of Way (ROW)
- Review of outstanding Field Orders or Change Notices required for work to continue

TPF Meeting

Funding Partners: None

- Review of outstanding items as they relate to the design and construction of the PG&E Interconnection
- Review of PG&E Interconnection schedule
- Discuss progress and next steps for the Single-Phase Study
- Discuss outstanding comments on the interconnection agreement
- Review and resolve open issues on the construction and design of the TPFs (paralleling stations, traction power substations, switching station)

PCEP Delivery Coordination Meeting – Bi-Weekly

Purpose: To facilitate high-level coordination and information sharing between cross-functional groups regarding the status of the work for which they are responsible.

Activity this Month

Funding Partners: SFCTA: Luis Zurinaga; MTC: Trish Stoops; CHSRA: Sharath Murthy

The next Project Management Oversight Consultant (PMOC) monitoring visit is scheduled to occur virtually on June 21-23. The PCEP presentation to the SFCTA Board has been rescheduled to July 27 and the presentation to the Citizens Advisory Committee (CAC) has been rescheduled to July 28. There are two remaining cutovers in Segment 4 that are scheduled for the weekend of June 11 and June 25. In Testing and Commissioning, the Factory Acceptance Test (FAT) for the TPS-2 control building has been set for June 2-4 and several JPB personnel will be in attendance to witness the testing. For EMU design and testing, the Train Control final design review (FDR) has been completed and two FDRs are now remaining. Train 2 heating, ventilation, and air conditioning (HVAC) air flow tests have been completed and Car B has left Salt Lake City, UT for climate room testing in Elmira, NY. Car F has arrived in Pueblo for eight-car testing, which will begin in June. A Federal Railroad Administration (FRA) sample car inspection is targeted for fall 2021 in Salt Lake City, UT. In Design Build activities, foundation installation is continuing in S2WA1 and S2WA2, and off-track foundation installation will resume in Segment 1 for OCS foundations. The strain gantry installation at PS-6 has been completed. Resolution for several open items from the SCADA FAT is ongoing.

Systems Integration Meeting – Bi-Weekly

Purpose: To discuss and resolve issues with inter-system interfaces and to identify and assign Action Item Owners for interface points that have yet to be addressed.

Activity this Month

Funding Partners: CHSRA: Sharath Murthy

Bi-weekly PCEP System Integration meetings are held to monitor and determine appropriate resolution for systems integration issues. The Systems Integration Lead also maintains contact with the EMU procurement team. The Traction Power SCADA team also holds bi-weekly status meetings. Coordination with the EMU procurement, Positive Train Control (PTC) and Caltrain Capital Project managers responsible for other capital projects on the corridor is ongoing. There is coordination with PG&E construction of the Interconnection to TPS-2, and the CEMOF upgrades as well. The Systems Integration meeting has been arranged to have a technical discussion of the interface issues to existing Caltrain legacy systems followed by a shorter session with CalMod management for elevation of issues identified. A smaller “breakout” group is meeting to determine and track what testing and with which resources will need to be coordinated among the various contracts and suppliers. This “Testing and Commissioning Meeting” is the primary interface to the PCEP Design-Build Team at this time. Work to define dependencies for completion of Segment 4 (Intermediate Milestone #1) is ongoing with the Testing & Commissioning discussion. The schedule fragnet for the achievement of Intermediate Milestone #1 has been largely developed and the group continues to refine

this and monitor progress toward achievement of the milestone. This group will report back to the System Integration meeting group with their findings.

Master Program Schedule (MPS) Meeting – Monthly

Purpose: To review the status of the MPS and discuss the status of major milestones, critical and near-critical paths, upcoming Board review items, and progress with the contracts, among others.

Activity this Month

Funding Partners: Metropolitan Transportation Commission (MTC): Trish Stoops; SFCTA: Luis Zurinaga; CHSRA: Sharath Murthy

JPB has proposed a new revised Revenue Service Date (RSD) as a result of the risk refresh exercise performed by FTA-PMOC in December 2020. RSD is forecasted to occur between January 1, 2024 and March 31, 2024. When six to eight months of risk contingency is included, the new proposed revised RSD is September 26, 2024.

The program's critical path was revised in May due to the incorporation of the signals cutover execution plan into the MPS.

Milestone #1 - Segment 4 Construction Completion continues to be impacted by damage to the TPS-2 switchgear sustained during mishandling at customs in North Carolina. The new forecasted date for Milestone # 1 is October 15, 2021.

Stadler's forecasted conditional acceptance of the 14th trainset in the MPS May update remains December 9, 2022 and 1st trainset arrival at JPB is November 24, 2022. The impact of both the replacement of the internal parts supplier remains unknown in Stadler's schedule during the upcoming months.

The JPB's forecasted electrification substantial completion date for the BBII contract in the MPS May update is December 31, 2023. JPB is working with BBII to improve progress on both the signals system, which lags behind baseline productivity level, and traction power facilities, which continue to progress at a slow rate.

Risk Assessment Meeting – Monthly

Purpose: To identify risks and corresponding mitigation measures. For each risk on the risk register, mitigation measures have been identified and are being implemented. Progress in mitigating these risks is confirmed at the ongoing risk monitoring and monthly risk assessment meetings.

Activity this Month

No meeting was held in May due to the absence of items for the agenda.

Change Management Board (CMB) – Monthly

Purpose: To review, evaluate and authorize proposed changes to PCEP over $200,000. The CMB discusses major topics including potential changes to PCEP contracts, contingency usage, track access delays and Differing Site Conditions (DSC) field order updates. Potential contract changes will follow the PCEP Change Order Procedure. Once approved changes are executed, they will be reported in the Change Management section (Section 9) of this report.

Activity this Month

Funding Partners: CHSRA: Boris Lipkin and Sharath Murthy; SFCTA: Luis Zurinaga; SMCTA: Joe Hurley; MTC: Trish Stoops and Kenneth Folan; VTA: Franklin Wong; FTA: Mike Eidlin

BBII Contract

Three changes were approved.

CEMOF Contract

No changes were identified for consideration.

Stadler Contract

No changes were identified for consideration.

SCADA Contract

No changes were identified for consideration.

Tunnel Modification Contract

No changes were identified for consideration.

Amtrak Contract

No changes were identified for consideration.

Other

One change was approved.

2.3. Schedule

JPB has proposed a new revised Revenue Service Date (RSD) as a result of the risk refresh exercise performed by FTA-PMOC in December 2020. RSD is forecasted to occur between January 1, 2024 and March 31, 2024. When six to eight months of risk contingency is included, the new proposed revised RSD is September 26, 2024.

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Table 2-1 indicates major milestone dates for the MPS.

Table 2-1 Schedule Status

Milestones	Program Plan	Progress Schedule (May 2021)[1]
Milestone #1 Segment 4 Construction Completion	11/21/2019	10/04/2021 [1]
Arrival of First Vehicle at JPB	N/A	11/24/2021 [2]
PG&E Provides Permanent Power	09/09/2021	04/15/2022
FFGA RSD	08/22/2022	08/22/2022
Acceptance of 14th Trainset	08/20/2021	12/09/2022 [2]
Electrification Substantial Completion	08/10/2020	12/31/2023 *
Revenue Service Date (RSD)	12/09/2021	01/01/2024 – 03/31/2024
Proposed Revised RSD with Contingency	N/A	09/26/2024

Note:
1. Dates may shift slightly in the next month's Progress Schedule update due to additional signal cutovers in Segment 4.
2. These dates are expected to be delayed due to the replacement of internal parts supplier.
A Completed Milestone.
* Pending mediation process resolution with BBII.

2.4. Budget

A summary of the overall budget and expenditure status for the PCEP is provided in Table 2-2 below.

Table 2-2 Budget and Expenditure Status

Description of Work	Budget (A)	Current Budget (B)[1]	Cost This Month (C)[2]	Cost To Date (D)[3]	Estimate To Complete (E)	Estimate At Completion (F) = (D) + (E)
Electrification Subtotal	$1,316,125,208	$1,316,125,208	$13,206,813	$936,747,974	$379,377,234	$1,316,125,208
EMU Subtotal	$664,127,325	$664,127,325	$643,461	$282,933,333	$381,193,992	$664,127,325
PCEP TOTAL	$1,980,252,533	$1,980,252,533	$13,850,274	$1,219,681,307	$760,571,225	$1,980,252,533

Notes regarding tables above:

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

2.5. Board Actions

- Authorize the Application for and Receipt of Annual Cap and Trade Funding for the Procurement of Electric Multiple Unit Vehicles
- Project office lease extension

Future anticipated board actions include:

- Change order to the Traction Power Facility Supervisory Control and Data Acquisition (SCADA) System contract with ARINC, Inc. for database changes
- Change orders as needed

2.6. Government and Community Affairs

There were two outreach events this month.

3.0 ELECTRIFICATION – INFRASTRUCTURE

This section reports on the progress of the Electrification, SCADA, and Tunnel Modification components. A brief description on each of the components is provided below.

3.1. Electrification

The Electrification component of the PCEP includes installation of 138 miles of wire and overhead catenary system (OCS) for the distribution of 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.

Activity This Month

- Continued installation of on-track foundations in S2 WA1 and 2.
- Continued installation of off-track foundations in Segment 1.
- Continued installation of OCS poles, cantilevers, and wires in Segments 3 and 4.
- Continued regulation of OCS wires (sagging the wires) in Segment 3.
- Continued installation of shunt wires in Segment 3.
- Continued to pothole at proposed OCS locations and utility locations in Segment 2 and Segment 1 in preparation of upcoming foundation installations.
- Continued to resolve conflicts found during the potholing process, such as loose concrete, asphalt, and other debris, and continued designing solutions for those conflicts that cannot be avoided. The conflicts must be resolved before installation of foundations at those locations.
- Relocated signal cables and remove abandoned facilities found in conflict with planned OCS foundations as conflicts were identified.
- PS-1:
  - Completed installation of gantry foundations.
  - Continued installation of ductbanks for PG&E service and lighting.
  - Began shallow foundation installation.
- PS-2:
  - Continued installation of PG&E ductbank, pulling wire and installing low voltage equipment.
  - Continued installing ground grid.
  - Installed bus from 25 kV transformer to riser structure.
- PS-3:
  - Continued construction of high voltage ductbank.

  - Reviewed city comment responses for the Issued for Construction (IFC) design draft with PGH Wong, BBII, and the City of Burlingame.
  - Updated low voltage drop easement survey drawings provided to the City of Burlingame.
  - Progressed work on ductbank excavation and gantry conduit layout.
  - Poured blast wall.
- PS-4:
  - Continued pulling low voltage wires.
  - Poured fence post foundations.
  - Placed drain rock.
  - Completed backfill for cinderblock wall footing.
- PS-5: Continued installation of plantar box and grouting of foundations.
- PS-6:
  - Continued drainage and access ramp installation.
  - Installed strain gantry foundations.
- PS-7: Continued low voltage drop termination.
- TPS-1: Continued installation of low voltage terminations.
- TPS-2: Continued installation of drain rock and light poles.
- SWS-1: Continued with low voltage termination.
- Continued to install signal ductbank, conduits, and cables in Segment 2 and Segment 1.
- Performed signal equipment and track circuit installation in Segment 2.
- Pulled signal cables, installed signal equipment and installed transformers in Segment 2.
- Installed signal house at Milepost (MP) MP 14.87 and MP 14.89.
- Performed track circuit setup and local testing at Control Point (CP) Shark and Alameda.
- Performed track bonding in Segments 2 and 4.
- Continued fiber optic cable installation and splicing in Segment 4.
- Install overhead bridge attachments at various locations in Segment 3 and 4.
- Progressed the OCS design with BBII in all segments, which included submittal and review of Design Change Notices for revised foundation locations.
- Continued Right of Way acquisition process for off-track foundation installation in Segment 1.
- Continue Right of Way acquisition for TPS-1 interconnection.
- Coordinated design review with local jurisdictions for the OCS, traction power facilities, and bridge attachments design, including responses to comments from jurisdictions.

- Continued to review and coordinate signal and communication design submittals with BBII.
- Continued internal discussions about design, installation and testing of signal and communications modifications to the Caltrain system and schedule for cutover plans.
- Continued discussions with VTA on Right of Way acquisition for TPS-2 interconnection.
- Worked with BBII through Site Specific Work Plans (SSWP) for upcoming field work.
- Continued model validation for the single phase study.
- PG&E continued work at East Grand and FMC substations.
- PG&E continued TPS-2 and TPS-1 Interconnection work.

A summary of the work progress by segment is provided in Table 3-1 below.

Table 3-1 Work Progress by Segment

Segment	Work Area	Foundations			Poles		
		Required[abc]	Completed this Month	Completed to Date	Required[ab]	Completed this Month	Completed to Date
1	Tunnels	32	0	32	32	0	32
	A	303	21	21	259	0	0
	B	232	3	92	177	0	0
2	5	247	0	246	208	0	160
	4	316	1	316	253	0	190
	3	177	0	176	140	0	43
	2	239	48	133	205	0	60
	1	202	37	115	154	0	33
3	2	509	0	509	445	0	445
	1	392	0	392	310	0	306
4	A	242	0	242	180	2	173
	B	128	0	128	124	2	105
	CEMOF	85	0	85	81	49	49
Total		**3,104**	**110**	**2,487**	**2,568**	**53**	**1,596**

Note:
a. Foundations required do not match poles required as guy foundations are needed in some locations for extra support.
b. Reported number of required poles and foundations fluctuate due to Design changes.
c. Update: To-date, 30 foundations have been installed by the South San Francisco in S2WA5 and 65 have been installed by the 25th Ave projects in S2WA3.

Activity Next Month

- Continue OCS foundation installations, in S2WA2 and 1.
- Continue off-track OCS foundation installations in S1.
- Continue resolution of foundation conflicts.
- Continue to install protective steel plates for protection of utilities during foundation installation.
- Continue to install OCS poles and assemblies in all Segments where available.

- Continue wire installation and regulation in Segments 3 and 4.
- Continue shunt wire installation.
- Continue work with BBII on field investigation activities and designs, which will include the progression of the OCS, traction power, bonding and grounding, signal systems, and other civil infrastructure such as overhead bridge protections.
- Pothole and clear obstructions at proposed OCS locations.
- Continue construction at TPS-1 and TPS-2.
- PS-1
  - Install ductbank and conduit stubups for PG&E service.
  - Complete shallow foundation installation.
  - Install grounding grid.
- PS-2
  - Install PG&E service ductbank.
  - Continue to install ground grid.
  - Install low voltage steel for risers and fuses.
- PS-3
  - Pour blast wall.
  - Install main gantry foundations and high voltage ductbank.
  - Complete city comment responses for the IFC design draft with PGH Wong, BBII, and the City of Burlingame.
  - Finalize low voltage drop easement drawings with City of Burlingame.
- PS-4
  - Finish installing ground grid and strain gantry foundations.
  - Install grounding pads, curb, gate, and fence panels.
- PS-6: Begin low-power drop civil and electrical work.
- PS-7:
  - Install communications equipment in 25 kV enclosure.
  - Complete low voltage termination.
- SWS-1: Complete low voltage termination.
- Continue to install conduit and foundations for signal and wayside power cubicle (WPC) units in all Segments.
- Continue cable termination at signal locations in Segment 4.
- Continue fiber installation and splicing in Segment 4.
- Continue preparation for next signal cutover in Segment 4.
- Continue conduit installations in Segments 2 and 1.
- Continue to install impedance bond connections.

- Continue to install bridge attachments.
- Continue to progress location-specific design for grade crossing system.
- Continue planning process for signal cutovers.
- Review BBII work plans for upcoming construction activities.
- Coordinate with PG&E on construction for PG&E infrastructure.
- Coordinate with local jurisdictions to review designs.
- Continue tree pruning and removals.
- Continue progress on Single Phase Study.

3.2. Supervisory Control and Data Acquisition

SCADA is a system that monitors and controls field devices for electrification, including 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.

Activity This Month

- Submitted Monthly Progress Report.
- Submitted May Schedule Update.
- Continued progress on change requests related to cutover.
- Received Limited Notice to Proceed (LNTP) to provide a proposal on the second part of the points list changes due to version 11 of the Points List.

Activity Next Month

- Prepare and deliver the Monthly Report and the Monthly Schedule Update.
- Attend project status meetings (virtually).
- Review and address punch list items from FAT.
- Begin installation of hardware at BCCF & CCF.

3.3. Tunnel Modification

Tunnel modifications will be required on the four tunnels located in San Francisco. This effort is needed to accommodate the required clearance for the OCS to support electrification of the corridor. Outside of the PCEP scope, Caltrain Engineering has requested the PCEP team to manage completion of design and construction for the Tunnel 1 and Tunnel 4 Drainage and Track Rehabilitation Project. The Tunnel Drainage and Track Rehabilitation Project is funded separately from PCEP.

Activity This Month

- Reconciled Change Orders.
- Progressed As-Built Drawings.

Activity Next Month

- Reconcile Change Orders.
- Receive As-Built Drawings from ProVen.
- Closeout Contract documents – Requests for Information (RFIs), submittals, and letters.

3.4. Interconnection Construction

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. Construction of the interconnections will be performed by PG&E under an amendment to Supplemental Agreement No. 2.

Activity This Month

- EGS – TPS-1:
  - Circuit #1 ductbank installation completed at the East Grand Substation.
  - Completed PG&E low-voltage gantry termination.
  - Completed fine-grade on-site.
  - Completed Transmission Structure Pole (TSP) redesign coordination with South San Francisco team, TRC and PG&E.
- FMC – TPS-2:
  - Circuit #2 and redundant fiber highway crossing rescheduled to May 2022.
  - Completed PG&E low-voltage gantry termination.
  - Provided 45kVa temporary generator for PG&E construction.

Activity Next Month

- EGS – TPS-1:
  - TRC to submit 90% redesign for final location.
  - Complete the ductbank installation for Circuit #2 at the East Grand Substation and Gateway Blvd.
  - Install strain gantry structures.
- FMC – TPS-2:
  - Complete Factory Acceptance Testing of TPS-2 control buildings.

4.0 ELECTRIC MULTIPLE UNITS

This section reports on the progress of the Electric Multiple Units (EMU) procurement and the Centralized Equipment Maintenance and Operations Facility (CEMOF) modifications.

4.1. Electric Multiple Units

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 from PCEP, and Option Order funded by a Transit and Intercity Rail Capital Program (TIRCP) grant. One more Option for additional cars is available.

Activity This Month

- Dynamic type testing continued on Train 1 at TTCI in Pueblo, CO, including brake testing, propulsion testing and wheel spin/slide protection testing. The train successfully operated at 115 miles per hour.
- HVAC qualification testing took place on Train 2, in Salt Lake City.
- Routine static testing continued on Trainset 3 and has started on Trainset 4.
- Production continued on Trainsets 3 through 13.
- COVID-19 related actions continued for the 15th month causing mixed disruptions to Stadler's activities:
  - Stadler's manufacturing facilities in Switzerland supporting the Caltrain Project have returned to normal levels of activity.
  - The Switzerland-based manufacturing of car shells and trucks frames is on schedule.
  - Salt Lake City-based manufacturing is delayed due to previously incurred and ongoing person-power limitations and sub-supplier parts shortages.
  - Stadler has submitted multiple requests for 'excusable delays' due to COVID-19. The extent of the continuing delay is being evaluated. Currently, delivery of the first trainset to Caltrain has been delayed 8.5 months to November 2021.
  - Stadler's supply chain has been disrupted by two supplier bankruptcies. Replacement suppliers were found, but the delivery schedule was impacted. In addition, one of the replacement suppliers is now having financial issues. Due to this, Stadler submitted another request for excusable delay in February 2021. The extent of the delay is being evaluated. The key point is Stadler's ability to assemble the luggage racks and ceiling panels themselves. Assembly of those parts will begin in June.
- Final Design Reviews (FDR) remain to be completed for two systems. These software-based systems include Monitoring and Diagnostics (MDS) and Positive Train Control (PTC). The train control FDR was completed in May, and MDS completion is near. For PTC, completion is anticipated in mid-2021.

- First Article Inspections (FAI) continue to have their paperwork formalized and closed out.
- 78 car shells have been shipped from Stadler Switzerland, with 70 arriving at Stadler's Salt Lake City facility (eight shells are in transit).
- Quality Assurance audits of USA-based sub-suppliers were halted in mid-March due to COVID-19 travel restriction. Audits will commence when sub-suppliers reopen and travel restrictions are lifted.

Activity Next Month

- Continue to close out system level FDRs and FAIs.
- Continue to support Caltrain/PCEP system integration and rail startup activation activities.
- Support type testing in SLC and at TTCI.

4.2. Centralized Equipment Maintenance and Operations Facility Modifications

The CEMOF Modifications Project will provide work areas to perform maintenance on new EMUs.

Activity This Month

- North Pit and South Pit:
  - Reinstalled and backfilled the oil line.
  - Formed and grouted pads under rail baseplate for south pit.
  - Backfilled trenching at Stair 70.
  - Continued shop drawings/submittals for north pit repair.
- Component Test Room:
  - Installed additional siding trim and exterior siding.
  - Pulled wires and trimmed out boxes.
- Part Storage Building:
  - Formed and poured out-of-sequence door landing.
  - Painted sheetrock walls.

Activity Next Month

- North Pit and South Pit:
  - Install ballast, track rubber and paving for south pit.
  - Implement north pit repairs.
  - Install WSP unit.
  - Continue shop drawings/submittals for north pit repair.
- Component Test Room:
  - Continue installing additional siding trim and exterior siding.

  - Continue pulling wires and trim out boxes.
  - Install 2’ wide floor leveling.
  - Inspect T-Bar ceiling and wall panels.
- Part Storage Building:
  - Continue electrical work.
  - Install warehouse lighting.
  - Install aerial cable conduit.

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5.0 SAFETY

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

Activity This Month

- Project staff provided input and continued its participation in the BBII contractor workforce safety meetings. Project incidents continue to be reviewed with project staff to reinforce the application of recommended safety mitigation measures.
- Conducted the monthly employee injury review for BBII and its subcontractors.
- Continued to provide input and oversight of the contractor SSWP safety provisions and ongoing safety construction oversight and inspections.
- Met with Santa Clara County Fire Department representatives to review emergency responder electrification training needs.
- Conducted the monthly project Safety and Security Certification and Fire/Life Safety Meetings.
- Continued to perform reviews and provide comments on the BBII Safety and Security Certification Design Criteria Conformance Checklists (DCCC) and Construction Specification Conformance Checklist (CSCC) submittals.
- Participated with internal stakeholders in Rail Activation Committee meetings.
- Investigated project incident occurrences and worked with the contractor representatives to identify incident root causes and develop and implement safety and security mitigation measures.
- Reviewed the status and next steps needed to support compliance to the FTA Oversight Procedure 54 (Readiness for Service) project safety and security requirements.
- Conducted ongoing safety inspections of contractor field activities.
- Performed hi-rail vehicle safety inspections of contractor on-track equipment.
- Participated in weekly project coordination meetings with the contractor to review open issues and recommended action items.

Activity Next Month

- Conduct monthly virtual safety communication meetings for the Project Safety and Security Certification Committee, Fire/Life Safety Committee, Rail Activation Committee, and other project-related contractor and JPB safety meetings to discuss safety priorities.
- Update project emergency responder presentations.
- Continue to finalize safety and security certification documentation requirements in coordination with project testing and commissioning activities.

- Continue focus on performing site safety inspections on the OCS foundations, pole installations, potholing, and CEMOF work activities to assess safety work practices and identify additional opportunities for improvement. Conduct contractor equipment inspections as needed.
- Reinforce the ongoing application of recommended mitigation measures in response to the COVID-19 virus.
- Investigate project incident occurrences as needed and work with the contractor representatives to identify incident root cause, contributing factors and safety mitigation measures.

6.0 QUALITY ASSURANCE

The Quality Assurance (QA) staff performs technical reviews for planning, implementing, evaluating, and maintaining an effective program to verify that all 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.

Activity This Month

- Reviewed BBII submittals of Inspector Daily Reports (IDR) and Contractor Quality Control Report (CQCR).
- Provided QA review of BBII submittals of Material Review Reports (MRR) to ensure that purchase order quality and test document requirements are met and included in the receiving inspection document package.
- Provided QA review of BBII submittals of Certificates of Conformance (C of C) and Certificates of Analysis (C of A).
- Provided QA review of BBII Non-Conformance Reports (NCR) and Construction Discrepancy Reports (CDR) to assure that in-process discrepancies are processed as required.
- Provided review of BBII QA Audit Surveillance Reports.
- Provided QA review of Supplier Certified Test Reports (CTR), and Certified Material Tests Reports (CMTR).
- Prepared for upcoming audits for design, quality audits, quality records and training.
- Continued review of BBII record set of As-Built Drawings related to open NCRs.
- Updated Buy America report submitted by BBII and is under review.
- Submitted revised JPB QMP R3 for review and approval
- NCR #14 issued to BBII for Impedance Bond work performed to unapproved drawing.
- NCR #15 issued to BBII for condensation build-up in TPS-2 unit.

Activity Next Month

- Review BBII quality records and prepare for upcoming audits for design, quality audits, quality records and training.

Table 6-1 below provides details on the status of audits performed through the reporting period.

Table 6-1 Quality Assurance Audit Summary

Quality Assurance Activity	This Reporting Period	Total to Date
Audits Conducted	0	131
Audit Findings		
Audit Findings Issued	0	81
Audit Findings Open	0	0
Audit Findings Closed	0	81
Non-Conformances		
Non-Conformances Issued	1	15
Non-Conformances Open	46	6
Non-Conformances Closed	0	9

7.0 SCHEDULE

JPB has proposed a new revised Revenue Service Date (RSD) as a result of the risk refresh exercise performed by FTA-PMOC in December 2020. RSD is forecasted to occur between January 1, 2024 and March 31, 2024. When six to eight months of risk contingency is included, the new proposed revised RSD is September 26, 2024.

The program's critical path was revised in May due to the incorporation of the signals cutover execution plan into the MPS.

Milestone #1 - Segment 4 Construction Completion continues to be impacted by damage to the TPS-2 switchgear sustained during mishandling at customs in North Carolina. The new forecasted date for Milestone # 1 is October 15, 2021.

Stadler's forecasted conditional acceptance of the 14th trainset in the MPS May update remains December 9, 2022 and 1st trainset arrival at JPB is November 24, 2022. The impact of both the replacement of the internal parts supplier remains unknown in Stadler's schedule during the upcoming months.

The JPB's forecasted electrification substantial completion date for the BBII contract in the MPS May update is December 31, 2023. JPB is working with BBII to improve progress on both the signals system, which lags behind baseline productivity level, and traction power facilities, which continue to progress at a slow rate.

Shown below, Table 7-1 indicates major milestone dates for the MPS.

Table 7-1 Schedule Status

Milestones	Program Plan	Progress Schedule (May 2021)[1]
Milestone #1 Segment 4 Construction Completion	11/21/2019	10/15/2021 [1]
Arrival of First Vehicle at JPB	N/A	11/24/2021 [2]
PG&E Provides Permanent Power	09/09/2021	04/15/2022
FFGA RSD	08/22/2022	08/22/2022
Acceptance of 14th Trainset	08/20/2021	12/09/2022 [2]
Electrification Substantial Completion	08/10/2020	12/31/2023 *
Revenue Service Date (RSD)	12/09/2021	01/01/2024 – 03/31/2024
Proposed Revised RSD with Contingency	N/A	09/26/2024

Note:
1. Dates may shift slightly in the next month's Progress Schedule update due to additional signal cutovers in Segment 4.
2. These dates are expected to be delayed due to COVID-19 impacts on Stadler's Assembly & Testing facility in Salt Lake City.

A Completed Milestone.

* Pending mediation process resolution with BBII.

Notable Variances

As a result of the latest schedule risk refresh model analysis exercise by FTA-PMOC, the RSD is forecasted to occur between January 1, 2024 and March 31, 2024. With project contingency, JPB's new Proposed Revised RSD is September 26, 2024.

Schedule delay in Milestone # 1, Segment 4 Construction Completion is due to a delay in the switchgear arrival date from June 14, 2021 to June 25, 2021. The new forecasted date for Milestone # 1, Segment 4 Construction Completion is October 15, 2021.

Table 7-2 Critical Path Summary

Activity	Start	Finish
Signals System Design, Installation & Cutover, and Integration Testing	05/01/2020	12/31/2023
Forecast Revenue Service Date - RSD	01/01/2024	03/31/2024

Schedule Hold Points

Schedule Hold Points (SHP) represent key milestones on or near a schedule's critical path that are used as measurement points with respect to contingency drawdown. Delays to these key milestones will result in consuming program schedule contingency.

Table 7-3 below reflects the SHPs for the PCEP master program schedule. The dates indicated the planned completion dates for each SHP.

Table 7-3 Schedule Hold Points

Schedule Hold Point (SHP)	Date
Segment 4 Construction Completion	10/15/2021 [1]
Arrival of 1st Trainset at JPB	11/24/2021
Conditional Acceptance of 1st Trainset	02/25/2022 [2]
Conditional Acceptance of 14th Trainset	12/09/2022 [2]
System Electrified	12/31/2023 *
Forecasted Revenue Service Date (RSD) –	01/01/ 2024-03/31/2024 [2]*

Note:
1. Dates may shift slightly in the next month's Progress Schedule update due to additional signal cutover in segment 4.
2. Dates may change due to COVID-19 Impact.
A Completed Schedule Hold Point (SHP).
* Pending mediation process resolution with BBII.

8.0 BUDGET AND EXPENDITURES

The summary of overall budget and expenditure status for the PCEP and Third-Party Improvements is shown in the following tables. Table 8-1 reflects the Electrification budget, Table 8-2 the EMU budget, Table 8-3 the overall PCEP budget, and Table 8-4 Third Party Improvements budget. Table 8-5 summarizes the budget transfers of contingency completed this month.

Table 8-1 Electrification Budget & Expenditure Status

Description of Work	Budget (A)	Current Budget (B)[1]	Cost This Month (C)[2]	Cost To Date (D)[3]	Estimate To Complete (E)	Estimate At Completion (F) = (D) + (E)
ELECTRIFICATION						
Electrification [4]	$696,610,558	$741,390,433	$6,835,209	$505,507,158	$235,883,275	$741,390,433
SCADA	$0	$3,842,455	$0	$2,980,726	$861,729	$3,842,455
Tunnel Modifications	$11,029,649	$41,469,522	$0	$41,314,390	$155,132	$41,469,522
Real Estate	$28,503,369	$28,503,369	$40,397	$23,383,557	$5,119,812	$28,503,369
Private Utilities [5]	$63,515,298	$117,850,334	$2,629,557	$133,627,108	($15,776,774)	$117,850,334
Management Oversight	$141,506,257	$168,029,038	$1,741,408	$159,692,166	$8,336,872	$168,029,038
Executive Management	$7,452,866	$9,568,427	$43,294	$9,366,026	$202,401	$9,568,427
Planning	$7,281,997	$6,281,997	$25,323	$5,985,630	$296,367	$6,281,997
Community Relations	$2,789,663	$1,789,663	$4,893	$1,481,452	$308,211	$1,789,663
Safety & Security	$2,421,783	$4,747,861	$95,386	$4,513,600	$234,261	$4,747,861
Project Management Services	$19,807,994	$17,526,725	$193,829	$14,093,786	$3,432,939	$17,526,725
Engineering & Construction	$11,805,793	$13,965,112	$167,085	$13,173,041	$792,071	$13,965,112
Electrification Eng & Mgmt	$50,461,707	$54,259,867	$352,914	$52,960,444	$1,299,424	$54,259,867
Construction Management	$0	$12,076,434	$672,816	$11,003,818	$1,072,617	$12,076,434
IT Support	$312,080	$407,170	$0	$400,132	$7,038	$407,170
Operations Support	$1,445,867	$3,337,383	$19,620	$3,070,695	$266,688	$3,337,383
General Support	$4,166,577	$6,963,434	$37,567	$6,826,324	$137,110	$6,963,434
Budget / Grants / Finance	$1,229,345	$1,626,354	$722	$1,622,835	$3,519	$1,626,354
Legal	$2,445,646	$4,993,672	$16,811	$4,950,302	$43,371	$4,993,672
Other Direct Costs	$5,177,060	$5,777,060	$111,149	$5,536,203	$240,857	$5,777,060
Prior Costs 2002 - 2013	$24,707,878	$24,707,878	$0	$24,707,878	$0	$24,707,878
TASI Support	$55,275,084	$59,409,403	$1,915,188	$59,193,509	$215,894	$59,409,403
Insurance	$3,500,000	$4,543,588	$0	$4,543,588	$0	$4,543,588
Environmental Mitigations	$15,798,320	$14,454,390	$0	$899,851	$13,554,540	$14,454,390
Required Projects	$17,337,378	$10,182,576	$3,246	$1,007,847	$9,174,729	$10,182,576
Maintenance Training	$1,021,808	$1,021,808	$0	$0	$1,021,808	$1,021,808
Finance Charges	$5,056,838	$6,137,156	$41,808	$4,598,074	$1,539,082	$6,137,156
Contingency	$276,970,649	$119,291,134	N/A	N/A	$21,746,060	$21,746,060
Forecasted Costs and Changes	$0	$0	N/A	N/A	$97,545,074	$97,545,074
ELECTRIFICATION SUBTOTAL	**$1,316,125,208**	**$1,316,125,208**	**$13,206,813**	**$936,747,974**	**$379,377,234**	**$1,316,125,208**

Notes regarding tables above:

1. Column B “Current Budget” includes executed change orders and awarded contracts.
2. Column C "Cost This Month" represents the cost of work performed this month.
3. Column D "Cost To Date" includes actuals (amount paid) and accruals (amount of work performed) to date.
4. Cost To Date for “Electrification” includes 5% for Contractor’s retention until authorization of retention release.
5. Private utilities cost to date includes the unbudgeted upfront cost for PG&E’s share of substation improvements prior to PG&E reimbursement.

Table 8-2 EMU Budget & Expenditure Status

Description of Work	Budget (A)	Current Budget (B)[1]	Cost This Month (C)[2]	Cost To Date (D)[3]	Estimate To Complete (E)	Estimate At Completion (F) = (D) + (E)
EMU						
EMU	$550,899,459	$555,247,601	$0	$220,686,565	$334,561,036	$555,247,601
CEMOF Modifications	$1,344,000	$7,392,755	$113,463	$6,460,595	$932,160	$7,392,755
Management Oversight	$64,139,103	$61,961,693	$488,088	$51,961,403	$10,000,290	$61,961,693
Executive Management	$5,022,302	$6,263,136	$25,326	$5,970,382	$292,754	$6,263,136
Community Relations	$1,685,614	$975,782	$2,999	$691,453	$284,328	$975,782
Safety & Security	$556,067	$766,796	$15,979	$745,474	$21,322	$766,796
Project Mgmt Services	$13,275,280	$11,275,280	$118,798	$8,813,973	$2,461,308	$11,275,280
Eng & Construction	$89,113	$89,113	$0	$23,411	$65,702	$89,113
EMU Eng & Mgmt	$32,082,556	$29,981,014	$309,159	$24,547,614	$5,433,400	$29,981,014
Construction Management	$0	$1,603,758	($82,664)	$1,480,100	$123,658	$1,603,758
IT Support	$1,027,272	$952,089	$13,299	$768,702	$183,388	$952,089
Operations Support	$1,878,589	$781,858	$4,632	$419,394	$362,463	$781,858
General Support	$2,599,547	$2,934,702	$12,595	$2,846,647	$88,055	$2,934,702
Budget / Grants / Finance	$712,123	$1,042,274	$481	$1,038,182	$4,092	$1,042,274
Legal	$1,207,500	$1,292,752	$76	$1,258,493	$34,259	$1,292,752
Other Direct Costs	$4,003,139	$4,003,139	$67,409	$3,357,578	$645,562	$4,003,139
TASI Support	$2,740,000	$2,789,493	$16,286	$430,053	$2,359,440	$2,789,493
Insurance	$0	$38,263	$0	$38,263	$0	$38,263
Required Projects	$4,500,000	$1,059,221	$0	$538,280	$520,941	$1,059,221
Finance Charges	$1,941,800	$3,761,482	$25,624	$2,818,174	$943,308	$3,761,482
Contingency	$38,562,962	$31,876,816	N/A	N/A	$26,057,694	$26,057,694
Forecasted Costs and Changes	$0	$0	N/A	N/A	$5,819,122	$5,819,122
EMU SUBTOTAL	**$664,127,325**	**$664,127,325**	**$643,461**	**$282,933,333**	**$381,193,992**	**$664,127,325**

Notes regarding tables above:

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

Table 8-3 PCEP Budget & Expenditure Status

Description of Work	Budget (A)	Current Budget (B)[1]	Cost This Month (C)[2]	Cost To Date (D)[3]	Estimate To Complete (E)	Estimate At Completion (F) = (D) + (E)
Electrification Subtotal	**$1,316,125,208**	**$1,316,125,208**	**$13,206,813**	**$936,747,974**	**$379,377,234**	**$1,316,125,208**
EMU Subtotal	**$664,127,325**	**$664,127,325**	**$643,461**	**$282,933,333**	**$381,193,992**	**$664,127,325**
PCEP TOTAL	**$1,980,252,533**	**$1,980,252,533**	**$13,850,274**	**$1,219,681,307**	**$760,571,225**	**$1,980,252,533**

Notes regarding tables above:

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

Table 8-4 Third Party Improvements/CNPA Budget & Expenditure Status

Description of Work	Budget (A)	Current Budget (B)[1]	Cost This Month (C)[2]	Cost To Date (D)[3]	Estimate To Complete (E)	Estimate At Completion (F) = (D) + (E)
CHSRA Early Pole Relocation	$1,000,000	$941,706	$0	$941,706	$0	$941,706
PS-3 Relocation (Design)	$500,000	$500,000	$0	$150,000	$350,000	$500,000
PS-3 Relocation (FEMA, BGSP Design Coord.)	$50,000	$50,000	$0	$0	$50,000	$50,000
TPSS-2 VTA/PCEP Pole Relocation (Design)	$110,000	$110,000	$0	$110,000	$0	$110,000
TPSS-2 VTA/PCEP Pole Height (Redesign)	$31,000	$31,000	$0	$27,900	$3,100	$31,000
EMU Option Cars	$172,800,047	$172,800,047	$0	$59,599,692	$113,200,355	$172,800,047
Add Flip-Up Seats into Bike Cars	$1,961,350	$1,961,350	$0	$980,675	$980,675	$1,961,350
Update Virtual Reality Experience	$43,000	$43,000	$0	$43,000	$0	$43,000
CNPA TOTAL	**$176,495,397**	**$176,437,103**	**$0**	**$61,852,973**	**$114,584,130**	**$176,437,103**

Notes regarding tables above:

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

Table 8-4 shows improvements outside of the scope of PCEP that are funded with non-PCEP funds. These improvements are implemented through the PCEP contracts. In FTA terminology, these efforts are categorized as Concurrent Non-Project Activities (CNPA).

CHSRA Early Pole Relocation: Relocation of 196 OCS poles as part of PCEP. Implementing these pole relocations minimizes future cost and construction impacts. This scope is funded by the CHSRA.

PS-3 Relocation (Design): Relocate PS-3 (Burlingame) as part of PCEP to avoid a future conflict with the Broadway Grade Separation Project (BGSP). This scope is funded by the BGSP.

PS-3 Relocation (FEMA, BGSP Design Coord.): PS-3 Relocation FEMA Update and Design Coordination: Perform incremental design effort related to the 2019 FEMA requirement update to the flood plain map and design coordination with the BGSP. This scope is funded by the BGSP.

TPSS-2 VTA/PCEP Pole Relocation and Height (Design): Design changes due to the relocation of VTA/BART Pole at TPSS-2 location and pole height redesign for live line clearances. This scope is funded by the VTA.

EMU Option Cars: Exercise Stadler Contract Option for 37 additional EMUs. This scope is funded with a combination of TIRCP and matching local funds.

Add Flip-Up Seats into Bike Cars: Stadler contract change order to add four additional flip-up seats in each of the two unpowered (bike) cars per trainset (eight total per trainset). This scope is funded by Caltrain outside of the PCEP.

Update Virtual Reality Experience: Stadler contract change order to update the virtual reality experience to reflect the latest configuration of the trainsets. This scope is funded by Caltrain outside of the PCEP.

Table 8-5 Budget Transfers of Contingency

Transfer	Description	Contingency[1]
ELECTRIFICATION		
BBI-053-CCO-073	South San Francisco Bioswale Redesign	$26,067
	ELECTRIFICATION SUBTOTAL	**$26,067**
EMU		
PROV-071-CCO-055	Windows and Glazing at Component Test Room	$17,679
	EMU SUBTOTAL	**$17,679**
	PCEP TOTAL	**$43,746**

Notes regarding tables above:

1. Budget amount transferred from project contingency. A negative amount represents a credit to contingency.

Table 8-5 shows budget transfers of project contingency implemented during the current monthly reporting period. This table includes contingency transfers for both executed contract change orders as covered under Section 9.0 and uses of contingency for Program budget line items outside the five PCEP contracts.

Appendix D includes costs broken down by Standard Cost Code (SCC) format. This format is required for reporting of costs to the FTA. The overall project total in the SCC format is lower than the project costs in table 8-3. This is due to the exclusion of costs incurred prior to the project entering the Project Development phase.

9.0 CHANGE MANAGEMENT

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

Currently the PCEP contracts are BBII, CEMOF, Stadler, SCADA, Tunnel Modifications, and Amtrak.

A log of all executed change orders can be found in Appendix E.

Executed Contract Change Orders (CCO) This Month

Electrification Contract

Change Order Authority (5% of BBII Contract) **5% x $696,610,558 = $34,830,528**

Date	Change Number	Description	CCO Amount
5/27/2021	BBI-053-CCO-073	South San Francisco Bioswale Redesign	$26,067
		Total	$26,067

[1] (When indicated) Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.

EMU Contract

Change Order Authority (5% of Stadler Contract) **5% x $550,899,459 = $27,544,973**

Date	Change Number	Description	CCO Amount
	None		$0
		Total	**$0**

[1] (When indicated) Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.

SCADA Contract

Change Order Authority (15% of ARINC Contract) **15% x $3,446,917 = $517,038**

Date	Change Number	Description	CCO Amount
	None		$0
		Total	**$0**

[1] (When indicated) Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.

Tunnel Modification Contract

Change Order Authority (10% of ProVen Contract)[2] **10% x $38,477,777 = $3,847,778**

Date	Change Number	Description	CCO Amount
	None		$0
		Total	**$0**

[1] (When indicated) Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.
[2] Tunnel modification contract ($38,477,777) includes: Notching ($25,281,170) and Drainage ($13,196,607).
[3.] Third Party Improvements/CNPA Projects that are funded with non-PCEP funds.

CEMOF Contract

Change Order Authority (10% of ProVen Contract) **10% x $6,550,777 = $655,078**

Date	Change Number	Description	CCO Amount
5/7/2021	PROV-071-CCO-055	Windows and Glazing at Component Test Room	$17,679
		Total	$17,679

[1] (When indicated) Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.

Amtrak AEM-7 Contract

Change Order Authority (Lump Sum) **Up to $150,000**

Date	Change Number	Description	CCO Amount
	None		$0
		Total	**$0**

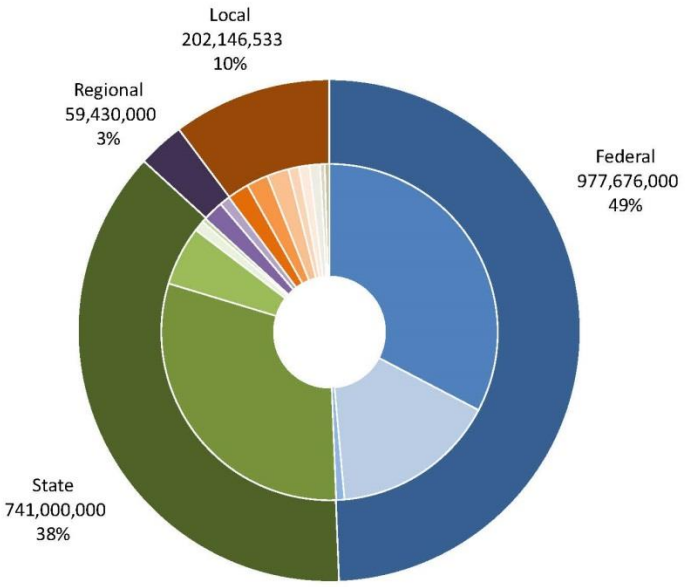
Notes:

1. When the threshold of 75% is reached, staff may return to the Board to request additional authority.

10.0 FUNDING

Figure 10-1 depicts a summary of the funding plan for the PCEP. It provides a breakdown of the funding partners as well as the allocated funds. On March 11, 2021, President Biden signed into law the American Rescue Plan, which will provide PCEP with an additional $52.4 million in Core Capacity funding, above and beyond the $647 million awarded to the project in 2017. PCEP staff will work with FTA Region IX staff to ensure these funds are added to the project in the coming weeks.

Figure 10-1 Funding Plan



Fund Source	Amount	%
FTA Core Capacity	$647,000,000	32.67%
FTA Section 5307 (EMU only)*	$315,000,000	15.91%
FTA Section 5307 (Environmental / Pre Development only)	$15,676,000	0.79%
Prop 1A	$600,000,000	30.30%
High Speed Rail Cap and Trade	$113,000,000	5.71%
Transit & Intercity Rail Capital Program	$20,000,000	1.01%
Prop 1B (Public Transportation Modernization & Improvement Account)	$8,000,000	0.40%
Bridge Toll Funds (RM1/RM2)	$39,430,000	1.99%
Carl Moyer	$20,000,000	1.01%
SFCTA/SFMTA**	$41,382,178	2.09%
SMCTA Measure A	$41,382,178	2.09%
VTA Measure A	$41,382,177	2.09%
Santa Clara (VTA) 7-Party MOU Contribution	$20,000,000	1.01%
San Francisco 7-Party MOU Contribution	$20,000,000	1.01%
San Mateo (SMCTA) 7-Party MOU Contribution	$20,000,000	1.01%
Caltrain Low Carbon Transit Operations Cap and Trade	$9,000,000	0.45%
Prior Local Contribution	$9,000,000	0.45%
Total	**$1,980,252,533**	

Notes:
*Includes necessary fund transfer with SMCTA
**Includes $4M CMAQ Transfer considered part of SF local contribution

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11.0 RISK MANAGEMENT

The risk management process is conducted in an iterative fashion throughout the life of the project. During this process, new risks are identified, other risks are resolved or managed, and potential impacts and severity modified based on the current situation. The Risk Management team's progress report includes a summary on the effectiveness of the Risk Management Plan, any unanticipated effects, and any correction needed to handle the risk appropriately.

The Risk Management team meets monthly to identify risks and corresponding mitigation measures. Each risk is graded based on the potential cost and schedule impacts they could have on the project. This collection of risks has the greatest potential to affect the outcome of the project and consequently is monitored most closely. For each of the noted risks, as well as for all risks on the risk register, mitigation measures have been identified and are being implemented. Progress in mitigating these risks is confirmed at monthly risk assessment meetings attended by project team management and through continuous monitoring of the Risk Management Lead.

The team has identified the following items as top risks for the project (see Appendix F for the complete Risk Table):

1. The contractor may not complete signal and communication design, installation and testing for the two-speed check (2SC) modifications within budget and schedule.
2. Extent of differing site conditions and associated redesign efforts results in delays to the completion of the electrification contract and increases program costs.
3. Sub-optimal contractor sequencing, when progressing design and clearing foundation locations may result in construction inefficiencies.
4. Property not acquired in time for contractor to do work.
5. Additional property acquisition is necessitated by change in design.
6. Contractor generates hazardous materials that necessitate proper removal and disposal in excess of contract allowances and expectations.
7. Change of vehicle sub-suppliers results in additional first article inspections at cost to JPB (i.e., COVID, bankruptcy).
8. Collaboration across multiple disciplines to develop a customized rail activation program may fail to comprehensively address the full scope of issues required to operate and maintain an electrified railroad and decommission the current diesel fleet.
9. Solution to FRA concerns over bike storage impeding path to emergency exit windows path results in increased costs and potential rework.
10. PG&E interconnection work may not be completed on time resulting in delays the reimbursement of PG&E Exhibit B Cost Allocation from PG&E.

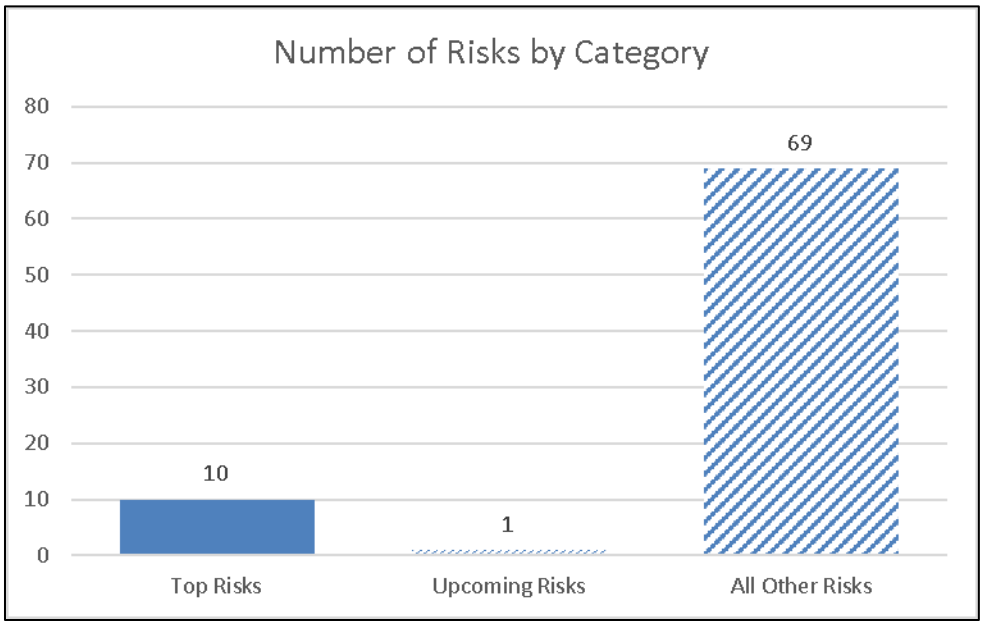
Activity This Month

- Updated risk descriptions, effects, and mitigations based upon weekly input from risk owners. Monthly cycle of risk updating was completed based on schedules established in the Risk Identification and Mitigation Plan.

- Updated risk retirement dates based upon revisions to the project schedule and input from risk owners.
- Continued weekly monitoring of risk mitigation actions and publishing of the risk register.
- Continued monitoring of issues on issues log for determination of new risks.
- The Risk Management team attended Project Delivery, Vehicle Design, Systems Integration, and Weekly Contractor Progress meetings to monitor developments associated with risks and to identify new risks.
- Updated contractor-owned risks through JPB and consultant personnel.

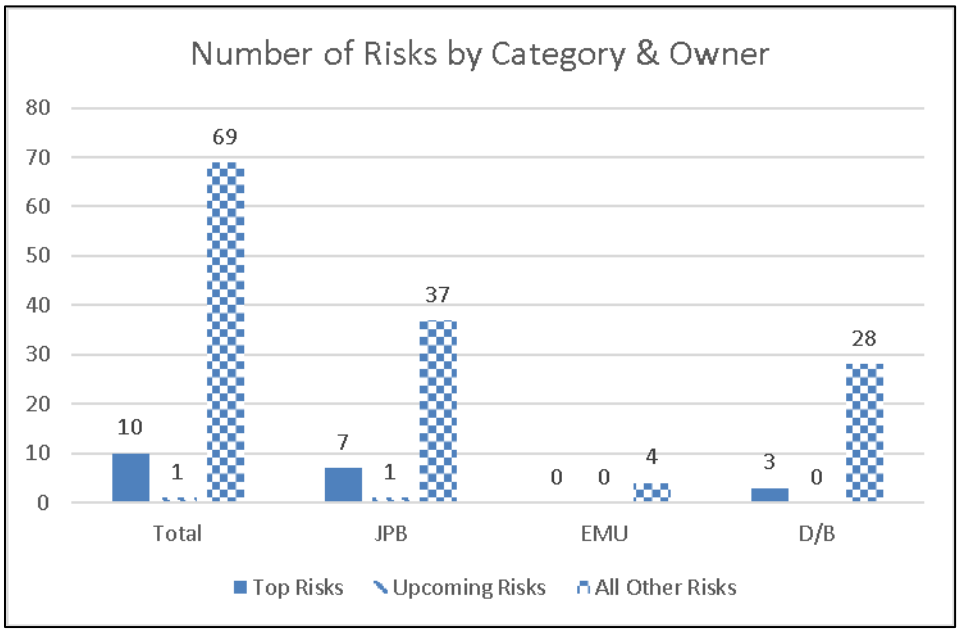
Figures 11-1 and 11-2 show the risks identified for the program. Risks are categorized as top risk, upcoming risk, and all other risks. The categories are based on a rating scale composed of schedule and cost factors. Top risks are considered to have a significantly higher than average risk grade. Upcoming risks are risks for which mitigating action must be taken within 60 days. All other risks are risks not falling into other categories.

Figure 11-1 Monthly Status of Risks



Total Number of Active Risks = 80

Figure 11-2 Risk Classification



Total Number of Active Risks = 80

Activity Next Month

- Conduct weekly monitoring of risk mitigation actions and continue publishing risk register.
- Update risk descriptions, effects, mitigations and retirement dates based on weekly monitoring and attendance at key project meetings.
- Monitor issues on issues log for determination of potential new risks.
- Convene Risk Assessment Committee meeting.

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12.0 ENVIRONMENTAL

12.1. Permits

The PCEP has obtained the required environmental permits from the following agencies/federal regulations: Section 106 of the National Historic Preservation Act of 1966 (NHPA), Section 7 of the Endangered Species Act (ESA), United States Army Corps of Engineers, San Francisco Bay Regional Water Quality Control Board (SFWQCB), the California Department of Fish and Wildlife, and the San Francisco Bay Conservation Development Commission.

Activity This Month

- None

Activity Next Month

- None

12.2. Mitigation Monitoring and Reporting Program (MMRP)

The California Environmental Quality Act (CEQA) requires that a Lead Agency establish a program to monitor and report on mitigation measures that it has adopted as part of the environmental review process. The PCEP team has prepared a MMRP to ensure that mitigation measures identified in the PCEP Environmental Impact Report are fully implemented during project implementation. PCEP will implement the mitigation measures through its own actions, those of the DB contractor and actions taken in cooperation with other agencies and entities. The status of each mitigation measure in the MMRP is included in Appendix G.

Activity This Month

- Environmental compliance monitors were present during project activities (OCS pole foundation installation, potholing for utility location, tree trimming/removal, conduit installation, etc.) occurring in areas that required environmental compliance monitoring. The monitoring was conducted in accordance with measures in the MMRP in an effort to minimize potential impacts on sensitive environmental resources.
- Biological surveyors continued to conduct pre-construction surveys for sensitive wildlife species including nesting bird surveys ahead of project activities. Pre-construction nesting bird surveys during the nesting bird season continued (Nesting bird season is defined as February 1 through September 15)
- Noise and vibration monitoring also occurred during project activities, and non-hazardous soil was removed from the right of way (ROW).
- Environmentally Sensitive Area (ESA) delineation (staking and/or fencing) occurred to delineate jurisdictional waterways and other potentially sensitive areas that should be avoided during upcoming construction activities. Second round of protocol-level burrowing owl surveys were conducted. Pre-construction surveys for sensitive wildlife species continued at previously identified potential habitat locations. Wildlife exclusion fencing installation and monitoring occurred adjacent to portions of the alignment designated for wildlife exclusion fencing.

- Best management practices (BMPs) installation and maintenance (e.g., silt fencing, straw wattles with no monofilament netting per wildlife agency permit requirements, soil covers, etc.) occurred at equipment staging areas and other work areas throughout the alignment in accordance with the project-specific Stormwater Pollution Prevention Plan (SWPPP).

Activity Next Month

- Environmental compliance monitors will continue to monitor project activities (OCS pole foundation installation, sawcutting on station platforms, potholing for utility location, tree trimming/removal, conduit installation, abandoned signal cable removal, etc.) occurring in areas that require environmental compliance monitoring in an effort to minimize potential impacts on sensitive environmental resources in accordance with the MMRP.
- Biological surveyors will continue to conduct pre-construction surveys for sensitive wildlife species including nesting bird surveys ahead of project activities. Pre-construction nesting bird surveys during the nesting bird season will continue (nesting bird season is defined as February 1 through September 15); and protocol-level surveys for sensitive avian species, including burrowing owls, will continue for the 2021 breeding season at previously identified potential habitat location.
- Noise and vibration monitoring of project activities will continue to occur and non-hazardous soil will continue to be removed.
- BMPs installation will continue in accordance with the project-specific SWPPP, and ESA staking and fencing will continue to be maintained, to delineate jurisdictional waterways, and other potentially sensitive areas, that should be avoided during upcoming project activities.
- Wildlife exclusion fencing will continue to be maintained prior to upcoming construction activities adjacent to potentially suitable habitat for sensitive wildlife species.

13.0 UTILITY RELOCATION

Implementation of the PCEP requires relocation or rerouting of both public and private utility lines and/or facilities. Utility relocation will require coordination with many entities, including regulatory agencies, public safety agencies, federal, state, and local government agencies, private and public utilities, and other transportation agencies and companies. This section describes the progress specific to the utility relocation process.

Activity This Month

- Conducted utility coordination meeting to discuss overall status and areas of potential concern from the utilities.
- Continued relocation of Comcast and AT&T Utilities in all Segments, with a focus on Segment 3 and 4 ahead of OCS wiring.

Activity Next Month

- Coordinate with individual utility owners on the next steps of relocations, including support of any required design information.
- Update the relocation schedule as information becomes available from the utility owners.
- Continue to review relocation design from communications companies and coordinate relocation field work.
- Continue communication relocations in all Segments.

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14.0 REAL ESTATE

The PCEP requires the acquisition of a limited amount of real estate. In general, Caltrain uses existing Right of Way (ROW) for the PCEP, but in certain locations, will need to acquire small portions of additional real estate to expand the ROW to accommodate installation of OCS supports (fee acquisitions or railroad easements) and associated Electrical Safety Zones (ESZ) (easements). There are two larger full acquisition areas required for wayside facilitates. The PCEP Real Estate team manages the acquisition of all property rights. Caltrain does not need to acquire real estate to complete the EMU procurement portion of the PCEP.

The Project has obtained possessory rights for all but one of the parcels identified at the beginning of the project.

The Real Estate team's current focus is working to identify new parcels and acquire them in conjunction with the project schedule.

- Staff has defined a process to ensure that BBII conveys new property needs (both for poles and for overhead wires) as soon as possible.
    - BBII must justify and JPB must approve all new parcels.
- Design needs to progress to enable BBII to identify exact acquisition areas.
- Staff is conducting pre-acquisition activities as appropriate.
- JPB has approved eight new parcels to date.

Activity This Month

- Staff continues to review potential new pole locations and is engaging in a system-wide review of potential ESZ needs Staff continues to meet with the internal signal team and BBII signal team to determine potential Real Estate interests.
- Staff continues to negotiate with Universal Paragon Corporation (UPC) to allow the potential for early access onto their property, a vital site for catenary pole installation.

Activity Next Month

- Continued review of ESZ needs submitted by BBII compared to direction from contract.
- Continue to meet with internal signal team and BBII signal team to determine potential Real Estate needs.
- Make offers on the parcel for which appraisals have been completed,
- Continue to work with project team to identify and analyze new potential parcels.
- Continue to work with UPC to finalize early access.

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15.0 THIRD PARTY AGREEMENTS

Third-party coordination is necessary for work impacting public infrastructure, utilities, ROW acquisitions, and others. Table 15-1 below outlines the status of necessary agreements for the PCEP.

Table 15-1 Third-Party Agreement Status

Type	Agreement	Third-Party	Status
Governmental Jurisdictions	Construction & Maintenance[1]	City & County of San Francisco	Executed
		City of Brisbane	Executed
		City of South San Francisco	Executed
		City of San Bruno	Executed
		City of Millbrae	Executed
		City of Burlingame	Executed
		City of San Mateo	Executed
		City of Belmont	Executed
		City of San Carlos	Executed
		City of Redwood City	Executed
		Town of Atherton	Not Needed
		County of San Mateo	Executed
		City of Menlo Park	Executed
		City of Palo Alto	Executed
		City of Mountain View	Executed
		City of Sunnyvale	Executed
		City of Santa Clara	Executed
		County of Santa Clara	Executed
		City of San Jose	Executed
	Condemnation Authority	San Francisco	In Process
		San Mateo	Executed
		Santa Clara	Executed
Utilities	Infrastructure	PG&E	Executed
	Operating Rules	CPUC	Executed
Transportation & Railroad	Construction & Maintenance	Bay Area Rapid Transit	Executed[2]
	Construction & Maintenance	California Dept. of Transportation (Caltrans)	In Process
	Trackage Rights	UPRR	Executed[2]

Notes regarding table above:

1. Agreements memorialize the parties' consultation and cooperation, designate respective rights and obligations and ensure cooperation between the JPB and the 17 cities and three counties along the Caltrain ROW and within the PCEP limits in connection with the design and construction of the PCEP.
2. Utilizing existing agreements.

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16.0 GOVERNMENT AND COMMUNITY AFFAIRS

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.

Presentations/Meetings

- BART Phase II – Downtown Community Working Group
- BART Phase II – Santa Clara Community Working Group

Third Party/Stakeholder Actions

- None

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17.0 DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION AND LABOR STATISTICS

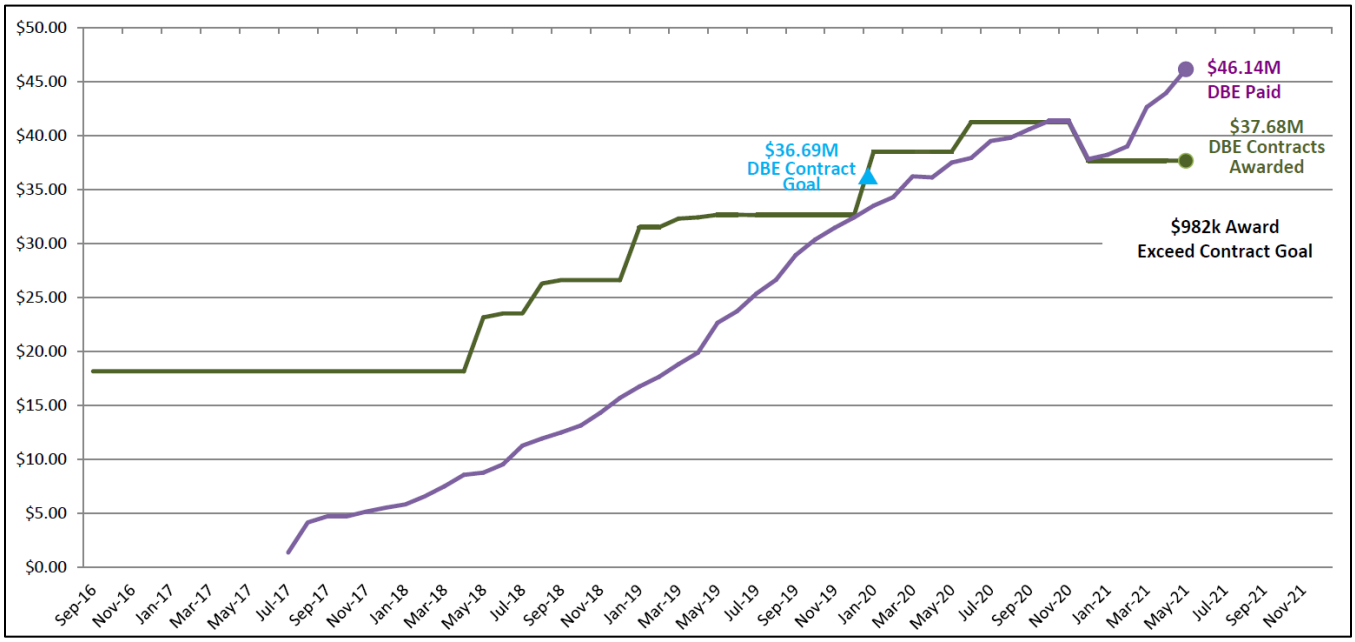
BBII proposed that 5.2% ($36,693,442) of the DB base contract value including DBE contract change orders ($705,643,121) would be subcontracted to DBEs.

Activity This Month

As expressed in Figure 17-1 below, to date BBII reports:

- **$46,143,445** has been paid to DBE subcontractors.
- **$37,675,908** of DBE contracts have been awarded.
- **6.54%** has been achieved.
- All reported figures are subject to verification by DBE Administrator.
- As a result of JPB's DBE Office's review of BBII's DBE reports, one subcontractor was disqualified in December 2020. After removing amounts paid to the disqualified subcontractor, BBII's reported awarded and achieved amounts show a decline from previous months. These amounts and are to be verified by JPB's DBE Administrator.

Figure 17-1 DBE Participation



Activity Next Month

BBII has proposed the following key actions:

"We continue to anticipate increasing our DBE commitments to firms who we are currently negotiating pricing on proposed work or Professional Services Agreements. We are optimistic about the prospect of making future awards to DBE firms. We also anticipate that the existing project work will increase resulting in expanded work for current DBE subcontractors."

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18.0 PROCUREMENT

Invitation for Bids (IFB)/Request for Quotes (RFQ)/ Request for Proposals (RFP) Issued this Month:

- None

Bids, Quotes, Proposals in Response to IFB/RFQ/RFP Received this Month:

- None

In Process IFB/RFQ/RFP/Contract Amendments for Award:

- None

Contract Awards this Month:

- None

Work Directive (WD)/Purchase Order (PO) Awards & Amendments this Month:

- Multiple WDs & POs issued to support the program needs

Upcoming Contract Awards/Contract Amendments:

- Contract 18-J-P-115 On-Call Construction Management Services for PCEP

Upcoming IFB/RFQ/RFP to be Issued:

- None

Existing Contracts Amendments Issued:

- None

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19.0 TIMELINE OF MAJOR PROJECT ACCOMPLISHMENTS

Below is a timeline showing major project accomplishments from 2001 to 2017:

Date	Milestone
2001	Began federal National Environmental Policy Act (NEPA) Environmental Assessment (EA) / state EIR clearance process
2002	Conceptual Design completed
2004	Draft NEPA EA/EIR
2008	35% design complete
2009	Final NEPA EA/EIR and Finding of No Significant Impact (FONSI)
2014	RFQ for electrification RFI for EMU
2015	JPB approves final CEQA EIR JPB approves issuance of RFP for electrification JPB approves issuance of RFP for EMU Receipt of proposal for electrification FTA approval of Core Capacity Project Development
2016	JPB approves EIR Addendum #1: PS-7 FTA re-evaluation of 2009 FONSI Receipt of electrification best and final offers Receipt of EMU proposal Application for entry to engineering to FTA Completed the EMU Buy America Pre-Award Audit and Certification Negotiations completed with Stadler for EMU vehicles Negotiations completed with BBII, the apparent best-value electrification firm JPB approves contract award (LNTP) to BBII JPB approves contract award (LNTP) to Stadler FTA approval of entry into engineering for the Core Capacity Program Application for FFGA
2017	FTA finalized the FFGA for $647 million in Core Capacity funding, met all regulatory requirements including end of Congressional Review Period (February) FTA FFGA executed, committing $647 million to the project (May) JPB approves $1.98 billion budget for PCEP (June) Issued NTP for EMUs to Stadler (June 1) Issued NTP for electrification contract to BBII (June 19) Construction began (August) EMU manufacturing began (October) Issued NTP for SCADA to Rockwell Collins (ARINC) (October) Issued NTP for CEMOF Facility Upgrades to HNTB (November)

Date	Milestone
2018	Completed all PG&E agreements
	JPB approves contract award to Mitsui for the purchase of electric locomotives and Amtrak for overhaul services, storage, acceptance testing, training, and shipment of locomotive to CEMOF
	JPB approves authorization for the Executive Director to negotiate final contract award to ProVen for tunnel modifications and track rehabilitation project
	JPB approves contract award (LNTP) to ProVen for tunnel modifications
	Issued NTP to ProVen for tunnel modifications (October)
	Amended contract with ProVen to include OCS in the tunnels (November)
2019	JPB approves contract award to ProVen for CEMOF modifications (February)
	JPB approves LNTP to ProVen for CEMOF modifications (April)
	JPB approves NTP to ProVen for CEMOF modifications (September)
2020	JPB approves agreement amendment to PG&E for interconnection construction
	JPB executes agreement with PG&E for interconnection construction (May)
	FRA approved the waiver for Alternative Vehicle Technology regarding crashworthiness of EMU cars
2021	The intertie between TPS-2 and FMC was completed (January 18)
	First EMU vehicle shipped to Pueblo, CO for testing (February 10)

APPENDICES

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Appendix A – Acronyms

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AIM	**Advanced Information Management**
ARINC	**Aeronautical Radio, Inc.**
BAAQMD	**Bay Area Air Quality Management District**
BBII	**Balfour Beatty Infrastructure, Inc.**
CAISO	**California Independent System Operator**
CalMod	**Caltrain Modernization Program**
Caltrans	**California Department of Transportation**
CDFW	**California Department of Fish and Wildlife**
CEMOF	**Centralized Equipment Maintenance and Operations Facility**
CEQA	**California Environmental Quality Act (State)**
CHSRA	**California High-Speed Rail Authority**
CIP	**Capital Improvement Plan**
CNPA	**Concurrent Non-Project Activity**
CPUC	**California Public Utilities Commission**
CTC	**Centralized Traffic Control**
DB	**Design-Build**
DBB	**Design-Bid-Build**
DBE	**Disadvantaged Business Enterprise**
DEMP	**Design, Engineering, and Management Planning**
EA	**Environmental Assessment**
EAC	**Estimate at Completion**
EIR	**Environmental Impact Report**
EOR	**Engineer of Record**
EMU	**Electric Multiple Unit**
ESA	**Endangered Species Act**
ESA	**Environmental Site Assessments**
FAI	**First Article Inspection**
FEIR	**Final Environmental Impact Report**
FNTP	**Full Notice to Proceed**
FFGA	**Full Funding Grant Agreement**
FONSI	**Finding of No Significant Impact**
FRA	**Federal Railroad Administration**
FTA	**Federal Transit Administration**
GO	**General Order**
HSR	**High Speed Rail**
ICD	**Interface Control Document**
IFC	**Issued for Construction**
ITS	**Intelligent Transportation System**
JPB	**Peninsula Corridor Joint Powers Board**
LNTP	**Limited Notice to Proceed**

MMRP	**Mitigation, Monitoring, and Reporting Program**
MOU	**Memorandum of Understanding**
MPS	**Master Program Schedule**
NCR	**Non Conformance Report**
NEPA	**National Environmental Policy Act (Federal)**
NHPA	**National Historic Preservation Act**
NMFS	**National Marine Fisheries Service**
NTP	**Notice to Proceed**
OCS	**Overhead Contact System**
PCEP	**Peninsula Corridor Electrification Project**
PCJPB	**Peninsula Corridor Joint Powers Board**
PG&E	**Pacific Gas and Electric**
PHA	**Preliminary Hazard Analysis**
PMOC	**Project Management Oversight Contractor**
PS	**Paralleling Station**
PTC	**Positive Train Control**
QA	**Quality Assurance**
QC	**Quality Control**
QMP	**Quality Management Plan**
QMS	**Quality Management System**
RAMP	**Real Estate Acquisition Management Plan**
RE	**Real Estate**
RFI	**Request for Information**
RFP	**Request for Proposals**
RFQ	**Request for Qualifications**
ROCS	**Rail Operations Center System**
ROW	**Right of Way**
RRP	**Railroad Protective Liability**
RSD	**Revenue Service Date**
RWP	**Roadway Worker Protection**
SamTrans	**San Mateo County Transit District**
SCADA	**Supervisory Control and Data Acquisition**
SCC	**Standard Cost Code**
SPUR	**San Francisco Bay Area Planning and Urban Research Association**
SFBCDC	**San Francisco Bay Conservation Development Commission**
SFCTA	**San Francisco County Transportation Authority**
SFMTA	**San Francisco Municipal Transportation Authority**
SFRWQCB	**San Francisco Regional Water Quality Control Board**
SOGR	**State of Good Repair**
SSCP	**Safety and Security Certification Plan**
SSMP	**Safety and Security Management Plan**
SSWP	**Site Specific Work Plan**

SWS	**Switching Station**
TASI	**TransitAmerica Services Inc.**
TBD	**To Be Determined**
TPS	**Traction Power Substation**
TSP	**Transmission Structure Pole**
TVA	**Threat and Vulnerability Assessment**
UPRR	**Union Pacific Railroad**
USACE	**United States Army Corp of Engineers**
USFWS	**U.S. Fish and Wildlife Service**
VTA	**Santa Clara Valley Transportation Authority**

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Appendix B – Funding Partner Meetings

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Funding Partner Meeting Representatives

Updated May 21, 2021

Agency	CHSRA	MTC	SFCTA/SFMTA/CCSF	SMCTA	VTA
FTA Quarterly Meeting	• Boris Lipkin • Simon Whitehorn • Wai Siu (info only) • Sharath Murthy (info only)	• Anne Richman	• Luis Zurinaga	• April Chan • Peter Skinner	• Jim Lawson
Funding Partners Quarterly Meeting	• Boris Lipkin • Simon Whitehorn • John Popoff • Sharath Murthy (info only)	• Trish Stoops	• Luis Zurinaga	• April Chan • Peter Skinner	• Krishna Davey • Edwin Castillo • Franklin Wong
Funding Oversight (monthly)	• Kelly Doyle	• Anne Richman • Kenneth Folan	• Anna LaForte • Maria Lombardo • Luis Zurinaga • Monique Webster • Ariel Espiritu Santo	• April Chan • Peter Skinner	• Jim Lawson • Marcella Rensi • Michael Smith
Change Management Board (monthly)	• Boris Lipkin • Simon Whitehorn	• Trish Stoops • Kenneth Folan	• Luis Zurinaga • Tilly Chang (info only)	• Joe Hurley	• Krishna Davey • Edwin Castillo • Franklin Wong • James Costantini • Jim Lawson
Master Program Schedule Update (monthly)	• Wai Siu • Sharath Murthy	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Jim Lawson
Risk Assessment Committee (monthly)	• Wai Siu • Sharath Murthy	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey • Edwin Castillo • Franklin Wong
PCEP Delivery Coordination Meeting (bi-weekly	• Wai Siu • Sharath Murthy	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey • Edwin Castillo • Franklin Wong • James Costantini
Systems Integration Meeting (bi-weekly	• Wai Siu • Sharath Murthy	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey • Edwin Castillo • Franklin Wong

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Appendix C – Schedule

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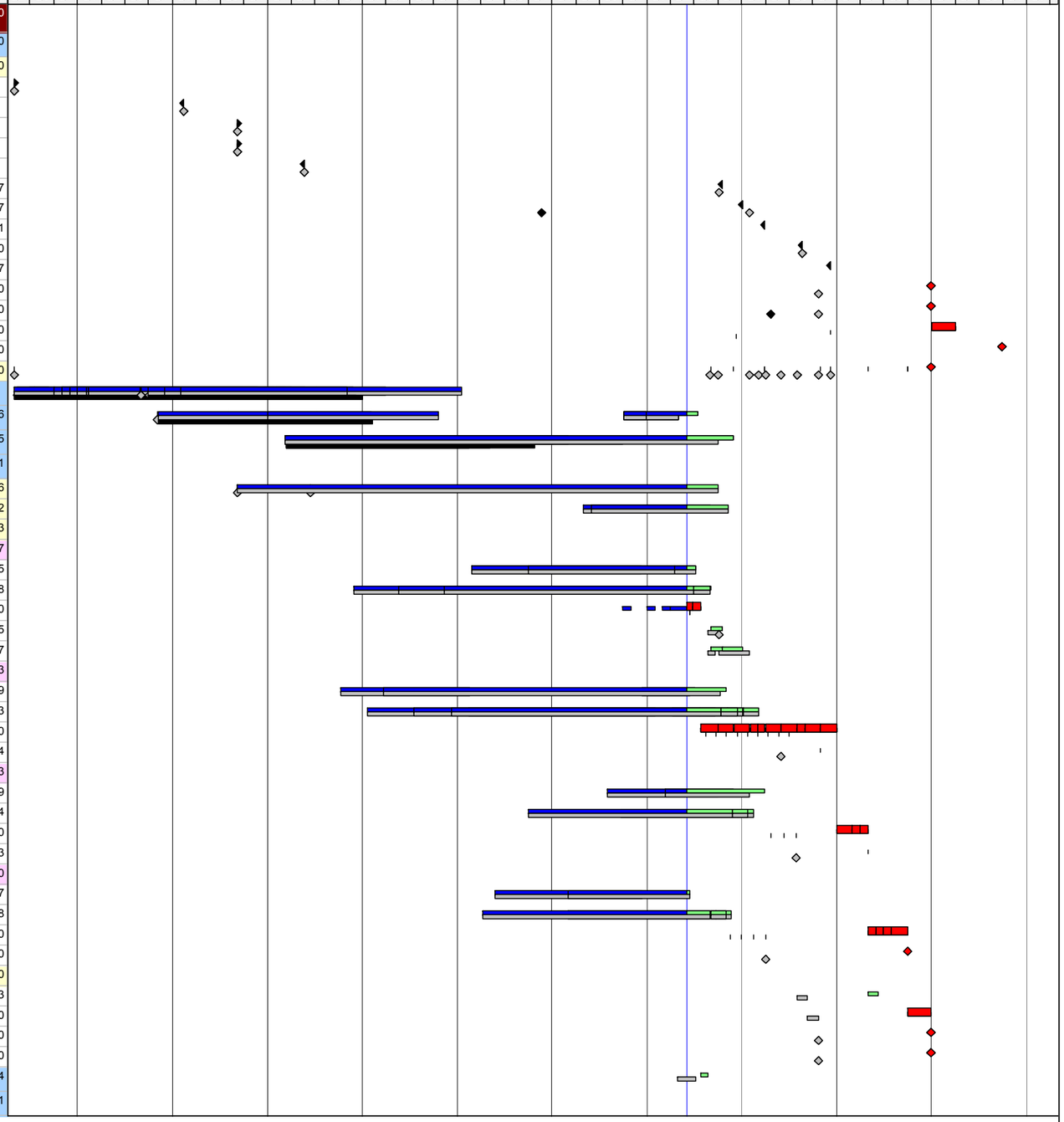
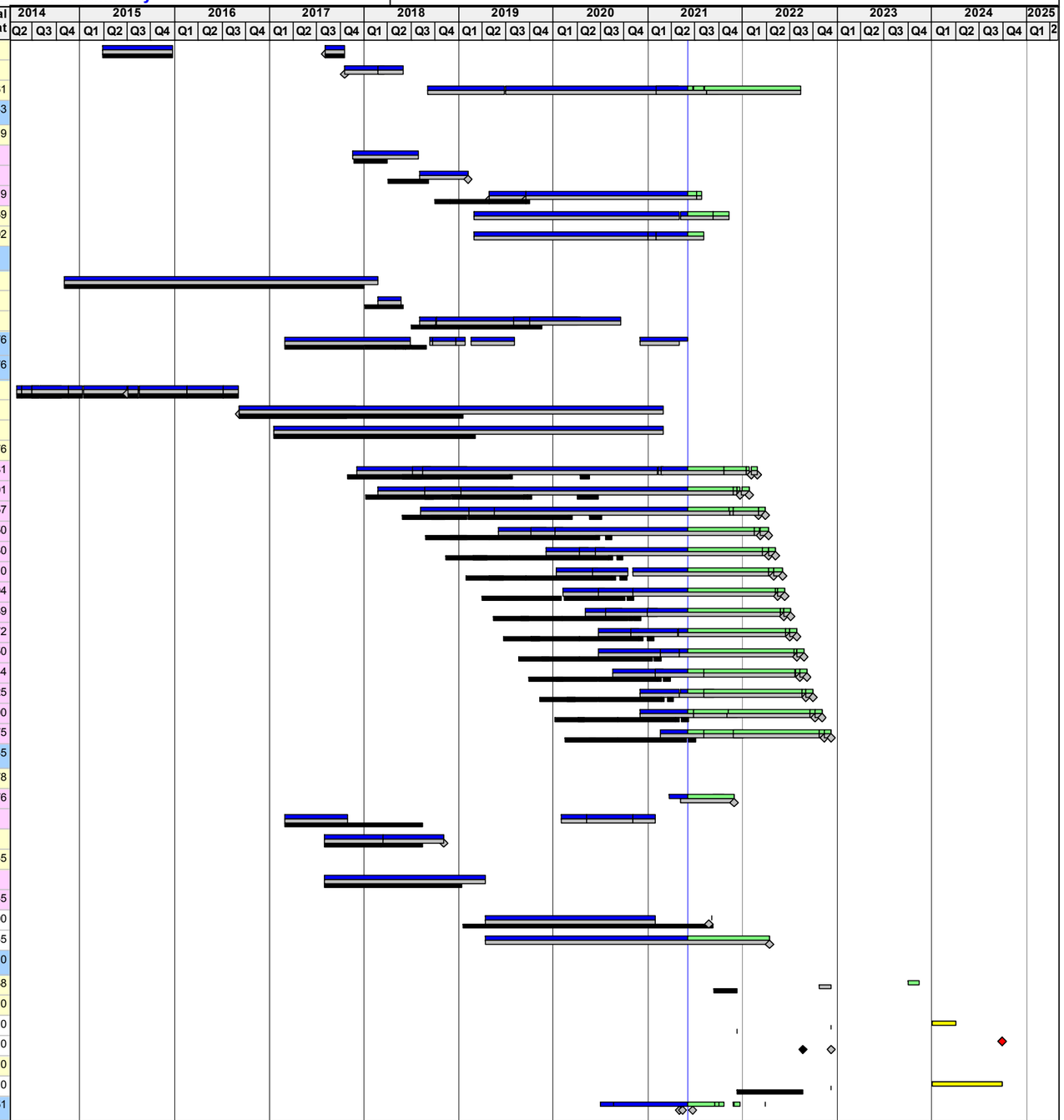
#	Activity Name	Duration	Start	Finish	Variance - Last	Total Float
1	***MASTER PROGRAM SCHEDULE C21.04***	2716	01-May-14 A	26-Sep-24	-469	0
2	**PROJECT MILESTONES**	2716	01-May-14 A	26-Sep-24	-469	0
3	**PROJECT LEVEL MILESTONES**	2716	01-May-14 A	26-Sep-24	-469	0
4	Start	0	01-May-14 A		0	
5	NEPA Reevaluation Complete	0		11-Feb-16 A	0	
6	LNTP to Electrification Contractor	0	06-Sep-16 A		0	
7	LNTP to Vehicle Manufacturer	0	06-Sep-16 A		0	
8	FTA Issues FFGA	0		23-May-17 A	0	
9	Segment 4 Construction Completion	0		15-Oct-21	-11	807
10	Segment 4 Intermediate Milestone Complete (EMU Testing)	0		04-Jan-22	24	727
11	Segment 1 OCS Wire Connected to Tunnel Term. Structures (Testing with Locomotive)	0		30-Mar-22		641
12	FFGA Revenue Service Date (RSD)	0		22-Aug-22*	0	0
13	14th Trainset Conditional Acceptance	0		09-Dec-22		387
14	Electrification Substantial Completion	0		31-Dec-23	-435	0
15	System Electrified	0		31-Dec-23	-435	0
16	Forecasted Revenue Service Period (RSD)	91	01-Jan-24	31-Mar-24*	-478	0
17	Proposed RRSD with contingency	0		26-Sep-24		0
18	**INTERIM MILESTONES**	2522	01-May-14 A	31-Dec-23	-275	0
19	**PLANNING / APPROVALS**	1230	01-May-14 A	16-Jan-19 A	0	
20	**REAL ESTATE ACQUISITION**	1445	05-Nov-15 A	15-Jul-21	-51	636
21	**OVERHEAD UTILITY RELOCATION (Various)**	1199	10-Mar-17 A	30-Nov-21	-41	735
22	**ELECTRIFICATION (BBII)**	1909	06-Sep-16 A	31-Dec-23	-310	1
23	**DESIGN**	1323	06-Sep-16 A	30-Sep-21	0	586
24	**SIGNALS DESIGN**	399	01-May-20 A	10-Nov-21	0	382
25	**CONSTRUCTION**	2183	09-Oct-17 A	30-Sep-23	-427	93
26	***Segment 4***	1496	01-Dec-17 A	04-Jan-22	24	727
27	**OCS**	864	25-Feb-19 A	07-Jul-21	0	815
28	**Traction Power**	1372	01-Dec-17 A	02-Sep-21	-4	718
29	**Signals**	298	01-Oct-20 A	25-Jul-21	-42	0
30	**Segment Completion**	43	03-Sep-21	15-Oct-21	-11	715
31	**Segment Testing - Milestone # 1**	124	03-Sep-21	04-Jan-22	24	727
32	***Segment 2***	1910	09-Oct-17 A	31-Dec-22	-184	363
33	**OCS**	1484	09-Oct-17 A	31-Oct-21	-21	789
34	**Traction Power**	1508	19-Jan-18 A	06-Mar-22	0	663
35	**Signals**	524	26-Jul-21	31-Dec-22	-184	0
36	**Segment Completion**	0	31-Oct-22	31-Oct-22	-153	424
37	***Segment 1***	1307	02-Oct-19 A	30-Apr-23	-274	113
38	**OCS**	607	01-Aug-20 A	30-Mar-22	-61	509
39	**Traction Power**	866	02-Oct-19 A	13-Feb-22	0	554
40	**Signals**	120	01-Jan-23	30-Apr-23	-274	0
41	**Segment Completion**	0	30-Apr-23	30-Apr-23	-274	113
42	***Segment 3***	1636	09-Apr-19 A	30-Sep-23	-547	0
43	**OCS**	750	28-May-19 A	15-Jun-21	0	837
44	**Traction Power**	958	09-Apr-19 A	21-Nov-21	0	678
45	**Signals**	153	01-May-23	30-Sep-23	-547	0
46	**Segment Completion**	0	30-Sep-23	30-Sep-23	-547	0
47	**TESTING**	245	01-May-23	31-Dec-23	-435	0
48	OCS / Comm / SCADA Acceptance Testing	40	01-May-23	09-Jun-23	-274	113
49	Integrated Testing	92	01-Oct-23	31-Dec-23	-435	0
50	Electrification Contractor Substantial Completion	0		31-Dec-23	-435	0
51	Integrated Testing Completion	0		31-Dec-23	-435	0
52	**DRILL TRACK (TASI)**	20	27-Jul-21	23-Aug-21	-33	514
53	**SCADA (Arinc)**	1875	30-Mar-15 A	11-Aug-22	0	361



Prog Plan (C16.00) | Progress | Near Critical | Start Milestone | Prog Plan (C16.00) | Critical Milestone
Last Months Update | Remaining | Critical | Finish Milestone | Last Months Update

#	Activity Name	Duration	Start	Finish	Variance - Last	Total Float
54	PREPARE SOLE SOURCE & AWARD	649	30-Mar-15 A	16-Oct-17 A	0	
55	DESIGN	157	16-Oct-17 A	31-May-18 A	0	
56	IMPLEMENTATION, TEST, INSTALL & CUTOVER	1003	04-Sep-18 A	11-Aug-22	0	361
57	CEMOF (Various)	1038	16-Nov-17 A	08-Nov-21	0	543
58	CEMOF MODIFICATIONS (ProVen)	964	16-Nov-17 A	27-Jul-21	0	519
59	*DESIGN*	178	16-Nov-17 A	31-Jul-18 A	0	
60	*BID & AWARD*	132	01-Aug-18 A	07-Feb-19 A	0	
61	*CONSTRUCTION*	587	29-Apr-19 A	27-Jul-21	0	519
62	PANTOGRAPH INSPECTION & MONITORING SYSTEM (Ctr TBD)	685	01-Mar-19 A	08-Nov-21	0	539
63	SCISSOR LIFT WORK PLATFORM (Ctr TBD)	618	01-Mar-19 A	04-Aug-21	0	592
64	TUNNEL MODIFICATION (ProVen)	1535	31-Oct-14 A	17-Sep-20 A	0	
65	DESIGN	840	31-Oct-14 A	22-Feb-18 A	0	
66	BID & AWARD	66	23-Feb-18 A	25-May-18 A	0	
67	CONSTRUCTION	557	01-Aug-18 A	17-Sep-20 A	0	
68	ELECTRIC LOCOMOTIVE (Amtrak / Mitsui)	1112	01-Mar-17 A	03-Jun-21	-23	576
69	EMU (Stadler)	2247	01-May-14 A	09-Dec-22	0	276
70	DEVELOP RFP, BID & AWARD	612	01-May-14 A	02-Sep-16 A	0	
71	DESIGN	1169	06-Sep-16 A	01-Mar-21 A	0	
72	PROCUREMENT (Material)	1075	16-Jan-17 A	01-Mar-21 A	0	
73	MANUFACTURING & TESTING	1310	04-Dec-17 A	09-Dec-22	0	276
74	*TRAINSET 1*	1105	04-Dec-17 A	25-Feb-22	0	481
75	*TRAINSET 2*	1026	22-Feb-18 A	27-Jan-22	0	501
76	*TRAINSET 3*	953	06-Aug-18 A	30-Mar-22	0	457
77	*TRAINSET 4*	745	03-Jun-19 A	08-Apr-22	0	450
78	*TRAINSET 5*	635	02-Dec-19 A	06-May-22	0	430
79	*TRAINSET 6*	625	13-Jan-20 A	03-Jun-22	0	410
80	*TRAINSET 7*	611	10-Feb-20 A	13-Jun-22	0	404
81	*TRAINSET 8*	566	04-May-20 A	04-Jul-22	0	389
82	*TRAINSET 9*	548	22-Jun-20 A	27-Jul-22	0	372
83	*TRAINSET 10*	570	22-Jun-20 A	26-Aug-22	0	350
84	*TRAINSET 11*	536	17-Aug-20 A	05-Sep-22	0	344
85	*TRAINSET 12*	479	01-Dec-20 A	30-Sep-22	0	325
86	*TRAINSET 13*	504	01-Dec-20 A	04-Nov-22	0	300
87	*TRAINSET 14*	475	15-Feb-21 A	09-Dec-22	0	275
88	PG&E INFRASTRUCTURE	1338	01-Mar-17 A	15-Apr-22	0	445
89	INTERCONNECT	1240	01-Mar-17 A	30-Nov-21	0	478
90	*TPS-1 Interconnection*	175	24-Mar-21 A	30-Nov-21	0	476
91	*TPS-2 Interconnection*	1023	01-Mar-17 A	29-Jan-21 A	0	
92	INTERIM POWER	322	01-Aug-17 A	05-Nov-18 A	0	
93	PERMANENT POWER	1196	01-Aug-17 A	15-Apr-22	0	445
94	*DESIGN & PERMITTING*	431	01-Aug-17 A	12-Apr-19 A	0	
95	*CONSTRUCTION*	764	15-Apr-19 A	15-Apr-22	0	445
96	FMC - Permanent Power	609	15-Apr-19 A	03-Sep-21	-9	600
97	EGS - Permanent Power	764	15-Apr-19 A	15-Apr-22	0	445
98	TESTING & STARTUP (JPB)	362	01-Oct-23	26-Sep-24	-657	0
99	PRE-REVENUE TESTING	45	01-Oct-23	14-Nov-23	-343	138
100	REVENUE OPERATIONS	270	01-Jan-24	26-Sep-24	-657	0
101	Revenue Service Date (RSD) Period, w/out Risk Contingency	91	01-Jan-24	31-Mar-24	-478	0
102	Propsed Revised RSD w/ Risk Contingency	0		26-Sep-24	-657	0
103	RISK CONTINGENCY	270	01-Jan-24	26-Sep-24	-657	0
104	Risk Contingency (FTA)	270	01-Jan-24	26-Sep-24	-657	0
105	RAIL ACTIVATION	456	01-Jul-20 A	30-Mar-22	-201	651



Prog Plan (C16.00) | Progress | Near Critical | Start Milestone | Prog Plan (C16.00) | Critical Milestone
Last Months Update | Remaining | Critical | Finish Milestone | Last Months Update

Appendix D – Standard Cost Codes

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Description of Work	FFGA Baseline	Approved Budget	Cost This Month	Cost To Date	Estimate To	Estimate At
10 - GUIDEWAY & TRACK ELEMENTS	$14,256,739	$27,369,522	$3,199	$25,016,684	$3,279,956	$28,296,640
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	$2,500,000	$2,500,000	$3,199	$147,880	$2,352,120	$2,500,000
10.07 Guideway: Underground tunnel	$8,110,649	$24,869,522	$0	$24,868,804	$927,836	$25,796,640
10.07 Allocated Contingency	$3,646,090	$0	$0	$0	$0	$0
30 - SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$2,265,200	$8,182,966	$113,463	$6,855,700	$1,505,895	$8,361,596
30.03 Heavy Maintenance Facility	$1,344,000	$8,182,966	$113,463	$6,855,700	$1,505,895	$8,361,596
30.03 Allocated Contingency	$421,200	$0	$0	$0	$0	$0
30.05 Yard and Yard Track	$500,000	$0	$0	$0	$0	$0
40 - SITEWORK & SPECIAL CONDITIONS	$255,072,402	$259,581,723	$4,222,494	$238,943,802	$31,058,131	$270,001,933
40.01 Demolition, Clearing, Earthwork	$3,077,685	$10,136,067	$195,509	$7,222,210	$2,925,396	$10,147,606
40.02 Site Utilities, Utility Relocation	$62,192,517	$98,238,387	$2,080,260	$125,289,461	($23,342,515)	$101,946,945
40.02 Allocated Contingency	$25,862,000	($0)	$0	$0	($0)	($0)
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water	$2,200,000	$8,744,961	$0	$6,555,554	$2,866,380	$9,421,934
40.04 Environmental mitigation, e.g. wetlands,	$32,579,208	$19,504,208	$50,625	$2,561,720	$16,942,488	$19,504,208
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	$113,000	$451,000	$2,284,000	$2,735,000
40.07 Automobile, bus, van accessways including roads, parking	$284,094	$0	$0	$0	$0	$0
40.08 Temporary Facilities and other indirect costs during	$107,343,777	$99,613,100	$1,783,101	$96,863,857	$28,943,430	$125,807,287
40.08 Allocated Contingency	$20,160,000	$20,610,000	$0	$0	$438,953	$438,953
50 - SYSTEMS	$504,445,419	$503,805,169	$6,938,407	$277,913,483	$251,327,413	$529,240,897
50.01 Train control and signals	$97,589,149	$120,137,993	$1,655,071	$53,105,674	$68,344,249	$121,449,923
50.01 Allocated Contingency	$1,651,000	$0	$0	$0	$0	$0
50.02 Traffic signals and crossing protection	$23,879,905	($0)	$0	$0	($0)	($0)
50.02 Allocated Contingency	$1,140,000	$1,140,000	$0	$0	$1,140,000	$1,140,000
50.03 Traction power supply: substations	$69,120,009	$101,632,202	$1,410,772	$57,530,663	$46,666,453	$104,197,116
50.03 Allocated Contingency	$31,755,013	$2,990,895	$0	$0	$1,778,337	$1,778,337
50.04 Traction power distribution: catenary and third rail	$253,683,045	$268,320,591	$3,710,563	$166,720,157	$128,338,906	$295,059,062
50.04 Allocated Contingency	$18,064,000	$4,018,488	$0	$0	$51,458	$51,458
50.05 Communications	$5,455,000	$5,547,000	$162,000	$556,989	$4,990,011	$5,547,000
50.07 Central Control	$2,090,298	$0	$0	$0	$0	$0
50.07 Allocated Contingency	$18,000	$18,000	$0	$0	$18,000	$18,000
60 - ROW, LAND, EXISTING IMPROVEMENTS	$35,675,084	$35,675,084	$40,397	$21,783,369	$14,699,852	$36,483,220
60.01 Purchase or lease of real estate	$25,927,074	$25,927,074	$40,397	$21,649,377	$13,833,843	$35,483,220
60.01 Allocated Contingency	$8,748,010	$8,748,010	$0	$0	($0)	($0)
60.02 Relocation of existing households and businesses	$1,000,000	$1,000,000	$0	$133,992	$866,008	$1,000,000
70 - VEHICLES (96)	$625,544,147	$619,576,898	$549,378	$264,880,438	$355,242,906	$620,123,345
70.03 Commuter Rail	$589,167,291	$590,626,491	$549,378	$262,118,266	$334,148,717	$596,266,983
70.03 Allocated Contingency	$9,472,924	$5,118,655	$0	$0	$24,610	$24,610
70.06 Non-revenue vehicles	$8,140,000	$5,067,821	$0	$538,280	$4,529,541	$5,067,821
70.07 Spare parts	$18,763,931	$18,763,931	$0	$2,223,893	$16,540,038	$18,763,931
80 - PROFESSIONAL SERVICES (applies to Cats. 10-50)	$323,793,010	$372,743,005	$1,915,504	$327,289,984	$62,516,607	$389,806,590
80.01 Project Development	$130,350	$130,350	$0	$289,233	($158,883)	$130,350
80.02 Engineering (not applicable to Small Starts)	$180,227,311	$218,534,794	$385,699	$204,333,994	$19,629,447	$223,963,441
80.02 Allocated Contingency	$1,866,000	$4,678	$0	$0	$4,678	$4,678
80.03 Project Management for Design and Construction	$72,029,265	$86,612,175	$904,294	$86,913,629	$15,632,723	$102,546,352
80.03 Allocated Contingency	$9,388,080	$5,471,844	$0	$0	($0)	($0)
80.04 Construction Administration & Management	$23,677,949	$35,036,659	$620,700	$25,807,196	$12,549,272	$38,356,467
80.04 Allocated Contingency	$19,537,000	$8,581,451	$0	$0	$5,261,643	$5,261,643
80.05 Professional Liability and other Non-Construction Insurance	$3,500,000	$4,581,851	$0	$4,581,851	$0	$4,581,851
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	$7,167,275	$8,721,371	$4,811	$5,310,208	$4,503,010	$9,813,218
80.06 Allocated Contingency	$556,000	$0	$0	$0	$0	$0
80.07 Surveys, Testing, Investigation, Inspection	$3,287,824	$3,418,022	$0	$53,873	$3,444,907	$3,498,781
80.08 Start up	$1,797,957	$1,021,808	$0	$0	$1,021,808	$1,021,808
80.08 Allocated Contingency	$628,000	$628,000	$0	$0	$628,000	$628,000
Subtotal (10 - 80)	$1,761,052,001	$1,826,934,367	$13,782,842	$1,162,683,460	$719,630,761	$1,882,314,221
90 - UNALLOCATED CONTINGENCY	$162,620,295	$93,837,929	$0	$0	$38,458,075	$38,458,075
Subtotal (10 - 90)	$1,923,672,296	$1,920,772,296	$13,782,842	$1,162,683,460	$758,088,836	$1,920,772,296
100 - FINANCE CHARGES	$6,998,638	$9,898,638	$67,432	$7,416,248	$2,482,390	$9,898,638
Total Project Cost (10 - 100)	$1,930,670,934	$1,930,670,934	$13,850,274	$1,170,099,708	$760,571,225	$1,930,670,934

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Appendix E – Change Order Logs

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Change Order Logs

Electrification Contract

Change Order Authority (5% of BBII Contract) **5% x $696,610,558 = $34,830,528**

Date	Change Number	Description	CCO Amount	Change Order Authority Usage[1]	Remaining Authority
08/31/17	BBI-053-CCO-001	Track Access Delays Q4 2016	$85,472	0.25%	$34,745,056
02/28/18	BBI-053-CCO-003	Deletion of Signal Cable Meggering (Testing)	($800,000)	(2.30%)	$35,545,056
02/21/18	BBI-053-CCO-004	Field Order for Differing Site Condition Work Performed on 6/19/17	$59,965	0.17%	$35,485,091
03/12/18	BBI-053-CCO-006	Track Access Delays for Calendar Quarter 1 2017	$288,741	0.83%	$35,196,350
04/24/18	BBI-053-CCO-002	Time Impact 01 Associated with Delayed NTP	$9,702,667	0.00%[2]	-
04/24/18	BBI-053-CCO-008	2016 Incentives (Safety, Quality, and Public Outreach)	$750,000	0.00%[2]	-
05/31/18	BBI-053-CCO-009	16th St. Grade Crossing Work Removal from BBII Contract	($685,198)	(1.97%)	$35,881,548
05/31/18	BBI-053-CCO-012	2017 Incentives (Safety, Quality, and Public Outreach)	$1,025,000	0.00%[2]	-
06/25/18	BBI-053-CCO-010	Pothole Change Of Shift	$300,000	0.86%	$35,581,548
06/25/18	BBI-053-CCO-013	Field Order for Signal Cable Relocation (FO# 31)	$95,892	0.28%	$35,485,656
06/25/18	BBI-053-CCO-015	TASI Pilot Transportation 2017	$67,345	0.19%	$35,418,311
06/26/18	BBI-053-CCO-005	Field Orders for Signal Cable Relocation (FO#s 26, 30)	$191,836	0.55%	$35,226,475
06/28/18	BBI-053-CCO-014	Field Orders for Signal Cable Relocation (FO-36 & FO-38)	$145,694	0.42%	$35,080,781
06/29/18	BBI-053-CCO-007	Track Access Delays for Calendar Quarter 2 2017	$297,512	0.85%	$34,783,269
06/29/18	BBI-053-CCO-011	Field Orders for Differing Site Condition (FO#s Partial 07A , 08-14)	$181,013	0.52%	$34,602,256
06/29/18	BBI-053-CCO-017	Field Order for NorCal Utility Potholing (FO# 27)	$93,073	0.27%	$34,509,183
06/29/18	BBI-053-CCO-018	Field Order for NorCal Utility Potholing (FO# 29)	$76,197	0.22%	$34,432,986
06/29/18	BBI-053-CCO-020	Field Orders for Differing Site Condition (FO#s 15-19)	$118,364	0.34%	$34,314,622
7/19/2018	BBI-053-CCO-019	Field Order for NorCal Utility Potholing (FO-032)	$88,956	0.26 %	$34,225,666
7/19/2018	BBI-053-CCO-021	As In-Service (AIS) Drawings for Segment 2 and 4 Signal Design (CN-009)	$105,000	0.30 %	$34,120,666
7/25/2018	BBI-053-CCO-022	CEMOF Yard Traction Power Feed (CN-008)	$332,700	0.96 %	$33,787,966
7/31/2018	BBI-053-CCO-028	Sonic Echo Impulse Testing	$4,541	0.01 %	$33,783,425
7/31/2018	BBI-053-CCO-026	TASI Pilot Transportation 2018 (CNC-0022)	$50,409	0.14%	$33,733,016
7/31/2018	BBI-053-CCO-027	Signal Cable Relocation (FOs-040 & 051)	$196,114	0.56%	$33,536,902
9/27/2018	BBI-053-CCO-030	Delete Spare 115k Disconnect Switches	($19,000)	(0.05)%	$33,555,902
9/28/2018	BBI-053-CCO-031	Bldg A HVAC and FOB Card Reader Systems	$76,500	0.22 %	$33,479,402
9/28/2018	BBI-053-CCO-025A	Addition of Shunt Wire at Transverse Utility Crossing Locations – Design	$925,000	2.66 %	$32,554,402
9/28/2018	BBI-053-CCO-016A	UPRR MT-1 Pole Relocation - Design Changes	$903,000	0.00%[2]	-
9/28/2018	BBI-053-CCO-024A	PG&E Utility Feed Connection to TPS#1 and TPS#2 (Design Only)	$727,000	0.00%[2]	-
12/17/2018	BBI-053-CCO-032	PS-2 Site Relocation (Design Only)	$291,446	0.84%	$32,262,956
1/17/2019	BBI-053-CCO-023	Insulated Rail Joints	$2,694,519	0.00%[2]	-
1/17/2019	BBI-053-CCO-029	CHSRA Early Pole Relocation (Design Only)	$625,000	0.00%[2,3]	-
2/5/2019	BBI-053-CCO-040A	Increase in Potholing Quantity (unit price contract bid item by 25%)	$1,662,500	4.77 %	$30,600,456

Change Order Authority (5% of BBII Contract) **5% x $696,610,558 = $34,830,528**

Date	Change Number	Description	CCO Amount	Change Order Authority Usage[1]	Remaining Authority
3/5/2019	BBI-053-CCO-042A	TPSS-2 VTA/BART Pole Relocation (Design Only) (CNPA funded by VTA)	$110,000	0.32%[3]	$30,490,456
3/11/2019	BBI-053-CCO-036	Field Order for Signal Cable Relocation (FO-064)	$86,538	0.25%	$30,403,918
3/20/2019	BBI-053-CCO-035	Millbrae Avenue Existing Overhead Barrier	($40,000)	(0.11)%	$30,443,918
3/19/2019	BBI-053-CCO-046	Training in Design Software and Potholing	$136,611	0.39%	$30,307,307
4/8/2019	BBI-053-CCO-041	Grade Crossing Warning System (CN59) – 5 mph Speed Check	$446,982	1.28%	$29,860,325
5/30/2019	BBI-053-CCO-044	Additional Daytime Potholing (Increase Quantity by 500 in Segment 4)	$150,000	0.43 %	$29,710,325
6/6/2019	BBI-053-CCO-048	Power Metering Devices	$101,908	0.29 %	$29,608,417
6/13/2019	BBI-053-CCO-045	Incentive Payment for 2018	$1,025,000	0.00%[2]	-
6/13/2019	BBI-053-CCO-024B	PG&E Utility Feed Connection to TPS #1 and TPS#2 (Material On Hand)	$1,600,000	4.59 %	$28,008,417
6/24/2019	BBI-053-CCO-043	PS-5 Site Relocation (Design Only)	$348,000	1.00 %	$27,660,417
6/24/2019	BBI-053-CCO-054	Change Design Sequence for OCS Foundations	$37,500	0.11%	$27,622,917
7/1/2019	BBI-053-CCO-040B	Increase Quantity for Utilities Potholing (Bid Item #9)	$1,867,700	5.36 %	$25,755,217
7/10/2019	BBI-053-CCO-033A	Relocation of PS3 (Design) (CNPA funded by BGSP)	$500,000	1.44 %[3]	$25,255,217
8/15/2019	BBI-053-CCO-047	CEMOF Slot Drains (Design Only)	$69,000	0.20%	$25,186,217
8/16/2019	BBI-053-CCO-055	Sheriff's Deputy in Segment 4B	$4,644	0.01%	$25,181,573
9/3/2019	BBI-053-CCO-037	Field Orders for Signal Cable Relocation (FO-053 & FO-059)	$184,576	0.53%	$24,996,997
9/7/2019	BBI-053-CCO-057	Mediator with Technical Expertise	$0	0.00%	$24,996,997
9/27/2019	BBI-053-CCO-061	Interconnect Renaming of Circuit Numbers	$58,058	0.17%	$24,938,939
9/27/2019	BBI-053-CCO-063A	Track Access Delays - Quarter 1 2018 (Partial)	$343,496	0.99%	$24,595,443
10/21/2019	BBI-053-CCO-064	TPS-2 VTA Pole Height Redesign (CNPA funded by VTA)	$31,000	0.09%[3]	$24,564,443
11/15/2019	BBI-053-CCO-038	Field Order for Signal Cable Relocation (FO-079 & FO-085)	$187,764	0.54 %	$24,376,680
11/26/2019	BBI-053-CCO-025B	Addition of OCS Shunt Wires in Segments 2 & 4 - Wire Assembly Materials Only - voided below on 7/31/20	$144,370	0.41 %	$24,232,310
12/11/2019	BBI-053-CCO-065A	Foundation Inefficiencies S2WA5	$401,501	1.15%	$23,830,809
12/17/2019	BBI-053-CCO-025C	Addition of OCS Shunt Wires in Segments 2 & 4 – Pole Assembly Materials Only - voided below on 7/31/20	$884,500	2.54 %	$22,946,309
1/7/2020	BBI-053-CCO-066A	Increase Quantity for Contaminated Soils (Bid Unit Price Item #1)	$950,000	2.73 %	$21,996,309
2/5/2020	BBI-053-CCO-023B	Insulated Rail Joints De-stressing	$890,600	2.56 %	$21,105,709
3/18/2020	BBI-053-CCO-072A	SVP Requirements for Joint SIS & SPS (Task 1) - voided below on 7/9/20	$80,000	0.23 %	$21,025,709
3/19/2020	BBI-053-CCO-023C	Portec Insulated Rail Joints	$375,000	1.08 %	$20,650,709
3/26/2020	BBI-053-CCO-076	Asbestos Pipe Abatement at CP Shark	$145,872	0.42 %	$20,504,837
3/31/2020	BBI-053-CCO-075	Norcal Utility Potholing (FO#39)	$98,105	0.28 %	$20,406,733
4/21/2020	BBI-053-CCO-077A	Contaminated Soil (Class 1) at TPS-1	$701,780	2.01 %	$19,704,953
4/27/2020	BBI-053-CCO-066B	Increase Quantity for Contaminated Soils (Bid Item #1)	$926,273	2.66 %	$18,778,680
4/27/2020	BBI-053-CCO-090A	Signal Cable Relocation (Field Order No. 340)	$47,258	0.14 %	$18,731,423
4/27/2020	BBI-053-CCO-091A	Signal Cable Relocation (Field Order No. 340)	$131,663	0.38 %	$18,599,759
4/29/2020	BBI-053-CCO-080A	Steel Plates to Protect Utilities (DTDS)	$135,128	0.39 %	$18,464,631

4/29/2020	BBI-053-CCO-081A	Steel Plates to Protect Utilities (DTDS)	$95,474	0.27 %	$18,369,157
4/29/2020	BBI-053-CCO-071	Increase Quantity for Tree Pruning (Bid Unit Price Item #4d)	$375,000	1.08 %	$17,994,157
5/1/2020	BBI-053-CCO-050	Switch Machine Isolation – Credit	($277,430)	(0.80)%	$18,271,586
5/19/2020	BBI-053-CCO-092A	Signal Cable Relocation (Field Order No. 340)	$106,773	0.31 %	$18,164,814
5/19/2020	BBI-053-CCO-093A	Signal Cable Relocation (Field Order No. 340)	$90,765	0.26 %	$18,074,049
5/27/2020	BBI-053-CCO-101	Asbestos Pipe Abatement at 46.3-07/08	$21,037	0.06 %	$18,053,012
6/15/2020	BBI-053-CCO-049A	Long-reach Foundations Installation - Unit Price	$46,560	0.13 %	$18,006,452
6/15/2020	BBI-053-CCO-049B	Long-reach Foundations Installation - Unit Price	$46,560	0.13 %	$17,959,892
6/18/2020	BBI-053-CCO-033B	PS-3 Site Relocation FEMA 2019 Update and BGSP Design Coordination – CNPA	$50,000	0.14 %[3]	$17,909,892
6/30/2020	BBI-053-CCO-082A	Steel Plates to Protect Utilities (DTDS)	$90,658	0.26 %	$17,819,235
6/30/2020	BBI-053-CCO-083A	Steel Plates to Protect Utilities (DTDS)	$181,900	0.52 %	$17,637,335
6/30/2020	BBI-053-CCO-094A	Signal Cable Relocation (Field Order No. 340)	$124,633	0.36 %	$17,512,702
7/9/2020	BBI-053-CCO-072A	SVP Requirements for Joint SIS & SPS (Task 1) – Voided	($80,000)	(0.23)%	$17,592,702
7/9/2020	BBI-053-CCO-072A REV2	SVP Requirements for Joint SIS & SPS (Tasks 0-5) - voided below on 2/23/2021	$300,000	0.86 %	$17,292,702
7/16/2020	BBI-053-CCO-100	Remove Tree Stump at 46.4-02	$1,459	0.00 %	$17,291,243
7/30/2020	BBI-053-CCO-078	Re-design CEMOF OCS Poles due to Stair 71 Conflict	$11,796	0.03 %	$17,279,447
7/30/2020	BBI-053-CCO-084A	Steel Plates to Protect Utilities (DTDS)	$101,334	0.29 %	$17,178,113
7/30/2020	BBI-053-CCO-085A	Steel Plates to Protect Utilities (DTDS)	$94,062	0.27 %	$17,084,051
7/30/2020	BBI-053-CCO-104	Utility Conflict During PVC Conduit Installation	$2,657	0.01 %	$17,081,394
7/31/2020	BBI-053-CCO-103	Track Access Delays – 2017 Quarter 3 - voided below on 2/16/2021	$145,892	0.42 %	$16,935,503
7/31/2020	BBI-053-CCO-025B	Addition of OCS Shunt Wires in Segments 2 & 4 - Wire Assembly Materials Only – Voided	($144,370)	(0.41)%	$17,079,873
7/31/2020	BBI-053-CCO-025C	Addition of OCS Shunt Wires in Segments 2 & 4 – Pole Assembly Materials Only – Voided	($884,500)	(2.54)%	$17,964,373
8/3/2020	BBI-053-CCO-063B	Track Access Delays – Quarter 1 2018 (Part 2)	$92,906	0.27 %	$17,871,466
8/14/2020	BBI-053-CCO-106	Track Access Delays – 2017 Quarter 4	$903,794	2.59 %	$16,967,672
9/10/2020	BBI-053-CCO-025F	OCS Shunt Wire (Construction)	$9,500,000	0.00%[2]	-
9/11/2020	BBI-053-CCO-126	Track Access Delays - 2019 Quarter 3 – OCS Foundations	$81,223	0.23 %	$16,886,450
9/24/2020	BBI-053-CCO-127	Track Access Delays – 2019 Quarter 4 – OCS Foundations	$147,223	0.42 %	$16,739,227
9/21/2020	BBI-053-CCO-051	CEMOF Yard OCS Changes (Design Only)	$210,300	0.60 %	$16,528,927
9/21/2020	BBI-053-CCO-074	Underground Utilities Clearance	$0	0.00 %	$16,528,927
10/19/2020	BBI-053-CCO-072C	PCEP SIS & SPS Additional Validation Work	$27,696	0.08 %	$16,501,231
10/27/2020	BBI-053-CCO-105	Pole Removal at Location 30.7-01	$2,297	0.01 %	$16,498,935
11/30/2020	BBI-053-CCO-056	Delivery of Signal Cable	$3,391	0.01 %	$16,495,544
12/22/2020	BBI-053-CCO-111	Incentives Payment for 2019	$825,000	0.00%[2]	-
2/9/2021	BBI-053-CCO-025G	OCS Shunt Wire (Design)	$0	0.00 %	$16,495,544
2/11/2021	BBI-053-CCO-047B	CEMOF Yard Slot Drains Relocation (Construction)	$360,000	1.03 %	$16,135,544
2/16/2021	BBI-053-CCO-103	Track Access Delays – 2017 Quarter 3 – voided	($145,892)	(0.42)%	$16,281,435
2/16/2021	BBI-053-CCO-103 REV1	Track Access Delays – 2017 Quarter 3	$164,518	0.47 %	$16,116,918

2/23/2021	BBI-053-CCO-072A REV2	SVP Requirements for Joint SIS & SPS (Tasks 0-5) – voided	($300,000)	(0.86)%	$16,416,918
2/23/2021	BBI-053-CCO-072B	Requirements for PCEP Joint System Impact Study & Single Phase Study	$520,000	1.49 %	$15,896,918
3/17/2021	BBI-053-CCO-203	Increase in Permit Allowance (Bid Allowance Item #5)	$300,000	0.86 %	$15,596,918
3/17/2021	BBI-053-CCO-205	Increase in Partnering Allowance (Bid Allowance Item #2)	$186,000	0.53 %	$15,410,918
3/26/2021	BBI-053-CCO-192	Abandoned Utility Pole Removal at MP24.72	$2,766	0.01 %	$15,408,151
4/23/2021	BBI-053-CCO-108A	Deletion of 5 & 5A Switch Crossover at CP Shark (Part 1)	$163,996	0.47 %	$15,244,156
4/23/2021	BBI-053-CCO-024C	TPSS 1&2 PG&E Interconnection-Procurement of Long Lead Materials (Credit)	($1,345,033)	(3.86)%	$16,589,188
4/30/2021	BBI-053-CCO-113A	Walk-in Enclosure at Luther Junction (BBI, PGH Wong and QEI)	$51,281	0.15 %	$16,537,907
5/27/2021	BBI-053-CCO-073	South San Francisco Bioswale Redesign	$26,067	0.07 %	$16,511,840
		Total	**$46,095,874**	**52.59 %**	**$16,511,840**

Notes:

1. When the threshold of 75% is reached, staff may return to the Board to request additional authority.
2. Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.
3. Third party improvements/CNPA projects that are funded with non-PCEP funds.

EMU Contract

Change Order Authority (5% of Stadler Contract) **5% x $550,899,459 = $27,544,973**

Date	Change Number	Description	CCO Amount	Change Order Authority Usage[1]	Remaining Authority
09/22/2017	STA-056-CCO-001	Contract General Specification and Special Provision Clean-up	$0	0.00%	-
10/27/2017	STA-056-CCO-002	Prototype Seats and Special Colors	$55,000	0.20%	$27,489,973
11/02/2017	STA-056-CCO-003	Car Level Water Tightness Test	$0	0.00%	-
12/05/2017	STA-056-CCO-004	Onboard Wheelchair Lift 800 Pound Capacity Provisions	$848,000	3.08%	$26,641,973
11/03/2017	STA-056-CCO-005	Design Progression (multiple)	$0	0.00%	-
12/12/2017	STA-056-CCO-006	Prototype Seats and Special Colors	($27,500)	(0.10%)	$26,669,473
01/17/2018	STA-056-CCO-007	Multi-Color Destination Signs	$130,760	0.47%	$26,538,713
02/09/2018	STA-056-CCO-008	Adjustment to Delivery and LDs due to delayed FNTP	$490,000	0.00%[2]	-
02/12/2018	STA-056-CCO-009	Ship Cab Mock-up to Caltrain	$53,400	0.19%	$26,485,313
04/17/2018	STA-056-CCO-010	Onboard Wheelchair Lift Locations	($1,885,050)	(6.84%)	$28,370,363
04/17/2018	STA-056-CCO-011	Multiple Change Group 3 and Scale Models	$0	0.00%	-
10/29/2018	STA-056-CCO-012	Multiple Change Group 4	$0	0.00%	-
10/29/2018	STA-056-CCO-013	Wheelchair Lift Installation Redesign	$228,400	0.83%	$28,141,963
12/14/2018	STA-056-CCO-014	PTC System Change	$0	0.00%	-
12/22/2018	STA-056-CCO-015	EMU Option Cars	$172,800,047	0.00%[2,3]	-
6/26/2019	STA-056-CCO-016	Testing at TTCI (Pueblo Facility) - First Trainset	$3,106,428	11.28 %	$25,035,535
8/27/2019	STA-056-CCO-017	Virtual Reality Experience	$400,000	1.45 %	$24,635,535
8/21/2019	STA-056-CCO-018	EMI Conducted Emissions Limits	$0	0.00%	$24,635,535
8/8/2019	STA-056-CCO-019	Option Car Payment Milestones	$0	0.00%	$24,635,535
8/21/2019	STA-056-CCO-020	Multiple No Cost No Schedule Impact Changes Group 5	$0	0.00%	$24,635,535
10/28/2019	STA-056-CCO-021	Plugging of High-Level Doorways	$736,013	2.67%	$23,899,523

Change Order Authority (5% of Stadler Contract)					**5% x $550,899,459 = $27,544,973**
Date	**Change Number**	**Description**	**CCO Amount**	**Change Order Authority Usage[1]**	**Remaining Authority**
11/13/2019	STA-056-CCO-022	Add Flip-Up Seats into Bike Cars (CNPA: $1.96M funded by Non-PCEP)	$1,961,350	7.12%[3]	$21,938,173
4/21/2020	STA-056-CCO-025	Removal of Vandal Film from Windows	($374,994)	(1.36)%	$22,313,167
5/6/2020	STA-056-CCO-023	Deferral of Wheelchair Lifts	$632,703	2.30 %	$21,680,464
7/13/2020	STA-056-CCO-026	Update VR Experiences (CNPA: $43K funded by Non-PCEP)	$43,000	0.16 %[3]	$21,637,464
9/14/2020	STA-056-CCO-027	EMU Liquidated Damages, and Delivery and Testing Schedule Modifications	$0	0.00 %	$21,637,464
10/12/2020	STA-056-CCO-029	Multiple No Cost / No Schedule Impact Changes Group 7	$0	0.00 %	$21,637,464
1/28/2021	STA-056-CCO-028	Procure Pantograph Automated Inspection System	$790,211	2.87 %	$20,847,253
2/26/2021	STA-056-CCO-031	Bike Car Dividers	$194,940	0.71 %	$20,652,313
3/8/2021	STA-056-CCO-030	Video of trainset while at TTC	$9,833	0.04 %	$20,642,481
3/25/2021	STA-056-CCO-032	Credit for Waived Testing	($1,040,000)	(3.78)%	$21,682,481
		Total	**$179,152,539**	**21.28 %**	**$21,682,481**

Notes:

1. When the threshold of 75% is reached, staff may return to the Board to request additional authority.
2. Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.
3. Third party improvements/CNPA projects that are funded with non-PCEP funds.

SCADA Contract

Change Order Authority (15% of ARINC Contract)					**15% x $3,446,917 = $517,038**
Date	**Change Number**	**Description**	**CCO Amount**	**Change Order Authority Usage[1]**	**Remaining Authority**
2/11/2021	ARINC-061-CCO-001	Traction Power Facility SCADA Database Changes	$395,538	76.50 %	$121,500
		Total	**$395,538**	**76.50 %**	**$121,500**

Notes:

1. When the threshold of 75% is reached, staff may return to the Board to request additional authority.
2. Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.

Tunnel Modifications Contract

Change Order Authority (10% of ProVen Contract[1])					**10% x $55,077,777 = $5,507,778**
Date	**Change Number**	**Description**	**CCO Amount**	**Change Order Authority Usage[2]**	**Remaining Authority**
3/27/2019	PROV-070-CCO-003	Track Access Delay	$25,350	0.46 %	$5,482,428
3/27/2019	PROV-070-CCO-004	Additional OCS Potholing Due to Conflict with Existing Utilities	$70,935	1.29 %	$5,411,493
3/27/2019	PROV-070-CCO-005	Install Tie Backs and Piles in Boulders at Tunnel 4	$29,478	0.54 %	$5,382,015
3/28/2019	PROV-070-CCO-001	Partnering Meetings (50% PCEP)	$14,443	0.26 %[4]	$5,367,572
4/25/2019	PROV-070-CCO-002	Furnish Galvanized E-clips	$37,239	0.68 %	$5,330,333
4/30/2019	PROV-070-CCO-006	Additional Rock Bolts and Testing	$22,549	0.41 %	$5,307,784
5/23/2019	PROV-070-CCO-013	Late Removal of Leaky Feeder Tunnel 4 (T-4)	$21,225	0.39 %	$5,286,559
5/28/2019	PROV-070-CCO-014	OCS Piles Utility Conflict at Tunnel-1 South (T-1S)	$16,275	0.30 %	$5,270,284
5/29/2019	PROV-070-CCO-012	OCS Piles Utility Conflict at T-4S	$6,871	0.12 %	$5,263,413

Change Order Authority (10% of ProVen Contract[1]) **10% x $55,077,777 = $5,507,778**

Date	Change Number	Description	CCO Amount	Change Order Authority Usage[2]	Remaining Authority
5/31/2019	PROV-070-CCO-016A	Portal Structure Detailing Changes	$84,331	1.53 %	$5,179,082
6/18/2019	PROV-070-CCO-009	Creosote Ties Covering (CNPA - Drainage $3,116.00)	$3,116	0.06 %[4]	$5,175,966
6/28/2019	PROV-070-CCO-008	Micropiles at South Tunnel-2 South (T-2S)	$41,322	0.75 %	$5,134,644
6/28/2019	PROV-070-CCO-010	Salvage Transition Panels (CNPA - Drainage $6,144.00)	$6,144	0.11 %[4]	$5,128,500
6/28/2019	PROV-070-CCO-011	Demo PVC and Plug Tunnel-1 South (T-1S) (CNPA - Drainage $4,035.00)	$4,035	0.07 %[4]	$5,124,465
6/28/2019	PROV-070-CCO-020	Unidentified SD Conflict with Junction Inlet (CNPA - Drainage $1,976.00)	$1,976	0.04 %[4]	$5,122,489
9/26/2019	PROV-070-CCO-007	Canopy Tube Drilling	$89,787	1.63%	$5,032,702
9/26/2019	PROV-070-CCO-023	Over-excavate Trapezoidal Ditch at T-1N (CNPA - Drainage $46,914.00)	$46,914	0.85%[4]	$4,985,788
10/4/2019	PROV-070-CCO-029	Additional DryFix Pins	$105,000	1.91%	$4,880,788
10/4/2019	PROV-070-CCO-021	Out of Sequence Piles	$185,857	3.37 %	$4,694,931
10/30/2019	PROV-070-CCO-017	Hard Piping in T-4 (CNPA - Drainage $2,200.00)	$2,200	0.04 %[4]	$4,692,731
1/25/2020	PROV-070-CCO-027	Grout Quantity Underrun	($1,216,000)	(22.08)%	$5,908,731
1/29/2020	PROV-070-CCO-026	HMAC Quantity Overrun (CNPA - Drainage $160,000.00)	$160,000	2.9 %[4]	$5,748,731
5/11/2020	PROV-070-CCO-025	NOPC #1 CWR (CNPA - Drainage $660,000.00)	$660,000	11.98 %[4]	$5,088,731
7/31/2020	PROV-070-CCO-032	Stone Masonry Fabrication at T-4S	$26,367	0.48 %	$5,062,364
7/31/2020	PROV-070-CCO-035	Low Overhead Obstruction at T-1N	$18,894	0.34 %	$5,043,470
8/20/2020	PROV-070-CCO-034	Milestone No. 2 - Overall Substantial Completion	$0	0.00 %	$5,027,819
1/27/2021	PROV-070-CCO-037	Additional Fence	$15,651	0.28 %	$5,027,819
		Total	**$479,959**	**8.71 %**	**$5,027,819**

Notes:

1. Tunnel modifications contract ($55,077,777) includes: Notching ($25,281,170), Drainage ($13,196,607) and OCS Installation ($16,600,000).
2. When the threshold of 75% is reached, staff may return to the Board to request additional authority.
3. Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.
4. Third Party Improvements/CNPA Projects that are funded with non-PCEP funds.

CEMOF Modifications Contract

Change Order Authority (10% of ProVen Contract) **10% x $6,550,777 = $655,078**

Date	Change Number	Description	CCO Amount	Change Order Authority Usage[1]	Remaining Authority
1/16/2020	PROV-071-CCO-001	Change Casing Size of Siphon Line to Schedule 80 PVC Pipe	$3,849	0.59 %	$651,229
1/13/2020	PROV-071-CCO-002	Leakage test for IW line	$1,339	0.20 %	$649,890
1/15/2020	PROV-071-CCO-003	Roughen surface of existing concrete	$3,159	0.48 %	$646,731
1/9/2020	PROV-071-CCO-004	Change Catch Basin Size from 24"X24" to 36" Round	$14,415	2.20 %	$632,316
1/15/2020	PROV-071-CCO-005	Hand Dig around Communication Lines	$906	0.14 %	$631,410
1/17/2020	PROV-071-CCO-008	Change Storm Drain Line A Material from 12-inch RCP Pipe to 12-inch PVC Pipe	$3,583	0.55 %	$627,827
1/16/2020	PROV-071-CCO-009	Demolition of Existing Exterior Light	$1,558	0.24 %	$626,269
2/13/2020	PROV-071-CCO-010	Deletion of Plastic Bollards Around New Inspection Pit	($3,324)	(0.51)%	$629,593

Change Order Authority (10% of ProVen Contract) **10% x $6,550,777 = $655,078**

Date	Change Number	Description	CCO Amount	Change Order Authority Usage[1]	Remaining Authority
2/13/2020	PROV-071-CCO-011	Fixing Broken Conduit in Concrete Slab North of Maintenance Building	$4,286	0.65 %	$625,307
2/13/2020	PROV-071-CCO-012	Epoxy Dowels at New Stairwells	$3,526	0.54 %	$621,781
2/13/2020	PROV-071-CCO-013	Deletion of the Removal and Replacement of Pump Disconnect Switches	($7,007)	(1.07)%	$628,788
2/13/2020	PROV-071-CCO-014	Recycled Base Rock for Backfill at Pressurized Water Line at Parts Storage Warehouse	$1,411	0.22 %	$627,377
2/20/2020	PROV-071-CCO-015	Cut and Cap Oil Line	$1,002	0.15 %	$626,375
2/25/2020	PROV-071-CCO-016	Installation of Homerun Conduit	$27,404	4.18 %	$598,971
2/25/2020	PROV-071-CCO-017	Potholing for Boosted Water Line	$18,476	2.82 %	$580,495
2/28/2020	PROV-071-CCO-018	Cap Compressed Air Line	$9,519	1.45 %	$570,976
2/28/2020	PROV-071-CCO-019	Acoustic Ceiling Removal at Component Test Room	$4,253	0.65 %	$566,723
3/5/2020	PROV-071-CCO-020	Ground Wire Relocation	$14,117	2.16 %	$552,606
3/13/2020	PROV-071-CCO-021	Zurn Drain Assembly in Lieu of Fibrelyte	$1,104	0.17 %	$551,502
4/8/2020	PROV-071-CCO-022	Deletion of Concrete Pad and Double Plywood Floor at PSW	($1,409)	(0.22)%	$552,911
4/8/2020	PROV-071-CCO-023	Flashing at Overflow Drain at Component Test Room	$2,981	0.46 %	$549,930
4/9/2020	PROV-071-CCO-024	Parts Storage Warehouse Power Feed	$16,412	2.51 %	$533,518
4/22/2020	PROV-071-CCO-025	Removal of Hazardous Soil from PSW Subgrade Excavation	$43,444	6.63 %	$490,073
4/22/2020	PROV-071-CCO-026A	Removal of Hazardous Soil from PSW Footing Excavation	$35,808	5.47 %	$454,266
4/27/2020	PROV-071-CCO-027	480 Volt Duct Bank and Wire Removal	$5,015	0.77 %	$449,251
5/28/2020	PROV-071-CCO-031A	Temporary Facilities - Eye Wash Stations	$656	0.10 %	$448,595
6/3/2020	PROV-071-CCO-032A	Water Diversion Pump for Catch Basin Work	$2,745	0.42 %	$445,850
6/3/2020	PROV-071-CCO-033A	Light Towers for Maintenance Building Yard	$3,897	0.59 %	$441,953
6/3/2020	PROV-071-CCO-034	Investigation of Concrete Underneath Ties at Track 5	$5,060	0.77 %	$436,893
6/16/2020	PROV-071-CCO-029A	Shoring Design for Boosted Water Line Work	$14,307	2.18 %	$422,586
6/16/2020	PROV-071-CCO-030A	Investigation and Re-wiring of Electrical Receptacles at CTR	$7,783	1.19 %	$414,803
6/10/2020	PROV-071-CCO-028	Credit for Electrical Feed to Parts Storage Warehouse	($18,682)	(2.85)%	$433,485
7/24/2020	PROV-071-CCO-029B	Shoring Design for Boosted Water Line Work	$2,175	0.33 %	$431,310
7/24/2020	PROV-071-CCO-032B	Water Diversion Pump for Catch Basin Work	$3,621	0.55 %	$427,689
7/24/2020	PROV-071-CCO-035	Settlement Slab Demolition	$479	0.07 %	$427,210
7/24/2020	PROV-071-CCO-036	Storm Drain Line A	$2,066	0.32 %	$425,144
7/30/2020	PROV-071-CCO-037	Owner Supplied WSP Cabinet - Added Mechanical Pad and Conduit Pull	$5,922	0.90 %	$419,222
7/30/2020	PROV-071-CCO-038	Interior and Exterior Metal Wall Panels at CTR	$10,317	1.57 %	$408,905
7/30/2020	PROV-071-CCO-039	Exterior CMU Wall at CTR	$16,152	2.47 %	$392,753
7/30/2020	PROV-071-CCO-040	Membrane Waterproofing Specification Modifications	$36,233	5.53 %	$356,520
12/17/2019	PROV-071-CCO-007	Demolition of Existing Transition Slab at North and South Pits	$8,101	1.24 %	$348,419
8/13/2020	PROV-071-CCO-041	Abandonment of Drainage Structure in Conflict with Shoring at Stair No. 71	$11,015	1.68 %	$337,404
8/14/2020	PROV-071-CCO-043	Lighting Circuit Restoration	$2,980	0.45 %	$334,424

Change Order Authority (10% of ProVen Contract) **10% x $6,550,777 = $655,078**

Date	Change Number	Description	CCO Amount	Change Order Authority Usage[1]	Remaining Authority
8/18/2020	PROV-071-CCO-026B	Removal of Hazardous Soil from PSW Ductbank Excavation	$6,838	1.04 %	$327,586
8/24/2020	PROV-071-CCO-044	Aerial Cable and Waterproofing Cable Penetrations at the CCF and PSW Buildings	$14,589	2.23 %	$312,997
8/24/2020	PROV-071-CCO-045	Conduit Outside Component Test Room	$6,865	1.05 %	$306,132
9/15/2020	PROV-071-CCO-030B	Component Test Room Data and Electrical Outlets and Masonry Work	$12,530	1.91 %	$293,602
9/17/2020	PROV-071-CCO-042	Shallow Fire Sprinkler Line	$162,000	0.00%[2]	-
10/19/2020	PROV-071-CCO-046A	Electrical Duct Bank Extension from Parts Storage Warehouse to CCF Building	$20,307	3.10 %	$273,295
10/19/2020	PROV-071-CCO-047	Removal of Oil Line at the Exterior of the Maintenance Building in the Way of Storm Drain Line A	$262	0.04 %	$273,033
10/20/2020	PROV-071-CCO-048	Electrical Conduit and Wires at Track 5	$6,770	1.03 %	$266,263
11/30/2020	PROV-071-CCO-033B	Light Towers for Maintenance Building Yard	$10,393	1.59 %	$255,870
11/17/2020	PROV-071-CCO-049	Lighting at Parts Storage Warehouse	$6,358	0.97 %	$249,512
11/25/2020	PROV-071-CCO-050	NTP Delay – Non-Compensable Time Extension	$0	0.00 %	$249,512
11/19/2020	PROV-071-CCO-051	Relocation of an Existing Boosted Water Line in Conflict with South Pit Extension	$250,000	0.00%[2]	-
2/26/2021	PROV-071-CCO-052	Acoustic Ceiling Framing at the Component Test Room	$3,998	0.61 %	$245,514
2/26/2021	PROV-071-CCO-053	Temporary Sanitary Facilities During Boosted Water/Copper Line Work	$963	0.15 %	$244,551
3/3/2021	PROV-071-CCO-054	Relocation of Material Onsite for OCS Foundation Project	$1,772	0.27 %	$242,779
5/7/2021	PROV-071-CCO-055	Windows and Glazing at Component Test Room	$17,679	2.70 %	$225,100
		Total	**$841,978**	**65.64 %**	**$225,100**

Notes:

1. When the threshold of 75% is reached, staff may return to the Board to request additional authority.
2. Change approved by the Board of Directors – not counted against the Executive Director's Change Order Authority.

AMTRAK AEM-7 Contract

Change Order Authority (Lump Sum) **Up to $150,000**

Date	Change Number	Description	CCO Amount	Change Order Authority Usage[1]	Remaining Authority
10/25/2019	AMTK-066-CCO-001	Change to Amtrak Contract for Test Locomotives	(72,179)	(48.12%)	222,179
		Total	**(72,179)**	**(48.12%)**	**$222,179**

Notes:

When the threshold of 75% is reached, staff may return to the Board to request additional authority.

Appendix F – Risk Table

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Listing of PCEP Risks and Effects in Order of Severity

ID	RISK DESCRIPTION	EFFECT(S)
314	The contractor may not complete signal and communication design, installation and testing for the Two-speed check (2SC) modifications within budget and schedule.	Delay to integrated testing and operations/revenue service
303	Extent of differing site conditions and associated redesign efforts results in delays to the completion of the electrification contract and increases program costs.	Extends construction of design-build contract with associated increase in project costs • DSC design cost • Inefficiencies • Construction costs related to DSCs (i.e., larger foundations) • Additional potholing
010	Potential for Stadler's sub-suppliers to fall behind schedule or delays in parts supply chain result in late completion of vehicles.	• Delay in obtaining parts / components. • Cost increases. (See Owner for allocation of costs) • Schedule increase - 3 months (See Owner for allocation of damages associated with this Risk)
313	Sub-optimal contractor sequencing, when progressing design and clearing foundation locations may result in construction inefficiencies	Contractor claims for increase in construction and design costs, and reduced production rates extending construction duration
240	Property not acquired in time for contractor to do work. Property Acquisition not complete per contractor availability date <>Fee <>Easement <>Contract stipulates that if parcels are not available by contract date, there is only a delay if parcels are not available by the time contractor completes the Segment	• Potential delays in construction schedule
267	Additional property acquisition is necessitated by change in design.	New project costs and delays to schedule.
273	Contractor generates hazardous materials, that necessitates proper removal and disposal in excess of contract allowances and expectations.	Delay to construction while removing and disposing of hazardous materials resulting in schedule delay, increased construction costs, and schedule delay costs.
308	Rejection of DVR for ATF and static wires results in cost and schedule impacts to PCEP.	Delay and delay claims

ID	RISK DESCRIPTION	EFFECT(S)
318	Change of vehicle sub-suppliers results in additional first article inspections at cost to JPB (i.e., COVID, bankruptcy)	PCEP incurs additional cost to validate supplier and product, including repeat FAIs as needed
263	Collaboration across multiple disciplines to develop a customized rail activation program may fail to comprehensively address the full scope of issues required to operate and maintain an electrified railroad and decommission the current diesel fleet.	Delay in testing of EMUs. Delay in Revenue Service Date. Additional costs for Stadler and BBII due to overall schedule delays.
304	Solution to FRA concerns over bike storage impeding path to emergency exit windows path results in increased costs and potential rework.	Protracted negotiations with FRA to achieve original design
330	PG&E interconnection work may not be completed on time resulting in delays to the reimbursement of PG&E Exhibit B Cost Allocation from PG&E.	• Potential cash flow issue requiring use of line-of-credit • Failure to receive reimbursement during course of project • Delay or otherwise affect close-out of FFGA
209	TASI may not have sufficient number of signal maintainers for testing.	• Delays to construction/testing. • Delays to completion of infrastructure may delay acceptance of vehicles
011	Risks in achieving acceptable vehicle operations performance: <> software problems <> electrical system problems <> mechanical problems <> systems integration problems <> interoperability with diesel equipment Increased issues lately with vehicles regarding system integration and compatibility.	Cost increase. Delays vehicle acceptance Potential spill-over to other program elements
244	Delays to completion of Segment 4 and then the entire alignment would create storage issues and impede the ability to exercise (power up and move) EMUs and delay testing of the delivered EMUs.	Delay claims from the EMU contractor (Stadler) and expiration of the EMU 2 year warranty before putting significant mileage on the EMUs. Inability to exercise EMUs
319	Failure of BBI to order cages in advance results in delays to foundation installation	Delays in installation of catenary system and additional cost for track protection and oversight.
325	EMU production delay. Possible that there are quality issues, failed factory tests, poor integration / control of suppliers.	Schedule Increase
327	EMU production delay. Possible that there is poor integration / control of suppliers.	Schedule Increase

ID	RISK DESCRIPTION	EFFECT(S)
329	Work for PCEP that is being constructed by other projects may not be completed in accordance with the BBII project schedule. Critical work includes: • Installation of signal house as part of SSF Station Project	Delay to BBII construction progress and associated delay claims
013	Vehicle manufacturer could default.	Prolonged delay to resolve issues (up to 12 months) Increase in legal expenses Potential price increase to resolve contract issue
067	Relocation of overhead utilities must precede installation of catenary wire and connections to TPSs. Relocation work will be performed by others and may not be completed to meet BBII's construction schedule.	Delay in progress of catenary installation resulting in claims and schedule delay
223	Major program elements may not be successfully integrated with existing operations and infrastructure in advance of revenue service.	Proposed changes resulting from electrification may not be fully and properly integrated into existing system. Rework resulting in cost increases and schedule delays
242	Track access does not comply with contract-stipulated work windows.	Contractor claims for delays, schedule delays and associated costs to owner's representative staff.
253	Permits for bridges may not be issued in a timely manner.	Delays to issuance of permit for construction while negotiating and executing an operation and maintenance agreement for equipment installed on bridges; existing bridge deficiencies could result in additional costs to PCEP.
261	Although EMUs meets their electromagnetic emissions limits and wayside signal system track circuits meet their susceptibility requirements there are still compatibility issues leading to improper signal system operation	Changes on the EMU and/or signal system require additional design and installation time and expense.
285	Potential for inflation, (except with respect to Maintenance Option) to increase contractor costs.	Higher cost
286	Potential for wage escalation, (except for Maintenance Option) to increase contractor costs.	Higher cost
056	Lack of operations personnel for testing.	• Testing delayed. • Change order for extended vehicle acceptance.

ID	RISK DESCRIPTION	EFFECT(S)
115	Other capital improvement program projects compete with PCEP for track access allocation and requires design coordination (design, coordination, integration).	Schedule delay as resources are allocated elsewhere, won't get track time, sequencing requirements may delay PCEP construction, track access requirements must be coordinated.
289	Coordination and delivery of permanent power for power drops for everything except traction power substations along alignment	Can't test resulting in delays to schedule and associated additional project costs.
296	PG&E needs to complete interconnection to be sufficiently complete to accept interim power	SCC
321	Single Phase Study and interconnection agreement may be delayed preventing energization of Segment 4 for milestone 1	
082	Unexpected restrictions could affect construction progress: <> night work <> noise <> local roads <> local ordinances	• Reduced production rates. • Delay
270	OCS poles or structures as designed by Contractor fall outside of JPB row	Additional ROW Take, additional cost and time
012	Potential for electromagnetic interference (EMI) to private facilities with sensitive electronic equipment caused by vehicles.	• Increased cost due to mitigation • Potential delay due to public protests or environmental challenge.
014	Contractor's proposal on stakeholder requested changes to the vehicles (e.g., High Level Doors in lieu of windows as emergency exits) may significantly exceed JPB authorized amount.	Schedule delay. Cost increase.
078	Need for unanticipated, additional ROW for new signal enclosures.	Delay while procuring ROW and additional ROW costs.
087	Unanticipated HazMat or contaminated hot spots encountered during foundation excavations for poles, TPSS, work at the yards.	Increased cost for clean-up and handling of materials and delay to schedule due to HazMat procedures.
088	Construction safety program fails to sufficiently maintain safe performance.	Work stoppages due to safety incidents resulting in schedule delay and additional labor costs.
171	Electrification facilities could be damaged during testing.	Delay in commencing electrified operations.
247	Timely resolution of 3rd party design review comments to achieve timely approvals	Delay to completion of design and associated additional labor costs.
251	Subcontractor and supplier performance to meet aggressive schedule <>Potential issue meeting Buy America requirements	Delay to production schedule resulting in increased soft costs and overall project schedule delay.

ID	RISK DESCRIPTION	EFFECT(S)
272	Final design based upon actual Geotech conditions	Could require changes
287	Design changes may necessitate additional implementation of environmental mitigations not previously budgeted.	Increased cost for environmental measures and delays to construct and overall delay in construction schedule
291	Order/manufacture of long lead items prior to 100% IFC design document that proves to be incorrect	Design change and/or delays
317	JPB may not make timely acquisition of resources to staff rail activation plan with key personnel.	Delay in operating electrified railroad - delay of RSD.
323	FRA concerns require re-design	
326	EMU production delay. Possible that there are failed factory tests	Schedule Increase
027	Vehicle power consumption may not meet requirements. <>System impact study and load flow show no issues	Issue with PG&E. Can't run full acceleration.
031	New cars possibly not reliable enough to be put into service as scheduled	Operating plan negatively impacted
101	PG&E may not be able to deliver permanent power for the project within the existing budget and in accordance with the project schedule	Additional project costs; potential delay to revenue service date
150	Number of OCS pole installation is significant. Any breakdown in sequencing of operations or coordination of multiple crews will have a substantial effect on the project.	Delay.
245	Failure of BBI to submit quality design and technical submittals in accordance with contract requirements • $3-$5M/month burn rate for Owner's team during peak	Delays to project schedule and additional costs for preparation and review of submittals.
252	Failure of BBI to order/manufacture long lead items prior to 100% IFC design document approval by JPB	Delays to project schedule and additional cost for contractor and JPB staff time.
271	Need for additional construction easements beyond that which has been provided for Contractor proposed access and staging	Additional cost and time
306	Possible legal challenge and injunction to any changes in PCEP requiring subsequent CEQA or NEPA environmental clearance documentation/actions.	Worst case: a judge issues an injunction, which would prohibit any work ONLY on the project scope of the environmental document. Impact to the project from cost and schedule impact depends on if work is on the critical or becomes on the critical path.

ID	RISK DESCRIPTION	EFFECT(S)
322	BBII needs to complete traction power substations to be sufficiently complete to accept interim power	Delay in testing and increased costs
008	Requests for change orders after vehicles are in production	Delays to manufacturing of vehicles and additional design and manufacturing costs.
025	Potential that vehicles cannot meet requirements for "Mean Time to Repair" (MTTR).	Increased maintenance cost.
032	Failure to come up to speed on stakeholder safety requirements: <> FTA <> FRA <> CPUC	Takes longer than expected to gain FRA/FTA concurrence on waiver and/or level boarding requirements.
053	Failure to meet Buy America requirements. (Contractor definition of component v. sub-component may not be accepted by Caltrain / FTA.)	Potential need for negotiations that might lead to delay of project award. (BA is not negotiable)
069	Potential need for additional construction easements. Especially for access and laydown areas. Contractor could claim project is not constructible and needs more easements after award.	Increased cost Delay
106	Potential that DB contractor will have insufficient field resources (personnel or equipment) to maintain aggressive schedule. Multiple segments will need to be under design simultaneously. Labor pool issue. 32 qualified linemen will be needed. Potential there is not enough available. Big storm damage anywhere in US will draw from the pool to make line repairs. Possible shortages with other specialty crafts as well.	Delay.
151	Public could raise negative concerns regarding wheel/rail noise.	Increased cost to mitigate: <> grind rails <> reprofile wheels <> sound walls
161	Unanticipated costs to provide alternate service (bus bridges, etc.) during rail service disruptions.	Cost increase.

ID	RISK DESCRIPTION	EFFECT(S)
192	Environmental compliance during construction. - Potential impact to advancing construction within the vicinity of any cultural finds that are excavated. - Failure to meet the commitments contained within the PCEP EA, FEIR and permit conditions	• Delay • Cost increase
195	Introduction of electrified train service will require training of first responders in working in and around the rail corridor. The new vehicles will be considerably quieter than the existing fleet and the presence of high voltage power lines will require new procedures for emergency response. A new training program will need to be developed and disseminated for: • Fire, police, and first responders • Local communities • Schools	Safety hazards resulting in incidents that delay construction and increase labor cost. Delays in RSD until training is completed as requirement of safety certification process.
237	JPB needs an agreement with each city in which catenary will be strung over an existing grade crossing (17 in all) under GO 88 (grade crossings). These agreements must be executed subsequent to installing overhead catenary. JPB is preparing a response to CPUC while working with the cities. Delays in reaching agreement could have impacts on schedule and budget.	Not completing the grade crossing diagnostics and getting agreement from the cities on the results can result in delays to necessary approvals for the project and revenue service.
248	3rd party coordination <>Jurisdictions, Utilities, UP, Contractors <>D/B needs to provide timely information to facilitate 3rd party coordination <>Risk is for construction	Delays in approvals resulting in project schedule delays and associated costs.
250	Potential for municipalities and other agencies to request betterments as part of the electrification project	Delay to project schedule in negotiating betterments as part of the construction within municipalities and associated increased cost to the project as no betterments were included in the project budget.
254	Potential that bridge clearance data are inaccurate and that clearances are not sufficient for installation of catenary.	Results in additional design and construction to create sufficient clearance.
266	Verizon poles in conflict with OCS may not be removed in advance of OCS installation.	Delay in progress of catenary installation resulting in claims and schedule delay

ID	RISK DESCRIPTION	EFFECT(S)
274	JPB as-built drawings and existing infrastructure to be used as basis of final design and construction is not correct	Additional cleanup of as-builts after PCEP construction
275	DB fails to verify as-built drawings and existing infrastructure	Additional cleanup of as-builts after PCEP construction
278	Failure of D/B contractor and subcontractors and suppliers to meet Buy America requirements	Delays while acceptable materials are procured and additional costs for delays and purchase of duplicative equipment.
282	Failure to maintain dynamic envelope and existing track clearances consistent with requirements.	Redesign entailing cost and schedule impacts.
284	Compliance with project labor agreement could result in inefficiencies in staffing of construction.	Increase in labor costs and less efficient construction resulting in schedule delays.
290	Delays in agreement and acceptance of initial VVSC requirements database.	Delay to design acceptance
292	Communications equipment, including the UPS, will not fit in the spaces allotted to communications work within the buildings.	Requisite equipment under design criteria could result in the need for larger unit than originally planned resulting in design and fabrication changes and associated schedule delays and costs.
311	Although project recordable injuries remain below the industry average, there have been numerous small impact incidents occurring that could potentially lead to a more serious event occurring.	The occurrence of a high impact safety event could result in project rework, construction delays, and increased project costs.
ID	**RISK DESCRIPTION**	**EFFECT(S)**
314	The contractor may not complete signal and communication design, installation and testing for the Two-speed check (2SC) modifications within budget and schedule.	Delay to integrated testing and operations/revenue service
303	Extent of differing site conditions and associated redesign efforts results in delays to the completion of the electrification contract and increases program costs.	Extends construction of design-build contract with associated increase in project costs • DSC design cost • Inefficiencies • Construction costs related to DSCs (i.e., larger foundations) • Additional potholing
010	Potential for Stadler's sub-suppliers to fall behind schedule or delays in parts supply chain result in late completion of vehicles.	• Delay in obtaining parts / components. • Cost increases. (See Owner for allocation of costs) • Schedule increase - 3 months (See Owner for allocation of damages associated with this Risk)

ID	RISK DESCRIPTION	EFFECT(S)
313	Sub-optimal contractor sequencing, when progressing design and clearing foundation locations may result in construction inefficiencies	Contractor claims for increase in construction and design costs, and reduced production rates extending construction duration
240	Property not acquired in time for contractor to do work. Property Acquisition not complete per contractor availability date <>Fee <>Easement <>Contract stipulates that if parcels are not available by contract date, there is only a delay if parcels are not available by the time contractor completes the Segment	• Potential delays in construction schedule
267	Additional property acquisition is necessitated by change in design.	New project costs and delays to schedule.
273	Contractor generates hazardous materials, that necessitates proper removal and disposal in excess of contract allowances and expectations.	Delay to construction while removing and disposing of hazardous materials resulting in schedule delay, increased construction costs, and schedule delay costs.
308	Rejection of DVR for ATF and static wires results in cost and schedule impacts to PCEP.	Delay and delay claims
318	Change of vehicle sub-suppliers results in additional first article inspections at cost to JPB (i.e., COVID, bankruptcy)	PCEP incurs additional cost to validate supplier and product, including repeat FAIs as needed
263	Collaboration across multiple disciplines to develop a customized rail activation program may fail to comprehensively address the full scope of issues required to operate and maintain an electrified railroad and decommission the current diesel fleet.	Delay in testing of EMUs. Delay in Revenue Service Date. Additional costs for Stadler and BBII due to overall schedule delays.
304	Solution to FRA concerns over bike storage impeding path to emergency exit windows path results in increased costs and potential rework.	Protracted negotiations with FRA to achieve original design
330	PG&E interconnection work may not be completed on time resulting in delays to the reimbursement of PG&E Exhibit B Cost Allocation from PG&E.	• Potential cash flow issue requiring use of line-of-credit • Failure to receive reimbursement during course of project • Delay or otherwise affect close-out of FFGA
209	TASI may not have sufficient number of signal maintainers for testing.	• Delays to construction/testing. • Delays to completion of infrastructure may delay acceptance of vehicles

ID	RISK DESCRIPTION	EFFECT(S)
011	Risks in achieving acceptable vehicle operations performance: <> software problems <> electrical system problems <> mechanical problems <> systems integration problems <> interoperability with diesel equipment Increased issues lately with vehicles regarding system integration and compatibility.	Cost increase. Delays vehicle acceptance Potential spill-over to other program elements
244	Delays to completion of Segment 4 and then the entire alignment would create storage issues and impede the ability to exercise (power up and move) EMUs and delay testing of the delivered EMUs.	Delay claims from the EMU contractor (Stadler) and expiration of the EMU 2 year warranty before putting significant mileage on the EMUs. Inability to exercise EMUs
319	Failure of BBI to order cages in advance results in delays to foundation installation	Delays in installation of catenary system and additional cost for track protection and oversight.
325	EMU production delay. Possible that there are quality issues, failed factory tests, poor integration / control of suppliers.	Schedule Increase
327	EMU production delay. Possible that there is poor integration / control of suppliers.	Schedule Increase
329	Work for PCEP that is being constructed by other projects may not be completed in accordance with the BBII project schedule. Critical work includes: • Installation of signal house as part of SSF Station Project	Delay to BBII construction progress and associated delay claims
013	Vehicle manufacturer could default.	Prolonged delay to resolve issues (up to 12 months) Increase in legal expenses Potential price increase to resolve contract issue
067	Relocation of overhead utilities must precede installation of catenary wire and connections to TPSs. Relocation work will be performed by others and may not be completed to meet BBII's construction schedule.	Delay in progress of catenary installation resulting in claims and schedule delay

ID	RISK DESCRIPTION	EFFECT(S)
223	Major program elements may not be successfully integrated with existing operations and infrastructure in advance of revenue service.	Proposed changes resulting from electrification may not be fully and properly integrated into existing system. Rework resulting in cost increases and schedule delays
242	Track access does not comply with contract-stipulated work windows.	Contractor claims for delays, schedule delays and associated costs to owner's representative staff.
253	Permits for bridges may not be issued in a timely manner.	Delays to issuance of permit for construction while negotiating and executing an operation and maintenance agreement for equipment installed on bridges; existing bridge deficiencies could result in additional costs to PCEP.
261	Although EMUs meets their electromagnetic emissions limits and wayside signal system track circuits meet their susceptibility requirements there are still compatibility issues leading to improper signal system operation	Changes on the EMU and/or signal system require additional design and installation time and expense.
285	Potential for inflation, (except with respect to Maintenance Option) to increase contractor costs.	Higher cost
286	Potential for wage escalation, (except for Maintenance Option) to increase contractor costs.	Higher cost
056	Lack of operations personnel for testing.	• Testing delayed. • Change order for extended vehicle acceptance.
115	Other capital improvement program projects compete with PCEP for track access allocation and requires design coordination (design, coordination, integration).	Schedule delay as resources are allocated elsewhere, won't get track time, sequencing requirements may delay PCEP construction, track access requirements must be coordinated.
289	Coordination and delivery of permanent power for power drops for everything except traction power substations along alignment	Can't test resulting in delays to schedule and associated additional project costs.
296	PG&E needs to complete interconnection to be sufficiently complete to accept interim power	SCC
321	Single Phase Study and interconnection agreement may be delayed preventing energization of Segment 4 for milestone 1	

ID	RISK DESCRIPTION	EFFECT(S)
082	Unexpected restrictions could affect construction progress: <> night work <> noise <> local roads <> local ordinances	• Reduced production rates. • Delay
270	OCS poles or structures as designed by Contractor fall outside of JPB row	Additional ROW Take, additional cost and time
012	Potential for electromagnetic interference (EMI) to private facilities with sensitive electronic equipment caused by vehicles.	• Increased cost due to mitigation • Potential delay due to public protests or environmental challenge.
014	Contractor's proposal on stakeholder requested changes to the vehicles (e.g., High Level Doors in lieu of windows as emergency exits) may significantly exceed JPB authorized amount.	Schedule delay. Cost increase.
078	Need for unanticipated, additional ROW for new signal enclosures.	Delay while procuring ROW and additional ROW costs.
087	Unanticipated HazMat or contaminated hot spots encountered during foundation excavations for poles, TPSS, work at the yards.	Increased cost for clean-up and handling of materials and delay to schedule due to HazMat procedures.
088	Construction safety program fails to sufficiently maintain safe performance.	Work stoppages due to safety incidents resulting in schedule delay and additional labor costs.
171	Electrification facilities could be damaged during testing.	Delay in commencing electrified operations.
247	Timely resolution of 3rd party design review comments to achieve timely approvals	Delay to completion of design and associated additional labor costs.
251	Subcontractor and supplier performance to meet aggressive schedule <>Potential issue meeting Buy America requirements	Delay to production schedule resulting in increased soft costs and overall project schedule delay.
272	Final design based upon actual Geotech conditions	Could require changes
287	Design changes may necessitate additional implementation of environmental mitigations not previously budgeted.	Increased cost for environmental measures and delays to construct and overall delay in construction schedule
291	Order/manufacture of long lead items prior to 100% IFC design document that proves to be incorrect	Design change and/or delays
317	JPB may not make timely acquisition of resources to staff rail activation plan with key personnel.	Delay in operating electrified railroad - delay of RSD.
323	FRA concerns require re-design	
326	EMU production delay. Possible that there are failed factory tests	Schedule Increase

ID	RISK DESCRIPTION	EFFECT(S)
027	Vehicle power consumption may not meet requirements. <>System impact study and load flow show no issues	Issue with PG&E. Can't run full acceleration.
031	New cars possibly not reliable enough to be put into service as scheduled	Operating plan negatively impacted
101	PG&E may not be able to deliver permanent power for the project within the existing budget and in accordance with the project schedule	Additional project costs; potential delay to revenue service date
150	Number of OCS pole installation is significant. Any breakdown in sequencing of operations or coordination of multiple crews will have a substantial effect on the project.	Delay.
245	Failure of BBI to submit quality design and technical submittals in accordance with contract requirements • $3-$5M/month burn rate for Owner's team during peak	Delays to project schedule and additional costs for preparation and review of submittals.
252	Failure of BBI to order/manufacture long lead items prior to 100% IFC design document approval by JPB	Delays to project schedule and additional cost for contractor and JPB staff time.
271	Need for additional construction easements beyond that which has been provided for Contractor proposed access and staging	Additional cost and time
306	Possible legal challenge and injunction to any changes in PCEP requiring subsequent CEQA or NEPA environmental clearance documentation/actions.	Worst case: a judge issues an injunction, which would prohibit any work ONLY on the project scope of the environmental document. Impact to the project from cost and schedule impact depends on if work is on the critical or becomes on the critical path.
322	BBII needs to complete traction power substations to be sufficiently complete to accept interim power	Delay in testing and increased costs
008	Requests for change orders after vehicles are in production	Delays to manufacturing of vehicles and additional design and manufacturing costs.
025	Potential that vehicles cannot meet requirements for "Mean Time to Repair" (MTTR).	Increased maintenance cost.
032	Failure to come up to speed on stakeholder safety requirements: <> FTA <> FRA <> CPUC	Takes longer than expected to gain FRA/FTA concurrence on waiver and/or level boarding requirements.

ID	RISK DESCRIPTION	EFFECT(S)
053	Failure to meet Buy America requirements. (Contractor definition of component v. sub-component may not be accepted by Caltrain / FTA.)	Potential need for negotiations that might lead to delay of project award. (BA is not negotiable)
069	Potential need for additional construction easements. Especially for access and laydown areas. Contractor could claim project is not constructible and needs more easements after award.	Increased cost Delay
106	Potential that DB contractor will have insufficient field resources (personnel or equipment) to maintain aggressive schedule. Multiple segments will need to be under design simultaneously. Labor pool issue. 32 qualified linemen will be needed. Potential there is not enough available. Big storm damage anywhere in US will draw from the pool to make line repairs. Possible shortages with other specialty crafts as well.	Delay.
151	Public could raise negative concerns regarding wheel/rail noise.	Increased cost to mitigate: <> grind rails <> reprofile wheels <> sound walls
161	Unanticipated costs to provide alternate service (bus bridges, etc.) during rail service disruptions.	Cost increase.
192	Environmental compliance during construction. - Potential impact to advancing construction within the vicinity of any cultural finds that are excavated. - Failure to meet the commitments contained within the PCEP EA, FEIR and permit conditions	• Delay • Cost increase

ID	RISK DESCRIPTION	EFFECT(S)
195	Introduction of electrified train service will require training of first responders in working in and around the rail corridor. The new vehicles will be considerably quieter than the existing fleet and the presence of high voltage power lines will require new procedures for emergency response. A new training program will need to be developed and disseminated for: • Fire, police, and first responders • Local communities • Schools	Safety hazards resulting in incidents that delay construction and increase labor cost. Delays in RSD until training is completed as requirement of safety certification process.
237	JPB needs an agreement with each city in which catenary will be strung over an existing grade crossing (17 in all) under GO 88 (grade crossings). These agreements must be executed subsequent to installing overhead catenary. JPB is preparing a response to CPUC while working with the cities. Delays in reaching agreement could have impacts on schedule and budget.	Not completing the grade crossing diagnostics and getting agreement from the cities on the results can result in delays to necessary approvals for the project and revenue service.
248	3rd party coordination <>Jurisdictions, Utilities, UP, Contractors <>D/B needs to provide timely information to facilitate 3rd party coordination <>Risk is for construction	Delays in approvals resulting in project schedule delays and associated costs.
250	Potential for municipalities and other agencies to request betterments as part of the electrification project	Delay to project schedule in negotiating betterments as part of the construction within municipalities and associated increased cost to the project as no betterments were included in the project budget.
254	Potential that bridge clearance data are inaccurate and that clearances are not sufficient for installation of catenary.	Results in additional design and construction to create sufficient clearance.
266	Verizon poles in conflict with OCS may not be removed in advance of OCS installation.	Delay in progress of catenary installation resulting in claims and schedule delay
274	JPB as-built drawings and existing infrastructure to be used as basis of final design and construction is not correct	Additional cleanup of as-builts after PCEP construction
275	DB fails to verify as-built drawings and existing infrastructure	Additional cleanup of as-builts after PCEP construction
278	Failure of D/B contractor and subcontractors and suppliers to meet Buy America requirements	Delays while acceptable materials are procured and additional costs for delays and purchase of duplicative equipment.

ID	RISK DESCRIPTION	EFFECT(S)
282	Failure to maintain dynamic envelope and existing track clearances consistent with requirements.	Redesign entailing cost and schedule impacts.
284	Compliance with project labor agreement could result in inefficiencies in staffing of construction.	Increase in labor costs and less efficient construction resulting in schedule delays.
290	Delays in agreement and acceptance of initial VVSC requirements database.	Delay to design acceptance
292	Communications equipment, including the UPS, will not fit in the spaces allotted to communications work within the buildings.	Requisite equipment under design criteria could result in the need for larger unit than originally planned resulting in design and fabrication changes and associated schedule delays and costs.
311	Although project recordable injuries remain below the industry average, there have been numerous small impact incidents occurring that could potentially lead to a more serious event occurring.	The occurrence of a high impact safety event could result in project rework, construction delays, and increased project costs.

Appendix G – MMRP Status Log

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Mitigation Monitoring and Reporting						
Mitigation Measure	**Mitigation Timing**				**Status**	**Status Notes**
	Pre-Construction	**Construction**	**Post-Construction**	**Operation**		
AES-2a: Minimize OCS construction activity on residential and park areas outside the Caltrain ROW.	**X**	**X**			Ongoing	The OCS proposed construction schedule has been provided to the JPB. OCS construction began the week of October 2, 2017. The D-B has utilized the potholing process to assist in locating conflicts in the 35% design and attempting to relocate OCS pole locations within the ROW.
AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers.	**X**				Ongoing	The design requirements indicated in the measure have been implemented as described, and coordination with the specific jurisdictions regarding pole colors and design is ongoing. Coordination with the JPB & local jurisdiction regarding Overbridge Protection Barriers and TPFs is ongoing.
AES-4a: Minimize spillover light during nighttime construction.		**X**			Ongoing	OCS construction began the week of October 2, 2017; and the BBI community relations lead has notified nearby residents of upcoming construction. During construction, lighting is faced inward, towards the railroad tracks, and any complaints will be documented and addressed by the BBI community relations lead.
AES-4b: Minimize light spillover at TPFs.	**X**				Upcoming	The design requirements indicated in the measure are being utilized in the design and construction process.

AQ-2a: Implement BAAQMD basic and additional construction mitigation measures to reduce construction-related dust.	**X**	**X**			Ongoing	The Dust Mitigation Plan was submitted to the JPB and approved. The requirements in the Dust Mitigation Plan will be implemented throughout the construction period and documented in daily reports.
AQ-2b: Implement BAAQMD basic and additional construction mitigation measures to control construction-related ROG and NOX emissions.	**X**	**X**			Ongoing	The Equipment Emissions Control Plan was submitted to the JPB and approved. The requirements in the Equipment Emissions Control Plan will be implemented throughout the construction period and documented in daily reports.
AQ-2c: Utilize clean diesel-powered equipment during construction to control construction-related ROG and NOX emissions.	**X**	**X**			Ongoing	The Equipment Emissions Control Plan was submitted to the JPB and approved. The requirements in the Equipment Emissions Control Plan will be implemented throughout the construction period and documented in daily reports.
BIO-1a: Implement general biological impact avoidance measures.	**X**	**X**			Ongoing	Worker Environmental Awareness Training is provided to all project-related personnel before they work on the project. All measures as described will be implemented throughout the construction period and documented in daily reports.
BIO-1b: Implement special-status plant species avoidance and revegetation measures.	**X**	**X**	**X**		Complete	Not applicable. Subsequent habitat assessment and avoidance of Communication Hill eliminated any potential to affect special-status plant species. The measure is not needed.
BIO-1c: Implement California red-legged frog and San Francisco garter snake avoidance measures.	**X**	**X**			Ongoing	Pre-construction surveys are occurring no more than 7 days prior to the initiation of construction activities nearby/adjacent to potential habitat for CRLF and SFGS. The Wildlife Exclusion Fencing Plans for Segments 1 and 4 were submitted and approved by the wildlife agencies, and installation and monitoring of wildlife exclusion

						fencing is ongoing. No CRLF / SFGS or sign of each species has been observed to date on the Project.
BIO-1d: Implement western pond turtle avoidance measures.	**X**	**X**			Ongoing	Pre-construction surveys are occurring no more than 7 days prior to the initiation of construction activities nearby/adjacent to potential habitat for WPT. No WPT or WPT sign have been observed to date on the Project.
BIO-1e: Implement Townsend's big-eared bat, pallid bat, hoary bat, and fringed myotis avoidance measures.	**X**	**X**			Ongoing	Pre-construction surveys are occurring no more than 7 days prior to the initiation of construction activities with the potential to disturb bats or their habitat. No special-status bats or sign have been observed to date on the Project.
BIO-1f: Implement western burrowing owl avoidance measures.	**X**	**X**			Ongoing	Protocol surveys for Western Burrowing Owl have been conducted from April–July, in 2017, 2018, 2019, and 2020, at previously identified potentially suitable habitat locations. Note that all of these locations are in Construction Segment 4 (southern Santa Clara and San Jose). No Burrowing Owls have been observed during the 2017-2019 surveys. Survey reports for the 2017, 2018, 2019, and 2020 surveys have been submitted to the JPB for the project record. In addition, pre-construction surveys of the potential BUOW habitat areas in Segment 4 are ongoing, as needed, and if required, they occur no more than 7 days prior to the onset of new ground-disturbing construction activities. During a 2020 pre-construction survey (March 24, 2020), two burrowing owls were observed adjacent to the Caltrain ROW, near MP 44.6. The owls were located

						approximately 150 feet away from the Caltrain ROW. A 200-meter no-disturbance buffer and a combination of full-time monitoring and weekly spot-checks, as approved by the CDFW, were implemented during the breeding season (March through August). No impacts to the BUOW were observed, and the BUOW was consistently observed at the northern most potential BUOW burrow location during the monitoring effort. On September 1, since there was some potential for indirect impacts during the non-breeding season (September 1 through January 31), the disturbance buffer was reduced from 200 meters to 75 meters, as approved by the CDFW. On February 2, 2021, while conducting nesting bird surveys in the area, a biologist checked the burrow and there were no sign of use and cobwebs were present. Subsequent check-ins of the area revealed the same results, and it was determined the burrow was no longer active, and the buffer was removed. The second round of protocol BUOW surveys were conducted in May and no BUOWs or signs were detected. The final two rounds of surveys will be conducted next month. The Biologist will continue to conduct preconstruction surveys for nesting burrowing owls no more than 7 days prior to ground disturbance as needed throughout the 2021 nesting season.
BIO-1g: Implement northern harrier, white-tailed kite, American peregrine falcon, saltmarsh common yellowthroat, purple martin, and other nesting bird avoidance measures.	**X**	**X**			Ongoing	Nesting Bird and raptor surveys were conducted from February 1 through September 15, in 2017, 2018, 2019, and 2020, prior to project-related activities with the potential to impact nesting birds. Nesting bird surveys continued during this reporting period for the 2021 nesting season. Active cliff swallow nests previously observed are still present on the underside of the Tunnel Ave bridge.

						Biological monitors were present as work occurred within the 50-foot monitoring buffer. No signs of distress were observed. No additional active nests were observed on the Project.
BIO-1h: Conduct biological resource survey of future contractor-determined staging areas.	**X**	**X**			Ongoing	The agency-approved Qualified Biologist has conducted surveys of the staging areas currently being used for construction activities. No special-status species or other potentially sensitive biological resources were observed. The agency-approved Qualified Biologist will continue to survey ahead of the initiation of activities at planned staging areas as the Project moves into new construction areas.
BIO-1i: Minimize impacts on Monarch butterfly overwintering sites.	**X**	**X**			Ongoing	The agency-approved Qualified Biologist has periodically monitored the project limits to evaluate the presence of Monarch butterfly overwintering sites. No Monarch butterfly overwintering sites have been observed on the Project to date.
BIO-1j: Avoid nesting birds and bats during vegetation maintenance.				**X**	Upcoming	To be completed during Project operation.
BIO-2: Implement serpentine bunchgrass avoidance and revegetation measures.	**X**	**X**	**X**		Complete	Not applicable. Subsequent habitat assessment and avoidance of Communication Hill eliminated any potential to affect serpentine bunchgrass. This measure is no longer needed.
BIO-3: Avoid or compensate for impacts on wetlands and waters.	**X**	**X**	**X**		Complete	The JPB has compensated for unavoidable wetland impacts by purchasing adequate credits from a wetlands mitigation bank approved by USACE and SFRWQCB.

BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan.	**X**	**X**	**X**		Ongoing	Tree removal and pruning activities were initiated in August 2017, and are ongoing, under the guidance of the BBI Arborist, and in accordance with the Tree Avoidance, Minimization, and Replacement Plan. Tree Removal and Pruning status is provided to the JPB on a regular basis.
BIO-6: Pay *Santa Clara Valley Habitat Plan* land cover fee (if necessary).	**X**				Complete	Not applicable. The SCVHP does not apply to the Project because TPS2, Option 1 was not selected and OCS does not extend to Communication Hill. This measure is not needed.
CUL-1a: Evaluate and minimize impacts on structural integrity of historic tunnels.	**X**				Upcoming	To be implemented prior to construction in tunnels.
CUL-1b: Minimize impacts on historic decorative tunnel material.	**X**				Upcoming	To be implemented prior to construction in tunnels. Historic American Engineering Record (HAER) documentation was completed in October 2018, pursuant to this measure.
CUL-1c: Install project facilities in a way that minimizes impacts on historic tunnel interiors.	**X**				Upcoming	To be implemented prior to construction in tunnels.
CUL-1d: Implement design commitments at historic railroad stations	**X**				Complete	The Qualified Architectural Historian completed and submitted the HABS Level III documents to the JPB for all seven of the historic stations. Pole placement has been designed to minimize the visual impact to historic stations and all design changes are reviewed by the Environmental Compliance Lead to ensure the mitigation measure is being implemented as the design of the project progresses.

CUL-1e: Implement specific tree mitigation considerations at two potentially historic properties and landscape recordation, as necessary.	**X**	**X**			Complete	It was determined that the project is not acquiring any ROW at either of the subject properties so all tree effects would be within the JPB ROW. Therefore, the APE does not include these two historic properties. This measure is no longer needed.
CUL-1f: Implement historic bridge and underpass design requirements.	**X**				Ongoing	This measure is being implemented as described during the design process and will be incorporated into the final design. The four bridges that are included in the MMRP are rail bridges crossing over another feature. Design of the OCS system is taking into account that there are requirements that restrict the design. Thus far, the designs for Construction Segments 2 & 4 are in process and designs are not yet complete. The D-B will forward to the Architectural Historian once complete.
CUL-2a: Conduct an archaeological resource survey and/or monitoring of the removal of pavement or other obstructions to determine if historical resources under CEQA or unique archaeological resources under PRC 21083.2 are present.	**X**				Ongoing	Periodic inspections of ground surface areas along the alignment, in conjunction with cultural monitoring as-needed of project activities in culturally sensitive areas are ongoing. The Archaeological Final Report will be provided at the conclusion of construction activities.
CUL-2b: Conduct exploratory trenching or coring of areas where subsurface project disturbance is planned in those areas with "high" or "very high" potential for buried site.	**X**				Ongoing	Exploratory trenching and subsurface testing of all potentially culturally sensitive areas occurred prior to the initiation of construction activities in those areas. The results will be included in the Archaeological Final Report. No cultural resources requiring the development of a treatment plan were observed. A Native American monitor has been present for all exploratory trenching and subsurface testing work.

CUL-2c: Conduct limited subsurface testing before performing ground-disturbing work within 50 meters of a known archaeological site.	**X**				Ongoing	Exploratory trenching and subsurface testing of all potentially culturally sensitive areas occurred prior to the initiation of construction activities in those areas. The results will be included in the Archaeological Final Report. No cultural resources requiring the development of a treatment plan were observed. A Native American monitor has been present for all exploratory trenching and subsurface testing work.
CUL-2d: Conduct exploratory trenching or coring of areas within the three zones of special sensitivity where subsurface project disturbance is planned.	**X**				Ongoing	Exploratory trenching and subsurface testing of all potentially culturally sensitive areas occurred prior to the initiation of construction activities in those areas. The results will be included in the Archaeological Final Report. No cultural resources requiring the development of a treatment plan were observed. A Native American monitor has been present for all exploratory trenching and subsurface testing work.
CUL-2e: Stop work if cultural resources are encountered during ground-disturbing activities.	**X**	**X**			Ongoing	No prehistoric or historic-period cultural materials have been observed during cultural monitoring.
CUL-2f: Conduct archaeological monitoring of ground-disturbing activities in areas as determined by JPB and SHPO.		**X**			Ongoing	Cultural monitoring as-needed of project activities in culturally sensitive areas is ongoing. The Archaeological Final Report will be provided at the conclusion of construction activities.
CUL-3: Comply with state and county procedures for the treatment of human remains discoveries.		**X**			Ongoing	No human remains have been observed to date on the Project.

EMF-2: Minimize EMI effects during final design, Monitor EMI effects during testing, commission and operations, and Remediate Substantial Disruption of Sensitive Electrical Equipment.	**X**	**X**	**X**		Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Designs are submitted and reviewed/commented on by JPB. Monitoring EMI effects will occur post construction.
GEO-1: Perform a site-specific geotechnical study for traction power facilities.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Geotechnical studies are being conducted by Parikh under subcontract with PGH Wong. Studies and results are submitted to JPB as completed.
GEO-4a: Identification of expansive soils.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design by the D-B as described. Geotechnical studies are being conducted by Parikh under subcontract with PGH Wong. Studies and results are submitted to JPB as completed.
GEO-4b: Mitigation of expansive soils.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design by the D-B as described. Geotechnical studies are being conducted by Parikh under subcontract with PGH Wong. Studies and results are submitted to JPB as completed.
HAZ-2a: Conduct a Phase II Environmental Site Assessment prior to construction.	**X**				Complete	A Phase II Environmental Assessment was completed prior to construction by the JPB consultant, and the results were provided to BBI, and the required mitigation is being implemented prior to the initiation of construction activities.

HAZ-2b: Implement engineering controls and best management practices during construction.	**X**	**X**			Ongoing	D-B field activities are being monitored daily for significant color changes or odors which may indicate contamination. In addition, assessments of existing subsurface pipes by a certified Asbestos Consultant are occurring as needed throughout the project as they are observed. Following the assessments, a specification describing the methods for removal and disposal are provided to the certified asbestos contractor. The removal and disposal work performed by the certified asbestos contractor is monitored by the certified asbestos consultant. During the reporting period, a certified asbestos consultant conducted exposure monitoring at PS-1 where naturally occurring asbestos was detected. Also, during the reporting period, samples of wrapped conduit at MP 46.7-12A were collected for asbestos analysis.
HYD-1: Implement construction dewatering treatment, if necessary.	**X**	**X**			Ongoing	Facilities & BMPs are in place to deal with this requirement should it arise in the OCS foundations.
HYD-4: Minimize floodplain impacts by minimizing new impervious areas for TPFs or relocating these facilities.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. The TPFs in Construction Segments 2 & 4 are currently in final design and design for TPFs in Construction Segments 1 & 3 has begun. The design minimizes hardscape only to required structure foundations; yard areas are to receive a pervious material.
HYD-5: Provide for electrical safety at TPFs subject to periodic or potential flooding.	**X**			**X**	Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. The TPFs in Construction Segments 2 & 4 are currently in final design and design for TPFs in Construction Segments 1 & 3 has begun. The design plan currently raises the TPFs above the floodplain.

HYD-7: Implement sea level rise vulnerability assessment and adaptation plan.				**X**	Ongoing	The JPB has initiated this measure and preparation of the sea level rise vulnerability assessment and adaptation plan is underway.
NOI-1a: Implement Construction Noise Control Plan.	**X**	**X**			Ongoing	The Noise and Vibration Control Plan has been submitted and is being implemented. Field activity is monitored per the Plan. If allowable noise levels are near or exceed allowable noise levels, mitigation such as blankets are used from that point forward.
NOI-1b: Conduct site-specific acoustical analysis of ancillary facilities based on the final mechanical equipment and site design and implement noise control treatments where required.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. PGH Wong has completed analysis and design and issued for JPB review.
NOI-2a: Implement Construction Vibration Control Plan.	**X**	**X**			Ongoing	The Noise and Vibration Control Plan has been submitted and is being implemented. Field activity is monitored per the Plan.
PSU-8a: Provide continuous coordination with all utility providers.	**X**	**X**			Ongoing	The design requirements indicated in the measure will be implemented through the final design as described. Coordination with utility providers is ongoing and there have not been any service interruptions thus far.
PSU-8b: Adjust OCS pole foundation locations.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described.

PSU-8c: Schedule and notify users about potential service interruptions.	**X**	**X**			Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. There have not been any service interruptions thus far.
PSU-9: Require application of relevant construction mitigation measures to utility relocation and transmission line construction by others.	**X**	**X**			Ongoing	JPB has initiated coordination with PG&E regarding transmission line construction. PG&E is currently raising overcrossing lines in Segment 2.
TRA-1a: Implement Construction Road Traffic Control Plan.	**X**	**X**			Ongoing	The D-B has begun traffic control design and permit applications with the City of Millbrae, Burlingame and San Mateo. Other communities will follow. Designs have been completed for all cross-over bridges in Segments 2 & 4 and submitted.
TRA-1c: Implement signal optimization and roadway geometry improvements at impacted intersections for the 2020 Project Condition.	**X**	**X**			Upcoming	This measure has not started
TRA-2a: Implement construction railway disruption control plan.	**X**	**X**			Ongoing	Minimization of railway disruption is being coordinated by the Site Specific Work Plan. A Construction Railway Disruption Control Plan was prepared to document the measures that are being implemented.
TRA-3b: In cooperation with the City and County of San Francisco, implement surface pedestrian facility improvements to address the Proposed Project's additional pedestrian movements at and immediately adjacent to the San Francisco 4th and King Station.	**X**	**X**	**X**		Upcoming	This measure has not started.

TRA-4b: Continue to improve bicycle facilities at Caltrain stations and partner with bike share programs where available following guidance in Caltrain's Bicycle Access and Parking Plan.				**X**	Ongoing	The JPB adopted the Caltrain Bicycle Parking Management Plan in November 2017, and staff has been working to implement the Plan's recommendations to improve wayside bike parking facilities along the corridor. Staff has also been coordinating with local jurisdictions that have launched bikeshare pilot programs to safely site bicycles near Caltrain stations.
NOI-CUMUL-1: Implement a phased program to reduce cumulative train noise along the Caltrain corridor as necessary to address future cumulative noise increases over FTA thresholds				**X**	Upcoming	This measure will be implemented during project operation.
NOI-CUMUL-2: Conduct project-level vibration analysis for Blended System operations and implement vibration reduction measures as necessary and appropriate for the Caltrain corridor				**X**	In Progress	CHSRA is conducting this analysis as part of the EIR/EIS for the San Francisco to San Jose section.
TRA-CUMUL-1: Implement a phased program to provide traffic improvements to reduce traffic delays near at-grade crossings and Caltrain stations				**X**	Upcoming	This measure will be implemented during project operation.
TRA-CUMUL-2: Implement technical solution to allow electric trolley bus transit across 16th Street without OCS conflicts in cooperation with SFMTA.	**X**				Complete	Not applicable. SFMTA has elected to not electrify the 16th Street crossing. This measure no longer applies.
Mitigation Measure TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide Plate H clearance as feasible between San Jose and Bayshore.				**X**	Upcoming	This measure will be implemented during project operation.

AES-2a: Minimize OCS construction activity on residential and park areas outside the Caltrain ROW.	**X**	**X**			Ongoing	The OCS proposed construction schedule has been provided to the JPB. OCS construction began the week of October 2, 2017. The D-B has used the potholing process to assist in locating conflicts in the 35% design and attempting to relocate OCS pole locations within the ROW, thereby avoiding parks and residential areas.
AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers.	**X**				Ongoing	The design requirements indicated in the measure have been implemented as described, and coordination with the specific jurisdictions regarding pole colors and design, TPFs, and Overbridge Protection Barriers, is ongoing.
AES-4a: Minimize spillover light during nighttime construction.		**X**			Ongoing	OCS construction began the week of October 2, 2017. The BBI community relations lead has notified nearby residents of upcoming construction. During construction, lighting is faced inward, towards the railroad tracks, and any complaints will be documented and addressed by the BBI community relations lead.
AES-4b: Minimize light spillover at TPFs.	**X**				Upcoming	The design requirements indicated in the measure are being used in the design process of the TPFs.
AQ-2a: Implement BAAQMD basic and additional construction mitigation measures to reduce construction-related dust.	**X**	**X**			Ongoing	The Dust Mitigation Plan was submitted to the JPB. The requirements in the Dust Mitigation Plan will be implemented throughout the construction period and documented in daily reports.
AQ-2b: Implement BAAQMD basic and additional construction mitigation measures to control construction-related ROG and NOX emissions.	**X**	**X**			Ongoing	The Equipment Emissions Control Plan was submitted to the JPB. The requirements in the Equipment Emissions Control Plan will be implemented throughout the construction period and documented in daily reports.

AQ-2c: Utilize clean diesel-powered equipment during construction to control construction-related ROG and NOX emissions.	**X**	**X**			Ongoing	The Equipment Emissions Control Plan was submitted to the JPB. The requirements in the Equipment Emissions Control Plan will be implemented throughout the construction period and documented in daily reports.
BIO-1a: Implement general biological impact avoidance measures.	**X**	**X**			Ongoing	Worker Environmental Awareness Training is provided to all project-related personnel before they work on the project. All measures as described will be implemented throughout the construction period and documented in daily reports.
BIO-1b: Implement special-status plant species avoidance and revegetation measures.	**X**	**X**	**X**		Complete	Not applicable. Subsequent habitat assessment and avoidance of Communication Hill eliminated any potential to affect special-status plant species. The measure is not needed.
BIO-1c: Implement California red-legged frog and San Francisco garter snake avoidance measures.	**X**	**X**			Ongoing	Pre-construction surveys are occurring no more than 7 days prior to the initiation of construction activities nearby/adjacent to potential habitat for CRLF and SFGS. The Wildlife Exclusion Fencing Plan for Segments 2 and 4 was submitted and approved by the wildlife agencies, and installation and monitoring of wildlife exclusion fencing is ongoing. No CRLF / SFGS or sign of each species has been observed to date on the Project. A separate Wildlife Exclusion Fencing Plan will be submitted for Segments 1 and 3, prior to initiation of construction activities in those segments.
BIO-1d: Implement western pond turtle avoidance measures.	**X**	**X**			Ongoing	Pre-construction surveys are occurring no more than 7 days prior to the initiation of construction activities nearby/adjacent to potential habitat for WPT. No WPT or WPT sign have been observed to date on the Project.

BIO-1e: Implement Townsend's big-eared bat, pallid bat, hoary bat, and fringed myotis avoidance measures.	**X**	**X**			Ongoing	Pre-construction surveys are occurring no more than 7 days prior to the initiation of construction activities with the potential to disturb bats or their habitat. No special-status bats or sign have been observed to date on the Project.
BIO-1f: Implement western burrowing owl avoidance measures.	**X**	**X**			Ongoing	Protocol surveys for Western Burrowing Owl were conducted from April 2017 through July 2017 at previously identified potentially suitable habitat locations. Note that all of these locations are in Construction Segment 4 (southern Santa Clara and San Jose). No Burrowing Owls were observed during the surveys. Construction in Segment 4 is anticipated to occur in 2018. Prior to construction activities in Segment 4, pre-construction surveys of the potential habitat areas will occur no more than 7 days prior to the onset of construction activities. In addition, protocol surveys were initiated in March 2018, and were completed in June 2018, at the previously identified potentially suitable habitat locations, which will allow work to occur during the 2019 breeding season, if necessary. No Burrowing Owls were observed during the 2018 surveys.
BIO-1g: Implement northern harrier, white-tailed kite, American peregrine falcon, saltmarsh common yellowthroat, purple martin, and other nesting bird avoidance measures.	**X**	**X**			Ongoing	Nesting Bird surveys were conducted from February 1 through September 15, 2017 prior to project-related activities with the potential to impact nesting birds. No active nests were observed during this reporting period. Nesting Bird surveys were initiated on February 1, 2018 and continued throughout the reporting period. Active nests were observed during this reporting period, and no-disturbance buffers were implemented to avoid any impacts to active nests, and all project activities which occurred nearby active nests were monitored by agency-approved biological monitors.

BIO-1h: Conduct biological resource survey of future contractor-determined staging areas.	**X**	**X**			Ongoing	The agency-approved Qualified Biologist has conducted surveys of the staging areas currently being used for construction activities. No special-status species or other potentially sensitive biological resources were observed. The agency-approved Qualified Biologist will continue to survey ahead of the initiation of activities at planned staging areas as the Project moves into new construction areas.
BIO-1i: Minimize impacts on Monarch butterfly overwintering sites.	**X**	**X**			Ongoing	The agency-approved Qualified Biologist has periodically monitored the project limits to evaluate the presence of Monarch butterfly overwintering sites. No Monarch butterfly overwintering sites have been observed on the Project to date.
BIO-1j: Avoid nesting birds and bats during vegetation maintenance.				**X**	Upcoming	To be completed during Project operation.
BIO-2: Implement serpentine bunchgrass avoidance and revegetation measures.	**X**	**X**	**X**		Complete	Not applicable. Subsequent habitat assessment and avoidance of Communication Hill eliminated any potential to affect serpentine bunchgrass. This measure is no longer needed.
BIO-3: Avoid or compensate for impacts on wetlands and waters.	**X**	**X**	**X**		Complete	The JPB has compensated for unavoidable wetland impacts by purchasing adequate credits from a wetlands mitigation bank approved by USACE and SFRWQCB.
BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan.	**X**	**X**	**X**		Ongoing	Tree removal and pruning activities were initiated in August 2017, and are ongoing, under the guidance of the BBI Arborist, and in accordance with the Tree Avoidance, Minimization, and Replacement Plan. Tree Removal and Pruning status is provided to the JPB on a weekly basis.

BIO-6: Pay *Santa Clara Valley Habitat Plan* land cover fee (if necessary).	**X**				Complete	Not applicable. The SCVHP does not apply to the Project because TPS2, Option 1 was not selected and OCS does not extend to Communication Hill. This measure is not needed.
CUL-1a: Evaluate and minimize impacts on structural integrity of historic tunnels.	**X**				Upcoming	To be implemented prior to construction in tunnels.
CUL-1b: Minimize impacts on historic decorative tunnel material.	**X**				Upcoming	To be implemented prior to construction in tunnels.
CUL-1c: Install project facilities in a way that minimizes impacts on historic tunnel interiors.	**X**				Upcoming	To be implemented prior to construction in tunnels.
CUL-1d: Implement design commitments at historic railroad stations	**X**				Complete	The Qualified Architectural Historian completed and submitted the HABS Level III documents to the JPB for all seven of the historic stations. Pole placement has been designed to minimize the visual impact to historic stations and all design changes are reviewed by the Environmental Compliance Lead to ensure the mitigation measure is being implemented as the design of the project progresses.
CUL-1e: Implement specific tree mitigation considerations at two potentially historic properties and landscape recordation, as necessary.	**X**	**X**			Complete	It was determined that the project is not acquiring any ROW at either of the subject properties so all tree effects would be within the JPB ROW. Therefore, the APE does not include these two historic properties. This measure is no longer needed.

CUL-1f: Implement historic bridge and underpass design requirements.	**X**				Ongoing	This measure is being implemented as described during the design process and will be incorporated into the final design. The four bridges that are included in the MMRP are rail bridges crossing over another feature. Design of the OCS system is taking into account that there are requirements that restrict the design. Thus far, the designs for Construction Segments 2 & 4 are in process and designs are not yet complete. The D-B will forward to the Architectural Historian once complete.
CUL-2a: Conduct an archaeological resource survey and/or monitoring of the removal of pavement or other obstructions to determine if historical resources under CEQA or unique archaeological resources under PRC 21083.2 are present.	**X**				Ongoing	Periodic inspections of ground surface areas along the alignment, in conjunction with cultural monitoring as-needed of project activities in culturally sensitive areas are ongoing. The Archaeological Final Report will be provided at the conclusion of construction activities.
CUL-2b: Conduct exploratory trenching or coring of areas where subsurface project disturbance is planned in those areas with "high" or "very high" potential for buried site.	**X**				Ongoing	Exploratory trenching and subsurface testing of all potentially culturally sensitive areas occurred prior to the initiation of construction activities in those areas. The results will be included in the Archaeological Final Report. No cultural resources requiring the development of a treatment plan were observed. A Native American monitor has been present for all exploratory trenching and subsurface testing work.
CUL-2c: Conduct limited subsurface testing before performing ground-disturbing work within 50 meters of a known archaeological site.	**X**				Ongoing	Exploratory trenching and subsurface testing of all potentially culturally sensitive areas occurred prior to the initiation of construction activities in those areas. The results will be included in the Archaeological Final Report. No cultural resources requiring the development of a treatment plan were observed. A Native American monitor has been present for all exploratory trenching and subsurface testing work.

CUL-2d: Conduct exploratory trenching or coring of areas within the three zones of special sensitivity where subsurface project disturbance is planned.	**X**				Ongoing	Exploratory trenching and subsurface testing of all potentially culturally sensitive areas occurred prior to the initiation of construction activities in those areas. The results will be included in the Archaeological Final Report. No cultural resources requiring the development of a treatment plan were observed. A Native American monitor has been present for all exploratory trenching and subsurface testing work.
CUL-2e: Stop work if cultural resources are encountered during ground-disturbing activities.	**X**	**X**			Ongoing	No prehistoric or historic-period cultural materials have been observed during cultural monitoring.
CUL-2f: Conduct archaeological monitoring of ground-disturbing activities in areas as determined by JPB and SHPO.		**X**			Ongoing	Cultural monitoring as-needed of project activities in culturally sensitive areas is ongoing. The Archaeological Final Report will be provided at the conclusion of construction activities.
CUL-3: Comply with state and county procedures for the treatment of human remains discoveries.		**X**			Ongoing	No human remains have been observed to date on the Project.
EMF-2: Minimize EMI effects during final design, Monitor EMI effects during testing, commission and operations, and Remediate Substantial Disruption of Sensitive Electrical Equipment.	**X**	**X**	**X**		Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Designs are submitted and reviewed/commented on by JPB. Monitoring EMI effects will occur post construction.

GEO-1: Perform a site-specific geotechnical study for traction power facilities.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Geotechnical studies and results are submitted to JPB as completed.
GEO-4a: Identification of expansive soils.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Geotechnical studies and results are submitted to JPB as completed.
GEO-4b: Mitigation of expansive soils.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Geotechnical studies and results are submitted to JPB as completed.
HAZ-2a: Conduct a Phase II Environmental Site Assessment prior to construction.	**X**				Complete	A Phase II Environmental Assessment was completed prior to construction by the JPB consultant, and the results were provided to BBI, and the required mitigation is being implemented prior to the initiation of construction activities.
HAZ-2b: Implement engineering controls and best management practices during construction.	**X**	**X**			Ongoing	Field activities are being monitored daily for significant color changes or odors which may indicate contamination. In addition, an assessment of two existing subsurface pipes by a certified Asbestos Consultant occurred during this reporting period, and a specification describing the methods for removal and disposal is currently in progress.
HYD-1: Implement construction dewatering treatment, if necessary.	**X**	**X**			Ongoing	Facilities & BMPs are in place to deal with this requirement should it arise in the OCS foundations.

HYD-4: Minimize floodplain impacts by minimizing new impervious areas for TPFs or relocating these facilities.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. The TPFs in Construction Segments 2 & 4 are currently in final design and design for TPFs in Construction Segments 1 & 3 has begun. The design minimizes hardscape only to required structure foundations; yard areas are to receive a pervious material.
HYD-5: Provide for electrical safety at TPFs subject to periodic or potential flooding.	**X**			**X**	Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. The TPFs in Construction Segments 2 & 4 are currently in final design and design for TPFs in Construction Segments 1 & 3 has begun. The design plan currently raises the TPFs above the floodplain.
HYD-7: Implement sea level rise vulnerability assessment and adaptation plan.				**X**	Ongoing	The JPB has initiated this measure and preparation of the sea level rise vulnerability assessment and adaptation plan is underway.
NOI-1a: Implement Construction Noise Control Plan.	**X**	**X**			Ongoing	The Noise and Vibration Control Plan has been submitted and is being implemented. Field activity is monitored per the Plan. If allowable noise levels are near or exceed allowable noise levels, mitigation such as blankets are used from that point forward.
NOI-1b: Conduct site-specific acoustical analysis of ancillary facilities based on the final mechanical equipment and site design and implement noise control treatments where required.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Design is still in process and a noise study is currently being performed.

NOI-2a: Implement Construction Vibration Control Plan.	**X**	**X**			Ongoing	The Noise and Vibration Control Plan has been submitted and is being implemented. Field activity is monitored per the Plan.
PSU-8a: Provide continuous coordination with all utility providers.	**X**	**X**			Ongoing	The design requirements indicated in the measure will be implemented through the final design as described. Coordination with utility providers is ongoing and there have not been any service interruptions thus far.
PSU-8b: Adjust OCS pole foundation locations.	**X**				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described.
PSU-8c: Schedule and notify users about potential service interruptions.	**X**	**X**			Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. There have not been any service interruptions thus far.
PSU-9: Require application of relevant construction mitigation measures to utility relocation and transmission line construction by others.	**X**	**X**			Ongoing	JPB has initiated coordination with PG&E regarding transmission line construction. PG&E is currently raising overcrossing lines in Segment 2.
TRA-1a: Implement Construction Road Traffic Control Plan.	**X**	**X**			Ongoing	The D-B has begun traffic control design and permit applications with cities in Segments 2 and 4. Designs have been completed and approved for all cross-over bridges in Segments 2 and 4.
TRA-1c: Implement signal optimization and roadway geometry improvements at impacted intersections for the 2020 Project Condition.	**X**	**X**			Upcoming	This measure has not started

TRA-2a: Implement construction railway disruption control plan.	**X**	**X**			Ongoing	Minimization of railway disruption is being coordinated by the Site Specific Work Plan. A Construction Railway Disruption Control Plan was prepared to document the measures that are being implemented.
TRA-3b: In cooperation with the City and County of San Francisco, implement surface pedestrian facility improvements to address the Proposed Project's additional pedestrian movements at and immediately adjacent to the San Francisco 4th and King Station.	**X**	**X**	**X**		Upcoming	This measure has not started.
TRA-4b: Continue to improve bicycle facilities at Caltrain stations and partner with bike share programs where available following guidance in Caltrain's Bicycle Access and Parking Plan.				**X**	Ongoing	The JPB adopted the Caltrain Bicycle Parking Management Plan in November 2017, and staff have been working to implement the Plan's recommendations to improve wayside bike parking facilities along the corridor. Staff have also been coordinating with local jurisdictions that have launched bikeshare pilot programs to safely site bicycles near Caltrain stations.
NOI-CUMUL-1: Implement a phased program to reduce cumulative train noise along the Caltrain corridor as necessary to address future cumulative noise increases over FTA thresholds				**X**	Upcoming	This measure will be implemented during project operation.
NOI-CUMUL-2: Conduct project-level vibration analysis for Blended System operations and implement vibration reduction measures as necessary and appropriate for the Caltrain corridor				**X**	In Progress	CHSRA is conducting this analysis as part of the EIR/EIS for the San Francisco to San Jose section.

TRA-CUMUL-1: Implement a phased program to provide traffic improvements to reduce traffic delays near at-grade crossings and Caltrain stations				**X**	Upcoming	This measure will be implemented during project operation.
TRA-CUMUL-2: Implement technical solution to allow electric trolley bus transit across 16th Street without OCS conflicts in cooperation with SFMTA.	**X**				Complete	Not applicable. SFMTA has elected to not electrify the 16th Street crossing. This measure no longer applies.
Mitigation Measure TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide Plate H clearance as feasible between San Jose and Bayshore.				**X**	Upcoming	This measure will be implemented during project operation.