



# Modernization Program

Peninsula Corridor Electrification Project (PCEP)



# December 2016 Monthly Progress Report

December 31, 2016



## Funding Partners



FTA Core Capacity

FTA Section 5307 (Environmental / Pre Development only)

FTA Section 5307 (EMU only)



Prop 1B (Public Transportation Modernization & Improvement Account)

Caltrain Low Carbon Transit Operations Cap and Trade



Prop 1A

High Speed Rail Cap and Trade



Carl Moyer Fund



Bridge Tolls (Funds (RM1/RM2))



SFCTA/SFMTA



San Mateo (SMCTA) Contribution

SMCTA Measure A



VTA Measure A

Santa Clara (VTA) Contribution



San Francisco Contribution

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## **1.0 BACKGROUND**

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

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

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

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

An electrified Caltrain system would set the stage for an enhanced, modern commuter rail service and for future blended California High-Speed Rail (CHSR) service. While this project will not include or study all infrastructure necessary to implement high-speed rail service on the corridor (such as CHSR maintenance facilities, station improvements, or passing tracks), the electrical infrastructure (such as overhead wire systems) will be compatible with later blended service.

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**2.0 EXECUTIVE SUMMARY**

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

**Figure 2-1 PCEP Work Segments**



The PCEP team continues work with Balfour Beatty Infrastructure, Inc (BBI) on the technical aspects of the project. The PCEP team and BBI are progressing with design work and field investigations. BBI continued conducting utility surveys, pothole location layouts, geotechnical boring layouts, completed physical geotechnical boring, and conducted cone penetrometer tests on the Caltrain ROW for Segments 2 and 4. Biological, archaeological, and Native American monitors were present during field investigation activities occurring in areas that require environmental compliance monitoring.

The PCEP team has continued to work with Stadler on the technical aspects of the project. The PCEP Team continues to address system-wide interface issues involving the emerging EMU design and the existing wayside infrastructure, the Electrification Project, the CBOSS Project, and the CEMOF Design Upgrade. The PCEP Team and Stadler conducted conceptual Design Reviews (CDRs) on several EMU systems, including the HVAC system, passenger side doors and controls, the propulsion system, the auxiliary power systems and the friction brakes. Stadler has submitted several deliverables to the PCEP team for review.

The PCEP team has also moved forward with developing an acquisition plan for all work segments. The PCEP team continues negotiations on offers pending, including working through relocation of one commercial business. The first grantor signed the offer package in late December and the PCEP team anticipates a number of grantors to sign in early January.

## **2.1 Schedule**

The Revenue Service Date (RSD) in the Master Program Schedule (MPS) remains unchanged. Without adjustment for contingency, the RSD is forecast as August 2021. With the addition of approximately five months of contingency to account for potential risk to the project, the RSD is anticipated as December 2021. Table 2-1 provides a summary of the current schedule and milestones.

## **2.2 Budget**

A summary of the overall budget and expenditure status for the PCEP is provided in Table 2-2 below.

## **2.3 Board Actions**

At the December 1, 2016 meeting, JPB took action by approving interim financing in an amount not to exceed \$150 million with DNT asset Trust. The JPB also authorized execution of the \$647 million Full Funding Grant Agreement (FFGA) with the Federal Transportation Administration (FTA).

The link to the full board meeting packet can be viewed here:

[http://www.caltrain.com/Assets/\\_Agendas+and+Minutes/JPB/Board+of+Directors/Agendas/2016/2016-12-01+JPB+BOD+Agenda+Packet.pdf#page78](http://www.caltrain.com/Assets/_Agendas+and+Minutes/JPB/Board+of+Directors/Agendas/2016/2016-12-01+JPB+BOD+Agenda+Packet.pdf#page78)

*(Note: For viewers accessing the links above electronically, please cut and paste the link into a browser if it does not direct you immediately to the document.)*

**Table 2-1 Schedule Status**

Milestones <sup>1,2</sup>	Program Plan	September	October
Full Notice to Proceed to Electrification Contractor	N/A	03/01/2017	03/01/2017
Full Notice to Proceed to EMU Manufacturer	N/A	03/01/2017	03/01/2017
Start of Electrification Major Construction	03/20/2017	07/24/2017	07/24/2017
First 8 Miles of Electrification Complete to Begin Testing	04/08/2019	10/08/2019	10/08/2019
Delivery of 1 <sup>st</sup> Vehicle	06/25/2019	07/30/2019	07/30/2019
Start Pre-Revenue Operations	09/08/2020	09/22/2020	09/22/2020
Potential Limited Service	12/31/2020	12/31/2020	12/31/2020
RSD (w/ Risk Contingency)	12/30/2021	12/30/2021	12/30/2021

Notes:

<sup>1</sup> Milestones reported on this table may differ from the current schedule. As the schedule continues to be refined over the coming months to incorporate approved baseline schedules from the Electrification and EMU contractors, changes to milestones will be thoroughly vetted prior to reflecting those changes in the Monthly Report.

<sup>2</sup> Program Plan only considered an NTP. It did not account for an LNTP and FNTP.

**Table 2-2 Budget and Expenditure Status**

Description of Work	Budget	Cost This Month	Cost To Date	Estimate To Complete	Estimate At Completion
	(A)	(B)	(C)	(D)	(E) = (C) + (D)
Electrification Subtotal	\$ 1,316,125,208	\$ 17,367,351	\$ 129,027,925	\$ 1,187,097,283	\$ 1,316,125,208
EMU Subtotal	\$ 664,127,325	\$ 750,110	\$ 17,895,148	\$ 646,232,177	\$ 664,127,325
<b>PCEP TOTAL</b>	<b>\$ 1,980,252,533</b>	<b>\$ 18,117,461</b>	<b>\$ 146,923,073</b>	<b>\$ 1,833,329,460</b>	<b>\$ 1,980,252,533</b>

## 2.4 Community Relations and Outreach

A number of community relations and outreach events took place during the month of November. PCEP staff attended 8 third party/stakeholder actions and meetings.

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### **3.0 ELECTRIFICATION – INFRASTRUCTURE**

This section reports on the progress of the Electrification, Supervisory Control and Data Acquisition (SCADA), and Tunnel Modification components. A brief description on each of the components is provided below.

#### **3.1 Electrification**

The Electrification component of the PCEP includes the installation of 138 miles of single-track and overhead contact system (OCS) for the distribution of electrical power to the EMUs. The OCS will be powered from a 25-kilovolt (kV), 60-Hertz (Hz), single phase, alternating current supply system consisting of two traction power substations (TPS), one switching station (SS), and seven paralleling stations (PS). Electrification will be performed using a DB delivery method.

##### **Activity This Month**

- The PCEP team continued working with BBI on initial design and field investigations. BBI continued conducting utility surveys, pothole location layouts, geotechnical boring layouts, and completed physical geotechnical boring and cone penetrometer tests on the Caltrain ROW for Segments 2 and 4.
- The PCEP team also continued to review requests for information (RFIs) and submittals from BBI. This effort is expected to continue during the upcoming months.
- Coordination efforts with PG&E continued for infrastructure improvements and traction power substation interconnects. Scoping documents prepared by PG&E are expected to be complete by early January.

##### **Activity Next Month**

- The PCEP team will continue to work with BBI on design and field investigation activities.
- Geotechnical investigations in Segments 1 and 3 are expected to start in January and potholing activities in Segments 2 and 4 are expected to start in January as well.
- The PCEP team will continue to respond to RFIs submitted for review.
- Coordination efforts will continue with PG&E on interconnection design and final design for PG&E infrastructure.

#### **3.2 Supervisory Control and Data Acquisition (SCADA)**

SCADA is a system that monitors and controls field devices for electrification, including substations, paralleling stations and sectionalization. SCADA will be integrated with the base operating system for Caltrain Operations and Control, which is the Rail Operations Center System (ROCS).

**Activity This Month**

- Activity continues to be limited to providing technical support on an as needed basis to the Caltrain Contract and Procurement Department for the procurement of the SCADA system.

**Activity Next Month**

- PCEP staff will continue to support Caltrain Contracts and Procurement Department on providing technical support during the procurement process.
- Finalization of procurement package for issuance in January to the sole-source supplier for a proposal.

**3.3 Tunnel Modification**

Tunnel modifications will be required on the four tunnels located in San Francisco. This effort is needed to accommodate the required clearance for the OCS to support electrification of the corridor. Outside of the PCEP scope, Caltrain Engineering and Construction has requested the PCEP team to manage completion of design and construction management for the Tunnel 1 and Tunnel 4 Drainage Rehab Project. The Drainage Rehab Project is funded separately from PCEP and will be a Design-Bid-Build (DBB) construction package. Construction will occur concurrently with the Electrification contractor's efforts in Segment 1.

**Activity This Month**

- PCEP team continued coordination efforts with the design team on drawings and specifications as well as field survey investigations on Tunnel 1 and Tunnel 4 Drainage Rehab projects.
- The PCEP team continues to progress 95% design drawings and specifications for tunnel modification.

**Activity Next Month**

- PCEP staff will complete 95% design drawings and specifications for review and resolve comments for preparation of Issued for Bid (IFB) documents
- Coordination of the 95% design on the Tunnel Modification design efforts with Union Pacific Railroad (UPRR) and other stakeholders will begin.

#### **4.0 ELECTRIC MULTIPLE UNITS**

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

##### **Activity This Month**

- The PCEP Team and Stadler participated in numerous coordination meetings regarding the EMU design to support Caltrain's Operation and Maintenance objectives plus upcoming public outreach initiatives.
- Stadler management submittals in December included a Baseline Master Schedule, an updated Contractual Submittals Report, and updated System Safety and Quality Assurance Plans. The PCEP team is currently reviewing these submittals and working with Stadler to finalize these deliverables.
- The PCEP Team conducted weekly conference calls with Stadler, Caltrain Operations, Maintenance and Safety and Security group representatives. The PCEP team also conducted a more in depth Monthly Progress Review Meeting.
- The PCEP Team continues to address system-wide interface issues involving the emerging EMU design and the existing wayside infrastructure, the Electrification Project, the CBOSS Project, and the CEMOF Design Upgrade.
- The PCEP Team and Stadler conducted conceptual Design Reviews (CDRs) on several EMU systems, including the HVAC system, passenger side doors and controls, the propulsion system, the auxiliary power systems and the friction brakes.

##### **Activity Next Month**

- Stadler will work towards PCEP's approval of several documents including: the Quality Plan, the Master Project Schedule, the System Safety Plan and Contractual Submittals Report. Stadler will be in San Mateo to review the documents with Caltrain Operation, Maintenance, and Outreach Groups as well as PCEP Quality Assurance and System and Safety representatives in San Mateo. CDRs are scheduled for the virtual mock-up and the cab mock-up.
- Stadler will be in San Mateo the later part of the month and meetings will be held with them and Caltrain's Operation, Maintenance, and Outreach Groups, as well as PCEP Quality Assurance and System Safety representatives.

**4.1 Centralized Equipment Maintenance and Operations Facility (CEMOF) Modifications**

The Centralized Equipment Maintenance and Operations Facility (CEMOF) Modifications project will provide safe work areas for performing maintenance on the new EMUs.

**Activity This Month**

- The PCEP team advanced the conceptual design to consider alternatives for the modification of CEMOF. The alternatives are under review with Operations.

**Activity Next Month**

- Determination of preferred concepts to allow progression of design.



## **5.0 SAFETY**

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

### **Activity This Month**

- Safety staff continued to review contractor safety and security contract documentation deliverables to ensure they meet project requirements. Meetings with continue with BBI and Stadler to progress project safety and security program implementation.
- Field visits were conducted to work sites to ensure Site Specific Work Plan (SSWP) was being followed by the contractors and sub-contractors.
- A kick-off meeting for the PCEP Fire/Life Safety & Security Committee (FLSSC) was held on December 8, 2016 and will occur every month. The Safety Staff continues to review EMU safety related documents including the Hazard Analysis program and Safety Certification programs.
- Kick-off meeting for the project Safety & Security Certification Review Committee (SSCRC) was held on December 15, 2016. Monthly meetings will be held as the project continues.
- Roadway Worker Protection (RWP) program was revised and presented to TASI and Rail Operations. Trial presentations have been conducted and the new program is currently being implemented.

### **Activity Next Month**

- Monthly meetings for SSCRC and FLSSC will be held.
- All staff safety meetings will be held with PCEP, BBI employees and subs to reinforce the importance of safety in the field.

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**6.0 QUALITY ASSURANCE**

The Quality Assurance (QA) staff performs technical review for planning, implementing, evaluating, and maintaining an effective program to verify that all equipment, structures, components, systems, and facilities are designed, procured, constructed, installed, and maintained in accordance with established criteria and applicable codes and standards throughout the design, construction, startup and commissioning of the PCEP.

**Activity This Month**

- The re-audit for LKG-CMC Document Control corrective action verification was conducted the first week of December and yielded six Findings and four Observations.
- QA review of Stadler’s BBI’s Quality Management Plan (QMP) was conducted. The QA team provided comments – closure of those comments is pending.
- QMP training for incoming PCEP employees was conducted.

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

**Table 6-1 Quality Assurance Audit Summary**

Quality Assurance Activity	This Reporting Period	Total to Date
Internal Audits Conducted	1	16
External Audits Conducted	0	0
Audit Findings Issued	6	6
Audit Findings Open	5	5
Audit Findings Closed	1	1
Non-Conformances Open	0	1
Non-Conformances Issued	0	4
Non-Conformances Closed	0	3

**Activity Next Month**

- QA Manager will continue to provide support of FTA document submittals, also provide reviews for Full Funding Grant Agreement (FFGA) items, and the review of technical documents from BBI and Stadler.
- Three audits are planned and scheduled: Parikh Geotechnical Lab, BBI Purchasing, and Design Package for 65% Traction Power System.
- QA review of Stadler’s QMP revision for EMU procurement.
- Regularly scheduled design reviews will begin on project design packages and will continue through the late summer.

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- Regularly scheduled QA staff meetings with BBI and Stadler will begin in January.

**7.0 SCHEDULE**

The schedule provided in this Monthly Progress Report is the approved schedule from November due to the timeframe necessary to update and approve the schedule. As indicated in Table 7-1, the Revenue Service Date (RSD), which is the date in which the project is deemed completed, remains unchanged in the Master Program Schedule (MPS). Without adjustment for contingency, the RSD is forecast as August 2021. With the addition of approximately five months contingency to account for potential risk to the project, the RSD is anticipated as December 2021. A summary of the overall schedule status for the PCEP is provided in Table 7-1, which provides comparisons between the baseline schedule (Program Plan), the previous update (October) and the current update (November) to capture any potential changes in the schedule. A complete schedule can be found in Appendix B.

Items listed in Table 7-2 show the critical path activities/milestones for the PCEP. Table 7-3 lists near-critical activities on the horizon.

**Notable Variances**

There were no notable variances this month.

**Table 7-1 Schedule Status**

Milestones <sup>1,2</sup>	Program Plan	October	November
Full Notice to Proceed to Electrification Contractor	N/A	03/01/2017	03/01/2017
Full Notice to Proceed to EMU Manufacturer	N/A	03/01/2017	03/01/2017
Start of Electrification Major Construction	03/20/2017	07/24/2017	07/24/2017
First 8 Miles of Electrification Complete to Begin Testing	04/08/2019	10/08/2019	10/08/2019
Delivery of 1 <sup>st</sup> Vehicle	06/25/2019	07/30/2019	07/30/2019
Start Pre-Revenue Operations	09/08/2020	09/22/2020	09/22/2020
Potential Limited Service	12/31/2020	12/31/2020	12/31/2020
RSD (w/ Risk Contingency)	12/30/2021	12/30/2021	12/30/2021

Notes:

<sup>1</sup> Milestones reported on this table may differ from the current schedule. As the schedule continues to be refined over the coming months to incorporate approved baseline schedules from the Electrification and EMU contractors, changes to milestones will be thoroughly vetted prior to reflecting those changes in the Monthly Report.

<sup>2</sup> Program Plan only considered an NTP. It did not account for an LNTP and FNTP.

**Table 7-2 Critical Path Summary**

<b>Activity</b>	<b>Start</b>	<b>Finish</b>
Electrification Design to Begin Major Construction	09/06/2016	07/21/2017
EMU Design to Delivery of First Carbody	09/06/2016	10/13/2017
Electrification OCS Construction	07/24/2017	02/26/2020
Electrification Acceptance & Integrated Testing	02/26/2020	04/25/2020
PG&E Complete Infrastructure Upgrades to Provide Permanent Power <sup>1</sup>	08/31/2020	08/31/2020
Vehicle Manufacturing & Assembly to Provide First 5 Trainsets	11/13/2017	09/09/2020
Pre-Revenue Operations	09/22/2020	12/10/2020
Potential Limited Service <sup>1</sup>	12/31/2020	12/31/2020
RSD w/out Risk Contingency <sup>1</sup>	08/16/2021	08/16/2021
RSD w/ Risk Contingency <sup>1</sup>	12/30/2021	12/30/2021

<sup>1</sup>Milestone activity

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

<b>WBS</b>	<b>Activity</b>	<b>Responsibility</b>
FTA	Path to Full Funding Grant Agreement (FFGA)	Project Delivery
Utilities	PG&E Scoping & Preliminary Design	Project Delivery

**8.0 BUDGET AND EXPENDITURES**

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

**Table 8-1 Electrification Budget & Expenditure Status**

Description of Work	Budget (A)	Cost This Month (B) <sup>1</sup>	Cost To Date (C) <sup>2</sup>	Estimate To Complete (D)	Estimate At Completion (E) = (C) + (D)
<b>ELECTRIFICATION</b>					
Electrification <sup>3</sup>	\$ 696,610,558	\$ 15,067,625	\$ 55,455,875	\$ 641,154,683	\$ 696,610,558
Tunnel Notching	\$ 11,029,649	\$ -	\$ -	\$ 11,029,649	\$ 11,029,649
Real Estate	\$ 28,503,369	\$ 141,130	\$ 5,451,285	\$ 23,052,084	\$ 28,503,369
Private Utilities	\$ 63,515,298	\$ 401,511	\$ 3,394,230	\$ 60,121,069	\$ 63,515,298
Management Oversight <sup>4</sup>	\$ 141,526,164	\$ 1,245,522	\$ 62,200,069	\$ 79,326,094	\$ 141,526,164
Executive Management	\$ 7,452,866	\$ 91,537	\$ 2,724,683	\$ 4,728,183	\$ 7,452,866
Planning	\$ 7,281,997	\$ 27,589	\$ 4,213,382	\$ 3,068,614	\$ 7,281,997
Community Relations	\$ 2,789,663	\$ 11,482	\$ 857,078	\$ 1,932,585	\$ 2,789,663
Safety & Security	\$ 2,421,783	\$ 11,719	\$ 485,170	\$ 1,936,613	\$ 2,421,783
Project Management Services	\$ 19,807,994	\$ 188,675	\$ 6,980,721	\$ 12,827,273	\$ 19,807,994
Engineering & Construction	\$ 11,805,793	\$ 19,500	\$ 1,836,328	\$ 9,969,465	\$ 11,805,793
Electrification Engineering & Management	\$ 50,461,707	\$ 571,756	\$ 15,370,119	\$ 35,091,589	\$ 50,461,707
IT Support <sup>6</sup>	\$ 331,987	\$ 216	\$ 331,987	\$ 0	\$ 331,987
Operations Support	\$ 1,445,867	\$ 5,525	\$ 356,210	\$ 1,089,657	\$ 1,445,867
General Support	\$ 4,166,577	\$ 56,881	\$ 1,251,176	\$ 2,915,402	\$ 4,166,577
Budget / Grants / Finance	\$ 1,229,345	\$ 25,924	\$ 207,851	\$ 1,021,493	\$ 1,229,345
Legal	\$ 2,445,646	\$ 166,266	\$ 1,678,386	\$ 767,261	\$ 2,445,646
Other Direct Costs	\$ 5,177,060	\$ 68,453	\$ 1,573,620	\$ 3,603,440	\$ 5,177,060
Prior Costs 2002 - 2013	\$ 24,707,878	\$ -	\$ 24,333,358	\$ 374,520	\$ 24,707,878
TASI Support	\$ 55,275,084	\$ 299,063	\$ 606,670	\$ 54,668,414	\$ 55,275,084
Insurance	\$ 4,305,769	\$ 212,500	\$ 1,155,769	\$ 3,150,000	\$ 4,305,769
Environmental Mitigations <sup>5</sup>	\$ 14,972,645	\$ -	\$ 397,000	\$ 14,575,645	\$ 14,972,645
Required Projects	\$ 17,337,378	\$ -	\$ 367,028.00	\$ 16,970,350	\$ 17,337,378
Maintenance Training	\$ 1,021,808	\$ -	\$ -	\$ 1,021,808	\$ 1,021,808
Finance Charges	\$ 5,056,838	\$ -	\$ -	\$ 5,056,838	\$ 5,056,838
Contingency	\$ 276,970,649	\$ -	\$ -	\$ 276,970,649	\$ 276,970,649
Owner's Reserve	\$ -	\$ -	\$ -	\$ -	\$ -
<b>ELECTRIFICATION SUBTOTAL</b>	<b>\$ 1,316,125,208</b>	<b>\$ 17,367,351</b>	<b>\$ 129,027,925</b>	<b>\$ 1,187,097,283</b>	<b>\$ 1,316,125,208</b>

Notes regarding tables above:

1. Column B "Cost This Month" represents the cost of work performed this month.
2. Column C "Cost To Date" includes actuals (amount paid) and accruals (amount of work performed) to date.
3. Cost To Date for "Electrification" include 5% for Contractor's retention until authorization of retention release.
4. The agency labor is currently accrued since end of October 2016 due to the upgrade of the accounting system. Expenditures for agency labor will be updated once the financial data is available
5. An internal budget transfer was performed in the current reporting month. A total of \$1,888,854.00 was transferred from Environmental Mitigations to IT Support and Finance Charges at \$216.00 and \$1,888,638.00, respectively.

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**Table 8-2 EMU Budget & Expenditure Status**

Description of Work	Budget (A)	Cost This Month (B) <sup>1</sup>	Cost To Date (C) <sup>2</sup>	Estimate To Complete (D)	Estimate At Completion (E) = (C) + (D)
EMU	\$ 550,899,459	\$ -	\$ 1,242,300	\$ 549,657,159	\$ 550,899,459
CEMOF Modifications	\$ 1,344,000	\$ -	\$ -	\$ 1,344,000	\$ 1,344,000
Management Oversight <sup>3</sup>	\$ 64,139,103	\$ 750,110	\$ 16,652,848	\$ 47,486,256	\$ 64,139,103
Executive Management	\$ 5,022,302	\$ 45,417	\$ 1,529,789	\$ 3,492,513	\$ 5,022,302
Community Relations	\$ 1,685,614	\$ 2,516	\$ 254,997	\$ 1,430,617	\$ 1,685,614
Safety & Security	\$ 556,067	\$ 81	\$ 146,222	\$ 409,845	\$ 556,067
Project Management Services	\$ 13,275,280	\$ 139,667	\$ 4,719,008	\$ 8,556,273	\$ 13,275,280
Engineering & Construction	\$ 89,113	\$ -	\$ 23,817	\$ 65,296	\$ 89,113
EMU Engineering & Management	\$ 32,082,556	\$ 401,298	\$ 7,316,413	\$ 24,766,144	\$ 32,082,556
IT Support <sup>3</sup>	\$ 1,027,272	\$ 22,632	\$ 216,642	\$ 810,631	\$ 1,027,272
Operations Support	\$ 1,878,589	\$ 2,000	\$ 284,347	\$ 1,594,241	\$ 1,878,589
General Support	\$ 2,599,547	\$ 24,978	\$ 608,414	\$ 1,991,133	\$ 2,599,547
Budget / Grants / Finance	\$ 712,123	\$ 6,548	\$ 100,700	\$ 611,424	\$ 712,123
Legal	\$ 1,207,500	\$ 63,073	\$ 481,184	\$ 726,316	\$ 1,207,500
Other Direct Costs	\$ 4,003,139	\$ 41,898	\$ 971,315	\$ 3,031,824	\$ 4,003,139
TASI Support	\$ 2,740,000	\$ -	\$ -	\$ 2,740,000	\$ 2,740,000
Required Projects	\$ 4,500,000	\$ -	\$ -	\$ 4,500,000	\$ 4,500,000
Finance Charges	\$ 1,941,800	\$ -	\$ -	\$ 1,941,800	\$ 1,941,800
Contingency	\$ 38,562,962	\$ -	\$ -	\$ 38,562,962	\$ 38,562,962
Owner's Reserve	\$ -	\$ -	\$ -	\$ -	\$ -
<b>EMU SUBTOTAL</b>	<b>\$ 664,127,325</b>	<b>\$ 750,110</b>	<b>\$ 17,895,148</b>	<b>\$ 646,232,177</b>	<b>\$ 664,127,325</b>

Notes regarding tables above:

- Column B "Cost This Month" represents the cost of work performed this month.
- Column C "Cost To Date" includes actuals (amount paid) and accruals (amount of work performed) to date.
- The agency labor is currently accrued since the end of October 2016 due to the upgrade of the accounting system. Expenditures for agency labor will be updated once the financial data is available.

**Table 8-3 PCEP Budget & Expenditure Status**

Description of Work	Budget (A)	Cost This Month (B) <sup>1</sup>	Cost To Date (C) <sup>2</sup>	Estimate To Complete (D)	Estimate At Completion (E) = (C) + (D)
Electrification Subtotal	\$ 1,316,125,208	\$ 17,367,351	\$ 129,027,925	\$ 1,187,097,283	\$ 1,316,125,208
EMU Subtotal	\$ 664,127,325	\$ 750,110	\$ 17,895,148	\$ 646,232,177	\$ 664,127,325
<b>PCEP TOTAL<sup>3</sup></b>	<b>\$ 1,980,252,533</b>	<b>\$ 18,117,461</b>	<b>\$ 146,923,073</b>	<b>\$ 1,833,329,460</b>	<b>\$ 1,980,252,533</b>

Notes regarding tables above:

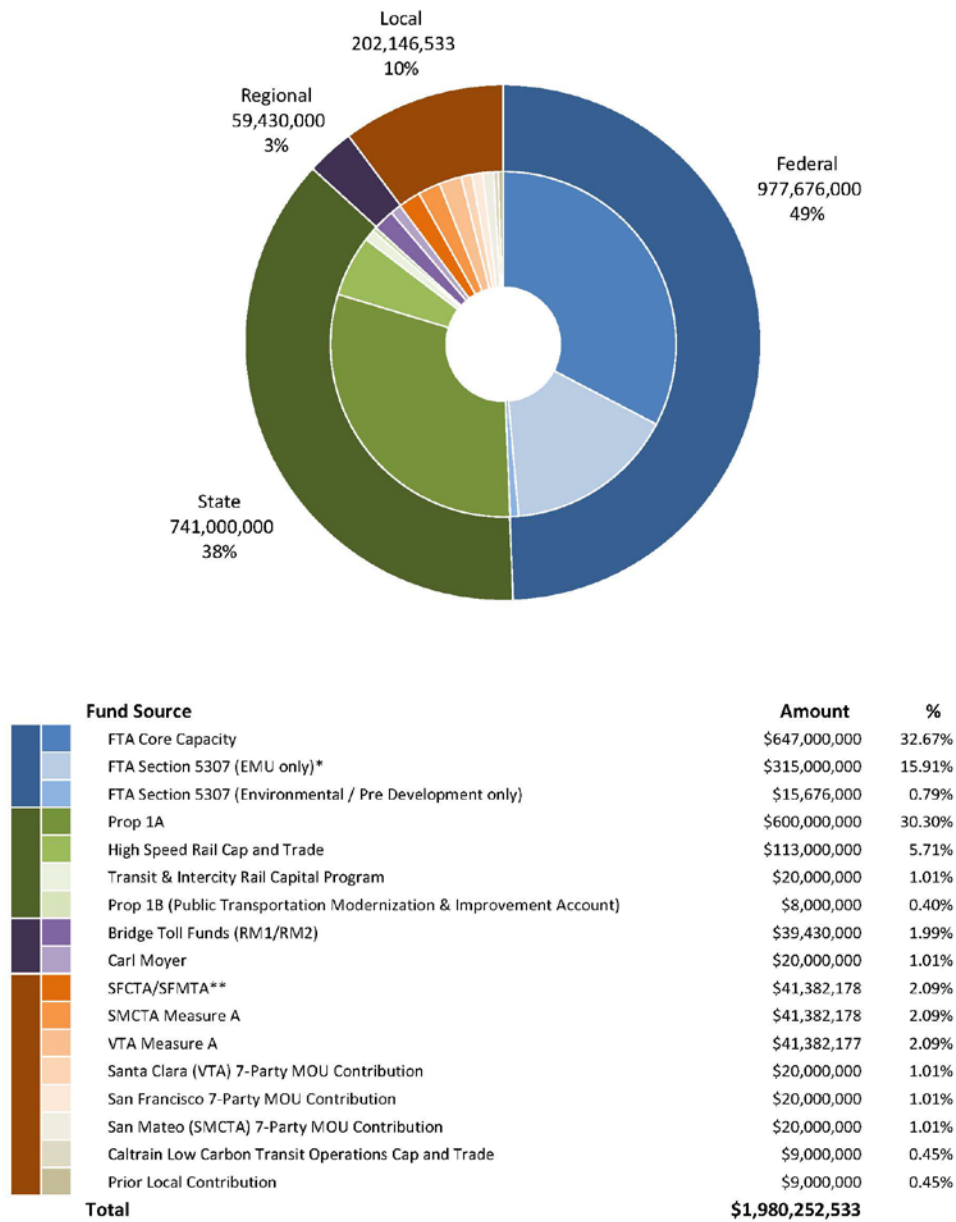
- Column B "Cost This Month" represents the cost of work performed this month.
- Column C "Cost To Date" includes actuals (amount paid) and accruals (amount of work performed) to date.
- The agency labor is currently accrued since the end of October 2016 due to the upgrade of the accounting system. Expenditures for agency labor will be updated once the financial data is available.



**9.0 FUNDING**

Figure 9-1 depicts a summary of the funding plan for the PCEP. It provides a breakdown of the funding partners as well as the allocated funds. As previously reported, all non-core capacity funds have been committed to the PCEP project and the JPB continued to work with FTA to secure a FFGA for the \$647 million in Core Capacity funding, including the preparation of an updated Financial Plan in response to FTA’s Financial Capacity Assessment.

**Figure 9-1 Funding Plan**



Notes:

\*Includes necessary fund transfer with SMCTA

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

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## **10.0 RISK MANAGEMENT**

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

The Risk Management team has identified the following items as Top Risks for the project:

- If overhead utilities are not relocated in time, BBI may incur delays.
- A delay in the execution of the FFGA by the FTA, could potentially result in delays to the project.
- Upgrades to the electrical service needed for the Electrification project are dependent upon final agreement with PG&E for which technical and contractual issues must first be resolved.
- The final configuration of the electrification system requires the installation of a duct bank under Union Pacific Railroad (UPRR) tracks. This will require further coordination with UPRR.
- Transit America Systems Inc. (TASI) may not be able to deliver sufficient staff resources to support the construction and testing of the electrification system.
- Recruitment of Key Staff is necessary to support the project.
- As built Communications Based Overlay Signal System (CBOSS) drawings needed by BBI may be incomplete, and will need to be revised.

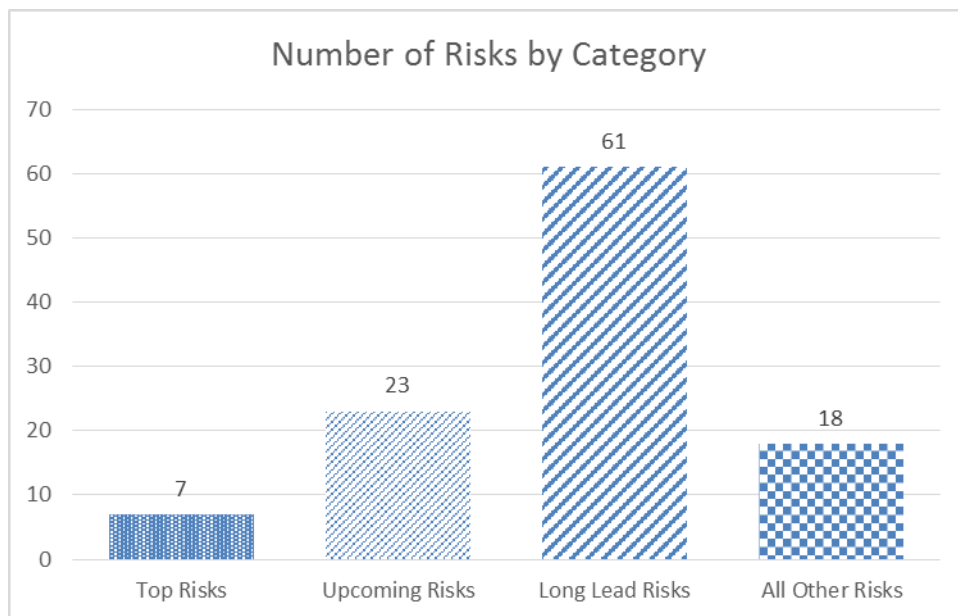
### **Activity This Month**

- Updates were made to risk descriptions, effects, and mitigations based upon weekly input from risk owners. Monthly cycle of risk updating was completed based on schedules established in the Risk Identification and Mitigation Plan.
- Risk retirement dates were updated based upon revisions to the project schedule and input from risk owners.
- Continued weekly monitoring of risk mitigation actions and publishing of the risk register.
- PCEP Risk Management Team attended Electrification, Project Delivery, and Systems Integration meetings to monitor developments associated with risks and to identify new risks.

- The Risk Assessment Committee convened to review risks proposed for retirement and major changes to grading of risks. Continued discussion of reputational risk as a potential adjunct to current risk management efforts.

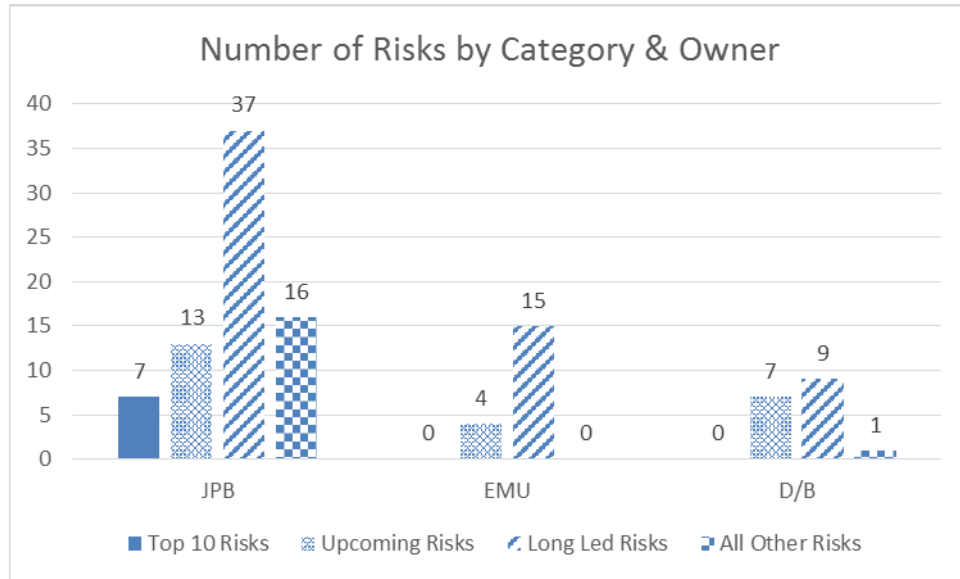
Tables 10-1 and 10-2 show the risks identified for the program. Risks are categorized as: top risk, upcoming risk, long lead, and all other risks. The categories are based on a rating scale comprised of schedule and cost factors. Simply put, top risks are considered to have a significantly higher than average risk grade. Upcoming risks are risks for which mitigating action must be taken within 60 days. Long lead risks are risks for which mitigating action must be taken as much as a year or more into the future. All other risks are risks not falling into other categories.

**Table 10-1 Monthly Status of Risks**



**Total Number of Active Risks = 108**

**Table 10-2 Risk Classification**



**Total Number of Active Risks = 108**

**Activity Next Month**

- Update risk descriptions, effects, mitigations, retirement dates.
- Conduct weekly monitoring of risk mitigation actions and continue publishing risk register.
- Further develop reputational risk analysis and submit recommendation.

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## 11.0 ENVIRONMENTAL

### 11.1 Permits

The PCEP requires environmental permits from the following agencies/federal regulations: Section 106 of the National Historic Preservation Act of 1966 (NHPA), Section 7 of the Endangered Species Act (ESA), United States Army Corps of Engineers (USACE), San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), the California Department of Fish and Wildlife (CDFW), and the San Francisco Bay Conservation Development Commission (BCDC).

Section 106 of the NHPA process as well as Section 7 of the ESA process have concluded.

#### Activity This Month

- All environmental permits have been obtained.

#### Activity Next Month

- There are no planned permit activities in the next month.

### 11.2 Mitigation Monitoring and Reporting Program

The California Environmental Quality Act (CEQA) requires that a Lead Agency establish a program to monitor and report on mitigation measures that it has adopted as part of the environmental review process. The JPB has prepared a Mitigation Monitoring and Reporting Program (MMRP) to ensure that mitigation measures identified in the PCEP EIR are fully implemented during project implementation. The JPB will implement the mitigation measures through its own actions, those of the design-build contractor and actions taken in cooperation with other agencies and entities. The MMRP is available on the Caltrain website:

<http://www.caltrain.com/Assets/Caltrain+Modernization+Program/Electrification+Documents/MMRP.pdf>

*(Note: For viewers accessing the link above electronically, please cut and paste the link into a browser if it does not direct you immediately to the document.)*

#### Activity This Month

- Biological, archaeological, and Native American monitors were present during the design phase investigation activities (geotechnical activities) occurring in areas that require environmental compliance monitoring. The monitoring was conducted in accordance with measures in the MMRP in an effort to minimize potential impact on sensitive environmental resources.
- A habitat assessment for a sensitive avian species was conducted at previously identified potential habitat locations. The habitat assessment was conducted in

order to determine the likelihood of encountering the sensitive species during upcoming project activities.

- Architectural historians took photos and documented site conditions at a number of historic railroad stations in support of historic documentation required as part of the MMRP.

**Activity Next Month**

- Biological, archaeological, and Native American monitors will continue to monitor design phase investigation activities (geotechnical activities) occurring in areas that require environmental compliance monitoring. In addition, biological survey teams will conduct protocol level surveys for sensitive avian species and an architectural historian will continue to take photos and document site conditions at historic railroad stations in support of historic documentation required as part of the MMRP.



## **12.0 UTILITY RELOCATION**

Implementation of the PCEP requires relocation or rerouting of both public and private utility lines and/or facilities. Utility relocation will require coordination with many entities, including regulatory agencies; public safety agencies; Federal, State, and local government agencies; private and public utilities; and other transportation agencies and companies. The section describes the progress specific to the utility relocation process.

### **Activity This Month**

- PCEP team continued monthly coordination meetings with telecommunication and power utilities. These meetings focused on overall project and relocation schedules, designation of responsibilities, applicable design standards, and reconciliation of agreements and records.
- Work continued with all utilities on review of overhead utility line relocations based on the current preliminary design. This effort is expected to continue for the next several months to support identification and confirmation, agreements, and design of all relocations.
- PCEP team began preparation of relocation notices and various design information for utility owners.

### **Activity Next Month**

- Monthly meetings will continue with telecom and power carriers.
- PCEP team will send relocation notices to utility owners and will also continue to provide design information for relocation designs.

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## **13.0 REAL ESTATE**

The PCEP requires the acquisition of a limited amount of real estate. In general, Caltrain uses existing ROW for the PCEP, but in certain locations, will need to acquire small portions of additional real estate to expand the right-of-way (ROW) to accommodate installation of OCS supports (fee acquisitions or railroad easements ) and associated Electrical Safety Zones (easements). There are two larger full acquisition areas required for wayside facilities (i.e., traction power stations, switching stations and paralleling stations). The PCEP real estate team (RE team) manages the acquisition of all property rights. Caltrain does not need to acquire real estate to complete the EMU procurement portion of the PCEP.

### **Activity This Month**

Table 13-1 below provides a brief summary of the Real Estate acquisition overview for the project.

- Table 13-1 below provides a brief summary of the Real Estate acquisition overview for the project.
- The RE Team continues negotiations on offers pending, including working through relocation of one commercial business.
- The first grantor has signed the offer package.
- The PCEP team conducted a number of surveys to help property owners identify the exact limits of property acquisition required for the project.
- The agency continues to negotiate the Cooperative Agreement for eminent domain authority with the City & County of San Francisco. The target for completion is for early 2017.
- Staff met with UPRR and developed a process for acquiring the two parcels necessary for the Project.

### **Activity Next Month**

- Negotiations for all outstanding offers will continue.
- The PCEP team will issue work directives to appraise and acquire parcels in Segments 1 and 3.
- It is anticipated that properties will close escrow for grantors who have accepted the offers.

**Table 13-1 Real Estate Acquisition Overview**

Segment	No. of Parcels Needed	No. of Appraisals Completed	Offers Presented	Offers Accepted	Acquisition Status		
					Escrow Closed	Value Litigation	Parcel Possession
Segment 1	8	0	0	0	0	0	0
Segment 2	27	24	17	4	0	0	0
Segment 3	11	0	0	0	0	0	0
Segment 4	11	11	4	0	0	0	0
<b>Total</b>	<b>57</b>	<b>35</b>	<b>21</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

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

**14.0 THIRD PARTY AGREEMENTS**

Third-party coordination is necessary for work impacting public infrastructure, utilities, ROW acquisitions, and others. The table below outlines the status of necessary agreements for the PCEP.

**Table 14-1 Third-Party Agreement Status**

Type	Agreement	Third-Party	Status
Governmental Jurisdictions	Construction & Maintenance <sup>1</sup>	City and County of San Francisco	In Process
		City of Brisbane	Executed
		City of South San Francisco	Executed
		City of San Bruno	Executed
		City of Millbrae	Executed
		City of Burlingame	Executed
		City of San Mateo	Executed
		City of Belmont	Executed
		City of San Carlos	Executed
		City of Redwood City	Executed
		City of Atherton	In Process
		County of San Mateo	Executed
		City of Menlo Park	Executed
		City of Palo Alto	In Process
		City of Mountain View	Executed
		City of Sunnyvale	Executed
		City of Santa Clara	Executed
	County of Santa Clara	Executed	
	City of San Jose	Executed	
	Condemnation Authority	San Francisco	In Process
San Mateo		Executed	
Santa Clara		Executed	
Utilities	Infrastructure	Pacific Gas & Electric (PG&E)	Executed <sup>3</sup>
	Operating Rules	California Public Utilities Commission (CPUC)	Executed <sup>2</sup>
Transportation & Railroad	Construction & Maintenance	Bay Area Rapid Transit (BART)	Executed <sup>4</sup>
	Construction & Maintenance	California Dept. of Transportation (Caltrans)	Not needed <sup>5</sup>
	Trackage Rights	Union Pacific Railroad (UPRR)	Executed <sup>4</sup>

Notes regarding table above:

1. Agreements memorialize the parties' consultation and cooperation, designate respective rights and obligations and ensure cooperation between the JPB and the cities and counties in connection with the design and construction of the PCEP. A comprehensive agreement is planned for each of the 17 cities and three counties along the Caltrain ROW and within the PCEP limits.
2. Approved by City Council, or Board of Supervisors, and awaiting signature for execution.
3. The Master agreement and supplemental agreements 1, 2 and 5 have been executed. Supplemental agreements 3 and 4 are to be negotiated and executed.
4. Utilizing existing agreements.
5. Caltrans Peer Process utilized. Formal agreement not needed.

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## **15.0 COMMUNITY RELATIONS AND OUTREACH**

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

- **Presentations/Meetings**

- Harbor Industrial Association
- C3
- Atherton Rail Committee
- Fire Life Safety
- Peninsula Freight User Group
- JPB CAC
- Visitation Valley Community Center
- Diridon Station Joint Policy Advisory Board
- JPB Citizen Advisory Committee

- **Third Party/Stakeholder Actions**

- None to report.

- **Stakeholder Meetings**

- San Mateo County Economic Development Association (SAMCEDA)
- Silicon Valley and San Francisco Bicycle Coalition

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**16.0 DBE PARTICIPATION AND LABOR STATISTICS**

Disadvantaged Business Enterprise (DBE) and labor statistics will be reported after construction has commenced.

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## **17.0 PROCUREMENT**

### **Contract Activity**

- Issued Amendment No. 2 to increase contract authority by \$5.5M for the CalMod Program Management Support Services contract.

### **IFB/RFQ/RFP Advertised this Month:**

- No IFB/RFQ/RFP's were issued for December.

### **IFB/RFQ/RFP Received this Month:**

- No IFB/RFQ/RFP's were received for December.

### **Contract Awards this Month:**

- No Contract Awards were made for December.

### **Work Directive (WD)/Purchase Order (PO) Awards & Amendments this Month:**

- Multiple WD & PO's were issued to support the program needs for December.
- Purchase Order issued to ARES for Prism Contract Management software.

### **Upcoming Invitation for Bid (IFB)/Request for Qualifications (RFQ)/ Request for Proposals (RFP):**

- RFP - SCADA system to support CalMod.
- RFP - On- Call Ambassador Support Services.

### **Upcoming Contract Awards:**

- Issue Amendment No. 3 to exercise Option Year 1 for the CalMod Program Management Support Services contract for URS (AECOM).

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## **18.0 TIMELINE OF MAJOR PROJECT ACCOMPLISHMENTS**

Below is a timeline showing major project accomplishments from 2002 to 2016:

<b>Date</b>	<b>Milestone</b>
2002	Conceptual Design Completed
2004	Draft NEPA Environmental Assessment (EA)/Environmental Impact Report (EIR) (2004)
2008	35% design complete
2009	Final NEPA EA/EIR and Finding of No Significant Impact (FONSI)
2014	Request for Qualifications (RFQ) for Electrification Request for Information for EMU
2015	JPB Approves Final CEQA Environmental Impact Report (EIR) JPB Approves Issuance of RFP for Electrification JPB Approves Issuance of RFP for EMU Receipt of Electrification of Proposal for Electrification FTA approval of Core Capacity Project Development
2016	JPB Approves EIR Addendum #1: PS-7 FTA Re-Evaluation of 2009 FONSI Receipt of Electrification BAFOs Receipt of EMU Proposal Application for Entry to Engineering to FTA  Completed the EMU Buy America Pre-Award Audit and Certification Negotiations completed with Stadler for EMU Vehicles Negotiations completed with BBI., the apparent best value Electrification firm  JPB Approves Contract Award (LNTP) BBI JPB Approves Contract Award (LNTP) Stadler FTA approval of Entry into Engineering for the Core Capacity Program

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**APPENDICES**

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Appendix A – Acronyms

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**Peninsula Corridor Electrification Project  
Monthly Progress Report**

<b>AIM</b>	<b>Advanced Information Management</b>	<b>EIR</b>	<b>Environmental Impact Report</b>
<b>ARINC</b>	<b>Aeronautical Radio, Inc.</b>	<b>EMU</b>	<b>Electric Multiple Unit</b>
<b>BAAQMD</b>	<b>Bay Area Air Quality Management District</b>	<b>ESA</b>	<b>Endangered Species Act</b>
<b>BBI</b>	<b>Balfour Beatty Infrastructure, Inc.</b>	<b>ESA</b>	<b>Environmental Site Assessments</b>
<b>CAISO</b>	<b>California Independent System Operator</b>	<b>FEIR</b>	<b>Final Environmental Impact Report</b>
<b>CalMod</b>	<b>Caltrain Modernization Program</b>	<b>FNTF</b>	<b>Full Notice to Proceed</b>
<b>Caltrans</b>	<b>California Department of Transportation</b>	<b>FFGA</b>	<b>Full Funding Grant Agreement</b>
<b>CDFW</b>	<b>California Department of Fish and Wildlife</b>	<b>FONSI</b>	<b>Finding of No Significant Impact</b>
<b>CEMOF</b>	<b>Centralized Equipment Maintenance and Operations Facility</b>	<b>FRA</b>	<b>Federal Railway Administration</b>
<b>CEQA</b>	<b>California Environmental Quality Act (State)</b>	<b>FTA</b>	<b>Federal Transit Administration</b>
<b>CHSRA</b>	<b>California High-Speed Rail Authority</b>	<b>GO</b>	<b>General Order</b>
<b>CIP</b>	<b>Capital Improvement Plan</b>	<b>HSR</b>	<b>High Speed Rail</b>
<b>CPUC</b>	<b>California Public Utilities Commission</b>	<b>ICD</b>	<b>Interface Control Document</b>
<b>DB</b>	<b>Design-Build</b>	<b>ITS</b>	<b>Intelligent Transportation System</b>
<b>DBB</b>	<b>Design-Bid-Build</b>	<b>JPB</b>	<b>Peninsula Corridor Joint Powers Board</b>
<b>DBE</b>	<b>Disadvantaged Business Enterprise</b>	<b>LNTF</b>	<b>Limited Notice to Proceed</b>
<b>DEMP</b>	<b>Design, Engineering, and Management Planning</b>	<b>MMRP</b>	<b>Mitigation, Monitoring, and Reporting Program</b>
<b>EA</b>	<b>Environmental Assessment</b>	<b>MOU</b>	<b>Memorandum of Understanding</b>
<b>EAC</b>	<b>Estimate at Completion</b>	<b>MPS</b>	<b>Master Program Schedule</b>
		<b>NCR</b>	<b>Non Conformance Report</b>
		<b>NEPA</b>	<b>National Environmental Policy Act (Federal)</b>

**Peninsula Corridor Electrification Project**  
**Monthly Progress Report**

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<b>NHPA</b>	<b>National Historic Preservation Act</b>	<b>RRP</b>	<b>Railroad Protective Liability</b>
<b>NMFS</b>	<b>National Marine Fisheries Service</b>	<b>RSD</b>	<b>Revenue Service Date</b>
<b>NTP</b>	<b>Notice to Proceed</b>	<b>RWP</b>	<b>Roadway Worker Protection</b>
<b>OCS</b>	<b>Overhead Contact System</b>	<b>SamTrans</b>	<b>San Mateo County Transit District</b>
<b>PCEP</b>	<b>Peninsula Corridor Electrification Project</b>	<b>SCADA</b>	<b>Supervisory Control and Data Acquisition</b>
<b>PCJPB</b>	<b>Peninsula Corridor Joint Powers Board</b>	<b>SCC</b>	<b>Standard Cost Code</b>
<b>PG&amp;E</b>	<b>Pacific Gas and Electric</b>	<b>SPUR</b>	<b>San Francisco Bay Area Planning and Urban Research Association</b>
<b>PHA</b>	<b>Preliminary Hazard Analysis</b>	<b>SFBCDC</b>	<b>San Francisco Bay Conservation Development Commission</b>
<b>PMOC</b>	<b>Project Management Oversight Contractor</b>	<b>SFCTA</b>	<b>San Francisco County Transportation Authority</b>
<b>PS</b>	<b>Paralleling Station</b>	<b>SFMTA</b>	<b>San Francisco Municipal Transportation Authority</b>
<b>PTC</b>	<b>Positive Train Control</b>	<b>SFRWQCB</b>	<b>San Francisco Regional Water Quality Control Board</b>
<b>QA</b>	<b>Quality Assurance</b>	<b>SOGR</b>	<b>State of Good Repair</b>
<b>QC</b>	<b>Quality Control</b>	<b>SS</b>	<b>Switching Station</b>
<b>QMP</b>	<b>Quality Management Plan</b>	<b>SSCP</b>	<b>Safety and Security Certification Plan</b>
<b>QMS</b>	<b>Quality Management System</b>	<b>SSMP</b>	<b>Safety and Security Management Plan</b>
<b>RAMP</b>	<b>Real Estate Acquisition Management Plan</b>	<b>SSWP</b>	<b>Site Specific Work Plan</b>
<b>RE</b>	<b>Real Estate</b>	<b>TASI</b>	<b>Transit America Services Inc.</b>
<b>RFI</b>	<b>Request for Information</b>	<b>TBD</b>	<b>To Be Determined</b>
<b>RFP</b>	<b>Request for Proposals</b>	<b>TPS</b>	<b>Traction Power Substation</b>
<b>RFQ</b>	<b>Request for Qualifications</b>		
<b>ROCS</b>	<b>Rail Operations Center System</b>		
<b>ROW</b>	<b>Right-of-Way</b>		

<b>TVA</b>	<b>Threat and Vulnerability Assessment</b>
<b>UPRR</b>	<b>Union Pacific Railroad</b>
<b>USACE</b>	<b>United States Army Corp of Engineers</b>
<b>USFWS</b>	<b>U.S. Fish and Wildlife Service</b>
<b>VTA</b>	<b>Santa Clara Valley Transportation Authority</b>

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Appendix B – Schedule

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#	Activity Name	Duration	Start	Finish	2014		2015				2016				2017				2018				2019				2020				2021				2022			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2				
1	<b>MASTER CPM SCHEDULE C15.04</b>		2001d	05/01/14 A	12/30/21																																	
2	<b>MILESTONES</b>		2001d	05/01/14 A	12/30/21	◇						◇	◇																							◇		
3	<b>PLANNING / APPROVALS PHASE</b>		929d	05/01/14 A	11/22/17																																	
4	ENVIRONMENTAL		466d	05/01/14 A	02/11/16 A																																	
5	DESIGN/BUILDER PROCUREMENT		596d	05/01/14 A	09/02/16 A																																	
6	AGENCY COORDINATION / APPROVALS		635d	10/01/14 A	03/31/17																																	
7	FEDERAL TRANSIT ADMINISTRATION		444d	04/16/15 A	01/16/17																																	
8	JURISDICTIONAL AGREEMENTS		635d	10/01/14 A	03/31/17																																	
9	CALIFORNIA PUBLIC UTILITIES COMMISSION		515d	11/03/14 A	11/10/16																																	
10	PACIFIC GAS & ELECTRIC		612d	11/03/14 A	03/31/17																																	
11	CALIFORNIA DEPARTMENT OF TRANSPORTATION		322d	02/02/15 A	05/05/16 A																																	
12	BAY AREA RAPID TRANSIT DISTRICT		221d	06/18/15 A	04/29/16 A																																	
13	SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		242d	06/18/15 A	05/31/16 A																																	
14	LABOR AGREEMENT		128d	01/02/15 A	07/02/15 A																																	
15	UTILITIES		432d	04/01/15 A	12/12/16																																	
16	PERMITS		468d	12/01/14 A	09/30/16 A																																	
17	RIGHT-OF-WAY		732d	02/02/15 A	11/22/17																																	
18	SCADA		546d	03/30/15 A	05/19/17																																	
19	<b>DESIGN / ENGINEERING PHASE</b>		960d	10/01/14 A	07/12/18																																	
20	UTILITY RELOCATION		273d	11/11/16	12/11/17																																	
21	PG&E INFRASTRUCTURE		368d	02/01/17	07/12/18																																	
22	TUNNEL MODIFICATION		802d	10/31/14 A	12/29/17																																	
23	CEMOF		804d	10/01/14 A	11/30/17																																	
24	<b>VEHICLES PHASE</b>		1902d	05/01/14 A	08/13/21																																	
25	SPECIFICATION		134d	07/01/14 A	01/12/15 A																																	
26	PROCUREMENT		613d	05/01/14 A	09/06/16 A																																	
27	DETAILED DESIGN (STADLER)		364d	09/06/16 A	02/12/18																																	
28	PROCUREMENT (MATERIAL & EQUIPMENT) (STADLER)		416d	01/09/17	08/24/18																																	
29	MOCK-UPS (STADLER)		170d	12/08/17	08/08/18																																	
30	ELECTRIC LOCO		875d	01/03/17	06/10/20																																	
31	MANUFACTURING, TESTING, & TAKE OVER (STADLER)		953d	11/13/17	08/13/21																																	
32	<b>CONSTRUCTION / INSTALLATION PHASE</b>		847d	05/02/17	08/31/20																																	
33	PG&E INFRASTRUCTURE		699d	12/01/17	08/31/20																																	
34	TUNNEL MODIFICATION		356d	01/02/18	05/24/19																																	
35	SCADA		744d	05/19/17	04/24/20																																	
36	UTILITY RELOCATION		353d	05/02/17	09/20/18																																	
37	CEMOF		109d	12/01/17	05/04/18																																	
38	<b>TESTING / STARTUP PHASE</b>		426d	04/27/20	12/30/21																																	
39	PRE-REVENUE OPERATIONS		236d	09/10/20	08/13/21																																	
40	REVENUE OPERATIONS		172d	12/11/20	08/16/21																																	

	Prog Plan (C14.02)		Remaining		Start Milestone		Last Months Update
	Last Months Update		Near Critical		Finish Milestone		Critical Milestone
	Progress		Critical		Prog Plan (C14.02)		Risk Contingency

Date	Revision	Checked	Approved
11/17/2016	Updates & Revisions Completed By A. Christofas & S. Iyer		
11/21/2016	Checked By S. Iyer & A. Christofas	x	
11/21/2016	Approved By R. Viswanathan		x

#	Activity Name	Duration	Start	Finish	2014		2015				2016				2017				2018				2019				2020				2021				2022	
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2		
41	RISK CONTINGENCY	426d	04/27/20	12/30/21																																
42	OPERATIONAL READINESS PHASE	791d	07/27/17	09/04/20																																
43	OPERATIONS & MAINTENANCE STAFFING	543d	07/27/17	09/16/19																																
44	NON-REVENUE EQUIPMENT	258d	09/03/19	09/04/20																																
45	SPARES	258d	09/03/19	09/04/20																																
46	OPERATIONS & MAINTENANCE TRAINING	255d	07/27/17	07/27/18																																
47	LOCAL AGENCY TRAINING	64d	04/19/18	07/19/18																																
48	<b>ELECTRIFICATION SCHEDULE (BB) 110116</b>	1606d	09/06/16 A	10/13/20																																
49	General	1606d	09/06/16 A	10/13/20																																
50	General	1551d	09/06/16 A	08/23/20																																
51	Communication	20d	11/08/16	12/07/16																																
52	Sitework	92d	09/07/16 A	12/23/16																																
53	Civil	80d	10/03/16 A	01/24/17																																
54	Traction Power	35d	12/06/16	01/23/17																																
55	Rail Signal & Comm System	1089d	12/27/16	10/08/19																																
56	Testing & Start-up	639d	02/25/19	10/13/20																																
57	Design	1358d	09/07/16 A	02/25/20																																
58	All Work Areas	1358d	09/07/16 A	02/25/20																																
59	Segments 2 WA 5	353d	09/07/16 A	08/01/17																																
60	Segment 2 WA 4 & 5	188d	04/07/17	09/29/17																																
61	Segment 2 WA 4	413d	09/07/16 A	09/26/17																																
62	Segment 2 & 4	475d	09/07/16 A	11/23/17																																
63	Segment 4	654d	09/12/16 A	05/14/18																																
64	Segment 2	559d	09/07/16 A	02/10/18																																
65	Segment 2 Wa's 1, 2, & 3-	430d	10/12/16 A	11/16/17																																
66	Segment 1 & 3	828d	09/19/16 A	10/30/18																																
67	Segment 1	776d	12/27/16	12/20/18																																
68	Segment 3	912d	12/29/16	04/29/19																																
69	Submittals	154d	09/06/16 A	01/26/17																																
70	Procurement	750d	11/01/16	10/01/18																																
71	Permits	601d	09/07/16 A	01/18/19																																
72	Construction / Installation	1305d	10/26/16 A	02/26/20																																
73	Segment 4	1063d	11/20/16	08/09/19																																
74	Segment 2	981d	10/26/16 A	04/29/19																																
75	Segment 1	1234d	12/29/16	02/24/20																																
76	Segment 3	1225d	01/09/17	02/26/20																																

█ Prog Plan (C14.02)	█ Remaining ▶	▶ Start Milestone	◇ Last Months Update
█ Last Months Update	█ Near Critical ◀	◀ Finish Milestone	◇ Critical Milestone
█ Progress	█ Critical	◆ Prog Plan (C14.02)	█ Risk Contingency

Date	Revision	Checked	Approved
11/17/2016	Updates & Revisions Completed By A. Christofas & S. Iyer		
11/21/2016	Checked By S. Iyer & A. Christofas	x	
11/21/2016	Approved By R. Viswanathan		x