

**MONTHLY MONITORING REPORT**  
*August 2020*

**Central Subway Project**  
San Francisco Municipal Transportation Agency (SFMTA)  
San Francisco, CA  
**FINAL**

Draft Report delivered to FTA on September 22, 2020  
Final Report delivered to FTA on September 28, 2020

*PMOC Contract No.: 69319519D000016*  
*Task Order No. 69319520F300115*  
*Requisition/Reference No.: FTA-TPM20-20-0234*  
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*CLIN 0002*

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## REPORT FORMAT AND FOCUS

This report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract #69319519D000016, Task Order #69319520F300115. Its purpose is to provide information and data to assist the FTA as it continually monitors the management capability and capacity of the San Francisco Municipal Transportation Agency (SFMTA) (the Project Sponsor) to execute the project efficiently and effectively, and hence, whether the Project Sponsor continues to be ready to receive federal funds for further project development. This report covers the project management activities on the Central Subway Project (CSP) managed by SFMTA, financed by the FTA Full Funding Grant Agreement (FFGA). The cost and schedule information in this report was extracted from SFMTA's July 2020 Monthly Progress Report, except where noted. *The report has been organized to comply with the requirements of updated Oversight Procedure 25 – Recurring Oversight and Related Reports dated June 2020.*

## THIRD-PARTY DISCLAIMER

This report and all subsidiary reports are prepared solely for the FTA. This report should not be relied upon by any party, except the FTA or the Project Sponsor, in accordance with the purposes as described below.

For projects funded through the FTA FFGA program, FTA and its Project Management Oversight Contractor (PMOC) use a risk-based assessment process to review and validate a Project Sponsor's budget and schedule. This risk-based assessment process is a tool for analyzing project development and management. Moreover, the assessment process is iterative in nature; any results of an FTA or PMOC risk-based assessment represent a "snapshot in time" for a particular project under the conditions known at that same point in time. The status of any assessment may be altered at any time by new information, changes in circumstances, or further developments in the project, including any specific measures a Project Sponsor may take to mitigate the risks to project costs, budget, and schedule, or the strategy a Project Sponsor may develop for project execution. Therefore, the information in the monthly reports will change from month to month, based on relevant factors for the month and/or previous months.

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## 1. EXECUTIVE SUMMARY

### 1.1. Project Description

The Central Subway Project (CSP) involves construction of a 1.7-mile extension of San Francisco Municipal Transportation Agency's (SFMTA (Project Sponsor)) T Third Line along 4th Street and beneath Stockton Street in downtown San Francisco. The CSP is Phase 2 of Muni's T Third Light Rail Transit (LRT) Project. The CSP will extend the T Third Line from the 4th Street Caltran Station to Chinatown, providing a direct rapid transit link from the Bayshore and Mission Bay areas to South of Market, Union Square, and downtown. Four new stations are being constructed as part of the project—an at-grade station at 4th and Brannan streets and three underground stations at Yerba Buena/Moscone Center (YBM), Union Square/Market Street (UMS), and Chinatown (CTS). Four light rail vehicles (LRVs) are included in the budget for the CSP as part of a larger procurement that will expand the LRV fleet and includes options for replacement of the entire fleet. Average weekday riders are projected to be 43,521 in 2030. The project cost is \$1,578 million.

### 1.2. Project Status

- Scope: There have been no changes in project scope.
- Schedule: Substantial completion of this contract was originally scheduled for February 10, 2018, *but the latest master program schedule update shows substantial completion occurring on January 11, 2021, which is a change of 13 days from the December 29, 2020 date stated in the prior report and represents more than 1,000 days later than the original substantial completion date.* SFMTA's most recent update of the program schedule forecasts the Revenue Service Date (RSD) to occur on *December 29, 2021.*
- Cost: The current cost estimate (CCE) for the project is \$1.578 billion in year of expenditure dollars. The SFMTA continues to evaluate the estimate at completion (EAC). Currently the SFMTA estimates the EAC to be \$1,626 billion or \$48 million above the current budget. This EAC has not been finalized as additional cost may need to be considered including the potential cost of delays due to the COVID-19 pandemic.
- Significant Project Activities and/or Key Milestones:
  - SFMTA stated that construction continues during the COVID-19 outbreak, although inefficiencies caused by COVID-19 are expected. *SFMTA indicated that inefficiencies are experienced for both contractors and SFMTA staff and consultants, especially with issues related to the field coordination and processing changes. SFMTA expects that contractors will submit delay claims related to COVID-19 impacts, and COVID-19 delays to the project are expected.*
  - SFMTA concluded a study of Tunnel/Crossover Ventilation Alternative Hazard Analysis (AHA), and a draft report was issued in July 2020. The report was

finalized in August 2020. SFMTA indicated that the outcome of the study will not impact the fire alarm systems but will impact the ATCS software system, which, in the PMOC’s opinion, will impact the dynamic testing and overall systems integration and testing. SFMTA stated that it may require SFMTA Board approval for the expenditure needed for the modification of ATCS software system, because it is specialized and therefore costly. *ATCS contractors proposed a 2-month extension.*

- Resource availability of the electrical specialty subcontractor (Abbett) continues to be a major concern going forward. SFMTA stated that resources required from Abbett to complete the Overhead Contact System (OCS) work on schedule are significantly lacking. SFMTA stated that, because the OCS work is on the critical path, a decision to resolve the issue needs to be made by the *third quarter of 2020* to prevent the delay of the CSP schedule. *Based on the current progress, the delay on the critical path is approximately 3 months.*
- SFMTA stated that adequate project funds are available to complete the project, except for the amount needed for the global settlement, which will be added to the project cost once the amount is approved by the SFMTA Board. However, SFMTA currently reports a negative \$34.9 million as the contingency amount. It is the PMOC’s understanding that SFMTA is in the process of reallocating available funds from other cost categories to contingency. It is the PMOC’s opinion that SFMTA should accelerate the reallocation process and align project cost with the construction progress. *SFMTA will share the revised EAC with the PMOC in September 2020.*
- SFMTA will prioritize its effort to draft a letter to the FTA to propose a revised FFGA RSD. SFMTA currently forecasts the RSD to occur in December 2021. Some of the delays are due to impacts of COVID-19. It is the PMOC’s opinion that SFMTA should explore mitigation measures to maintain an RSD that will occur in 2021. *SFMTA indicated that the letter will be ready for transmittal in the third week of September 2020 with the backup information associated with the proposed RSD extension.*

**1.3. Major Issues and/or Concerns**

<b>Issue/Concern</b>	<i>Construction inefficiencies and delays as a result of the COVID-19 pandemic. Delay claims by contractors are expected.</i>
Date Identified	<i>April 2020</i>
Status	<i>Ongoing</i>
Project Sponsor Action	<i>SFMTA is developing mitigation measures.</i>
PMOC Recommendation	<i>The PMOC recommends that schedule impacts of the COVID-19 pandemic be estimated now to determine overall impacts to project milestone dates.</i>
<b>Issue/Concern</b>	<i>Resource availability of the electrical specialty subcontractor (Abbett) continues to be a major concern. SFMTA stated that resources required from Abbett to complete the OCS work on schedule are significantly</i>

	<i>lacking. SFMTA stated that, because the OCS work is on the critical path, a decision to resolve the issue needs to be made soon to prevent the delay of the CSP schedule. Based on the current progress, the delay on the critical path is approximately 3 months.</i>
Date Identified	<i>June 2020</i>
Status	<i>Ongoing</i>
Project Sponsor Action	<i>SFMTA is working with the General Contractor to seek additional resources.</i>
PMOC Recommendation	<i>The PMOC recommends resolving the issues by the third quarter of 2020 to avoid impacts on the project schedule.</i>

## 1.4. Key Indicators Dashboard

Table 1 – Key Indicators Dashboard

<b>Project Sponsor:</b>	San Francisco Municipal Transportation Agency				
<b>Project Name:</b>	Central Subway Project				
<b>Date:</b>	August 31, 2020				
<b>Project Detail</b>					
<b>Oversight Frequency:</b>	<b>Monthly</b>				
<b>Element</b>	<b>Status</b>			<b>Prior Status</b>	<b>Issue or Concern</b>
	●	●	●		
	<b>G</b>	<b>Y</b>	<b>R</b>		
<b>PMP</b>		●		G	<i>The PMP was last updated April 2019. An update is required to reflect COVID-19 protocols and transition to preparation for revenue service.</i>
<b>MCC</b>	●			G	
<b>Cost*</b>			●	R	<i>SFMTA is updating the CSP EAC to include the reallocation of project funds and global settlement.</i>
<b>Schedule</b>			●	R	<i>COVID-19 and specialty subcontractors resource availability are impacting the critical path work.</i>
<b>Quality</b>	●			G	<i>None.</i>
<b>Safety</b>	●			G	<i>None..</i>
<b>Risk</b>			●	R	<i>COVID-19 related issues and upcoming system integration/operational readiness are major risks.</i>
<b>Legend</b>					
<b>Green</b>	<i>Satisfactory: no Corrective Action necessary</i>				
<b>Yellow</b>	<i>Caution: Risk/Issues exist. Corrective Action may be necessary.</i>				
<b>Red</b>	<i>Elevated for immediate Corrective Action: significant risk to the health of the project.</i>				

\*Note: With regard to cost, the PMOC should indicate the following status:

Yellow – forecast cost exceeds the project budget by up to 3%

Red – forecast cost exceeds the project budget by more than 5%

## 1.5. Core Accountability Items

Table 2 shows the core accountability items for the project, including the current status of the project and the major issues and how they are being addressed.

Table 2 – Core Accountability Items

		<b>Original (Grant)</b>	<b>Current Forecast</b>	<b>PMOC Assessment of Current Forecast</b>
<b>Cost</b>	Capital Cost Estimate	\$1,578,300,000	\$1,578,300,000	Optimistic
<b>Contingency</b>	Unallocated Contingency	\$74,722,000	\$6,882,669	Unacceptable
	Total Contingency	\$185,500,000	(\$53,650,129)	Unacceptable
<b>Schedule</b>	Revenue Service Date	12/26/2018	12/29/2021 (SFMTA forecast)	Optimistic
<b>Project Progress</b>				
			<b>Amount (\$)</b>	<b>Percent of Total</b>
<b>Total Expenditures</b>	Actual cost of all eligible expenditures completed to date		<i>\$1,557,531,474</i>	<i>96.8%</i>
<b>Planned Cost to Date<sup>1</sup></b>	Actual value of work completed to date		<i>\$1,471,276,361</i>	<i>93.2%</i>
<b>Contract Status</b>				
			<b>Amount (\$)</b>	<b>Percent of Total</b>
<b>Total Contracts Awarded</b>	Value of all contracts (design, support, construction, equipment) awarded; % of total value to be awarded		<i>\$1,508,97,014</i>	
<b>Construction Contracts Awarded<sup>1</sup></b>	Value of construction contracts awarded; % of total construction value to be awarded		<i>\$1,137,848,462</i>	
<b>Physical Construction Completed<sup>1</sup></b>	Value of physical construction (infrastructure) completed; % of total construction value completed			
<b>Rolling Stock Vehicle Status</b>				
		<b>Date Awarded</b>	<b>No. Ordered</b>	<b>No. Delivered</b>
<b>Next Quarterly Review Meeting Date:</b>	To be determined			

<sup>1</sup>. SFMTA CSP Monthly Report



## **2. OBSERVATIONS AND FINDINGS**

### **2.1. Summary of Monitoring Activities**

- July 21, 28, and August 11 – Weekly Construction Status Meetings with Project Team (contractor, SFMTA, San Francisco Public Utilities Commission [SFPUC], and other agencies)
- August 11 – Update Meetings with SFMTA Team
- August 17 – Update Meeting with contractor
- This report reflects financial information SFMTA provided in July 2020 (financial cutoff date of June 30, 2020) and information obtained in the above-referenced meetings.

Note: Items that have changed from the previous month's report are indicated in *italics*. Other information is unchanged.

### **2.2. Oversight Triggers**

- *If TPC does not substantially complete the work by December 2020, an FTA risk assessment is recommended to evaluate the reasonableness of the targeted RSD (December 29, 2021).*

### **2.3. Project Management Plan and Sub-Plans**

SFMTA delivered an update of the Project Management Plan (PMP) in April 2019. A comprehensive review of the PMP by the PMOC was not requested by FTA.

### **2.4. Management Capacity and Capability**

#### **2.4.1. Agency Staff**

SFMTA appointed a permanent program director for the CSP in July 2019. Transition from the current acting director began the week of July 15, 2019. The permanent program director attended the SFMTA Quarterly Progress Review Meeting (QPRM) held on August 8, 2019. In November 2019, SFMTA appointed a permanent Director of Transportation. The new Director of Transportation started his position on December 16, 2019.

#### **2.4.2. Contractor Staff**

There were no changes in the contractor's management staff.

### **2.5. National Environmental Policy Act Process and Environmental Mitigation**

The PMOC received the First Quarter 2018 Mitigation Monitoring Reporting Program (MMRP) update from SFMTA on July 10, 2018. The PMOC's review of the report indicates that SFMTA continues to meet its commitments for monitoring and mitigation of project impacts.

### **2.6. Project Delivery Method and Procurement**

The project delivery method is Design-Bid-Build.

## **2.7. Design**

Design is complete.

## **2.8. Value Engineering and Constructability Reviews**

All contracts are under construction.

## **2.9. Real Estate Acquisition and Relocation**

SFMTA has acquired all project right-of-way, and all commercial and residential relocations are complete.

SFMTA submitted the Real Estate Acquisition Management Plan (RAMP) Revision 5, dated September 26, 2013, to FTA on November 19, 2013. SFMTA has acquired all required real estate for the project in accordance with the RAMP.

## **2.10. Third-Party Agreements and Utilities**

### **2.10.1. Bay Area Rapid Transit**

No updates to report related to Bay Area Rapid Transit (BART).

### **2.10.2. California Department of Transportation**

SFMTA needs an Encroachment Permit to install electrical and traffic signal equipment at the I-80 off-ramp, which terminates at the intersection of 4th and Bryant streets. SFMTA Sustainable Streets Division (SSD) is planning other improvements to the intersection that would be implemented after completion of the CSP. California Department of Transportation (Caltrans) is insisting that the Encroachment Permit include all planned improvements, while SFMTA is requesting that the later work by SSD be covered by a separate permit. SFMTA and Caltrans have been unable to resolve the issue, and it has been escalated to the SFMTA Director of Transportation. However, Caltrans agreed to provide a permit for the rail work separate from the minor striping work that is awaiting environmental clearance.

### **2.10.3. California Public Utilities Commission**

The California Public Utilities Commission (CPUC) is participating in the various safety meetings, including the Safety and Security Certification Review Committee (SSCRC) and Fire and Life Safety Committee (FLSC) meetings. Representatives of the CPUC also regularly attend the SFMTA/FTA QPRMs and were in attendance at the *February 6, 2020* QPRM. The FLSC is working to approve items on the certifiable items list for the Stations contract. SFMTA has expressed concern that CPUC may have insufficient staff to witness the required safety tests for CSP, which could further delay the RSD. This potential risk is being monitored in the risk register, and mitigation strategies have been identified.

### **2.10.4. San Francisco Public Utilities Commission**

No updates to report.

**2.10.5. San Francisco Department of Public Works**

The San Francisco Department of Public Works (SFDPW) inspects completed street and sidewalk facilities that the contractor has proposed to release to the city. SFDPW develops punch lists of required repairs that must be completed by the contractor prior to acceptance of the streets and sidewalks.

**2.10.6. San Francisco Parks and Recreation Department**

No updates to report.

**2.10.7. Private Property Owners**

All real estate acquisitions are complete. There will be a need to extend the duration of some of the licenses for compensation grouting. A number of private property owners and businesses have issued claims for damage associated with the project construction. The builder's insurance policies maintained by the contractor cover the costs associated with these claims, and the contractor has demonstrated improved responsiveness to damage claims that are associated with ongoing construction work.

**2.11. Construction**

**Contract 1250 (UR #1).** This completed contract relocated utilities within the footprint of the proposed Yerba Buena/Moscone Center Station (YBM).

**Contract 1251 (UR #2).** This completed contract included the relocation of utility lines within the footprint of the proposed Union Square/Market Street Station (UMS) and temporarily rerouted existing trolley coach lines around the construction zone.

**Contract 1252 Tunnel.** This completed contract included the construction of 1.5 miles of twin tunnels excavated by tunnel boring machines (TBMs) and construction of the tunnel portal, retrieval shaft, and five cross-passages. Final completion has been achieved, and final contract closeout is now underway. SFMTA presented the final cost data for the contract at the August 2018 QPRM. Not including costs of extra work paid from non-project sources, the final cost of the Central Subway tunneling work is \$233,511,253, compared to the most current estimate at completion of \$234,967,069. When SFMTA reconciles the final contract cost with the program budget, about \$1.4 million in additional unallocated contingency should be available as a result of the final cost of the tunneling work being well below the current allocated budget for the work.

**Contract 1300 (Combination of UMS, CTS, YBM, and STS).** This contract includes the construction of three underground stations, one surface station, all surface works required for the installation of LRT between 4th and King streets and the tunnel portal, and all LRT track and systems components. *As of the end of June 2020, the construction of the stations and the Surface, Track, and Systems (STS) contract were 93.46 percent complete based on cost and around 93 percent complete based on the value of completed construction.*

***Table 3 shows the forecast date for completion of construction for each work package for the May 2020 and June 2020 schedule updates.***

**Table 3 – Forecast Construction Completion Dates for CSP Work Packages**

<i>Work Package</i>	<i>June 2020 Forecast Construction Completion Date</i>	<i>July 2020 Forecast Construction Completion Date</i>
1253 – Union Square/Market Street Station	12/30/2020	1/12/2021
1254 – Chinatown Station	12/30/2020	1/12/2021
1255 – Yerba Buena/Moscone Center Station	12/30/2020	1/12/2021
1256 – Surface, Track, and Systems	02/25/2021	02/25/2021

Source: SFMTA Monthly Progress Reports for *May 2020 and June 2020*

Union Square/Market Street Station (UMS): Construction of stairs and elevators continued throughout the station. The contractor continued installing fire protection, security system, and emergency lighting throughout the station. The installation of the glass enclosure around the elevators and escalators at the north and south concourses continued. The installation of Mechanical, Electrical, and Plumbing (M/E/P) and fire protection components continued throughout the station. The contractor continued installing the unistrut for ceiling panels and Light Emitting Diode (LED) artwork at the concourse level. The installation of precast architectural concrete elements for the United States Gypsum Corporation (USG) terrace level is underway. The installation of the USG roof-level exhaust vent continued. The pavement renovation at the north side of Market Street is underway. The construction work at the emergency command post continued.

Chinatown Station (CTS): The installation of M/E/P and fire protection components continued throughout the station. The contractor continued the installation of escalators Nos. 5 and 6 at the upper mezzanine level. Work on elevators Nos. 1, 2, 3, and 4 at the platform and concourse levels continued. The contractor completed the installation of Pacific Gas & Electric (PG&E) feeder conduits for normal and alternate feeders. The electrical switchgear installation continued at the headhouse platform level. The contractor continued the installation of the Glass Fiber Reinforced Concrete (GFRC) panels at the concourse level. The contractor continued erecting structural steel for the plaza level. The street work, monitoring, and surveying activities are ongoing. The emergency ventilation fan installation at the headhouse continued. The construction of surface slabs and PCC #50 Chinatown Station Plaza walls and stairs continued. The contractor began utility construction at the intersection of Stockton and Washington streets.

Yerba Buena/Moscone Station (YBM): The installation of M/E/P components, interior walls, and stairs continued throughout the station. Installation of escalators Nos. 3 and 4 and elevators Nos. 3 and 4 continued. The contractor completed installing the lighting at the station concourse. Work on the street-level elements such as elevator shafts and steel framing continued. The installation of electric vehicle controls at the station mezzanine continued. The contractor continued the ceiling installation at the headhouse concourse. The artwork installation at the headhouse concourse continued. The contractor completed placing concrete sidewalk sections along Clementina Street.

Surface, Track, and Systems (STS): The traction power conduit and other electrical conduit installation inside the tunnels continued. The tunnel lighting installation is ongoing. Installation of the standpipe in the tunnel and cross passages was completed. The OCS hanger installation inside the tunnel continued. The platform construction at 4th Street and Brannan Street continued. The

Fire Department Connection (FDC) work near the 4th Street portal continued. The installation of the ATCS began. The installation of blast doors at tunnel cross passages began. SFMTA is still awaiting an Encroachment Permit from Caltrans for work at the Interstate 80 (I-80) off-ramp at Bryant Street. However, Caltrans agreed to provide a permit for the rail work separate from the minor striping work that is awaiting environmental clearance.

### Systems and Track

Work on track had been suspended pending delivery of new track to replace the nonconforming track supplied by the contractor. The track was delivered at the end of October 2019 and is stored on 4th Street. Installation of the replacement track continues. SFMTA retained ownership of the nonconforming rail and is working with project representatives for the Sacramento Streetcar project to potentially transfer ownership of the rail for use on that project.

### Tunnel Work

The electrical subcontractor continues to make progress on the installation of conduits and OCS support equipment in the tunnels.

## **2.12. Vehicle Technology and Procurement**

The four LRVs for the Central Subway have been delivered and accepted by SFMTA. An additional 24 LRVs for near-term fleet expansion (four for service to the new Warriors Arena) and 151 LRVs for fleet replacement are in various stages of production and delivery. SFMTA has identified which of the new cars are considered to be funded by the CSP and will provide information on the date they are placed into revenue service for ongoing tracking of these assets in which the federal government has a financial interest.

## **2.13. Project Cost**

### **2.13.1. Project Cost Control Systems**

SFMTA continued to maintain the Trend Log and logs of Change Order Requests (CORs), PCCs, Notice of Potential Claims (NOPC), and Certified Claims for Contract 1300 using CM13. The Trend Log includes all potential changes in contract value, including items that, in the opinion of the CSP staff, are not merited and new items for which merit has not been determined. The contract change management log includes CORs that have been determined to have merit as well as agency initiated PCCs that are progressing through negotiations toward a Contract Modification (CMod). The NOPC Log and the Claim Log include CORs rejected by SFMTA for which the contractor expects to submit or has submitted a claim. The latest versions of the Trend Log (dated August 8, 2019) and Trend Summary indicate that 118 contract modifications had been executed for the Contract 1300. The total value of executed CMods at August 8, 2019, was \$7,169,271, which is a \$1.2 million increase from the June 2019 report. The Claim Log, through the same period, indicates that there are now 142 certified claims with a total value at \$48.5 million.

### **2.13.2. Project Cost (as of July 2020)**

Cost estimate: \$1.5783 billion

Total contingency: *Negative \$53.6 million (minimum contingency is \$25 million), further decreased by \$18.7 million from June 2020*

Actual Cost (AC): *\$1,557,531,474, an increase of \$10.2 million from June 2020 (98.7 percent of the total project budget)*

Current funding level: *\$1,517,025,000 (96.1 percent of the total project budget)*

Earned Value (EV): *\$1,471,276,361, increased by \$3.7 million since June 2020*

Cost Performance Index (CPI): *0.94*

CPI is a measure of cost efficiency on a project. It is the ratio of EV to AC. A CPI equal to or greater than 1.0 indicates a cost underrun, and a value of less than 1.0 indicates a trend towards a cost overrun. A value of 0.9 or greater is considered acceptable, considering the margin of error in estimating the value of completed work.

### **2.13.3. Project Cost Trends**

SFMTA tracks potential changes in project cost, calling these potential changes “trends.” Trends include all potential changes in a contract’s value. As the status of an identified trend changes, it may become a contract modification; it may become an item that is paid on a force account basis; or it may be denied/closed with no impact to the project cost. Extra cost items identified by the Contract 1300 contractor that CSP management concludes have no merit are carried in the total trend amount at a lower value than the contractor’s estimate of extra costs, and the value reflects SFMTA’s assessment of the likelihood that the change would ultimately be approved through the contract dispute resolution process.

Table 4 shows the overall budget, trends, and contingency status for the entire CSP program. Note that the values in Table 4 reflect the project status as of the end of *June 2020* as reported in SFMTA’s latest Monthly Progress Report. Claims and denied CORs are not included in the cost forecast in Table 4.

### **2.13.4. Change Order Control**

SFMTA is maintaining its management tools for tracking potential contract changes for Contract 1300. The latest available CN1300 Trend Summary is dated August 8, 2019. This report shows that 118 contract modifications had been approved, for a net increase in the contract value of \$7,169,271. CORs (generated by the contractor) that have been determined to have merit and PCCs (generated by SFMTA) had a combined estimated net cost impact of \$9.07 million in increased contract value, which is \$65,000 less than in the previous report. This estimate includes expected reimbursements by third-parties for work completed for their benefit. SFMTA expects to settle the outstanding CORs for less than the overall cost currently claimed by the contractor.

An additional 1,053 items were being tracked in the Trend Log. Of these, SFMTA judged 493 items to be without merit and denied them. Many of these denied trend items are included in contractor claims. An additional 415 items have been voided and are carried at no cost. There were 144 items covered by certified claims and NOPCs by the contractor (\$41.57 million in estimated maximum total exposure), and one item was “open” or new and awaiting a determination of merit.

The potential exposure of the project to additional costs from the NOPCs, claims, and open items was \$41.57 million, which, when added to the \$11.83 million in increased project costs from merited contract changes, yields a possible exposure of the project to additional costs for Contract 1300 of \$53.4 million. In comparison, the remaining contingency for the project is negative \$7.9 million, after accounting for the latest contract modifications. An additional \$1.4 million in contingency should be available from Contract 1252 based on the final contract value. In the opinion of the PMOC, the rapid increase in claims by TPC calls into question the adequacy of the program contingency. Unless the claims are settled for less than the claimed amount, there continues to be a risk that the program budget could be exceeded.

#### **2.13.5. Cost Contingency**

The total available contingency (approved contingency less approved contract changes) as of *June 2020 is at negative \$53,650,129*, which *is significantly* below the minimum required contingency of \$25 million. Additional unallocated contingency of \$1.4 million should be available as a result of the final closeout price for the Tunnel contract. The latest available trend summary report estimated a maximum potential additional cost increase from claims, denied change order requests, and pending changes of more than \$75 million, which is substantially higher than the amount that was estimated in previous reporting cycles. The contingency needs to be replenished to cover the current estimate of maximum cost exposure from claims. SFMTA does not include claims in its forecast of EAC.

**Table 4 – Budget and Contingency Status for Central Subway Project<sup>1</sup>**

<sup>1</sup> Data reported in the July 2020 Central Subway Project Monthly Progress Report – SFMTA (reformatted by the PMOC).

SFMTA Central Subway Project, Budget, Costs and EAC by SCC April 2020		FFGA Budget	Budget Transfers	Current Budget = Committed	Change	Base Budget	Contingency	Expenditures to Date		Remaining Budget	Cost to Complete	Estimate at Completion	Budget Forecast Variance
		\$	\$	\$	%	\$	\$	\$	%	\$	\$	\$	\$
<b>10</b>	<b>Guideway and Track Elements</b>	<b>315,926,081</b>	<b>(31,664,633)</b>	<b>284,261,448</b>	<b>-10%</b>			<b>282,648,964</b>	<b>99%</b>	<b>1,612,484</b>			
10.02	Guideway: At Grade, Semi-exclusive	2,395,143	464,857	2,860,000	19%			2,855,000	100%	5,000			
10.06	Guideway: Underground cut and cover	74,407,195	(4,590,788)	69,816,407	-6%			69,117,301	99%	699,106			
10.07	Guideway: Underground tunnel	224,933,257	(24,558,942)	200,374,315	-11%			199,485,368	100%	888,947			
10.09	Track: Direct fixation	7,293,157	(532,068)	6,761,089	-7%			6,741,658	100%	19,431			
10.10	Track: Embedded	1,601,763	(1,601,763)	-	-100%			-	0%	-			
10.12	Track: Special	5,295,566	(845,929)	4,449,637	-16%			4,449,637	100%	-			
<b>20</b>	<b>Stations, Stops, Terminals, Intermodal</b>	<b>432,698,735</b>	<b>99,604,225</b>	<b>541,663,143</b>	<b>25%</b>			<b>534,626,594</b>	<b>99%</b>	<b>7,036,549</b>			
20.01	At-grade station	774,913	6,827,944	7,602,857	881%			6,208,049	82%	1,394,808			
20.02	Aerial station, stop, shelter, mall, terminal, platform	-	1,544,543	1,544,543	NA			-	0%	1,544,543			
20.03	Underground station	412,084,888	88,758,780	500,843,668	22%			509,261,664	102%	(8,417,996)			
20.04	Other Stations, Landing, Terminals: Intermodal, Ferry, Trolley, Etc.	-	-	9,360,183	-			-	-	-			
20.07	Elevators, escalators	19,838,934	2,472,958	22,311,892	12%			19,156,881	86%	3,155,011			
<b>40</b>	<b>Sitework and Special Conditions</b>	<b>232,551,627</b>	<b>32,254,398</b>	<b>264,806,025</b>	<b>14%</b>			<b>268,595,810</b>	<b>101%</b>	<b>(3,789,785)</b>			
40.01	Demolition, clearing, earthwork	8,887,028	3,867,587	12,754,615	44%			12,495,015	98%	259,600			
40.02	Site utilities, utility relocation	29,562,587	39,190,856	68,753,443	133%			78,368,341	114%	(9,614,898)			
40.03	Haz. Material, contam'd soil removal, ground water treatment	2,957,442	6,465,683	9,423,125	219%			9,378,786	100%	44,339			
40.04	Environmental mitigation	3,146,216	(2,023,317)	1,122,899	-64%			1,121,899	100%	1,000			
40.05	Site structures, including retaining walls, sound walls	2,894,074	(187,643)	2,706,431	-6%			2,706,431	100%	-			
40.06	Pedestrian and bike access and accommodation, landscaping	14,393,910	(4,602,915)	9,790,995	-32%			5,128,831	52%	4,662,164			
40.07	Automobile, van, bus accessways, including roads and parking lots	11,919,550	(5,340,451)	6,579,099	-45%			6,409,470	97%	169,629			
40.08	Temporary facilities and other construction indirect costs	158,790,820	(5,115,402)	153,675,418	-3%			152,987,037	100%	688,381			
<b>50</b>	<b>Systems</b>	<b>108,429,774</b>	<b>(7,791,998)</b>	<b>100,637,776</b>	<b>-7%</b>			<b>76,691,276</b>	<b>76%</b>	<b>23,946,500</b>			
50.01	Train control and signals	37,447,116	(9,155,753)	28,291,363	-24%			34,156,947	121%	(5,865,584)			
50.02	Traffic signals and crossing protection	3,013,232	9,791,724	12,804,956	325%			12,144,191	95%	660,765			
50.03	Traction power supply	20,379,634	1,085,439	21,465,073	5%			18,681,948	87%	2,783,125			
50.04	Traction power distribution	16,239,951	(3,798,838)	12,441,113	-23%			3,120,128	25%	9,320,985			
50.05	Communications	28,545,305	(11,624,620)	16,920,685	-41%			7,099,693	42%	9,820,992			
50.06	Fare collection system and equipment	2,804,536	3,295,464	6,100,000	118%			627,988	10%	5,472,012			
50.07	Central Control	-	2,614,586	2,614,586	NA			860,381	33%	1,754,205			
<b>Subtotal (10 - 50)</b>		<b>1,089,606,217</b>	<b>92,401,992</b>	<b>1,191,368,392</b>	<b>9%</b>	<b>1,216,849,427</b>	<b>(25,481,035)</b>	<b>1,162,562,644</b>	<b>98%</b>	<b>28,805,748</b>	<b>69,672,639</b>	<b>1,232,235,283</b>	<b>(40,866,891)</b>
<b>60</b>	<b>ROW, Land, Existing Improvements</b>	<b>37,398,029</b>	<b>(5,151,708)</b>	<b>32,246,321</b>	<b>-14%</b>	<b>32,246,321</b>	<b>-</b>	<b>30,648,969</b>	<b>95%</b>	<b>1,597,352</b>	<b>1,597,352</b>	<b>32,246,321</b>	<b>-</b>
60.01	Purchase or lease of real estate	33,798,029	(3,732,219)	30,065,810	-11%	30,065,810	-	28,239,539	94%	1,826,271	1,597,352	29,836,891	228,919
60.02	Relocation of existing households and businesses	3,600,000	(1,419,489)	2,180,511	-39%	2,180,511	-	2,409,430	110%	(228,919)	-	2,409,430	(228,919)
<b>70</b>	<b>Vehicles</b>	<b>26,385,653</b>	<b>(9,585,653)</b>	<b>16,800,000</b>	<b>-36%</b>	<b>16,800,000</b>	<b>-</b>	<b>11,929,247</b>	<b>71%</b>	<b>4,870,753</b>	<b>4,870,753</b>	<b>16,800,000</b>	<b>-</b>
70.01	Light Rail Vehicles	26,385,653	(9,585,653)	16,800,000	-36%	16,800,000	-	11,929,247	71%	4,870,753	4,870,753	16,800,000	-
<b>80</b>	<b>Professional Services</b>	<b>361,568,360</b>	<b>(30,565,742)</b>	<b>331,002,618</b>	<b>-8%</b>	<b>329,644,196</b>	<b>1,358,422</b>	<b>313,093,966</b>	<b>95%</b>	<b>17,908,652</b>	<b>16,550,230</b>	<b>329,644,196</b>	<b>1,358,422</b>
80.01	Preliminary Engineering	46,317,094	(114,420)	46,202,674	0%	46,202,674	-	46,202,675	100%	(1)	-	-	-
80.02	Final Design	86,053,240	(24,734,909)	61,318,331	-29%	61,318,331	-	61,200,826	100%	117,505	-	-	-
80.03	Project Management for Design and Construction	191,025,800	(108,781,519)	82,244,281	-57%	82,244,281	-	79,881,982	97%	2,362,299	(79,881,982)	-	-
80.04	Construction Administration and Management	15,495,521	101,495,778	116,991,299	655%	116,991,299	-	112,955,748	97%	4,035,551	(112,955,748)	-	-
80.05	Professional Liability and Other Non-Construction Insurance	6,800,000	-	6,800,000	0%	6,800,000	-	6,340,196	93%	459,804	(6,340,196)	-	-
80.06	Legal, Permits, Review Fees by Other Agencies	7,242,340	970,264	8,212,604	13%	8,212,604	-	5,605,986	68%	2,606,618	(5,605,986)	-	-
80.07	Surveys, Testing, Investigation, Inspection	234,036	699,064	933,100	299%	933,100	-	906,553	97%	26,547	(906,553)	-	-
80.08	Start up	8,400,329	(100,000)	8,300,329	-1%	6,941,907	1,358,422	-	0%	8,300,329	-	-	-
<b>Subtotal (10 - 80)</b>		<b>1,514,958,258</b>	<b>56,459,073</b>	<b>1,571,417,331</b>	<b>4%</b>	<b>1,595,539,944</b>	<b>(24,122,613)</b>	<b>1,525,846,545</b>	<b>97%</b>	<b>45,570,786</b>	<b>85,079,255</b>	<b>1,610,925,800</b>	<b>(39,508,469)</b>
90	Unallocated Contingency	63,341,742	(56,459,073)	6,882,669	-89%	-	6,882,669	-	0%	6,882,669	-	-	6,882,669
<b>Total Project Costs (10 - 100)</b>		<b>1,578,300,000</b>	<b>-</b>	<b>1,578,300,000</b>	<b>0%</b>	<b>-</b>	<b>(17,239,743)</b>	<b>1,525,846,545</b>	<b>97%</b>	<b>52,453,455</b>	<b>85,079,255</b>	<b>1,610,925,800</b>	<b>(32,625,800)</b>

SCC Breakdown of Forecast Construction Costs Not Available



The Trend Log showed the following trend items that had potential cost increases in excess of \$250,000:

1. # 24 - Change to grade 50 steel from specified grade 70 steel (due to availability issues) - \$572,884
2. # 36 - Extra trucking costs for contaminated soil at CTS - \$2,274,225
3. # 39 - Harder rock than anticipated for CTS slurry wall excavation - \$2,290,471
4. # 61 - Delays to installation of tangent piles at UMS - \$627,081
5. # 176 - UMS Garage underpinning requirements - \$732,157
6. # 192 - 12-inch waterline at UMS, added scope - \$336,236
7. # 193 - Sewer line conflict at UMS - \$495,001
8. # 246 - UMS art glass installation requirements - \$270,001
9. # 272 - Obstructions to jet grout placement at UMS - \$3,135,764
10. # 341 - Change in track switch machine manufacturer at STS - \$347,670
11. # 399 - Additional monitoring instruments at CTS - \$429,777
12. # 466 - Extra work to prepare existing tunnel - \$399,000
13. # 528 - Additional traffic control requirements for STS work package - \$1,032,302
14. # 537 - Cost of changes to the design of CTS to accommodate the plaza requested by the community - \$2,759,569 (paid from non-project funds)
15. # 543 - Change in construction sequence at CTS - \$250,001
16. # 546 - Additional 12-inch water line work at YBM - \$254,106
17. # 580 - Missing conduit between manholes at UMS - \$250,001
18. # 592 - Extra excavation costs for rock at CTS - \$450,001
19. # 636 - Changes in emergency vent design (all stations) - \$500,001
20. # 644 - Contractor-claimed change in contract requirements for pre-loading permanent struts at UMS - \$1,853,352
21. # 695 - Change in scope for slip-lining of 78-inch sewer on 4th Street - \$800,016
22. # 840 - Change in drain piping details at UMS - \$313,854
23. # 892 - Temporary drainage to re-direct water off new ramps at UMS - \$261,851
24. # 1052 - Change in design for BART elevator at UMS - \$400,000
25. # 1099 - Extra costs for Sequential Excavation Method (SEM) excavation at CTS due to tunnel segments being 5 feet long - \$1,480,001
26. # 1117 - Extra costs due to concrete obstruction at CTS south platform cavern - \$451,688

27. # 1152 - Extra costs for tying wall reinforcing into invert slab at UMS - \$359,905
28. # 1175 - Time impacts due to power pole conflict during demolition at CTS - \$520,000
29. # 1268 - Revised reinforcing steel for headhouse invert at CTS - \$1,147,356
30. # 1378 - General claimed extra costs for SEM work at CTS - \$3,520,001
31. # 1424 - Extra work due to changes in form-savers and couplers at roof to wall connection at YBM - \$250,001
32. # 1479 - Large volume of water inflow at end of probe - \$300,000
33. # 1485 - Conflict between YBM headhouse column reinforcing steel and temporary struts - \$298,912
34. # 1509 - Unidentified duct bank removal at YBM - \$264,013
35. # 1571 - Increase in allowance for Dispute Review Board (DRB) costs - \$1,296,364
36. # 1606 - Claim of defective specifications at YBM - \$2,500,001
37. # 1669 - Extra quantity of compensation grouting material all stations - \$775,000
38. # 1670 - Differing site conditions at CTS - \$2,280,001
39. # 1766 - Changes in finishes at UMS Ellis Street entrance - \$300,001
40. # 1785 - Extra costs for design changes at UMS - \$2,668,575
41. # 1885 - Change in structural reinforcement requirements in CTS headhouse - \$1,000,001
42. # 1886 - Addition of horn and strobe lights for fire alarm at UMS - \$288,976
43. # 1914 - Extra costs to transport excavated soil to Ox Mountain - \$1,621,173
44. # 1936 - CTS COR #1568 Elevators 1 and 2 Rotunda - \$258,279
45. # 1971 - STS CCC 107 CMod #093 ATCS - \$14,600,000
46. # 1993 - CTS COR #1717 All Stations – Exterior - \$3,638,400
47. # 2028 - CTS CMod #092 – Delay PCC #233 - \$1,000,001
48. # 2055 - CTS COR #1743 Stair 1 and Escalator 1 - \$542,484
49. # 2061 - UMS CMod #116 COR #1788 - \$899,852
50. # 2085 - STS (GEN) COR #1769 Global Impact, E - \$4,000,001
51. # 2089 - CTS COR #1778 CTS and UMS Escalator D - \$553,619
52. # 2116 - CTS PCC #532 Reinforced Stairs 1-2-3 - \$418,675
53. # 2138 - YBM PCC #536 Access Control Systems - \$320,000
54. # 2231 - CTS Schedule Delay Costs - \$31,240,000
55. # 2240 - YBM PCC #594 Mitigation of Water Int. - \$300,000

56. # 2252 - STS COR #1812 GEN Added Costs SFMTA - \$1,495,566

57. # 2254 - YBM COR #1906 GEN Best Construction - \$1,783,583

58. # 2255 - CTS PCC #564 Stair 1 and Escalator - \$517,369

59. # 2257 - UMS COR #1910 GEN Schindler Claim - \$6,653,186

60. # 2258 - YBM COR #1916 DMI Delay Claim Notice - \$7,130,758

The estimated cost impacts of several large trends have been revised downwards by SFMTA since 2018.

In addition to these large potential cost increases, the Trend Log includes the following major cost savings:

1. Deletion of compensation grouting bid items at YBM - savings of \$1,833,869
2. Deletion of the Air Replenishment System (ARS) - savings of \$4,689,000
3. Replace specified Closed Circuit Television equipment with alternate for all stations - (\$1,600,000)

### 2.13.6. Funding

Table 5 shows federal, state, and local project funding and expenditures. The awarded funding now represents *96.1 percent* of the project budget.

**Table 5 – Project Funding, as of July 2020**

Source	Committed (\$1,000)	Awarded (\$1,000)
<b><u>Federal</u></b>		
New Starts	942,200	942,200
Congestion Mitigation	41,025	41,025
<i>Federal Subtotal</i>	983,225	983,225
<b><u>State</u></b>		
TCRP	14,000	14,000
State RIP	88,000	12,498
Prop. 1B / PTMISEA*	307,792	307,792
Prop. 1A / HSR	61,308	61,308
<i>State Subtotal</i>	471,100	395,598
<b><u>Local</u></b>		
MTA	0	475
Prop. K Sales Tax	123,975	137,727
<i>Local Subtotal</i>	123,975	138,202
<b>Project Total:</b>	<b>1,578,300</b>	<b>1,517,025</b>

\* PTMISEA = Public Transportation Modification, Improvement, and Service Enhancement Account.

## 2.14. Project Schedule

As of the end of *July 2020*, the project was more than 1,000 days late, based on the projected RSD of *December 29, 2021*. The substantial completion date for Contract 1300 is now forecast to be *January 29, 2021*, which is *greater than 1,000 days later* than the original date (February 10, 2018).

The critical path for the construction work still flows through the CTS headhouse concrete work, electrical activities, STS start-up and testing, commissioning, and pre-revenue activities. Work at UMS is close to the critical path, so that any delays at UMS or time savings at CTS may cause a change in the critical path.

SFMTA stated that it has reached a settlement with TPC on the delay claim up to the date of September 3, 2019. The commitment from TPC includes a substantial completion date of construction in June 2020 with the following conditions:

- SFMTA must procure and deliver all radio cables by the end of December 2019.
- PG&E will provide permanent power by November 2019.
- Fire Department will sign off on Fire Alarm Systems by December 2019.

SFMTA sought and received approval of the delay claim settlement (applicable to September 3, 2019) during the September 17, 2019 SFMTA Board meeting. Subsequent to this delay claim settlement, SFMTA will continue to work with TPC on settlements:

- With TPC's subcontractors
- With TPC as a prime contractor

### 2.14.1. Project Schedule Data (as of *July 2020*)

The project's EV is *\$1,471,276,361* and its Planned Value (PV) is *\$1,592,567,980*. The project's Schedule Performance Index (SPI) is *0.92*. SPI is a measure of schedule efficiency on a project. It is the ratio of EV to PV. An SPI equal to or greater than 1.0 indicates more work was completed than planned, and a value of less than 1.0 indicates less work was completed than planned. A value of equal to or greater than 0.9 reflects satisfactory performance, considering the margin of error in estimating both EV and PV. The current value of *0.92* indicates that the project is significantly behind schedule.

Schedule contingency management criteria were developed from the FTA Risk Assessment prior to entry into Final Design (FD). Minimum schedule contingency levels at various project milestones or "hold points" were agreed to with SFMTA at Risk Workshop #4, which was held in 2009. The FTA-recommended schedule contingency for the current stage of the project is four months.

### 2.14.2. Schedule Contingency

All contingency in the schedule has been consumed, and there are more than 12 months of negative float from the baseline schedule. *The schedule submitted by SFMTA dated July 2020 forecasts an RSD of December 29, 2021*, which represents 672 days of additional delays. SFMTA submitted an

FFGA Schedule Extension letter to the FTA on December 6, 2018, with a request to extend the FFGA RSD to May 26, 2020, and FTA issued an approval letter on February 27, 2019.

### **2.14.3. Critical Path Summary (*Baseline Schedule*)**

CTS Install Guidewalls, Slurry Walls, and Install Surface Deck (complete)

CTS Excavate Headhouse and Bracing (complete)

CTS SEM and Install Supports (complete)

CTS Headhouse Structural Concrete/Remove Bracing (underway)

CTS Install M/E/P Equipment

CTS Start-up and Testing

CTS P-1254R Commissioning of Station

Safety and Security Certification/Pre-revenue Activities

RSD on December 26, 2018 (currently forecast for *December 29, 2021*)

### **2.14.4. 3-month Look-ahead**

The following activities are planned over the next three months:

#### **Contract 1300**

*UMS:*

- Platform Station:
  - Complete Concrete Masonry Unit wall construction
  - Complete deck installation
  - Complete all structural concrete work
  - Complete construction of stairs and escalators
  - Complete installation of ceiling panels
  - Complete installation of emergency lighting at tunnel tie-in on platform level
  - Continue installation of fireproofing
  - Continue installation of terrazzo flooring
  - Continue installation of artwork on concourse and platform levels
  - Continue installation of light fixtures and controls
  - Continue installation of overhead plumbing, fire protection piping, and overhead fixture and electrical
  - Continue installation of frames and pressurized doors at intermediate strut level
  - Continue installation of low-voltage systems

- North Concourse:
  - Complete installation of ceiling and glass panels
  - Complete installation of stairs, elevators, and escalators
  - Continue installation of terrazzo flooring
  - Complete installation of access controls
  - Continue installation of fire alarm, security, and public announcement systems
- South Concourse:
  - Complete installation of ceiling and glass panels
  - Complete installation of stairs and escalators
  - Complete installation of rolling and grille doors
  - Continue terrazzo flooring
  - Complete installation of access controls
  - Continue installation of fire alarm, security, and public announcement systems
- Street/Surface:
  - Complete installation of granite curb, brick sidewalk, and pedestrian ramps north of Market Street
  - Complete installation of glass roof walk artwork on USG terrace level
  - Complete installation of precast architectural concrete elements for USG terrace level
  - Complete landscaping and drainage at USG terrace level
  - Complete the USG roof level exhaust vent
  - Complete the Tap room and emergency command post at surface level
  - Continue installation of permanent historic streetlights at O'Farrell and Stockton streets
  - Continue installation of traffic cabinets

**CTS:**

- Complete M/E/P at surface, plaza, and roof levels at headhouse
- Complete construction of surface, plaza, and roof levels at headhouse
- Complete construction of PCC #50 Chinatown Station Plaza
- Abandon dewatering wells on Stockton Street
- Begin street utility work on Washington Street

## YBM:

- Continue installation of interior finishes on mezzanine and concourse levels within the Station Box
- Begin installation of the sculpture at the surface level
- Complete escalators Nos. 3 and 4 and escalators Nos. 3 and 4
- Complete grinding of platform and concourse station terrazzo floors
- Complete installation and grinding of concourse Headhouse terrazzo floor
- Complete platform kiosks
- Complete station agent booth
- Complete systems start up and acceptance testing
- Complete fire alarm system

## STS

- Complete OCS/streetlight pole installation
- Continue OCS support/wire installation in tunnel and on 4th Street
- Continue 4th/Brannan platform construction
- Continue tunnel walkway stairs installation
- Continue electrical conduit installation inside tunnel
- Continue tunnel lighting installation
- Continue installation of mini power center
- Continue pulling traction power feeder cables on surface
- Continue train case work at 4th Street and King Street
- Continue FDC work near 4th Street portal

## 2.15. Project Risk

SFMTA conducts monthly meetings to review the status of identified risks, monitor the implementation of mitigation measures, identify new risks, and evaluate the probability and potential impacts of existing and newly identified risks. The current major risks to the project address the potential for further delays to the construction of the stations, which cannot be mitigated or recovered, resulting in further delays to the RSD. At the risk mitigation meeting on April 16, 2019, these and other major remaining project risks were evaluated.

The PMOC noted the following significant items of discussion:

- Risk 99 – Breakdown in relationships between SFMTA and contractors during construction results in increased claims and delays to the overall construction schedule:

The rating has been increased, resulting in this being the top-ranked risk. Along with risk 240 – Unresolved Assignment of Schedule Delay Responsibility leading to higher costs for the program, the effects of this risk are occurring now. SFMTA has started to conduct its detailed review of the causes of and responsibilities for delays in an effort to establish a negotiating position for a global resolution of the outstanding delay claims. Risks 99 and 240 remain the top threats to the program. SFMTA stated that the mitigation for this risk is to identify additional funding sources to address potential cost overrun due to the increased claims.

- Risk 205 – Prolonged time to execute CMods creates additional cost and causes conflict between REs and the contractor: TPC is now refusing to progress work that includes changes to the contract documents without an executed CMod, which may delay future work. SFMTA noted that its standard procedures for contract modifications lead to delays in execution of all changes.
- The meeting proceeded with routine updates to previously identified risks. Risks associated with underground mining at CTS are nearing retirement, pending completion of the final lining of the platform and cross-cut caverns.
- CSP's new quality manager noted that there has been an increase in Non-conformance Notices (NCNs), which are issued when the contractor fails to issue a Contractor Non-conformance Report (CNCR).
- Initial ratings were developed for a new risk that had been identified at previous risk mitigation meetings:
  - Systems elements not working properly – rated high for probability and cost impact and medium for schedule impact, resulting in a rating of 8.

**The PMOC encourages SFMTA to continue to identify new risks associated with the system integration/testing and operational readiness, as the major risks associated with civil work and related differing site conditions are being retired.**

SFMTA has been applying updated schedule risks to a Monte Carlo analysis of the program schedule in order to establish a range of likely construction completion dates and RSDs. SFMTA provided an updated report on the schedule risk assessment to the PMOC as part of the schedule workshop conducted in November. SFMTA finalized its risk assessment and submitted a letter to the FTA requesting an extension of the RSD to May 26, 2020.

## **2.16. Quality Assurance/Quality Control**

### **2.16.1. QA/QC Plan Implementation**

The Contract 1300 contractor's staff includes a Contractor's Quality Manager (CQM), who reports to the contractor's management at an organization level superior to the contractor's Project Manager. The CQM is provided by a subcontractor. The reporting structure is to provide the CQM with direct access to the contractor's Principal Officers. A CNCR Log for identifying, correcting, documenting, and controlling non-conformances is maintained by the contractor and reviewed at weekly status meetings for each work package. Subsequent work may not progress for work that is the subject of a Corrective Action Request (CAR) until conditions adverse to quality are corrected.



In the event that the contractor does not issue a CNCR, SFMTA may issue a NCN in which non-conforming work is identified by SFMTA's quality assurance staff.

The quality concerns for the Contract 1300 Stations contract identified in the SFMTA June 2018 monthly report included issues identified in the previous month. A key activity for SFMTA is to determine the causes for acceptance of non-conforming rail during the submittal review process and at delivery of the rail to the project site.

*As of June 30, 2020, TPC's Quality Manager had filed 551 CNCRs (17 more since May). Ten new items were under review (no change from May); 34 other items had responses identified but not yet approved (eight more since May); the proposed responses to seven items were disapproved (two less since May); and 30 items had approved responses that were not yet implemented (one less since May). In addition, 417 items were closed (21 more since May), and 53 items had been voided (no change from May).*

## **2.17. Safety and Security**

### **2.17.1. Safety and Security Management Plan**

An updated Safety and Security Management Plan (SSMP) Revision 2, dated February 2, 2014, was submitted to FTA on May 2, 2014. The SSMP outlines the plans needed prior to revenue operations. These plans include the Rail Activation Plan (RAP), the System Integration Test Plan, the Safety and Security Certification Plan (SSCP), and the Pre-Revenue Operations and Start-up Plan. SFMTA has completed the SSCP, which is being used to guide safety certification activities. The initial draft of the RAP was completed along with the latest update of the PMP. The System Integration Test Plan and the Pre-Revenue Operations and Start-up Plan are expected to be provided now that SFMTA has hired a Start-up and Testing Manager for the program.

### **2.17.2. Fire and Life Safety/Safety and Security Issues**

The Construction Specification Conformance Checklists have been completed and approved for all construction packages. In September 2013, the CPUC staff began attending monthly as-built meetings to review the completed items. All items related to the tunnel construction have been certified and accepted by SFMTA's safety staff. The certification work was started to address the station construction items in 2016. As of August 6, 2018, 264 of the 1,660 items on the Safety and Security Conformance Checklist were approved, and 31 items required follow-up responses from the SFMTA construction team. Twelve items were under review by the committee. The San Francisco Fire Department regularly attends the now combined FLSC and SSCRC meetings.

### **2.17.3. Construction Safety**

*There were no recordable incidents in the month of May 2020.* The performance metrics relating to accidents per working hour remain well below the Occupational Safety and Health Administration (OSHA) goals for similar construction. The current incident statistics for the project are shown in Table 6, as well as where they are not applicable (NA).

**Table 6 – Construction Safety Data**

<i>Through May 2020</i>	Number of Incidents	Incident Rate <sup>1</sup>	Goal
<b>Contract 1300</b>			
OSHA Recordable Accidents	40	1.85	<3.4
Job Transfer/Restricted Duty Incidents	0	0.00	NA
Lost Time Incidents	11	0.51	<1.6
Total Incidents	51	2.36	NA
Hours Worked	4,325,327		

<sup>1</sup> OSHA incident rate = incidents x 200,000/hours worked.

### **2.18. Americans with Disabilities Act**

There are no Americans with Disabilities Act (ADA) issues for the project at this time.

### **2.19. Buy America**

There are no Buy America issues.

### **2.20. Start-Up, Commissioning, Testing**

SFMTA submitted a draft of the RAP in April 2019. A conference call was held in June 2019 between SFMTA and the PMOC's System Integration Manager as part of the monthly recurring call to discuss the required documentation for OP #54 (Readiness for Revenue Operation). The requirements listed below were discussed. The PMOC recommends commencement of the OP #54 review in the first quarter of 2021, which is approximately 6 to 9 months prior to the current targeted RSD. However, contingent upon SFMTA's updated projection of the RSD, PMOC's OP #54 review could be delayed.

- System Integration/Testing
- Safety and Security
- Pre-Revenue Operations
- Management Capability and Capacity

**ATTACHMENT A – LIST OF ACRONYMS**

AC	Actual Cost
ADA	Americans with Disabilities Act
AHA	Alternative Hazard Analysis
APTA	American Public Transportation Association
ARS	Air Replenishment System
ATCS	Automated Train Control System
BART	Bay Area Rapid Transit
BCE	Baseline Cost Estimate
BHAG	Big Hairy Audacious Goal
BRT	Bus Rapid Transit
Caltrans	California Department of Transportation
CAR	Corrective Action Request
CCE	Current Cost Estimate
CFR	Code of Federal Regulations
CLIN	Contract Line Item Number
CMB	Configuration Management Board
CM/GC	Construction Manager/General Contractor
CMod	Contract Modification
CNCR	Contractor Non-conformance Report
CO	Change Order
COR	Change Order Request
CPI	Cost Performance Index
CPUC	California Public Utilities Commission
CQM	Contractor's Quality Manager
CSP	Central Subway Project
CTS	Chinatown Station
DBE	Disadvantaged Business Enterprise
DF	Designated Function
DRB	Dispute Review Board
EAC	Estimate at Completion

EV	Earned Value
FD	Final Design
FDC	Fire Department Connection
FFGA	Full Funding Grant Agreement
FLSC	Fire and Life Safety Committee
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GFRC	Glass Fiber Reinforced Concrete
IRP	Independent Review Panel
LED	Light Emitting Diode
LONP	Letter of No Prejudice
LRT	Light Rail Transit
LRV	Light Rail Vehicle
M/E/P	Mechanical, Electrical, and Plumbing
MMRP	Mitigation Monitoring Reporting Program
MPS	Master Project Schedule
Muni	Common Public Reference to SFMTA
NA	Not Applicable
NCN	Non-conformance Notice
NOPC	Notice of Potential Claim
NTP	Notice to Proceed
O&M	Operations and Maintenance
OCS	Overhead Contact System
OHA	Operational Hazard Analysis
OP	Oversight Procedure
OSHA	Occupational Safety and Health Administration
PCC	Proposed Contract Change
PE	Preliminary Engineering
PG&E	Pacific Gas & Electric
PHA	Preliminary Hazard Analysis
PMOC	Project Management Oversight Contractor

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PMP	Project Management Plan
PTMISEA	Public Transportation Modernization, Improvement, and Service Enhancement Account
PV	Planned Value
QA/QC	Quality Assurance/Quality Control
QAM	Quality Assurance Manager
QPRM	Quarterly Progress Review Meeting
RAMP	Real Estate Acquisition Management Plan
RAP	Rail Activation Plan
RE	Resident Engineer
ROD	Record of Decision
RSD	Revenue Service Date
SBE	Small Business Enterprise
SCIL	Safety Certifiable Item List
SEM	Sequential Excavation Method
SEPP	Security and Emergency Preparedness Plan
SFDPW	San Francisco Department of Public Works
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SIT	Systems Integration Test
SOP	Standard Operating Procedure
SSCP	Safety and Security Certification Plan
SSCRC	Safety and Security Certification Review Committee
SSCVR	Safety and Security Certification Verification Report
SSD	Sustainable Streets Division
SSMP	Safety and Security Management Plan
SSO	State Safety Oversight
SSPP	System Safety Program Plan
STS	Surface, Track, and Systems
TBD	To Be Determined
TBM	Tunnel Boring Machine

TPC	Tutor Perini Corporation
TVA	Threat and Vulnerability Analysis
UMS	Union Square/Market Street Station
USG	United States Gypsum Corporation
YBM	Yerba Buena/Moscone Center Station

**ATTACHMENT B – SAFETY AND SECURITY CHECKLIST**

<b>Project Overview</b>			
Project Mode (Rail, Bus, BRT, Multimode)	Light Rail Transit		
Project Phase (Project Development, Engineering, Construction, Start-Up)	Construction		
Project Delivery Method (Design/Build, DBOM, CMGC, etc.)	Design-Bid-Build		
<b>Project Plans</b>	<b>Version</b>	<b>Review by FTA</b>	<b>Status</b>
Safety and Security Management Plan (SSMP)	2014	2011	Revision 1 Update submitted to FTA 02/25/2011. Not submitted to Federal Railroad Administration (FRA). Revision 2 submitted to FTA on May 2, 2014.
Safety and Security Certification Plan (SSCP)	2011		SSCP was revised 10/2011. Revision 1 was developed in November 2011. Not submitted to FRA.
System Safety Program Plan (SSPP)	2009	2009	SSPP dated 03/13/2009 submitted to FTA 07/31/2009. Not submitted to FRA.
System Security Plan or Security and Emergency Preparedness Plan (SEPP)	2009		Not submitted to FTA. Not submitted to FRA.
Construction Safety and Security Plan (CSSP)	2012		Health and Safety. Construction Safety Standards Revision 3, June 27, 2012.
<b>Area of Focus</b>	<b>Y/N</b>	<b>Notes/Status</b>	
<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 Part 659.9?	Y	California Public Utilities Commission (CPUC) Consumer Protection & Safety Division 505 Van Ness Avenue San Francisco, CA 94102 (415) 703-1017 phone (415) 703-1758 fax Point of contact: Arun Mehta	
Has the oversight agency reviewed and approved the project sponsor's Security Plan or SSPP as per 49 CFR Part 659.17?	Y	SFMTA currently operates its LRT system in compliance with an SSPP approved by the CPUC. These plans will be revised, as required, to incorporate the addition of the CSP during the late construction and early testing phase and submitted to the CPUC for approval prior to the planned start of revenue operations.	
Did the oversight agency participate in the last Quarterly Program Review Meeting?	N		
Has the project sponsor submitted its safety certification plan to the oversight agency?	Y	SFMTA submitted the SSCP to CPUC staff for review and Commission approval during the preliminary engineering phase. The plan was approved in March 2009. The SSCP that was revised in November 2011 was submitted to the CPUC and was approved. CPUC attends monthly certification review meetings conducted by SFMTA.	

Has the project sponsor implemented security directives issued by the Department Homeland Security and/or Transportation Security Administration?	NA	Currently, there are no Transportation Security Administration directives or programs applicable to the project. If any arise during the course of the project, the activities to comply will be developed and shown on a revision of the project safety and security activities schedule.
<b>SSMP Monitoring</b>		
Is the SSMP project-specific, clearly demonstrating the scope of safety and security activities for this project?	Y	The PMOC reviewed the CSP SSMP and provided a spot report to FTA in May 2011. FTA approved the CSP SSMP on May 16, 2011. A follow-up Adherence Audit was conducted September 14-16, 2011. The audit found that CSP is conducting its activities in accordance with the SSMP.
Does the project sponsor review the SSMP and related project plans to determine if updates are necessary?	Y	SSMP Revision 2 was submitted to FTA on May 2, 2014.
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	Safety and security are under the direction of the SFMTA Safety and Security Manager and supplemented by Project Management/Construction Management consultant staff, including a Safety and Security Certification professional who has been dedicated to supervise project Safety and Security Certification.
Does the project sponsor maintain a regularly scheduled report on the status of safety and security activities?	Y	Safety and security certification status and activities are reported in the weekly construction progress meetings and the CSP Monthly Progress Report.
Has the project sponsor established staffing requirements, procedures, and authority for safety and security activities throughout all project phases?	Y	
Does the project sponsor update the safety and security responsibility matrix/organizational chart as necessary?	Y	The PMOC found the revised matrix in the SSMP, Rev. 1, 02/08/11, to be compliant.
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	CSP has prepared a Preliminary Hazard Analysis Report, Rev. 0, April 23, 2009. Corrective actions and analysis for different project phases have been identified in the report.
Does the project sponsor implement regularly scheduled meetings to track to resolution any identified hazards and/or vulnerabilities?	Y	
<b>Area of Focus</b>	<b>Y/N</b>	<b>Notes/Status</b>
Does the project sponsor monitor the progress of safety and security activities throughout all project phases? Please describe briefly.	Y	Safety and security is an ongoing agenda item for the current construction contract (Contract 1300) work package status meetings. The status of safety and security certifications is reviewed at weekly project management meetings.
Does the project sponsor ensure the conduct of preliminary hazard and vulnerability analyses? Please specify analyses conducted.	Y	
Has the project sponsor ensured the development of safety design criteria?	Y	Design is complete and construction is underway.



Has the project sponsor ensured the development of security design criteria?	Y	Design is complete and construction is underway.
Has the project sponsor ensured conformance with safety and security requirements in design?	Y	Certification checklists have been developed. Certification is achieved through monthly meetings. Design is complete and construction is underway
Has the project sponsor verified construction specifications conformance?	Y	This is ongoing as construction progresses and is verified through the Safety and Security Certification process.
Has the project sponsor identified safety and security critical tests to be performed prior to passenger operations?	N	Currently being developed.
Has the project sponsor verified conformance with safety and security requirements during testing, inspection, and start-up phases?	N	Project is in construction, and the RSD is about 18 months in the future.
Does the project sponsor evaluate change orders, design waivers, or test variances for potential hazards and/or vulnerabilities?	Y	
Has the project sponsor ensured the performance of safety and security analyses for proposed workarounds?	NA	Currently no work-arounds have been identified.
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>	In Process	The second draft of the Rail Activation Plan (RAP) has been completed. An Integration Matrix has been implemented for all disciplines and includes safety and security concerns. Grantee intends to hire a Start-up and Testing Manager who will develop the plans and procedures. This hire is becoming a critical activity.
Has the project sponsor issued final safety and security certification?	N	Project is in the construction phase.
Has the project sponsor issued the final safety and security verification report?	N	Project is in the construction phase.
<b>Construction Safety</b>		
Does the project sponsor have a documented/implemented Contractor Safety Program with which it expects to comply?	Y	Health and Safety Construction Safety Standards Revision 3, June 27, 2012.
Does the project sponsor's contractor(s) have a documented companywide safety and security program plan?	Y	
Does the project sponsor's contractor(s) have a site-specific safety and security program plan?	Y	The remaining active contractor has a plan. Contract documents require that the contractor follows an Environmental Health and Safety Program, specific to the contract work.
How do the project sponsor's OSHA statistics compare to the national average for the same type of work?	Y	Provided in the Central Subway Monthly Progress Report. Statistics remain favorable compared to national averages and project safety goals.
If the comparison is not favorable, what actions are being taken by the project sponsor to improve its safety record?	NA	Statistics are favorable. No action needed.
<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.)	NA	No shared track. No waivers are anticipated.

Area of Focus	Y/N	Notes/Status
If shared corridor: has the project sponsor specified specific measures to address shared corridor safety concerns?	NA	This is not a shared corridor.
Is the Collision Hazard Analysis underway?	NA	
Other FRA required Hazard Analysis – Fencing, etc.?	NA	
Does the project have Quiet Zones?	N	
Does FRA attend the Quarterly Review Meetings?	N	

## ATTACHMENT C – TOP 5 PROJECT RISKS

### Top Risks Discussed at Most Recent Meeting:

**Risk 240** – Unresolved assignment of responsibility for schedule delays may lead to increased costs for the program. This risk continues to be a concern. TPC continues to push for a global settlement of the outstanding claims. If accepted, the proposed settlement would have significant cost impacts.

**Risk 255** – Water leaks at YBM. Water leaks continue at YBM despite ongoing repair activities. Most of the leaks are at the interface between the station box and the headhouse. Thus far, the schedule impacts of the leaks have been minor, but SFMTA expects to be liable for the costs of the repairs. SFMTA has spent \$500,000 to \$800,000 on leak mitigation work. SFMTA has received one finding of a third-party evaluation of the reasons for the leaks and is starting work to mitigate the impacts of the leaks. The findings of the leak evaluation indicate that the design did not provide a complete “bathtub” that would keep groundwater out of the structure.

**Risk 253** – Insufficient resources are available to complete the work as planned. Thus far, crew shortages have not been experienced. However, there are concerns about the adequacy of the electrical subcontractor’s resources.

**Risks 229 and 230** – Risk that contractor and SFMTA systems testing and commissioning will take longer than currently planned. SFMTA has delivered to the PMOC a more detailed schedule for ATCS, which includes the contractor’s system tests. SFMTA still needs to complete a more detailed commissioning schedule that includes identification of required testing and the responsibilities for witnessing and approving the tests. SFMTA appointed a full-time Systems Integration and Testing Manager in December 2018. SFMTA also plans to obtain consultant support for the testing and commissioning process in addition to the services of staff assigned from SFMTA Operations. The start-up and testing staff members have not started work on the project.

**Risk 254** – CPUC has insufficient staff to witness required testing. This risk of delays due to insufficient CPUC staffing continues to be a concern. SFMTA has identified a possible mitigation measure of having CPUC audit tests conducted by others. SFMTA is working with CPUC to advance the certification process that must be completed in advance of testing.

### ATTACHMENT D – AWARDED CONTRACTS

The following sections provide the status of ongoing contracts associated with the CSP. Note that the Disadvantage Business Enterprise (DBE) participation percentages are updated by SFMTA on a quarterly basis. The current values are through *June 30, 2020*.

<b>Contract No.</b>	<b>1250</b>	
<b>Contract Description:</b>	<b>UR #1 (Yerba Buena/Moscone Center Station [YBM])</b>	
<b>Status:</b>	Completed June 2011.	
<b>Cost:</b>	Original Contract Value	\$9,273,939
	Approved Change Orders	\$2,694,211
	Final Contract Value	\$11,968,150
	Expended to Date	\$11,968,150
	% Expended	100%
	Small Business Enterprise (SBE) Participation	97%
<b>Schedule:</b>	Notice to Proceed (NTP) issued January 2010. Substantial completion in June 2011.	
<b>Issues or Concerns:</b>		

<b>Contract No.</b>	<b>1251</b>	
<b>Contract Description:</b>	<b>UR #2 (Union Square/Market Street Station [UMS])</b>	
<b>Status:</b>	Work is complete.	
<b>Cost:</b>	Original Contract Value	\$16,832,550
	Approved Change Orders	\$3,836,531
	Final Contract Value	\$20,669,081
	Expended to Date	\$20,794,581
	% Expended	100%
	SBE Participation	87.4%
<b>Schedule:</b>	NTP issued January 2011. Substantial completion in August 2012.	
<b>Issues or Concerns:</b>	Final total cost claim by contractor has been settled.	

<b>Contract No.</b>	<b>1252</b>	
<b>Contract Description:</b>	<b>Tunnels</b>	
<b>Status:</b>	Final completion achieved. Financial closeout underway. Final contract cost to be lower than reported here.	
<b>Cost:</b>	Original Contract Value	\$233.58 million
	Approved Change Orders	\$7.83 million
	Current Contract Value	\$241.41 million
	Expended to Date	\$233.59 million; \$6.2 million is paid from non-project funds
	% Expended	96.8%
	SBE Participation	5.8%
<b>Schedule:</b>	Final completion achieved May 15, 2015.	
<b>Issues or Concerns:</b>	None.	

<b>Contract No.</b>	<b>1277</b>	
<b>Contract Description:</b>	<b>Pagoda Palace Demolition</b>	
<b>Status:</b>	Construction is complete; contract is in closeout.	
<b>Cost:</b>	Original Contract Value	\$498,995
	Approved Change Orders	\$149,981
	Current Contract Value	\$648,976
	Expended to Date	\$648,976
	% Expended	100%
	SBE Participation	100%
<b>Schedule:</b>		
<b>Issues or Concerns:</b>	None.	

<b>Contract No.</b>	<b>1300</b>	
<b>Contract Description:</b>	<b>Three subway stations (YBM, UMS, and CTS) and STS</b>	
<b>Status:</b>	Mass excavation complete at one station and well underway at two other stations.	
<b>Cost:</b>	Original Contract Value	\$839.68 million
	Approved Change Orders	\$21.96 million
	Current Contract Value (budget)	\$861.64 million
	Expended to Date	\$735.1 million
	% Expended	85.95%
	SBE Participation	22.9%
<b>Schedule:</b>	NTP issued June 17, 2013. Substantial Completion planned February 2018 and <i>forecast June 2020</i> .	
<b>Issues or Concerns:</b>	The work on this contract is behind schedule.	

<b>Contract No.</b>	<b>CS-155-1</b>	
<b>Contract Description:</b>	<b>Design Package 1 for Contracts 1250, 1251, and 1252. PB/Telemon</b>	
<b>Status:</b>	Design is complete. Construction support is nearly complete for Contract 1252.	
<b>Cost:</b>	Original Contract Value	\$5,795,000 (includes exercised options)
	Approved Change Orders	\$2,145,159
	Current Contract Value	\$7,940,159
	Expended to Date	\$7,904,713
	% Expended	99.6%
	SBE Participation	30.2%
<b>Schedule:</b>		
<b>Issues or Concerns:</b>		

<b>Contract No.</b>	<b>CS-155-2</b>	
<b>Contract Description:</b>	<b>Design Package 2 for UMS, CTS, and YBM. Prime: CSDG</b>	
<b>Status:</b>	Designs are complete for all of the station contracts. Construction support of Contract 1300 is underway.	
<b>Cost:</b>	Original Contract Value	\$39,949,948
	Approved Change Orders	\$7,950,658
	Current Contract Value	\$47,900,606
	Expended to Date	\$42,196,304
	% Expended	88.1%
	SBE Participation	31.6%
<b>Schedule:</b>		
<b>Issues or Concerns:</b>		

<b>Contract No.</b>	<b>CS-155-3</b>	
<b>Contract Description:</b>	<b>Design Package 3 for STS. Prime: HNTB-B&amp;C</b>	
<b>Status:</b>	Design is complete. Construction support of Contract 1300 is underway.	
<b>Cost:</b>	Original Contract Value	\$16,864,250
	Approved Change Orders	\$1,637,474
	Current Contract Value	\$18,501,724
	Expended to Date	\$15,275,838
	% Expended	82.6%
	SBE Participation	25.9%
<b>Schedule:</b>		
<b>Issues or Concerns:</b>		

<b>Contract No.</b>	<b>CS-149</b>	
<b>Contract Description:</b>	<b>Central Subway Partnership (Project Manager/Construction Manager)</b>	
<b>Status:</b>	Work is ongoing.	
<b>Cost:</b>	Original Contract Value	\$85,139,092
	Approved Change Orders	\$0
	Current Contract Value	\$85,139,092
	Expended to Date	\$72,666,838
	% Expended	85.4%
	SBE Participation	32.4%
<b>Schedule:</b>		
<b>Issues or Concerns:</b>		

<b>Contract No.</b>	<b>CS 156</b>	
<b>Contract Description:</b>	<b>Project Controls Consultant</b>	
<b>Status:</b>	Work is ongoing.	
<b>Cost:</b>	Base Contract Value	\$17,112,873
	Approved Change Orders	\$0
	Current Contract Value	\$17,112,873
	Expended to Date	\$10,081,808
	% Expended	58.9%
	SBE Participation	30.0%
<b>Schedule:</b>		
<b>Issues or Concerns:</b>		

**ATTACHMENT E – PROJECT MILESTONES/KEY EVENTS**

(P = Planned Date, A = Actual Date, F = Forecast Date)	
PE:	Authorized in July 2002 (A)
Record of Decision (ROD):	Issued November 26, 2008 (A)
FD:	Authorized in January 2010 (A)
FFGA Request:	Submitted September 2011 (A)
FFGA Executed:	October 11, 2012 (A)
Groundbreaking: (Utility Relocation Contract)	February 9, 2010 (A)
Tunnel Excavation Complete (hole through):	June 2, 2014 (southbound); June 11, 2014 (northbound) (A)
Cross Passages Complete:	December 20, 2014 (P); April 15, 2015 (A)
Tunneling Substantial Completion:	April 15, 2015 (A)
Station Construction NTP:	June 17, 2013 (A)
Station Construction Substantial Completion:	February 24, 2018 (P); <i>January 11, 2021 (F)</i>
RSD:	December 26, 2018 (P); <i>December 29, 2021 (F)</i>

Schedule contingency management criteria were developed from the FTA Risk Assessment prior to entry into FD. Minimum schedule contingency levels at various project milestones or “hold points” were agreed to with SFMTA at Risk Workshop #4, which was held in 2009. The FTA-recommended schedule contingency for the current stage of the project is 4 months.



**ATTACHMENT F – ROADMAP TO REVENUE OPERATIONS (To be updated in 4th Quarter 2020)**

<b>Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT</b>				
<b>Description</b>	<b>Estimated Start Date</b>	<b>Estimated Completion Date</b>	<b>Actual Completion Date</b>	<b>Notes</b>
<b>Testing</b>				
Finalize/update Systems Integration Test (SIT) Plan				
Prepare Schedule for Testing (update)				
Finalize Test Procedures				
Conduct System Integrated Testing with trains, including procedures and reports				
Complete Testing Reports				
<b>Operating Plan, Rules, and Training</b>				
Finalize Operating Plan				
Finalize/revise SOPs, manuals, and rulebook as applicable				
Operations Manuals				
Staffing and Operations Plan				
Training of Operations and Maintenance (O&M) personnel				

<b>Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT</b>				
<b>Description</b>	<b>Estimated Start Date</b>	<b>Estimated Completion Date</b>	<b>Actual Completion Date</b>	<b>Notes</b>
Emergency response plan, training, and drills				
<b>Facility and Right-of-Way Maintenance Plan, Equipment, Facilities, and Training</b>				
Maintenance Schedules and Procedures				
Spare Parts Requirements				
Maintenance Manuals				
Maintenance Training				
<b>Pre-Revenue Operations</b>				
Finalize and/or update RAP and/or Pre-Revenue Operations Plan				
Implement Rail Activation Committee				
Develop/revise SSPP & Security Plan (approved by State Safety Oversight (SSO))				
FTA Office of Safety & Security Readiness Review				
PMOC OP-54 Readiness for Revenue Operations Review Report, Phase I				

<b>Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT</b>				
<b>Description</b>	<b>Estimated Start Date</b>	<b>Estimated Completion Date</b>	<b>Actual Completion Date</b>	<b>Notes</b>
Conduct Operational Hazard Analysis (OHA) and resolve other hazards/vulnerabilities				
Pre-Revenue Operations				
<b>Public Outreach</b>				
Develop Safety Outreach Plan				
Provide Community Outreach				
Grand Opening Plan				
<b>Construction Closeout</b>				
Closeout of Non-Conformance Reports				
Punch List Complete				
Certificates of Occupancy/Substantial Completion				
<b>Safety, Security, and Fire-Life Safety Certifications</b>				
Update/Finalize SSMP				
Finalize and/or update Safety Certifiable Item List (SCIL) and SSCP				
Implement Safety and Security Certification Committee				

<b>Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT</b>				
<b>Description</b>	<b>Estimated Start Date</b>	<b>Estimated Completion Date</b>	<b>Actual Completion Date</b>	<b>Notes</b>
Implement Fire Life Safety Committee				
Preliminary Hazard Analysis (PHA)				
Threat and Vulnerability Analysis (TVA)				
Design Criteria Reflecting Safety and Security Requirements				
Review status of quality non-conformances				
Closeout of non-safety critical items				
Closeout of safety critical items				
Complete Safety & Security Certification Verification Report (SSCVR)				
Document Workarounds/Open Items List				
Verify emergency drills, tabletops, training, etc. are completed				
SSO final certification/signature				

<b>Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT</b>				
<b>Description</b>	<b>Estimated Start Date</b>	<b>Estimated Completion Date</b>	<b>Actual Completion Date</b>	<b>Notes</b>
<i>Revenue Service</i>				
Target RSD				
FFGA RSD				

# ATTACHMENT G – PROJECT MAP

