

## Quarterly Monitoring Report – September 2019

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

November 4, 2019

PMOC Contract Number: DTFT60-14-D-00018  
Task Order Number: 005  
Project Number: DC-27-5346  
Work Order Numbers: 08 and 09  
OPs Referenced: 25 - Recurring Oversight and Related Reports  
01 - Administrative Conditions and Requirements

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## **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 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. The initial EMU order was supplemented in December 2018 when the JPB exercised an option to purchase an additional 37 EMUs; the resulting fleet will consist of nineteen (19) seven-car trainsets. The additional 37 EMUs are not part of the JPB's Core Capacity grant. Caltrain's Central Equipment Maintenance and Operation Facility (CEMOF) is being 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 is being constructed primarily in the existing Caltrain corridor on rights-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 project is in construction. The Full Funding Grant Agreement (FFGA) was executed on May 23, 2017; the Final Completion Date is August 22, 2022.
- *The JPB awarded its final major construction contract to ProVen Management, Inc. for modification of its CEMOF, and issued a full Notice to Proceed (NTP) on September 16, 2019. Proven's work is expected to take approximately seven (7) months, after which Balfour-Beatty Infrastructure, Inc. (BBII) will install the Overhead Contact System (OCS) in the CEMOF yard.*

- PG&E is constructing the improvements at its FMC and East Grand substations to provide permanent power to TPSS #2 and TPSS #1, respectively. *The FMC substation has already been modified to provide interim power to TPSS #2 for testing purposes. Construction of the interconnection between FMC and TPSS #2 has been slightly delayed by procurement and PG&E subcontractor manpower issues and is now expected to be completed in late-April 2020.*
- The JPB has procured an additional 37 EMUs from Stadler using a contract option; this will result in an initial electrified fleet of nineteen (19) seven car trains. This action will 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 September 23-25, 2019.*

### C. Core Accountability Information through July 2019

<b>FFGA Core Accountability Items</b>			
Project Status: <b>In Construction</b>		Original at FFGA	Current Estimate (EAC) <sup>1</sup>
Cost	Cost Estimate	\$ 1,930,670 934	\$ 1,930,670 934
Contingency	Unallocated Contingency	\$152,913,317	\$89,393,137
	Total Contingency (Allocated plus Unallocated)	\$315,533,611	\$183,841,653
Schedule	Final Completion Date	August 22, 2022	August 22, 2022
		Amount (\$)	Percent
Planned Value to Date <sup>2</sup>	Total budgeted cost of work scheduled to date <sup>3</sup>	\$872,812,287	45.21%
Earned Value to Date	Budgeted cost of work completed to date, i.e., actual total value of work earned or done <sup>3</sup>	\$525,503,792	27.22%
Actual Cost <sup>4</sup>	Total cost of work completed to date (actual total expenditures) <sup>3</sup>	\$694,312,729	35.96%
		Amount (\$)	Percent
Contracts	Total contracts awarded to date <sup>4</sup>	\$1,600,722,761	85.11%
	Total construction contracts awarded to date <sup>5</sup> (construction & vehicle contracts only)	\$1,410,890,265	75.02%
	Physical construction work completed <sup>6,7</sup> (amount of construction contract work actually completed)	\$487,034,029	34.52%
Major Issue	Status	Comments/Actions/Planned Actions	
<i>Contractor Claims</i>	<i>The Electrification contractor has now submitted a total of four</i>	<i>The JPB has issued a Change Notice that eliminates the Dispute Review Board</i>	

	<i>claims; the most significant claim is associated with its efforts to provide Consistent Warning Time (CWT) at grade crossings. Other claims include denial of a Design Variance Request for alternate feeder and contact wire; percent of payment for CWT under Allowance Item #10; and costs for an alternate designer for Segment 1A.</i>	<i>(DRB) as a dispute resolution process and substitutes a technically facilitated mediation process. The Electrification contractor has criticized this action.</i>
Unresolved Schedule Impacts	The JPB is evaluating the Electrification contractor's Time Impact Analysis (TIA) for changes to the grade crossing warning system. The TIA and related documents allege a delay of 1,092 days. This delay is independent of delays associated with impacts to OCS foundation construction from differing site conditions; however, the two types of delays are not necessarily additive.	<i>The JPB and the Electrification contractor are discussing how to proceed to resolve the schedule related issues.</i>  <i>The JPB's most recent Monte Carlo schedule risk assessment projects a potential delay to the FFGA Final Completion Date at the p70 level. The formal report on this work has not been released.</i>
Technical Capacity and Capability	The System Integration Lead is only part-time and needs assistance.  Rail Operations has not hired an individual to be responsible for the new fleet of EMU vehicles.	Systems Integration is ranked #5 on the PCEP Risk Register.  <i>The JPB has hired an additional 2 FTE's to address this concern.</i>
OCS Construction Progress	Progress continues to be impacted by in-ground obstacles, causing redesign of some pole locations and inefficient foundation construction. <i>The contractor suspended foundation construction for two (2) weeks in August 2019 claiming insufficient cleared locations were available for efficient production. 3,154 foundations are required; 78 were completed through 9/22 for a total of 1,205.</i>	The JPB continues to meet weekly with the contractor on the progress of potholing and foundation construction. <i>These efforts have had some beneficial impact on productivity. Additional potholing resources may be required to sustain improved productivity.</i>  Various elements of OCS construction are now active in all four (4) Segments.
Consistent Warning Time (CWT) for Grade Crossings	The Electrification contractor is moving forward with design using a dual speed-check solution which apparently will satisfy FRA and CPUC requirements.	<i>The JPB and its contractor met with the FRA and the California Public Utilities Commission (CPUC) on August 8, 2019, and held a follow-up meeting on September 19, 2019. The Federal Railroad Administration (FRA) requested a test plan for a complex, multiple crossing installation such as San Jose. FRA still needs to decide if the proposed CWT solution is "new and novel</i>

		<i>technology;" a HQ decision is expected soon.</i>
Systems Integration and Testing	<p>A number of complex Systems Integration issues are currently unresolved, including:</p> <ul style="list-style-type: none"> <li>• Lack of a grade crossing cutover plan.</li> <li>• Potential changes to the communications system.</li> <li>• Impacts from the JPB's PTC activities on the cutover of signal and grade crossing systems.</li> </ul>	<p>The JPB holds bi-weekly systems integration meetings which include the contractor and rail operations. The entire Caltrain corridor is now under configuration management for Positive Train Control (PTC) purposes, led by a member of the Rail Operations staff in the JPB's San Carlos office. <i>PCEP has identified John Moore as the single point of responsibility for systems integration at the PCEP level.</i> The PMOC continues to recommend additional resources for this vital activity.</p>
Date of Next Monitoring Visit:		<i>TBD – December 2019</i>
Date of Next Quarterly Review Meeting:		<i>October 8, 2019</i>

**Core Accountability Table Footnotes:**

- <sup>1</sup> Current estimate is the remaining balance which includes known change orders that will draw from Contingency funds, both Allocated and Unallocated.
- <sup>2</sup> 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.
- <sup>3</sup> Work is defined as construction or manufacturing by Balfour Beatty, Stadler, PG&E, CEMOF, Tunnel Modification, and other Required Projects.
- <sup>4</sup> Percentage is calculated based on a project value of \$1,930,670,934.
- <sup>5</sup> Total construction contracts awarded to date (construction & vehicle contracts only) includes design costs and executed change orders.

**D. Major Problems and/or Issues**

- *The Electrification contractor has now submitted a total of four claims; the most significant claim is associated with its efforts to provide CWT at grade crossings. Other claims include denial of a Design Variance Request for alternate feeder and contact wire; percent of payment for CWT under Allowance Item #10; and costs for an alternate designer for Segment 1A. The JPB, in response to the contractor's failure to follow the contractually required dispute elevation process, has issued a Change Notice that eliminates the Dispute Review Board (DRB) as a contractual dispute resolution process and substitutes a technically facilitated mediation process. The Electrification contractor has criticized this action. The JPB and the Electrification contractor are discussing and negotiating the various claims and also how to proceed to resolve the schedule related issues.*
- Two (2) major technical problems, the slow progress on OCS foundation construction, and the implementation of Consistent Warning Time (CWT) for grade crossings, have continued to impact the Electrification contract schedule for many months. *The Electrification contractor's most recent Schedule Update Narrative for August 2019 shows a Substantial Completion date of July 4, 2022, compared to the contractual date of August 10, 2020. The JPB has rejected the Electrification contractor's monthly schedule update and is carrying a substantial completion date of December 31, 2021 in its comparable Master Project*

*Schedule.* The PMOC remains concerned that the JPB does not have sufficient scheduling resources to review and analyze the contractor's most recent TIA and the associated claim while providing timely support to other project management activities.

- The JPB continues to move forward with its solution to provide Consistent Warning Time at grade crossings following electrification of the project. *The JPB and its contractor met with the Federal Railroad Administration (FRA) and the California Public Utilities Commission (CPUC) on September 19, 2019. The FRA requested test plans for the complex crossing situations (several interrelated crossings); the test plans should be submitted to the FRA in mid-October. The next meeting was tentatively scheduled for November 14, 2019 at the PCEP offices in San Mateo. The contractor is proceeding with the design of selected crossings using the dual speed check approach. The FRA must still issue its determination as to whether the proposed solution is “new and novel technology,” in which case additional steps may be required.*
- Construction of the Overhead Contact System (OCS) is far behind initial projections due to encountering numerous obstructions in planned pole locations. Foundation construction, which controls the ultimate pace of the program, improved in late Spring 2019 after the JPB loosened restrictions on work in adjacent work areas. *Unfortunately, the contractor again halted foundation installation for two (2) weeks in August 2019 claiming there were insufficient cleared holes for efficient continuous progress.* The JPB continues to use a more focused approach involving weekly small group meeting on specific topics to facilitating prompt action.
- The PMOC remains concerned that the Contractor has not implemented procedures and processes to verify that the train clearance envelopes are preserved during the construction phase of the project, nor is there an intermediate catenary and appurtenance maintenance plan in place to ensure that a catenary component does not come loose and create a clearance issue. This issue has been brought to the Sponsor's attention on several occasions.
- The JPB established a system to reconcile responsibility for track access delays (TAD) and compute the associated costs. The prompt reconciliation and resolution of track access delays and the resulting costs continues to be a challenge. The JPB has not completed reconciliation of track access delay costs for 2018 or later, but the unreconciled numbers keep rising as the contractor's crew sizes increase. *The JPB has allocated additional resources to review the contractor's payment requests. The JPB did not achieve its goal of finalizing all TAD costs through the end of 2018 by September 30, 2019.*
- *The JPB's Rail Operations group has entered the Revenue Service Demonstration (RSD) phase with its PTC system. Few problems are being encountered; however, the possibility remains that PTC issues may affect rail operations, resulting in track access or other impacts to the Electrification contractor.*
- The PCEP team is still acquiring the real estate needed for the project. The refinement of the design for the overhead contact system (OCS) as a result of pole shifts, and some modifications to the traction power system (TPS) has resulted in the creation of some new parcels and modifications of other parcels. Timely acquisition of ROW has recently been elevated to medium on the PCEP's risk register.

## **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, implementation of the dual speed check 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 participated in a Schedule Workshop with the PCEP team on September 24, 2019 and is awaiting the final results of the analytical work currently underway. The PMOC will apply additional resources when a definitive schedule and/or an acceptable TIA is available from the JPB.*
- The PMOC will continue to monitor the JPB's Systems Integration activities and the development of its Rail Activation Plan (RAP). *The PMOC is reviewing an outline of the RAP and a preliminary critical path schedule provided by the JPB.*
- *The PMOC is reviewing the JPB's updated Project Management Plan, Rev. 2 (PMP); Project Controls Plan, Rev. 2; Document Control Plan, Rev. 1; Safety and Security Management Plan (SSMP), Rev. 5; Risk Identification and Mitigation Plan, Rev 2A; and several supporting procedures.*

**2) Table of Contents**

**Executive Summary ..... i**

**A. Project Description..... i**

**B. Project Status ..... i**

**C. Core Accountability Information through July 2019 ..... ii**

**D. Major Problems and/or Issues ..... iv**

**E. Monitoring Plan Items ..... vi**

**2) Table of Contents..... vii**

**3) Significant PMOC Observations.....1**

**A. Project Status .....1**

Environmental Process ..... 1

Support Services and Design..... 1

Concurrent Non-Project Activities: ..... 2

Value Engineering (VE): ..... 3

Procurement – Executed Contracts and Changes ..... 3

Project Delivery ..... 5

Real Estate Acquisition ..... 9

Third-party Agreements and Coordination..... 10

**B. Project Management Plan (PMP) and Sub-Plans .....13**

**C. Project Management Capacity and Capability .....14**

**D. Project Cost.....14**

**Project Schedule .....17**

**E. Quality Assurance / Quality Control (QA/QC) .....21**

**F. Safety and Security.....22**

**G. Americans with Disabilities Act (ADA).....22**

**H. Buy America .....23**

**I. Vehicles.....23**

**4) Project Risk and Contingency .....24**

**5) Discussion of Monitoring Plan Items.....25**

**6) Action Items .....27**

**Appendix A: List of Acronyms ..... A-1**

**Appendix B: Safety and Security Checklist .....B-1**

**Appendix C: Project Map ..... C-1**

**Appendix D: PCEP Organization Chart ..... D-1**

**Appendix E: Summary Project Schedule.....E-1**

**Appendix F: Top Project Risks .....F-1**

**Appendix G: PMOC Team..... G-1**



### 3) **Significant PMOC Observations**

*This monitoring report covers the period from June 6, 2019 through September 25, 2019. This report contains information obtained during the on-site monitoring visit September 23-25, 2019, 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 received notification from the FTA in July 2019 that its environmental re-evaluation of the relocation of both PS-2 and PS-3 was approved.*

##### **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:

- *Providing design support during construction of the CEMOF modifications. A full NTP was issued to the contractor on September 16, 2019.*
- *Participated in an FRA Compliance Review of the EMU design conducted in Stadler's Salt Lake City (SLC) facility on September 10 – 11, 2019.*
- *Fourteen (14) final design reviews of the eighteen (18) major systems have been completed. The remaining four (4) reviews are conditionally approved and scheduled for completion in late 2019 and early 2020.*
- Continue to support the JPB in discussions with the FRA on EMU compliance issues.

**Electrification Services:** 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 also provided design support during construction (DSDC) for the Tunnel Notching contract and will resume that role when work to install the OCS in the tunnel resumes in late 2019.

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

- Providing design 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 Union Pacific Railroad (UPRR), FRA and the CPUC. *Although the dual speed check technical solution to the CWT issue has been generally approved, the FRA has stated that it will determine whether this is “new and novel” technology. The CWT issue continues to impact BBII’s schedule for signal system design and installation because design is only progressing on a few selective crossings.*
- Supporting discussions and negotiations with BBII related to various change orders.
- *Construction management (CM) activities by the Electrification Services team has ended. This work is now being performed by the Jacobs Project Management Company as the new CM contractor.*
- Participating in weekly meetings with the JPB’s PTC management team.
- Providing oversight and direction to Aeronautical Radio, Incorporated, (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’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, ARINC, and ProVen.

#### **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:

- *TPSS-2 Pole Relocation (Design): Design changes due to the relocation of the Santa Clara Valley Transportation Authority (VTA)/ Bay Area Rapid Transit District (BART) Pole at TPSS-2 location. This scope is funded by the VTA.*
- Design of the relocation of PS-3 in Burlingame to avoid a future conflict with the Broadway Grade Separation Project (BGSP). The BGSP will pay for the cost of this PCEP work.
- *Drainage improvements for tunnels 1 and 4 in Segment 1: This work is complete and was included in the Tunnel Notching and Drainage Improvements contract awarded to ProVen.*
- 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 October 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 December 2019.
- OCS foundations, as part of the Los Gatos Bridge project in Segment 4: This work is complete.

### **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. No additional construction contracts are planned following the recent award of the CEMOF Modification contract.

**Electrification:** The electrification of the corridor is being performed using a design-build 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 approximate amount of \$3,026,000 since June 2019. The COs cover Design of the Relocation of PS-3; Additional Potholing; Sheriff Support; Partial Payment for Track Access Delays in Q1 of 2018; Slot Drains at the CEMOF; and Field Orders for Signal Cable Relocation.*

**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 a change order (CO) to Stadler in late June 2019 in the amount of \$3.2 million for testing of the first EMU at the Transportation Test Center, Inc (TTCI) in Pueblo, Colorado, and a CO for \$400,000 in August 2019 for the production of a Virtual Reality Experience.*

**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, OCS Installation 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 (2) 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 were performed as a Concurrent Non-Project Activity (CNPA) and was paid for by Caltrain. The JPB issued a Notice to Proceed to the contractor on October 6, 2018.

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 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 locomotives arrived at Amtrak's yard in Oakland, CA, on June 6, 2019, and have been prepared for long term storage until needed for testing of the electrified system.*

**CEMOF Modifications:** The JPB awarded a contract to ProVen Management, Inc. in the amount of \$6,550,777 to modify the Central Equipment Maintenance and Operations Facility (CEMOF) to accommodate the new EMUs. The CEMOF contract is the last of the PCEP's major construction contracts. *ProVen was issued a full Notice to Proceed (NTP) on September 16, 2019.*

**Consultant Contracts:** The JPB is continuing to process work directives for its pre-existing consultant contracts for the FY 2020 period. The JPB has completed negotiating with Jacobs for its initial CM work directive.

**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. The JPB approved award of a \$17 million, five-year contract to Jacobs Project Management Company (Jacobs) of Oakland, CA, at its April meeting. Jacobs will also perform the construction management activities that are currently being performed by Gannett Fleming under its Electrification Services contract.

**Upcoming Procurements:** *The JPB has initiated the procurement process for a Pantograph Inspection System to be installed at the CEMOF. The JPB is also planning to conduct Independent Cost Estimate (ICE) and Cost or Price Analysis training for early December in response to the recent FTA triennial review, although no deficiencies were found for PCEP activities.*

## 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 an LNTP on September 6, 2016, which 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 and Traction Power System (TPS) design in all Segments.
- Work continues to address Caltrans' requirements for bridge protection barriers.
- *The Electrification contractor has proposed a dual speed checks solution to provide CWT at grade crossings. This solution has been agreed to by the JPB, the UPRR, the FRA, and the CPUC, subject to verification of its effectiveness. The JPB and its contractor met with the FRA and the CPUC on September 19, 2019. The FRA requested test plans for the complex crossing situations (several interrelated crossings); the test plans should be submitted to the FRA in mid-October. The next meeting was tentatively scheduled for November 7, 2019 at the PCEP offices in San Mateo. The contractor is proceeding with the design of selected crossings using the dual speed check approach. FRA Headquarters will issue its determination of whether the proposed solution is "new and novel technology," and therefore, requires additional steps prior to its acceptance. The JPB is continuing to hold weekly meetings with the contractor, similar to the weekly pothole/foundation meetings, in an effort to improve the overall performance of this critical activity.*

The Electrification contractor has been reporting a delay to its substantial completion date for many months based on its alleged inability to begin work on the grade crossing warning system as planned in its baseline schedule. The delay has been day-for-day. The contractor submitted a delay claim on behalf of its signals' subcontractor; the material submitted stated in part "[a]t this juncture MRS estimates that the cost associated with this issue, to include but not limited to, indirect cost, direct cost, materials, escalation, contingency, risk, and delays is \$76,223,166, which includes 1,092 days in delay costs associated with the project duration being extended." Shortly thereafter, the Electrification contractor submitted its TIA for the delays associated with the CWT issue. The transmittal letter for the TIA presented a Change Order Cost Proposal in the amount of \$239,550,209 consisting of \$71,882,763 in Direct Costs and \$167,667,445 in Delay Costs. The time impact presented in the letter is 1,092 calendar days, made up of 224 calendar days associated with Change Order No. 41 (the 5 MPH Solution) and 868 calendar days to perform the added scope or work. **[PMOC Note:** Prior to the development of the dual speed check solution, the contractor had been working on an approach which would have used a series of detectors to provide warning time based on train speeds in 5 mph increments. *Change Order No. 41 was issued to the contractor for the direct cost of that work. The amount of the subcontractor's claim mentioned above is included in the Change Order Cost Proposal. The JPB has denied the contractor's claim. The JPB also initially rejected the TIA for lack of sufficient detailed information, but is proceeding with a detailed review of the document.*

*The TIA process is the first step in determining whether the contractor suffered a delay, who is responsible for the delay, whether there are offsetting delays, and whether the delay is excusable and/or compensable. Once the circumstances are determined, there may be opportunities to mitigate schedule impacts by a variety of techniques.*

- *Potholing of OCS foundation locations is now active in all Segments, but activity is concentrated in Segments 3 and 4. Potholing continues to encounter a significant number of underground conditions, which slow progress. The JPB's Construction Management team continues to issue Field Orders to remove the obstacles and review whether the contractor is entitled to additional compensation. Potholing is required for OCS poles, traction power facilities, and signal ductbank and wayside power cabinets (WPCs). The JPB is now holding weekly meetings with the Electrification contractor, focused specifically on potholing and utility location and relocation activities. The PCEP team and the contractor have developed various check lists and reports to assist them in this activity. A significant amount of potholing activity remains despite the large number of potholes already completed.*
- *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) station; this conflict has now been resolved.*
- *The Electrification contractor submitted a Design Variance Request (DVR) in 2017 to substitute alternative products for the specified Autotransformer Feeder (ATF) Wire and Static Wire used in the OCS. This wire is slightly different in dimension than the wire specified in the contract. The JPB reviewed the request in 2017, but never took the formal action required to approve the request. The JPB recently rejected the DVR. The contractor requested reconsideration of the rejection, which has been denied. The contractor does not agree with the JPB's position on this matter and has submitted a claim for resolution.*
- *The JPB's Rail Operations group has imposed a moratorium on changes to the current signal system points list while it works through the early stage of Revenue Service Demonstration of the PTC system. This moratorium limits some aspects of design on the SCADA system, including testing, but the work does not appear on the project's critical path.*

Construction Activity: The JPB provided the following report on construction activity. Table 1 below presents the status of construction of OCS foundations and erection of OCS poles in the different Segments and Work Areas:

- Continued to install OCS foundations in Segment 3 and 4 both on and off track.
- Continued to install OCS poles, identification plates, down guys, and balance weights in Segment 2.
- Begin OCS pole installation in Segment 4.
- Continued to install OCS wires in Segment 2.
- Continued to install form and rebar and high-voltage cable at TPS-2 (Segment 4).
- Continued to install ductbank and manholes, transformer accessory fit-up, and form and rebar work at TPS-1. (Segment 2)

- Delivered PG&E metering devices to both TPS-1 and TPS-2 (Segments 2 and 4).
- Continued to install ductbank and manholes at PS-6 (Segment 3).
- Continued grading work at PS-7 (Segment 4).
- Continued to install ductbanks and manholes at SWS-1 (Segment 3).
- Continued to install signal ductbank and conduits at Control Point (CP) Shark (Segment 4), CP Ralston (Segment 2), and CP Dumbarton (Segment 2).
- Continued signal equipment kit installation at CP Michael (Segment 4).
- Continued drilling of rails for impedance bond connections in all Segments at various control points and crossings.
- Continued installation of insulated joints (IJs) corridor wide.
- Continued installation of bridge attachments in Segment 2.
- The JPB and BBII are holding Executive Partnering meetings in an effort to improve overall progress and reduce conflicts related to the project; these meetings are in addition to the regular partnering meetings. *The most recent session was held the week of September 16, 2019.*

**Table 1 – OCS Construction Progress (September 30, 2019)**

Segment	Work Area	Foundations			Poles		
		Required <sup>1,2,3</sup>	9/1-9/30	to Date	Required <sup>2</sup>	9/1-9/30	to Date
1	<b>Tunnels</b>	32	0	32	32	0	0
	<b>A</b>	309	0	0	259	0	0
	<b>B</b>	237	0	0	177	0	0
2	<b>5</b>	243 <sup>3</sup>	0	184	208	0	160
	<b>4</b>	314	0	243	253	0	186
	<b>3</b>	174 <sup>3</sup>	0	60	140	0	36
	<b>2</b>	248	0	78	205	0	54
	<b>1</b>	206	0	79	154	0	26
3	<b>2</b>	514	0	0	442	0	0
	<b>I</b>	390	70	353	311	0	0
4	<b>A</b>	244	53	161	180	46	46
	<b>B</b>	131	0	70	124	20	47
	<b>CEMOF</b>	112	0	0	102	0	0
<b>Total</b>		<b>3154</b>	<b>123</b>	<b>1250</b>	<b>2587</b>	<b>66</b>	<b>555</b>
<sup>1</sup> Foundations required do not match poles required as guy foundations are needed in some locations for extra support.							
<sup>2</sup> The number of required poles and foundations fluctuate due to design changes.							
<sup>3</sup> 55 foundations in S2WA5 will be installed by South San Francisco and 64 foundations in S2WA3 will be installed by 25th Avenue.							

**SCADA Contract**

- *The SCADA contractor submitted its formal schedule for review by the JPB.*
  - *Worked on development of test procedures (ongoing).*
  - *Submitted 23 test procedures for JPB review.*
- **PMOC Observations:** *Caltrain’s entry into the Revenue Service Demonstration (RSD) phase for its new Positive Train Control (PTC) system is a major milestone. There have been few impacts to the PCEP as a result of*

*PTC testing, and hopefully this trend continues. The JPB did not achieve its goal of finalizing all Track Access Delay (TAD) costs through the end of 2018 by September 30, 2019. The JPB is re-evaluating some of the earlier determinations in light of additional information and the estimated cost for 2018 - Q1 decreased significantly since the previous report. The JPB has not reviewed the hours of delay incurred thus far in 2019. 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. The following table shows the amount of track access delay incurred and the associated cost of delay. **Note that the responsibility for the delay, and therefore, the resulting cost to the project is unreconciled for all periods in 2018, and the cost of delay is unreconciled for 2017-Q4.***

**Table 2 – Potential Track Access Delay and Cost**

<b>Period</b>	<b>Track Access Delay Time (Hrs:Min)</b>	<b>Potential Track Access Delay Cost</b>
2017-Q4	277:04	\$909,510
2018-Q1	145:00	\$510,000
2018-Q2	277:40	\$1,108,388
2018-Q3	421:00	\$765,000
2018-Q4	441:00	\$1,495,000

- The JPB reports that it is working with Operations and Transit America Services, Inc. (TASI) to look at both front end and back end track access delays (TADs). This review has reduced front end delay from previous 40 - 50% to 12% in March 2019 and reduced back end delay from previous 20 - 30% to 16% in March 2019. The PCEP expects that the change to the adjacent track work rule will further reduce TADs, which should appear in April 2019.

**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 Communications Based Overlay Signal System (CBOSS) - Positive Train Control (PTC) contractor. The PMOC notes that this information is being captured in the Change Order logs being maintained by the JPB and reviewed by the Change Management Board (CMB). 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 the contractor avoid the areas and locations where the interferences have, or in the future occur. The JPB should consider initiating a back charge or other action to recover its extra costs as additional information is gathered. The PMOC notes that the FTA will not participate in costs associated with remediating the CBOSS-PTC fiber optic conflicts.



## **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 numerous 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 3 below as additional parcels. Potholing for OCS foundations, and follow-on construction work located outside of JPB owned right-of-way (ROW), require that the JPB acquire the property or an appropriate property right.

The JPB has revised its format for reporting real estate activities and is no longer providing tabular data in its monthly reports. The JPB continues to state that the contractor has not claimed any delays as a result of late delivery of required real estate. The real estate team has recently completed, or is conducting the following activities:

- *Sent updated First Written Offer (FWO) package to Willowbend (Segment 3).*
- *Staff reviewing potential new pole locations and providing feedback to the design team.*
- *Commenced appraisal for KB Homes.*
- *Working with property owners for Segment 3 and 4 to enable potholing.*

- *Reviewing parcel acquisition options for Marchese parcel (Segment 4) with the Santa Clara Valley Water District (SCVWD). Working with City of San Jose and Diridon Hospitality to finalize design.*
- *Actively working with Silicon Valley Power (SVP) in Segments 3 and 4 to de-energize and install foundations.*
- *Met with new property owner at former Tripp parcel (Segment 4) to resolve an encroachment in JPB right of way.*
- *Staff is actively working with PG&E and VTA to gain access to their properties (Segment 4) for potholing.*
- *Finalizing appraisal map for Britannia Gateway (Segment 1).*
- *Working with UPRR on encroachment permit and/or easement (Segment 4).*

**Status of Real Estate Activities**

The status of real estate activity is presented in Table 3 below.

**Table 3 – Real Estate Status (9-25-2019)**

Segment	No. of Parcels Needed <sup>1</sup>	Appraisals Completed	Acquisition Status	
			Escrow Closed <sup>4</sup>	Parcel Possession <sup>1</sup>
1	7 <sup>3</sup>	7	0	0
2	27	27	23	26
3	10	10	7	8
4	8 <sup>2</sup>	8	1	8
Additional Parcels	8	2	0	2
<b>TOTAL</b>	<b>60</b>	<b>54</b>	<b>31</b>	<b>44</b>

**Notes:**

1. Possession obtained either through acquisition of parcel, possession date in contract or Order for Possession through condemnation action.
2. Four (4) of the Segment 4 parcels are owned by PG&E.
3. All seven (7) parcels are owned by a single entity.
4. *The JPB no longer reports the status of escrow activity; the information was current as of May 1, 2019.*

- **PMOC Observations:** The progress of real estate acquisition continues to be slower than anticipated. Real Estate acquisition has not yet delayed the Electrification contractors ability to install foundations.
- 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 has executed all agreements except the one with the Town of Atherton (Segment 2), which is no longer being pursued. The Town of Atherton must issue traffic control permits 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, when such action is required, to acquire the real property rights located in the respective counties for the PCEP. The City and County of San Francisco (CCSF) has declined to approve an agreement for use of its eminent domain powers on behalf of the PCEP.

### 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. The JPB reports the following activities related to third-party utility work:

- Worked with all utilities on review of overhead utility line relocations based on the current design.
- Coordinated with PG&E and SVP on relocation and de-energization of parallel power facilities in Segment 3 to enable foundation construction and future pole installation.
- Continued to coordinate relocation by communication cable owners such as AT&T and Comcast.
  - **PMOC Observation:** The JPB continues to coordinate closely with the various utility companies, especially on near term conflicts with construction activities. *The JPB reported that it is again verifying the height of many third-party utility lines to avoid potential conflicts or accidental strikes.*

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 through 5 to that agreement. Supplement 4, which includes the cost of constructing the substation modifications, was fully executed on October 18, 2018. *The parties disagreed on the allocation of costs for the work, and following discussions between the parties, PG&E filed an application with the CPUC for a cost allocation plan. A hearing before an Administrative Law Judge is set for October 10, 2019 in San Francisco.*

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. *PG&E continues with the permanent modifications to both its FMC and East Grand Substations.* Design of the

interconnections between PG&E's FMC substation and TPSS #2 and PG&E's East Grand substation and TPSS #1 by the PCEP's Electrification contractor continues using a PG&E approved design consultant. Similarly, construction of the interconnects will be performed by the Electrification contractor, using a PG&E approved sub-contractor. *Construction of the interconnection to TPSS #2 has been delayed because the contractor had objections to the JPB's contract terms and conditions that took longer than anticipated to resolve. Although the commercial issues were resolved, the contractor has still not ordered the long-lead materials. The contractor also reports a shortage of qualified electricians due to PG&E's ongoing wildfire "hardening" activities in northern California.* 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 is the FTA's Certified State Safety Oversight Agency (SSOA) for the State of California, and also has responsibility for grade crossing safety in the state. The PCEP's proposed solution to providing Consistent Warning Time (CWT) 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 on the use of dual speed checks to provide CWT at grade crossings between the PCEP team, Caltrain's Rail Operations, the Electrification contractor, the UPRR and the FRA. This agreement is subject to demonstrated safe operation of the crossings. *The JPB and its contractor met with the FRA and the CPUC on August 8, 2019, and held a follow-up meeting on September 19, 2019. The PCEP's Electrification contractor submitted a test plan to the FRA and that plan is under review. The FRA requested a test plan for a complex, multiple crossing installation such as San Jose. The JPB has begun filing General Order (GO) 88B forms for each modified crossing for approval by the CPUC and the CPUC has approved four (4) crossings.* The FRA does not approve the crossings, but has both regulatory and enforcement authority if the crossings do not perform as required by its regulations.

#### 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.

The JPB received a letter from the UPRR, dated January 16, 2019, in which the railroad stated that it does not oppose the JPB's plan to provide CWT, as long as the JPB complies with the CPUC and other regulatory requirements. This letter cleared the way to move forward with final regulatory approvals.

### 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's 2018 Business 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 recently released the staff-recommended preferred alternative to the public for comment. The CHSRA Board will make a decision on the preferred alternative that will be evaluated in the Draft Environmental Impact Report/Environmental Impact Study (EIR/EIS).* 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 has moved 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 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.

### Federal Railroad Administration (FRA)

The FRA has authority over the JPB's rail operations. As noted above and elsewhere in this report, 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.

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

The PMOC received an updated PMP and several sub-plans and procedures on May 17, 2019. *The PMOC is in the process of reviewing the updated documents.* The PMOC conducted an on-site audit of the PCEP's Quality programs in November 2018 and resolution of the issues identified during that visit are underway. The JPB's Rail Activation Committee (RAC) resumed work on its Rail Activation Plan (RAP) in April 2019. *The RAC has produced an outline and is preparing various sections of the RAP. The RAC also developed a critical path schedule for rail activation activities, and that schedule is being reviewed by the PMOC.* The RAP must be in place before testing of the new EMU's can begin.

### C. Project Management Capacity and Capability

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

- Jacobs Project Management Company (Jacobs) is now in place as the CM consultant, replacing the Gannett Fleming personnel that were performing that function.
- *Erik Whittleton (AECOM) has replaced Aandy Ly as Project Controls lead following Aandy's retirement.*
- *Added Michael Ball (Jacobs), Assistant Resident Engineer.*
- *Added Thomas Nguyen (Jacobs), Office Engineer.*
- *Added Lucelle Gutliffe (Jacobs), Assistant Resident Engineer (RE) for PG&E Interface.*

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

- **PMOC Observations:** The JPB reports that its backlog of Requests for Information (RFIs) and other submittals has been reduced.
- **PMOC Recommendations:** The PMOC recommends that the JPB continue to monitor its backlog of RFIs, Change Notices, submittals and other contractual documentation and increase office and field staff as appropriate to maintain the appropriate records and turn documents around as required by contract.

### D. Project Cost

Table 4 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, and the current information has been added to Table 4 for ease of comparison. The JPB now expects to re-baseline its Capital Cost Estimate in mid-2019 after it assesses the cost impact of the current delays to the Electrification contract, following the completion of the necessary TIAs, and completes its Monte Carlo risk assessment update to inform the contingency requirements.

**Table 4 – Project Cost**

STANDARD COST CATEGORY	Base Year Dollars w/o Contingency	Base Year Dollars Allocated Contingency	Base Year Dollars TOTAL	YOE Dollars TOTAL	4-30-2019 Estimate at Completion Dollars
10 GUIDEWAY & TRACK ELEMENTS (51 route miles)	9,930,050	3,443,415	13,373,465	14,256,739	28,074,129
20 STATIONS, STOPS, TERMINALS, INTERMODAL (NONE)	0	0	0	0	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	1,727,666	396,732	2,124,398	2,265,200	7,050,777
40 SITEWORK & SPECIAL CONDITIONS	197,354,697	42,465,878	239,820,575	255,072,402	262,751,916
50 SYSTEMS	429,641,995	46,687,882	476,329,877	504,445,419	532,306,531
60 ROW, LAND, EXISTING IMPROVEMENTS	26,526,146	8,447,380	34,973,526	35,675,084	35,675,084
70 VEHICLES (96)	564,044,890	8,364,433	572,409,323	625,544,147	625,755,807
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	279,886,974	29,338,981	309,225,955	323,793,010	333,675,457
90 UNALLOCATED CONTINGENCY			150,353,131	162,620,295	98,382,596
100 FINANCE CHARGES			6,600,802	6,998,638	6,998,638
<b>Total Project Cost (10 - 100)</b>			<b>1,805,211,052</b>	<b>1,930,670,934</b>	<b>1,930,670,935</b>

Note: Totals may not add due to rounding.

### Project Expenditures

The status of the PCEP budget and expenditures through April 30, 2019, in SCC format, is shown on Table 5.

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 Project Development (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 5 – Project Expenditures in SCC Format (9-30-2019)**

Description of Work	Approved Budget (A)	Cost This Month <sup>(B)</sup>	Cost To Date (C)	Estimate To Complete (D)	Estimate At Completion (E) = (C) + (D)
<b>10 - GUIDEWAY &amp; TRACK ELEMENTS</b>	<b>\$28,143,966</b>	<b>(\$1,543,070)</b>	<b>\$22,857,688</b>	<b>\$5,476,065</b>	<b>\$28,333,753</b>
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	\$2,500,000	\$0	\$66,807	\$2,533,193	\$2,600,000
10.07 Guideway: Underground tunnel	\$25,643,966	(\$1,543,070)	\$22,790,881	\$2,942,872	\$25,733,753
10.07 Allocated Contingency	\$0	\$0	\$0	\$0	\$0
<b>30 - SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>	<b>\$7,050,777</b>	<b>\$281,057</b>	<b>\$1,138,912</b>	<b>\$5,911,865</b>	<b>\$7,050,777</b>
30.03 Heavy Maintenance Facility	\$6,550,777	\$281,057	\$1,138,912	\$5,411,865	\$6,550,777
30.03 Allocated Contingency	\$0	\$0	\$0	\$0	\$0
30.05 Yard and Yard Track	\$500,000	\$0	\$0	\$500,000	\$500,000
<b>40 - SITEWORK &amp; SPECIAL CONDITIONS</b>	<b>\$265,429,560</b>	<b>\$6,725,343</b>	<b>\$140,188,977</b>	<b>\$125,662,056</b>	<b>\$265,851,032</b>
40.01 Demolition, Clearing, Earthwork	\$3,077,685	\$975,000	\$3,921,000	(\$843,315)	\$3,077,685
40.02 Site Utilities, Utility Relocation	\$91,128,599	\$4,660,561	\$61,680,449	\$27,275,151	\$88,955,599
40.02 Allocated Contingency	(\$0)	\$0	\$0	(\$0)	(\$0)
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	\$2,200,000	\$0	\$3,800,000	\$994,473	\$4,794,473
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	\$32,579,208	\$45,000	\$1,493,045	\$31,086,163	\$32,579,208
40.05 Site structures including retaining walls, sound walls	\$568,188	\$0	\$0	\$568,188	\$568,188
40.06 Pedestrian / bike access and accommodation, landscaping	\$764,933	\$0	\$0	\$764,933	\$764,933
40.07 Automobile, bus, van accessways including roads, parking lots	\$284,094	\$0	\$0	\$284,094	\$284,094
40.08 Temporary Facilities and other indirect costs during construction	\$114,216,852	\$1,044,781	\$69,294,484	\$45,122,368	\$114,416,852
40.08 Allocated Contingency	\$20,610,000	\$0	\$0	\$20,410,000	\$20,410,000
<b>50 - SYSTEMS</b>	<b>\$521,476,559</b>	<b>\$8,753,048</b>	<b>\$105,704,761</b>	<b>\$426,258,442</b>	<b>\$531,963,202</b>
50.01 Train control and signals	\$99,483,666	\$1,740,189	\$16,753,873	\$82,789,586	\$99,543,459
50.01 Allocated Contingency	\$0	\$0	\$0	\$0	\$0
50.02 Traffic signals and crossing protection	\$23,879,905	\$0	\$0	\$23,879,905	\$23,879,905
50.02 Allocated Contingency	\$1,140,000	\$0	\$0	\$1,140,000	\$1,140,000
50.03 Traction power supply: substations	\$72,744,787	\$2,055,483	\$25,678,484	\$59,351,622	\$85,030,106
50.03 Allocated Contingency	\$27,990,895	\$0	\$0	\$27,990,895	\$27,990,895
50.04 Traction power distribution: catenary and third rail	\$274,335,624	\$4,899,387	\$63,214,414	\$222,266,466	\$285,480,880
50.04 Allocated Contingency	\$14,338,381	\$0	\$0	\$1,334,659	\$1,334,659
50.05 Communications	\$5,455,000	\$57,989	\$57,989	\$5,397,011	\$5,455,000
50.07 Central Control	\$2,090,298	\$0	\$0	\$2,090,298	\$2,090,298
50.07 Allocated Contingency	\$18,000	\$0	\$0	\$18,000	\$18,000
<b>60 - ROW, LAND, EXISTING IMPROVEMENTS</b>	<b>\$35,675,084</b>	<b>\$67,335</b>	<b>\$18,409,665</b>	<b>\$17,265,420</b>	<b>\$35,675,084</b>
60.01 Purchase or lease of real estate	\$25,927,074	\$67,335	\$18,281,091	\$7,645,984	\$25,927,074
60.01 Allocated Contingency	\$8,748,010	\$0	\$0	\$8,748,010	\$8,748,010
60.02 Relocation of existing households and businesses	\$1,000,000	\$0	\$128,574	\$871,426	\$1,000,000
<b>70 - VEHICLES (96)</b>	<b>\$625,680,624</b>	<b>\$14,506,961</b>	<b>\$169,414,219</b>	<b>\$454,809,752</b>	<b>\$624,223,971</b>
70.03 Commuter Rail	\$591,541,609	\$14,506,961	\$168,922,969	\$422,532,565	\$591,455,534
70.03 Allocated Contingency	\$7,235,083	\$0	\$0	\$5,864,506	\$5,864,506
70.06 Non-revenue vehicles	\$8,140,000	\$0	\$491,250	\$7,648,750	\$8,140,000
70.07 Spare parts	\$18,763,931	\$0	\$0	\$18,763,931	\$18,763,931
<b>80 - PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>	<b>\$330,222,946</b>	<b>\$3,596,263</b>	<b>\$283,685,479</b>	<b>\$54,869,737</b>	<b>\$338,555,216</b>
80.01 Project Development	\$130,350	\$0	\$280,180	(\$149,830)	\$130,350
80.02 Engineering (not applicable to Small Starts)	\$187,058,830	\$745,027	\$195,365,837	(\$2,914,368)	\$192,451,469
80.02 Allocated Contingency	\$230,308	\$0	\$0	\$549,119	\$549,119
80.03 Project Management for Design and Construction	\$74,332,188	\$1,399,018	\$65,832,863	\$11,120,144	\$76,953,008
80.03 Allocated Contingency	\$8,000,396	\$0	\$0	\$8,000,396	\$8,000,396
80.04 Construction Administration & Management	\$25,347,671	\$787,683	\$12,960,194	\$18,296,869	\$31,257,063
80.04 Allocated Contingency	\$17,867,277	\$0	\$0	\$11,957,888	\$11,957,888
80.05 Professional Liability and other Non-Construction Insurance	\$4,543,588	\$641,308	\$4,543,588	\$0	\$4,543,588
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	\$6,341,599	\$19,354	\$4,670,794	\$1,670,805	\$6,341,599
80.06 Allocated Contingency	\$556,000	\$0	\$0	\$556,000	\$556,000
80.07 Surveys, Testing, Investigation, Inspection	\$3,388,781	\$3,874	\$32,022	\$3,356,759	\$3,388,781
80.08 Start up	\$1,797,957	\$0	\$0	\$1,797,957	\$1,797,957
80.08 Allocated Contingency	\$628,000	\$0	\$0	\$628,000	\$628,000
<b>Subtotal (10 - 80)</b>	<b>\$1,813,679,516</b>	<b>\$32,386,937</b>	<b>\$741,399,699</b>	<b>\$1,090,253,337</b>	<b>\$1,831,653,036</b>
<b>90 - UNALLOCATED CONTINGENCY</b>	<b>\$107,092,780</b>	<b>\$0</b>	<b>\$0</b>	<b>\$89,119,260</b>	<b>\$89,119,260</b>
<b>Subtotal (10 - 90)</b>	<b>\$1,920,772,296</b>	<b>\$32,386,937</b>	<b>\$741,399,699</b>	<b>\$1,179,372,597</b>	<b>\$1,920,772,296</b>
<b>100 - FINANCE CHARGES</b>	<b>\$9,898,638</b>	<b>\$140,000</b>	<b>\$5,920,070</b>	<b>\$3,978,568</b>	<b>\$9,898,638</b>
<b>Total Project Cost (10 - 100)</b>	<b>\$1,930,670,934</b>	<b>\$32,526,937</b>	<b>\$747,319,770</b>	<b>\$1,183,351,164</b>	<b>\$1,930,670,934</b>

**Project Funding**

The PCEP is relying on several sources of funding to complete the project. Table 6 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 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 awarded the JPB a \$164,522,000 grant in 2018 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.

- **PMOC Observation:** The JPB has committed to reviewing the PCEP’s ability to meet cash flow requirements later in the project in light of lower than expected expenditures to date, which would lead to higher than projected monthly expenditures if BBII completes the work on schedule.

**Table 6 – Project Funding Summary**

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

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

### **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 JPB updates its MPS schedule monthly. The JPB had planned to re-baseline its current MPS earlier in 2019 to account for a number of significant changes including the contract award dates for the tunnel and CEMOF contracts; differing site conditions impacts on OCS construction; progress on the PG&E substations and interties; and implications of the CWT issue. The re-baselining was not accomplished as planned because the PCEP team did not receive an acceptable TIA (TIA 2) from the contractor for the delays associated with CWT. Although the JPB rejected TIA 2 as submitted by the contractor, it is reviewing the TIA to better understand the contractor’s position. The PMOC held preliminary discussions with the PCEP’s schedule management team on August 22, 2019, followed by a schedule workshop on September 24, 2019. The objective of the workshop was to gain a better understanding of the implications of the Electrification contractor’s claimed delays and potential impacts to the PCEP’s MPS. The PCEP scheduling team provided an update on its activities with the goal of completing its activities prior to QPRM No. 11, scheduled for October 8, 2019.*

*The JPB’s internal schedule update as of August 31, 2019 reflects the incorporation of some of the known impacts listed above, and its own assessment of other impacts such as differing site conditions (DSCs) and CWT. Because of the elapsed time since the June 2019 monitoring*

report, the PMOC has included the following significant changes identified in the JPB's June 30, July 31, and August 31, 2019 schedule updates:

a. Vehicles

- i. Variances exist from the prior month as the Change Order for testing in Pueblo, CO, has been finalized.
- ii. Additional delays have been experienced by Stadler during assembly of the first trainset. The resulting effect is a delay to arrival of the first trainset at JPB; however, there is no anticipated effect on the overall vehicle schedule at this time. JPB management has met with Stadler executives who have committed to addressing recent issues to prevent any additional delays.
- iii. The progress schedule for August 2019 was submitted 10 days late by contractor, thus has not been incorporated into the MPS.

b. Electrification

- i. Variances exist from the prior month due to delays to the planned TPS-2 interconnect construction as BBII has struggled to find a PG&E approved contractor to perform this work. JPB continues to work with the contractor to resolve this issue.
- ii. The JPB forecasted date for BBII's Substantial Completion has been updated to reflect the inclusion of the signal system work which has been impacted by CWT. The resulting effect is a delay to the start of Phased Revenue Service, from September 27, 2021 to January 3, 2022.
- iii. The progress schedule for August 2019 has not been submitted by contractor, thus has not been incorporated into MPS.
- iv. Variances exist to the contractual substantial completion due to the time it has taken to finalize the modifications required for the grade crossings, as well as the effect that differing site conditions (DSCs) are having on OCS foundation installation. The JPB continues to work with BBII and is urging BBII to accelerate the crossing design completion and issues relating to DSCs.

Table 7 below, which is based on the MPS C18.07 with a Data Date of September 1, 2019, shows the current projected dates for completion of various significant project activities.

**Table 7 – 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 in Pueblo, CO	N/A	5/29/20 (P)	5/29/20 (P)
Arrival of First EMU at JPB	7/29/19	2-26-21 (P)	2-26-21 (P)
Final Engineering (FE) Completion:	04/03/18 (P)	7-5-20 (P)	7-5-20 (P)
Systems Integration Testing Completed:	01/29/19 (P)	12/31/21 (P)	12/31/21 (P)
Segment 4 Complete to Begin EMU Testing:	11/21/19	5/22/20 (P)	7/19/20 (P)
Completion of Interconnection from PG&E to TPSS 2	N/A	4/27/20 (P)	4/27/20 (P)
Design/Build Substantial Completion:	02/16/19 (P)	12/31/21 (P)	12/31/21 (P)

Milestone	Baseline	Grantee Forecast	PMOC Forecast
Conditional Acceptance of First EMU Trainset:		4/9/21	4/23/21
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)
Begin Phased Revenue Service:		1/3/22 (P)	1/3/22 (P)
Revenue Service Date (without Risk Contingency):	12/9/21 (P)	5/6/22 (P)	5/6/22
FFGA Final Completion Date:	05/07/20 (P)	8/22/2022 (P)	8/22/2022
<b>(P) Planned Date (A) Actual Date</b>			

Appendix E presents the PCEP's summary schedule C18.07 as contained in its August 2019 Monthly Report.

The following comments are based on a review of the various schedules available to the PMOC:

- The Electrification contractor's most recent Schedule Update Narrative for August 2019 shows a Substantial Completion date of July 4, 2022, compared to the contractual date of August 10, 2020, or a total delay of 693 days. The July 4, 2022 date represents a further slippage of approximately three (3) months from the date reported in the PMOC's June 2019 report. The continued slippage has been due to the lack of resolution of the Consistent Warning Time (CWT) issue, which has caused a day-for-day delay based on the contractor's current schedule logic. The JPB previously directed the Electrification contractor to proceed with the design of the grade crossing warning system using the dual speed check approach to achieve CWT. However, design work using the dual speed check solution is only moving forward on a limited number of crossings. The Electrification contractor submitted TIA 2 based on use of the dual speed check solution; however, the initial submittal was rejected by the JPB because it lacked fundamental data. The JPB is currently analyzing TIA 2 using its own interpretations. The contractor has not submitted a TIA to account for the known delays to the OCS schedule due to Differing Site Conditions (DSCs), although the JPB has requested this information. The JPB's review of the TIAs is expected to be a significant effort, but necessary to gain a clear understanding of the current status of the project's schedule.*
- The JPB's purchase of additional EMUs, including a new Power Car for each trainset, has delayed the delivery of the first trainset. The JPB has decided that the first trainset will be delivered to the Association of American Railroads' (AAR) Transportation Technology Center, Inc. (TTCI) in Pueblo, Colorado, for initial testing. This decision avoids delaying testing of the first trainset because of the delay in completing electrification and testing of Segment 4. Segment 4 will be used to test the other EMUs following their arrival. Conditional Acceptance of the first trainset is now shown as April 23, 2021; previously it was scheduled for December 2020.
- The PCEP's current schedule includes revised logic, referred to as Phased Revenue Service, related to the start of service using the new EMUs. This concept has not been described in detail. Previous versions of the schedule had included a period of pre-revenue testing following the completion of integrated testing of the electrified system, followed by a soft

opening for revenue service on April 22, 2022 with a partial fleet of EMU vehicles, followed by a full Revenue Service Date (RSD) of August 22, 2022.

### **PMOC Observations:**

- *The JPB has developed its own projections for the various impacts to the Electrification contractor's schedule, including those associated with the CWT issue. These projections have been incorporated into the MPS and have resulted in changes to the anticipated completion dates for the OCS, for Substantial Completion of the Electrification contract, and for the start of Phased Revenue Service.*
- The PMOC has expressed concern that the MPS does not include all activities necessary to deliver the project; for example, Rail Activation is currently only shown as a role up activity. *The Rail Activation Committee has recently produced a draft schedule, which is being reviewed by the PMOC, and has not yet been incorporated into the MPS; this draft schedule is a positive step toward addressing the PMOC's concerns.* The PMOC's opinion is that the startup of electrified operations (EMU testing) on Segment 4 will provide an excellent opportunity to refine the Rail Activation Plan well in advance of starting electrified operations for revenue service.
- Construction activities have expanded to all four segments; however, the overall progress of work is far behind the original schedule. Foundation placement, which controls the pace of the OCS, continues to be delayed due to underground obstructions and the pace of potholing work being implemented by the Electrification Contractor .
- The JPB has been using the partnering process to focus attention on improving overall progress and has instituted weekly meeting with the contractor on foundation related issues; these appear to be improving production. The JPB also reports that track access delays have been reduced since April 2019.
- BBII has shifted its original potholing subcontractor to foundation work and all potholing work is now being done by a single subcontractor. 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, in an effort to improve productivity, temporarily halted and recently re-started foundation construction and pole erection after a sufficient number of cleared foundation locations were available to allow the work to proceed effectively. *That process of halting foundation placement was repeated in August 2019.* 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 is also limited by the time allowed for on-track work.
- The impact of DSC, TAD, and the prolonged discussions related to CWT on the project's schedule is highlighted by comparing BBII's actual billing for August 2019 of \$12,681,874, compared to a budget for the period of

\$16,352,178. On a cumulative basis, BBII has billed \$342,595,870 or approximately 47% of the contract value, adjusted for change orders, thru August 2019. *BBII's had budgeted to be approximately 86% complete at this time.*

- The JPB's recent decision to use the TTCI test track in Pueblo, Colorado, to test and accept the first EMUs is a positive action which avoids the anticipated delay in completion of the JPB's 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.

#### **E. Quality Assurance / Quality Control (QA/QC)**

The following quality management activities were reported for the PCEP:

- *The PCEP Quality Management Plan (QMP) has been updated to more fully address the quality requirements for the Stadler EMUs.*
- *There was a process audit of Stadler's Salt Lake City (SLC) facility conducted June 24 and 25; there were nine findings. Stadler is working on closing out the audit findings.*
- *Steve Mahler and Bill Downs, LTK's QA Lead, did an Executive Quality Briefing and separate Quality Training sessions in early September.*
- *The Annual Executive Review of the Quality Program will happen at the end of the year; it did not occur last year due to scheduling complications.*
- Weekly meetings continue with BBII QA/Quality Control (QC) management representatives.
- Tunnel Modifications Project: *ProVen received a Corrective Action Request (CAR) for failure to properly implement its Non-conformance Report (NCR) program; no response has been received, although it was due June 10, 2019. The issue will be discussed with ProVen when progress meetings resume in December 2019. Progress meetings were discontinued in April 2019 when the tunnel and grading work was completed, and will resume when OCS installation begins in December.*

#### **PMOC Observations and Recommendations:**

- The PMOC completed an on-site review of the PCEP quality program in November 2018. The review revealed a number of deficiencies that are being addressed by the JPB. *The PCEP's Quality Management Plan (QMP) has been revised to address the lack of a Project Specific Quality Plan for the EMU services consultant. The PMOC has also observed that there are gaps in the JPB's overall quality program with respect to areas involving the PCEP, and has brought those gaps to the attention of the JPB.*
- The PMOC previously recommended that PCEP make use of appropriate staff from the San Carlos office to augment the PCEP quality program; the PCEP QA Manager recently conducted quality training for personnel in that office.

## F. Safety and Security

The JPB contracts for safety and security consulting services to support the PCEP. The initial contract expired on December 31, 2018; the JPB authorized the award of a new five-year contract to the incumbent contractor at its December 2018 meeting.

The PCEP safety team continues to monitor the safety performance of the various contractors and subcontractors working on the project, including their compliance with Site Specific Work Plans. *The start of construction activities at the CEMOF in September 2019 adds another area requiring attention by the safety team.*

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 Fire and Life Safety Committee continues to coordinate with local first responders to set up emergency drills. *The most recent meetings of both committees were held on September 25, 2019.*

The Electrification contractor is updating its Safety and Security Certification Plan (SSCP), which will be incorporated into the project's SSMP. The contractor is also updating the Threat and Vulnerability Assessment (TVA).

The PCEP Safety Consultant is assisting with the development of the Rail Activation Plan.

- **PMOC Observations:** *The PMOC is concerned that the dispersion of construction activity throughout much of the 51-mile rail corridor, including several off-track locations, and the additional challenge of multi-shift activity, may exceed the current capacity of the safety team.*
- The PMOC remains concerned that a formal clearance signoff process is not in place prior to returning track to service on the various contracts within the PCEP, e.g., following the erection of catenary appurtenances.

## G. 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. *Caltrain's Rail Operations Department recently requested the interim removal of the two (2) on-board lifts until such time as the EMUs operate in blended service with the CHSRA trains. The justification for this request is that the space occupied by the on-board lifts will interfere with the movement of passengers using the stairs where the lifts are installed. Further, the accommodation of passengers using mobility devices and wishing to use the restroom can be accomplished by de-boarding the passenger and repositioning the train at any station, a procedure currently in use. The change was approved by the Change Management Board at its September 2019 meeting.*

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

## **H. Buy America**

- The EMU vehicle consultant visited Stadler's Salt Lake City facility during late January 2018 to verify Stadler's Buy America compliance and its progress in arranging for American equipment suppliers. The EMU vehicle consultant plans to perform an intermediate Buy America audit in the fall of 2019.
- The PCEP's QA Manager reports that he routinely reviews Buy America documentation as a part of his audit of vendor files.

## **I. Vehicles**

The JPB 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 JPB ordered an additional thirty-seven (37) EMUs in December 2018 using an option in the Stadler contract. The JPB has now ordered an electrified fleet of one hundred thirty-three (133) EMUs configured as nineteen (19) seven-car trains. The JPB has remaining options to purchase up to fifty-nine (59) more EMUs at prices based on the date when the option is exercised.

The EMU contract contained an option for Stadler to maintain the vehicles; the JPB did not 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. See additional discussion under Regulatory Issues below.

The JPB is moving forward with a change in performance requirements for train sets 2-19. This change will reduce the 110-mph testing requirement to 90-mph for all but the first EMU trainset. This requirement is associated with the future operation of the EMUs in blended service with the CHSRA trains.

Stadler reported the following progress on the vehicles:

- *The starting date for dynamic commissioning of the first train was pushed back by three (3) months. This change reflects some delays that have already occurred, as well as a new assessment of the duration for the still unfinished work on train 1.*
- *There was a very productive 2-day FRA Compliance Review of the EMU design conducted in Stadler's Salt Lake City (SLC) facility on September 10 – 11, 2019; six FRA employees participated.*
- *19 of 133 car shells (first three 7-car trainsets) are in SLC in incremental stages of completion, and 2 completely wired cars are undergoing electrical testing.*

- *Overall production in the SLC facility is behind schedule. Two major reasons have been cited, a shortage of sub-supplier parts and the lack of shop personnel to assemble trains. Stadler has augmented its workforce with personnel from its European facilities.*
- *A meeting was held on May 21, 2019 with representatives of the PCEP, Stadler, and PG&E to discuss the critical importance of regeneration by the EMUs into PG&E's grid. No significant concerns were expressed by those in attendance.*
- *A Change Order has been issued to Stadler for testing of the first trainset at the TTCI in Pueblo, Colorado. The tests are being planned for late spring 2020.*

### **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. *The JPB's Change Management Board, at its September 2019 meeting, approved the JPB's request for a change order that will install temporary panels in place of the high-level doors until the trains operate in blended service with the CHSRA. This decision has been pending for several months.*

*The JPB's Change Management Board, at its September 2019 meeting, approved the JPB's request for a change order that will install additional flip-up seats and railings in each of its bike cars. The flip-up seats and railings accommodate access to emergency egress windows in the bike cars. This request came from Caltrain's bicycle user community. The JPB has reviewed the issue with the car manufacturer and the FRA and states that the EMUs are in compliance with applicable FRA regulations.*

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.

#### **4) Project Risk and Contingency**

The PCEP has been implementing its RIMP (Risk Identification and Mitigation Plan) since its development in 2014. The PCEP's Risk Management Lead conducts weekly updates of a subset 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 JPB held an EMU Risk Refresh on December 18, 2018 and an Electrification Risk Refresh on January 15, 2019. The JPB's risk team re-ran the Monte Carlo simulation models for both cost and schedule risk; however, the results have not been finalized. Initial indications are that the direct cost of risk (without considering schedule related costs) was reduced from approximately \$150 million to \$106 million, and the p70 project completion date extended slightly beyond the current Final Completion Date (FCD) of August 22, 2022. The Risk lead



has assembled additional data on overhead costs for the various contracts to more accurately assess the schedule related costs. The JPB has also created a “Watch List” of possible occurrences such as currency fluctuations or labor shortages to better understand the PCEP’s risk position.

The following are the top risks, with risk number, shown on the current PCEP risk register. *Risks shown in italics are new to the list of top risks since the previous report.*

*(314) Design and construction of grade crossing modifications that meets stakeholder and regulatory requirements may cost more than was budgeted and delay the revenue service date.*

(313) Contractor sequencing of early utility location, preliminary design, and foundation construction may result in inefficiencies in construction, redesign, and reduced production rates.

(303) Extent of differing site conditions and delays in resolving differing site conditions delays completion of electrification increases program costs. The contractor is encountering more DSCs than anticipated and taking longer to resolve.

(242) Track access does not comply with contract-stipulated work windows.

(223) Major program elements may not be successfully integrated with existing operations and infrastructure in advance of revenue service.

(257) Potential that modifications to the PTC database and signal software are not completed in time for cutover and testing.

(267) Additional property acquisition is necessitated by change in design.

*(273) Contractor generates hazardous materials that necessitates proper removal and disposal in excess of contract allowances and expectations.*

(308) Rejection of Design Variance Request for autotransformer feeder (ATF) and static wires results in cost and schedule impacts to PCEP.

(298) 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.

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

- **PMOC Observations:** The changes in risk ranking, and the addition of new risks or the retirement of existing risks, is the result of the PCEP’s risk management process. The decisions are made at the Monthly Risk Management Committee meeting and the rationale for the changes is not always fully articulated in the monthly risk register updates reviewed by the PMOC.
- The PMOC has observed an improvement in coordination between the PCEP and Caltrain operations, which has resulted in reduced conflicts related to track access for the project’s contractors.

## 5) 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, implementation of the dual speed check 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 participated in a Schedule Workshop with the PCEP team on September 24, 2019 and is awaiting the final results of the analytical work currently underway. The PMOC will apply additional resources when a definitive schedule and/or an acceptable TIA is available from the JPB.*

- *The PMOC will continue to monitor the JPB's Systems Integration activities and the development of its Rail Activation Plan (RAP). The PMOC is reviewing an outline of the RAP and a preliminary critical path schedule provided by the JPB.*
- *The PMOC is reviewing the JPB's updated Project Management Plan, Rev. 2 (PMP); Project Controls Plan, Rev. 2; Document Control Plan, Rev. 1; Safety and Security Management Plan, Rev. 5; Risk Identification and Mitigation Plan, Rev 2A; and several supporting procedures.*

6) **Action Items**

Table 8 shows the status of Action items as of September 25, 2019.

**Table 8 – Action Items**

No.	Action Item	Discussion	Agreed Due Date	Responsibility Agency/Name	Status
9.02	Complete an inventory of any on-board or wayside equipment purchased for CBOSS which will not be used for PTC.	General status of on-board and wayside equipment provided.	NLT QPRM #11	Bouchard	
10.01	Verify the extent of TASI Involvement in implementing the planned Grade Crossing Solution.	It's unclear whether anyone has discussed with TASI its role in servicing and implementing the CWT solution.	QPRM #11	Bouchard	
10.02	Verify that FRA does not consider CWT New and Innovative Technology.	PCEP meeting with FRA and CPUC on 8/8/2019	ASAP	Larano	<i>FRA HQ to review and provide a determination.</i>
10.03	Implement a Schedule Containment Workshop prior to QPRM #11.	Bring PMOC schedule expertise to assist in working through TIAs	QPRM #11	Eidlin	<i>Schedule workshop held September 24, 2019; results forthcoming.</i>

No.	Action Item	Discussion	Agreed Due Date	Responsibility Agency/Name	Status
10.04	JPB to add a bullet to the PG&E slide for future meetings updating the status of the Continuing Control issue. Close item 5.05	Indicate what direction resolution is progressing	QPRM #11	Funghi/Larano	

**Legend: Colored italics indicate a new entry from the previous version. Shaded cells indicate a completed item.**  
 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
AAR	<i>Association of American Railroads</i>
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ARINC	Aeronautical Radio, Incorporated
ATF	Autotransformer Feeder
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.
BGSP	Broadway Grade Separation Project
Caltrans	California Department of Transportation
CAR	Corrective Action Request
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
CMB	Change Management Board
CM/GC	Construction Manager/General Contractor
CNPA	Concurrent Non-Project Activity
CO	Change Order
CP	Control Point
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
DEIR	Draft Environmental Impact Report
DQP	Design Quality Plan
DRB	Disputes Review Board
DSC	Differing Site Condition
DSDC	Design Support During Construction

Acronyms	List of Terms
DVR	Design Variance Request
EA	Environmental Assessment
EAC	Estimate at Completion
EE	Entry into Engineering
EIR	Environmental Impact Report
<i>EIS</i>	<i>Environmental Impact Study</i>
EMU	Electric Multiple Unit Rail Vehicle
ETB	Electrified Trolley Buses
FCD	Final Completion Date
FD	Final Design
FEIR	Final Environmental Impact Report
FERC	Federal Energy Regulatory Commission
FPGA	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
<i>FWO</i>	<i>First Written Offer</i>
FY	Fiscal Year
GO	General Order (issued by the CPUC)
HSR	High-Speed Rail
<i>ICE</i>	<i>Independent Cost Estimate</i>
I-ETMS	Interoperable Electronic Train Management System
IFB	Invitation for Bids
IFC	Issued for Construction
IGA	Inter-Governmental Agreement
<i>IJ</i>	<i>Insulated Joints</i>
Cal ISO	California Independent System Operator
ITCS	Incremental Train Control System
JPB or PCJPB	Peninsula Corridor Joint Powers Board
Jacobs	Jacobs Project Management Company
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

Acronyms	List of Terms
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.
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
RAC	Rail Activation Committee
RAP	Rail Activation Plan
RAMP	Real Estate Acquisition Management Plan
<i>RE</i>	<i>Resident Engineer</i>
RFI	Request for Information
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 <i>or Revenue Service Demonstration</i>
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
<i>SCVWD</i>	<i>Santa Clara Valley Water District</i>
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

Acronyms	List of Terms
SME	Subject Matter Expert
SOGR	State of Good Repair
SONO	Statement of No Objection
SP	Southern Pacific Transportation Company
SSCP	Safety and Security Certification Plan
SSI	Sensitive Security Information
SSMP	Safety and Security Management Plan
SSOA	State Safety Oversight Agency
SVP	Silicon Valley Power
TAD	Track Access Delay
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
TTCI	Transportation Technology Center, Inc.
TVA	Threat and Vulnerability Analysis
TVM	Transit Vehicle Manufacturer
UPRR	Union Pacific Railroad
USDOT	U. S. Department of Transportation
USFWS	United States Fish and Wildlife Service
VE	Value Engineering
VECP	Value Engineering Change Proposal
VTA	Santa Clara Valley Transportation Authority
WPC	Wayside Power Cabinet
YOE	Year of Expenditure



## Appendix B: Safety and Security Checklist

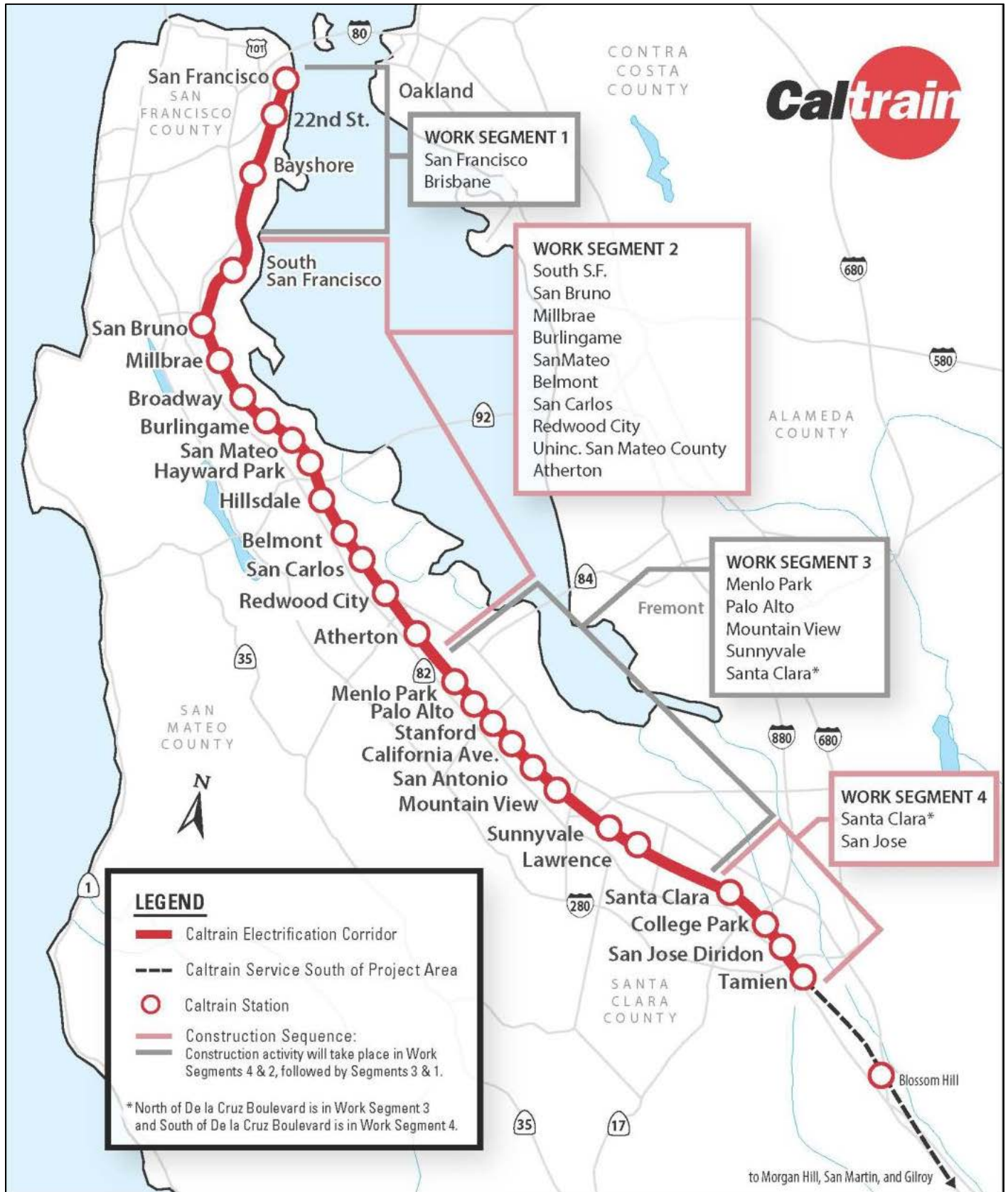
Project Overview			
Project Mode	Commuter Rail		
Project Phase	FFGA – Construction		
Project Delivery Method	Design-Build, Design-Bid-Build		
Project Plans	Version	Review by FTA	Status
Safety and Security Management Plan (SSMP)	Rev 4	Y	Under Review
Safety and Security Certification Plan (SSCP)	Rev 0		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
<b>Safety and Security Authority</b>		
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. 10 was held July 16, 2019
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.
<b>SSMP Monitoring</b>		
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.

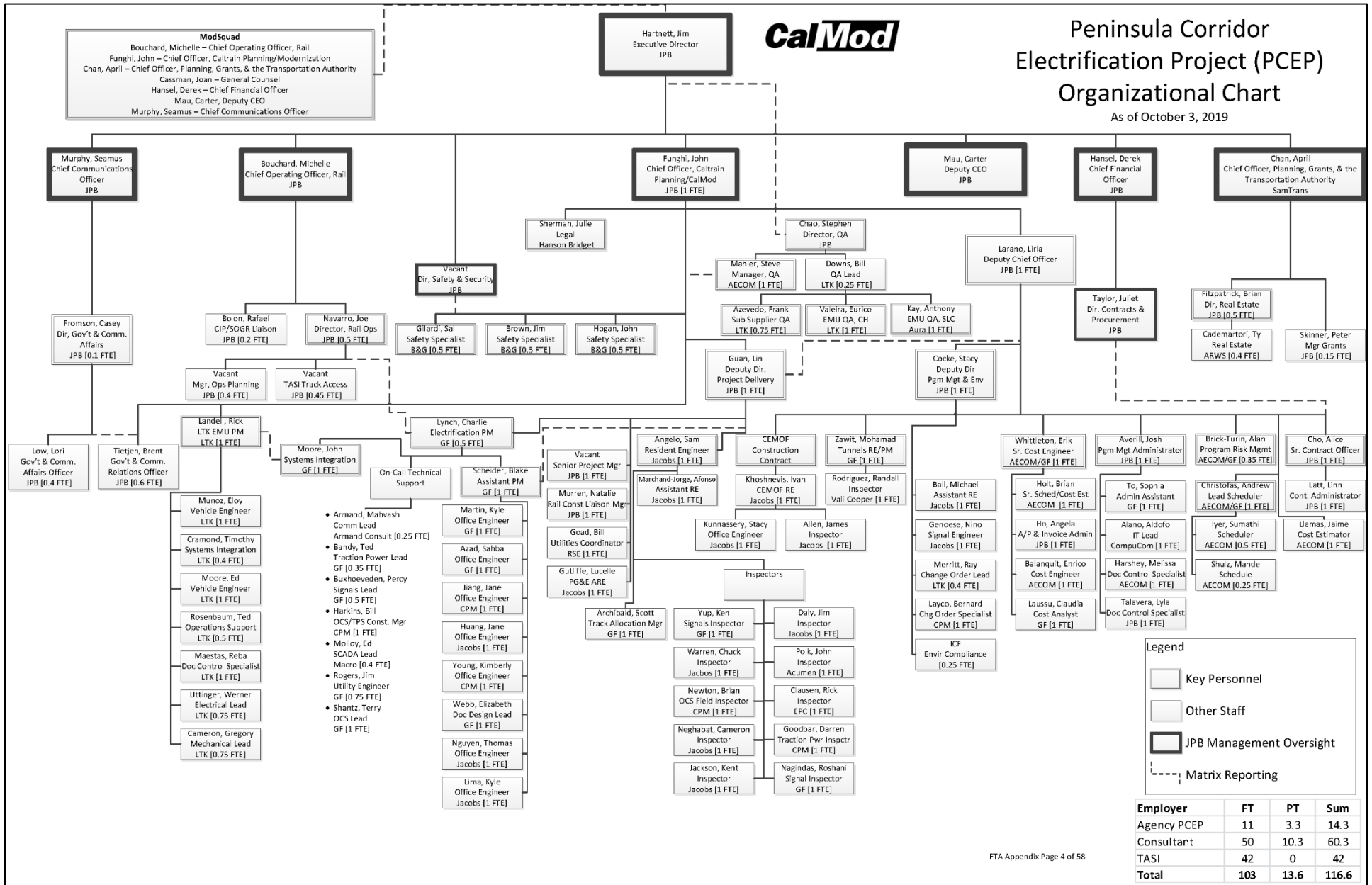
Area of Focus	Y/N	Notes/Status
Has the Project Sponsor established staffing requirements, procedures and authority for safety and security activities throughout all project phases?	Y	Section 3.0 of SSMP
Does the Project Sponsor update the safety and security responsibility matrix/organizational chart 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: <ul style="list-style-type: none"> <li>• Activation Plan and Procedures</li> <li>• Integrated Test Plan and Procedures</li> <li>• Operations and Maintenance Plan</li> <li>• Emergency Operations Plan</li> </ul>	Y Y N N	A Rail Activation Plan is currently being developed for initial testing and operation of the new EMUs. <i>The Rail Activation Committee has been meeting regularly since May 2019 and an outline and preliminary Rail Activation Schedule have been prepared.</i> 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.
<b>Construction Safety</b>		
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 1.42 for the year 2018 compared to the most recent (2017) BLS rate of 2.5 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
<b>Federal Railroad Administration</b>		
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	<i>FRA attended QPRM No. 10 on July 16, 2019.</i>

**Figure 1**  
**Peninsula Corridor Electrification Project Map**



# Appendix D: PCEP Organization Chart



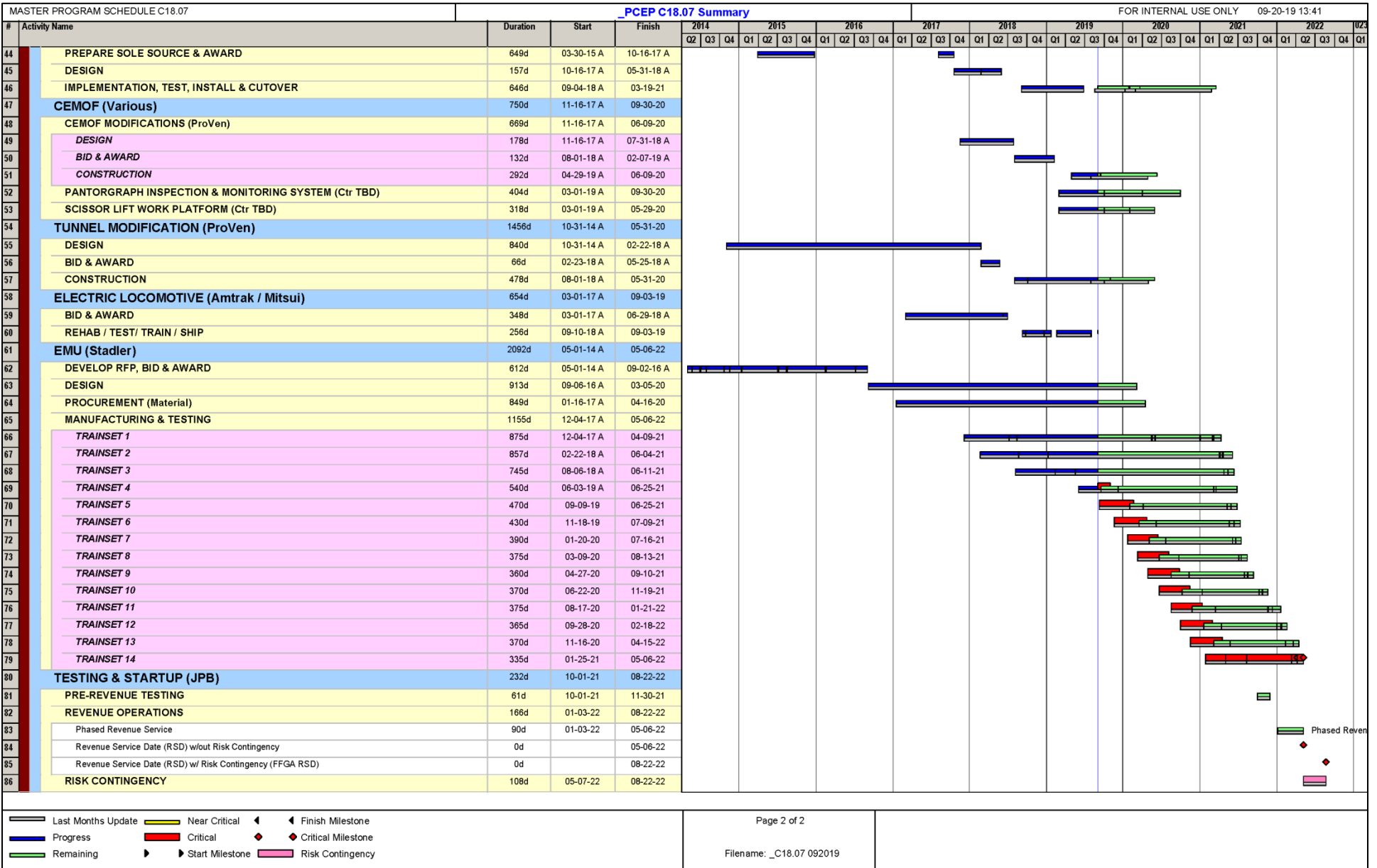
FTA Appendix Page 4 of 58

# Appendix E: Summary Project Schedule

MASTER PROGRAM SCHEDULE C18.07				_PCEP C18.07 Summary												FOR INTERNAL USE ONLY 09-20-19 13:41																
#	Activity Name	Duration	Start	Finish	2014			2015			2016			2017			2018			2019			2020			2021			2022			023
					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
1	<b>MASTER PROGRAM SCHEDULE C18.07</b>	2168d	05-01-14 A	08-22-22																												
2	<b>MILESTONES</b>	2168d	05-01-14 A	08-22-22																												
3	Start	0d	05-01-14 A																													
4	NEPA Reevaluation Complete	0d		02-11-16 A																												
5	LNTP to Electrification Contractor	0d	09-06-16 A																													
6	LNTP to Vehicle Manufacturer	0d	09-06-16 A																													
7	FTA Issues FFGA	0d		05-23-17 A																												
8	Segment 4 (incl. Test Track) Complete	0d		05-22-20																												
9	Electrification Substantial Completion	0d		12-31-21																												
10	Start Phased Revenue Service	0d	01-03-22																													
11	Revenue Service Date (RSD) w/out Risk Contingency	0d		05-06-22																												
12	Revenue Service Date (RSD) w/ Risk Contingency (FFGA RSD)	0d		08-22-22																												
13	<b>PLANNING / APPROVALS</b>	1230d	05-01-14 A	01-16-19 A																												
14	<b>REAL ESTATE ACQUISITION</b>	971d	11-05-15 A	09-03-19																												
15	<b>OVERHEAD UTILITY RELOCATION (Various)</b>	852d	03-10-17 A	07-17-20																												
16	<b>PG&amp;E INFRASTRUCTURE</b>	1151d	03-01-17 A	09-09-21																												
17	INTERCONNECT (Feasibility Study)	171d	03-01-17 A	10-31-17 A																												
18	INTERIM POWER	322d	08-01-17 A	11-05-18 A																												
19	PERMANENT POWER	1044d	08-01-17 A	09-09-21																												
20	DESIGN & PERMITTING	431d	08-01-17 A	04-12-19 A																												
21	CONSTRUCTION	612d	04-15-19 A	09-09-21																												
22	<b>ELECTRIFICATION (BBII)</b>	1389d	09-06-16 A	12-31-21																												
23	DESIGN	999d	09-06-16 A	07-05-20																												
24	CONSTRUCTION	1453d	10-09-17 A	09-30-21																												
25	Segment 1	604d	09-01-19	04-26-21																												
26	OCS	309d	04-29-20	03-03-21																												
27	Traction Power	406d	09-01-19	10-10-20																												
28	Segment Testing	54d	03-04-21	04-26-21																												
29	Segment 2	1453d	10-09-17 A	09-30-21																												
30	OCS	1015d	10-09-17 A	07-19-20																												
31	Traction Power	1351d	01-19-18 A	09-30-21																												
32	Segment Testing	54d	12-19-20	02-11-21																												
33	Segment 3	621d	04-09-19 A	12-19-20																												
34	OCS	385d	05-28-19 A	06-15-20																												
35	Traction Power	502d	04-09-19 A	08-22-20																												
36	Segment Testing	54d	10-27-20	12-19-20																												
37	Segment 4	1061d	12-01-17 A	10-26-20																												
38	OCS	477d	02-25-19 A	06-15-20																												
39	Traction Power	969d	12-01-17 A	07-26-20																												
40	Segment Testing	92d	07-27-20	10-26-20																												
41	TESTING	249d	04-26-21	12-31-21																												
42	<b>DRILL TRACK (TASI)</b>	20d	09-03-19	09-30-19																												
43	<b>SCADA (Arinc)</b>	1518d	03-30-15 A	03-19-21																												

█ Last Months Update   
 █ Near Critical   
 ◀    ▶   
 ◀    ▶    Finish Milestone  
█ Progress   
 █ Critical   
 ◆    ◆    Critical Milestone  
█ Remaining   
 ▶    ▶    Start Milestone   
█ Risk Contingency

Page 1 of 2  
 Filename: \_C18.07 092019



MASTER PROGRAM SCHEDULE C18.07		Data Date: 09-01-19		_PCEP C18.07 Critical Path		FOR INTERNAL USE ONLY 09-20-19 13:44																	
#	Activity Name	Duration	Start	Finish	Total Float	2019				2020				2021				2022					
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
1	<b>MASTER PROGRAM SCHEDULE C18.07</b>	841d	06-03-19 A	08-22-22	0d																		
2	<b>MILESTONES</b>	76d	05-06-22	08-22-22	0d																		
3	Revenue Service Date (RSD) w/ Risk Contingency (FFGA RSD)	0d		08-22-22	0d																		
4	Revenue Service Date (RSD) w/out Risk Contingency	0d		05-06-22	0d																		
5	<b>EMU (Stadler)</b>	765d	06-03-19 A	05-06-22	0d																		
6	<b>MANUFACTURING &amp; TESTING</b>	765d	06-03-19 A	05-06-22	0d																		
7	TRAINSET 4	110d	06-03-19 A	11-01-19	1d																		
8	TRAINSET 5	120d	09-09-19	02-21-20	1d																		
9	TRAINSET 6	115d	11-18-19	04-24-20	1d																		
10	TRAINSET 7	105d	01-20-20	06-12-20	1d																		
11	TRAINSET 8	106d	03-09-20	08-03-20	1d																		
12	TRAINSET 9	110d	04-27-20	09-25-20	1d																		
13	TRAINSET 10	105d	06-22-20	11-13-20	1d																		
14	TRAINSET 11	106d	08-17-20	01-11-21	1d																		
15	TRAINSET 12	110d	09-28-20	02-26-21	1d																		
16	TRAINSET 13	110d	11-16-20	04-16-21	1d																		
17	TRAINSET 14	335d	01-25-21	05-06-22	0d																		
18	<b>TESTING &amp; STARTUP (JPB)</b>	76d	05-06-22	08-22-22	0d																		
19	<b>REVENUE OPERATIONS</b>	76d	05-06-22	08-22-22	0d																		
20	Revenue Service Date (RSD) w/ Risk Contingency (FFGA RSD)	0d		08-22-22	0d																		
21	Revenue Service Date (RSD) w/out Risk Contingency	0d		05-06-22	0d																		
22	<b>RISK CONTINGENCY</b>	108d	05-07-22	08-22-22	0d																		
23	Risk Contingency (FTA)	108d	05-07-22	08-22-22	0d																		

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

Page 1 of 1  
Filename: \_C18.07 092019



# Appendix F: Top Project Risks

Program Risk Register										Caltrain					
Version Date: September 13, 2019 - Top Risks															
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							
						1	2	3	4	5					
						LOW	MEDIUM	HIGH	VERY HIGH	SIGNIFICANT					
						< 10%	10% - 50%	60% - 75%	75% - 90%	> 90%					
						< \$500 K	\$500 K - \$2 M	\$2 M - \$10 M	\$10 M - \$20 M	\$20 M - \$50 M					
						< 3 Months	1 - 3 Months	3 - 6 Months	6 - 12 Months	> 12 Months					
314	R	Elect	Construction	Design and construction of grade raising modifications that meets stakeholder and regulatory requirements may cost more than was budgeted and delay the revenue service start.	Delay and additional cost/revenue.	T	5	5	5	30	DB	1. Review final design reviews. 2. Initiate construction prior to RPT. 3. Considerable lead time for testing, where needed.	Substantial Completion/Revenue Service	Action as recommended for Risk #275 per Risk Assessment Committee 7/31/2019.	See Risk #275 for status prior to remediation and addition of this risk.
313	R	Elect	Construction	Contractor sequencing of early utility location, preliminary design, communication of utility information to sub-contractors and foundation construction may result in inefficiencies in construction, redesign, and reduced production rates.	Delay and additional cost/revenue.	T	5	4	4	40	DB	1. Positive identify known utilities in advance of foundation construction. 2. Perform foundation locations when all design elements have been taken into consideration including line of sight, adjustment of poles, etc. 3. BE to empower field supervision to identify and respond to obstacles. 4. Conduct workshop with BE to identify improved productivity - Originality.	Completion of construction of foundations	Mistakecheck revised per Risk Assessment Committee - 7/24/2019	Challenge is to have sufficient number of overheads complete before advancing foundation work.  Need to start with more pulling down than foundation work - overhead and overhead foundation operations proceeding. Success in Segment 3, Segment 2 and 4 - many reviews via a contractor time to review. Office engineering staff supporting Balfour. Conflicts must be coordinated with the owning authority to develop an escalation mitigation.  Conflicts with signal cable - need to determine if cable is in service or not. If not - out of service - look for slack to move out of the path of the foundation.  C. Union 7/19/2019  Revised to include communication between contractor and sub-contractors per Risk Assessment Committee - 8/27/19.
303	R	Elect	Physics Site	Short of offering site conditions and associated redesign efforts result in delays to the completion of the electrification contract and increased program costs.	Minor offering site conditions and (cost) to resolve.  Extensive construction of foundations and the OCS system and results in less efficient construction of foundations.	T	5	3	4	35	Quan	1. Define process for resolving DDCs to clear locations for foundation installation. 2. Add additional supporting crews to increase production and deal effectively with DDCs. 3. Operative MCP visit to expedite responses to AFDs - Ongoing	Completion of test foundation	Risk description revised and revised per Risk Assessment Committee - 7/21/2019.	Program team continues to meet with the contractors on a weekly basis and each individual Segment team meet on a daily basis for resolution of conflicts.  - L. Quan 7/26/2019  Revised per Risk Assessment Committee - 5/27/19.
242		Elect	Construction	TRCA access does not comply with contractor stipulated work windows.	Contractor demands delay, schedule delay and associated costs to owners representative staff.		4	4	3	28	Quan	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 trackside work • Workload adjustments • Identifying additional teams for accelerated work windows • Use bridges • Add on-site contractor resources (e.g., additional supporting equipment) • Changes to scheduled meals • Negative impact of construction operations on TRCA bus operations.	Completion of Construction		Meeting forward. One was proposed meeting with BEI on the pushing together specific operations work items together for construction activities to further find reduce potential for track access delays.  - Lin G. 8/2/2019
223		Elect	Contracting	Major program elements may not be successfully integrated with existing operations and staff available in advance of revenue service.	Proposed changes resulting from when location may not be fully and properly integrated into existing system.  Rework resulting in cost increases and schedule delays.	T	5	2	3	25	Moore	Routinely meet with RPT, signal, Balfour. Identify interface and resolve issues through coordinated working groups.  Identify work (especially signal related) that will require configuration of Database changes as early as possible to avoid delays.	Revenue Service Data	Risk #254 was retired and incorporated into this risk per Risk Assessment Committee - 5/9/2018	Minimal activity. Rail Activation committee has been reinitiated. Addressing OVI/leaves. Addressing line of sight leaves and 38th Avenue OCS Installation project.  -J. Moore 7/30/2019  No activity - J. Moore 8/1/2018
237		Elect	Construction	Relational map modifications to the RPT database and signal software are not completed in time for delivery and testing.	Failure to follow the Configuration Management process will result in delays in completing Phase 2 sign cabinets. This could delay revenue collection as well as direct customer interaction.		4	2	4	24	Moore	1. Pull on Caltrain's Database Management process for any changes associated with Balfour that may affect the RPT database. 2. Early identification to ensure sufficient time. 3. Continuing meetings between RPT, PTC, and configuration manager to facilitate coordination.	Completion of Construction	Reassigned to J. Moore per Risk Assessment Committee - 8/16/2018	Awaiting submission of software from Balfour. RPT team leading us to revenue service demonstration.  Little progress on "temp ops" - Considering using RBE to do the WLI mapping first, assuming they have sufficient manpower. Will be an additional cost to the project.  -J. Moore 7/30/2019

Program Risk Register										Caltrain					
Version Date: September 13, 2019 - Top Risks															
		1		2		3		4		5					
		LOW		MEDIUM		HIGH		VERY HIGH		SIGNIFICANT					
		< 10%		10% - 50%		50% - 75%		75% - 90%		> 90%					
		< \$500 K		\$500 K - \$2 M		\$2 M - \$10 M		\$10 M - \$20 M		\$20 M - \$50 M					
		< 1 Month		1 - 3 Months		3 - 6 Months		6 - 12 Months		> 12 Months					
ID	RBS		RISK DESCRIPTION	EFFECT(S)	TYP E	IMPACT				OWNER	MITIGATION ACTIONS	RETIREMENT DATE(S)	NOTES	A - C	STATUS & REMARK(S)
	FUNC. (P)	FUNC. (S)				PROBABILIT Y	CO ST	SCH EDULE	PRIORIT Y						
267	R	Becc	Construction	Additional property acquisition is necessitated by change in design.	New project close and delay to schedule.	T	4	1	4	30	Repeatable	1. Project delivery team to work with contractor to get new details well before they are needed for construction 2. Expedite development of new and revised 3. Enter into work agreements for appraisal and acquisition before details are finalized	Completion of Construction	Most acquisition is for easements, some foundations not on JPS property, maximum time impact of 3 months. Unfunded but not major impact. - 12/21/2018	- B. Rizzotrick 4/17/2019 No change - B. Rizzotrick 5/29/2019 No change - B. Rizzotrick 7/16/2019 No change - B. Rizzotrick 8/27/2019
273	R	Becc	Construction	Contractor generates hazardous materials that necessitates proper removal and disposal in excess of jurisdictional and regulatory.	Delay to construction while removing and disposing of hazardous materials resulting in schedule delay, increased construction costs, and schedule delay costs.	T	5	3	1	20	UBCM		Completion of Construction	Appears Perceps contract quantities will be overrun. Also shortening contractor schedules - 2. Angelo 8/27/19	
308	R	Becc	Contracting	Reaction of UVM for AEP and stack wires results in cost and schedule impacts to P&H.	Delay and delay costs	T	5	2	2	20	Punghi	The JPS is utilizing O&E Design Engineers to perform immediate review of the BEI cost revisions to ensure design optimization to minimize and track costs	Installation of wire in all segments	On independent cost estimate. Identify \$3 million more for direct costs. HDPA has questioned and JPS has responded. BEI done \$4.2 million in direct. Next stage is to determine a final \$50 in the process. - J. Punghi 7/11/2019 No change - J. Punghi 8/29/2019	
498	R	Becc	Construction	Changes to PTC implementation schedule could delay completion of the electrification work. Cost and schedule of BEI contract could increase as a result of change in PTC system	1. Changes in detail could affect what software provides, could delay timing for testing, could change books that PRA has to review. 2. Full integrated testing between EMI and wireline cannot be completed without PTC in place. 3. Delay to completion of signal system could result in conflicts with PTC testing and PCB construction and integrated testing. 4. Potential for track access impacts due to PTC testing.	T	2	2	2	18	Lynch	1. Changes in details could affect what software provides, could delay timing for testing, could change books that PRA has to review. 2. Full integrated testing between EMI and wireline cannot be completed without PTC in place. 3. Delay to completion of signal system could result in conflicts with PTC testing and PCB construction and integrated testing. 4. Potential for track access impacts due to PTC testing.	Completion of Integrated testing	BEI budget from BEI and O&E per BEI Assessment Committee - 2/27/2019	No change - PTC is still trying to implement their Rationalizing Demonstration to the PRA. PCB will be coordinating track time for construction and testing with the PTC project. They will make their (likely) have priority. - C. Lynch 6/17/2019 No change - C. Lynch 7/25/2019

## 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 15 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.