Modernization Program
Peninsula Corridor Electrification Project (PCEP)

October 2017
Monthly Progress Report

October 31, 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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Table of Contents

List of Tables

Page

List of Figures

Page

List of Appendices

Page

1.0 BACKGROUND

Over the last decade, Caltrain has experienced a substantial increase in ridership and anticipates further increases in ridership demand as the San Francisco Bay Area's population grows. The Caltrain Modernization (CalMod) Program, scheduled to be implemented by 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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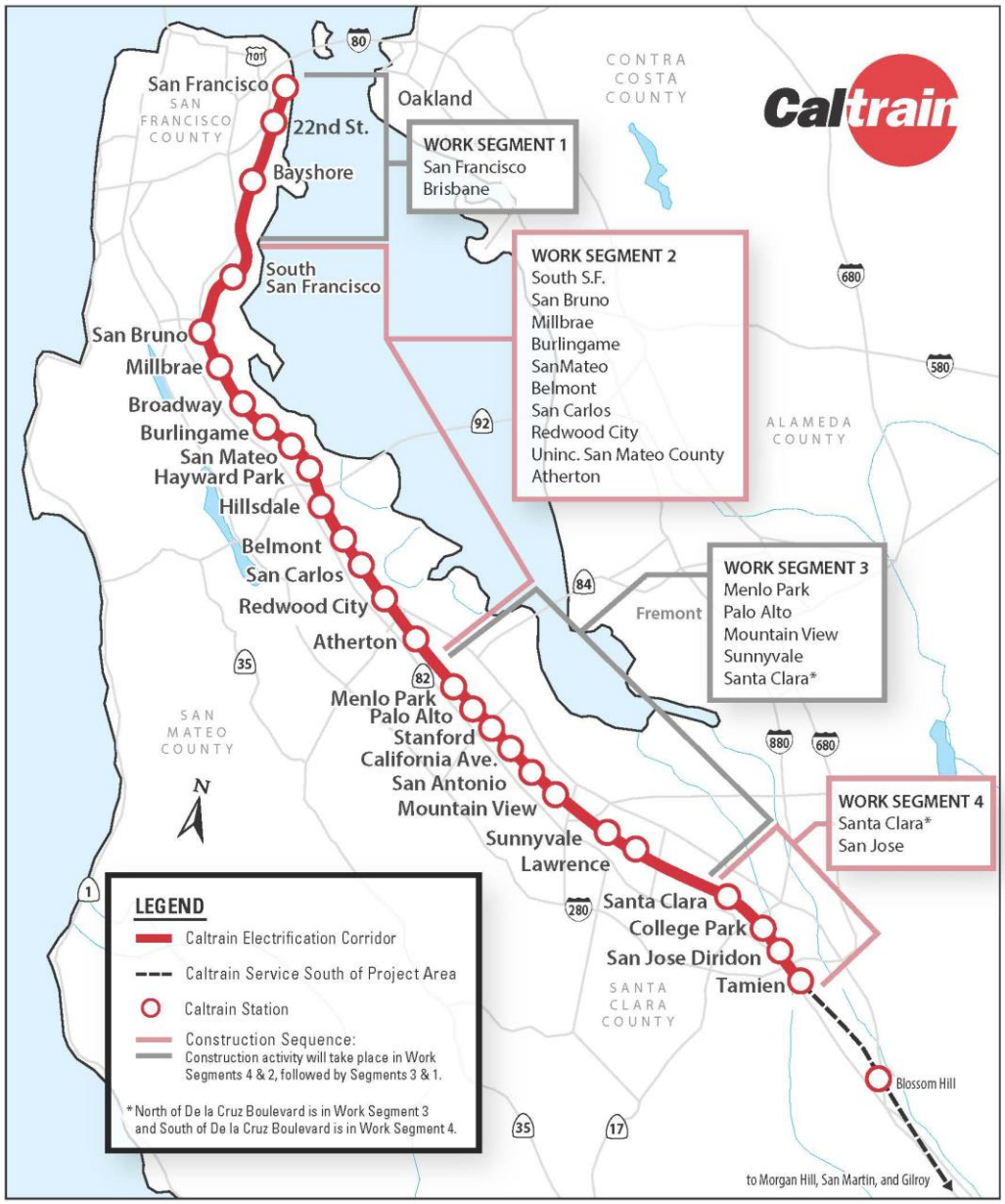
2.0 EXECUTIVE SUMMARY

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



Foundation installation began in Segment 2 Work Area 5, the "Issued for Construction" (IFC) Overhead Contact System (OCS) layout designs were completed for Segment 2 Work Area 4, the OCS poles and layout designs for Segment 4 and other work areas in Segment 2 were advanced to 65%, and workshops were held to advance signal design solutions.

The Supervisory Control and Data Acquisition (SCADA) Notice to Proceed (NTP) was issued and a kickoff meeting was held. The next step is to work on the design.

A groundbreaking ceremony was held for the new EMU manufacturing facility in Salt Lake City, Utah and was attended by Senator Orrin Hatch and Governor Gary Herbert. The Preliminary Design Review (PDR) packages for features such as ventilation, the car shell, door controls, and propulsion are being finalized. Car shell extrusions and machined parts are being prepared for the start of car shell manufacturing.

The JPB System Modification Review Committee reviewed and approved improvements for the Centralized Equipment Maintenance and Operations Facility (CEMOF). The design work is expected to begin in November.

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, Union Pacific Railroad (UPRR), Bay Area Rapid Transit, California State Department of Transportation (Caltrans), 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 updates from utility companies, tunnel design, the SCADA contract status, progress on Design-Build (DB) contract, upcoming changes to the contract in preparation for the Change Management Board (CMB), Right of Way (ROW) needs due to the project and coordination with 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

October 10 Funding Partners: CHSRA: Ian Ferrier and Wai-On Siu;
SFCTA: Luis Zurinaga

BBII completed the first foundation October 9. The bike configuration has been decided as the stacking option, which will increase capacity by 12%. Risk management has completed the preliminary analysis of the Risk Refresh. The Utilities Partnering meeting went very well.

October 24 Funding Partners: CHSRA: Ian Ferrier; SFCTA: Luis Zurinaga

The CHSRA Quarterly Meeting has been scheduled for November 29 and the FTA Quarterly Meeting has been scheduled for November 30. Public Outreach will be developing incremental metrics to show project job creation. The Document Control team has begun development on additional document control sites, including PG&E, Tunnels, CEMOF, SCADA, and Utilities. The DB Contractor Systems Integration Test Plan has been submitted. Stadler held a groundbreaking ceremony on October 13 for their new Salt Lake City facility. Design for the Centralized Equipment Maintenance and Operations Facility (CEMOF) upgrade is scheduled to be complete and ready for bid April 2018 and completion of construction scheduled in September 2019.

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 regular interface meetings, defining the de-energized zone for EMU maintenance at CEMOF, a Rail Activation Committee has been created and is proceeding with the preparation of a schedules of activities to include energization of the traction power substations (TPS), EMU delivery and DB construction, systems integration testing activities, safety certification, and community outreach.

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

Due to delays in federal funding, the MPS was frozen in February. The FFGA was received in May and now the overall schedule is being refined to establish a new baseline. In October's MPS monthly meeting, the revised summary schedule and key interface components of the draft MPS re-baseline were reviewed. At this time it is anticipated that the revised baseline will be presented at the November MPS monthly meeting for formal adoption.

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, Wai-On Su; Metropolitan Transportation Commission (MTC): Trish Stoops; SFCTA: Luis Zurinaga

No risks were retired or added. One risk was reassigned from JPB to Stadler. Changes took place in September with the Risk Refresh Workshop. 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.

Activity this Month

There was no CMB meeting this month.

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

No changes were identified for consideration.

Stadler Contract

No changes were identified for consideration.

SCADA Contract

No changes were identified for consideration.

2.2 Schedule

The Revenue Service Date (RSD), which is the date the project is deemed completed, is delayed due to the FFGA delay and resulting effect on availability of permanent power from PG&E. Without adjustment for contingency, the RSD is forecast as December 2021. With the addition of approximately five months of contingency to account for potential risk to the project, the RSD is anticipated as April 2022. Due to FTA contingency requirements, an FFGA RSD will also be tracked. This date is forecast as August 22, 2022.

Table 2-1 indicates milestone dates for the MPS. At this time, not all milestones have been established as the revised Program Plan continues to be refined.

Table 2-1 Schedule Status[1]

Milestones	Program Plan (April 2016)	Revised Program Plan (October 2017)[3]
First Eight Miles of Electrification Complete to Begin Testing	04/08/2019	11/21/2019
Arrival of First Vehicle at JPB	06/25/2019	07/30/2019
PG&E Provides Permanent Power	09/01/2020	09/09/2021
Start Pre-Revenue Testing	09/08/2020	09/10/2021
RSD (w/o Risk Contingency)	08/16/2021	12/09/2021
RSD (w/ Risk Contingency)	12/30/2021	04/22/2022
FFGA RSD[2]	N/A	08/22/2022

Notes regarding the table above:

1. Schedule status is an approximation as the details of the revised MPS remain under review.
2. FFGA RSD did not exist at the time of the April 2016 Program Plan.
3. Program Plan dates may continue to shift slightly as the re-baseline process nears completion.

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	$ 17,746,991	$ 275,399,154	$ 1,040,726,054	$ 1,316,125,208
EMU Subtotal	$ 664,127,325	$ 664,127,325	$ 17,870,327	$ 84,327,540	$ 579,799,785	$ 664,127,325
PCEP TOTAL	**$ 1,980,252,533**	**$ 1,980,252,533**	**$ 35,617,318**	**$ 359,726,693**	**$ 1,620,525,839**	**$ 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

- Addendum #2 to the Final Environmental Impact Report (FEIR) and approval of the inclusion of OCS pole alignment modifications to not preclude CHSRA future service
- Addendum #3 to the FEIR and approval of the inclusion of interconnection and PG&E substation design level detail for the PCEP

Future anticipated board actions include:

- To Be Scheduled
  - Cooperative Agreement with CCSF
  - PG&E Supplemental Agreement #4: Construction
  - Authority to procure used electric locomotives
  - Ambassador Request for Proposal (RFP) award
  - Switching station real estate transaction

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 two 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 TPSs, one switching station, and seven paralleling stations (PS). Electrification will be performed using a DB delivery method.

Activity This Month

- OCS foundation installation began in Segment 2 Work Area 5. The first foundations are being installed is in an environmentally sensitive area. Those foundations were completed in October within the work window requirements of the environmental permit. Foundation installation will continue in the rest of Segment 2 Work Area 5.
- Potholing of utilities at proposed OCS locations continued in Segments 2 and 4 in preparation of foundation installation. BBII also continued to remove obstructions found during the potholing process, such as loose concrete, asphalt, and other debris.
- Test piles were tested and final results are pending.
- Relocation of signal cables found in conflict with planned OCS foundations continues as conflicts are identified.
- Continued progression of design with BBII for the OCS. IFC layouts for Segment 2 Work Area 4 were completed in October and BBII continues to advance the OCS poles and layout designs for Segment 4 and other work areas in Segment 2 to 65%.
- Continued design review coordination with local jurisdictions for the OCS design in Segments 2 and 4, including responses to comments from jurisdictions and finalization of OCS pole colors in select station areas.
- Continued to review and coordinate signal and communication design submittals with BBII. The project team and BBII held workshops with the signal designer to advance constant warning solutions. A preferred option from the workshops will be selected to be presented at the next meeting with the UPRR.
- The project team and contractor continued the feasibility study for the 115 kV interconnections between the future Caltrain substations and PG&E's substations.
- The project team reviewed 95% TPS specifications and plans for TPS-2. Comments were returned to the contractor for the next round of submittals.
- 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.
- The Time Impact Analysis (TIA) was completed and agreed by the project and the contractor. The finalized TIA is being processed as a Contract Change Order.

Activity Next Month

- Continue OCS foundation installation in Segment 2 Work Area 5, including preparation work in the South San Francisco Yard during day time shifts.
- 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 in Segments 2 Segment 4.
- Continue coordination with UPRR on signal and OCS 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. The feasibility study for the 115 kV interconnections will be completed and a routing option will be selected 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

- Issued NTP to Rockwell Collins.
- The project team held kickoff meeting for the contract.

Activity Next Month

- Hold bi-weekly technical meetings to advance SCADA contract.
- Begin work on design.

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 draft of general and special provision for the contract.

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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's new Salt Lake City manufacturing facility for design and construction is progressing. Groundbreaking Ceremony held on October 13, 2017.
- Preliminary Design Review (PDR) packages are being finalized for car shell, coupler/draft gear, heating, ventilation, air conditioning, door controls, propulsion, auxiliary electric, accessible toilet room, lighting and PTC.
- EMU design coordination discussions continue with representatives from Caltrain Operations and Maintenance, Caltrain Public Outreach, the Federal Railroad Administration (FRA), the FTA Project Management Oversight Contractor, 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/PTC Project.
- Car shell extrusions and machined parts being manufactured at Stadler sub-supplier facilities and being shipped to Stadler.

Activity Next Month

- PDRs for trucks, suspension and the onboard wheelchair lift.
- Continue Conceptual Design Reviews.
- Continue to work with the FRA on EMU compliance issues.
- Safety workshop.
- FRA onsite visit to tour Caltrain system and to discuss EMU compliance issues.
- Commencement of car shell manufacturing.

4.1 Centralized Equipment Maintenance and Operations Facility (CEMOF) Modifications

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

Activity This Month

- System Modification Review Committee reviewed and approved improvements.
- Budget estimating and associated negotiation occurred with LTK sub-consultant HNTB.
- Developed project schedule for design, procurement and construction phases.

Activity Next Month

- Complete negotiations with HNTB and issue NTP.
- Commence design activities.

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

- The monthly project Safety and Security Certification meeting was held on October 11, and the Fire/Life Safety and the Capital Safety Committee meetings were both held on October 25. Fire/Life Safety meeting topics included a review of a training familiarization module for emergency responders. In addition, project staff continues to participate in BBII monthly "All Hands" workforce meeting and contractor safety committee meetings.
- Project safety staff continues to provide input and oversight of the contractor SSWP safety provisions including the BBII job hazard analysis and recommended mitigations. Throughout October, safety staff continued to provide safety construction oversight presence by performing safety inspections of work being performed by BBII subcontractors.
- Project safety staff continued to closely work with JPB, PCEP, BBII and Transit America Services, Inc. (TASI) representatives to identify recommended corrective actions resulting from incident investigations that were performed in October. Although there were no injuries incurred from the October work-related incidents, Safety Stand Downs were conducted to reinforce safe practices from lessons learned.

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 designed 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 work to assess safety work practice and identify additional opportunities for improvement.
- An EMU safety workshop is being planned for the end of November and will include Operations staff that will provide input on the functional aspects of the vehicle design. This information will be utilized to support the development of the EMU Operating Hazard Analysis.
- Project safety staff will meet with the FTA PMOC staff to provide a status of project safety program development, challenges, and initiatives.
- Project safety will continue to work closely with contractor staff to identify safety improvement opportunities.

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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.
- A draft revision of the PCEP Quality Management Plan issued in August is under review for preliminary comments.
- Regularly scheduled design reviews and surveillance began on project design packages and will continue through spring of 2018.
- Three design audits were conducted this month: Traction Power Facilities at 95%, Traction Power Systems at 95%, and Alstom Signaling Control Points at 65%.
- A non-conformance report 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.

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

Table 6-1 Quality Assurance Audit Summary

Quality Assurance Activity	This Reporting Period	Total to Date
Audits Conducted	3	38
Audit Findings		
Audit Findings Issued	0	24
Audit Findings Open	0	0
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

- Five audits are planned and scheduled: Quikrete in Sacramento and Fremont, Wayside Power Cabinets at 95%, BBII RFI Procedures, BBII Purchasing.

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7.0 SCHEDULE

Due to delays in federal funding, the MPS was frozen in February. The FFGA was received in May and now the overall schedule is being re-evaluated. In July a revised high-level Program Plan was established (a summary of which can be found in Appendix C), which reflected a delay to the RSD, the date on which the project is deemed completed. The delay to RSD was caused primarily due to delay to FFGA and the resulting effect on availability of permanent power from PG&E.

Without adjustment for contingency, the RSD is forecast as December 2021, representing a four-month delay from the April 2016 Program Plan. 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. Due to FTA contingency requirements, an FFGA RSD will also be tracked. This date is forecast as August 22, 2022.

Table 7-1 indicates milestone dates for the MPS. At this time, not all milestones have been established as the revised Program Plan continues to be refined. Items listed in Table 7-2 show the critical path activities/milestones for the PCEP. Table 7-3 lists near-critical activities on the horizon.

Notable Variances

As the FFGA has now been approved the MPS is under review for evaluation of variances. Once this review is complete and a revised Program Plan is established, variances will be reported against the revised plan.

Table 7-1 Schedule Status[1]

Milestones	Program Plan (April 2016)	Revised Program Plan (October 2017)[3]
First Eight Miles of Electrification Complete to Begin Testing	04/08/2019	11/21/2019
Arrival of First Vehicle at JPB	06/25/2019	07/30/2019
PG&E Provides Permanent Power	09/01/2020	09/09/2021
Start Pre-Revenue Testing	09/08/2020	09/10/2021
RSD (w/o Risk Contingency)	08/16/2021	12/09/2021
RSD (w/ Risk Contingency)	12/30/2021	04/22/2022
FFGA RSD[2]	N/A	08/22/2022

Notes regarding the table above:

1. Schedule status is an approximation as the details of the revised MPS remain under review.
2. FFGA RSD did not exist at the time of the April 2016 Program Plan.
3. Program Plan dates may continue to shift slightly as the re-baseline process nears completion.

Table 7-2 Critical Path Summary[1]

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[2]	12/09/2021	12/09/2021
RSD w/ Risk Contingency[2]	04/22/2022	04/22/2022

Note:
1. Critical path is an approximation as the details of the revised MPS remain under review.
2. Milestone activity.

Table 7-3 Near-Term, Near-Critical with Less Than Three Months of Float[1]

Work Breakdown Structure	Activity	Responsibility
Vehicles	EMU Design	Project Delivery

Note:
1. Near-Term, Near-Critical Path is an approximation as the details of the revised MPS remain under review.

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	$ 13,601,693	$ 170,763,290	$ 525,932,740	$ 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	$ 499,123	$ 11,119,380	$ 17,383,989	$ 28,503,369
Private Utilities	$ 63,515,298	$ 63,515,298	$ 1,509,347	$ 8,555,345	$ 54,959,954	$ 63,515,298
Management Oversight[5]	$ 141,506,257	$ 141,526,164	$ 1,198,007	$ 75,942,650	$ 65,583,514	$ 141,526,164
Executive Management	$ 7,452,866	$ 7,452,866	$ 150,281	$ 3,684,898	$ 3,767,968	$ 7,452,866
Planning	$ 7,281,997	$ 7,281,997	$ 94,818	$ 4,936,886	$ 2,345,111	$ 7,281,997
Community Relations	$ 2,789,663	$ 2,789,663	$ 34,336	$ 1,158,860	$ 1,630,802	$ 2,789,663
Safety & Security	$ 2,421,783	$ 2,421,783	$ 78,662	$ 909,667	$ 1,512,116	$ 2,421,783
Project Mgmt Services	$ 19,807,994	$ 19,807,994	$ 169,283	$ 8,526,554	$ 11,281,440	$ 19,807,994
Eng & Construction	$ 11,805,793	$ 11,805,793	$ 136,319	$ 2,706,965	$ 9,098,829	$ 11,805,793
Electrification Eng & Mgmt[6]	$ 50,461,707	$ 50,461,707	$ 259,200	$ 21,747,500	$ 28,714,208	$ 50,461,707
IT Support	$ 312,080	$ 331,987	$ -	$ 331,987	$ -	$ 331,987
Operations Support	$ 1,445,867	$ 1,445,867	$ 22,709	$ 488,315	$ 957,552	$ 1,445,867
General Support	$ 4,166,577	$ 4,166,577	$ 114,842	$ 2,046,832	$ 2,119,745	$ 4,166,577
Budget / Grants / Finance	$ 1,229,345	$ 1,229,345	$ 42,288	$ 534,827	$ 694,518	$ 1,229,345
Legal	$ 2,445,646	$ 2,445,646	$ 27,566	$ 2,381,239	$ 64,407	$ 2,445,646
Other Direct Costs	$ 5,177,060	$ 5,177,060	$ 67,702	$ 2,154,760	$ 3,022,299	$ 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	$ 821,039	$ 4,548,728	$ 50,726,356	$ 55,275,084
Insurance	$ 3,500,000	$ 4,305,769	$ -	$ 2,555,769	$ 1,750,000	$ 4,305,769
Environmental Mitigations [7]	$ 15,798,320	$ 14,972,644	$ -	$ 522,000	$ 14,450,644	$ 14,972,644
Required Projects	$ 17,337,378	$ 17,337,378	$ -	$ 367,028	$ 16,970,350	$ 17,337,378
Maintenance Training	$ 1,021,808	$ 1,021,808	$ -	$ -	$ 1,021,808	$ 1,021,808
Finance Charges [7]	$ 5,056,838	$ 5,056,838	$ 117,782	$ 1,024,964	$ 4,031,874	$ 5,056,838
Contingency	$ 276,970,649	$ 273,438,260	$ -	$ -	$ 257,636,281	$ 257,636,281
Forecasted Costs and Changes	$ -	$ -	$ -	$ -	$ 15,801,979	$ 15,801,979
ELECTRIFICATION SUBTOTAL	**$ 1,316,125,208**	**$ 1,316,125,208**	**$ 17,746,991**	**$ 275,399,154**	**$ 1,040,726,054**	**$ 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 September 2017 and accrued for October 2017.
6. The lower accrued amount for Electrification Engineering & Management is result of lighter consultant support performed than forecasted in the previous reporting periods.
7. The budget for these two items has been miss-stated in the past; they were amended as part of the FFGA submission.

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	$ 17,147,461	$ 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	$ 650,678	$ 22,994,190	$ 41,144,914	$ 64,139,103
Executive Management	$ 5,022,302	$ 5,022,302	$ 139,746	$ 2,326,152	$ 2,696,150	$ 5,022,302
Community Relations[5]	$ 1,685,614	$ 1,685,614	$ (13,963)	$ 393,413	$ 1,292,201	$ 1,685,614
Safety & Security	$ 556,067	$ 556,067	$ 13,307	$ 264,227	$ 291,841	$ 556,067
Project Mgmt Services	$ 13,275,280	$ 13,275,280	$ 105,369	$ 5,658,289	$ 7,616,991	$ 13,275,280
Eng & Construction	$ 89,113	$ 89,113	$ -	$ 23,817	$ 65,296	$ 89,113
EMU Eng & Mgmt	$ 32,082,556	$ 32,082,556	$ 292,625	$ 10,309,967	$ 21,772,589	$ 32,082,556
IT Support	$ 1,027,272	$ 1,027,272	$ 11,096	$ 330,442	$ 696,830	$ 1,027,272
Operations Support[6]	$ 1,878,589	$ 1,878,589	$ (1,859)	$ 277,200	$ 1,601,388	$ 1,878,589
General Support	$ 2,599,547	$ 2,599,547	$ 39,576	$ 903,045	$ 1,696,502	$ 2,599,547
Budget / Grants / Finance	$ 712,123	$ 712,123	$ 22,795	$ 306,487	$ 405,637	$ 712,123
Legal	$ 1,207,500	$ 1,207,500	$ -	$ 867,662	$ 339,838	$ 1,207,500
Other Direct Costs	$ 4,003,139	$ 4,003,139	$ 41,984	$ 1,333,490	$ 2,669,649	$ 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	$ 72,189	$ 616,409	$ 1,325,391	$ 1,941,800
Contingency	$ 38,562,962	$ 38,507,962	$ -	$ -	$ 37,209,202	$ 37,209,202
Forecasted Costs and Changes	$ -	$ -	$ -	$ -	$ 1,298,760	$ 1,298,760
EMU SUBTOTAL	**$ 664,127,325**	**$ 664,127,325**	**$ 17,870,327**	**$ 84,327,540**	**$ 579,799,785**	**$ 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 September 2017 and accrued for October 2017.
5. Negative accrued amount is reported in October 2017 is result of lighter consultant support performed than forecasted in the previous reporting periods.

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	$ 17,746,991	$ 275,399,154	$ 1,040,726,054	$ 1,316,125,208
EMU Subtotal	$ 664,127,325	$ 664,127,325	$ 17,870,327	$ 84,327,540	$ 579,799,785	$ 664,127,325
PCEP TOTAL	**$ 1,980,252,533**	**$ 1,980,252,533**	**$ 35,617,318**	**$ 359,726,693**	**$ 1,620,525,839**	**$ 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
10/27/2017	CCO 00002 – Prototype Seats and Special Colors	$55,000
	Total	**$55,000**

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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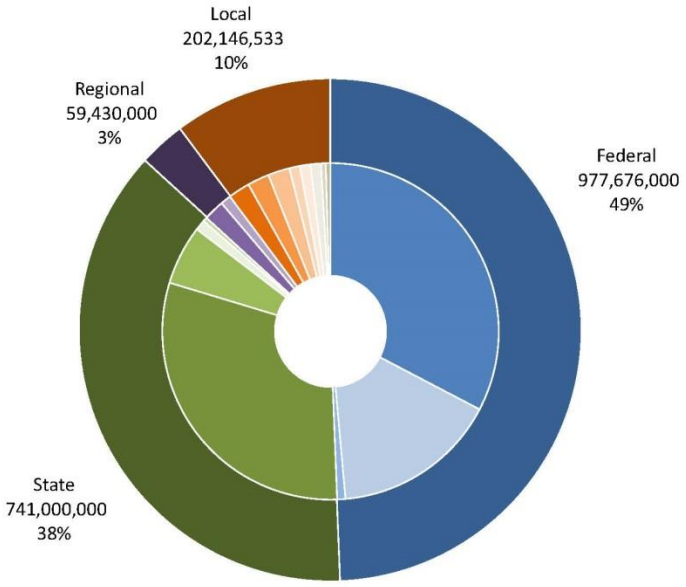
10.0 FUNDING

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. 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.

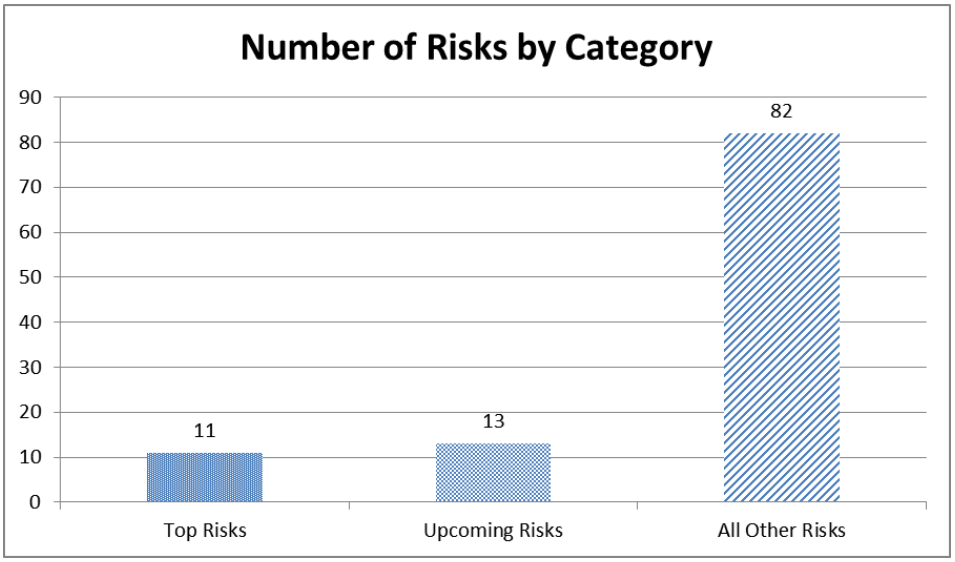
The team has identified the following items as top risks for the project (see Appendix G for the complete Risk Table):

- 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.
- Relocation of Verizon must precede installation of foundations and connections to Traction Power Substations (TPS). Relocation work will be performed by others and may not be completed to meet BBII's construction schedule.
- 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.
- TASI may be unable to deliver sufficient resources to support construction and testing for the electrification contract.

Activity This Month

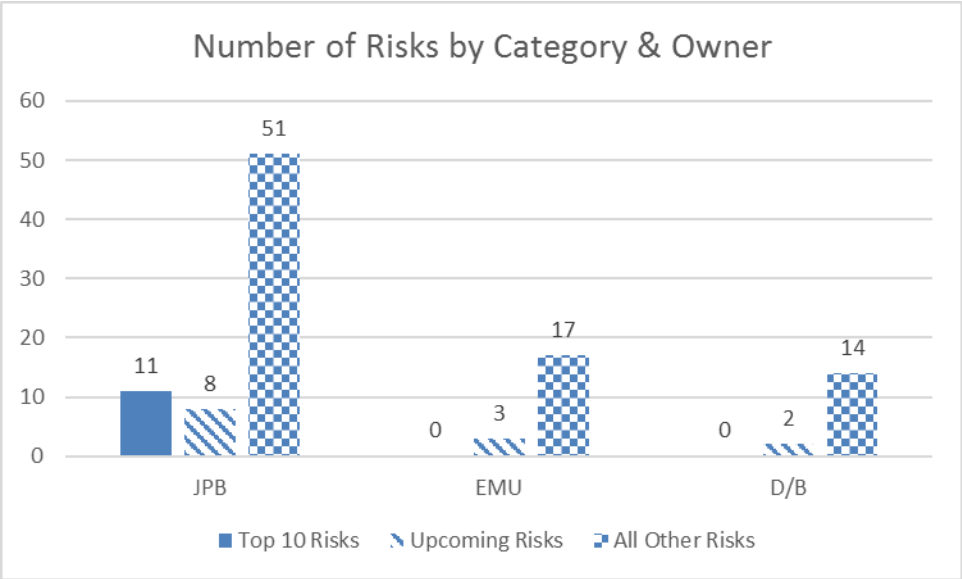
- Information received during Risk Refresh Workshop was reviewed and incorporated into a Summary Memorandum and a draft Risk Analysis Report. A Monte Carlo analysis was performed on the cost impacts of the risk register. Refinements to retirement dates and updating of the program schedule were made in preparation for a Monte Carlo analysis of schedule impacts.
- 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.
- Refined wording for top 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. Simply put, 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 = 106

Table 11-2 Risk Classification



Total Number of Active Risks = 106

Activity Next Month

- Document Risk Refresh Workshop and incorporate changes into risk register.
- 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.
- Update Risk Identification and Mitigation Plan.
- Finalize risk assessment report based upon results of Risk Refresh Workshop.

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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

- OCS pole foundation installation began this month and environmental compliance monitors were present during project activities 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 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 occurred to delineate jurisdictional waterways, and other potentially sensitive areas, that should be avoided during upcoming construction activities, and wildlife exclusion fencing installation was initiated 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.

- Archaeological exploratory trenching was initiated within known archaeological sites and other culturally sensitive areas.

Activity Next Month

- OCS pole foundation installation will continue in Segment 2.
- 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 Segment 2, 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 in Segment 2 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 in Segment 2 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 with Verizon on the permanent relocation as well as the commercial terms of the relocation.
- The project team worked in collaboration with PG&E on SSWPs required for the relocation of PG&E facilities.

Activity Next Month

- Continue monthly meetings with telecom and power carriers.
- 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.
- Continue work with Verizon to relocate their parallel aerial fiber optic cable on a permanent basis and the terms of the relocation.
- Continue review of relocation design from PG&E and coordinate with PG&E on permitting and work planning for relocations.
- Provide support for PG&E's first relocations in Segment 2 Work Area 5.

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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 (RE 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 RE team continues to work with two commercial tenants to help them find a relocation site.
- One owner in Segment 4 agreed to terms. The RE team continued negotiations on offers pending with PG&E and Central Concrete.
- 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 Requests for Information (RFI) to support the appraisal process.
- One owner in Segment 3 signed a purchase agreement.

Activity Next Month

- Negotiations for all outstanding offers will continue.
- The appraisal for the UPRR site in Segment 4 is being updated.
- Appraisals in Segments 1 and 3 will be finalized

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	0	0	0	0	0	0
Segment 2	27	26	25	20	20	3	20
Segment 3	10	7	6	0	0	0	0
Segment 4	9	9	8	1	0	1	0
Total	**55**	**42**	**39**	**21**	**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.
- 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.
  - Exception: PG&E property – 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	In Process
		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: Belmont/San Carlos
- Menlo Park Chamber of Commerce

Third Party/Stakeholder Actions

- None

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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
September Cumulative	$1,848,482*	0.27%*
October	$288,099	0.04%
Cumulative	$2,136,581	0.31%

*In September, the cumulative amount was mistakenly reported as $1,795,031 or 0.258% due to an error in the figures. The table above reflects the corrections.

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)

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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**
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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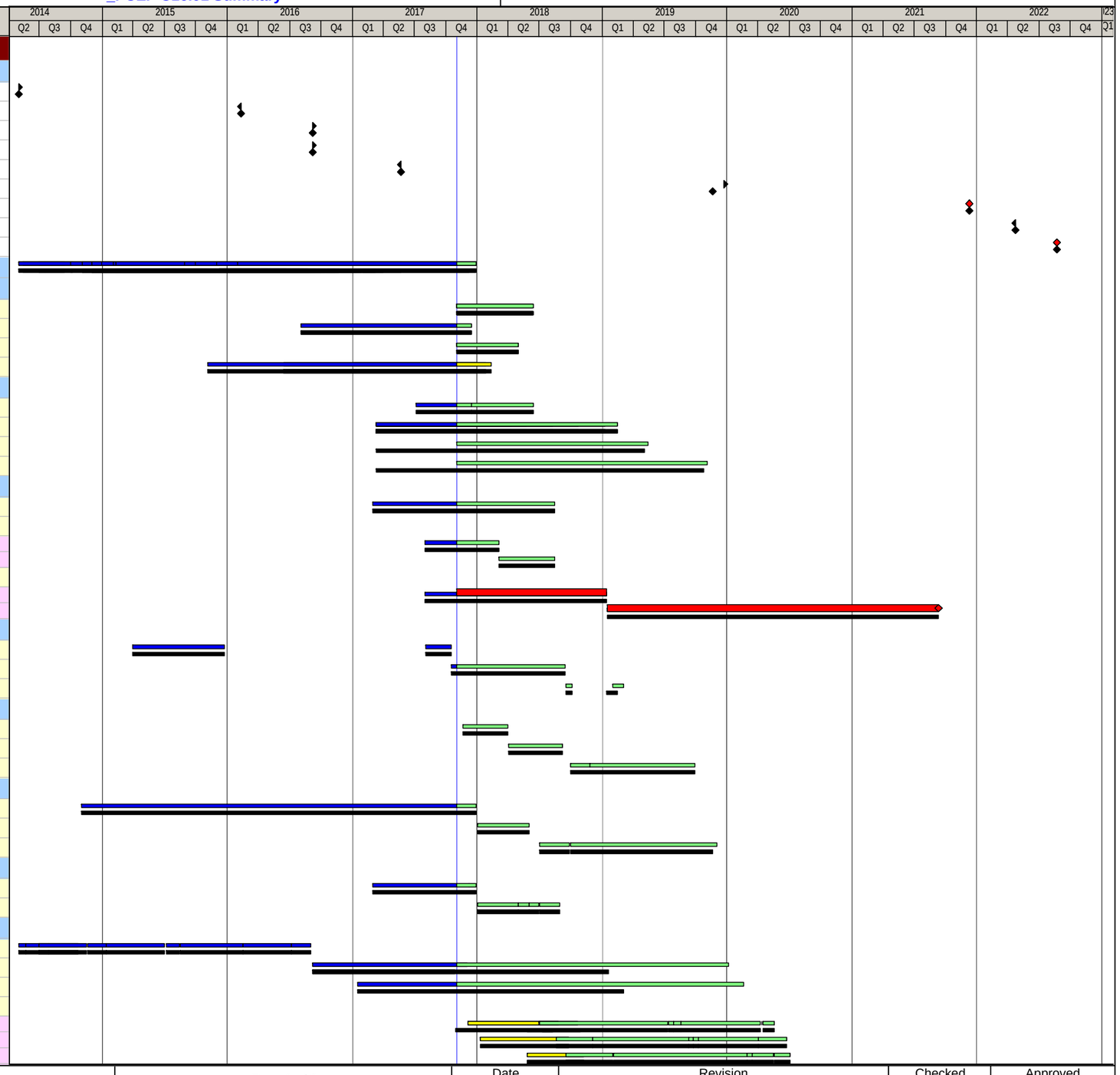
#	Activity Name	Duration	Start	Finish
1	***MASTER PROGRAM SCHEDULE C16.01***	2168d	05/01/14 A	08/22/22
2	**MILESTONES**	2112d	05/01/14 A	08/22/22
3	Start	0d	05/01/14 A	
4	NEPA Reevaluation Complete	0d		02/11/16 A
5	LNTP to Electrification Contractor	0d	09/06/16 A	
6	LNTP to Vehicle Manufacturer	0d	09/06/16 A	
7	FTA Issues FFGA	0d		05/23/17 A
8	Segment 4 (Test Track) Complete	0d	12/23/19	
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**	661d	11/05/15 A	06/13/18
14	**SEGMENT 1**	155d	11/02/17	06/13/18
15	**SEGMENT 2**	345d	08/04/16 A	12/14/17
16	**SEGMENT 3**	126d	11/02/17	05/02/18
17	**SEGMENT 4**	574d	11/05/15 A	02/09/18
18	**OVERHEAD UTILITY RELOCATION**	674d	03/10/17 A	11/04/19
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)**	554d	03/10/17 A	05/15/19
22	**AT&T**	674d	03/10/17 A	11/04/19
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**	472d	11/20/17	09/30/19
36	**DESIGN**	91d	11/20/17	03/30/18
37	**BID & AWARD**	111d	04/02/18	09/06/18
38	**CONSTRUCTION**	254d	10/01/18	09/30/19
39	**TUNNEL MODIFICATION**	1290d	10/31/14 A	12/02/19
40	**DESIGN**	802d	10/31/14 A	12/29/17
41	**BID & AWARD**	107d	01/02/18	05/31/18
42	**CONSTRUCTION**	359d	07/03/18	12/02/19
43	**ELECTRIC LOCOMOTIVE**	393d	03/01/17 A	08/31/18
44	**BID & AWARD**	218d	03/01/17 A	12/29/17
45	**REHAB / TEST/ TRAIN / SHIP**	172d	01/02/18	08/31/18
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

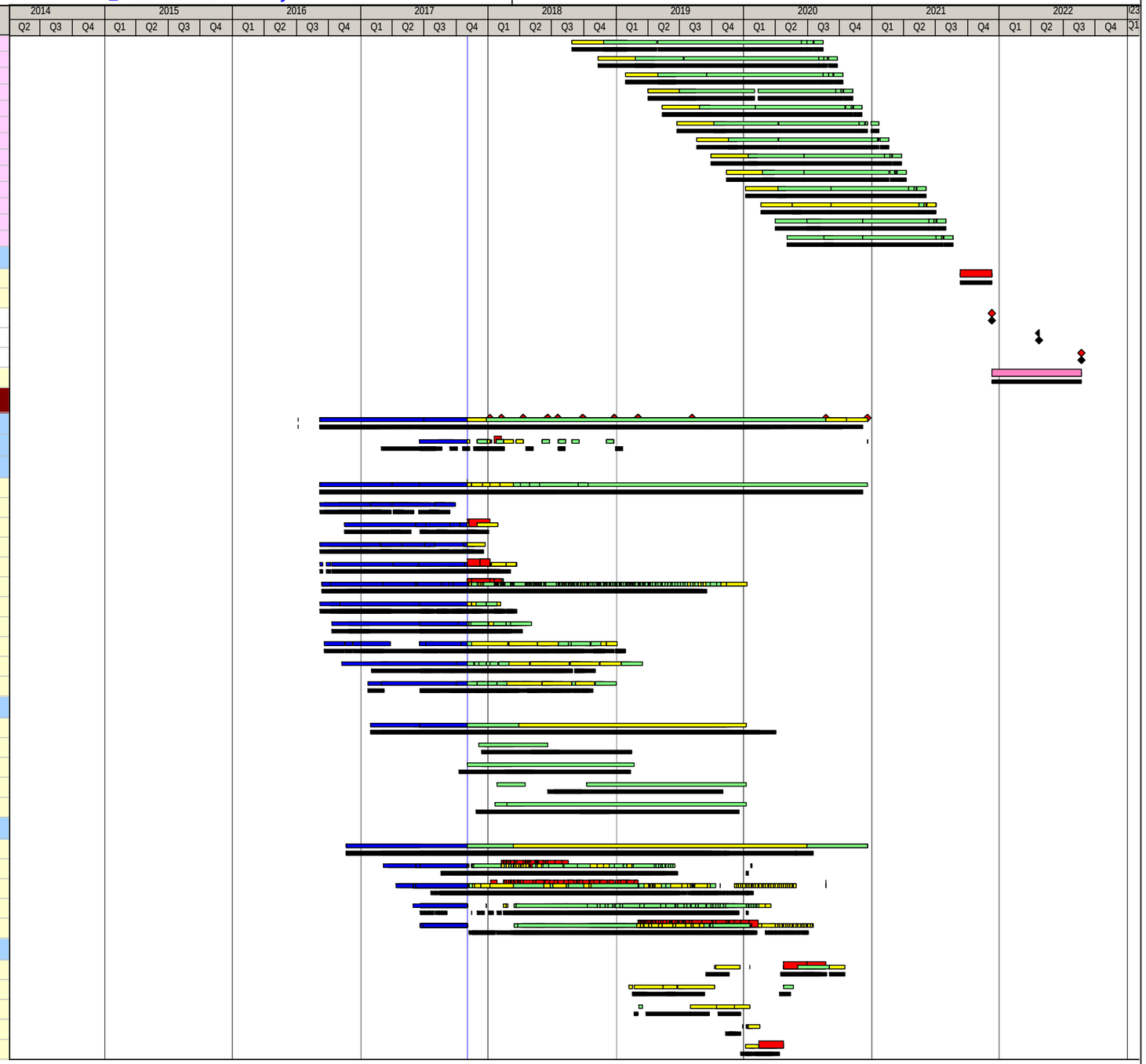


Actual Level of Effort
Prog Plan (C16.00)
Progress
Remaining
Near Critical
Critical
Start Milestone
Finish Milestone
Prog Plan (C16.00)
Critical Milestone
Risk Contingency

Filename: _C16.01 111917...

Date	Revision	Checked	Approved
	Updates & Revisions Completed By A. Christofas		
	Checked By S. Iyer		
	Approved By		

#	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) 110117***	1741d	07/07/16 A	12/19/20
75	**General**	1741d	07/07/16 A	12/19/20
76	**Permits**	1279d	06/19/17 A	12/19/20
77	**Design**	1676d	09/06/16 A	12/18/20
78	**All Work Areas**	1676d	09/06/16 A	12/18/20
79	**Segment 2 WA 5**	415d	09/07/16 A	09/30/17 A
80	**Segment 2 WA 4 & 5**	471d	11/16/16 A	01/29/18
81	**Segment 2 WA 4**	505d	09/07/16 A	12/22/17
82	**Segment 2 & 4**	603d	09/07/16 A	03/23/18
83	**Segment 4**	1303d	09/12/16 A	01/09/20
84	**Segment 2**	553d	09/07/16 A	02/04/18
85	**Segment 2 WA's 1, 2 ,& 3**	610d	10/12/16 A	05/04/18
86	**Segment 1 & 3**	898d	09/19/16 A	01/03/19
87	**Segment 1**	920d	11/09/16 A	03/17/19
88	**Segment 3**	759d	01/23/17 A	12/31/18
89	**Procurement**	1151d	01/30/17 A	01/08/20
90	**All Work Areas**	1151d	01/30/17 A	01/08/20
91	**Segment 4**	211d	12/06/17	06/20/18
92	**Segment 2**	658d	06/19/17 A	02/21/19
93	**Segment 1**	765d	01/25/18	01/08/20
94	**Segment 3**	770d	01/21/18	01/08/20
95	**Construction/Installation**	1594d	11/22/16 A	12/18/20
96	**All Work Areas**	1594d	11/22/16 A	12/18/20
97	**Segment 4 (6.6 Mi)**	1130d	03/06/17 A	01/23/20
98	**Segment 2 (21.1 Mi)**	1316d	04/11/17 A	08/21/20
99	**Segment 1 (8 Mi)**	1095d	05/31/17 A	03/18/20
100	**Segment 3 (15.4 Mi)**	1203d	06/21/17 A	07/17/20
101	**Testing & Commissioning**	660d	02/07/19	10/14/20
102	**All Work Areas**	396d	10/11/19	10/14/20
103	**Segment 4**	504d	02/07/19	05/22/20
104	**Segment 2**	125d	03/07/19	01/19/20
105	**Segment 1**	44d	12/28/19	02/15/20
106	**Segment 3**	38d	01/06/20	04/23/20



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

Filename: _C16.01 111917...

Date	Revision	Checked	Approved
	Updates & Revisions Completed By A. Christofas		
	Checked By S. Iyer		
	Approved By		

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**	**$2,351,414**	**$48,726,292**	**$216,048,777**	**$264,775,069**
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	$1,473,000	$6,473,889	$55,718,628	$62,192,517
40.02 Allocated Contingency	$25,862,000	$0	$0	$25,862,000	$25,862,000
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	$57,375	$141,375	$32,537,833	$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	$821,039	$41,941,028	$75,005,416	$116,946,444
40.08 Allocated Contingency	$20,160,000	$0	$0	$20,160,000	$20,160,000
50 - SYSTEMS	**$502,706,079**	**$1,185,611**	**$8,154,437**	**$489,123,091**	**$497,277,528**
50.01 Train control and signals	$97,589,149	$0	$1,000,000	$96,008,848	$97,008,849
50.01 Allocated Contingency	$1,651,000	$0	$0	$1,431,300	$1,431,300
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	$0	$2,948,853	$67,722,268	$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	$1,185,611	$4,205,584	$251,948,911	$256,154,494
50.04 Allocated Contingency	$18,064,000	$0	$0	$10,964,000	$10,964,000
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**	**$449,980**	**$9,001,257**	**$26,673,827**	**$35,675,084**
60.01 Purchase or lease of real estate	$25,927,074	$449,980	$8,977,060	$16,950,014	$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**	**$17,797,270**	**$78,095,075**	**$547,634,832**	**$625,729,907**
70.03 Commuter Rail	$589,222,291	$17,797,270	$78,095,075	$512,425,977	$590,521,051
70.03 Allocated Contingency	$9,472,924	$0	$0	$8,304,924	$8,304,924
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**	**$13,643,073**	**$164,526,660**	**$165,424,052**	**$329,950,712**
80.01 Project Development	$130,350	$0	$280,180	-$149,830	$130,350
80.02 Engineering (not applicable to Small Starts)	$181,346,859	$12,299,119	$126,859,185	$58,695,838	$185,555,022
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	$1,019,531	$29,696,258	$43,214,643	$72,910,901
80.03 Allocated Contingency	$9,270,000	$0	$0	$9,270,000	$9,270,000
80.04 Construction Administration & Management	$23,677,949	$247,714	$2,442,309	$21,235,640	$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	$76,709	$2,692,959	$3,648,640	$6,341,599
80.06 Allocated Contingency	$556,000	$0	$0	$556,000	$556,000
80.07 Surveys, Testing, Investigation, Inspection	$3,287,824	$0	$0	$3,287,824	$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**	**$35,427,348**	**$308,503,721**	**$1,461,426,517**	**$1,769,930,238**
90 UNALLOCATED CONTINGENCY [5]	**$162,565,295**	**$0**	**$0**	**$153,742,058**	**$153,742,058**
Subtotal (10 - 90)	**$1,923,672,296**	**$35,427,348**	**$308,503,721**	**$1,615,168,575**	**$1,923,672,296**
100 FINANCE CHARGES	**$6,998,638**	**$189,970**	**$1,641,373**	**$5,357,265**	**$6,998,638**
Total Project Cost (10 - 100)	**$1,930,670,934**	**$35,617,318**	**$310,145,094**	**$1,620,525,840**	**$1,930,670,934**

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Appendix E – Change Order Logs

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Change Order Logs

Electrification Contract

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

Date	Description	CCO Amount	Percent of Authority[1]	Remaining Authority
8/31/2017	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
9/22/2017	CCO 00001 – Contract General Specification and Special Provision Clean-up	$0		
10/27/2017	CCO 00002 - Prototype Seats and Special Colors	$55,000	0.20%	$27,489,973
	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 ductbank 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.

ID	RISK DESCRIPTION	EFFECT(S)
263	Collaboration across multiple disciplines to develop a customized rail activation program may fail to comprehensively address the full scope of issues required to operate and maintain an electrified railroad and decommission the current diesel fleet.	Delay in testing of EMUs. Delay in Revenue Service Date. Additional costs for Stadler and BBII due to overall schedule delays.
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.
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 CTC 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.	Additional 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.

ID	RISK DESCRIPTION	EFFECT(S)
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 costs 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.
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.

ID	RISK DESCRIPTION	EFFECT(S)
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 D-B labor to support multiple work segments.	Additional cost and time.
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.	Additional time for testing and additional cost.
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.
242	JPB's ability to deliver work windows to contractor as dictated per contract.	Delays to construction schedule and associated delay claims.

ID	RISK DESCRIPTION	EFFECT(S)
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 UP 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.
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 BBII

ID	RISK DESCRIPTION	EFFECT(S)
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.

ID	RISK DESCRIPTION	EFFECT(S)
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.
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.

ID	RISK DESCRIPTION	EFFECT(S)
292	A large Uninterrupted Power Supply will be required. There is a risk it will not fit in the spaces allotted to do communications work within the buildings.	Additional cost to provide more space.
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 to Balfour contract.
245	Failure of BBI to submit quality design and technical submittals in accordance with contract requirements. • $3-$5M/month burn rate for Owner's team during peak	Delays to project schedule and additional costs for preparation and review of submittals.
252	Failure of BBI to order/manufacture long lead items prior to 100% IFC design document approval by JPB.	Delays to project schedule and additional cost for contractor and JPB staff time.
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 - 3 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.

ID	RISK DESCRIPTION	EFFECT(S)
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 TPSS installation.	Delay to take actions to remedy conditions or relocate foundations. Increased cost for design and construction of remediation.
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.

ID	RISK DESCRIPTION	EFFECT(S)
136	UPRR agreement. Operator performance.	Potential to violate agreements with UP, which could have financial consequences. Would affect UP's ability to operate.
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 3rd 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.
192	Environmental compliance during construction. Failure to meet the commitments contained within the PCEP EA, FEIR and permit conditions.	Delay. Cost increase.

ID	RISK DESCRIPTION	EFFECT(S)
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	3rd party coordination • Jurisdictions, Utilities, UP, Contractors • D/B needs to provide timely information to facilitate 3rd party coordination • Risk is for construction	Delays in approvals resulting in project schedule delays and associated costs.
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 drawings and existing infrastructure to be used as basis of final design and construction is not correct	Additional cleanup of as-builts after PCEP construction.
275	DB fails to verify as-built drawings and existing infrastructure.	Additional cleanup of as-builts after PCEP construction.
278	Failure of D/B contractor and subcontractors and suppliers to meet Buy America requirements.	Delays while acceptable materials are procured and additional costs for delays and purchase of duplicative equipment.

ID	RISK DESCRIPTION	EFFECT(S)
282	Failure to maintain dynamic envelope and existing track clearances consistent with requirements.	Redesign entailing cost and schedule impacts.
283	Fluctuation in foreign currency v US dollar.	Increase in costs.
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.