Modernization Program
Peninsula Corridor Electrification Project (PCEP)

November 2017
Monthly Progress Report

November 30, 2017

Funding Partners

Federal Transit Administration (FTA) Core Capacity

FTA Section 5307 (Environmental / Pre Development only)

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

Prop 1B (Public Transportation Modernization & Improvement Account)

Caltrain Low Carbon Transit Operations Cap and Trade

Proposition 1A

California High Speed Rail Authority (CHSRA) Cap and Trade

Carl Moyer Fund

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

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

San Mateo County Transportation Authority (SMCTA) Contribution

SMCTA Measure A

Santa Clara Valley Transportation Authority (VTA) Measure A

VTA Contribution

City and County of San Francisco (CCSF) Contribution

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1.0 BACKGROUND

Over the last decade, Caltrain has experienced a substantial increase in ridership and anticipates further increases in ridership demand as the San Francisco Bay Area's population grows. The Caltrain Modernization (CalMod) Program, scheduled to be implemented by 2020, will electrify and upgrade the performance, operating efficiency, capacity, safety, and reliability of Caltrain's commuter rail service.

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

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

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

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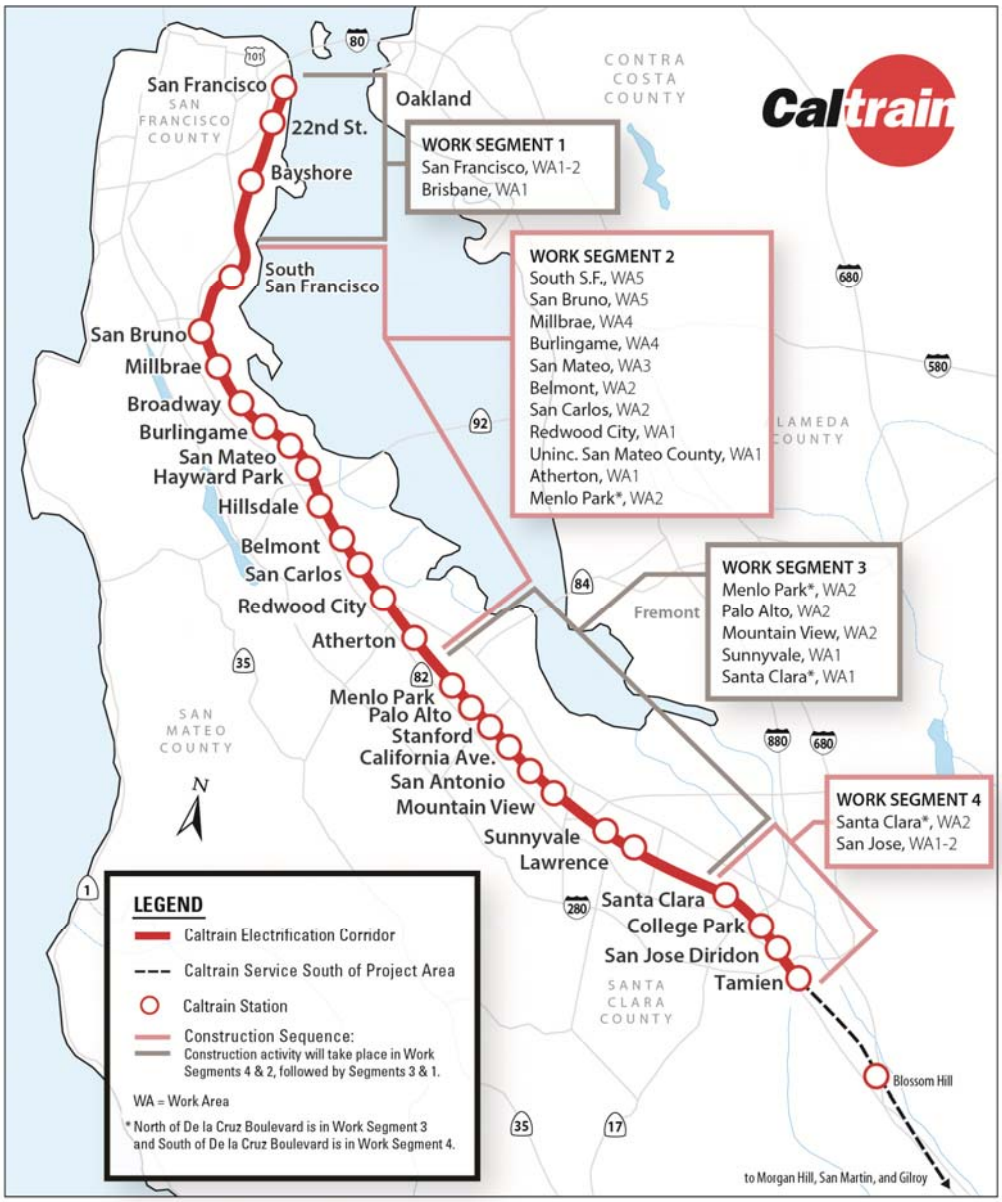
2.0 EXECUTIVE SUMMARY

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

Figure 2-1 PCEP Work Segments



Overhead Contact System (OCS) foundation installation continued in Segment 2. OCS design for Segment 4 continues to be redefined as contractors resolve potential conflicts with utilities. The preferred option for the constant warning system will be selected and reviewed with Union Pacific Railroad (UPRR) and the Federal Railroad Administration (FRA) prior to moving into final design.

The Supervisory Control and Data Acquisition (SCADA) contractor, Rockwell Collins, and the project team began working on the preliminary schedule, which is expected to be submitted to JPB in December.

Stadler is progressing with building their new Salt Lake City EMU manufacturing facility. The construction permits have been obtained and a steel structure contractor has been selected. EMU design review packages are nearly finalized at the 65% design phase. Manufacturing of EMU car shells is progressing.

HNTB, the LTK sub consultant working on the Centralized Equipment Maintenance and Operations Facility (CEMOF), began design work on the recently approved improvement plan.

2.1 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 – Engineering Meeting – Weekly

Purpose: To discuss status, resolution and tracking of Balfour Beatty Infrastructure, Inc. (BBII) and Electrification design-related issues, to discuss and monitor the progress of utility relocation compared to schedule, and to discuss third-party coordination activities with Pacific Gas and Electric (PG&E), CHSRA, UPRR, Bay Area Rapid Transit, California State Department of Transportation (Caltrans), Communications-Based Overlay Signal System (CBOSS) and others.

Activity this Month

Funding Partners: CHSRA: Ian Ferrier

Major topics included: PG&E power quality study and the interconnections feasibility study, coordination between the PCEP and CBOSS projects, the utility relocation status, tunnel design, the SCADA contract status, progress on Design-Build (DB) contract, including design and construction updates, upcoming changes to the contract in preparation for the Change Management Board (CMB), and coordination with key third parties on design review and permitting for the project.

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

November 7 Funding Partners: CHSRA: Ian Ferrier; SFCTA: Luis Zurinaga

The Board asked for the risk register to be added the appendix of the Monthly Progress Report. The Project Management Oversight Consultant has reduced their meetings from monthly to quarterly. BBII will work through the Tuesday before Thanksgiving and will reopen in the field Sunday November 26 for night work. Risk management has finalized the risk analysis based on the results of the Risk Refresh. Systems Integration Database Status Summary Matrix has been updated. An onsite visit and Caltrain tour with the FRA has been scheduled for November 28 and 29.

November 21 Funding Partners: CHSRA: Ian Ferrier; SFCTA: Luis Zurinaga

Half of the foundations have been completed in Segment 2 Work Area (WA) 5 and the rest are expected to be done before Christmas week. BBII will be shut down the week between Christmas and New Year's. Restart will begin on January 2 and will start in Segment 2 WA4. The final Contractor Systems Integration Management Plan has been submitted. The whitepaper on the AEM-7 Electrification Test Locomotives has been sent to the FTA. A Hazards Identification and Occupational Safety and Health Administration Safety Workshop with internal stakeholders scheduled for November 29 through December 1. The Notice to Proceed for the CEMOF Facility Upgrade design was issued to HNTB on November 16.

Systems Integration Meeting – Bi-Weekly

Purpose: To discuss and resolve issues with inter-system interfaces and to identify and address interface points which have yet to be addressed.

Activity this Month

Funding Partners: CHSRA: Ian Ferrier and Wai-on Siu

Major topics included: Monitoring and resolution of systems integration issues and scheduling bi-weekly internal interface meetings and contractor systems integration meetings. The Traction Power SCADA team held a kickoff meeting and monthly status meetings have been scheduled. Coordination commenced with Caltrain Capital Projects that include work associated with the PCEP and a roster of personnel of three of the construction projects was circulated. A Rail Activation Committee meets bi-weekly and progress on a schedule of activities including systems integration testing activities, FRA, FTA and safety certification, and community outreach, operating procedures and training is being tracked.

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: CHSRA: Ian Ferrier and Wai Su; SFCTA: Luis Zurinaga

In November a new Program Plan (baseline) was established. This update was necessitated due to the delay in receiving a Full Funding Grant Agreement (FFGA) from the FTA. This delay impacted several aspects of the PCEP including the DB electrification effort, manufacturing of EMU trainsets, and permanent power availability. The program critical path now runs through PG&E design and construction to provide permanent power, and concludes with pre-revenue testing. The near-critical path runs through design and manufacturing of EMU trainsets.

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: CHSRA: Ian Ferrier; SFCTA: Luis Zurinaga

One risk was added and one risk retired. One risk was reassigned from JPB to Stadler. See the Risk Management section (Section 11) in this report for more details.

Change Management Board (CMB) – Monthly

Purpose: To review, evaluate and authorize proposed changes to PCEP over $200,000.

Activity this Month

Funding Partners: CHSRA: Bruce Armistead and Boris Lipkin; Metropolitan Transportation Commission: Trish Stoops and Glen Tempke; SFCTA: Luis Zurinaga; SMCTA: Joe Hurley; VTA: Krishna Davey and Carol Lawson

Major topics included: contingency usage, potential changes to the Stadler contract and track access delays, differing site condition field orders updates as well as other potential changes as part of the BBII contract.

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.

BBII Contract

Four changes were approved. One was a deductive change.

Stadler Contract

One change was approved.

SCADA Contract

No changes were identified for consideration.

2.2 Schedule

Due to delays in federal funding the MPS was frozen in February 2017. The FFGA was received in May and the overall schedule was reevaluated. In November 2017 a new Program Plan (baseline) was established. The Program Plan reflects a delay to the Revenue Service Date (RSD), the date on which the project is deemed completed.

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

Table 2-1 Schedule Status[1]

Milestones	Program Plan	Progress Schedule (November 2017)[1]
First Eight Miles of Electrification Complete to Begin Testing	11/21/2019	12/22/2019[2]
Arrival of First Vehicle at JPB	07/29/2019	07/29/2019
PG&E Provides Permanent Power	09/09/2021	09/09/2021
Start Pre-Revenue Testing	09/10/2021	09/10/2021
RSD (w/o Risk Contingency)	12/09/2021	12/09/2021
RSD (w/ Risk Contingency)	04/22/2022	04/22/2022
FFGA RSD	08/22/2022	08/22/2022

Note:

1. Dates may shift slightly as the update of the November Progress Schedule is still in progress.
2. See “Notable Variances” in Section 7 for explanation on date shift.

2.3 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	$ 12,720,922	$ 288,120,075	$ 1,028,005,133	$ 1,316,125,208
EMU Subtotal	$ 664,127,325	$ 664,127,325	$ 961,981	$ 85,289,521	$ 578,837,804	$ 664,127,325
PCEP TOTAL	**$ 1,980,252,533**	**$ 1,980,252,533**	**$ 13,682,903**	**$ 373,409,596**	**$ 1,606,842,937**	**$ 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.

2.4 Board Actions

- None

Future anticipated board actions include:

- To Be Scheduled
  - PG&E Supplemental Agreement #4: Construction
  - Authority to procure used electric locomotives
  - Ambassador Request for Proposal (RFP) award

2.5 Government and Community Affairs

A number of community relations and outreach events took place during the month. The PCEP team participated in a total of five meetings with stakeholders.

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 the installation of 138 miles of single track and 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, and seven paralleling stations (PS). Electrification will be performed using a DB delivery method.

Activity This Month

- OCS foundation installation continued in Segment 2 WA5 and is expected to be completed in December.
- Potholing of utilities at proposed OCS locations continued in Segment 2 in advance of foundation installation. BBII also continued to remove obstructions found during the potholing process, such as loose concrete, asphalt, and other debris.
- Test pile results were received and reviewed. The results were in accordance with requirements of the specification.
- Relocation of signal cables found in conflict with planned OCS foundations continues as conflicts are identified.
- Continued progression of the OCS design with BBII. 65% OCS poles and layout designs were completed for other work areas for Segment 2. Design for Segment 4 continues to be refined as contractors resolve potential conflicts with utilities.
- Continued design review coordination with local jurisdictions for the OCS design in Segments 2 and 4, including responses to comments from jurisdictions.
- Continued to review and coordinate signal and communication design submittals with BBII. The project team and BBII continued to work on potential options for the constant warning solution. A preferred option will be selected for review with UPRR and the FRA before moving forward with final design.
- The feasibility study for the 115 kV interconnections between the future Caltrain substations and PG&E's substations was completed. An alternative was selected for each location and the contractor will proceed with design.
- Continued coordination efforts with PG&E for infrastructure improvements, TPS interconnects and new service drop locations. The PCEP team continues to work with PG&E for the finalization of protection scheme studies.
- The PCEP team and BBII continue to work through Site Specific Work Plans (SSWP) for upcoming field work.
- BBII continued tree pruning and removal in Segment 2.

Activity Next Month

- Continue OCS foundation installation in Segment 2 WA5, including preparation work in the South San Francisco Yard during day time shifts. This work is expected to be completed in December.
- 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 infrastructures such as overhead bridge protections.
- Continue potholing and clearing of obstructions at proposed OCS locations. Potholing will continue with a focus on Segment 2 for foundation installation.
- Continue coordination with UPRR on signal and OCS design. Select a preferred option for the constant warning time to move forward with final design
- Continue review of BBII work plans for upcoming construction activities.
- Coordinate with PG&E on interconnection design and final design for PG&E infrastructure.
- Start final design of for the 115 kV interconnections for each of the two substations.
- Continue design reviews and coordination with local jurisdictions.
- Continue tree pruning and removals.

3.2 Supervisory Control and Data Acquisition (SCADA)

SCADA is a system that monitors and controls field devices for electrification, including substations, PSs and the OCS. SCADA will be integrated with the base operating system for Caltrain Operations and Control, which is the Rail Operations Center System.

Activity This Month

- Began bi-weekly meetings to advance design of SCADA.
- Began work with Rockwell Collins on the preliminary schedule for the contract.

Activity Next Month

- Continue bi-weekly technical meetings to advance SCADA design.
- Submit preliminary schedule.

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 manage completion of design and construction management for the Tunnel 1 and Tunnel 4 Drainage Rehab Project. The Drainage Rehab Project is funded separately from PCEP and will be a Design-Bid-Build construction package. Construction will occur concurrently with the Electrification DB contractor's efforts in Segment 1.

Activity This Month

- The PCEP team continued coordination efforts with the design team on drawings and specifications on Tunnel 1 and Tunnel 4 Drainage Rehab Project.
- The project team continued the resolution of comments on 100% plans and specifications.
- Continued preparations of contract documents, including the general provision and special provision for bid.

Activity Next Month

- Continue coordination efforts with UPRR and other stakeholders.
- Complete comment resolution for 100% plans and specifications.
- Complete general and special provision for the contract.
- Complete final bid package for advertisement.

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4.0 ELECTRIC MULTIPLE UNITS

The EMU procurement component of the PCEP consists of the purchase of 96 Stadler EMUs. The EMUs will consist of both cab and non-cab units configured as 16 six-car fixed trainsets. Power will be obtained from the OCS via roof-mounted pantographs, which will power the electric traction motors. The EMUs will replace a portion of the existing diesel locomotives and passenger cars currently in use by Caltrain.

Activity This Month

- Stadler obtained construction permits and has selected a steel structure contractor for their new Salt Lake City manufacturing facility.
- Preliminary Design Reviews (PDRs) for EMU systems continue and design review packages being finalized.
- EMU design coordination discussions continue with representatives from Caltrain Operations and Maintenance, Caltrain Public Outreach, the FRA, the FTA PMOC, Safety and Quality Assurance personnel, and PCEP Program Scheduling.
- The PCEP team continues to address system-wide interface issues involving the emerging EMU design and the existing wayside infrastructure, the electrification project, and the CBOSS/Positive Train Control (PTC) Project.
- The extrusions and machined parts for the first four car shells continue to be shipped and staged at Stadler's facility in Switzerland.
- Conducted onsite meeting and Caltrain facility tour with FRA.
- Conducted Hazard Identification Safety Workshop, established Safety Committee membership, and held first EMU Safety Committee Meeting.

Activity Next Month

- Completion of PDRs and finalization of all PDR packages at 65% design phase.
- Continue to work with the FRA on EMU compliance issues.
- Car shell subassembly welding and machining to commence.

4.1 Centralized Equipment Maintenance and Operations Facility (CEMOF) Modifications

The CEMOF Upgrade project will provide work areas for performing maintenance on the new EMUs.

Activity This Month

- LTK sub-consultant, HNTB, commenced upgrade design engineering.

Activity Next Month

- LTK/HNTB internal kick off meeting and design review scheduled for December 6.
- Design update review meeting with PCEP and internal stakeholders to be scheduled for early January 2018.

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5.0 SAFETY

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

Activity This Month

- Held the monthly project DB Safety and Security Certification meeting, the Fire/Life Safety Committee meeting, and the EMU Safety and Security Certification meeting. Project staff participated in the BBII monthly "All Hands" contractor workforce meetings. Safety communication with project stakeholders remains a priority to discuss project related hazards and mitigation initiatives.
- Project safety staff continues to provide input and oversight of the contractor SSWP safety provisions and continues to provide ongoing safety construction oversight and inspections. Safety awareness training of overhead power line hazards was provided to contractor staff during the month.
- An EMU safety workshop was conducted from 11/29 to 12/1 in San Mateo with PCEP, Stadler, BBII, and Caltrain Operations and Maintenance staff participating throughout the workshop to assess the status of the project Safety and Security Certification and safety assurance processes. Caltrain Operations and Maintenance staff also participated in the EMU Operating Hazard Analysis discussion.
- Project safety staff participated in the FTA Quarterly Update Meeting and provided a status of project safety program development, challenges and initiatives.

Activity Next Month

- Monthly safety communication meetings continue to be scheduled for the Project Safety and Security Certification Committee, Fire/Life Safety Committee, and other project-related contractor and JPB safety meetings conducted to discuss project safety priorities. Project safety staff will continue to actively participate and present safety topics at the BBII "All Hands" monthly safety meetings.
- Project safety staff will continue its focus on performing site safety inspections on the OCS foundation and potholing field work to assess safety work practices and identify additional opportunities for improvement.
- Project staff is reviewing the current RWP training modules and will provide recommendations designed to enhance program efficiencies as new contractor staff is brought onboard.
- Project safety will continue to work closely with contractor staff to identify safety improvement opportunities.
- Project safety staff and transit police will conduct office safety and security awareness training for project office employees to review emergency response procedures.

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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 management representatives continue bi-weekly.
- Revision 2 of the PCEP Quality Management Plan is out for management review.
- Regularly scheduled design reviews and surveillances began on project design packages and will continue through the spring of 2018.
- Three design audits were conducted this month: Traction Power Facilities at 95%, Systemwide Ductbanks at 95%, and Stations Grounding and Bonding at 65%.
- A non-conformance report (NCR) was issued to BBII for lack of mix design submittal, lack of concrete shrinkage tests, lack of approval of concrete batch plant, lack of concrete batch plant accreditation, and lack of 24-hour notice to JPB for construction activities. The NCR remains open, pending Engineer of Record (EOR) approval of the two Quikrete batch plants.
- Two audits were conducted of Quikrete concrete batch plants in Sacramento and Fremont. The audits yielded five findings which remain open.
- An audit of BBII's Request for Information (RFI) procedure was conducted and had no findings.

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	6	44
Audit Findings		
Audit Findings Issued	5	29
Audit Findings Open	5	5
Audit Findings Closed	0	24
Non-Conformances		
Non-Conformances Issued	1	5
Non-Conformances Open	1	1
Non-Conformances Closed	0	4

Activity Next Month

- Two audits are planned and scheduled: BBII Purchasing in accordance with FTA Quality Assurance Guidelines and Structural Steel Products (SSP) in Ft. Worth Texas – the Overhead Catenary System (OCS) Pole Manufacturer. OCS pole deflection testing/witnessing and approval will be conducted concurrently with the audit.

7.0 SCHEDULE

Due to delays in federal funding the MPS was frozen in February 2017. The FFGA was received in May and the overall schedule was reevaluated. In November 2017 a new Program Plan (baseline) was established. The Program Plan reflects a delay to the Revenue Service Date (RSD), the date on which the project is deemed completed.

Without adjustment for contingency the RSD is forecast as December 2021, representing a four-month delay from the April 2016 Program Plan. This was necessitated as a result of the delayed issuance of the FFGA. With the addition of approximately five months of contingency to account for potential risk to the project, the RSD is anticipated as April 2022, which also represents a similar four-month delay to the Program Plan. Additionally, due to FTA contingency requirements, an FFGA RSD will also be tracked. This date is forecast as August 22, 2022 and represents the final milestone in the Program Plan.

Shown below, Table 7-1 indicates major milestone dates for the MPS. Items listed in Table 7-2 reflect the critical path activities/milestones for the PCEP. Table 7-3 lists near-critical activities on the horizon.

Notable Variances

BBII is currently reporting an overall delay to substantial completion, including the intermediate milestone of Segment 4/Test Track (first eight miles of electrification) completion. This delay is being evaluated by the BBII and JPB and does not constitute a schedule extension at this time. Additionally, this delay does not affect the RSD.

Stadler has stated that material delay has held up the start of EMU manufacturing by approximately five weeks. It is believed that this lost time will be recovered and there will be no overall effect on arrival of the first trainset in Salt Lake City.

Table 7-1 Schedule Status

Milestones	Program Plan	Progress Schedule (November 2017)[1]
First Eight Miles of Electrification Complete to Begin Testing	11/21/2019	12/22/2019[2]
Arrival of First Vehicle at JPB	07/29/2019	07/29/2019
PG&E Provides Permanent Power	09/09/2021	09/09/2021
Start Pre-Revenue Testing	09/10/2021	09/10/2021
RSD (w/o Risk Contingency)	12/09/2021	12/09/2021
RSD (w/ Risk Contingency)	04/22/2022	04/22/2022
FFGA RSD	08/22/2022	08/22/2022

Note:
1. Dates may shift slightly as the update of the November Progress Schedule is still in progress.
2. See “Notable Variances” above for explanation on date shift.

Table 7-2 Critical Path Summary

Activity	Start	Finish
PG&E Final Design and Construction to provide Permanent Power	April 2016	09/09/2021
Pre-Revenue Testing	09/10/2021	12/09/2021
RSD w/out Risk Contingency[1]	12/09/2021	12/09/2021
RSD w/ Risk Contingency[1]	04/22/2022	04/22/2022

Note:
1. Milestone activity.

Table 7-3 Near-Term, Near-Critical with Less Than Three Months of Float

Work Breakdown Structure	Activity	Responsibility
Vehicles	EMU Design	Project Delivery

8.0 BUDGET AND EXPENDITURES

The summary of overall budget and expenditure status for the PCEP is shown in the following tables. Table 8-1 reflects the Electrification budget, Table 8-2 reflects the EMU budget, and Table 8-3 reflects the overall project budget.

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	$ 696,696,030	$ 7,741,229	$ 178,504,519	$ 518,191,511	$ 696,696,030
SCADA	$ -	$ 3,446,917	$ -	$ -	$ 3,446,917	$ 3,446,917
Tunnel Modifications	$ 11,029,649	$ 11,029,649	$ -	$ -	$ 11,029,649	$ 11,029,649
Real Estate	$ 28,503,369	$ 28,503,369	$ 119,436	$ 11,238,816	$ 17,264,553	$ 28,503,369
Private Utilities	$ 63,515,298	$ 63,515,298	$ 2,896,843	$ 11,452,188	$ 52,063,110	$ 63,515,298
Management Oversight[5]	$ 141,506,257	$ 141,526,164	$ 1,196,898	$ 77,139,547	$ 64,386,616	$ 141,526,164
Executive Management	$ 7,452,866	$ 7,452,866	$ 141,096	$ 3,825,994	$ 3,626,872	$ 7,452,866
Planning	$ 7,281,997	$ 7,281,997	$ 91,884	$ 5,028,770	$ 2,253,227	$ 7,281,997
Community Relations	$ 2,789,663	$ 2,789,663	$ 42,462	$ 1,201,322	$ 1,588,341	$ 2,789,663
Safety & Security	$ 2,421,783	$ 2,421,783	$ 69,216	$ 978,883	$ 1,442,900	$ 2,421,783
Project Mgmt Services	$ 19,807,994	$ 19,807,994	$ 129,311	$ 8,655,865	$ 11,152,129	$ 19,807,994
Eng & Construction	$ 11,805,793	$ 11,805,793	$ 245,468	$ 2,952,433	$ 8,853,360	$ 11,805,793
Electrification Eng & Mgmt[6]	$ 50,461,707	$ 50,461,707	$ 146,063	$ 21,893,563	$ 28,568,144	$ 50,461,707
IT Support	$ 312,080	$ 331,987	$ -	$ 331,987	$ 0	$ 331,987
Operations Support	$ 1,445,867	$ 1,445,867	$ 25,576	$ 513,891	$ 931,976	$ 1,445,867
General Support	$ 4,166,577	$ 4,166,577	$ 133,727	$ 2,180,560	$ 1,986,017	$ 4,166,577
Budget / Grants / Finance	$ 1,229,345	$ 1,229,345	$ 57,401	$ 592,228	$ 637,117	$ 1,229,345
Legal	$ 2,445,646	$ 2,445,646	$ 42,552	$ 2,423,791	$ 21,856	$ 2,445,646
Other Direct Costs	$ 5,177,060	$ 5,177,060	$ 72,142	$ 2,226,902	$ 2,950,158	$ 5,177,060
Prior Costs 2002 - 2013	$ 24,707,878	$ 24,707,878	$ -	$ 24,333,358	$ 374,520	$ 24,707,878
TASI Support	$ 55,275,084	$ 55,275,084	$ 643,801	$ 5,192,529	$ 50,082,555	$ 55,275,084
Insurance	$ 3,500,000	$ 4,305,769	$ -	$ 2,555,769	$ 1,750,000	$ 4,305,769
Environmental Mitigations	$ 15,798,320	$ 14,972,644	$ -	$ 522,000	$ 14,450,644	$ 14,972,644
Required Projects	$ 17,337,378	$ 17,337,378	$ 4,747	$ 371,775	$ 16,965,603	$ 17,337,378
Maintenance Training	$ 1,021,808	$ 1,021,808	$ -	$ -	$ 1,021,808	$ 1,021,808
Finance Charges	$ 5,056,838	$ 5,056,838	$ 117,968	$ 1,142,932	$ 3,913,906	$ 5,056,838
Contingency	$ 276,970,649	$ 273,438,260	$ -	$ -	$ 234,729,958	$ 234,729,958
Forecasted Costs and Changes	$ -	$ -	$ -	$ -	$ 38,708,302	$ 38,708,302
ELECTRIFICATION SUBTOTAL	**$ 1,316,125,208**	**$ 1,316,125,208**	**$ 12,720,922**	**$ 288,120,075**	**$ 1,028,005,133**	**$ 1,316,125,208**

Notes regarding tables above:

1. "Current Budget" includes executed change orders and awarded contracts.
2. Column C "Cost This Month" represents the cost of work performed this month.
3. Column D "Cost To Date" includes actuals (amount paid) and accruals (amount of work performed) to date.
4. Cost To Date for "Electrification" includes 5% for Contractor's retention until authorization of retention release.
5. The agency labor is actual through October 2017 and accrued for November 2017.
6. The lower accrued amount for Electrification Engineering & Management is result of lighter consultant support performed than forecasted in the previous reporting periods.

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	$ 550,899,459	$ 550,954,459	$ -	$ 60,716,941	$ 490,237,518	$ 550,954,459
CEMOF Modifications	$ 1,344,000	$ 1,344,000	$ -	$ -	$ 1,344,000	$ 1,344,000
Management Oversight[4]	$ 64,139,103	$ 64,139,103	$ 889,678	$ 23,883,868	$ 40,255,235	$ 64,139,103
Executive Management	$ 5,022,302	$ 5,022,302	$ 72,929	$ 2,399,080	$ 2,623,222	$ 5,022,302
Community Relations	$ 1,685,614	$ 1,685,614	$ 3,302	$ 396,715	$ 1,288,899	$ 1,685,614
Safety & Security	$ 556,067	$ 556,067	$ 15,591	$ 279,817	$ 276,250	$ 556,067
Project Mgmt Services	$ 13,275,280	$ 13,275,280	$ 81,078	$ 5,739,367	$ 7,535,914	$ 13,275,280
Eng & Construction	$ 89,113	$ 89,113	$ -	$ 23,817	$ 65,296	$ 89,113
EMU Eng & Mgmt	$ 32,082,556	$ 32,082,556	$ 555,557	$ 10,865,524	$ 21,217,032	$ 32,082,556
IT Support	$ 1,027,272	$ 1,027,272	$ 15,119	$ 345,561	$ 681,711	$ 1,027,272
Operations Support	$ 1,878,589	$ 1,878,589	$ -	$ 277,200	$ 1,601,388	$ 1,878,589
General Support	$ 2,599,547	$ 2,599,547	$ 61,768	$ 964,813	$ 1,634,734	$ 2,599,547
Budget / Grants / Finance	$ 712,123	$ 712,123	$ 31,223	$ 337,710	$ 374,413	$ 712,123
Legal	$ 1,207,500	$ 1,207,500	$ 5,615	$ 873,277	$ 334,223	$ 1,207,500
Other Direct Costs	$ 4,003,139	$ 4,003,139	$ 47,497	$ 1,380,987	$ 2,622,152	$ 4,003,139
TASI Support	$ 2,740,000	$ 2,740,000	$ -	$ -	$ 2,740,000	$ 2,740,000
Required Projects	$ 4,500,000	$ 4,500,000	$ -	$ -	$ 4,500,000	$ 4,500,000
Finance Charges	$ 1,941,800	$ 1,941,800	$ 72,303	$ 688,712	$ 1,253,088	$ 1,941,800
Contingency	$ 38,562,962	$ 38,507,962	$ -	$ -	$ 38,736,702	$ 38,736,702
Forecasted Costs and Changes	$ -	$ -	$ -	$ -	$ (228740)	$ (228,740)
EMU SUBTOTAL	**$ 664,127,325**	**$ 664,127,325**	**$ 961,981**	**$ 85,289,521**	**$ 578,837,804**	**$ 664,127,325**

Notes regarding tables above:

1. "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. The agency labor is actual through October 2017 and accrued for November 2017.

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	$ 12,720,922	$ 288,120,075	$ 1,028,005,133	$ 1,316,125,208
EMU Subtotal	$ 664,127,325	$ 664,127,325	$ 961,981	$ 85,289,521	$ 578,837,804	$ 664,127,325
PCEP TOTAL	**$ 1,980,252,533**	**$ 1,980,252,533**	**$ 13,682,903**	**$ 373,409,596**	**$ 1,606,842,937**	**$ 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.

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 three PCEP contracts are BBII, Stadler, and SCADA. Future PCEP contracts such as CEMOF Modifications and the Tunnel Notching will also follow the change management process.

A log of all executed change orders can be found in Exhibit 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	Description	CCO Amount
	No changes executed this month	
	Total	

EMU Contract

Change Order Authority (5% of Stadler Contract)		**5% x $550,899,459 = $27,544,973**
Date	Description	CCO Amount
11/02/2017	CCO 00003 – Car Level Water Tightness Test	$0
11/03/2017	CCO 00005 – Design Progression (multiple)	$0
	Total	**$0**

SCADA Contract

Change Order Authority (15% of ARINC Contract)		**15% x $3,446,917 = $517,038**
Date	Description	CCO Amount
	None to date	
	Total	

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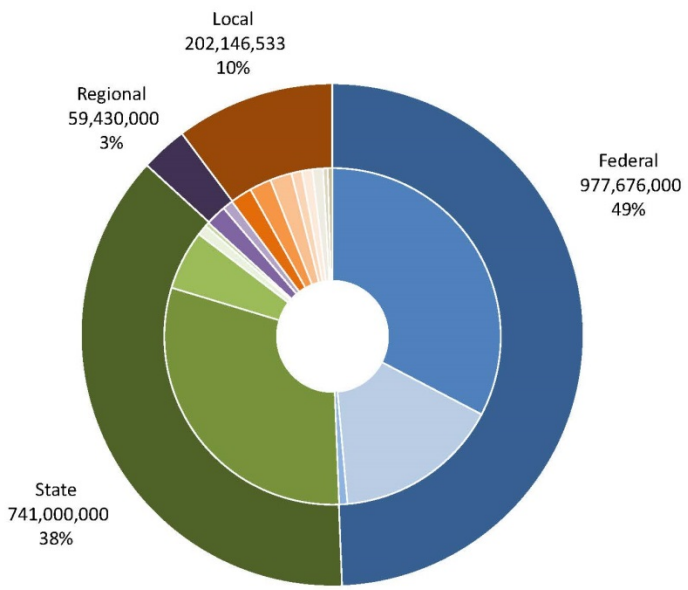
10.0 FUNDING

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, the JPB received approval of the FFGA from the FTA in May 2017. The Agreement provides the project with a commitment of $647 million in federal funding, with $72.9 million available immediately. As previously noted, an additional $100 million in Fiscal Year 2017 funding has been made available by FTA through the annual apportionment process and those funds are now included as part of the FFGA.

Figure 10-1 Funding Plan



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

Notes:

*Includes necessary fund transfer with SMCTA

**Includes $4M CMAQ Transfer considered part of SF local contribution

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11.0 RISK MANAGEMENT

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

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

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

- BBII may be unable to develop grade crossing modifications that meet operational requirements prior to scheduled sub-system testing of the grade crossings.
- Costs for upgrades to PG&E power stations may exceed the current budget.
- A complex and diverse collection of major program elements may not be successfully integrated with existing operations and infrastructure.
- Additional work in the form of signal/pole adjustments may be required to remedy sight distance impediments arising from modifications to original design.
- Working PTC signal system may not be in place in advance of integrated testing and commissioning.
- Design changes may necessitate additional implementation of environmental mitigations not previously budgeted.
- 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.
- Collaboration across multiple disciplines may fail to comprehensively address all of the elements required to operate and maintain an electrified railroad and decommission the current diesel fleet.
- BBII may be unable to get permits required by jurisdictions for construction in a timely manner.
- Transit America Services, Inc. (TASI) may be unable to deliver sufficient resources to support construction and testing for the electrification contract.

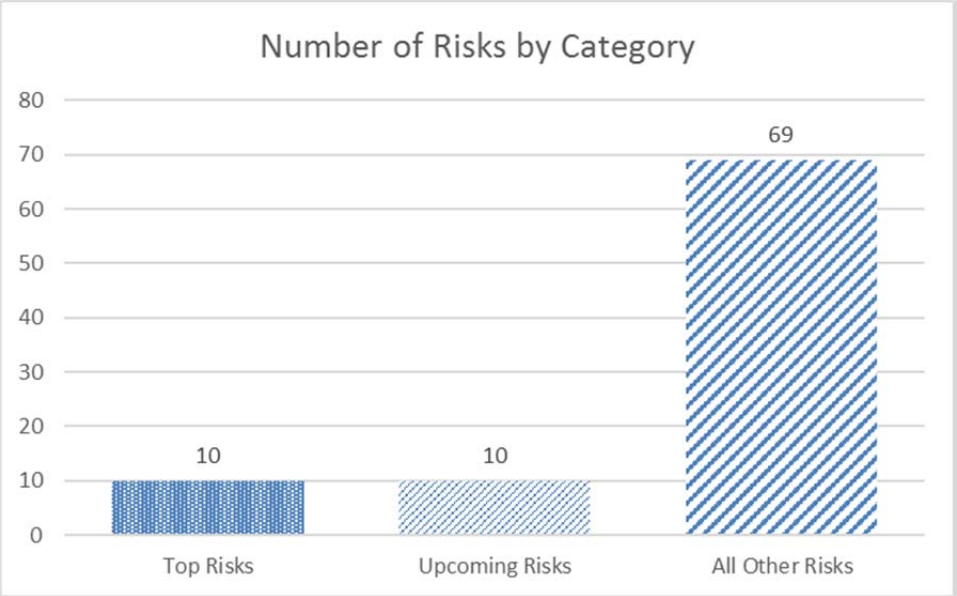
Activity This Month

- Updates were made to 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.

- Risk retirement dates were updated 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.
- The Risk Management team attended Project Delivery and Systems Integration meetings to monitor developments associated with risks and to identify new risks.

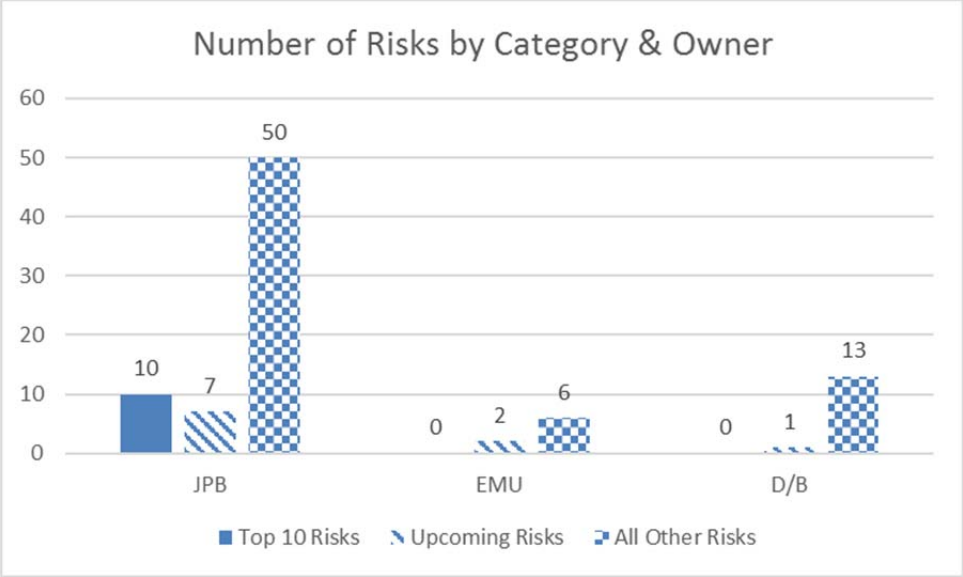
Tables 11-1 and 11-2 show the risks identified for the program. Risks are categorized as top risk, upcoming risk, and all other risks. The categories are based on a rating scale composed of schedule and cost factors. Top risks are considered to have a significantly higher than average risk grade. Upcoming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

Table 11-1 Monthly Status of Risks



Total Number of Active Risks = 89

Table 11-2 Risk Classification



Total Number of Active Risks = 89

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.
- Continue reviewing risks on project risk register with Systems Integration database.
- Finalize Risk Identification and Mitigation Plan.

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12.0 ENVIRONMENTAL

12.1 Permits

The PCEP requires 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.

Section 106 of the NHPA process and Section 7 of the ESA process have concluded.

Activity This Month

- No permit updates occurred.

Activity Next Month

- No permit updates are planned.

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 (EIR) 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, ductbank installation, tree trimming/removal, etc.) occurring in areas that required 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).
- Pre-construction surveys for sensitive wildlife ahead of project activities occurred to help ensure no special-status species were impacted during project activities.
- Environmentally Sensitive Area (ESA) staking and/or fencing occurred to delineate jurisdictional waterways and other potentially sensitive areas that should be avoided during upcoming construction activities, and wildlife exclusion fencing installation and monitoring occurred adjacent to portions of the alignment designated for wildlife exclusion fencing.
- Silt fencing installation occurred at equipment staging areas in accordance with the project-specific Stormwater Pollution Prevention Plan.

Activity Next Month

- Environmental compliance monitors will continue to monitor project activities occurring in areas that require 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.
- Tree trimming and removal will continue in Segments 2 and 4, and biological surveyors will continue to conduct pre-construction surveys for sensitive wildlife species ahead of project activities.
- Silt fencing installation will continue.
- ESA staking 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 prior to upcoming construction activities adjacent to potentially suitable habitat for sensitive wildlife species.
- Archaeological exploratory trenching will continue to occur prior to construction activities within culturally sensitive areas.

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

- Work continued with all utilities on review of overhead utility line relocations based on the current preliminary design.
- Continued individual coordination with utility companies on relocation plans and schedule for incorporation with project master schedule.
- Continued to work on relocation design review for PG&E and coordinate with PG&E on permitting and work planning.
- Continued to work with Verizon to resolve the relocation of fiber optic cable within the Caltrain ROW. A temporary relocation method has been agreed by both parties for the installation of foundation. The project team will continue to work on the temporary relocation agreement for the project.
- Provided PG&E support for first relocations in Segment 2 WA5.

Activity Next Month

- Continue to coordinate with 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.
- Complete temporary relocation agreement with Verizon and continue to work on permanent relocation for the project.
- Continue review of relocation design from PG&E and coordinate with PG&E on permitting and work planning for relocations.
- Complete PG&E's first relocations in Segment 2 WA5.

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14.0 REAL ESTATE

The PCEP requires the acquisition of a limited amount of real estate. In general, Caltrain uses existing ROWs 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 Safely Zones (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.

Activity This Month

Table 14-1 below provides a brief summary of the Real Estate acquisition overview for the project.

- The Relocation team continues to work with the two commercial tenants on the Loop Bus site with the hope of helping them find a relocation site. Loop Bus has informed staff that they have identified a site and are making plans to move.
- Surveying has begun for parcels and will support negotiations for Central Concrete and a majority of Segment 3 parcels.
- Alternate locations are being analyzed for PS-2.
- There are three active eminent domain actions in Segment 2, with other property owners either settling or in active negotiations to settle.
- The remaining appraisals continued in Segments 1 and 3 and technical staff responded to a number of RFIs to support the appraisal process.

Activity Next Month

- Negotiations for all outstanding offers will continue.
- The appraisal for the UPRR site in Segment 4 and for the PS-2 will be finalized and sent to FTA for concurrence.
- The updated appraisal for the Loop Bus site will be sent to FTA for concurrence.
- Appraisals in Segments 1 and 3 will be finalized.
- Staff will present the results of the BBII redesign to Central Concrete and PG&E.

Table 14-1 Real Estate Acquisition Overview

Segment	No. of Parcels Needed*	No. of Appraisals Completed	Offers Presented	Offers Accepted	Acquisition Status		
					Escrow Closed	Eminent Domain Action Filed	Parcel Possession
Segment 1	8	1	0	0	0	0	0
Segment 2	27	26	25	21	20	3	20
Segment 3	10	7	6	1	0	0	0
Segment 4	9	9	8	1	0	1	0
Total	**55**	**43**	**39**	**23**	**20**	**4**	**20**

Note:
During design development, the real estate requirements may adjust to accommodate design refinements. Parcel requirements will adjust accordingly. The table in this report reflects the current property needs for the Project.

Status of Segment 2 and Segment 4 ROW Acquisition

- Segment 2
  - Three eminent domain actions have been filed with possession expected in January 2018.
  - Exception: UPRR requested JPB follow their utility approval process. Once BBII finishes the catenary plan in this area, it will be submitted to UPRR.
  - Del Rio Trust signed for the appraised amount; paperwork being processed.
- Segment 4
  - The Loop Bus eminent domain actions were filed, providing access by February 2018.
  - One parcel agreed to terms and paperwork is being processed.
  - JPB working with BBII to redesign the poles that impact PG&E operations.

15.0 THIRD PARTY AGREEMENTS

Third-party coordination is necessary for work impacting public infrastructure, utilities, ROW acquisitions, and others. The table 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	In Process
		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[2]
	Operating Rules	CPUC	Executed
Transportation & Railroad	Construction & Maintenance	Bay Area Rapid Transit	Executed[3]
	Construction & Maintenance	California Dept. of Transportation (Caltrans)	Not needed[4]
	Trackage Rights	UPRR	Executed[3]

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. The Master Agreement and Supplemental Agreements 1, 2, 3 and 5 have been executed. Supplemental Agreement 4 is the remaining agreement to be negotiated and executed.
3. Utilizing existing agreements.
4. Caltrans Peer Process utilized. Formal agreement not needed.

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16.0 GOVERNMENT AND COMMUNITY AFFAIRS

The Community Relations and Outreach team coordinates all issues with all jurisdictions, partner agencies, government organizations, businesses, labor organizations, local agencies, residents, community members, other interested parties, and the media. In addition, the team oversees the DB contractor's effectiveness in implementing its Public Involvement Program. The following PCEP-related external affairs meetings took place this month:

Presentations/Meetings

- Pre-Construction Community Meeting: South San Francisco
- Pre-Construction Community Meeting: San Jose/Santa Clara
- South San Francisco City Council
- Commute.org
- Caltrain Bicycle Advisory Committee

Third Party/Stakeholder Actions

- Foundation and Pole Layout 100% Drawings shared with South San Francisco and San Bruno
- Foundation and Pole Layout 95% Drawings shared with Santa Clara

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17.0 DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION AND LABOR STATISTICS

The DB electrification contract has a DBE goal of 5.2% (or $36,223,749).

	Payment	Percentage
October Cumulative	$2,136,581	0.31%
November	$299,694	0.04%
Cumulative	$2,436,275	0.35%

Upcoming DBE/Small Business Enterprise opportunities:

- Tunnel Modifications
- CEMOF Facility Upgrades for EMUs
- On-call Safety & Security Support for PCEP

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18.0 PROCUREMENT

Contract Activity

- No contract activity

Invitation for Bid (IFB)/Request for Qualifications (RFQ)/ Request for Proposals (RFP) Issued this Month:

- None

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:

- RFP – 17-J-S-062 – On-Call Ambassador Support Services
- RFP – 17-J-S-070 – On-Call Quality Assurance Independent Testing Laboratory
- Memorandum of Understanding MOU – 18-J-P-065 – Purchase of Electric Locomotive – Mitsui
- RFP – 18-J-S-066 – Overhaul Services of Electric Locomotive for PCEP – Amtrak

Upcoming Contract Awards:

- No upcoming contract awards

Upcoming IFB/RFQ/RFP:

- IFB – Tunnel Modifications
- IFB – CEMOF Facility Upgrades for EMUs
- RFP – On-Call Safety and Security Support for PCEP

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19.0 TIMELINE OF MAJOR PROJECT ACCOMPLISHMENTS

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

Date	Milestone
2001	Began federal National Environmental Policy Act (NEPA) Environmental Assessment (EA) / state EIR clearance process
2002	Conceptual Design completed
2004	Draft NEPA EA/EIR
2008	35% design complete
2009	Final NEPA EA/EIR and Finding of No Significant Impact (FONSI)
2014	RFQ for electrification RFI for EMU
2015	JPB approves final CEQA EIR JPB approves issuance of RFP for electrification JPB approves issuance of RFP for EMU Receipt of proposal for electrification FTA approval of Core Capacity Project Development
2016	JPB approves EIR Addendum #1: PS-7 FTA re-evaluation of 2009 FONSI Receipt of electrification best and final offers Receipt of EMU proposal Application for entry to engineering to FTA Completed the EMU Buy America Pre-Award Audit and Certification Negotiations completed with Stadler for EMU vehicles Negotiations completed with BBII, the apparent best-value electrification firm JPB approves contract award (LNTP) BBII JPB approves contract award (LNTP) 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 (October) Issued NTP for CEMOF Facility Upgrades to HNTP (November)

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APPENDICES

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Appendix A – Acronyms

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AIM	Advanced Information Management
ARINC	Aeronautical Radio, Inc.
BAAQMD	Bay Area Air Quality Management District
BBII	Balfour Beatty Infrastructure, Inc.
CAISO	California Independent System Operator
CalMod	Caltrain Modernization Program
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEMOF	Centralized Equipment Maintenance and Operations Facility
CEQA	California Environmental Quality Act (State)
CHSRA	California High-Speed Rail Authority
CIP	Capital Improvement Plan
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
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
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
SS	Switching Station
SSCP	Safety and Security Certification Plan
SSMP	Safety and Security Management Plan
SSWP	Site Specific Work Plan
TASI	Transit America 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**

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Appendix B – Funding Partner Meetings

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Funding Partner Meeting Representatives
Updated July 25, 2017

Agency	CHSRA	MTC	SFCTA/SFMTA/CCSF	SMCTA	VTA
FTA Quarterly Meeting	• Bruce Armistead • Boris Lipkin • Ben Tripousis (info only) • Ian Ferrier (info only) • Wai Siu (info only)	• Anne Richman • Glen Tepke	• Luis Zurinaga	• April Chan • Peter Skinner	• Jim Lawson
Funding Partners Quarterly Meeting	• Bruce Armistead • Boris Lipkin • Ben Tripousis • John Popoff	• Trish Stoops	• Luis Zurinaga	• April Chan • Peter Skinner	• Krishna Davey
Funding Oversight (monthly)	• Ben Tripousis • Kelly Doyle	• Anne Richman • Glen Tepke • 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)	• Bruce Armistead • Boris Lipkin	• Trish Stoops	• Luis Zurinaga • Tilly Chang (info only)	• Joe Hurley	• Krishna Davey • Jim Lawson • Carol Lawson • Nuria Fernandez (info only)
Master Program Schedule Update (monthly)	• Ian Ferrier • Wai Siu	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Jim Lawson
Risk Assessment Committee (monthly)	• Ian Ferrier • Wai Siu	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey
PCEP Delivery Coordination Meeting (bi-weekly	• Ian Ferrier	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey
Systems Integration Meeting (bi-weekly	• Ian Ferrier • Wai Siu	• Trish Stoops	• Luis Zurinaga	• Joe Hurley	• Krishna Davey

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Appendix C – Schedule

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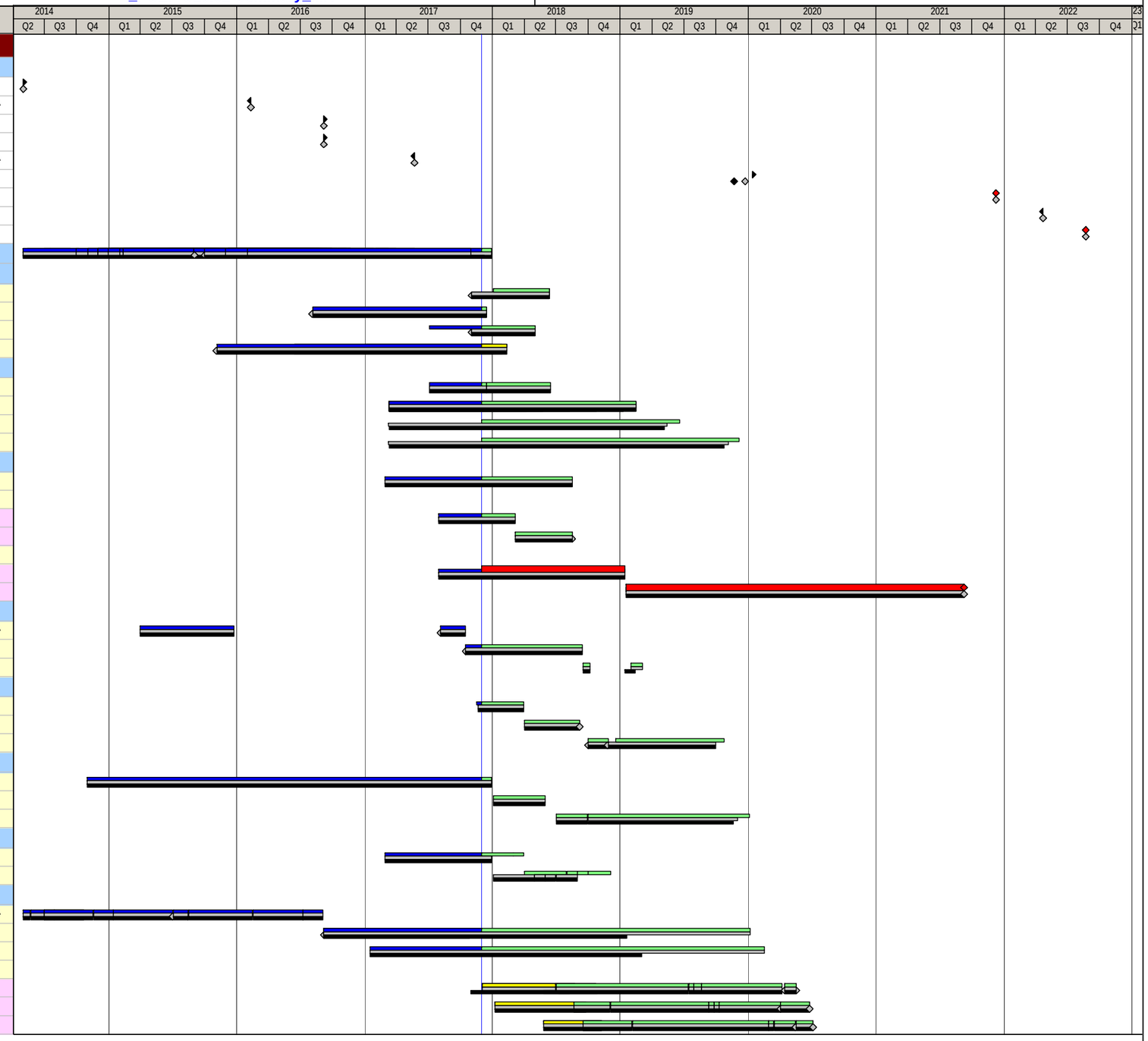
MASTER PROGRAM SCHEDULE C16.02...

_PCEP C16.02 Summary_MR

FOR INTERNAL USE ONLY 12/18/17 13:30

#	Activity Name	Duration	Start	Finish
1	***MASTER PROGRAM SCHEDULE C16.02***	2168d	05/01/14 A	08/22/22
2	**MILESTONES**	2112d	05/01/14 A	08/22/22
3	Start	0d	05/01/14 A	
4	NEPA Reevaluation Complete	0d		02/11/16 A
5	LNTP to Electrification Contractor	0d	09/06/16 A	
6	LNTP to Vehicle Manufacturer	0d	09/06/16 A	
7	FTA Issues FFGA	0d		05/23/17 A
8	Segment 4 (Test Track) Complete	0d	01/13/20	
9	Revenue Service Date (RSD) w/out Risk Contingency	0d		12/09/21
10	Revenue Service Date (RSD) w Risk Contingency (JPB Target)	0d		04/22/22
11	Revenue Service Date (RSD) w/ Risk Contingency (FFGA RSD)	0d		08/22/22
12	**PLANNING / APPROVALS**	957d	05/01/14 A	12/29/17
13	**REAL ESTATE ACQUISITION**	660d	11/05/15 A	06/12/18
14	**SEGMENT 1**	113d	01/04/18	06/12/18
15	**SEGMENT 2**	345d	08/04/16 A	12/14/17
16	**SEGMENT 3**	210d	07/06/17 A	05/02/18
17	**SEGMENT 4**	574d	11/05/15 A	02/09/18
18	**OVERHEAD UTILITY RELOCATION**	696d	03/10/17 A	12/06/19
19	**SILICON VALLEY POWER (SVP)**	241d	07/06/17 A	06/15/18
20	**PG&E**	491d	03/13/17 A	02/15/19
21	**CITY OF PALO ALTO (CoPA)**	577d	03/10/17 A	06/18/19
22	**AT&T**	696d	03/10/17 A	12/06/19
23	**PG&E INFRASTRUCTURE**	1151d	03/01/17 A	09/09/21
24	**INTERCONNECT (Supporting TPS-2)**	372d	03/01/17 A	08/15/18
25	**INTERIM POWER**	265d	08/01/17 A	08/15/18
26	***DESIGN & PERMITTING***	151d	08/01/17 A	03/06/18
27	***CONSTRUCTION***	115d	03/06/18	08/15/18
28	**PERMANENT POWER**	1044d	08/01/17 A	09/09/21
29	***DESIGN & PERMITTING***	369d	08/01/17 A	01/15/19
30	***CONSTRUCTION***	675d	01/16/19	09/09/21
31	**SCADA**	999d	03/30/15 A	03/05/19
32	**PREPARE SOLE SOURCE & AWARD**	649d	03/30/15 A	10/16/17 A
33	**DESIGN**	232d	10/16/17 A	09/14/18
34	**INSTALLATION & TEST**	118d	09/17/18	03/05/19
35	**CEMOF**	490d	11/16/17 A	10/23/19
36	**DESIGN**	93d	11/16/17 A	03/30/18
37	**BID & AWARD**	111d	04/02/18	09/06/18
38	**CONSTRUCTION**	270d	10/01/18	10/23/19
39	**TUNNEL MODIFICATION**	1312d	10/31/14 A	01/03/20
40	**DESIGN**	802d	10/31/14 A	12/29/17
41	**BID & AWARD**	107d	01/02/18	05/31/18
42	**CONSTRUCTION**	381d	07/03/18	01/03/20
43	**ELECTRIC LOCOMOTIVE**	460d	03/01/17 A	12/04/18
44	**BID & AWARD**	283d	03/01/17 A	03/30/18
45	**REHAB / TEST/ TRAIN / SHIP**	172d	04/02/18	12/04/18
46	**EMU**	1907d	05/01/14 A	08/20/21
47	**DEVELOP RFP, BID & AWARD**	612d	05/01/14 A	09/02/16 A
48	**DESIGN**	870d	09/06/16 A	01/06/20
49	**PROCUREMENT (Material)**	806d	01/16/17 A	02/17/20
50	**MANUFACTURING**	970d	12/04/17	08/20/21
51	***TRAINSET 1***	641d	12/04/17	05/18/20
52	***TRAINSET 2***	642d	01/09/18	06/24/20
53	***TRAINSET 3***	550d	05/28/18	07/03/20



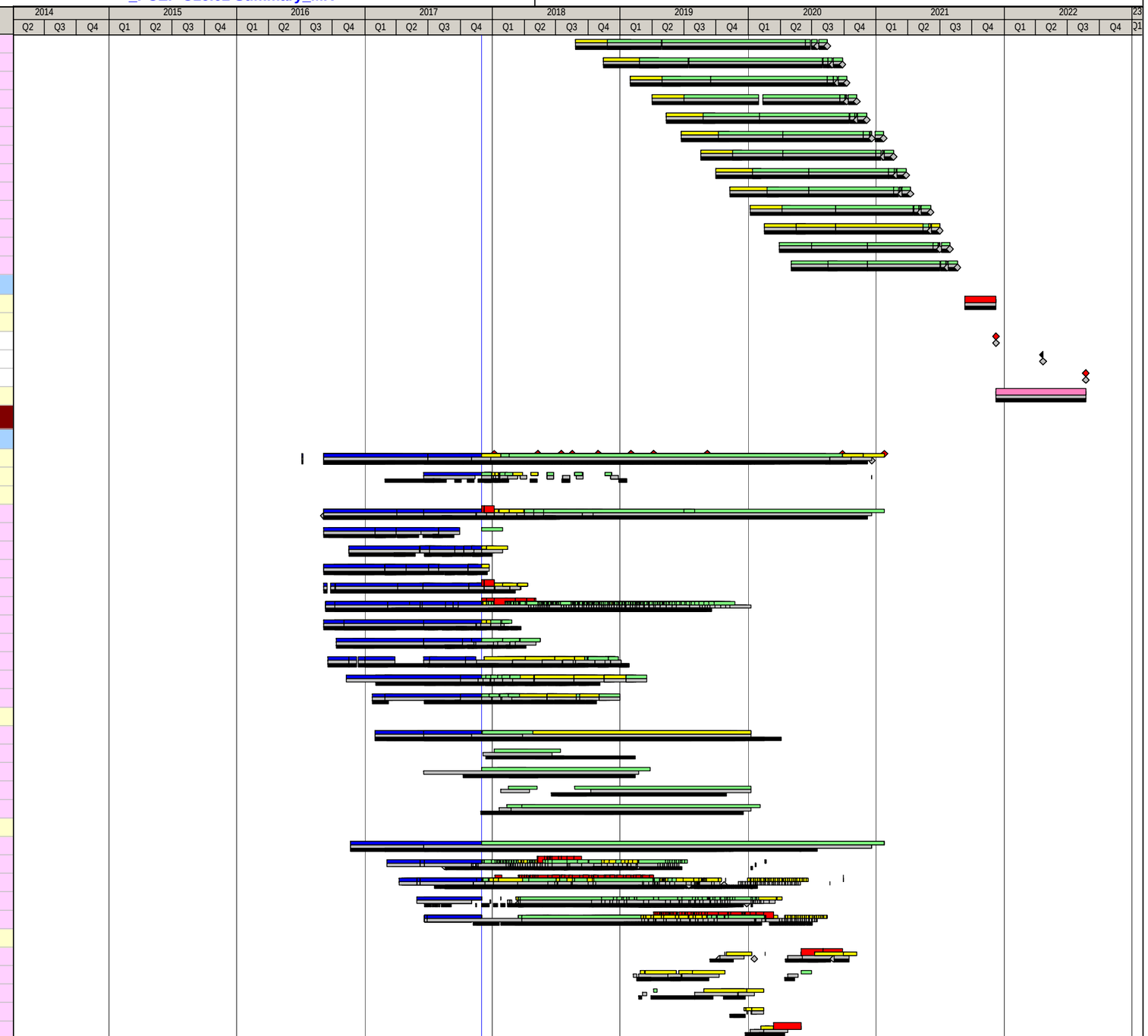
Actual Level of Effort | Progress | Critical | Prog Plan (C16.00) | Risk Contingency
Prog Plan (C16.00) | Remaining | Start Milestone | Last Months Update
Last Months Update | Near Critical | Finish Milestone | Critical Milestone

Filename: _C16.02 121417...

NOVEMBER SCHEDULE UPDATE IS DRAFT UNTIL FINALIZED AT DECEMBER MONTH END

_PCEP C16.02 Summary_MR

#	Activity Name	Duration	Start	Finish
54	*TRAINSET 4*	515d	08/27/18	08/14/20
55	*TRAINSET 5*	490d	11/12/18	09/25/20
56	*TRAINSET 6*	445d	01/28/19	10/09/20
57	*TRAINSET 7*	420d	04/01/19	11/06/20
58	*TRAINSET 8*	410d	05/13/19	12/04/20
59	*TRAINSET 9*	415d	06/24/19	01/22/21
60	*TRAINSET 10*	395d	08/19/19	02/19/21
61	*TRAINSET 11*	390d	09/30/19	03/26/21
62	*TRAINSET 12*	370d	11/11/19	04/09/21
63	*TRAINSET 13*	370d	01/06/20	06/04/21
64	*TRAINSET 14*	360d	02/17/20	07/02/21
65	*TRAINSET 15*	350d	03/30/20	07/30/21
66	*TRAINSET 16*	340d	05/04/20	08/20/21
67	**TESTING & STARTUP**	247d	09/10/21	08/22/22
68	**PRE-REVENUE TESTING**	63d	09/10/21	12/09/21
69	**REVENUE OPERATIONS**	180d	12/09/21	08/22/22
70	Revenue Service Date (RSD) w/out Risk Contingency	0d		12/09/21
71	Revenue Service Date (RSD) w Risk Contingency (JPB Target)	0d		04/22/22
72	Revenue Service Date (RSD) w/ Risk Contingency (FFGA RSD)	0d		08/22/22
73	**RISK CONTINGENCY**	256d	12/10/21	08/22/22
74	***ELECTRIFICATION SCHEDULE (BB) 120117***	1780d	07/07/16 A	01/24/21
75	**PCEP Baseline WBS Structure**	1780d	07/07/16 A	01/24/21
76	**General**	1780d	07/07/16 A	01/24/21
77	**Permits**	537d	06/19/17 A	12/07/18
78	**Design**	1715d	09/06/16 A	01/23/21
79	*All Work Areas*	1715d	09/06/16 A	01/23/21
80	*Segment 2 WA 5*	546d	09/07/16 A	01/29/18
81	*Segment 2 WA 4 & 5*	486d	11/16/16 A	02/12/18
82	*Segment 2 WA 4*	505d	09/07/16 A	12/22/17
83	*Segment 2 & 4*	624d	09/07/16 A	04/11/18
84	*Segment 4*	1251d	09/12/16 A	11/23/19
85	*Segment 2*	574d	09/07/16 A	02/24/18
86	*Segment 2 WA's 1, 2 ,& 3*	625d	10/12/16 A	05/18/18
87	*Segment 1 & 3*	890d	09/19/16 A	12/27/18
88	*Segment 1*	920d	11/09/16 A	03/17/19
89	*Segment 3*	759d	01/23/17 A	12/31/18
90	**Procurement**	1179d	01/30/17 A	02/03/20
91	*All Work Areas*	1151d	01/30/17 A	01/08/20
92	*Segment 4*	203d	01/05/18	07/13/18
93	*Segment 2*	693d	06/19/17 A	03/26/19
94	*Segment 1*	742d	02/15/18	01/08/20
95	*Segment 3*	775d	02/11/18	02/03/20
96	**Construction/Installation**	1633d	11/22/16 A	01/23/21
97	*All Work Areas*	1633d	11/22/16 A	01/23/21
98	*Segment 4 (6.6 Mi)*	1160d	03/06/17 A	02/21/20
99	*Segment 2 (21.1 Mi)*	1356d	04/11/17 A	09/28/20
100	*Segment 1 (8 Mi)*	1116d	05/31/17 A	04/07/20
101	*Segment 3 (15.4 Mi)*	1233d	06/21/17 A	08/14/20
102	**Testing & Commissioning**	661d	02/28/19	11/06/20
103	*All Work Areas*	403d	10/28/19	11/06/20
104	*Segment 4*	523d	02/28/19	06/29/20
105	*Segment 2*	123d	04/05/19	02/13/20
106	*Segment 1*	49d	12/21/19	02/15/20
107	*Segment 3*	38d	02/07/20	05/31/20



Actual Level of Effort | Progress | Critical | Prog Plan (C16.00) | Risk Contingency
Prog Plan (C16.00) | Remaining | Start Milestone | Last Months Update
Last Months Update | Near Critical | Finish Milestone | Critical Milestone

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NOVEMBER SCHEDULE UPDATE IS DRAFT UNTIL FINALIZED AT DECEMBER MONTH END

Appendix D – Standard Cost Codes

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Description of Work	Approved Budget (A)	Cost This Month (B)	Cost To Date (C)	Estimate To Complete (D)	Estimate At Completion (E) = (C) + (D)
10 - GUIDEWAY & TRACK ELEMENTS	**$14,256,739**	**$0**	**$0**	**$14,256,739**	**$14,256,739**
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	$2,500,000	$0	$0	$2,500,000	$2,500,000
10.07 Guideway: Underground tunnel	$8,110,649	$0	$0	$8,110,649	$8,110,649
10.07 Allocated Contingency	$3,646,090	$0	$0	$3,646,090	$3,646,090
30 - SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	**$2,265,200**	**$0**	**$0**	**$2,265,200**	**$2,265,200**
30.03 Heavy Maintenance Facility	$1,344,000	$0	$0	$1,344,000	$1,344,000
30.03 Allocated Contingency	$421,200	$0	$0	$421,200	$421,200
30.05 Yard and Yard Track	$500,000	$0	$0	$500,000	$500,000
40 - SITEWORK & SPECIAL CONDITIONS	**$255,072,402**	**$3,670,101**	**$52,396,393**	**$231,878,676**	**$284,275,069**
40.01 Demolition, Clearing, Earthwork	$3,077,685	$0	$170,000	$2,907,685	$3,077,685
40.02 Site Utilities, Utility Relocation	$62,192,517	$2,977,550	$9,451,439	$72,741,078	$82,192,517
40.02 Allocated Contingency	$25,862,000	$0	$0	$25,362,000	$25,362,000
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	$2,200,000	$0	$0	$2,200,000	$2,200,000
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	$32,579,208	$48,750	$190,125	$32,489,083	$32,679,208
40.05 Site structures including retaining walls, sound walls	$568,188	$0	$0	$568,188	$568,188
40.06 Pedestrian / bike access and accommodation, landscaping	$804,933	$0	$0	$804,933	$804,933
40.07 Automobile, bus, van accessways including roads, parking lots	$284,094	$0	$0	$284,094	$284,094
40.08 Temporary Facilities and other indirect costs during construction	$107,343,777	$643,801	$42,584,829	$74,361,615	$116,946,444
40.08 Allocated Contingency	$20,160,000	$0	$0	$20,160,000	$20,160,000
50 - SYSTEMS	**$502,706,079**	**$1,105,942**	**$9,260,379**	**$489,196,149**	**$498,456,528**
50.01 Train control and signals	$97,589,149	$0	$1,000,000	$98,389,149	$99,389,149
50.01 Allocated Contingency	$1,651,000	$0	$0	0	0
50.02 Traffic signals and crossing protection	$23,879,905	$0	$0	$23,879,905	$23,879,905
50.02 Allocated Contingency	$1,140,000	$0	$0	$1,140,000	$1,140,000
50.03 Traction power supply: substations (1)	$70,671,121	-$36,375	$2,912,478	$67,758,643	$70,671,121
50.03 Allocated Contingency	$28,464,560	$0	$0	$28,464,560	$28,464,560
50.04 Traction power distribution: catenary and third rail	$253,683,045	$1,142,317	$5,347,901	$251,169,293	$256,517,194
50.04 Allocated Contingency	$18,064,000	$0	$0	$10,831,300	$10,831,300
50.05 Communications	$5,455,000	$0	$0	$5,455,000	$5,455,000
50.07 Central Control	$2,090,298	$0	$0	$2,090,298	$2,090,298
50.07 Allocated Contingency	$18,000	$0	$0	$18,000	$18,000
60 - ROW, LAND, EXISTING IMPROVEMENTS	**$35,675,084**	**$119,335**	**$9,120,593**	**$26,554,491**	**$35,675,084**
60.01 Purchase or lease of real estate	$25,927,074	$119,335	$9,096,395	$16,830,679	$25,927,074
60.01 Allocated Contingency	$8,748,010	$0	$0	$8,748,010	$8,748,010
60.02 Relocation of existing households and businesses	$1,000,000	$0	$24,198	$975,803	$1,000,000
70 - VEHICLES (96)	**$625,599,147**	**$887,038**	**$78,982,113**	**$546,720,294**	**$625,702,407**
70.03 Commuter Rail	$589,222,291	$887,038	$78,982,113	$510,011,439	$588,993,551
70.03 Allocated Contingency	$9,472,924	$0	$0	$9,804,924	$9,804,924
70.06 Non-revenue vehicles	$8,140,000	$0	$0	$8,140,000	$8,140,000
70.07 Spare parts	$18,763,931	$0	$0	$18,763,931	$18,763,931
80 - PROFESSIONAL SERVICES (applies to Cats. 10-50)	**$325,532,351**	**$7,710,217**	**$172,236,877**	**$157,877,158**	**$330,114,034**
80.01 Project Development	$130,350	$0	$280,180	-$149,830	$130,350
80.02 Engineering (not applicable to Small Starts)	$181,346,859	$6,402,745	$133,261,929	$52,396,450	$185,658,380
80.02 Allocated Contingency	$1,742,144	$0	$0	$1,952,341	$1,952,341
80.03 Project Management for Design and Construction	$72,910,901	$1,381,828	$31,078,086	$41,892,780	$72,970,866
80.03 Allocated Contingency	$9,270,000	$0	$0	$9,270,000	$9,270,000
80.04 Construction Administration & Management (2)	$23,677,949	-$121,755	$2,320,554	$21,357,395	$23,677,949
80.04 Allocated Contingency	$19,537,000	$0	$0	$19,537,000	$19,537,000
80.05 Professional Liability and other Non-Construction Insurance	$4,305,769	$0	$2,555,769	$1,750,000	$4,305,769
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	$6,341,599	$42,652	$2,735,611	$3,605,988	$6,341,599
80.06 Allocated Contingency	$556,000	$0	$0	$556,000	$556,000
80.07 Surveys, Testing, Investigation, Inspection	$3,287,824	$4,747	$4,747	$3,283,077	$3,287,824
80.08 Start up	$1,797,957	$0	$0	$1,797,957	$1,797,957
80.08 Allocated Contingency	$628,000	$0	$0	$628,000	$628,000
Subtotal (10 - 80)	**$1,761,107,001**	**$13,492,633**	**$321,996,354**	**$1,468,748,707**	**$1,790,745,061**
90 UNALLOCATED CONTINGENCY (5)	**$162,565,295**	**$0**	**$0**	**$132,927,235**	**$132,927,235**
Subtotal (10 - 90)	**$1,923,672,296**	**$13,492,633**	**$321,996,354**	**$1,601,675,942**	**$1,923,672,296**
100 FINANCE CHARGES	**$6,998,638**	**$190,270**	**$1,831,643**	**$5,166,995**	**$6,998,638**
Total Project Cost (10 - 100)	**$1,930,670,934**	**$13,682,903**	**$323,827,997**	**$1,606,842,937**	**$1,930,670,934**

Notes:

(1) 50.03 - Negative accrued amount is reported in November 2017 and is result of adjustment of retention amount for Electrification contractor.

(2) 80.04 - Negative accrued amount is reported in November 2017 and is result of lighter consultant support performed than forecasted in the previous periods.

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Appendix E – Change Order Logs

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Change Order Logs

Electrification Contract

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

Date	Description	CCO Amount	Percent of Authority[1]	Remaining Authority
08/31/2017	CCO 00001 – Track Access Delays for 2016, Quarter 4	$85,472		
	Total	**$85,472**	**0.25%**	**$34,745,056**

Notes:

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

EMU Contract

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

Date	Description	CCO Amount	Percent of Authority[1]	Remaining Authority
09/22/2017	CCO 00001 – Contract General Specification and Special Provision Clean-up	$0		
10/27/2017	CCO 00002 – Prototype Seats and Special Colors	$55,000		
11/02/2017	CCO 00003 – Car Level Water Tightness Test	$0		
11/03/2017	CCO 00005 – Design Progression (multiple)	$0		
	Total	**$55,000**	**0.20%**	**$27,489,973**

Notes:

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

SCADA Contract

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

Date	Description	CCO Amount	Percent of Authority[1]	Remaining Authority
	None to date			
	Total	**$0**	**0%**	**$517,038**

Notes:

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

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Appendix F – Risk Table

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Listing of PCEP Risks and Effects in Order of Severity

ID	RISK DESCRIPTION	EFFECT(S)
279	BBII may be unable to develop grade crossing modifications that meet regulatory requirements prior to scheduled testing and commissioning of the system.	Crossing operations will not be acceptable to CPUC and FRA and therefore delay commissioning.
101	Costs for upgrades to PG&E power stations may exceed the current budget.	Additional project costs; potential delay to revenue service date.
223	A complex and diverse collection of major program elements and current Caltrain capital works projects may not be successfully integrated with existing operations and infrastructure.	Proposed changes resulting from electrification may not be fully and properly integrated into existing system.
281	Additional work in the form of signal/pole adjustments may be required to remedy sight distance impediments arising from modifications to original design.	Add repeater signals, design duct bank would result in increased design and construction costs.
100	Working PTC signal system may not be in place in advance of integrated testing and commissioning.	Integrated testing cannot be conducted without PTC in place to permit operation of vehicles on tracks. Delays to completion of signal system could result in conflicts with PTC testing and PCEP construction and integrated testing. Potential for claims for D/B contractor.
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.
67	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.
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 RSD. Additional costs for Stadler and BBII due to overall schedule delays.
276	BBII may be unable to get permits required by jurisdictions for construction in a timely manner.	Additional cost and time resulting from delays to construction.
209	TASI may be unable to deliver sufficient resources to support construction and testing for the electrification contract.	Testing delayed. Additional construction costs. Change order for extended vehicle acceptance.

ID	RISK DESCRIPTION	EFFECT(S)
294	UPRR does not accept catenary pole offsets from centerline of track necessitating further negotiation or relocation of poles.	Delay to construction and additional costs for redesign and ROW acquisition.
241	Balfour Beatty needs to build TP2 and Interconnection in time for PG&E to supply power in time to support testing. • Date is December 2018 to support contractor's schedule. • Interim power was mitigation to providing permanent power. Risk of PG&E delay in interim power availability.	Delay in testing and increased costs.
247	Timely resolution of 3rd party design review comments to achieve timely approvals.	Delay to completion of design and associated additional labor costs.
257	Modifications to the Centralized Traffic Control system hardware and software and Back Office Server database and systems to support DB must be completed in time for cutover and testing.	Failure to follow the DB Management process will result in major interruption to train service and overall capital projects delay.
267	Additional property acquisition is necessitated by design changes.	New project costs and delays to schedule.
268	Potential that vehicles will not receive timely notification of compliance from FRA. Most significant issues include: • Placement of windows as emergency exits. • Compliance with acceptable alternate crash management standards.	Delays to completion of construction and additional cost to changes in design.
213	Unable to acquire property required to build PS-2.	Extensive redesign of existing and future facilities and utilities resulting in potential delay an additional cost to DB contractor.
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.

ID	RISK DESCRIPTION	EFFECT(S)
64	Relocation of underground utilities must precede construction of catenary pole foundations. Potholing will identify any need for revisions to pole placement, which may result in a need for additional ROW or relocation of the utility by others.	Delay in installation of catenary poles resulting in claims and schedule delay. CBOSS FOC conflicts additional costs and delays include: 1. Potholing 2. Design 3. OCS materials 4. Encasement 5. ROW JPB Signal Cable conflicts additional costs and delays include: 1. Trenching 2. Splicing 3. Cable
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.
174	Installation of electrification infrastructure may require the relocation of signals, which would affect the block design.	Cost and schedule impacts resulting from the design, construction, and testing of modified signal system and review of revised block design.
184	Risk that CBOSS is not certified by FRA in time for integrated testing.	Schedule delay. Additional costs associated with design revisions necessary to secure Type Approval.
260	EMU Contractor's facility is not completed before needed for vehicle assembly.	Delay in commencement of assembly of EMUs delaying final delivery and system-wide testing.
261	EMU electromechanical emissions and track circuit susceptibility are incompatible.	Changes on the EMU and/or signal system require additional design and installation time and expense.
262	Configuration changes from other capital projects could necessitate changes to electrification design.	Potential increase or decrease in final construction cost for electrification; additional cost for rework of completed construction; delays to overall project schedule due to inefficiencies.
265	PG&E must deliver interim power in time for testing for Balfour testing.	Delay in testing and increased costs.
277	Inadequate DB labor to support multiple work segments.	Additional cost and time.

ID	RISK DESCRIPTION	EFFECT(S)
280	Field equipment installed by D/B contractor may not communicate with the Central Control Facility (CCF), the Back-Up Central Control Facility (BCCF) through SCADA and function as designed.	Could require the acquisition and installation of additional equipment at BCCF and CCF. Could therefore require additional cost and time.
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.
136	UPRR may not complete review of BBII design in accordance with agreed deadlines (90 days in Segment 4, 60 days in other segments).	Delays to completion of design and claims for delay.
242	JPB's ability to deliver work windows to contractor as dictated per contract.	Delays to construction schedule and associated delay claims.
56	Lack of O&M support for testing and/or vehicle operations. Includes operational readiness and personnel hired and scheduled to be trained.	• Testing delayed. • Change order for extended vehicle acceptance.
88	Construction safety program fails to sufficiently maintain safe performance.	Work stoppages due to safety incidents resulting in schedule delay and additional labor costs.
161	Unanticipated costs to provide alternate service (bus bridges, etc.) during rail service disruptions.	Cost increase.
179	Risk that municipal reviews take additional time due to absence of municipal agreement.	Possible delay to: (1) to design review; (2) permit issuance; (3) construction within local jurisdiction right of way.
183	Installation and design of new duct bank takes longer because of UPRR coordination.	Schedule - Delay. May need to use condemnation authority to acquire easement. Cost - Additional cost for PG&E to make connections increasing project costs.
250	Potential for municipalities 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.

ID	RISK DESCRIPTION	EFFECT(S)
259	Work on 25th Avenue Grade Separation Project could delay Balfour construction schedule.	Increased cost for BBII as catenary construction in this section was anticipated to be constructed under the 25th Avenue Grade Separation Project. Potential delays in construction schedule. Risk is delay to BBI.
266	Relocation of Verizon must precede installation of foundations 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.
270	OCS poles or structures as designed by Contractor fall outside of JPB ROW.	Additional ROW take, additional cost and time.
82	Unexpected restrictions could affect construction progress: <> night work <> noise <> local roads <> local ordinances	Reduced production rates. Delay.
119	Coordination of electrification design with Operations.	Qualified individuals may not be available. Training may take longer than anticipated.
253	Risk that existing conditions of Caltrans-owned bridges will not support bridge barriers. The existing bridge conditions and structural systems are unknown and may not support mounting new work. <>Design exceptions necessary w/ Caltrans <>History of slow response time w/ Caltrans <>Contractor is responsible for design, approval, and fabrication <>Risk is inability to make attachments to bridge due to bridge being in some state of disrepair Overhead bridge barriers need to be attached to existing bridges. Structural condition of bridge is unknown resulting in technical difficulties in attaching the barrier to the bridge.	Delays while negotiating and executing an operation and maintenance agreement for equipment installed on bridges; induced current has potential to corrode bridge resulting in additional costs to PCEP.
78	Need for unanticipated, additional ROW for new signal enclosures.	Delay while procuring ROW and additional ROW costs.
154	Potential for encountering unidentified or unknown private crossings along the corridor. Could impose unanticipated rights or requirements on the design.	Additional cost and time to acquire ROW by condemnation.

ID	RISK DESCRIPTION	EFFECT(S)
171	Electrification facilities could be damaged during testing.	Delay in commencing electrified operations.
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.
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.
271	Need for additional construction easements beyond that which has been provided for Contractor proposed access and staging.	Additional cost and time.
272	Final design based upon actual Geotech conditions.	Could require changes.
288	Independent checker finds errors in signal design and technical submittals.	Additional cost and time.
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	A physically large UPS will be required. There is a risk it 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.
19	Potential for vehicle delivery to be hampered by international conflict; market disruption; labor strikes at production facility.	Delay in production of vehicle with associated cost implications.
42	Full complement of EMUs not available upon initiation of electrified revenue service.	Late delivery impacts 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.

ID	RISK DESCRIPTION	EFFECT(S)
245	Failure of BBII 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 BBII 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.
264	Design coordination with other capital improvement projects is required.	Rework resulting in cost increases and schedule delays.
10	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 - three months (See Owner for allocation of damages associated with this Risk).
12	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.
50	Leadership and / or key personnel changes with car builder results in delays to completion of design and manufacture of vehicles.	Cost Increase. Schedule Increase – not supported by a TIA.
51	Damage during delivery of first six EMUs.	Schedule delay.
54	Infrastructure not ready for vehicles (OCS, TPS, Commissioning site / facility).	Increases cost if done off property.
69	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.
87	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.
93	Unanticipated subsurface conditions affecting pole or TPS installation.	Delay to take actions to remedy conditions or relocate foundations. Increased cost for design and construction of remediation.

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.
146	Wayside signal / pole adjustments to avoid sighting distance problems.	Change order.
148	Potential impact to advancing construction within the vicinity of any cultural finds that are excavated.	Minor disruption of the construction work.
151	Public could raise negative concerns regarding wheel/rail noise.	Increased cost to mitigate: <> grind rails <> reprofile wheels <> sound walls
182	Compliance with Buy America requirements for third party utility relocations. <>Utility relocations covered under existing Caltrain agreements that require utilities to move that will not have effect on project cost - will not be Buy America. <>Installation of new equipment inside PG&E substations that will provide all PG&E customers, about 1/6 of that provides power to our system - is upgrade that benefits all customers subject to Buy America requirements, is it 1/6th, or 100%. <>Risk is substation not relocations. <>Substation equipment is available domestically, has 6 month longer lead time and increased cost of 20%.	•Increased cost. • Delay.
189	EMUs will need I-ITCS equipment that is compatible with wayside equipment. Same supplier thereby reducing the risk.	Could drive up price because the car builder may not be a priority customer.

ID	RISK DESCRIPTION	EFFECT(S)
192	Environmental compliance during construction. Failure to meet the commitments contained within the PCEP EA, FEIR and permit conditions.	Delay. Cost increase.
237	JPB needs and 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	Third 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.
249	Coordination and delivery of permanent power for power drops along alignment.	Delays in completion of construction and testing with associated increase in costs.
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.
269	Potholing unearths the fact that pole locations conflict with utilities. OCS pole or structure locations as designed by Contractor conflict with utilities where conflict could have been avoided by allowable final design adjustments.	Additional cost and time.
273	Contractor generates new hazardous materials, necessitates proper removal and disposal of existing hazardous materials identified in the Contract for D-B remediation.	Delay to construction while removing and disposing of hazardous materials resulting in schedule delay, increased construction costs, and schedule delay costs.
274	JPB as-built dwgs 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 dwgs 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.
283	Fluctuation in foreign currency v US dollar.	Increase in costs.

ID	RISK DESCRIPTION	EFFECT(S)
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.

Appendix G – MMRP Status Log

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Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
AES-2a: Minimize OCS construction activity on residential and park areas outside the Caltrain ROW.	X	X			Ongoing	The OCS proposed construction schedule has been provided to the JPB. OCS construction began the week of October 2, 2017. The D-B has 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 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 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.
BIO-1d: Implement western pond turtle avoidance measures.	X	X			Ongoing	Pre-construction surveys are occurring no more than 7 days prior to the initiation of construction activities nearby/adjacent to potential habitat for WPT. No WPT or WPT sign have been observed to date on the Project.
BIO-1e: Implement Townsend's big-eared bat, pallid bat, hoary bat, and fringed myotis avoidance measures.	X	X			Ongoing	Pre-construction surveys are occurring no more than 7 days prior to the initiation of construction activities with the potential to disturb bats or their habitat. No special-status bats or sign have been observed to date on the Project.
BIO-1f: Implement western burrowing owl avoidance measures.	X	X			Ongoing	Protocol surveys for Western Burrowing Owl were conducted from April 2017 through July 2017 at previously identified potentially suitable habitat locations. Note that all of these locations are in Construction Segment 4 (southern Santa Clara and San Jose). No Burrowing Owls were observed during the surveys. Construction in Segment 4 is not anticipated to occur until 2018, at which time, pre-construction surveys of the potential habitat areas will occur no more

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
						than 7 days prior to the onset of construction activities.
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 will be initiated again on February 1, 2018.
BIO-1h: Conduct biological resource survey of future contractor-determined staging areas.	X	X			Ongoing	The agency-approved Qualified Biologist has conducted a survey of the proposed staging area to be used for construction activities planned for the remainder of 2017. 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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
BIO-1j: Avoid nesting birds and bats during vegetation maintenance.				X	Upcoming	To be completed during Project operation.
BIO-2: Implement serpentine bunchgrass avoidance and revegetation measures.	X	X	X		Complete	Not applicable. Subsequent habitat assessment and avoidance of Communication Hill eliminated any potential to affect serpentine bunchgrass. This measure is no longer needed.
BIO-3: Avoid or compensate for impacts on wetlands and waters.	X	X	X		Complete	The JPB has compensated for unavoidable wetland impacts by purchasing adequate credits from a wetlands mitigation bank approved by USACE and SFRWQCB.
BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan.	X	X	X		Ongoing	Tree removal and pruning activities were initiated in August 2017 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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
CUL-1b: Minimize impacts on historic decorative tunnel material.	X				Upcoming	To be implemented prior to construction in tunnels.
CUL-1c: Install project facilities in a way that minimizes impacts on historic tunnel interiors.	X				Upcoming	To be implemented prior to construction in tunnels.
CUL-1d: Implement design commitments at historic railroad stations	X				Complete	The Qualified Architectural Historian completed and submitted the HABS Level III documents to the JPB for all seven of the historic stations. Pole placement has been designed to minimize the visual impact to historic stations.
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

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
						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 is occurring 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 is occurring 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-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 is occurring prior to the initiation of construction activities in those areas. The results will be included in the Archaeological Final Report. No cultural resources requiring the development of a treatment plan were observed. A Native American monitor has been present for all exploratory trenching and subsurface testing work.
CUL-2e: Stop work if cultural resources are encountered during ground-disturbing activities.	X	X			Ongoing	No prehistoric or historic-period cultural materials have been observed during cultural monitoring.
CUL-2f: Conduct archaeological monitoring of ground-disturbing activities in areas as determined by JPB and SHPO.		X			Ongoing	Cultural monitoring as-needed of project activities in culturally sensitive areas is ongoing. The Archaeological Final Report will be provided at the conclusion of construction activities.
CUL-3: Comply with state and county procedures for the treatment of human remains discoveries.		X			Ongoing	No human remains have been observed to date on the Project.

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 and results are submitted to JPB as completed.
GEO-4a: Identification of expansive soils.	X				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Geotechnical studies and results are submitted to JPB as completed.
GEO-4b: Mitigation of expansive soils.	X				Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. Geotechnical studies and results are submitted to JPB as completed.

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	Field activities are being monitored daily for significant color changes or odors which may indicate contamination.
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 design. The design minimizes hardscape only to required structure foundations; yard areas are to receive a pervious material.
HYD-5: Provide for electrical safety at TPFs subject to periodic or potential flooding.	X			X	Ongoing	The design requirements indicated in the measure are being implemented through the final design as described. The TPFs in Construction Segments 2 & 4 are currently in design. The design plan currently raises the TPFs above the floodplain.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
HYD-7: Implement sea level rise vulnerability assessment and adaptation plan.				X	Upcoming	This measure has not yet been initiated.
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.
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.

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
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. Construction has not begun.
TRA-1a: Implement Construction Road Traffic Control Plan.	X	X			Upcoming	The D-B has begun traffic control design and permit applications with the City of Millbrae. Other communities will follow.
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

Mitigation Monitoring and Reporting

Mitigation Measure	Mitigation Timing				Status	Status Notes
	Pre-Construction	Construction	Post-Construction	Operation		
TRA-2a: Implement construction railway disruption control plan.	X	X			Ongoing	Minimization of railway disruption is being coordinated by the Site Specific Work Plan.
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	Upcoming	This measure will be implemented during project 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.

Mitigation Monitoring and Reporting

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