Caltrain Modernization Program
Peninsula Corridor Electrification Project (PCEP)

October 2020
Monthly Progress Report

October 31, 2020

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

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Contents

List of Tables

Page

List of Figures

Page

List of Appendices

Page

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 2021, 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:

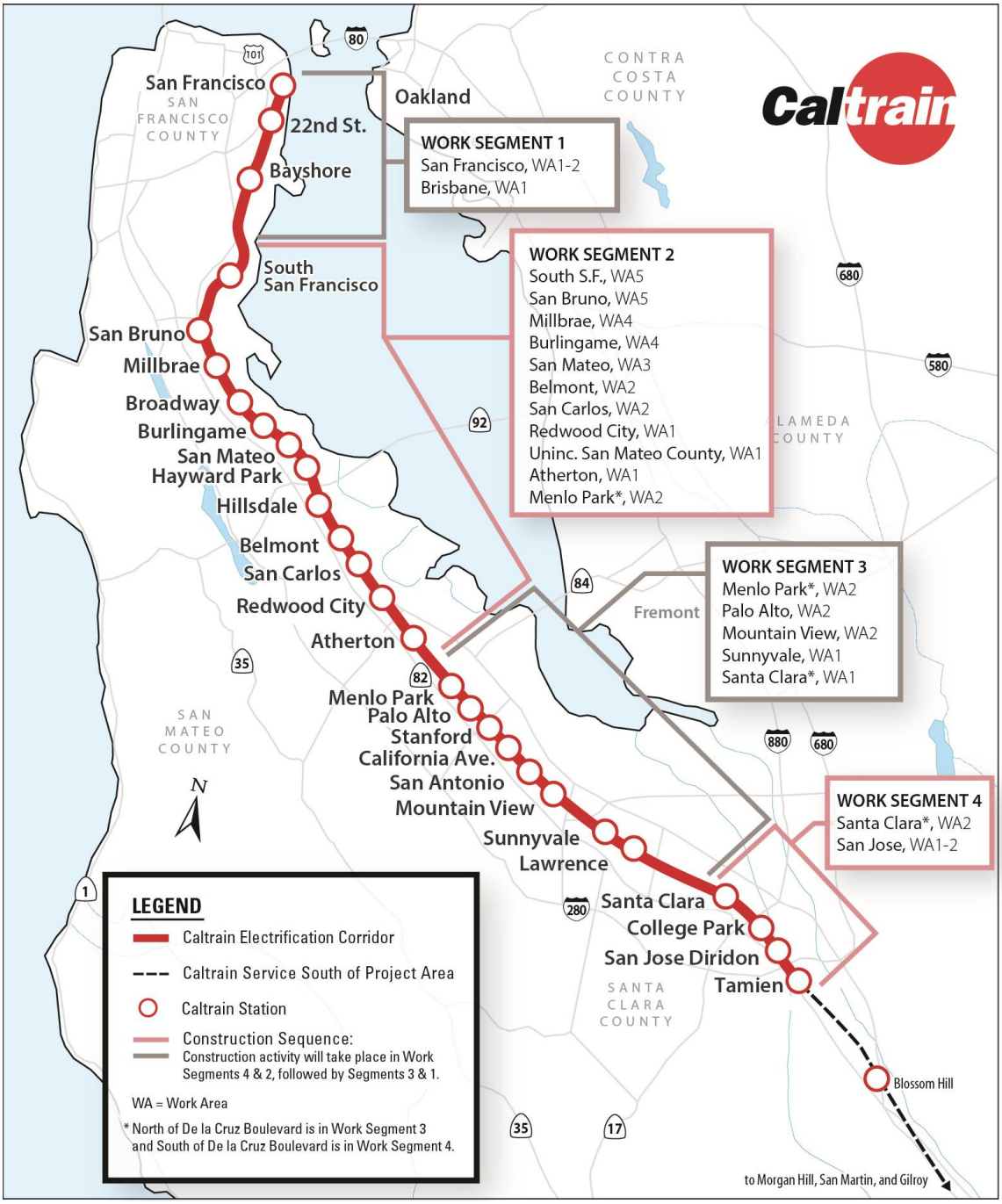
- **Improved Train Performance, Increased Ridership Capacity and Increased Service:** Electrified trains can accelerate and decelerate more quickly than diesel-powered trains, allowing Caltrain to run more efficiently. In addition, because of their performance advantages, electrified trains will enable 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.

THIS PAGE INTENTIONALLY LEFT BLANK

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



The first signal cutover was completed in Segment 4 this month. Preparation for other cutovers is ongoing. Off-track foundations continued to be installed in Segment 1, and on-track foundations were installed in Segments 3, and 4. Ground grid and gantry steel were installed at Paralleling Station (PS) PS-5. Crews continued to install poles, cantilevers, and wires in Segment 3, as well as regulation (sagging) of Overhead Catenary System wires.

Stadler's EMU activities in Switzerland have returned to normal production levels. The first EMU trainset to be delivered to Caltrain has been delayed over three months to the end of June 2021 due to Coronavirus Disease 2019 (COVID-19) impacts. Progress on Trainset 1 type testing is slow due to travel restrictions. However, Stadler has managed to obtain some emergency visas to allow some progress. Stadler's supply chain has been disrupted by two supplier bankruptcies also due to COVID-19 impacts, and the resulting delay to the delivery of trainsets is currently being evaluated.

Construction progress at the Centralized Equipment Maintenance and Operations Facility (CEMOF) included mechanical work in the Parts Storage Warehouse (PSW), completion of the fabric installation in the PSW, construction of the wall at the north pit, and backfilling the south pit walls.

2.1. Monthly Dashboards

Dashboard progress charts are included below to summarize construction progress.

Figure 2-2 Expenditure – Planned vs. Actual

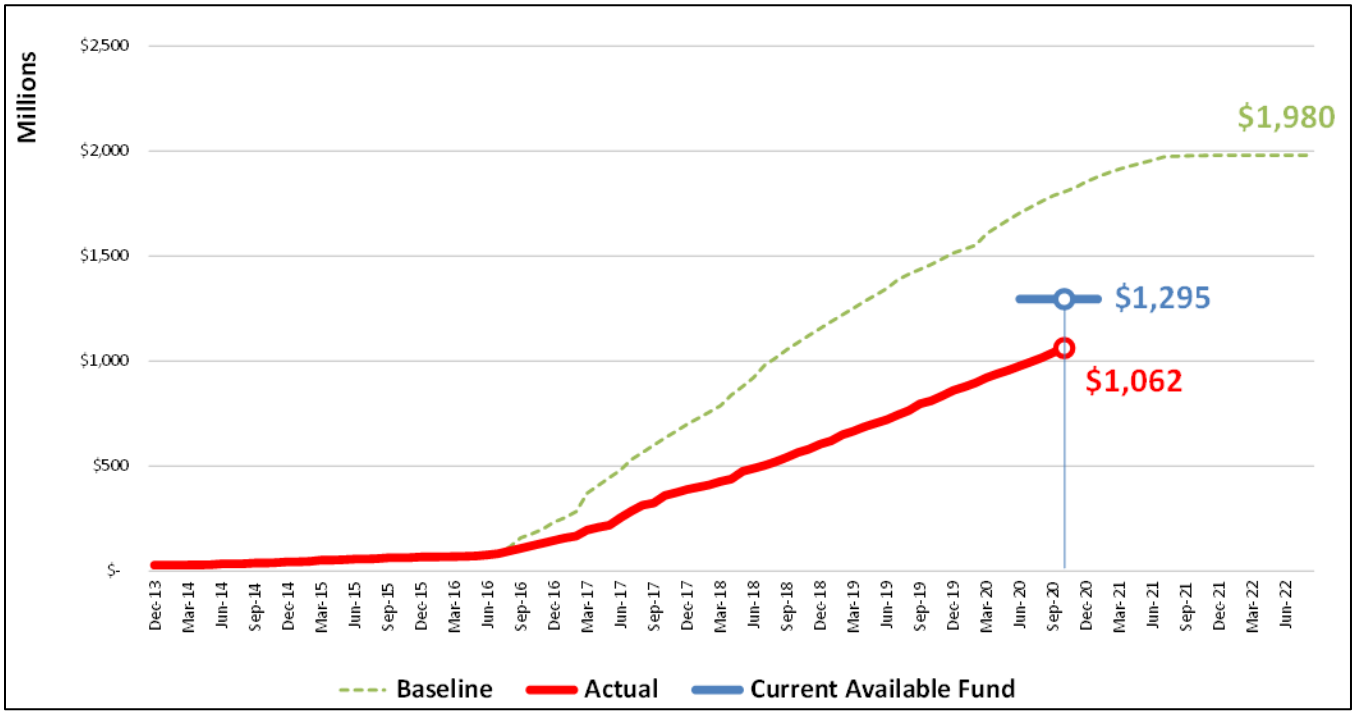


Figure 2-3 Spending Rate vs. Required

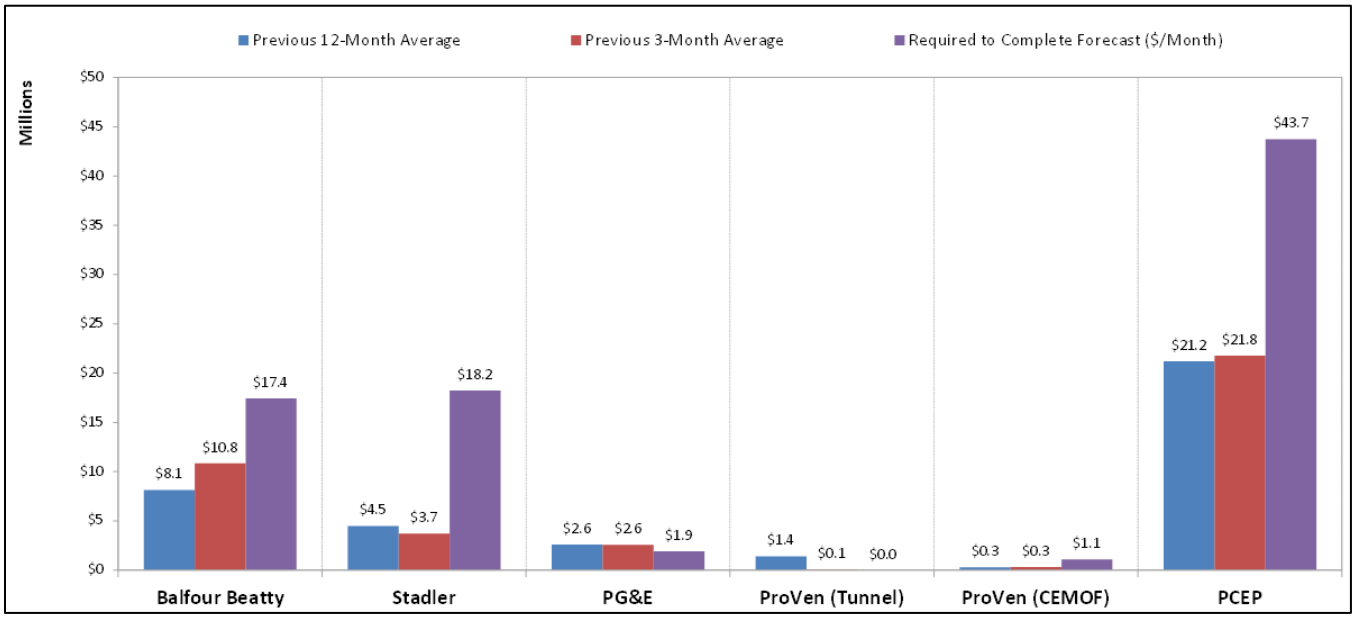


Figure 2-4 Construction Contract Budgets

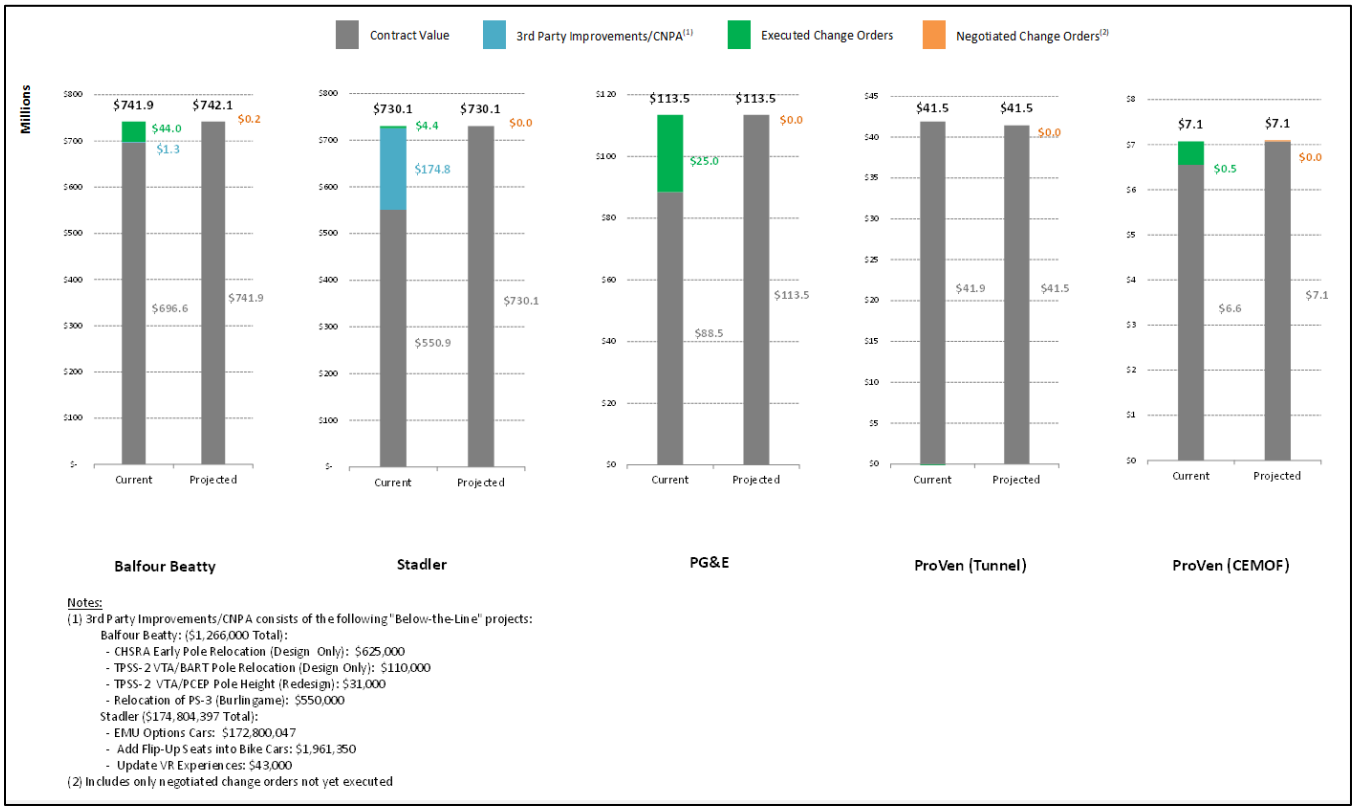
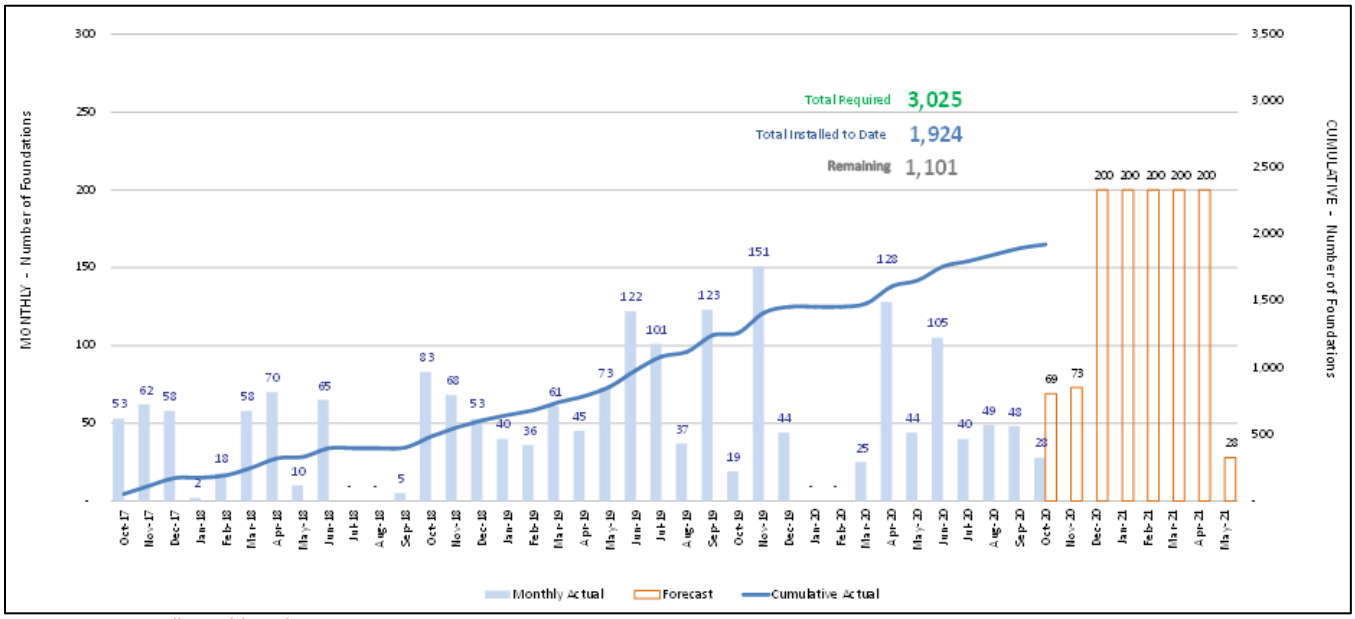


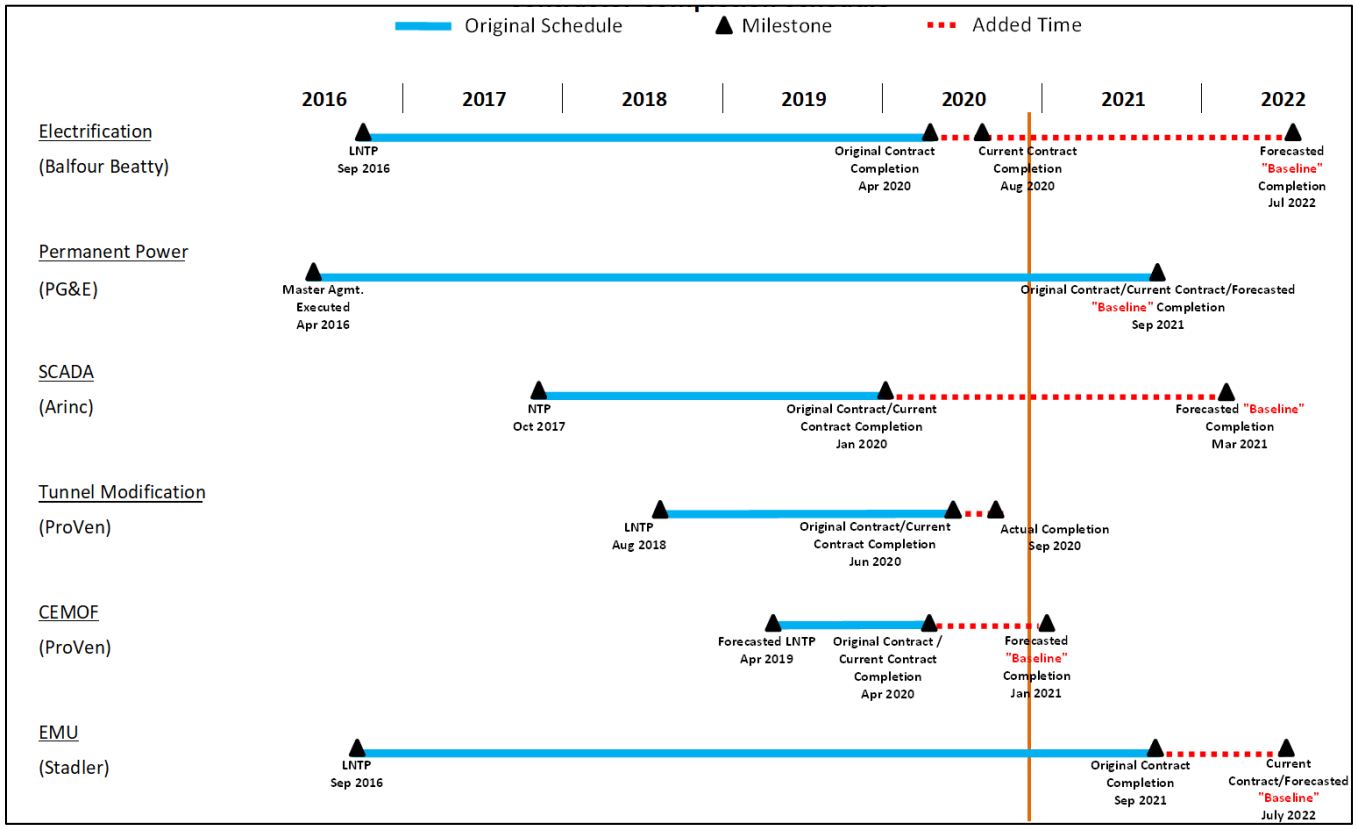
Figure 2-5 OCS Foundation Production



Notes regarding tables above:

1. BBII is now reporting a delay in the completion date for the OCS foundations from March 31, 2021 to May 7, 2021. The monthly forecast will be 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 did 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 status of long-lead material procurement
- 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; VTA: Dennis Ratcliffe

The Federal Transit Administration (FTA) Quarterly Update occurred virtually on October 29. Quotes for the Scissor Lift Work Platforms are due on November 6. The EMU static two-passenger table testing has been conducted with favorable results and the dynamic testing is scheduled for November. The final inspection for Trainset 1 Readiness for Type Testing will take place the week of November 16, and Trainset 1 is on track to arrive in Pueblo in January. The redesign of the Federal Railroad Administration (FRA) requested bike car barriers is currently with Caltrain for consideration. The FRA may rescind the request for one barrier and Caltrain is currently waiting for confirmation. Work is ongoing with the CEMOF pit and equipment room, and two change orders have been approved for the project. In design build activities, off-track foundations have resumed in Segment (S) S1B, and on-track foundations will resume in S3 and S4 the week of November 16. The JPB is preparing a presentation for the November SamTrans Board regarding the Britannia Gateway condemnation. Traction Power Substation (TPS) TPS-2 overhead work is forecasted to start by October 22. TPS-1 underground is forecasted to start by February 5 and overhead work will start late March/early April. A construction bid walk for the underground utilities at East Grand

occurred on October 22 and three subcontractors were in attendance. The bid is due on November 17.

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: Trish Stoops – Metropolitan Transportation Commission

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 delivery of the 25th Avenue Grade Separation Project, Marin Napoleon Bridge Rehabilitation Project, and the South San Francisco Station Project is ongoing. Discussions have started regarding an upcoming capital project to replace the Guadalupe River Bridge. There is coordination with the Tunnel Modification Project, PG&E construction of the Interconnection to TPS-2, and the CEMOF upgrades as well. The Systems Integration meeting has been re-focused to track and coordinate issues between PCEP and the overall agency (JPB). This was done to avoid task overlap with the JPB Rail Activation Committee. 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. Work continues to develop a schedule fragnet for the achievement of Intermediate Milestone #1. 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; VTA: Manolo Gonzalez-Estay; SFCTA: Luis Zurinaga; CHSRA: Wai-on Siu

The program critical path was revised in October due to delays on the Electrification contract. Balfour Beatty Infrastructure Inc. (BBII) continues to progress signals design and construction effort below baseline productivity levels. The incorporation of this delay has resulted in a three month delay to BBII’s substantial completion and a shift of the program critical path from vehicles to electrification.

Additionally, BBII had previously reported delays in delivery of traction power switchgear. These impacts have been reviewed and incorporated into the MPS and represent the near-critical path to completion of electrification.

The forecasted completion for BBII is now July 27, 2022. JPB is working with BBII on these issues and is urging BBII to accelerate resolution. This impact has also resulted in a drawdown of five days on contingency, leaving the program with 26 days of remaining contingency.

Additionally, due to electrification efforts now being forecasted to complete after acceptance of all trainsets, the concept of Phased Revenue Service has been removed from the schedule. Phased Revenue Service assumed that some trainsets would be placed into service upon completion of electrification. However, as the schedule currently stands, all trainsets will be ready for service once the system is electrified.

Stadler's forecasted completion date remains at July 22, 2022, placing their effort on the near-critical path. However, COVID-19 continues to impact Stadler's ability to assemble and test EMU trainsets. This remains a fluid situation as the effect of COVID-19 on Stadler during the upcoming winter months remains unknown. These delays continue to be examined for potential impact to remaining program contingency and FFGA RSD.

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

Funding Partners: Luis Zurinaga, Trish Stoops

Two risks were regraded, on was both regraded and the risk description revised, and two new risks were identified. These new risks will be reviewed with risk owners and entered onto the risk register.

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

The CMB meeting occurred on October 21.

Funding Partners: CHSRA: Boris Lipkin and Simon Whitehorn; VTA: Franklin Wong; SFCTA: Luis Zurinaga; SMCTA: Joe Hurley; MTC: Trish Stoops and Kenneth Folan

BBII Contract

One change was approved.

CEMOF Contract

Two changes were approved.

Stadler Contract

One change was approved.

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

No changes were identified for consideration.

2.3. Schedule

The program critical path was revised in October due to delays on the Electrification contract. Balfour Beatty Infrastructure Inc. (BBII) continues to progress signals design and construction effort below baseline productivity levels. The incorporation of this delay has resulted in a three month delay to BBII's substantial completion and a shift of the program critical path from vehicles to electrification.

Additionally, BBII had previously reported delays in delivery of traction power switchgear. These impacts have been reviewed and incorporated into the MPS and represent the near-critical path to completion of electrification.

The forecasted completion for BBII is now July 27, 2022. JPB is working with BBII on these issues and is urging BBII to accelerate resolution. This impact has also resulted in a drawdown of five days on contingency, leaving the program with 26 days of remaining contingency.

Additionally, due to electrification efforts now being forecasted to complete after acceptance of all trainsets, the concept of Phased Revenue Service has been removed from the schedule. Phased Revenue Service assumed that some trainsets would be placed into service upon completion of electrification. However, as the schedule currently stands, all trainsets will be ready for service once the system is electrified.

Stadler's forecasted completion date remains at July 22, 2022, placing their effort on the near-critical path. However, COVID-19 continues to impact Stadler's ability to assemble and test EMU trainsets. This remains a fluid situation as the effect of COVID-19 on Stadler during the upcoming winter months remains unknown. These delays continue to be examined for potential impact to remaining program contingency and the FFGA RSD.

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

Table 2-1 Schedule Status

Milestones	Program Plan	Progress Schedule (October 2020)[1]
Arrival of First Vehicle in Pueblo, CO	N/A	11/25/2020
Arrival of First Vehicle at JPB	N/A	04/30/2021[2]
Segment 4 Completion	11/21/2019	06/30/2021
○ Interconnection from PG&E Substation to Traction Power Substation (TPS)	N/A	01/29/2021[3]
PG&E Provides Permanent Power	09/09/2021	09/09/2021
Acceptance of 14th Trainset	08/20/2021	07/22/2022[2]
Electrification Substantial Completion	08/10/2020	07/27/2022[3]
RSD (w/o Risk Contingency)	12/09/2021	07/28/2022[3]
FFGA RSD (w/ Risk Contingency)	08/22/2022	08/22/2022

Note:
1. Dates may shift slightly as the update of this month's Progress Schedule is still in process.
2. These dates are expected to be delayed due to COVID-19 impacts on Stadler's manufacturing facility in Salt Lake City.
3. See "Notable Variances" in Section 7 for explanation on date shift.

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	$15,510,424	$815,406,167	$500,719,041	$1,316,125,208
EMU Subtotal	$664,127,325	$664,127,325	$5,913,468	$246,667,835	$417,459,490	$664,127,325
PCEP TOTAL	**$1,980,252,533**	**$1,980,252,533**	**$21,423,893**	**$1,062,074,002**	**$918,178,531**	**$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

- None

Future anticipated board actions include:

- Change orders for CEMOF fire sprinkler waterline and boosted waterline
- Change orders as needed

2.6. Government and Community Affairs

There were two outreach events this month.

THIS PAGE INTENTIONALLY LEFT BLANK

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 to install on-track in Segments 3 and 4 as conflicts are resolved.
- Continue to install off-track foundations in Segment 1.
- Continued installation of OCS poles, cantilevers, and wires in Segment 3 following the foundations.
- Continued regulation of OCS wires (sagging the wires) in Segment 3.
- Continued installation of shunt wires in Segment 3.
- Potholed at proposed OCS locations and utility locations in all Segments in advance of foundation installation. BBII and PCEP also 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.
- Continued installation of ground grid and gantry steel at PS-5.
- Completed installation of high and low voltage cable at PS-2.
- Continued wall rebar installation at PS-4.
- Continued CMU wall construction at PS-6.
- Continued fence installation at PS-7.
- Continued to install signal ductbank, conduits, and cables in Segment 2.
- Continued to install signal ductbank, conduits, and cables in Segment 4.
- Completed first signal cutover in Segment 4.
- Continued conduit and cable installation at Control Point (CP) Stockton.
- Continued cable termination at CP Alameda Auzerais Crossing.
- Performed pre-testing at multiple sites in Segment 4.
- Installed fiber optic cable in Segment 4.

- Continued drilling of rails for impedance bond connections in Segments 1, 2, 3, and 4 at various control points and crossings.
- Install overhead bridge attachments at various locations in Segment 3.
- 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 and Segment 3.
- 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 FRA and CPUC on grade crossing design.
- Continued planning for signal cutovers in Segment 4.
- Continued discussions with VTA on Right of Way acquisition and access for construction of 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.

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[e]	Required[ab]	Completed this Month	Completed to Date[d]
1	Tunnels	32	0	32	32	0	32
	A	309	0	0	259	0	0
	B	237	12	48	177	0	0
2	5	236	10	209	209	0	160
	4	314	0	238	254	0	190
	3	176	0	128	141	0	36
	2	247	0	78	205	0	60
	1	207	0	79	154	0	33
3	2	510	2	503	441	42	416
	1	387	0	374	310	10	272
4	A	241	11	217	177	15	127
	B	128	3	113	123	0	86
	CEMOF	96	0	0	81	0	0
Total		**3,120**	**38**	**2,019**	**2,563**	**67**	**1,412**

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.
d. Miscalculations total quantities of poles installed in S3WA1 and S3WA2 for September reporting.

Activity Next Month

- Continue off-track foundation installation in Segment 1.
- Continue foundation installation in Segments 3 and 4.
- Continue resolution of DSCs.
- 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 in Segment 2.
- 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.
- Continue construction at PS-7, PS-5, PS-4, PS-6, PS-2, and the Switching Station.
- Continue to install conduit and foundations for signal and wayside power cubicle (WPC) units in Segment 4 and Segment 2.
- Continue cable termination at signal locations in Segment 4.
- Continue to install impedance bond connections.

- Continue to install bridge attachments.
- Continue to coordinate with stakeholders on the consistent warning time solution and advance location-specific design.
- 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 final design and 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 formal schedule for review and Monthly Progress Report.
- Continued Progress to SCADA Operations User Manual.
- Continued work on Training Plan.
- Started reviewing updated points listing received from BBII.
- Work on the Training Manual was delayed due to a staff personal emergency. Expected to be complete in November.

Activity Next Month

- Prepare and deliver the Monthly Report and the Monthly Schedule Update.
- Attend project status meetings (virtually).
- Complete revisions for Operations User Manual.
- Complete revisions for Training Manual.
- Complete Training Plan.

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

- Letters, submittals, and Requests for Information closeout.
- Change Order reconciliation.
- Completed the OCS testing.
- Finished the signage installation.

Activity Next Month

- Review and respond to letters.
- Punch List items.

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

- FMC – TPS-2:
  - PG&E and JPB working on the easement at VTA prior to construction.
  - PG&E/TRC started the installation of the H frames at TPS-2.
  - Caltrans permit to cross I-880/remove trees submitted on 9/4.
- EGS – TPS-1:
  - JPB provided the staging at TPS-1.

Activity Next Month

- FMC – TPS-2:
  - Continue with the installation of the H- Frames and TSPs.
- EGS – TPS-1:
  - Continue the Coordination for the TSP pole design with South San Francisco team and JPB planning and development.

THIS PAGE INTENTIONALLY LEFT BLANK

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

- COVID-19 related actions continued for the eighth 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.
  - Stadler's manufacturing facility in Salt Lake City has reverted back to two production shifts in order to limit the number of workers per car. This is due to a recent outbreak of COVID-19 at that facility.
  - 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 a request for an 'excusable delay' due to COVID-19. The extent of the continuing delay is being evaluated. Currently, shipping the first trainset to Pueblo, Colorado for testing has been delayed five months to January 2021, and the first trainset to be delivered to Caltrain delayed 3.5 months to the end of June 2021.
  - Salt Lake City-based 'Type Testing' of Trainset No. 1 is progressing slowly due to COVID-19 travel restrictions. Workarounds, including Stadler obtaining emergency visas, have allowed progress in this area. Type testing is scheduled to begin in mid-November.
  - Stadler's supply chain has been disrupted by two supplier bankruptcies. This will delay delivery of trainsets. The extent of the delay is being evaluated by Stadler.
- Final Design Reviews remain to be completed for three systems. These software-based systems include 'Train Control,' 'Monitoring and Diagnostics,' and 'PTC.' Completion is scheduled for November 2020 and must be performed prior to the commencement of Type Testing.
- First Article Inspections (FAI) continue to have their paperwork formalized and closed out.
- 52 car shells have been shipped from Stadler Switzerland, with 43 onsite in Stadler's Salt Lake City facility (eight in transit and one returned for minor repair).

- 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.
- Stadler's trainset delivery and testing schedule on Caltrain property has been re-baselined.

Activity Next Month

- Continue to close out system level FDRs and FAIs.
- Continue to support Caltrain/PCEP system integration and rail startup activation activities.
- Determine Train 1 readiness for type testing.

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

- Mechanical work inside the Parts Storage Warehouse (PSW) continued.
- Received all storage racks and started the installation of the racks in the PSW.
- Completed fabric installation of the Parts Storage Warehouse.
- Poured stair 71 slab.
- Completed installation of fire sprinkler line at Parts Storage Warehouse.
- Constructed wall at north pit.
- Completed backfill of south pit walls.
- Received material, saw cut CMU wall, demolished CMU wall, and started installation of the steel frame at the Component Test Room.

Activity Next Month

- Boosted Water line work.
- Backfill walls at south pit.
- Cure, strip formwork, sack & patch and waterproof north pit walls.
- Continue work on installation of the steel frame, grouting frames, and removal of the shoring at the Component Test Room.
- Construct the concrete ramps at the PSW.
- Start electrical work inside the PSW.
- Continue to install racks/furnishings in the PSW.
- Continue to install the office within the PSW.

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 2020 monthly employee injury reviews for BBII and its subcontractors.
- Continued to provide input and oversight of the contractor SSWP safety provisions and ongoing safety construction oversight and inspections.
- Conducted the monthly project Safety and Security Certification and Fire/Life Safety Meetings.
- Participated in the FTA and Caltrain / PCEP Quarterly Meeting.
- Participated in the preparations and lessons learned discussions resulting from the initial project signal cutover process.
- 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 and performed pre-work site hazards assessment walks with BBII and subcontractor staff.
- 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.
- Continued to coordinate with JPB Safety and the project contractors with the application of mitigation measures in response to the evolving COVID-19 virus.

Activity Next Month

- Monthly virtual safety communication meetings continue to be scheduled 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.
- Finalize safety and security certification documentation requirements in coordination with ongoing 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 evolving COVID-19 virus.
- Investigate project incident occurrences as needed and work with the contractor representatives to identify incident root causes and develop and implement safety and security 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

- Staff meetings with BBII QA/Quality Control (QC) management representatives continue weekly.
- Continued review of BBII-generated Nonconformance Reports (NCR) and Construction Discrepancy Reports for proper discrepancy condition, cause, disposition, corrective and preventive action and verification of closure.
- Continued review and approval of Design Variance Requests for BBII and PGH Wong for QA/QC and inspection issues/concerns.
- Continued review of BBII QC Inspectors Daily Reports, Construction QC Reports and Surveillance Reports for work scope, performance of required duties, adequacy, non-conformances, test/inspection results, follow-up on unresolved issues, and preciseness.
- Continued review of BBII Material Receipt Reports, Certificates of Conformance, Certified Tests Reports, and Certificates of Analysis to ensure delivered project materials conform to specifications, and that contractually required quality and test support documents are adequate and reflect concise conditions per the purchase order requirements.
- Continued regularly scheduled design reviews and surveillances on project design packages.
- Conducted three PGH Wong design package audits.

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	3	127
Audit Findings		
Audit Findings Issued	0	79
Audit Findings Open	0	0
Audit Findings Closed	3	79
Non-Conformances		
Non-Conformances Issued	0	12
Non-Conformances Open	0	3
Non-Conformances Closed	0	9

Activity Next Month

- Conduct field surveillances at TPS-2, 3 and 4.
- Conduct a Part 3 Audit of BBII second shift OCS Poles and Wires Assembly and Alignment.

7.0 SCHEDULE

The program critical path was revised in October due to delays on the Electrification contract. Balfour Beatty Infrastructure Inc. (BBII) continues to progress signals design and construction effort below baseline productivity levels. The incorporation of this delay has resulted in a three month delay to BBII's substantial completion and a shift of the program critical path from vehicles to electrification.

Additionally, BBII had previously reported delays in delivery of traction power switchgear. These impacts have been reviewed and incorporated into the MPS and represent the near-critical path to completion of electrification.

The forecasted completion for BBII is now July 27, 2022. JPB is working with BBII on these issues and is urging BBII to accelerate resolution. This impact has also resulted in a drawdown of five days on contingency, leaving the program with 26 days of remaining contingency.

Additionally, due to electrification efforts now being forecasted to complete after acceptance of all trainsets, the concept of Phased Revenue Service has been removed from the schedule. Phased Revenue Service assumed that some trainsets would be placed into service upon completion of electrification. However, as the schedule currently stands, all trainsets will be ready for service once the system is electrified.

Stadler's forecasted completion date remains at July 22, 2022, placing their effort on the near-critical path. However, COVID-19 continues to impact Stadler's ability to assemble and test EMU trainsets. This remains a fluid situation as the effect of COVID-19 on Stadler during the upcoming winter months remains unknown. These delays continue to be examined for potential impact to remaining program contingency and FFGA RSD.

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

Table 7-1 Schedule Status

Milestones	Program Plan	Progress Schedule (October 2020)[1]
Arrival of First Vehicle in Pueblo, CO	N/A	11/25/2020
Arrival of First Vehicle at JPB	N/A	04/30/2021[2]
Segment 4 Completion	11/21/2019	06/30/2021
○ Interconnection from PG&E Substation to Traction Power Substation (TPS)	N/A	01/29/2021[3]
PG&E Provides Permanent Power	09/09/2021	09/09/2021
Acceptance of 14th Trainset	08/20/2021	07/22/2022[2]
Electrification Substantial Completion	08/10/2020	07/27/2022[3]
RSD (w/o Risk Contingency)	12/09/2021	07/28/2022[3]
FFGA RSD (w/ Risk Contingency)	08/22/2022	08/22/2022

Note:
1. Dates may shift slightly as the update of this month's Progress Schedule is still in process.
2. These dates are expected to be delayed due to COVID-19 impacts on Stadler's manufacturing facility in Salt Lake City.
3. See "Notable Variances" for explanation on date shift.

Notable Variances

Completion of the construction of the interconnection from the PG&E substation to the Traction Power Substation 2 (TPS-2) has been delayed from January 29, 2021 due to delays in commencing with construction. This delay is not expected to impact completion of Segment 4 to support EMU testing.

BBII continues to report an overall delay to substantial completion. JPB is working with BBII on the issue and is urging BBII to accelerate resolution. As of the end of October, a three month delay is reflected in the MPS to substantial completion of the electrification system due to continued delays in the design and construction of the signals system.

The delay to completion of the electrification system has also resulted in a drawdown of five days on contingency, leaving the program with 26 days of remaining contingency.

Table 7-2 Critical Path Summary

Activity	Start	Finish
Signal Design, Installation and Cutover	In progress	05/04/2022
OCS / Comm / SCADA Acceptance Testing	05/05/2022	06/13/2022
Integrated Testing	06/14/2022	07/27/2022
FFGA RSD w/ Risk Contingency	08/22/2022	08/22/2022

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 have the potential to require a program to utilize available contingency. Table 7-3 below reflects the SHPs for the PCEP program schedule. The dates indicated reflect the planned completion dates for each SHP.

Table 7-3 Schedule Hold Points

Schedule Hold Point (SHP)	Date
FTA/PMOC Risk Refresh	08/30/2016 (A)
Begin EMU Manufacturing	12/04/2017 (A)
Arrival of 1st Trainset in Salt Lake City	02/04/2019 (A)
Arrival of 1st Trainset in Pueblo, CO	11/25/2020
Arrival of 1st Trainset at JPB	04/30/2021
Segment 4 Completion	06/30/2021
Conditional Acceptance of 1st Trainset	12/17/2021
Conditional Acceptance of 14th Trainset	07/22/2022
System Electrified	07/27/2022
FFGA RSD w/ Risk Contingency	08/22/2022

Note: "(A)" denotes an actual completion

THIS PAGE INTENTIONALLY LEFT BLANK

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	$740,578,339	$10,694,660	$444,214,665	$296,363,674	$740,578,339
SCADA	$0	$3,446,917	$0	$1,934,371	$1,512,546	$3,446,917
Tunnel Modifications	$11,029,649	$41,453,871	$0	$41,298,739	$155,132	$41,453,871
Real Estate	$28,503,369	$28,503,369	$114,245	$22,752,889	$5,750,480	$28,503,369
Private Utilities	$63,515,298	$117,735,634	$1,655,505	$98,523,682	$19,211,953	$117,735,634
Management Oversight	$141,506,257	$158,603,388	$1,506,459	$148,137,742	$10,465,647	$158,603,388
Executive Management	$7,452,866	$9,568,427	$103,671	$8,869,367	$699,060	$9,568,427
Planning	$7,281,997	$6,281,997	$3,174	$5,842,882	$439,115	$6,281,997
Community Relations	$2,789,663	$1,789,663	$6,061	$1,601,753	$187,910	$1,789,663
Safety & Security	$2,421,783	$4,297,861	$89,196	$3,907,857	$390,004	$4,297,861
Project Management Services	$19,807,994	$17,526,725	$163,699	$13,660,716	$3,866,009	$17,526,725
Engineering & Construction	$11,805,793	$13,310,956	$211,037	$11,798,029	$1,512,928	$13,310,956
Electrification Eng & Mgmt	$50,461,707	$50,461,707	$208,002	$50,623,223	($161,516)	$50,461,707
Construction Management	$0	$7,553,100	$503,274	$6,970,329	$582,771	$7,553,100
IT Support	$312,080	$407,170	$0	$407,170	$0	$407,170
Operations Support	$1,445,867	$3,337,383	$35,304	$2,831,343	$506,040	$3,337,383
General Support	$4,166,577	$6,963,434	$86,668	$6,023,843	$939,591	$6,963,434
Budget / Grants / Finance	$1,229,345	$1,626,354	$1,396	$1,356,969	$269,385	$1,626,354
Legal	$2,445,646	$4,993,672	$21,360	$4,743,553	$250,119	$4,993,672
Other Direct Costs	$5,177,060	$5,777,060	$73,618	$4,792,830	$984,230	$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	$58,655,803	$1,516,580	$48,060,029	$10,595,774	$58,655,803
Insurance	$3,500,000	$4,543,588	$0	$4,543,588	$0	$4,543,588
Environmental Mitigations	$15,798,320	$14,754,390	$0	$806,777	$13,947,614	$14,754,390
Required Projects	$17,337,378	$11,007,576	$2,016	$965,004	$10,042,572	$11,007,576
Maintenance Training	$1,021,808	$1,021,808	$0	$0	$1,021,808	$1,021,808
Finance Charges	$5,056,838	$6,137,156	$20,961	$4,168,683	$1,968,473	$6,137,156
Contingency	$276,970,649	$129,683,367	N/A	N/A	$46,001,871	$46,001,871
Forecasted Costs and Changes	$0	$0	N/A	N/A	$83,681,496	$83,681,496
ELECTRIFICATION SUBTOTAL	**$1,316,125,208**	**$1,316,125,208**	**$15,510,424**	**$815,406,167**	**$500,719,041**	**$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.

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	$555,292,618	$4,753,440	$190,775,082	$364,517,536	$555,292,618
CEMOF Modifications	$1,344,000	$7,074,253	$341,261	$4,858,423	$2,215,830	$7,074,253
Management Oversight	$64,139,103	$61,869,311	$779,376	$47,617,869	$14,251,441	$61,869,311
Executive Management	$5,022,302	$6,263,136	$64,406	$5,452,245	$810,891	$6,263,136
Community Relations	$1,685,614	$985,614	$3,780	$669,149	$316,465	$985,614
Safety & Security	$556,067	$766,796	$16,096	$642,762	$124,035	$766,796
Project Mgmt Services	$13,275,280	$11,275,280	$86,421	$8,807,133	$2,468,148	$11,275,280
Eng & Construction	$89,113	$89,113	$0	$23,817	$65,296	$89,113
EMU Eng & Mgmt	$32,082,556	$29,981,014	$439,137	$22,219,465	$7,761,549	$29,981,014
Construction Management	$0	$1,501,543	$62,897	$1,044,643	$456,900	$1,501,543
IT Support	$1,027,272	$952,089	$12,593	$691,187	$260,902	$952,089
Operations Support	$1,878,589	$781,858	$9,111	$434,611	$347,246	$781,858
General Support	$2,599,547	$2,934,702	$35,481	$2,582,300	$352,402	$2,934,702
Budget / Grants / Finance	$712,123	$1,042,274	$961	$901,089	$141,185	$1,042,274
Legal	$1,207,500	$1,292,752	$4,065	$1,245,130	$47,622	$1,292,752
Other Direct Costs	$4,003,139	$4,003,139	$44,426	$2,904,339	$1,098,800	$4,003,139
TASI Support	$2,740,000	$2,789,493	$26,545	$284,918	$2,504,575	$2,789,493
Insurance	$0	$38,263	$0	$38,263	$0	$38,263
Required Projects	$4,500,000	$927,821	$0	$538,280	$389,541	$927,821
Finance Charges	$1,941,800	$3,761,482	$12,847	$2,554,999	$1,206,483	$3,761,482
Contingency	$38,562,962	$32,374,084	N/A	N/A	$29,342,223	$29,342,223
Forecasted Costs and Changes	$0	$0	N/A	N/A	$3,031,861	$3,031,861
EMU SUBTOTAL	**$664,127,325**	**$664,127,325**	**$5,913,468**	**$246,667,835**	**$417,459,490**	**$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**	**$15,510,424**	**$815,406,167**	**$500,719,041**	**$1,316,125,208**
EMU Subtotal	**$664,127,325**	**$664,127,325**	**$5,913,468**	**$246,667,835**	**$417,459,490**	**$664,127,325**
PCEP TOTAL	**$1,980,252,533**	**$1,980,252,533**	**$21,423,893**	**$1,062,074,002**	**$918,178,531**	**$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	$55,158,731	$117,641,316	$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	$0	$43,000	$43,000
CNPA TOTAL	**$176,495,397**	**$176,437,103**	**$0**	**$57,369,012**	**$119,068,091**	**$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-072C	PCEP SIS & SPS Additional Validation Work	$27,696
BBI-053-CCO-105	Pole Removal at Location 30.7-01	$2,297
BT-030	Bus Bridge Services for Tunnel Mods	$457,585
BT-033B	PG&E Tariff Schedule Work	$66,000
BT-023B	TASI Signal Cable Relocation #2	$1,180,719
	ELECTRIFICATION SUBTOTAL	**$1,734,297**
EMU		
PROV-071-CCO-007	Demolition of Existing Transition Slab at North and South Pits	$8,101
PROV-071-CCO-026B	Removal of Hazardous Soil from PSW Ductbank Excavation	$6,838
PROV-071-CCO-030B	Component Test Room Data and Electrical Outlets and Masonry Work	$12,530
PROV-071-CCO-041	Abandonment of Drainage Structure in Conflict with Shoring at Stair No. 71	$11,015
PROV-071-CCO-042	Shallow Fire Sprinkler Line	$162,000
PROV-071-CCO-043	Lighting Circuit Restoration	$2,980
PROV-071-CCO-044	Aerial Cable and Waterproofing Cable Penetrations at the CCF and PSW Buildings	$14,589
PROV-071-CCO-045	Conduit Outside Component Test Room	$6,865
	EMU SUBTOTAL	**$224,918**
	PCEP TOTAL	**$1,959,215**

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
10/19/2020	BBI-053-CCO-072C	PCEP SIS & SPS Additional Validation Work	$27,696
10/27/2020	BBI-053-CCO-105	Pole Removal at Location 30.7-01	$2,297
		Total	**$29,993**

[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
10/12/2020	STA-056-CCO-029	Multiple No Cost / No Schedule Impact Changes Group 7	$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
	None		$0
		Total	**$0**

[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
10/25/2019	AMTK-066-CCO-001	Change to Amtrak Contract for Test Locomotives	($72,179)
		Total	**($72,179)**

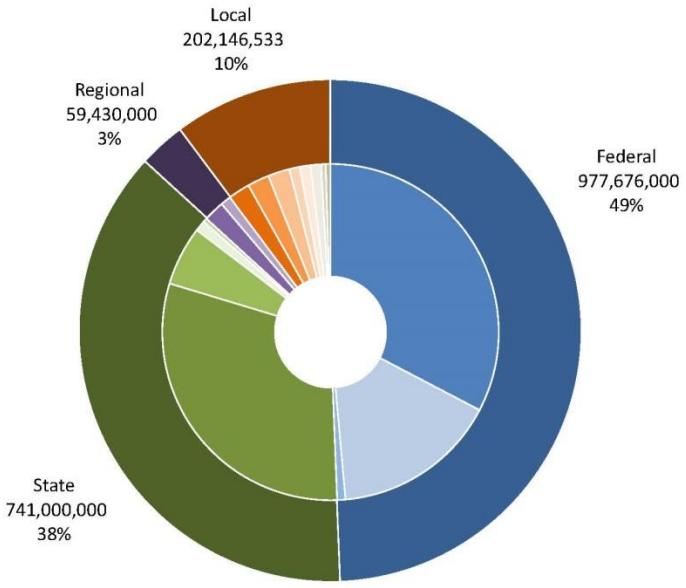
Notes:

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. As previously noted, FTA awarded $97 million in Section 5307 funding for the project and the next $100 million in Core Capacity funding.

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

THIS PAGE INTENTIONALLY LEFT BLANK

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 and install signal design including 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. Solution to FRA concerns over bike storage impeding path to emergency exit windows path results in increased costs and potential rework.
7. Change of vehicle sub-suppliers results in additional first article inspections at cost to JPB (i.e., COVID, bankruptcy).
8. TASI may not have sufficient number of signal maintainers for testing.
9. Contractor generates hazardous materials that necessitate proper removal and disposal in excess of contract allowances and expectations.
10. 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.

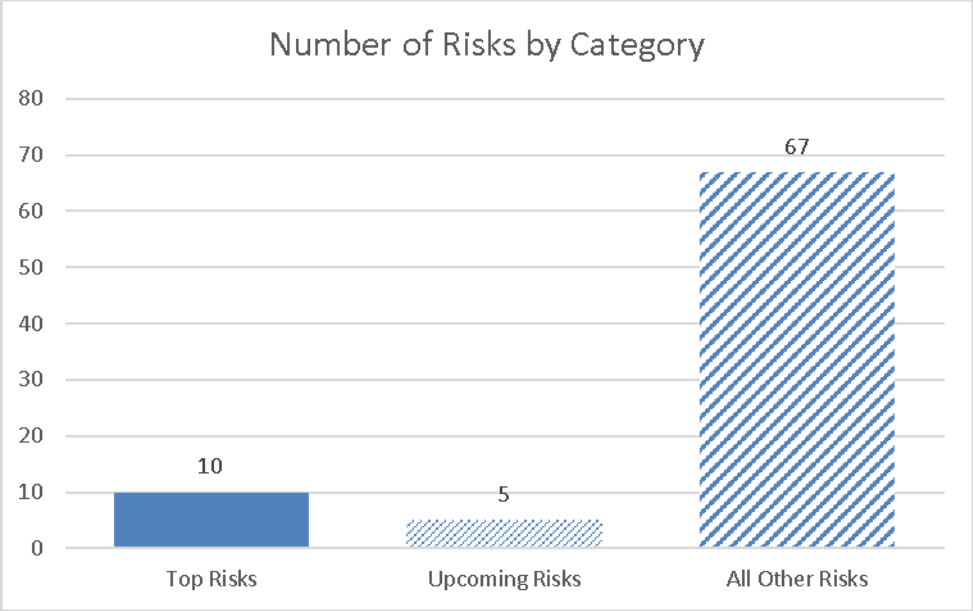
Activity This Month

- 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, and Systems Integration meetings to monitor developments associated with risks and to identify new risks.

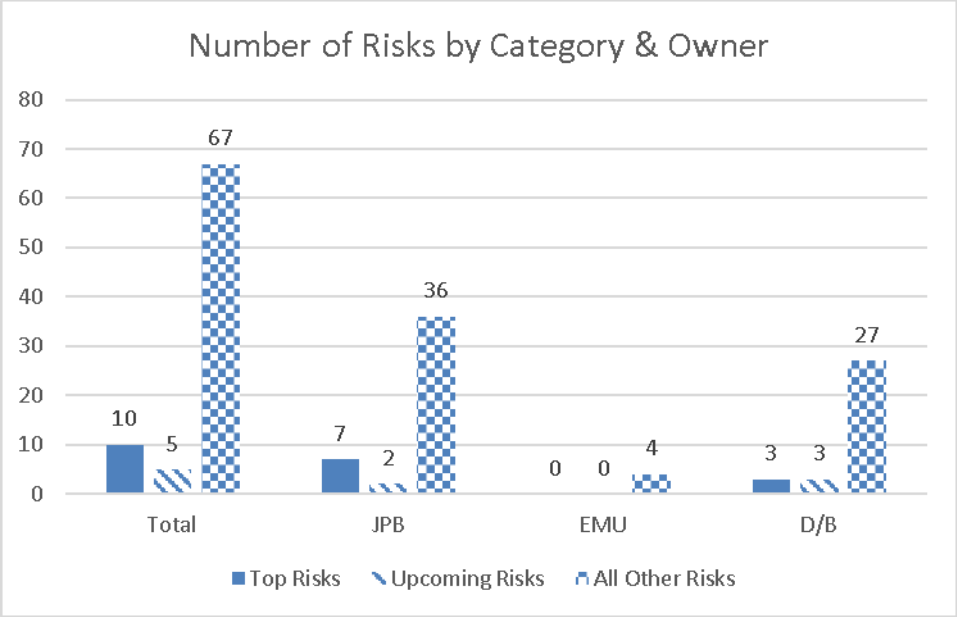
Figures 11-1 and 11-2 show the risks identified for the program. Risks are categorized as top risk, upcoming risk, and all other risks. The categories are based on a rating scale composed of schedule and cost factors. Top risks are considered to have a significantly higher than average risk grade. Upcoming 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 = 82

Figure 11-2 Risk Classification



Total Number of Active Risks = 82

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.

THIS PAGE INTENTIONALLY LEFT BLANK

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 and fiber optic cable installation, abandoned signal cable removal, setting gantry at PS-5, permanent fence 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.
- 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. Pre-construction surveys for sensitive avian 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, pot holing for utility location, tree trimming/removal, conduit installation, abandoned signal cable removal, permanent fence installation, fiber optic cable installation, utility work at Diridon Station, setting signal house at CT 12.16, 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.
- Noise and vibration monitoring of project activities will continue to occur and non-hazardous soil will continue to be removed.
- Biological surveyors will continue to conduct pre-construction surveys for sensitive wildlife species ahead of project activities. Pre-construction nesting bird surveys have ceased for the 2020 season and will recommence on February 1, 2021 for the 2021 season.
- BMPs installation will continue in accordance with the project-specific SWPPP, and ESA staking and fencing will continue to occur, to delineate jurisdictional waterways, and other potentially sensitive areas, that should be avoided during upcoming project activities.
- Wildlife exclusion fencing will continue to be installed and 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 utilities in Palo Alto by Palo Alto Power.
- Continued relocation of Comcast Utilities in Segment 4.

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 Palo Alto Power, and communications companies and coordinate relocation field work.
- Continue communication relocations in all Segments.
- Review SSWPs by Palo Alto Power for relocation work in Segment 3. Continue Palo Alto Power relocations in Segment 3.

THIS PAGE INTENTIONALLY LEFT BLANK

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.

Of the parcels identified at the beginning of the project, there remain only five owners from whom the agency requires possession.

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.

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.
- Map newly identified parcels.

THIS PAGE INTENTIONALLY LEFT BLANK

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
		City of Atherton	In Process
		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)	Not needed[3]
	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.
3. Caltrans Peer Process utilized. Formal agreement not needed.

THIS PAGE INTENTIONALLY LEFT BLANK

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

- City/County Staff Coordinating Group
- Local Policy Makers Group

Third Party/Stakeholder Actions

- None

THIS PAGE INTENTIONALLY LEFT BLANK

17.0 DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION AND LABOR STATISTICS

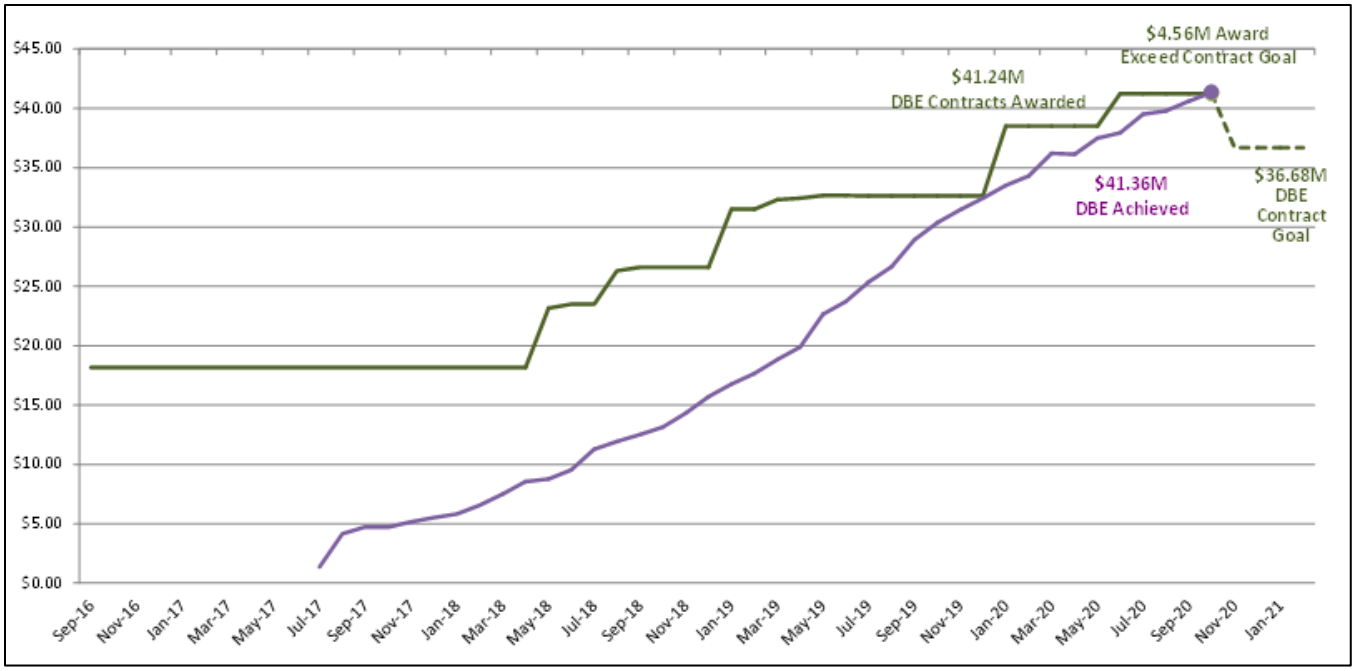
BBII proposed that 5.2% ($36,681,279) of the DB base contract value including DBE contract change orders ($705,409,217) would be subcontracted to DBEs.

Activity This Month

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

- **$41,361,619** has been paid to DBE subcontractors.
- $41,242,326 million of DBE contracts have been awarded (to be verified).
- **5.86%** has been achieved.

Figure 17-1 DBE Participation



Activity Next Month

BBII has proposed the following key actions:

"In the month of November, 2020, 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."

THIS PAGE INTENTIONALLY LEFT BLANK

18.0 PROCUREMENT

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

- RFQ – Scissor Lift Work Platform for Peninsula Corridor Electrification Project (PCEP)

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

- 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

In Process IFB/RFQ/RFP/Contract Amendments:

- None

Upcoming Contract Awards/Contract Amendments:

- None

Upcoming IFB/RFQ/RFP to be Issued:

- None

Existing Contracts Amendments Issued:

- None

THIS PAGE INTENTIONALLY LEFT BLANK

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.

APPENDICES

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix A – Acronyms

THIS PAGE INTENTIONALLY LEFT BLANK

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**
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**

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix B – Funding Partner Meetings

THIS PAGE INTENTIONALLY LEFT BLANK

Funding Partner Meeting Representatives

Updated July 16, 2020

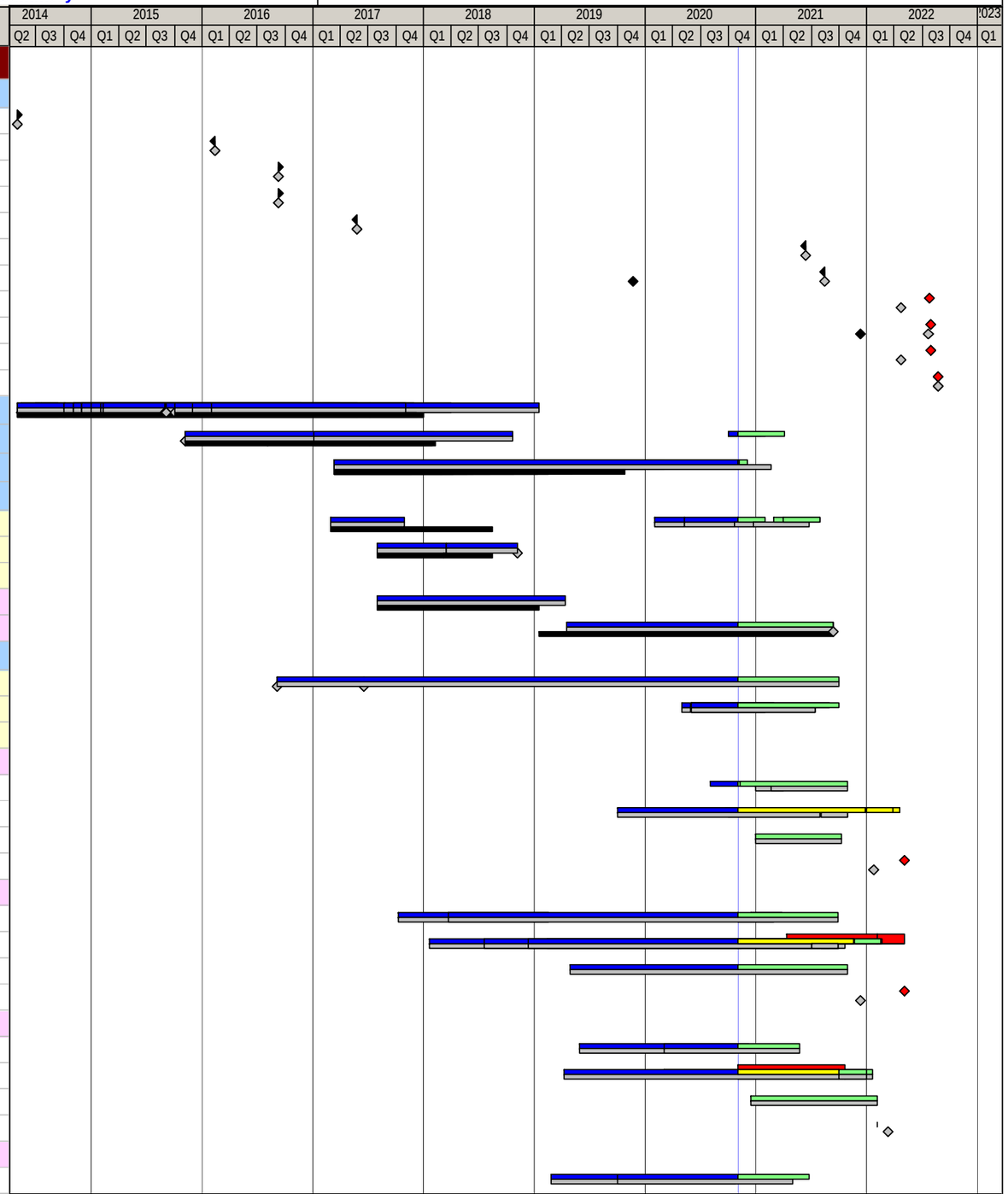
Agency	CHSRA	MTC	SFCTA/SFMTA/CCSF	SMCTA	VTA
FTA Quarterly Meeting	• Boris Lipkin • Simon Whitehorn • Wai Siu (info only)	• Anne Richman	• Luis Zurinaga	• April Chan • Peter Skinner	• Jim Lawson
Funding Partners Quarterly Meeting	• Boris Lipkin • Simon Whitehorn • John Popoff	• Trish Stoops	• Luis Zurinaga	• 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 • Jim Lawson • Nuria Fernandez (info only)
Master Program Schedule Update (monthly)	• Wai Siu	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Jim Lawson
Risk Assessment Committee (monthly)	• Wai Siu	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey • Edwin Castillo • Franklin Wong
PCEP Delivery Coordination Meeting (bi-weekly	• Wai Siu	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey • Edwin Castillo • Franklin Wong
Systems Integration Meeting (bi-weekly	• Wai Siu	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey • Edwin Castillo • Franklin Wong

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix C – Schedule

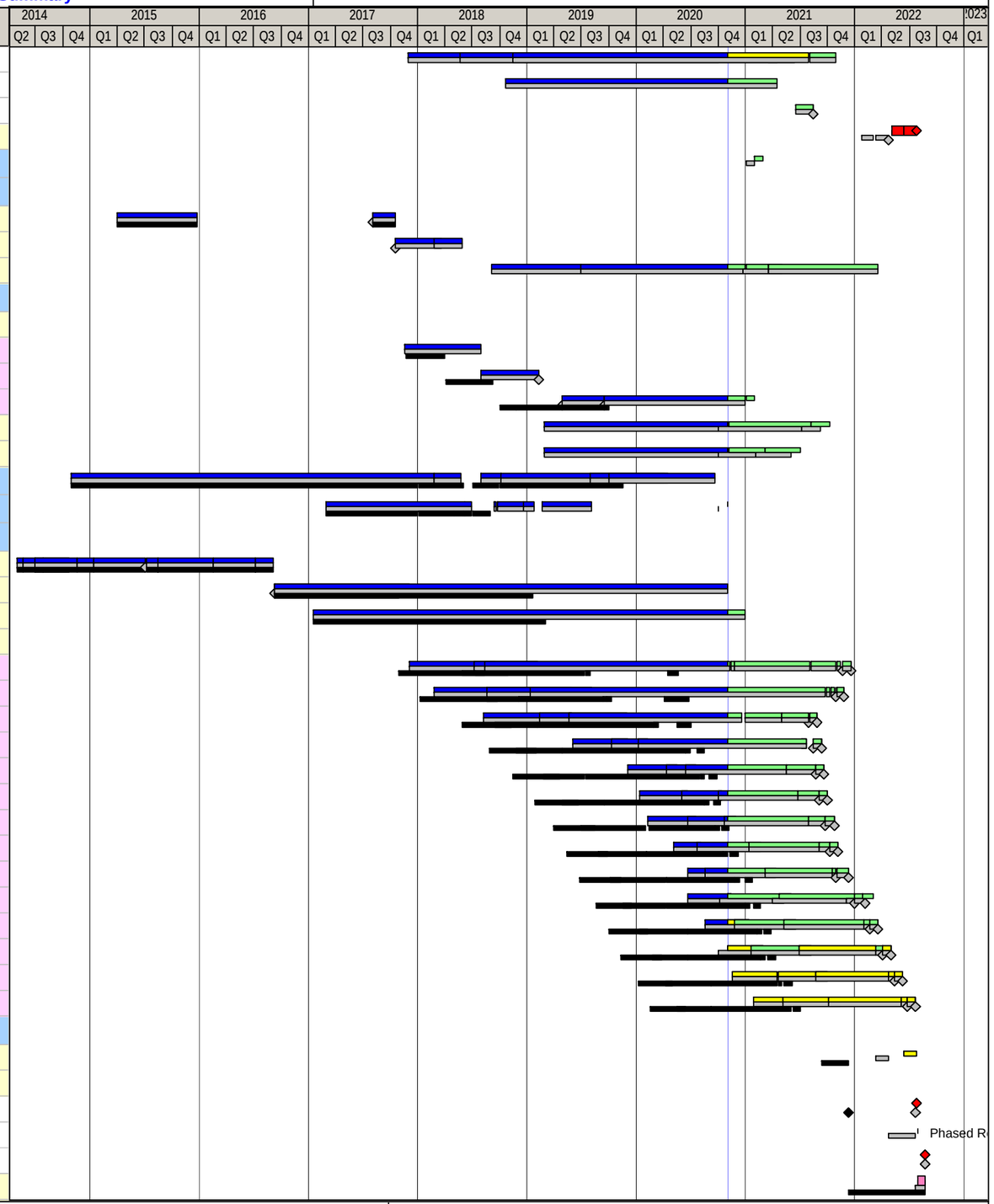
THIS PAGE INTENTIONALLY LEFT BLANK

#	Activity Name	Duration	Start	Finish	Var. to C20.04
1	***MASTER PROGRAM SCHEDULE C20.05***	2168d	05-01-14 A	08-22-22	0d
2	**MILESTONES**	2168d	05-01-14 A	08-22-22	0d
3	Start	0d	05-01-14 A		0d
4	NEPA Reevaluation Complete	0d		02-11-16 A	0d
5	LNTP to Electrification Contractor	0d	09-06-16 A		0d
6	LNTP to Vehicle Manufacturer	0d	09-06-16 A		0d
7	FTA Issues FFGA	0d		05-23-17 A	0d
8	Segment 4 Ready for EMU Testing	0d		06-14-21	0d
9	Segment 4 Intermediate Milestone Complete	0d		08-13-21	0d
10	Electrification Substantial Completion	0d		07-27-22	-96d
11	Revenue Service Date (RSD) w/out Risk Contingency	0d		07-28-22	-3d
12	Start Phased Revenue Service	0d	07-28-22		-96d
13	Revenue Service Date (RSD) w/ Risk Contingency (FFGA RSD)	0d		08-22-22	0d
14	**PLANNING / APPROVALS**	1230d	05-01-14 A	01-16-19 A	0d
15	**REAL ESTATE ACQUISITION**	1372d	11-05-15 A	04-01-21	-621d
16	**OVERHEAD UTILITY RELOCATION (Various)**	948d	03-10-17 A	12-03-20	54d
17	**PG&E INFRASTRUCTURE**	1182d	03-01-17 A	09-09-21	0d
18	**INTERCONNECT**	1153d	03-01-17 A	07-30-21	-25d
19	**INTERIM POWER**	322d	08-01-17 A	11-05-18 A	0d
20	**PERMANENT POWER**	1044d	08-01-17 A	09-09-21	0d
21	***DESIGN & PERMITTING***	431d	08-01-17 A	04-12-19 A	0d
22	***CONSTRUCTION***	612d	04-15-19 A	09-09-21	0d
23	**ELECTRIFICATION (BBII)**	1537d	09-06-16 A	07-27-22	-68d
24	**DESIGN**	1323d	09-06-16 A	09-30-21	0d
25	**SIGNALS DESIGN**	370d	05-01-20 A	09-30-21	-55d
26	**CONSTRUCTION**	1669d	10-09-17 A	05-04-22	-56d
27	***Segment 1***	946d	10-02-19 A	05-04-22	-103d
28	**OCS**	453d	08-01-20 A	10-27-21	0d
29	**Traction Power**	929d	10-02-19 A	04-17-22	-170d
30	**Signals**	284d	12-30-20	10-09-21	0d
31	**Segment Completion**	0d	05-04-22	05-04-22	-103d
32	***Segment 2***	1669d	10-09-17 A	05-04-22	-146d
33	**OCS**	1449d	10-09-17 A	09-26-21	0d
34	**Traction Power**	1567d	01-19-18 A	05-04-22	-198d
35	**Signals**	916d	04-26-19 A	10-27-21	0d
36	**Segment Completion**	0d	05-04-22	05-04-22	-146d
37	***Segment 3***	1032d	04-09-19 A	02-03-22	34d
38	**OCS**	727d	05-28-19 A	05-23-21	0d
39	**Traction Power**	1016d	04-09-19 A	01-18-22	0d
40	**Signals**	415d	12-16-20	02-03-22	0d
41	**Segment Completion**	0d	02-03-22	02-03-22	34d
42	***Segment 4***	1429d	12-01-17 A	10-29-21	0d
43	**OCS**	852d	02-25-19 A	06-25-21	-57d



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 | Risk Contingency

#	Activity Name	Duration	Start	Finish	Var. to C20.04
44	Traction Power	1429d	12-01-17 A	10-29-21	0d
45	Signals	907d	10-22-18 A	04-15-21	0d
46	Segment Completion	60d	06-15-21	08-13-21	0d
47	TESTING	84d	05-05-22	07-27-22	-96d
48	DRILL TRACK (TASI)	20d	02-01-21	02-26-21	-20d
49	SCADA (Arinc)	1771d	03-30-15 A	03-18-22	0d
50	PREPARE SOLE SOURCE & AWARD	649d	03-30-15 A	10-16-17 A	0d
51	DESIGN	157d	10-16-17 A	05-31-18 A	0d
52	IMPLEMENTATION, TEST, INSTALL & CUTOVER	899d	09-04-18 A	03-18-22	0d
53	CEMOF (Various)	1016d	11-16-17 A	10-07-21	-22d
54	CEMOF MODIFICATIONS (ProVen)	837d	11-16-17 A	01-31-21	-21d
55	*DESIGN*	178d	11-16-17 A	07-31-18 A	0d
56	*BID & AWARD*	132d	08-01-18 A	02-07-19 A	0d
57	*CONSTRUCTION*	460d	04-29-19 A	01-31-21	-21d
58	PANTOGRAPH INSPECTION & MONITORING SYSTEM (Ctr TBD)	663d	03-01-19 A	10-07-21	-22d
59	SCISSOR LIFT WORK PLATFORM (Ctr TBD)	596d	03-01-19 A	07-02-21	-22d
60	TUNNEL MODIFICATION (ProVen)	1535d	10-31-14 A	09-17-20 A	0d
61	ELECTRIC LOCOMOTIVE (Amtrak / Mitsui)	958d	03-01-17 A	11-02-20	-22d
62	EMU (Stadler)	2147d	05-01-14 A	07-22-22	0d
63	DEVELOP RFP, BID & AWARD	612d	05-01-14 A	09-02-16 A	0d
64	DESIGN	1084d	09-06-16 A	11-02-20	0d
65	PROCUREMENT (Material)	1034d	01-16-17 A	12-31-20	0d
66	MANUFACTURING & TESTING	1210d	12-04-17 A	07-22-22	0d
67	*TRAINSET 1*	1055d	12-04-17 A	12-17-21	0d
68	*TRAINSET 2*	982d	02-22-18 A	11-26-21	0d
69	*TRAINSET 3*	800d	08-06-18 A	08-27-21	0d
70	*TRAINSET 4*	595d	06-03-19 A	09-10-21	0d
71	*TRAINSET 5*	470d	12-02-19 A	09-17-21	0d
72	*TRAINSET 6*	450d	01-13-20 A	10-01-21	0d
73	*TRAINSET 7*	445d	02-10-20 A	10-22-21	0d
74	*TRAINSET 8*	395d	05-04-20 A	11-05-21	0d
75	*TRAINSET 9*	385d	06-22-20 A	12-10-21	0d
76	*TRAINSET 10*	443d	06-22-20 A	03-02-22	-18d
77	*TRAINSET 11*	415d	08-17-20 A	03-18-22	0d
78	*TRAINSET 12*	390d	11-02-20	04-29-22	0d
79	*TRAINSET 13*	410d	11-16-20	06-10-22	0d
80	*TRAINSET 14*	390d	01-25-21	07-22-22	0d
81	TESTING & STARTUP (JPB)	50d	06-14-22	08-22-22	0d
82	PRE-REVENUE TESTING	44d	06-14-22	07-27-22	-96d
83	REVENUE OPERATIONS	18d	07-27-22	08-22-22	0d
84	Revenue Service Date (RSD) w/out Risk Contingency	0d		07-27-22	-3d
85	Phased Revenue Service	0d	07-28-22	07-28-22	-5d
86	Revenue Service Date (RSD) w/ Risk Contingency (FFGA RSD)	0d		08-22-22	0d
87	RISK CONTINGENCY	26d	07-28-22	08-22-22	0d



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 | Risk Contingency

Appendix D – Standard Cost Codes

THIS PAGE INTENTIONALLY LEFT BLANK

Description of Work	FFGA Baseline Budget (A)	Approved Budget (B)	Cost This Month (C)	Cost To Date (D)	Estimate To Complete (E)	Estimate At Completion (F) = (D) + (E)
10 - GUIDEWAY & TRACK ELEMENTS	**$14,256,739**	**$27,353,871**	**$0**	**$24,997,834**	**$3,082,261**	**$28,080,095**
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	$2,500,000	$2,500,000	$0	$144,681	$2,355,319	$2,500,000
10.07 Guideway: Underground tunnel	$8,110,649	$24,853,871	$0	$24,853,153	$726,942	$25,580,095
10.07 Allocated Contingency	$3,646,090	$0	$0	$0	$0	$0
30 - SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	**$2,265,200**	**$7,074,253**	**$341,261**	**$4,858,423**	**$3,389,799**	**$8,248,222**
30.03 Heavy Maintenance Facility	$1,344,000	$7,074,253	$341,261	$4,858,423	$3,389,799	$8,248,222
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**	**$268,912,556**	**$3,699,816**	**$197,045,176**	**$75,862,101**	**$272,907,277**
40.01 Demolition, Clearing, Earthwork	$3,077,685	$3,077,685	$457,700	$6,123,100	($3,015,415)	$3,107,685
40.02 Site Utilities, Utility Relocation	$62,192,517	$94,595,387	$1,679,877	$97,567,166	($1,517,498)	$96,049,668
40.02 Allocated Contingency	$25,862,000	($0)	$0	$0	($0)	($0)
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	$2,200,000	$4,944,961	$108,200	$6,461,428	($1,509,495)	$4,951,934
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	$32,579,208	$32,954,208	$87,000	$2,146,995	$30,807,213	$32,954,208
40.05 Site structures including retaining walls, sound walls	$568,188	$568,188	$0	$0	$568,188	$568,188
40.06 Pedestrian / bike access and accommodation, landscaping	$804,933	$764,933	$0	$0	$764,933	$764,933
40.07 Automobile, bus, van accessways including roads, parking lots	$284,094	$284,094	$0	$0	$284,094	$284,094
40.08 Temporary Facilities and other indirect costs during construction	$107,343,777	$111,113,100	$1,367,039	$84,746,487	$45,795,127	$130,541,614
40.08 Allocated Contingency	$20,160,000	$20,610,000	$0	$0	$3,684,953	$3,684,953
50 - SYSTEMS	**$504,445,419**	**$525,592,189**	**$10,053,419**	**$214,585,847**	**$322,586,279**	**$537,172,126**
50.01 Train control and signals	$97,589,149	$101,030,416	$335,599	$40,682,309	$61,662,747	$102,345,056
50.01 Allocated Contingency	$1,651,000	$0	$0	$0	$0	$0
50.02 Traffic signals and crossing protection	$23,879,905	$23,879,905	$0	$0	$23,879,905	$23,879,905
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	$97,744,787	$5,452,625	$43,235,825	$54,511,503	$97,747,328
50.03 Allocated Contingency	$31,755,013	$2,990,895	$0	$0	$1,578,187	$1,578,187
50.04 Traction power distribution: catenary and third rail	$253,683,045	$287,109,699	$4,265,196	$130,609,724	$172,187,051	$302,796,775
50.04 Allocated Contingency	$18,064,000	$4,133,188	$0	$0	$121,577	$121,577
50.05 Communications	$5,455,000	$5,455,000	$0	$57,989	$5,397,011	$5,455,000
50.07 Central Control	$2,090,298	$2,090,298	$0	$0	$2,090,298	$2,090,298
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**	**$114,245**	**$20,593,553**	**$15,081,531**	**$35,675,084**
60.01 Purchase or lease of real estate	$25,927,074	$25,927,074	$114,245	$20,460,944	$13,916,130	$34,377,074
60.01 Allocated Contingency	$8,748,010	$8,748,010	$0	$0	$298,010	$298,010
60.02 Relocation of existing households and businesses	$1,000,000	$1,000,000	$0	$132,609	$867,391	$1,000,000
70 - VEHICLES (96)	**$625,544,147**	**$620,587,713**	**$5,405,095**	**$231,302,893**	**$387,826,666**	**$619,129,560**
70.03 Commuter Rail	$589,167,291	$591,340,151	$5,405,095	$230,764,614	$362,433,429	$593,198,043
70.03 Allocated Contingency	$9,472,924	$5,415,810	$0	$0	$2,099,765	$2,099,765
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	$0	$18,763,931	$18,763,931
80 - PROFESSIONAL SERVICES (applies to Cats. 10-50)	**$323,793,010**	**$335,970,389**	**$1,776,250**	**$312,384,994**	**$45,940,909**	**$358,325,903**
80.01 Project Development	$130,350	$130,350	$0	$280,180	($149,830)	$130,350
80.02 Engineering (not applicable to Small Starts)	$180,227,311	$188,700,404	$275,579	$199,087,125	($5,096,298)	$193,990,827
80.02 Allocated Contingency	$1,866,000	$190,678	$0	$0	$10,147	$10,147
80.03 Project Management for Design and Construction	$72,029,265	$79,164,962	$921,498	$81,826,769	$17,495,531	$99,322,299
80.03 Allocated Contingency	$9,388,080	$5,471,844	$0	$0	($0)	($0)
80.04 Construction Administration & Management	$23,677,949	$30,110,163	$555,797	$21,175,422	$16,880,098	$38,055,520
80.04 Allocated Contingency	$19,537,000	$13,104,785	$0	$0	$5,159,428	$5,159,428
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	$8,671,371	$21,360	$5,388,111	$4,390,632	$9,778,742
80.06 Allocated Contingency	$556,000	$0	$0	$0	$0	$0
80.07 Surveys, Testing, Investigation, Inspection	$3,287,824	$3,418,022	$2,016	$45,537	$3,453,244	$3,498,781
80.08 Start up	$1,797,957	$1,797,957	$0	$0	$3,797,957	$3,797,957
80.08 Allocated Contingency	$628,000	$628,000	$0	$0	($0)	($0)
Subtotal (10 - 80)	**$1,761,052,001**	**$1,821,166,055**	**$21,390,085**	**$1,005,768,721**	**$853,769,546**	**$1,859,538,267**
90 - UNALLOCATED CONTINGENCY	**$162,620,295**	**$99,606,241**	**$0**	**$0**	**$61,234,029**	**$61,234,029**
Subtotal (10 - 90)	**$1,923,672,296**	**$1,920,772,296**	**$21,390,085**	**$1,005,768,721**	**$915,003,575**	**$1,920,772,296**
100 - FINANCE CHARGES	**$6,998,638**	**$9,898,638**	**$33,807**	**$6,723,682**	**$3,174,956**	**$9,898,638**
Total Project Cost (10 - 100)	**$1,930,670,934**	**$1,930,670,934**	**$21,423,893**	**$1,012,492,403**	**$918,178,531**	**$1,930,670,934**

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix E – Change Order Logs

THIS PAGE INTENTIONALLY LEFT BLANK

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

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
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)	$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	$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
		Total	**$45,283,779**	**52.63 %**	**$16,498,935**

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
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
		Total	**$179,197,556**	**21.45 %**	**$21,637,464**

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
	None to date				
		Total	**$0**	**0.00%**	**$517,038**

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
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

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**
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
		Total	**$464,308**	**8.43 %**	**$5,043,470**

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
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

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
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
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]	-
		Total	**$523,476**	**55.18 %**	**$293,602**

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:

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

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix F – Risk Table

THIS PAGE INTENTIONALLY LEFT BLANK

Listing of PCEP Risks and Effects in Order of Severity

ID	RISK DESCRIPTION	EFFECT(S)
314	The contractor may not complete and install signal design including Two-speed check (2SC) modifications within budget and schedule.	Delay and additional cost for rework.
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
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.
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)
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
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

ID	RISK DESCRIPTION	EFFECT(S)
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
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
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.
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
296	PG&E needs to complete interconnection to be sufficiently complete to accept interim power	Delay in testing and increased costs
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.
322	BBII needs to complete traction power substations to be sufficiently complete to accept interim power	Delay in testing and increased costs
325	EMU production delay. Possible that there are quality issues, failed factory tests, poor integration / control of suppliers.	Schedule Increase

ID	RISK DESCRIPTION	EFFECT(S)
327	EMU production delay. Possible that there is poor integration / control of suppliers.	Schedule Increase
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.
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.
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

ID	RISK DESCRIPTION	EFFECT(S)
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.
291	Order/manufacture of long lead items prior to 100% IFC design document that proves to be incorrect	Design change and/or delays
292	Potential that UPS will not fit in the spaces allotted to communications work within the buildings.	Requisite backup capacity units 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.
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
042	Full complement of EMUs not available upon initiation of electrified revenue service	Late delivery impacts revenue service date.
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.

ID	RISK DESCRIPTION	EFFECT(S)
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.
008	Requests for change orders after vehicles are in production	Delays to manufacturing of vehicles and additional design and manufacturing costs.
023	Manufacturer cannot control vehicle weight to meet specifications.	Increased operating cost.
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)
054	Infrastructure not ready for vehicles (OCS, TPS, Commissioning site / facility).	Increases cost if done off property
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

ID	RISK DESCRIPTION	EFFECT(S)
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
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.

ID	RISK DESCRIPTION	EFFECT(S)
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.
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
293	Readiness of 115kV interconnect for temporary power to support testing	Delay in testing

ID	RISK DESCRIPTION	EFFECT(S)
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.

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix G – MMRP Status Log

THIS PAGE INTENTIONALLY LEFT BLANK

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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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, and 2019, 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, and 2019 surveys have been submitted to the JPB for the project

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
						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. Surveys for the 2020 breeding season will commenced in March 2020. On 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 continued to be implemented during the reporting period. Balfour was granted approval by the CDFW to drive vehicles and equipment through the buffer in order to access foundation installation locations to the North and South of the BUOW. During the first week of mobilization through the buffer, a Qualified Biological Monitor provided full-time biological monitoring to determine if the presence of vehicle travel had any impact on the BUOW. 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. Due to the lack of observed impacts to the BUOW during the monitoring effort, the CDFW subsequently approved weekly spot-checks through the end of the breeding season, which are currently ongoing, and continued through August 31, 2020. No signs of distress from the

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
						owl were observed due to construction activities during weekly spot checks. In addition, since there is some potential for indirect impacts during the non-breeding season (September 1 through January 31), during ongoing work on the Caltrain ROW and the completion of OCS pole foundations, the CDFW approved the reduction of the disturbance buffer from 200 meters down to 75 meters. The Qualified Biologist will monitor the burrows during construction activities within 75 meters of the burrows to look for any changes in owl foraging behavior in response to construction activities. If any change in owl nesting and foraging behavior is observed because of construction activities, activities will cease within the 75-meter buffer and the CDFW will be notified to determine next steps.
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. No nesting bird surveys occurred during this reporting period. Nesting bird surveys will recommence on February 1,2021 for the 2021 nesting season.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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	**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

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
unique archaeological resources under PRC 21083.2 are present.						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

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
						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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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	**X**	**X**			Upcoming	This measure has not started

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
impacted intersections for the 2020 Project Condition.						
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

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 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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
						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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
						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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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				**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

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
Caltrain's Bicycle Access and Parking Plan.						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				**X**	Upcoming	This measure will be implemented during project operation.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
as feasible between San Jose and Bayshore.						