Quarterly Monitoring Report – November 2018

Peninsula Corridor Electrification Project (PCEP)
Peninsula Corridor Joint Powers Board (JPB)/Caltrain
San Mateo, CA

January 11, 2019

PMOC Contract Number: DTFT60-14-D-00018
Task Order Number: 005
Project Number: DC-27-5346
Work Order Numbers: 07 and 08
OPs Referenced: 25 - Recurring Oversight and Related Reports
01 - Administrative Conditions and Requirements

PMOC Firm: **Kal Krishnan Consulting Services, Inc. (KKCS)**
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Length of Time Firm Assigned to Project: 3 Years, 5 months
Length of Time Person Assigned to Project: 3 Years, 5 months

2) Executive Summary

A. Project Description

The Project Sponsor is the Peninsula Corridor Joint Powers Board (JPB) which operates rail service as Caltrain. The JPB is responsible for managing and delivering the project.

The Peninsula Corridor Electrification Project (PCEP) corridor is approximately 51 miles in length. This Core Capacity Improvement Project (CC) includes two (2) components: infrastructure and rolling stock. The infrastructure component is comprised of the installation of Traction Power Substations (TPSS) and the Overhead Contact System (OCS) over the tracks beginning at the 4th and King Caltrain Station in San Francisco and ending at Tamien Station in San Jose. The infrastructure work also includes modifications to the wayside signal system and grade crossing signals to accommodate the new electrified rail system. In addition, four (4) existing rail tunnels will be enlarged to accommodate the expanded clearance envelope of the electrified vehicles.

The rolling stock component includes the design and procurement of ninety-six (96) Electric Multiple Unit (EMU) rail vehicles to replace approximately 75 percent of the existing diesel rolling stock. Caltrain's Central Equipment Maintenance and Operation Facility (CEMOF) will also be modified to service the electrified vehicles.

The PCEP is part of a larger JPB initiative known as the Caltrain Modernization Program (CalMod). The CalMod program is separately installing a Positive Train Control (PTC) system, which is an advanced signal system that includes federally-mandated safety improvements.

The project will be constructed primarily in the existing Caltrain corridor on right-of-way (ROW) controlled by JPB/Caltrain. Additional ROW will be required to accommodate the TPSS and related facilities as well as elements of the OCS system; all ROW transactions will be made in accordance with the Uniform Relocation Act.

The PCEP Final Environmental Impact Report (FEIR) forecasts Caltrain ridership of 69,151 daily boardings in the year 2020 and 111,427 daily boardings in 2040, including service in 2040 to the Transbay Transit Center. This ridership represents an increase of 21.1% and 32.1% respectively, over the projected Caltrain ridership in those years without the core capacity improvements.

B. Project Status

- The Full Funding Grant Agreement (FFGA) for the project was executed on May 23, 2017.
- The project is in construction. The JPB issued a full Notice to Proceed (NTP) to the EMU supplier on June 1, 2017 and a full NTP to the Electrification design-build contractor on June 19, 2017.
- The JPB approved award of the Tunnel Notching contract to the sole bidder, ProVen Management, Inc. of Oakland, California, at its June 7, 2018 meeting. *The JPB issued a final Notice to Proceed (NTP) to the contractor on October 6, 2018.*
- *The JPB received only a single bid on November 9, 2018 for modifications to its Central Equipment Operations and Maintenance Facility (CEMOF) to accommodate the new EMU vehicles. The single bid was from ProVen Management, Inc. of Oakland, CA; ProVen recently submitted the only bid on the tunnel modification contract and was awarded that*

work. The bid was approximately $7.2 million compared to the Engineer's Estimate of approximately $5.7 million. The CEMOF contract is the final major contract planned for the PCEP.

- *Supplement 4 to the PG&E contract was fully executed on October 18, 2018. The proposed allocation of costs between the parties will be resolved by PG&E's regulatory agencies.*
- *The JPB is proceeding with the procurement of an additional thirty-seven (37) EMUs using an option in the existing Stadler contract. This procurement will result in an initial electrified fleet of nineteen (19) seven car trains. This action will likely delay the delivery of the first complete trainset to the JPB until early 2020 because of the time required to produce and introduce the new seventh car into the first train set.*
- *The PMOC conducted its quarterly on-site monitoring visit and meetings on November 12-14, 2018. The next Quarterly Progress Review Meeting (QPRM) is scheduled for December 18, 2018.*

C. Core Accountability Information through September 2018

FFGA **Core Accountability Items**			
Project Status: **In Construction**		Original at FFGA	Current Estimate (EAC)
Cost	Cost Estimate	$ 1,930,670 934	$ 1,930,670 934
Contingency	Unallocated Contingency[1]	$162,620,294	*$119,635,467*
	Total Contingency[1] (Allocated plus Unallocated)	$315,533,611	*$217,699,288*
Schedule	Final Completion Date	August 22, 2022	August 22, 2022
		Amount ($)	Percent
Planned Value to Date[2]	Total budgeted cost of work scheduled to date[3]	*$625,784,190*	*32.41%*
Earned Value to Date	Budgeted cost of work completed to date, i.e., actual total value of work earned or done[3]	*$373,331,243*	*19.34%*
Actual Cost[4]	Total cost of work completed to date (actual total expenditures)[3]	*$491,758,616*	*25.47%*
Contracts		Amount ($)	Percent
	Total contracts awarded to date[4]	*$1,521,194,135*	*80.88%*
	Total construction contracts awarded to date[5] (construction & vehicle contracts only)	*$1,354,891,167*	*72.04%*
	Physical construction work completed[6,7] (amount of construction contract work actually completed)	*$336,934,837*	*24.87%*

Major Issue	Status	Comments/Actions/Planned Actions
Personnel changes	*The vacant position of Project Delivery Director will not be refilled. The duties have been distributed amongst John Funghi, the Chief Officer, Liria Larano, the Deputy Chief Officer, Lin Guan, the Deputy Delivery Director, and Stacy Cocke, Deputy Director Program Management and Environmental Compliance.*	*Cathy Hoang is the new PCEP Contract Officer, with oversight from Alice Cho, a Senior Contract Officer from the JPB's Procurement Department.*
Progress on OCS construction work much slower than anticipated.	The contractor's progress continues to be impacted by unexpected in-ground obstacles, resulting in redesign of some pole locations and inefficient foundation construction. *OCS foundation construction resumed in late-September after sufficient cleared locations were available to allow work to progress without interruption.*	The contractor has increased the number of potholing rigs to provide more cleared foundation locations. *The JPB has also engaged a specialty consultant to assist in locating and identifying underground utilities found during potholing. The contractor resumed foundation construction after several months hiatus to allow potholing to clear enough locations to make construction efficient. The JPB is also working its own version of a Time Impact Analysis (TIA) based on its understanding of the conditions.*
Consistent Warning Time (CWT) for Grade Crossings	*Confirmation of a Final Design (FD) solution has still not occurred, despite general agreement between the JPB, BBII, the Federal Railroad Administration (FRA), and the California Public Utilities Commission (CPUC) that dual speed checks will provide the necessary warning time. Design information was sent to the Union Pacific Railroad (UPRR) for review on September 27, 2018 without response.*	Final designs have been completed for the two (2) crossings in Segment 4. *The JPB is also planning a trip to meet with the UPRR in Omaha in an effort to reach a decision. Recent large-scale layoffs by the UPRR have impacted this effort.*
Unresolved schedule impacts	The JPB has been unable to accurately assess the significant cumulative schedule impacts resulting from delays to OCS foundation construction due to encountering differing site conditions, and the lack of a confirmed solution for Constant Warning Time (CWT).	*The JPB has initiated preparation of its own Time Impacted schedule based on a series of conversations with the Electrification contractor, production achieved to date and actions taken by the contractor to date. The JPB also plans to conduct an EMU risk refresh on December 18, 2018, which should provide additional insight on the project's critical path, which has historically run through the EMUs and not the Electrification construction. The PMOC*

		continues to recommend an increase in scheduling resources.
Date of Next Monitoring Visit:		*TBD - February 2019*
Date of Next Quarterly Review Meeting:		*December 18, 2018*

Core Accountability Table Footnotes:

[1] Current estimate is the remaining balance which includes known change orders that will draw from Contingency funds, both Allocated and Unallocated.

[2] Planned Value to Date is based upon the Program Schedule and Estimate (Rev. 4B) that were updated in October 2017 to reflect the FFGA delay.

[3] Work is defined as construction or manufacturing by Balfour Beatty, Stadler, PG&E, CEMOF, Tunnel Modification, and other Required Projects.

[4] Percentage is calculated based on a project value of $1,930,670,934.

[5] Total construction contracts awarded to date (construction & vehicle contracts only) includes design costs and executed change orders.

D. Major Problems and/or Issues

- Two (2) major technical problems, the slow progress on OCS foundation construction, and a confirmed solution to providing Constant Warning Time for grade crossings, have continued to impact the Electrification contract schedule for many months. The JPB has taken steps to address each of the issues independently, with some success; however, the JPB has been unable to accurately assess the cumulative impact of these issues. *The Electrification contractor's most recent Schedule Update Narrative for October 2018 shows a Substantial Completion date of August 19, 2021, compared to the contractual date of August 10, 2020.* The PMOC remains concerned that the JPB is not applying sufficient resources to clearly understand the magnitude of the schedule problem, the potential costs associated with these problems, and how best to mitigate the situation.
- *The JPB has decided not to replace the Delivery Director and has distributed the duties between the Chief Officer, Deputy Chief Officer, Deputy Delivery Director, and the Deputy Director Program Management and Environmental Compliance. The PMOC is concerned that this arrangement may dilute or prolong decision making and/or lead to confusion amongst the PCEP team.*
- Construction of the Overhead Contact System (OCS) continues to progress much slower than anticipated. Progress has been slowed by potholing operations encountering numerous unanticipated obstructions in planned pole locations, track access issues attributable to both the contractor and the JPB, and in some cases external factors such as a change in clearance requirements by the UPRR. In some cases, poles must be relocated resulting in additional potholing and potential re-design work. The contractor has increased the number of potholing rigs to ten (10) and is working on multiple segments. The contractor has also brought on additional design services to expedite re-design where required. *Foundation construction, which follows successful potholing, resumed in October following several months of inactivity to allow a sufficient number of locations to be cleared to allow efficient and continuing construction. The erection of catenary poles also resumed. The resumption of foundation construction is a positive step; however, the JPB must have a clear*

understanding of the overall status of the schedule and its interrelationships in order to take appropriate steps to manage the project.

- The Electrification contractor may be unable to develop grade crossing modifications that meet operational requirements prior to scheduled testing and commissioning of the system, which may delay commissioning. *As noted above, the Electrification contractor has proposed a conceptual solution to provide CWT, which is acceptable to the JPB. The designs were sent to the UPRR for review and concurrence in September 2018. Design of two (2) crossings in Segment 4 using the proposed system is underway, and a third crossing in UPRR territory is being accounted for in the design of these crossings.* The JPB also authorized the Electrification contractor to proceed with the design of the remaining crossings based on the assumption that the CWT solution will be approved by all parties.
- Much of the Electrification contractor's OCS foundation work must be performed during periods when rail operations have been partially restricted by contractually established work windows. The JPB reports that there continue to be problems in maximizing the available track access time, whether as a result of the contractor's actions, or in some cases because of rail operations' issues. The JPB established a system to reconcile responsibility for track access delays and compute the associated costs. *The JPB has made progress in reducing the backlog of track access delays and reports that it has reconciled hours of delay for the first quarter of 2018. The JPB also reported that track access delays for the fourth quarter 2017 amount to approximately $1 million, which the JPB deems unacceptable.* The JPB reports that the quarterly costs for track access delays continues to rise, largely due to increased crew size, but the number of delays attributable to the JPB is declining.
- The JPB executed a contract with Wabtec on March 1, 2018 to complete implementation of Caltrain's PTC system using Wabtec's Interoperable Electronic Train Management System (I-ETMS) technology. I-ETMS is a different technology than the Incremental Train Control System (ITCS) that was being installed for the CBOSS-PTC system. The JPB believes that most of the wayside equipment already installed for the CBOSS-PTC system can be used for the new system, but the possibility exists that there may be some impact to the scope of the Electrification contractor's signal work if changes within the signal houses are required. *The JPB reports that testing of the PTC system, which is now in progress, is having negligible impact on the Electrification contractor's use of the tracks during the contractually established work windows. This has been an issue of concern to the PMOC.*
- The JPB's progress in acquiring the needed real estate is still behind the original plan; however, progress continues to improve. *The refinement of the design for the overhead contact system (OCS) and the traction power system (TPS) could result in the creation of approximately thirty-five (35) new parcels; the acquisition of these parcels may result in some delays to construction, although some parcels are attributable to the contractor's actions.*
- The JPB has identified an alternative location for Paralleling Station #2 (PS-2) that is within its Bayshore Station property. This alternative location resolves the property acquisition issue identified in the PMOC's November 2017 report. The JPB has completed its analysis and developed the environmental documentation needed to support the change. The JPB adopted Addendum 4 to its Environmental Impact Report (EIR) at its August 2018 meeting.
- The JPB recently identified a conflict between the planned location of Paralleling Station #3 (PS-3) and a future grade separation project in the City of Burlingame that will require

the relocation of PS-3. The JPB and the City of Burlingame have reached agreement on an acceptable location, and the JPB has completed the necessary environmental documentation to support the change. The JPB adopted Amendment 5 to its EIR at its August 2018 meeting.

- Pacific Gas & Electric (PG&E) must modify two (2) existing electrical sub-stations to provide the power necessary to operate the electrified rail system. The design and construction of these sub-station modifications are now on the project's critical path. *Supplement 4, which includes the cost of constructing the sub-station modifications was fully executed on October 18, 2018. The proposed allocation of costs between the parties will be resolved by PG&E's regulatory agencies.* Although the JPB believes that PG&E's construction schedule can be compressed, the completion of the work is on the Critical Path for operating the electrified service. The completion date will not be known until PG&E awards the construction contract and the contractor submits its schedule.

E. Monitoring Plan Items

- The PMOC plans to increase its focus on the PCEP's schedule performance including the JPB's mitigation of delays to OCS foundation installation, final adoption and implementation of a solution to provide the required Consistent Warning Time at grade crossings, and completion of Time Impact Analyses related to the previous two (2) issues.
- The PMOC also plans to monitor PCEP staffing levels as project activities expand geographically and the complexity of project activities increases with the start of the tunnel notching and drainage work, and the anticipated start of work at the CEMOF.
- The PMOC recently alerted the JPB to the significant effort required to prepare for electrified operations, which must take place before initial testing of EMUs on either the Santa Clara Drill Track or on the mainline. The PMOC will begin monitoring progress on this activity.

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4) Significant PMOC Observations

This monitoring report covers the period from August 18, 2018 through November 14, 2018. Quarterly Progress Review Meeting (QPRM) No. 8 was held on September 11, 2018; that meeting is documented in the Report dated October 5, 2018. This report contains information obtained during site visits, meeting attendance, document reviews, telephone conversations and general interaction with the project sponsor's personnel.

A. Project Status

Environmental Process

The JPB previously relocated Paralleling Station No. 2 (PS-2) to a site controlled by the JPB. The JPB learned recently that the planned site for PS-3 conflicts with a future Caltrain/City of Burlingame grade separation project and that PS-3 must be relocated. The JPB and the City of Burlingame have agreed on a new location for PS-3 and the JPB completed the environmental documentation to support this action. The JPB approved Amendments 3 and 4 to its Environmental Baseline Report for the PCEP at its August 2, 2018 meeting. The JPB had expected to submit a single package covering both PS-2 and PS-3 to the FTA for review in September 2018.

Support Services and Design

The JPB awarded contracts in early 2014 for Program Management Consultant Services; EMU Vehicle Consultant Services; and Electrification Services. The scope and status of work for each of the consultant contracts is described as follows:

Program Management: The consultant team provides various program management support services such as document control, project controls including estimating and scheduling, quality assurance, risk management and contract administration during implementation of the PCEP.

EMU Services: The consultant team provides EMU management and oversight support services which included development of the vehicle procurement documents, and now encompasses vehicle design reviews, vehicle-related Buy America compliance services, monitoring and inspection during vehicle manufacture/assembly, integration of on-board systems with the JPB's PTC Project, design of modifications to the CEMOF; and support during the delivery, testing and commissioning of the EMUs.

The EMU Services team is currently working on the following tasks:

- *Supporting the procurement of an additional thirty-seven (37) EMUs under a pre-existing option in the Stadler contract. The contract contains two options to purchase additional EMUs, the difference being the period when the option expires and the price of the option vehicles. The PMOC understands that the first option period expires on December 31, 2018 and the vehicle prices are the same as the original contract price. The procurement will include sixteen (16) power cars, one each to be added to the existing 16 six-car trainsets to create seven-car trains, and three (3) additional seven-car trainsets. This will bring the total EMU order to 133 units.*
- Final Design reviews of the EMU are mostly complete and the Design Packages are being finalized. The software intensive system Final Design Reviews are scheduled for the end of 2019.

- Monitoring vehicle manufacturing and testing activities.
- Continue to support the JPB in discussions with the FRA on EMU compliance issues.
- Continue to address systemwide interface issues involving the emerging EMU design, existing Caltrain wayside infrastructure, Electrification Project designs and the Caltrain PTC Program.
- Assist in developing sequencing workaround solutions to address the current gap between EMU initial deliveries and availability of electrified track for EMU testing.

Electrification Services: The consultant provides management and oversight support services which included development of the procurement documents and participation in negotiation of the design-build contract. The consultant now provides design reviews and monitoring, and support of manufacture/assembly of products, construction, installation, integrated testing, and commissioning related to overhead catenary systems, traction power substations, communications, supervisory control and data acquisition (SCADA), rail signaling, and train controls. The Electrification Services team and is now providing design support during construction (DSDC) for the Tunnel Notching contract following its recent award.

The Electrification Services team is currently working on the following activities:

- Providing oversight and direction to the Balfour-Beatty Infrastructure, Inc. (BBII) team.
- Continued to support the JPB in various ways related to resolution of the Constant Warning Time issue at grade crossings. These activities include interaction with BBII, the UPRR, and FRA and will soon involve the CPUC. Final resolution of the CWT issue is impacting BBII's schedule for signal system design and installation.
- Supporting discussions and negotiations with BBII related to various change orders.
- Monitoring and reporting on BBII's field activities including tree-trimming, pot-holing of OCS pole locations, OCS foundation construction, OCS pole erection and traction power substation construction.
- Participating in weekly meetings with the JPB's PTC management team.
- Providing oversight and direction to ARINC, the SCADA supplier.
- Providing technical direction, as needed, to BBII related to PG&E's design of temporary and permanent power connections to the traction power system.
- Supporting the JPB in finalizing protection scheme studies related to the PG&E interconnections.
- Supporting the JPB's staff in identifying utilities located within the corridor and working with the utilities to develop relocation plans, as necessary.
- Reviewing submittals and other materials prepared by BBII and ARINC.
- Reviewing submittals and other materials prepared by ProVen, the tunnel notching contractor.

Concurrent Non- Project Activities:

The JPB has an on-going capital construction program that includes several projects that will share some common elements with the PCEP. These projects have been designated as Concurrent Non-Project Activities (CNPAs), and the project elements that will be constructed for the benefit of the PCEP will be appropriately segregated for cost purposes. The JPB has identified the following CNPAs:

- Drainage improvements for tunnels 1 and 4 in Segment 1: This work is included in the Tunnel Notching and Drainage Improvements contract awarded to ProVen, as noted above. The drainage improvements will be performed following the completion of the tunnel notching in the respective tunnels and is expected to be completed by the final completion milestone of March 17, 2019.
- OCS foundations, as part of the South San Francisco Station construction in Segment 2: This work is in construction and the PCEP work is scheduled for completion in June 2019.
- OCS foundations, as part of the 25th Avenue Grade Separation Project in San Mateo: This work is in construction and the PCEP work is scheduled for completion in June 2019.
- OCS foundations, as part of the Los Gatos Bridge project in Segment 4: This work is complete.
- Trackwork on the Santa Clara Drill Track in Segment 4. This work was originally planned to be done under the Los Gatos Bridge Project, but that did not occur. *The JPB has decided to have the work performed by Transit America Services, Inc. (TASI), Caltrain's contract rail operator.*
- New Control Point at CP Brittan in Segment 2: This work is currently on-hold and involved the supply of a new signal house by the Electrification contractor for the JPB's project.

Value Engineering (VE):

The project sponsor did not undertake a formal VE effort. However, the PCEP team undertook a significant cost reduction effort in late 2014 which identified an estimated $84.3M in potential cost savings achieved by eliminating or deferring certain tasks previously included in the baseline program. In addition, the procurement process for the Electrification D-B contract included the submission of alternate technical proposals (ATPs) to reduce cost or improve schedule. In addition to those ATPs that were incorporated into the Electrification contract, that contract contains a Value Engineering Change Proposal (VECP) clause whereby any savings that result from an accepted VECP are shared by the contractor and the JPB.

Procurement – Executed Contracts and Changes

The following contracts comprise the majority of the PCEP scope, except for the CEMOF Modifications work; the bid period for the CEMOF contract is now closed.

Electrification: The electrification of the corridor is being performed using a design-build (DB) contract which was awarded to Balfour-Beatty Infrastructure, Inc. (BBII) and executed on August 15, 2016. The JPB issued a full NTP to BBII on June 19, 2017.

Electrification Contract Changes: The JPB reported issuing Change Orders (COs) to BBII in the amount of $2,612,500 during September 2018. These COs covered a variety of work

including design of an OCS shunt wire required by CPUC, design of the PG&E Interconnections for TPSS Nos. 1 and 2, and design of OCS pole relocations at UPRR's MT-1. These contract changes have been discussed for some time and have been making their way through the Change Management Board process.

Additional change orders are being processed to address differing site conditions encountered in the field, track access delays and other changes.

EMU Vehicles: The 96 EMUs are being supplied by Stadler US under a contract that was executed on August 15, 2016. The JPB issued a full NTP to Stadler on June 1, 2017. Design of the vehicles is being performed in Switzerland and final assembly of the vehicles will occur at a location near Salt Lake City, Utah.

EMU Contract Changes:

- *The JPB issued COs to Stadler in the amount of $228,400 in October 2018. The only CO involving cost was redesign of the wheelchair lift installation. A number of specification related no-cost COs were also issued in October.*
- The JPB has requested pricing from Stadler for the changes related to the change to the Wabtec PTC system from the originally specified CBOSS-PTC system.

Systems Control and Data Acquisition (SCADA) Equipment: The JPB executed a sole-source contract with ARINC, Inc., for the supply of SCADA equipment in September 2017. The equipment will be used to control the traction power system and design and integration activities are underway. The SCADA contract is being managed by the Electrification consultant and installation of the SCADA equipment will be performed by BBII under the Electrification contract.

Tunnel Notching and Drainage Improvements

A contract was awarded to ProVen Management, Inc. of Oakland, California, for Tunnel Notching and Drainage Improvements on the tunnels in Segment 1 of the PCEP corridor. The contract consists of two main elements: notching of the four (4) tunnels to increase clearance for the new EMU vehicles; and drainage improvements in tunnels 1 and 4 for the benefit of Caltrain operations. The drainage improvements are being performed as a Concurrent Non-Project Activity (CNPA) that will be paid for by Caltrain. *The JPB issued a Notice to Proceed to the contractor on October 6, 2018.*

Tunnel OCS: The tunnel notching contract included an option for installation of the Overhead Contact System (OCS) in the tunnel bores. The pricing of this work by the single bidder, ProVen Management, Inc., was significantly higher than the Engineer's Estimate, and the work was not awarded as part of the contract. *The JPB concluded negotiations with ProVen and the Board approved award of a $16.6 million change order (CO) at its November 2018 meeting. A CO was required because the JPB did not exercise the OCS option when it issued the original tunnel contract.*

Used Electrified Locomotives: The JPB, at its June 7, 2018 meeting, approved contracts to acquire and overhaul two (2) used electrified locomotives to perform initial testing of the electrification system. The objective is to avoid inadvertent damage to the new EMUs by using them to test the electrification system. One unit will be used for testing and the second unit will be used for spare parts in the event of breakdown. The locomotives will be disposed of

after testing has been completed. *The locomotives are scheduled to arrive at the CEMOF in the early spring of 2019.*

Consultant Contracts: The JPB has received and evaluated updated staffing plans and associated cost proposals from each of the PCEP's primary consultants to cover its FY 2019 project budget. The JPB is in the process of issuing new work directives to each of the consultants. The PMOC has requested copies of the updated staffing plans.

Upcoming Procurements

CEMOF Modifications: *A single bid was received on November 9, 2018 to construct modifications to the CEMOF. The $7.2 million bid was significantly higher than the Engineer's Estimate for the work and the JPB is considering its next steps.* Construction of the modifications will follow electrification of the yard and is expected to be complete by late-2019 or early 2020; this procurement is approximately six (6) months later than originally planned.

On-call Construction Management Services for the PCEP: The JPB solicited proposals for On-call Construction Management Services to support electrification construction, the recently awarded tunnel notching contract, modifications to the CEMOF, reconstruction of the Santa Clara Drill Track, installation of mini-high block platforms, and other work, as needed. Proposals were received on September 20, 2018 and are currently under review. The PMOC has been told that this contract will replace the construction management activities which are currently being performed by Gannett Fleming under its Electrification Services contract.

Project Delivery

Electrification Design-Build Contract

Design and Design-related Activity: Balfour-Beatty Infrastructure, Inc. (BBII) is responsible for the Final Design of the electrification and related facilities under the terms of its D-B contract with the JPB. PGH Wong Engineering, Inc., is the Engineer of Record for the work. Work was initiated following the JPB's issuance of a Limited Notice to Proceed (LNTP) on September 6, 2016; this was followed by issuance of a full NTP to BBII on June 19, 2017. The following design and design-related activities are currently under way:

- Preparation of contractually required plans and submittals.
- *Advancing OCS design in all Segments.*
- Work continues to address Caltrans' requirements for bridge protection barriers.
- A preferred solution to provide Consistent Warning Time (CWT) at grade crossings has been identified, and tentatively agreed to by the UPRR. Design work has been completed on the Virginia and Auzerais crossings in Segment 4, which will serve as prototypes for the proposed solution. *The JPB sent the designs to the UPRR on September 27, 2018 and is awaiting a response. The JPB plans to meet with the UPRR in Omaha, NE in an effort to resolve the CWT issue.*
- Potholing of OCS foundation locations is now active in all Segments. Potholing continues to encounter a significant number of differing site conditions, which slow progress. BBII's sub-contractor is now operating ten (10) crews to improve the overall production rate. The

JPB's Construction Management team continues to issue Field Orders to remove the obstacles and compensate the contractor for the impact of these conditions.

- Design of the 115kV interconnection with PG&E at the TPSS-2 location continues. The Santa Clara Valley Transportation Authority (VTA) previously identified a conflict between a proposed pole location and a Bay Area Rapid Transit District (BART) substation. *This conflict has apparently been resolved.*

Construction Activity: The JPB provided the following report on construction activity:

- *Foundation construction resumed in October 2018. Table 1 below shows the status of OCS construction activity through October 31, 2018.*
- *Installed 2 transformers at TPS-2. Performed ductbank, transformer secondary containment wall, storm drain, and pull box installation at TPS-2.*
- *Performed site work, ductbank installation, and transformer foundation work at TPS-1.*
- Continue conduit installations for signal and Wayside Power Cabinet units in Segment 2.
- *Began ductbank installation in Segment 4 at Auzerais Avenue in preparation for signal house installation.*
- *Relocation of signal cable conflicts as they are identified.*
- *OCS Bracket Installation in Segment 2 WAs 4 and 5.*
- *The JPB and BBII held a regularly scheduled meeting with the Disputes Review Board (DRB) during the week of November 4, 2018.*
- BBII is now operating out of the Burlingame and Redwood City siding areas for upcoming foundation work.

Table 1 – OCS Construction Progress (October 31, 2018)

Segment	Work Area	Foundations			Poles		
		Required[1]	this Month	to Date	Required	this Month	to Date
2	5				2	0	150
	4	320	13	212	259	22	23
	3	190	16	53	147	0	0
	2	260	12	12	218	0	0
	1	206	41	41	155	0	0
Total		**1,232**	**83**	**491**	**941**	**22**	**173**

[1]Foundations required do not match poles required as guy foundations are needed in some locations for extra support.

SCADA Contract

- *Received SCADA equipment and established laboratory for equipment testing.*
- *Team continues to implement features such as Clearance, Remote Power Terminal and others.*
- *Preparing Final Report on Power and Heating, Ventilation, and Air Conditioning (HVAC) Sufficiency Study.*

- **PMOC Observations:** *The Electrification contractor resumed foundation construction in October 2018. The JPB believes that sufficient foundation locations have been cleared such that placement of foundations and subsequent erection of poles can continue uninterrupted in an orderly progression.*
- *The PMOC was pleased to learn that PTC testing being conducted by Rail Operations has not interfered with track access for the Electrification contractor. However, the significant cost of track access delays incurred by the JPB during the fourth quarter 2017 is a growing concern. The resumption of foundation construction by the Electrification contractor means that more crews will be moving about the tracks during non-revenue periods, increasing the likelihood of delays with higher costs per delay as crew sizes increase.*
- **PMOC Recommendation:** The JPB states that it is tracking and segregating the extra costs incurred to relocate foundations or otherwise avoid or relocate the fiber optic cable installed by the CBOSS-PTC contractor. The JPB should produce a report documenting the sources of funds used for the original installation of the CBOSS-PTC cabling, and documenting the costs incurred to date by the PCEP as described above. The report should also document any specifications or other technical direction previously given to the CBOSS-PTC contractor that required that contractor to avoid the areas and locations where the interferences have, or in the future occur. The JPB should provide the FTA and the PMOC a schedule for completing this report no later than the PMOC's next monitoring visit in November 2018. To the extent that the CBOSS-PTC contractor is found to have installed the fiber optic cable in contravention of the applicable contractual requirements, thus leading to the conflicts and remedial actions by the PCEP, the JPB should consider initiating a back charge or other action to recover its extra costs. The PMOC notes that the FTA may decline to participate in costs associated with remediating the CBOSS-PTC fiber optic conflicts.
- *The PMOC recommended that the JPB offer to pay the UPRR to review its signal design drawings for CWT in light of the significant reduction in signal design staff following the UPRR's recent large-scale layoffs.*
- *The PMOC suggested that the PCEP Construction Management (CM) team consider holding a partnering session with the Operations staff, including dispatchers, in an effort to improve understanding between the teams.*
- *The PMOC suggests that the Electrification CM team refer to the track sheets kept by Rail Operations to make the final determination regarding the underlying cause of track access delays.*

Real Estate Acquisition

Background Information

The PCEP is acquiring real estate for three (3) primary purposes: (1) for placement of Overhead Contact System (OCS) poles; (2) for the two (2) primary Traction Power Substations (TPSS); and (3) to provide electrical clearance and safety zones for the OCS wires. The corridor has

been sub-divided into four (4) segments numbered from north to south to more effectively manage the electrification and other related work (See Appendix C).

The corridor spans three counties and the JPB must collaborate with Santa Clara County on the south, its home county of San Mateo, and the City and County of San Francisco on the north to exercise eminent domain power as necessary during the ROW acquisition process. The JPB executed an agreement with the Santa Clara Valley Transportation Authority (VTA) to exercise eminent domain on behalf of the JPB for property acquired in Santa Clara County, which includes all of Segment 4 and some portions of Segment 3. The JPB also executed an agreement with the San Mateo County Transit District (SamTrans) to act as the condemning agency for all property in San Mateo County. San Mateo County includes all properties in Segment 2 and some properties in Segments 1 and 3. The JPB was unsuccessful in reaching an agreement with the City Supervisor for the City of San Francisco related to the City's exercise of eminent domain powers on behalf of the JPB for properties located within the City and County of San Francisco (CCSF). The CCSF includes only properties in Segment 1 that will be needed later in the construction schedule.

Real Estate Activities

Initial Electrification construction took place in Segments 4 and 2 and has since been expanded to include all segments. Segment 4 includes electrification of a test track for testing and acceptance of the EMUs. Real estate acquisition is being coordinated with Electrification construction activities; however, the discovery of a variety of unexpected conditions at a large number of the planned OCS pole locations has resulted in the movement of a large number of foundations, which in some cases requires acquisition of new rights-of-way.

The major challenges facing real estate are design changes that are impacting already acquired properties and design changes requiring new or re-defined acquisitions, shown on Table 2 below as additional parcels. Potholing for OCS foundations, and follow-on construction work located outside of JPB owned right-of-way (ROW) requires that the JPB acquire the property or an appropriate property right. *The PCEP's Real Estate Manager stated that refinement of the design for the overhead contact system (OCS) and the traction power system (TPS) could result in the identification of approximately thirty-five (35) new parcels, although access to some of these parcels is the responsibility of the Electrification contractor. The number of required parcels owned or controlled by the San Mateo County Transit Authority (SamTrans) has increased substantially from the original estimate.*

Segment 1

- The real estate in Segment 1 is needed to site OCS poles because the passing tracks for the Baby Bullet operation used up the right-of-way that would otherwise have been available for that purpose.
- An alternate location for PS-2 was defined in Segment 1, appraisal maps were drafted, an appraisal was ordered, and pre-acquisition discussions are ongoing with the property owner.

Segment 2

- Seven (7) parcels are not in the JPB's possession; three (3) are in condemnation proceedings, two (2) are in escrow, and two (2) are awaiting design changes.

Segment 3

- *Received concurrence from the FTA for one (1) administrative settlement.*

Segment 4

- The parcel owned by the UPRR is now in escrow.
- Seven (7) parcels are not in the JPB's possession; five (5) are awaiting design changes, and of those, four (4) belong to PG&E; the remaining two (2) are clearing title issues.

Other Real Estate Activities

The status of real estate activity is presented in Table 2 below.

Table 2 – Real Estate Status (*9-30-2018*)

Segment	No. of Parcels Needed[1]	Appraisals Completed	Offers Presented	*Offers Accepted*	Acquisition Status		
					Escrow Closed	Eminent Domain Action Filed	Parcel Possession
1	*7*	*0*	0	0	0	0	0
2	27	26	25	22	*19*	3	*25*
3	10	9	8	*5*	*4*	0	*4*
4	9[2]	*8*	8	*1*	0	1	*2*
Additional Parcels[3,4]	*5*	0	*0*	*0*	*0*	*0*	*0*
TOTAL	***58***	***43***	**41**	***28***	***23***	**4**	***31***

Notes:

1. 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.
2. Four (4) of the Segment 4 parcels are owned by a single owner, PG&E.
3 The five (5) newly identified parcels are in Segments 2 and 3.
4. *The JPB reports that 35 new parcels could be needed, the PMOC cannot explain the lack of correspondence with the numbers in this table.*

- **PMOC Observation:** The progress of real estate acquisition continues to be slower than anticipated. The PMOC expects that the Electrification contractor is likely to request compensation for some delays associated with the late delivery of real estate parcels.
- **PMOC Issues/Concern:** The JPB identified the need for an alternate location for Paralleling Station #3 (PS-3) at its Burlingame Station site in Segment 2. The initial location conflicts with a future grade separation of the Broadway crossing. *A new location has been agreed to with the City of Burlingame and environmental clearance documents are being prepared for the site.*
- The continued appearance of new parcels as a result of shifts in the placement of OCS poles is problematic if possession is needed before foundations can be constructed. The PMOC understands that BBII's designers are attempting to avoid or minimize such situations.

Third-party Agreements and Coordination

A significant number of third-party agreements were required to support the PCEP. These agreements are grouped into the following general categories, with status comments as appropriate to each:

Jurisdictional Agreements for Construction and Maintenance

The JPB reports that as of September 30, 2018, it has executed all agreements except those with the Town of Atherton (Segment 2), and the City of Palo Alto (Segment 3). *The agreement with the City of Palo Alto continues to progress; the JPB plans to meet with the City in November 2018 to finalize any remaining details.* The JPB is no longer pursuing an agreement with the Town of Atherton. The only remaining action by the Town of Atherton is issuing a traffic control permit to the contractor, and the Town staff has been cooperative to date.

Jurisdictional Agreements for Exercise of Eminent Domain Powers

The JPB has executed agreements with the Santa Clara Valley Transportation Authority (VTA) and the San Mateo County Transportation District (SamTrans) under which the VTA and SamTrans will exercise eminent domain authority on behalf of the JPB, if such action is required, to acquire the real property rights located in the respective counties for the PCEP. It now appears unlikely that the CCSF will approve an agreement.

Utility Relocation Agreements

The JPB's right to relocate utilities that exist within its PCEP corridor exists by virtue of the property rights it acquired when it purchased the corridor from the Southern Pacific Transportation Company (SP) in November 1991. The JPB has the right to cause the relocation of both overhead and underground utilities to accommodate its railroad activities upon thirty (30) days' notice to the utilities at the utilities expense.

- PG&E is continuing to relocate its power lines.
- The JPB reports that Verizon is moving ahead to complete the overhead relocation of its Communication lines by the end of 2018. Any associated costs will be payable to the JPB. The JPB will provide necessary flagging support to allow Verizon to complete the work.
- The JPB reports that Silicon Valley Power has produced a schedule for relocation of its lines, but also reports that the company has already consumed considerable schedule float.
- The JPB reported that Palo Alto Power has acknowledged financial responsibility for relocation of its lines. Because the community has an ordinance that prohibits tall utility poles, the relocated lines will be placed under the tracks as permitted by the JPB's standards. The JPB has declined to fund the undergrounding of the power lines and the issue is being discussed at the Executive level.
- The VTA is constructing a traction power substation to provide power to a BART extension. The VTA had identified a conflict between its TPSS and a pole location needed for the interconnection between PG&E and PCEP's TPSS #2. *This issue has apparently been resolved and coordination with the VTA continues.*

The JPB is also negotiating specialized agreements with the following entities:

Pacific Gas & Electric (PG&E)

PG&E will supply power from two (2) existing substations to the new PCEP Traction Power System. Both substations must be modified to provide the required power. The JPB has executed a Master Agreement with PG&E as well as Supplements 1, 2, 3 and 5 to that agreement. Supplement 1 is for scoping and design services; Supplement 2 is for PG&E oversight of design and construction; Supplement 3 includes the costs for engineering and design of the modifications and funding for the procurement of long lead-time equipment; and Supplement 5 is for the supply of temporary power for initial system and vehicle testing. *Construction of the temporary power feed at PG&E's "FMC" substation in San Jose is complete and awaiting construction of the interconnection to TPSS #2; this work will be performed by the Electrification contractor using a PG&E approved sub-contractor.*

Supplement 4, which includes the cost of constructing the substation modifications, was fully executed on October 18, 2018. The language regarding the proposed allocation of costs between the parties was removed from Supplement 4 and will now be resolved by PG&E's regulatory agencies. Execution of Supplement 4 will permit PG&E to finalize its construction contracts. The date for PG&E's supply of permanent power to the PCEP is currently shown as September 9, 2021; this activity is on the project's critical path.

California Public Utilities Commission (CPUC)

The CPUC has responsibility for grade crossing safety in California. The PCEP's proposed solution to providing Constant Warning Time at grade crossings must be approved by the CPUC before the modifications can be installed and the crossings returned to service. *The JPB states that there is agreement between the PCEP team, Caltrain's Rail Operations, the Electrification contractor, the FRA and the CPUC on a solution, subject to the UPRR's approval. Design documents were sent to the UPRR on September 6, 2018, but no response has been received. The JPB plans a trip to Omaha, NE to meet with the UPRR to attempt resolution of this issue.*

Union Pacific Railroad (UPRR)

The JPB is engaged in on-going confidential negotiations with the UPRR regarding a variety of issues. The UPRR is a tenant and operates service on tracks owned by Caltrain in the PCEP corridor; Caltrain operates service on tracks owned by the UPRR south of the PCEP corridor. The UPRR is considering selling its rights to operate freight service in the Caltrain corridor to a short line operator. This arrangement, if completed, could simplify bringing the freight service operator into conformance with the JPB's PTC system. The JPB stated that it is negotiating with the UPRR to acquire the short line rights for the tracks north of Santa Clara.

The UPRR imposed an increased lateral clearance requirement of 15 ft. between its MT-1 (northbound) track in Segment 4 of the corridor and some of the planned OCS pole locations. The typical clearance for railroad tracks is 8 ft. 6 in. The PCEP team reports that it continues to have difficulty in resolving the final locations of the remaining poles with UPRR and is working with the railroad to resolve the remaining conflicts.

As noted above, the UPRR's approval of a CWT solution is critical to resolving a major uncertainty for the project. A major layoff by the UPRR in October 2018 has reduced the railroad's signal design resources and, therefore, its ability to respond to this issue. The JPB

reports that the UPRR has responded to its September 27, 2018 correspondence regarding CWT and has assigned the issue to its Public Projects group.

California High Speed Rail Authority (CHSRA)

The California High-Speed Rail Authority (CHSRA) proposes to operate in blended service with Caltrain in the PCEP corridor in the future. The CHSRA recently published its 2018 Business Plan; that plan calls for initial construction of the Silicon Valley to Central Valley line from Diridon Station in San Jose to Bakersfield. The plan would also expand electrification of the Caltrain corridor south of San José to Gilroy. The CHSRA continues to be in discussions with Caltrain, Caltrans, the City of San José, Santa Clara County, Union Pacific Railroad and other partners about right of way and operational options, including how passenger and diesel freight trains could share the corridor. This sharing may potentially allow enhanced electrified service all the way to Gilroy, eliminating the need to use passenger diesel trains in the corridor and potentially allow the line to be used for express high-speed rail operations between San Francisco and Gilroy.

The JPB has been continuously involved in technical discussions with the CHSRA to ensure that the facilities being constructed as part of the PCEP are consistent with those being planned by the CHSRA. Representatives of the CHSRA are now participating regularly in a variety of PCEP meetings.

The JPB reported that it is moving forward with a plan to relocate a number of the OCS poles to permit future curve-straightening by the CHSRA without impacting the electrification system. Straightening of some curves will allow the CHSRA to achieve higher operating speeds. Prior to the issuance of a change order to BBII, the CHSRA will complete an environmental assessment to ensure that there are no new or substantially significant environmental impacts beyond those that were environmentally cleared in the PCEP Environmental Impact Report (EIR) and Environmental Assessment (EA). This documentation will be shared with the FTA. All costs associated with the pole relocation work will be paid for by the CHSRA. The JPB adopted the Final Environmental Impact Report (FEIR) Addendum #2: Inclusion of Overhead Contact System (OCS) pole and wire relocations to accommodate California High Speed Rail Authority (CHSRA) Service, at its October 5, 2017 meeting. *The FTA recently approved the National Environmental Policy Act (NEPA) Re-evaluation documentation of this project change.*

Federal Railroad Administration (FRA)

The JPB is coordinating with the FRA on several issues, including technical issues related to the EMU vehicles, resolution of the CWT issue, and the agency's PTC program. Issues related to the EMU's are discussed in Section J of this report. The JPB continues to hold monthly conference calls with the FRA to discuss PTC progress and any related issues.

- **PMOC Observation:** Gauging the progress on UPRR issues continues to be difficult because of confidentiality restrictions placed on the participants. *The JPB has been unable to provide a specific path or schedule for resolution of the remaining issues with the UPRR.*

B. Project Management Plan (PMP) and Sub-Plans

The JPB states that it plans to update its Program Management Plan (PMP) in late 2018, and that work on the update is underway. The current version of the PMP is Revision 2 dated

October 16, 2017. The PMOC plans to review the updated PMP when it is available. *The PMOC conducted an on-site review of the PCEP's Quality programs in November 2018.*

C. Project Management Capacity and Capability

The JPB reported the following recent changes to its organization and that of the PCEP:

- *The vacant position of Project Delivery Director will not be refilled. The duties have been distributed amongst John Funghi, the Chief Officer, Liria Larano, the Deputy Chief Officer, Lin Guan, the Deputy Delivery Director, and Stacy Cocke, Deputy Director Program Management and Environmental Compliance.*
- *Alice Cho, Senior Contract Officer from the JPB, joined the team in November 2018.*

The most recent PCEP organization chart is attached as Appendix D.

- **PMOC Observation:** *The JPB's decision to distribute the duties formerly performed by the Delivery Director to other senior members of the organization rather than filling the vacant position was unexpected. The PMOC will withhold judgement on the JPB's approach until observable results can be assessed.*
- **PMOC Recommendations:** The PMOC recommends adding field staff to monitor the progress of an increasing mix of Electrification construction activities, during both day and night shifts. Additional office engineering assistance is also required to stay current with change related documentation. The PMOC will reconsider these recommendations after it has reviewed the recently approved staffing budget for the coming year.

D. Project Cost

Table 3 below presents the PCEP cost estimate, dated November 16, 2016, as the estimate was revised and incorporated into the FFGA. The JPB is re-forecasting the estimated cost at completion (EAC) monthly. The JPB will likely re-baseline the Capital Cost Estimate after it concludes the negotiation of Supplement 4 to the PG&E agreement, awards the CEMOF contract in late 2018, and assesses the cost impact of the current delays to the Electrification contract, following the completion of the necessary TIAs.

Table 3 – Project Cost

STANDARD COST CATEGORY	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	YOE Dollars TOTAL (X000)
10 GUIDEWAY & TRACK ELEMENTS (51 route miles)	9,930,050	3,443,415	13,373,465	14,256,739
20 STATIONS, STOPS, TERMINALS, INTERMODAL (NONE)	0	0	0	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	1,727,666	396,732	2,124,398	2,265,200
40 SITEWORK & SPECIAL CONDITIONS	197,354,697	42,465,878	239,820,575	255,072,402
50 SYSTEMS	429,641,995	46,687,882	476,329,877	504,445,419
60 ROW, LAND, EXISTING IMPROVEMENTS	26,526,146	8,447,380	34,973,526	35,675,084
70 VEHICLES (96)	564,044,890	8,364,433	572,409,323	625,544,147
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	279,886,974	29,338,981	309,225,955	323,793,010
90 UNALLOCATED CONTINGENCY			150,353,131	162,620,295
100 FINANCE CHARGES			6,600,802	6,998,638
Total Project Cost (10 - 100)			**1,805,211,052**	**1,930,670,934**

Note: Totals may not add due to rounding.

Project Expenditures

The status of the PCEP budget and expenditures through September 30, 2018, in SCC format, is shown on Table 4.

PMOC Note: The JPB publicly reports expenditures against a total project budget of $1,980,252,533. This higher amount includes expenditures prior to the project's entry into the PD phase, which is excluded from the FTA's project budget. Costs incurred prior to the project's entry into the PD phase were removed from the estimate at the FTA's request during its review of the FFGA materials.

Table 4 – Project Expenditures in SCC Format (9-30-2018)

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	**$ 27,781,170**	**$ 2,902,160**	**$ 2,902,160**	**$ 24,979,010**	**$ 27,881,170**
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	$ 2,500,000	$ -	$ -	$ 2,600,000	$ 2,600,000
10.07 Guideway: Underground tunnel	$ 25,281,170	$ 2,902,160	$ 2,902,160	$ 22,379,009	$ 25,281,170
10.07 Allocated Contingency	$ 0	$ -	$ -	$ 0	$ 0
30 - SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	**$ 2,265,200**	**$ -**	**$ -**	**$ 2,265,200**	**$ 2,265,200**
30.03 Heavy Maintenance Facility	$ 1,344,000	$ -	$ -	$ 1,344,000	$ 1,344,000
30.03 Allocated Contingency	$ 421,200	$ -	$ -	$ 421,200	$ 421,200
30.05 Yard and Yard Track	$ 500,000	$ -	$ -	$ 500,000	$ 500,000
40 - SITEWORK & SPECIAL CONDITIONS	**$ 267,064,916**	**$ 1,931,508**	**$ 80,295,297**	**$ 201,479,637**	**$ 281,774,934**
40.01 Demolition, Clearing, Earthwork	$ 3,077,685	$ 17,000	$ 1,250,000	$ 1,902,685	$ 3,152,685
40.02 Site Utilities, Utility Relocation	$ 92,728,599	$ 677,447	$ 25,962,224	$ 81,465,393	$ 107,427,617
40.02 Allocated Contingency	$ (0)	$ -	$ -	$ (0)	$ (0)
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	$ 2,200,000	$ -	$ -	$ 2,200,000	$ 2,200,000
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	$ 32,679,208	$ 91,500	$ 812,625	$ 31,866,583	$ 32,679,208
40.05 Site structures including retaining walls, sound walls	$ 568,188	$ -	$ -	$ 568,188	$ 568,188
40.06 Pedestrian / bike access and accommodation, landscaping	$ 804,933	$ -	$ -	$ 740,933	$ 740,933
40.07 Automobile, bus, van accessways including roads, parking lots	$ 284,094	$ -	$ -	$ 284,094	$ 284,094
40.08 Temporary Facilities and other indirect costs during construction	$ 114,562,209	$ 1,145,561	$ 52,270,448	$ 62,491,760	$ 114,762,209
40.08 Allocated Contingency	$ 20,160,000	$ -	$ -	$ 19,960,000	$ 19,960,000
50 - SYSTEMS	**$ 502,689,544**	**$ 5,236,135**	**$ 43,745,354**	**$ 454,926,365**	**$ 498,671,719**
50.01 Train control and signals	$ 96,789,149	$ 156,890	$ 4,692,466	$ 96,728,408	$ 101,420,874
50.01 Allocated Contingency	$ 2,451,000	$ -	$ -	$ -	$ -
50.02 Traffic signals and crossing protection	$ 23,879,905	$ -	$ -	$ 23,879,905	$ 23,879,905
50.02 Allocated Contingency	$ 1,140,000	$ -	$ -	$ 1,140,000	$ 1,140,000
50.03 Traction power supply: substations	$ 71,003,821	$ 4,097,906	$ 10,861,869	$ 60,141,952	$ 71,003,821
50.03 Allocated Contingency	$ 28,131,860	$ -	$ -	$ 28,131,860	$ 28,131,860
50.04 Traction power distribution: catenary and third rail	$ 253,692,929	$ 981,339	$ 28,191,019	$ 228,325,859	$ 256,516,878
50.04 Allocated Contingency	$ 18,037,581	$ -	$ -	$ 9,015,081	$ 9,015,081
50.05 Communications	$ 5,455,000	$ -	$ -	$ 5,455,000	$ 5,455,000
50.07 Central Control	$ 2,090,298	$ -	$ -	$ 2,090,298	$ 2,090,298
50.07 Allocated Contingency	$ 18,000	$ -	$ -	$ 18,000	$ 18,000
60 - ROW, LAND, EXISTING IMPROVEMENTS	**$ 35,675,084**	**$ 660,803**	**$ 13,196,589**	**$ 22,478,496**	**$ 35,675,084**
60.01 Purchase or lease of real estate	$ 25,927,074	$ 660,803	$ 13,118,153	$ 12,808,921	$ 25,927,074
60.01 Allocated Contingency	$ 8,748,010	$ -	$ -	$ 8,748,010	$ 8,748,010
60.02 Relocation of existing households and businesses	$ 1,000,000	$ -	$ 78,435	$ 921,565	$ 1,000,000
70 - VEHICLES (96)	**$ 625,755,807**	**$ 677,386**	**$ 117,224,818**	**$ 508,530,989**	**$ 625,755,807**
70.03 Commuter Rail	$ 588,831,901	$ 677,386	$ 116,954,818	$ 472,813,084	$ 589,767,901
70.03 Allocated Contingency	$ 10,019,974	$ -	$ -	$ 9,083,974	$ 9,083,974
70.06 Non-revenue vehicles	$ 8,140,000	$ -	$ 270,000	$ 7,870,000	$ 8,140,000
70.07 Spare parts	$ 18,763,931	$ -	$ -	$ 18,763,931	$ 18,763,931
80 - PROFESSIONAL SERVICES (applies to Cats. 10-50)	**$ 328,451,444**	**$ 8,774,006**	**$ 230,203,155**	**$ 102,734,759**	**$ 332,937,914**
80.01 Project Development	$ 130,350	$ -	$ 280,180	$ (149,830)	$ 130,350
80.02 Engineering (not applicable to Small Starts)	$ 185,495,676	$ 4,741,440	$ 169,966,673	$ 20,155,474	$ 190,122,147
80.02 Allocated Contingency	$ 435,919	$ -	$ -	$ 295,919	$ 295,919
80.03 Project Management for Design and Construction	$ 72,987,401	$ 2,038,465	$ 47,684,051	$ 25,303,350	$ 72,987,401
80.03 Allocated Contingency	$ 9,270,000	$ -	$ -	$ 9,270,000	$ 9,270,000
80.04 Construction Administration & Management	$ 23,795,703	$ 1,057,009	$ 5,193,318	$ 26,300,856	$ 31,494,174
80.04 Allocated Contingency	$ 19,419,246	$ -	$ -	$ 11,720,775	$ 11,720,775
80.05 Professional Liability and other Non-Construction Insurance	$ 4,305,769	$ 875,000	$ 3,430,769	$ 875,000	$ 4,305,769
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	$ 6,341,599	$ 60,537	$ 3,633,225	$ 2,708,374	$ 6,341,599
80.06 Allocated Contingency	$ 556,000	$ -	$ -	$ 556,000	$ 556,000
80.07 Surveys, Testing, Investigation, Inspection	$ 3,287,824	$ 1,555	$ 14,939	$ 3,272,885	$ 3,287,824
80.08 Start up	$ 1,797,957	$ -	$ -	$ 1,797,957	$ 1,797,957
80.08 Allocated Contingency	$ 628,000	$ -	$ -	$ 628,000	$ 628,000
Subtotal (10 - 80)	**$ 1,789,683,165**	**$ 20,181,999**	**$ 487,567,373**	**$ 1,317,394,455**	**$ 1,804,961,828**
90 UNALLOCATED CONTINGENCY	**$ 133,989,131**	**$ -**	**$ -**	**$ 118,710,468**	**$ 118,710,468**
Subtotal (10 - 90)	**$ 1,923,672,296**	**$ 20,181,999**	**$ 487,567,373**	**$ 1,436,104,923**	**$ 1,923,672,296**
100 FINANCE CHARGES	**$ 6,998,638**	**$ 319,145**	**$ 4,191,243**	**$ 2,807,395**	**$ 6,998,638**
Total Project Cost (10 - 100)	**$ 1,930,670,934**	**$ 20,501,144**	**$ 491,758,616**	**$ 1,438,912,317**	**$ 1,930,670,934**

Project Funding

The PCEP is relying on several sources of funding to complete the project. Table 5 below summarizes the JPB's funding plan, as updated through June 23, 2017. The updated funding plan shows total funding of $1,930,670,934 including $647 million in Section 5309 funds. The plan also includes federal funding from the Section 5307 Urbanized Area Formula program of $287,150,000.

The JPB also has in-place an interim financing agreement for up to $150 million to provide additional cash flow flexibility to address differences in the timing of contractor invoices and the availability of drawdowns from funding sources.

The State of California recently awarded the JPB a $164,522,000 grant under its Transportation and Intercity Rail Capital Program (TIRCP). The grant will fund the purchase of additional EMUs using options included in the base contract with Stadler. The grant also includes targeted funding for 8-car platforms, improves wayside bicycle facilities (bike sharing and bike parking), and installs a broadband communications system that expands onboard Wi-Fi and enhances reliability by creating the capability to conduct remote diagnostics and optimize ongoing operations and maintenance.

Table 5 – Project Funding Summary

Funding Source	Planned/Budgeted*	Committed*	Total ($x1000)
Local	$0	$996,521	$996,521
Federal	0	$934,150	$934,150
Total	**$574,043**	**$1,356,628**	**$1,930,671**

* Definitions from Guidelines and Standards for Assessing Local Financial Commitment, FTA, June 2007

E. Project Schedule

The FFGA was executed on May 23, 2017.

The JPB completed a re-baselining of its Master Project Schedule (MPS) in December 2017; the current schedule reflects the execution of the FFGA, the issuance of the final NTPs to the EMU and Electrification contractors, and the impacts to the overall project resulting from these delays. The following is based on a review of the contractors' schedules:

- *BBII, the Electrification contractor, is now reporting that the substantial completion date has slipped further to August 19, 2021, approximately two and one-half (2.5) months later than reported in the PMOC's August 2018 report.* The continued slippage is due to the lack of resolution of the Consistent Warning Time (CWT) issue, which causes a day-for-day delay based on the contractor's current schedule logic. *The JPB is working on its own assessment of the impact of the current delays. The JPB is also considering its options to resolve the CWT issue in the absence of an acceptable UPRR decision.*

- The delivery of the first EMU trainset to the JPB is scheduled for July 2019, this is approximately three (3) months later than originally planned. The delivery of the first six (6) EMU trainsets will be delayed, but no impact is expected to the deliveries of the remaining trainsets. *The JPB's decision to acquire additional EMUs, including a new Power Car for each trainset, will delay the delivery of the first trainset. This delay will*

allow the JPB additional time to complete electrification of the test track and other vehicle related activities.

- Testing of the new EMUs requires that reconstruction and electrification of the Santa Clara Drill Track be complete; this work is currently scheduled to be finished in the second quarter 2020. The JPB is considering using the USDOT's Pueblo, Colorado, test track for receipt and testing of the first EMUs to avoid delaying those activities while construction of its own test track is completed.

The PCEP's most recent schedule includes a soft opening for revenue service on April 22, 2022, with a partial fleet of EMU vehicles, and a full Revenue Service Date (RSD) of August 22, 2022.

PMOC Observations:

- Construction progress in Segments 2 and 4 continues to be much slower than originally planned due to the presence of numerous unanticipated underground obstructions. This problem has been compounded by various factors, including other JPB capital projects, which have resulted in less on-track work time for the contractor's crews. The PMOC's opinion is that these conditions are likely to persist for the remainder of the corridor.
- The in-ground obstacles have forced the relocation of a significant number of the OCS poles, each requiring some re-design effort before the new location can be cleared and the foundation placed. BBII has increased design resources to reduce the impacts of this re-design activity.
- BBII now has a second potholing sub-contractor and has increased the number of potholing rigs to ten (10), a significant increase in resources. The overall pace of the OCS work is controlled by the completion of foundations; however, efficient erection of the OCS poles can only occur when a continuous line of foundations is available for work crews. *BBII re-started foundation construction and pole erection after sufficient cleared foundation locations were available to allow the work to proceed effectively.* Although the OCS work is not on the project's critical path, continuing low productivity may result in it becoming critical. The contractor's ability to significantly increase the amount of OCS work put in place during any given period of time will be limited by the time allowed for on-track work.
- *The impact of these various factors is highlighted by comparing BBII's actual billing for November 2018 of $7,109,650, compared to a budget for the period of $14,357,311. On a cumulative basis, BBII has billed $269,319,756 or approximately 50% of the expected amount thru November 2018, compared to a budget of $537,743,090 for the same period. Using only BBII's projected average billings as reported in November 2018, to expend the original contract value by the originally planned date of August 2020 will require an average monthly expenditure of $21,364,540.09.* If a normal expenditure curve, similar to that originally projected by BBII is assumed, the maximum monthly billing could be significantly greater than the approximately $24 million in the present plan. The above analysis is based on the original contract value and does not

consider the additional costs incurred, or likely to be incurred because of change orders. The PMOC questions whether that level of expenditure is achievable given the current schedule constraints.

- The JPB revised its schedule for weekend interruptions of rail service in Segment 1 to permit Electrification construction and concurrent work on the Tunnel Notching contract. The service interruptions must now take place following the close of the 2018 Major League Baseball season. This constraint was not present at the time the Electrification contract was awarded and it is not clear how this will impact the Electrification contractor's accepted baseline schedule. The JPB has issued a Change Notice to compensate the Electrification contractor for some initial work related to this schedule change.
- The JPB is considering using the USDOT's test track in Pueblo, Colorado to test and accept the first EMUs because of the anticipated delay in completing its own test track. The PMOC notes that the Pueblo facility also contains facilities suitable for demonstrating the EMU's contractually required 110 mph capability. The PMOC's opinion is that demonstrating the EMU's high-speed capability on Caltrain's current Segment 4 tracks would require some upgrades to the track system and associated regulatory approvals.

Table 6 below, which is based on the MPS C16.11 with a Data Date of September 1, 2018, shows the current projected dates for completion of various significant project activities.

Table 6 – Schedule Status

Milestone	Baseline	Grantee Forecast	PMOC Forecast
New Starts/Core Capacity Grant Agreement:	Not in MPS	5/23/2017 (A)	5/23/2017 (A)
Design/Build Notice to Proceed:	12/08/15 (P)	6/19/2017 (A)	6/19/17 (A)
Arrival of First EMU at JPB	7/29/19	7/15/19 (P)	7/15/19 (P)
Final Engineering (FE) Completion:	04/03/18 (P)	3/14/2018 (P)	9/13/19 (P)
Systems Integration Testing Completed:	01/29/19 (P)	12/9/21 (P)	12/9/21 (P)
First Eight Miles of Electrification Complete to Begin Testing	11/21/19	7/19/20 (P)	7/19/20 (P)
Design/Build Completion	02/16/19 (P)	8/10/20 (P)	8/10/20 (P)
PG&E Provides Permanent Power	9/9/21	9/9/21 (P)	9/9/21 (P)
Pre-Revenue Operation Completed:	05/07/20 (P)	12/9/21 (P)	12/9/21 (P)
Revenue Service – Soft Opening		4/22/22 (P)	4/22/22 (P)
Revenue Operations Date:	05/07/20 (P)	8/22/2022 (P)	8/22/2022
(P) Planned Date (A) Actual Date			

Appendix E presents the PCEP's summary schedule C17.0 dated October 23, 2018, as contained in its September 2018 Monthly Report.

- **PMOC Recommendation:** *The PMOC recommends that the JPB leadership team apply additional scheduling resources to complete its recently initiated internal schedule assessment as early as possible, which will provide the maximum amount of time to assess the results and develop appropriate*

responses. The PMOC's opinion is that the PCEP's scheduling resources are currently fully occupied with schedule management and have insufficient time to devote to this type of activity.

- The PMOC recommends that the JPB increase the PCEP's scheduling resources to address the demands associated with initiation of the Tunnel Notching contract, the work required to analyze and respond to the required TIAs for the delays being experienced on the Electrification contract, and the award of the CEMOF Modification contract later this year.

F. Quality Assurance / Quality Control (QA/QC)

The following quality management activities were reported for the PCEP:

- *Staff meetings with BBII QA/Quality Control (QC) management representatives continue weekly.*
- *Continued review of BBII-generated Nonconformance Reports (NCR) and Construction Discrepancy Reports for proper discrepancy condition, discrepancy cause, disposition, corrective and preventive action and verification of closure.*
- *Continued review and approval of Design Variance Requests for BBII and PGH Wong for QA/QC and inspection issues/concerns.*
- *Continued review of BBII QC Inspectors Daily Reports, Construction Quality Control Reports and Surveillance Reports for work scope, performance of required duties, adequacy, non-conformances, test/inspection results, follow up on unresolved issues, and preciseness.*
- *Continued review of BBII Material Receipt Reports, Certificates of Conformance, Certified Tests Reports, and Certificates of Analysis to ensure delivered project materials conform to specifications, and that contractually required quality and test support documents are adequate and reflect concise conditions per the purchase order requirements.*
- *Continued review of Stadler QA activities, including: NCR review, Inspection Exception Reports, Car History Reports and Weekly Status Reports.*
- *Conducted three QA design package audits of PGH Wong Systems Integration Testing Plan, Rev 1, Grounding and Bonding IFC, and Systems Communications Ductbanks Segments 1 and 3 at 65%.*

The JPB's Procurement Department issued an RFP for On-Call Special Inspection and Testing Services to support both the PCEP and the JPB's Capital program. *Proposals were received on June 11, 2018 and are under review.*

- **PMOC Observations and Recommendations:** *The PMOC conducted an on-site assessment of the PCEP Quality program November 5-9, 2018 and the results are being assembled for review.*

  The PMOC's opinion is that the additional quality resources requested previously are needed and may be inadequate to address the full range of quality activities on a project of the scale of the PCEP.

The PMOC recommended that PCEP make use of appropriate staff from the San Carlos office to augment the PCEP quality program. The PCEP QA Manager commented that he would have to conduct appropriate quality training before unqualified staff conduct quality activities.

G. Safety and Security

The JPB contracts for safety and security consulting services to support the PCEP. *The current contract is due to expire and the JPB recently solicited proposals for the next five-year period; proposals were received on September 21, 2018.* The PMOC is concerned about the potential loss of continuity if a new contractor is selected. The PMOC's opinion is that the requested level of effort of approximately 2.5 full time equivalent (FTE) may be less than needed given the expected level of activity on the various contracts.

The PCEP safety team continues to monitor the safety performance of BBII's field activities including compliance with Site Specific Work Plans.

The JPB submitted its Draft Safety and Security Management Plan (SSMP), Rev. 4, on April 11, 2017 for PMOC review. The PMOC completed its review of the Rev. 4 Draft and provided comments and recommendations to the PCEP's safety team in August 2017. The SSMP Update Review report is currently being finalized.

The PCEP's safety management team continues to hold regular monthly meetings of the Fire and Life Safety Committee and the Safety and Security Certification Review Committee. *The next meetings are set for November 28, 2018.*

H. Americans with Disabilities Act (ADA)

The new EMU vehicles will be equipped with powered on-board lifts to provide assistance to passengers using mobility devices. The JPB requested the FTA's concurrence to reduce the number of on-board lifts from 32 per train set to 16 per train set, and to phase the installation of the lifts. The JPB's proposal calls for initial installation of two (2) lifts per train set, one (1) each in the northernmost car and one (1) in the following car, which will be equipped with an accessible restroom. The remaining four (4) lifts per train set are to be installed prior to the start of blended service with the CHSRA trains. The FTA, following its review of the JPB's proposal and further clarification provided by a conference call, concurred with the JPB's proposed reduction in the total number of passenger lifts per train set. The phased installation of the lifts was also discussed and associated grant timing considerations.

The new EMU vehicles must comply with the FTA's current ADA requirements and the guidance in FTA Circular 4710.1.

I. Buy America

- The FTA concurred in November 2016 with the JPB's determination that the EMU contract is governed by a 60% domestic content requirement, based on the General Public Interest Waiver provisions in the FTA's current Buy America regulations.
- The JPB reports that it has received guidance from the FTA confirming the acceptability of a protocol for certifying compliance of PG&E substation modifications with Buy America requirements. The JPB also reported that PG&E has determined that it will not need to install Gas Insulated Switchgear when it modifies its FMC substation to supply power to

the JPB's TPSS #2. This determination by PG&E eliminates a major concern related to Buy America compliance because Gas Insulated Switchgear is not manufactured in the U.S.

- The EMU vehicle consultant visited Stadler's Salt Lake City facility during late January 2018 to verify its Buy America compliance and its progress in arranging for American equipment suppliers. The JPB has not mentioned plans for additional intermediate Buy America audits.
- The project's QA Manager reports that he routinely reviews Buy America documentation as a part of his audit of vendor files.

J. Vehicles

The PCEP has placed an order for ninety-six (96) new bi-level EMU vehicles to be produced by Stadler US, Inc. and delivered in six-car train sets. The EMU contract contains an option for JPB to purchase up to ninety-six (96) additional EMUs at prices based on the date when the option is exercised. *The JPB is proceeding with the procurement of an additional thirty-seven (37) EMUs using the option in the existing Stadler contract. The first option period expires at the end of 2018 and the price of the option vehicles is the same as the original contract price. This procurement will result in an initial electrified fleet of nineteen (19) seven car trains.*

The EMU contract also contains an option for Stadler to maintain the vehicles; the JPB has decided not to exercise this option and the vehicles will be maintained by TASI, the JPB's current rail operator. The JPB states that Stadler will provide on-site training and assistance for TASI's personnel for two (2) years following vehicle acceptance.

The EMUs will be delivered with two (2) sets of doors, one set at approximately 22" above top of rail, and one at approximately 50.5" above top of rail. Initially, only the lower set of doors will be activated, and a small step will automatically deploy outside the vehicle to reduce the boarding height to the current platforms. Later, when the EMUs operate in blended service with the CHSRA vehicles, the high-level doors will be operated to provide level boarding at the higher CHSRA platforms at those stations served by both systems.

The JPB has negotiated a change order to reduce the number of interior lifts from twelve (12) to six (6) in each trainset. This topic is discussed in more detail in Section H, Americans with Disabilities Act, above. A second change order has been issued to increase the capacity of lifts that provide ADA access to restrooms in those cars so equipped; this change order is in response to recent change in the standards for such lifts.

The JPB previously reported that it has finalized the on-board bicycle parking arrangement and will continue to stack bikes as is currently done. However, a concern has been raised by one of Caltrain's passengers regarding bikes blocking emergency egress, as noted below under regulatory issues.

Stadler reported the following progress on the vehicles:

- *The Final Design Phase of EMU systems continues. Major systems have frozen their designs to commence prototype testing and series production.*
- *Software intensive systems (e.g., Monitoring and Diagnostic, Train Control and Passenger Information Systems) are scheduled to be complete in late 2019.*

- *The first two (2) carshells (cab cars) are in Stadler Salt Lake City facility undergoing initial fitting of interior bracketry. The remaining carshells (4) for Trainset 1 are in transit to Salt Lake City.*
- *PTC technical and commercial discussions are progressing and the needed no cost change order to implement the JPB's Interoperable Electronic Train Management System (I-ETMS) is in development.*
- *EMU design coordination discussions continue with representatives from Caltrain Operations and Maintenance, Caltrain Public Outreach, the FRA, the FTA Project Management Oversight Contractor, Safety, Quality Assurance, and PCEP Program Scheduling.*
- *The PCEP team continues to address systemwide interface issues involving the emerging EMU design, existing Caltrain wayside infrastructure, Electrification Project designs and the Caltrain PTC program.*
- *Caltrain and FRA representatives discussed several aspects of the EMUs and FRA compliance. Caltrain is currently evaluating options and possible impacts.*

Regulatory Issues

The JPB sent the FRA a request for interpretation, dated September 19, 2017, related to use of the high-level doors in lieu of emergency egress windows in passenger intermediate seating levels. The JPB followed that request with a letter dated December 21, 2017 formally requesting a waiver of the requirements of 49 CFR 238.113(a)(3) and 238.114(a)(3) for the EMU cars A, B, C and E. The FRA, in a letter dated June 8, 2018, denied the JPB's request for a waiver on the use of the high-level doors for emergency egress from the EMUs. The JPB previously developed an alternative to address this possible outcome. The alternative is complicated and requires creation of an interim configuration that replaces the high-level doors with an emergency exit window. This alternative has several difficult and potentially expensive impacts and the JPB has not reached a decision on how to proceed.

The JPB reported that a customer has complained about the plan to store bicycles in the area immediately in front of the emergency exit windows in the new EMU bicycle cars, and that the customer has also brought the issue to the attention of the FRA. The safety implications were discussed at QPRM No. 7, and at that time, the FRA stated that one of its staff is working with the JPB and Stadler. The FRA further stated that Caltrain has been put on notice that the emergency exit blockage would become a problem, if not resolved, when the cars are placed in service and could require a re-design of the area. *The JPB presented two diagrams at QPRM No. 8 to demonstrate how the potential reduction in seats would affect its aggregate passenger carrying capacity, but not below the core capacity threshold. The JPB continues to work with Stadler and the FRA to resolve this matter.*

The FRA granted the JPB's request for a waiver of compliance from a portion of 49 CFR §238.113(a)(2), Emergency window exits for the restroom car of their new 6-car EMU trainsets, on February 9, 2018.

The FRA has raised questions related to a retractable lower step and whether it is a "safety appliance" subject to its regulations. The JPB's opinion is that the step is not a safety appliance.

5) Project Risk and Contingency

The PCEP has been implementing its RIMP since its development in 2014. The PCEP's Risk Management Specialist conducts weekly updates of a sub-set of the Risk Register and the project's Risk Management Committee meets monthly to review those risks proposed for retirement, risks with a major change in severity, and proposed additions to the Risk Register.

The third quarterly risk management meeting with the Electrification contractor scheduled for August 14, 2018 was re-scheduled. *The JPB reported that the quarterly risk management meeting did not produce the desired results, i.e., the contractor did not understand its responsibility to periodically update the status of its "owned" risks and mitigation measures. The JPB is working with the Electrification contractor to obtain the appropriate risk management information for its internal use.*

The JPB plans to hold an EMU Risk Refresh on December 18, 2018 following the conclusion of QPRM No. 9. The scope of this risk refresh has not been fully described.

The following are the top risks, with risk number, shown on the current PCEP risk register.

(279) BBII may be unable to develop grade crossing modifications that meet regulatory requirements prior to scheduled testing and commissioning of the system.

(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.

(242) JPB's ability to deliver work windows to contractor, as dictated per contract.

(257) Modifications to the PTC system hardware and software and Back Office Server database and systems to support DB must be completed in time for cutover and testing.

(298) Cost and schedule of BBII contract could increase as a result of this change in PTC system.

(209) Number of staff requested of TASI may be insufficient.

(240) Property not acquired in time for contractor to do work.

(295) Contractor may not be able to complete tunnel work within contractual requirement to complete within the twenty (20) scheduled weekends due to the extent and complexity of the work and need to coordinate civil/structural work with electrical work.

(302) May not have a 110-mph electrified section of track that will be ready for testing when needed.

Appendix F is a listing of the top project risks from the most recent PCEP Risk Register.

- **PMOC Recommendation:** The PMOC recommends that the JPB increase coordination between the PCEP and Caltrain operations to avoid or minimize impacts to the Electrification contractor's activities. *The PMOC acknowledges that both PCEP and Rail Operations report that PTC testing has not caused any significant interference with the Electrification contractor's operations.*

6) Discussion of Monitoring Plan Items

The PMOC plans to increase its focus on the PCEP's schedule performance including the JPB's mitigation of delays to OCS foundation installation, final adoption and implementation

of a solution to provide the required Constant Warning Time at grade crossings, and completion of Time Impact Analyses related to the previous two (2) issues. The PMOC also plans to monitor PCEP staffing levels as project activities expand geographically and the complexity of project activities increases with the start of the tunnel notching and drainage work, and the anticipated start of work at the CEMOF. The PMOC has recently alerted the JPB to the significant effort required to prepare for electrified operations, which must take place before initial testing of EMUs on either the Santa Clara Drill Track or on the mainline. The PMOC will begin monitoring progress on this activity.

7) Action Items

Table 6 – Action Items

No.	Action Item	Discussion	Agreed Due Date	Responsibility Agency/Name	Status
5.05	JPB to prepare a white paper describing how the federal interest in the PG&E-JPB interconnection will be preserved if the real estate becomes the property of PG&E.	This issue is unresolved and part of the negotiation of Supplement #4.	NLT QPRM #8	JPB: Legal Counsel FTA: Wu	Issue is Ripe as of QPRM #6 *Unchanged 6-14-2018*
7.01	JPB to provide an assessment of how much of the previously purchased and/or installed CBOSS-PTC equipment is still considered useful with the Wabtec system.	*An inventory comparing on-board and wayside components for CBOSS-PTC and Wabtec I-ETMS should be provided.*	NLT QPRM #8	Bouchard	*On-board equipment discussed 9-11-18; wayside equipment and inventory still needed. Close 7.01 and Open new Action Item 8.08.*
7.02	JPB to provide an updated organization chart showing FTE.		NLT QPRM #8	Funghi	*Completed 9-11-18*
7.03	JPB to indicate on design package and other similar progress charts, the number of packages or installations required and completed (Req/Comp)		NLT QPRM #8	Couch	*Completed 9-7-18*
7.04	JPB to provide seat and bike data related to the core capacity ridership calculation.	*Scenario sheet provided to FTA*	NLT QPRM #8	Cocke	*Completed 9-7-18*
7.05	FTA to provide a chart showing ROW acquisition progress for use in future JPB quarterly presentations.	FTA has an example	FTA – ASAP JPB – NLT QPRM #8	FTA – Carranza JPB - Fitzpatrick	*Completed 9-7-18*

No.	Action Item	Discussion	Agreed Due Date	Responsibility Agency/Name	Status
7.06	JPB, FTA and the PMOC to have a Schedule Containment Workshop.	Timing should consider when TIA 2 complete	NLT QPRM#8	PMOC - Eidlin JPB- A. Christofas	*Preliminary Discussions held 8-16-2018*
8.01	*JPB to indicate percent of Full-time Equivalent by position on Org Chart.*		*NLT QPRM #9*	*Larano*	
8.02	*JPB to produce a Roadmap to Rail Activation/System Integration Testing with dates.*		*NLT QPRM #9*	*Funghi/Bouchard*	
8.03	*JPB to show anticipated completion dates on the slides for items such as potholing, UPRR approval of grade crossing design, and other critical path items.*		*NLT QPRM #9*	*Larano*	
8.04	*JPB to produce a slide showing aging on Change Orders, Change Notices, RFIs, etc.*		*NLT QPRM #9*	*Cocke*	
8.05	*JPB to consider re-aligning its Quality reporting to be independent of project management and revise its Org Chart accordingly.*	*QA reports to LTK on the EMU procurement.*	*NLT QPRM #9*	*Funghi/Bouchard*	
8.06	*JPB to provide a revised scope, description, schedule and work plan for completing proposed CEMOF modifications.*		*NLT PMOC Nov 2018 Visit*	*Guan*	
8.07	*JPB to produce a slide showing the number of conflicts between proposed foundation locations and installed CBOSS-PTC fiber optic cable by Segment.*		*NLT QPRM #9*	*Guan*	

No.	Action Item	Discussion	Agreed Due Date	Responsibility Agency/Name	Status
8.08	*The PMOC requested that the JPB complete an inventory of the on-board and wayside equipment purchased and installed by CBOSS-PTC, and which items will be reusable for the Wabtec system.*	*This replaces Action Item*	*NLT QPRM #9*	*Bouchard*	

Legend: Each Action Item indicates the number of the Quarterly Progress Review Meeting where the Action Item was identified. Colored italics indicate a new entry from the previous version. Shaded cells indicate a completed item. Items are removed from the Action Item list for the second report following the report in which they are reported complete.

Appendix A: List of Acronyms

Acronyms	List of Terms
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ATP	Alternate Technical Proposal
BAAQMD	Bay Area Air Quality Management District
BAFO	Best and Final Offer
BART	Bay Area Rapid Transit District
BBII	Balfour-Beatty Infrastructure, Inc.
Caltrans	California Department of Transportation
CBOSS	Communications Based Overlay Signal System
CC	FTA's Core Capacity Improvement Program
CCB	Change Control Board
CCIP	Contractor Controlled Insurance Program
CCSF	City and County of San Francisco
CEL	Certified Elements List
CEMOF	Central Equipment Maintenance and Operations Facility
CEQA	California Environmental Quality Act
CGA	Construction Grant Agreement
CHSRA	California High-Speed Rail Authority
CIG	FTA's Capital Investment Grant Process
CIL	Certifiable Items List
CM/GC	Construction Manager/General Contractor
CNPA	Concurrent Non-Project Activity
CO	Change Order
CPUC	California Public Utilities Commission
CSCG	City/County Staff Coordinating Group
CWT	Constant Warning Time
D-B	Design-Build
DBB	Design-Bid-Build
DBE	Disadvantaged Business Enterprise
DBFOM	Design-Build-Finance-Operate and Maintain
DEIR	Draft Environmental Impact Report
DQP	Design Quality Plan
DRB	Disputes Review Board
DSDC	Design Support During Construction
EA	Environmental Assessment
EAC	Estimate at Completion
EE	Entry into Engineering
EIR	Environmental Impact Report
EMU	Electric Multiple Unit Rail Vehicle
ETB	Electrified Trolley Buses
FCD	Final Completion Date

Acronyms	List of Terms
FD	Final Design
FEIR	Final Environmental Impact Report
FERC	Federal Energy Regulatory Commission
FFGA	Full Funding Grant Agreement
FMOC	Financial Management Oversight Consultant
FMP	Fleet Management Plan
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FTE	Full-time Equivalent
FY	Fiscal Year
GO	General Order (issued by the CPUC)
HSR	High-Speed Rail
HVAC	Heating Ventilation and Air Conditioning
I-ETMS	Interoperable Electronic Train Management System
IFC	Issued for Construction
IFB	Invitation for Bids
IGA	Inter-Governmental Agreement
Cal ISO	California Independent System Operator
ITCS	Incremental Train Control System
JPB or PCJPB	Peninsula Corridor Joint Powers Board
KKCS	Kal Krishnan Consulting Services, Inc.
LNTP	Limited Notice to Proceed
LONP	Letter of No Prejudice
LPMG	Local Policy Makers Group
MCC	Management Capacity and Capability
MOU	Memorandum of Understanding
MPS	Master Project Schedule
MTC	Metropolitan Transportation Commission
NCR	Non-conformance Report
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NTO	Notice to Owner (for Utility Relocation)
NTP	Notice to Proceed
OCS	Overhead Contact System/Overhead Catenary System
PCEP	Peninsula Corridor Electrification Program
PCWG	Peninsula Corridor Working Group
PD	Project Development Phase
PG&E	Pacific Gas and Electric
PHA	Preliminary Hazard Assessment
PMOC	Project Management Oversight Contractor
PMP	Project Management Plan
ProVen	ProVen Management, Inc.

Acronyms	List of Terms
PS	Paralleling Station for Traction Power Supply
PTC	Positive Train Control
PTG	Parsons Transportation Group
QA	Quality Assurance
QAP	Quality Assurance Plan
QC	Quality Control
QMP	Quality Management Plan
QPRM	Quarterly Progress Review Meeting
RAMP	Real Estate Acquisition Management Plan
RFMP	Rail Fleet Management Plan
RFP	Request for Proposal
RIMP	Risk Identification and Mitigation Plan
RON	Resolution of Necessity (for Eminent Domain purposes)
ROW	Right of Way
RSD	Revenue Service Date
RWIC	Roadway Worker in Charge
RWQCB	Regional Water Quality Control Board
SamTrans	San Mateo County Transit District
SCADA	Supervisory Control and Data Acquisition
SCC	Standard Cost Category
SCVTA/VTA	Santa Clara Valley Transportation Authority
SF	City of San Francisco
SFCTA	San Francisco County Transportation Authority
SFMTA	San Francisco Municipal Transportation Agency
SHPO	State Historic Preservation Office
SJ	City of San Jose
SMCTA	San Mateo County Transportation Authority
SME	Subject Matter Expert
SOGR	State of Good Repair
SONO	Statement of No Objection
SP	Southern Pacific Transportation Company
SSI	Sensitive Security Information
SSMP	Safety and Security Management Plan
SSOA	State Safety Oversight Agency
TASI	Transit America Services, Inc.
TEAM	Transportation Electronic Award Management System
TIA	Time Impact Analysis
TIRCP	Transportation and Intercity Rail Capital Program
TJPA	Transbay Joint Powers Authority
TPS	Traction Power System
TPSS	Traction Power Substation
TrAMS	Transportation Award Management System
TVA	Threat and Vulnerability Analysis

Acronyms	List of Terms
TVM	Transit Vehicle Manufacturer
UPRR	Union Pacific Railroad
USFWS	United States Fish and Wildlife Service
VE	Value Engineering
VECP	Value Engineering Change Proposal
VTA	Santa Clara Valley Transportation Authority
YOE	Year of Expenditure

Appendix B: Safety and Security Checklist

Project Overview			
Project Mode	Commuter Rail		
Project Phase	FFGA – Construction		
Project Delivery Method	Design-Build, Design-Bid-Build		
Project Plans	**Version**	**Review by FTA**	**Status**
Safety and Security Management Plan (SSMP)	Rev 4	Y	Under Review
Safety and Security Certification Plan (SSCP)	Rev 0		Under Review
System Safety Program Plan (SSPP)	Rev 7		Under Review
System Security Plan or Security and Emergency Preparedness Plan (SEPP)	Rev 0		SSP being revised
Construction Safety and Security Plan (CSSP)	V3 Part C of SPs		In Contract Documents

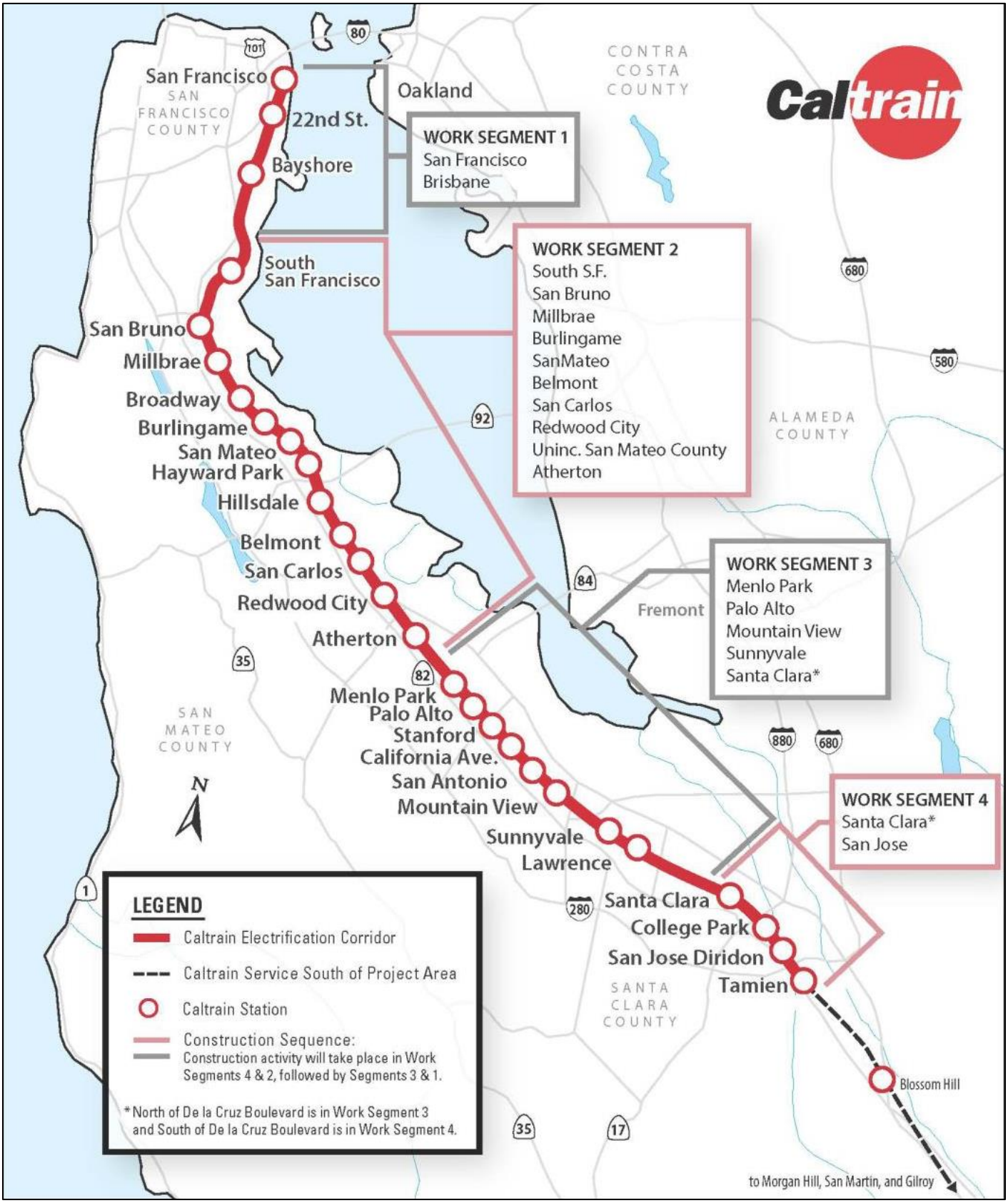
Area of Focus	**Y/N**	**Notes/Status**
Safety and Security Authority		
Is the Project Sponsor subject to 49 CFR Part 659 state safety oversight requirements?	Y	
Has the state designated an oversight agency as per 49 CFR Part 659.9?	Y	California Public Utilities Commission is SSOA; *the FTA certified California's SSOA program on October 23, 2018.*
Has the oversight agency reviewed and approved the Project Sponsor's Security Plan or SSPP as per 49 CFR Part 659.17?	TBD	Not known at this time
Did the oversight agency participate in the last Quarterly Program Review Meeting?	*N*	*QPRM No. 8 was held September 11, 2018*
Has the Project Sponsor submitted its safety certification plan to the oversight agency?	TBD	SSCP submitted Rev. 0 which is currently under review.
Has the Project Sponsor implemented security directives issued by the Department of Homeland Security and/or Transportation Security Administration?	Y	No directives have been received at this time; Transit Police is the liaison between DHS and Caltrain.
SSMP Monitoring		
Is the SSMP project-specific, clearly demonstrating the scope of safety and security activities for this project?	Y	
Does the Project Sponsor review the SSMP and related project plans to determine if updates are necessary?	Y	
Does the Project Sponsor implement a process through which the Designated Function (DF) for Safety and DF for Security are integrated into the overall project management team? Please specify.	Y	In the SSMP and Section 11.0 of the PMP.
Does the Project Sponsor maintain a regularly scheduled report on the status of safety and security activities?	Y	Safety & Security activities are reported in the monthly PCEP report.

Area of Focus	Y/N	Notes/Status
Has the Project Sponsor established staffing requirements, procedures and authority for safety and security activities throughout all project phases?	Y	Section 3.0 of SSMP
Does the Project Sponsor update the safety and security responsibility matrix/organizational chart as necessary?	Y	
Has the Project Sponsor allocated sufficient resources to oversee or carry out safety and security activities?	Y	
Has the Project Sponsor developed hazard and vulnerability analysis techniques, including specific types of analysis to be performed during different project phases?	Y	PHA Rev. 1, APR 16
Does the Project Sponsor implement regularly scheduled meetings to track to resolution any identified hazards and/or vulnerabilities?	Y	Yes, in Safety and Certification Committee meetings which started in December 2016 on a project level and through our "Capital Safety Committee" which meets monthly. IndustrySafe is also being used to track safety activities.
Does the Project Sponsor monitor the progress of safety and security activities throughout all project phases? Please describe briefly.	Y	Yes, through the Safety & Security Certification Committee and the Fire/Life Safety Committee which are ongoing committees throughout the life of the project.
Does the Project Sponsor ensure the conduct of preliminary hazard and vulnerability analyses? Please specify the analyses conducted.	Y	PHA Rev. 1 APR 16, Under review. *A PHA is being prepared for changes to the CEMOF facility to accommodate the new EMUs.* TVA Rev. 1 APR 16, Under review. OHA is currently being developed.
Has the Project Sponsor ensured the development of safety design criteria?	Y	
Has the Project Sponsor ensured the development of security design criteria?	Y	
Has the Project Sponsor ensured conformance with safety and security requirements in design?	Y	Design Criteria checklists are currently being developed and reviewed by the Safety & Security Certification Review Committee.
Has the Project Sponsor verified conformance with safety and security requirements in equipment and materials procurement?	Y	Through the Safety & Security Certification Process.
Has the Project Sponsor verified construction specifications conformance?	Y	Currently only for foundation construction and OCS pole erection which is under way.
Has the Project Sponsor identified safety and security critical tests to be performed prior to passenger operations?	Y	Addressed in SSMP as required by D/B Contractor during construction.
Has the Project Sponsor verified conformance with safety and security requirements during testing, inspection and start-up phases?	Y	Addressed in SSMP and SSCP.
Has the Project Sponsor evaluated change orders, design waivers, or test variances for potential hazards and/or vulnerabilities?	Y	Through the Change Management Board.
Has the Project Sponsor ensured the performance of safety and security analyses for proposed work-arounds?	Y	This is included in the Rail Activation Committee scope during testing/startup activities. BBII's Safety & Security Certification flow chart identifies the process.

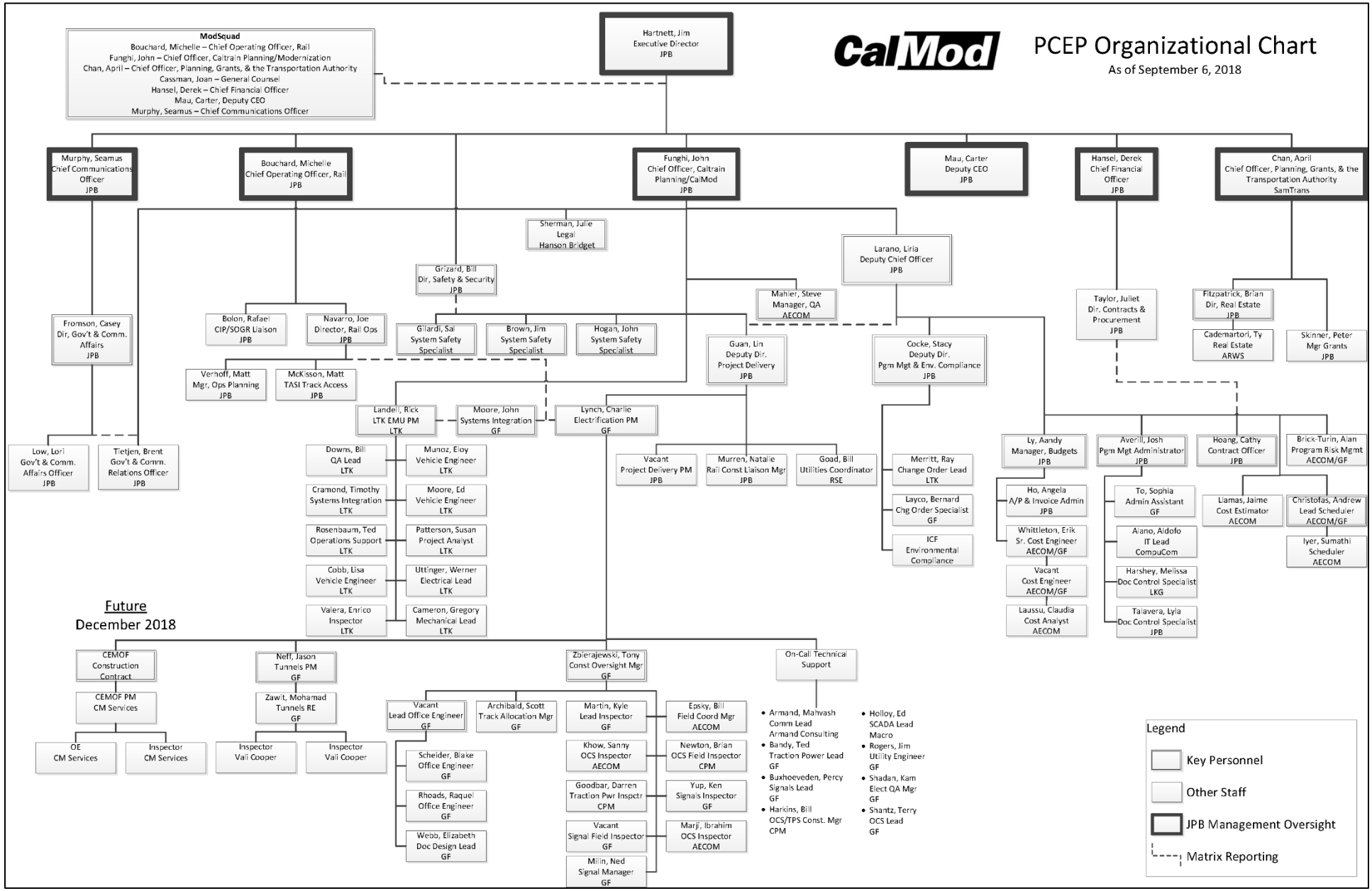
Area of Focus	Y/N	Notes/Status
Has the Project Sponsor demonstrated through meetings or other methods the integration of safety and security in the following: • Activation Plan and Procedures • Integrated Test Plan and Procedures • Operations and Maintenance Plan • Emergency Operations Plan	 Y Y N N	*A Rail Activation Plan is currently being developed for initial testing and operation of the new EMUs; however, the individual in charge of that activity left and a permanent replacement has not been designated.* Integrated Test Plan & Procedures developed.
Has the Project Sponsor issued final safety and security certification?	N	Project is in construction. Final Completion Date is 8-22-2022.
Has the Project Sponsor issued the final safety and security verification report?	N	Project is in construction. Final Completion Date is 8-22-2022.
Construction Safety		
Does the Project Sponsor have a documented/implemented Contractor Safety Program with which it expects to comply?	Y	The Design/Build contractors "Construction Safety Program" and "Health and Safety Plan" have been accepted.
Does the Project Sponsor's contractor(s) have a documented company-wide safety and security program plan?	Y	System Safety Plan submitted and Approved 2/1/2017
Does the Project Sponsor's contractor(s) have a site-specific safety and security program plan?	Y	Rev. 2 submitted and Approved 12/9/2016
How do the Project Sponsor's OSHA statistics compare to the national average for the same type of work?		The Design Build contractor's reported OSHA statistics for the project showed a Total Recordable Incident Rate of 1.51 through October 2017 compared to the most recent (2016) BLS rate of 2.8 for Heavy and Civil Engineering construction.
If the comparison is not favorable, what actions are being taken by the Project Sponsor to improve its safety record?		NA
Federal Railroad Administration		
If shared track: has the Project Sponsor submitted its waiver request application to FRA? (Please identify specific regulations for which waivers are being requested.)	Y	Waivers approved 1/13/2016 for 49 CFR: 49 CFR 238.203, Static end strength; 238.205, Anti- climbing mechanism; and 238.207, link between coupling mechanism and car body.
If shared corridor: has the Project Sponsor specified specific measures to address safety concerns?	Y	In Caltrain/TA Services/UP Passenger Train Emergency Preparedness Plan and Caltrain System Safety Program Plan
Is the Collision Hazard Analysis underway?	Y	*Car body testing and Collision Analysis has been completed.*
Other FRA required Hazard Analysis – Fencing, etc.?	TBD	This is an operating ROW and no service change is expected.
Does the project have Quiet Zones?	TBD	This is an operating ROW and no service change is expected.
Does FRA attend the Quarterly Review Meetings?	*Y*	*FRA attended QPRM No. 8 on September 11, 2018.*

Appendix C: Project Map

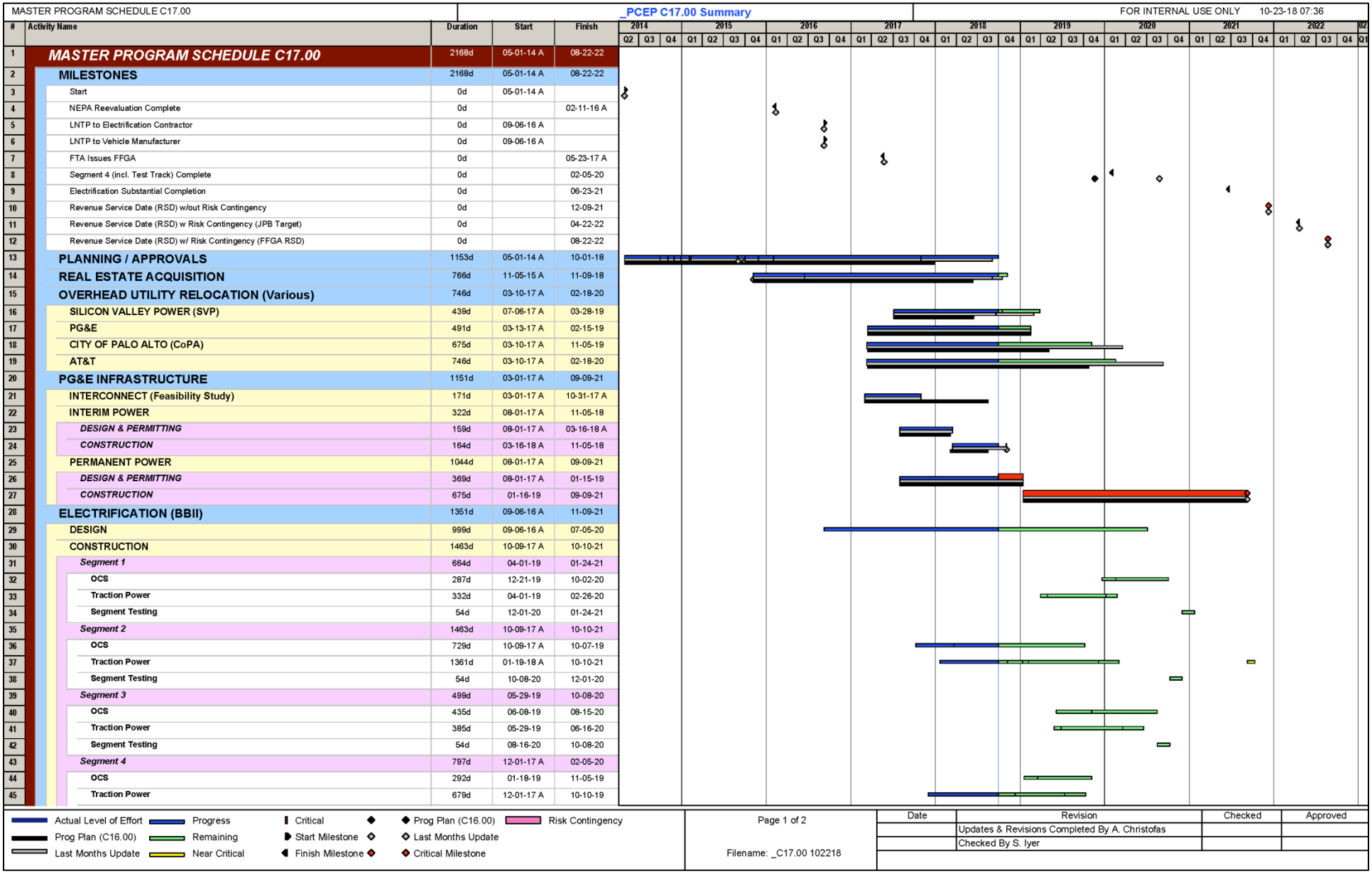
Figure 1
Peninsula Corridor Electrification Project Map

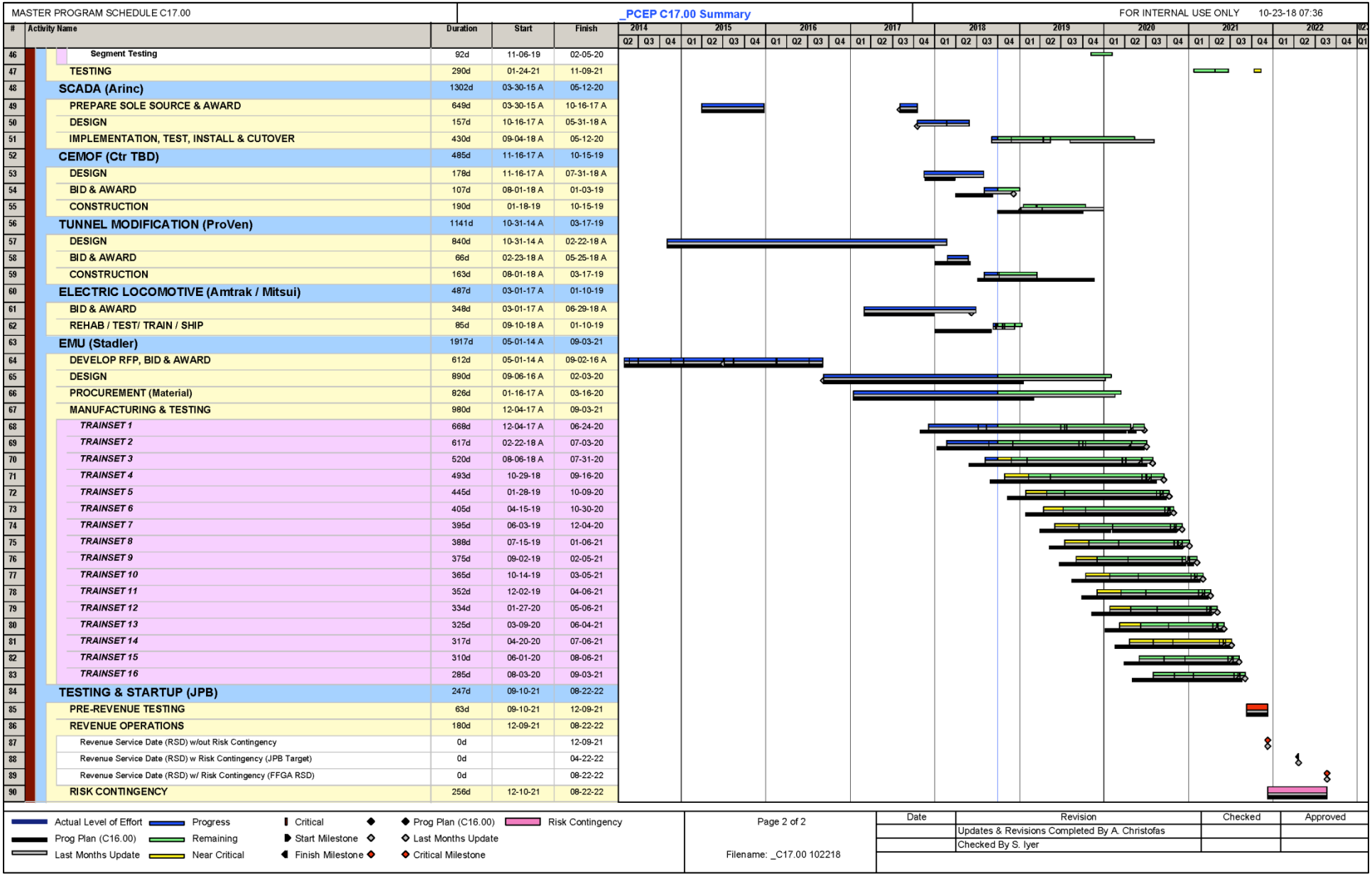


Appendix D: PCEP Organization Chart



Appendix E: Summary Project Schedule




MASTER PROGRAM SCHEDULE C17.00
_PCEP C17.00 Summary
FOR INTERNAL USE ONLY 10-23-18 07:36
Activity Name Duration Start Finish
46 Segment Testing 92d 11-06-19 02-05-20
47 TESTING 290d 01-24-21 11-09-21
48 SCADA (Arinc) 1302d 03-30-15 A 05-12-20
49 PREPARE SOLE SOURCE & AWARD 649d 03-30-15 A 10-16-17 A
50 DESIGN 157d 10-16-17 A 05-31-18 A
51 IMPLEMENTATION, TEST, INSTALL & CUTOVER 430d 09-04-18 A 05-12-20
52 CEMOF (Ctr TBD) 485d 11-16-17 A 10-15-19
53 DESIGN 178d 11-16-17 A 07-31-18 A
54 BID & AWARD 107d 08-01-18 A 01-03-19
55 CONSTRUCTION 190d 01-18-19 10-15-19
56 TUNNEL MODIFICATION (ProVen) 1141d 10-31-14 A 03-17-19
57 DESIGN 840d 10-31-14 A 02-22-18 A
58 BID & AWARD 66d 02-23-18 A 05-25-18 A
59 CONSTRUCTION 163d 08-01-18 A 03-17-19
60 ELECTRIC LOCOMOTIVE (Amtrak / Mitsui) 487d 03-01-17 A 01-10-19
61 BID & AWARD 348d 03-01-17 A 06-29-18 A
62 REHAB / TEST/ TRAIN / SHIP 85d 09-10-18 A 01-10-19
63 EMU (Stadler) 1917d 05-01-14 A 09-03-21
64 DEVELOP RFP, BID & AWARD 612d 05-01-14 A 09-02-16 A
65 DESIGN 890d 09-06-16 A 02-03-20
66 PROCUREMENT (Material) 826d 01-16-17 A 03-16-20
67 MANUFACTURING & TESTING 980d 12-04-17 A 09-03-21
68 TRAINSET 1 668d 12-04-17 A 06-24-20
69 TRAINSET 2 617d 02-22-18 A 07-03-20
70 TRAINSET 3 520d 08-06-18 A 07-31-20
71 TRAINSET 4 493d 10-29-18 09-16-20
72 TRAINSET 5 445d 01-28-19 10-09-20
73 TRAINSET 6 405d 04-15-19 10-30-20
74 TRAINSET 7 395d 06-03-19 12-04-20
75 TRAINSET 8 388d 07-15-19 01-06-21
76 TRAINSET 9 375d 09-02-19 02-05-21
77 TRAINSET 10 365d 10-14-19 03-05-21
78 TRAINSET 11 352d 12-02-19 04-06-21
79 TRAINSET 12 334d 01-27-20 05-06-21
80 TRAINSET 13 325d 03-09-20 06-04-21
81 TRAINSET 14 317d 04-20-20 07-06-21
82 TRAINSET 15 310d 06-01-20 08-06-21
83 TRAINSET 16 285d 08-03-20 09-03-21
84 TESTING & STARTUP (JPB) 247d 09-10-21 08-22-22
85 PRE-REVENUE TESTING 63d 09-10-21 12-09-21
86 REVENUE OPERATIONS 180d 12-09-21 08-22-22
87 Revenue Service Date (RSD) w/out Risk Contingency 0d 12-09-21
88 Revenue Service Date (RSD) w Risk Contingency (JPB Target) 0d 04-22-22
89 Revenue Service Date (RSD) w/ Risk Contingency (FFGA RSD) 0d 08-22-22
90 RISK CONTINGENCY 256d 12-10-21 08-22-22
2014 2015 2016 2017 2018 2019 2020 2021 2022
Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1
Actual Level of Effort
Prog Plan (C16.00)
Last Months Update
Progress
Remaining
Near Critical
Critical
Start Milestone
Finish Milestone
Prog Plan (C16.00)
Last Months Update
Critical Milestone
Risk Contingency
Page 2 of 2
Filename: _C17.00 102218
Date Revision Checked Approved
Updates & Revisions Completed By A. Christofas
Checked By S. Iyer

Appendix F: Top Project Risks

Program Risk Register

Version Date: November 23, 2018 - Top Risks

	1	2	3	4	5
	LOW	MEDIUM	HIGH	VERY HIGH	SIGNIFICANT
Probability	< 10%	10% - 50%	50% - 75%	75% - 90%	> 90%
Cost	< $500 K	$500 K - $2 M	$2 M - $10 M	$10 M - $20 M	$20 M - $50 M
Schedule	< 1 Month	1 - 3 Months	3 - 6 Months	6 - 12 Months	> 12 Months

ID	RBS		RISK DESCRIPTION	EFFECT(S)	TYPE	IMPACT			PRIORITY	OWNER	MITIGATION ACTIONS	RETIREMENT DATE(S)	NOTES	A-C	STATUS & REMARK(S)
	FUNC. (P)	FUNC. (S)				PROBABILITY	COST	SCHEDULE	GRADING						
279	R Elect.	Construction	BBII may be unable to develop grade crossing modifications that meets stakeholder and regulatory requirements.	Crossing operations will not be acceptable to CPUC and FRA and therefore delay energization and commissioning.	T	5	4	5	45	DB/Signals	1. Develop solution under Allowance Item 1.d.1 Item # 10. 2. Advance speed check solution. 3. Coordinate solution with Operations. - Complete 4. Approve concepts on case-by-case basis. 5. Meet with FRA staff in Washington and Sacramento, CPUC, and UP. 6. Consider giving BBI approval for concept developed and sharing risk resulting from implementation. 7. Revise budget to achieve desired solution if needed.	Approval of Signal Design	Revised per Risk Assessment Committee - 11/7/2018		Relying on speed check solution. Operations needs to agree. Showed concept to FRA and they verbally don't have an issue. Met with staff in DC. Have not met with Regional FRA or CPUC. Responding to FRA with BBI information. Regional meeting in Sacramento. Allowance ("$5 million) problem is $50 million. - C. Lynch 6/4/2018
223	Elect.	Contracting	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. Rework resulting in cost increases and schedule delays	T	4	5	4	36	Moore	Routinely meet with PTC, capital projects, Balfour. Identify interfaces and resolve issues through specialized working groups.	Revenue Service Date	Risk #264 was retired and incorporated into this risk per Risk Assessment Committee - 5/9/2018		Convened meetings with configuration manager and configuration team. BBII not clear on how far in advance of signal cutover will PTC need to make their corresponding change; both cutovers must occur simultaneously. Establishing what needs to be delivered to configuration manager and when. PTC has priority over PCEP. Risk increases for PCEP. - J. Moore 11/14/2018
242	Elect.	Construction	Track access may not meet expectations contributing to a prolonged construction schedule.	Contractor claims for delays, schedule delays and associated costs to owner's representative staff.		4	3	3	24	Guan	Develop a Comprehensive and multi-faceted program to increase track access for contractor that avoids impacts to daily train operations. Actions to be considered include: • Additional weekend work • Weekend shutdowns • Accepting additional claims for abbreviated work windows • Bus bridges • Additional contractor resources (e.g., additional potholing equipment) • Changes to scheduled meets • Negotiate impact of construction operations on TASI bonus payments.	Completion of Construction			Work windows are being revisited on a Segment by Segment basis to more accurately reflect restriction in Operation. Additional potholing rigs has also been added to improve productivity of potholing. Work windows are continuing to be reviewed to assess potential changes to the work windows available in the RFP. Project team is also breaking down current TAD data to categorize different areas of delays in attempt to mitigate each specific areas of delay. Also working actively with Operations for solutions to decrease delays experienced in the field. - Lin G. 11/8/2018
287	Elect.	Construction	Potential that modifications to the PTC database and signal software are not completed in time for cutover and testing.	Failure to follow the DB Management process will result in major interruption to train service, possible violations and fines from FRA and overall capital projects delay.		4	2	4	24	Moore	1. Follow Caltrain's Database Management process for any changes associated with Electrification that may affect the PTC database. 2. Early identification to assure sufficient time. 3. Continuing meetings between PCEP, PTC, and configuration manager to facilitate coordination.	Completion of Construction	Reassigned to J. Moore per Risk Assessment Committee - 8/29/2018		PTC intends to request from FRA for "alternate schedule" extension through the end of 2020. - J. Moore 11/14/2018
298	R Elect.	Construction	Changes to PTC implementation schedule could delay completion of the electrification work. Cost and schedule of BBII contract could increase as a result of change in PTC system	1. Changes in datafiles could affect what Balfour provides; could delay timing for testing; could change books that FRA had to review. 2. Full Integrated testing between EMU and wayside cannot be conducted without PTC in place. 3. Delays to completion of signal system could result in conflicts with PTC testing and PCEP construction and integrated testing. 4. Potential for track access impacts due to PTC testing.	T	3	3	3	18	Lynch	1. Changes in datafiles could affect what Balfour provides; could delay timing for testing; could change books that FRA had to review. 2. Full Integrated testing between EMU and wayside cannot be conducted without PTC in place. 3. Delays to completion of signal system could result in conflicts with PTC testing and PCEP construction and integrated testing. 4. Potential for track access impacts due to PTC testing.	Completion of Integrated testing	Risk divided into JPB risk and D/B risk per Risk Assessment Committee - 2/27/2018		Risk divided into JPB risk and D/B risk per Risk Assessment Committee - 2/27/2018 PTC project will begin testing this summer and the goal is to get a Revenue Service Demonstration section of about 10 miles in Segment 3 in service.
209	Elect.	Construction	Number of staff requested of TASI may be insufficient	• Testing delayed. Additional construction costs. • Change order for extended vehicle acceptance.	T	2	4	4	16	Guan	1. Communicate staffing requirements for track protection with TASI. - Complete 2. Revise language in TASI contract to clearly describe required support for EMUs and electrification. - Complete 3. Discuss TASI resource requirements associated with bids by leading contractor or contractors with TASI management. - Complete 4. Maintain ongoing dialogue with TASI regarding requirements of contractors. - In progress 5. Issue advance notice to TASI to enable them to adjust to changes in the construction schedule. 7. Build into TASI budget for signal maintainers and flagging for next contract year. - Complete	Completion of Integrated Testing	Reassign to L. Guan - 6/18/2018		Due to the number of different site conditions encountered, additional crews have been added to mitigate schedule impacts, but will likely result in an increase in TASI personnel needed. Increase in number of personnel has not resulted in additional TASI costs. Likely that cost will ultimately be exceed but cannot determine impact until completion of TTA #2. No updates. Staff is currently reviewing the anticipated TASI manpower due to the increased amount of change related work. - Lin G. 11/12/2018

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Program Risk Register

Version Date: November 23, 2018 - Top Risks

	1	2	3	4	5
	LOW	MEDIUM	HIGH	VERY HIGH	SIGNIFICANT
Probability	< 10%	10% - 50%	50% - 75%	75% - 90%	> 90%
Cost	< $500 K	$500 K - $2 M	$2 M - $10 M	$10 M - $20 M	$20 M - $50 M
Schedule	< 1 Month	1 - 3 Months	3 - 6 Months	6 - 12 Months	> 12 Months

ID	RBS FUNC. (P)	RBS FUNC. (S)	RISK DESCRIPTION	EFFECT(S)	TYPE	IMPACT: PROBABILITY	IMPACT: COST	IMPACT: SCHEDULE	PRIORITY: GRADING	OWNER	MITIGATION ACTIONS	RETIREMENT DATE(S)	NOTES	A-C	STATUS & REMARK(S)
240	Elect.	ROW	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		3	2	3	18	Fitzpatrick	1. The delivery date of each parcel to date work is listed as starting in the segment and work area in which the parcel is located 2. Select time to initiate eminent domain proceedings to avoid delay. 3. Attempt to negotiate right-of-entry or possession and use agreement.	Completion of foundation construction for all segments.	Added to Risk Register per Risk Refresh - 7/12/2016		PG&E site, Central Concrete site, and Willowbend sites need more design to establish land requirements. Time for establishing required property tied to full segment and not specifically these parcels. - B. Fitzpatrick 6/1/2018 No change. - B. Fitzgerald 8/27/2018 All identified parcels have been acquired. Some design changes necessitate new acquisitions. Developing a process to identify and acquire properties. Meeting with BBI weekly. Regraded to increase probability from 2 to 3. - B. Fitzpatrick 11/6/2018
298	R	Elect.	Construction	Contractor may not be able to complete tunnel work within contractual requirement to complete within the 20 scheduled weekends due to the extent and complexity of the work and need to coordinate civil/structural work with electrical work. • Contractor may not be able to complete notching and grouting work during 24 weekend shutdowns • Notching work could adversely effect radio communication equipment in the tunnels, solution to avoid impact may not be developed in time to implement. • Extent of grouting is unknown and work could require more grout than was initially budgeted. • Presence of bio-hazards and homeless population around the tunnels could interfere with the project.	Delays to completion of construction and associated claims costs.	T	3	3	2	18	Neff	1. Tracking progress in advance of the 20-weekend work. 2. Tracking progress on work during 20 weekends. 3. Address prohibitions on certain weekends and keep contractor informed. 4. Advance work during non-revenue periods to compensate for delays in construction progress.	Completion of Tunnel Contract	Revisit retirement date at conclusion of design of Segment 4 to address any financial remuneration from UP.		Negotiated a contract with Proven. BBI to do electrification portion. Asking BBI for cost to give estimate for contact rail. Proven is comfortable with their schedule. BBI is looking for more weekends. - C. Lynch 7/9/2018 Revised risk description per Risk Assessment Committee - 10/24/2018 The notching and grouting work is mostly on schedule at this point. Mohamed and I both agree that the higher risk is the track and drainage work. We have a solution for nearly all locations; will likely result in change orders (differing site conditions, conflicts, etc.). PM1/DTDB's current plan is to protect in place. So far, there has not been significant enough notching to confirm the potential severity of this risk. Thankfully, the contract clearly states that the Contractor is responsible to protect it. Grouting is getting close to completion (Tunnel 3 remains). Tunnels 1 & 4 had less grout volume than the contract amounts, which decreases the project costs for those tunnels. This is definitely a risk and has caused some concerns in the first few weeks. We're getting more positive feedback as we move through each shutdown. - J. Neff 11/6/2018
302	R	EMU	Physical Site	May not have a 110-mph electrified section of track that will be ready for testing for final acceptance of vehicle.	Contract with Stadler implies readiness of Electrification Project and track upgrades for EMU testing Delays in testing may increase Caltrain costs.	T	3	2	3	18	Landell	1. Use Pueblo test track. 2. Use Denver for testing...no longer being considered 3. Defer testing until 110 mph test track is completed on property.	T1-Breaking Performance / Propulsion Design Tests	Added to Risk Register per Risk Assessment Committee - 6/8/2018 Regraded based on updated information and alternative scenario - A. Brick-Turin/L. Lareno 8/9/2018		Intent to perform testing at TTCI in Pueblo, CO solidifies and draft Change Requests in development -R. Landell 10/11/18 Changes noted under effects and mitigations. - A. Brick-Turin 11/13/2018

Appendix G: PMOC Team

The report was prepared by the Task Order Manager, **Mike Eidlin**, J.D. (KKCS) who has more than 40 years of complex project management experience including over 26 years in transit. Mr. Eidlin possesses a B.S. degree, a graduate Degree of Engineer, and a Juris Doctor degree. He is a licensed attorney in the State of Oregon. He has been working as a PMOC for 14 years.

Brett L. Rekola, **P.E. (KKCS)**, contributed to the preparation of the report and provided the Quality Assurance of the report. Mr. Rekola is the Program Manager for KKCS' FTA PMOC prime contract. He is a California professional civil engineer with more than thirty (30) years of experience managing railroad maintenance, planning, and design, construction, and rail operations. He has served as a program manager delivering port/rail/public works projects and programs.

Nancy Voltura (KKCS), assisted with the report. Ms. Voltura has over forty (40) years of Quality Assurance (QA) experience working as a QA Engineer, QA Auditor and QA Manager on large design and construction projects. Ms. Voltura is a trained Apparent Cause Analyst evaluating heavy construction quality issues, is a trained professional QA Auditor and has been a certified Lead QA Auditor per ASME/NQA-1 and N45.2.23 standards.

Kevin Byers, P.S.P. (KKCS) assisted with the report. He is KKCS' Project Scheduling Manager, holds a B.S. degree in Construction Management, and has 26 years' experience in scheduling and claims analysis for railroad and rail transit projects.

The administrative Quality Control review of this report was done by **Janice Johnson, (KKCS)**, who also serves as the Contracts & Terms Manager. Ms. Johnson has a background in English Studies and over twenty (20) years of experience providing quality review checks of PMOC work products.