MONTHLY MONITORING REPORT
September 2017

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

Draft Report Delivered to FTA on October 25, 2017
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PMOC Contract No.: DTFT6014D00010
Task Order No. 5
Project No.: FTA-13-0294

Work Order Number: 002
OPs Referenced: 01 and 25
CLIN 0002B

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Time on project: 3 years

EXECUTIVE SUMMARY

Project Description

The Central Subway Project (CSP) involves construction of a 1.7-mile extension of Muni's T Third Line along 4th Street and Stockton Street in downtown San Francisco. The CSP is Phase 2 of the San Francisco Municipal Transportation Agency's (SFMTA) T Third Light Rail Transit (LRT) Project. Phase 1 of the project constructed a 5.1-mile LRT line along the densely populated 3rd Street corridor. Revenue service commenced on the T Third Line in April 2007. The CSP will extend the T Third Line from the 4th Street Caltrain 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 replace the entire LRV fleet. Average weekday boardings are projected to be 43,521 in 2030.

Project Status

The project has been under construction since February 2010. *At the end of August 2017, the project was 70.6% complete based on expenditures.* There was one active construction contract: 1300 Stations and Systems/Trackwork*, which was 59.4% complete based on incurred cost.* Substantial completion of this contract was originally scheduled for February 2018, but the latest master program schedule update forecasts substantial completion on June 26, 2019, a delay of 502 days. The contractor has submitted revised schedule updates through *July 2017 but the 17 most recent monthly updates from the contractor have been rejected by SFMTA.* The master schedule information for the project is based on SFMTA's latest update of the construction schedule, which indicates a forecast Revenue Service Date (RSD) of December 10, 2019. This is 349 days later than the required RSD of December 26, 2018 in the Full Funding Grant Agreement (FFGA). **The Project Management Oversight Contractor (PMOC) notes that the forecast RSD has not changed over the past *four* reporting periods.**

SFMTA and the contractor collaborated to start work on the CTS crossover cavern, which was on the critical path, early. The substantial completion date remained unchanged due to the early start of this work. A risk of further delays to the completion of the mining work of up to four months remains, because the production rate remains below the planned rate. ***CTS is the only station where mass excavation and the primary structural support system are incomplete and, in the opinion of the PMOC, the greatest cost and schedule risks for the project are associated with completion of these work elements at CTS.***

Table 1 - Core Accountability Items

Project Status: *(as of August 31, 2017)*		**Original at FFGA:**	**Current Estimate:**
Cost	Cost Estimate	$1,578,300,000	$1,578,300,000
Contingency	Unallocated Contingency	$74,722,000	$9,005,903
	Total Contingency (Including Approved Contract Changes)	$185,500,000	$75,631,545
Schedule	Revenue Service Date	12/26/2018	12/10/2019 (SFMTA forecast)
Total Project Percent Complete	Based on Expenditures	*70.59%*	
	Based on Earned Value	*71.38%*	
Major Issues	**Status**	**Comments/Planned Action**	
Schedule Contingency	Based on the latest program master schedule, there is negative schedule float of nearly 12 months. SFMTA's worst case forecast for CTS excavation projects a further four months of delay.	*SFMTA is working through the action item list from the July 26/27 schedule workshop.* Several time-saving strategies are under evaluation. SFMTA to identify range of potential RSDs and possible "Revenue Service Demonstration" that could include operation over a portion of the alignment with free fares.	
Cost Contingency	The current Total Contingency is $75.6 million. The Federal Transit Administration (FTA) recommends a minimum contingency level of $60 million.	Accumulating delays will likely lead to an increase in project soft costs, and the contractor has issued many claims. However, the contingency appears adequate for the current level of project completion	
Technical Capacity and Capability	*Interviews are scheduled for start-up and testing manager candidates.*	*Depending on the qualifications of the candidates for the start-up and testing manager, the new Resident Engineer (RE) for Surface, Track, and Systems (STS) might assume these duties.*	
Date of Next Quarterly Meeting:		*November 16, 2017*	

Earned Value (EV): *$1,126,662,176, an increase of $11.76 million from July.*

Planned Value (PV): *$1,446,661,369, a planned increase of $12.05 million from July.*

Actual Cost (AC): *$1,114,097,352, an increase of $19.26 million from July.*

Cost Performance Index (CPI): 1.01, indicating that the value of completed work is slightly higher than the cost.

Schedule Performance Index (SPI): 0.78, indicating that the amount of work completed is far less than planned and the project is well behind schedule.

Contingency

Cost Contingency

The total available contingency (approved contingency less approved contract changes) *as of August 31, 2017* was $*75,631,545*, which is above the minimum required contingency of $60 million *and unchanged from July. SFMTA's latest trend summary report estimates a total potential cost increase of $54.87million (not including executed contract modifications), which is $20.76 million less than the available contingency.*

Schedule Contingency

All contingency in the schedule has been consumed, and there is nearly 12 months of negative float. SFMTA has completed an initial assessment of schedule risk associated with the Sequential Excavation Method (SEM) work at CTS. The worst case scenario would result in an RSD of April 29, 2020, four months later than the current forecast. After further evaluation of schedule risks for station finishing work, SFMTA will establish a new RSD including appropriate schedule float.

PMOC Observations, Opinions, and Concerns

In the opinion of the PMOC, SFMTA and the contractor demonstrated effective collaboration to arrest the accrual of delays by advancing critical path work ahead of the baseline schedule.

The PMOC supports SFMTA's plans to establish a range of potential RSD achievement dates based on a refined project master schedule and recognizing the remaining schedule risks. The PMOC recommends that SFMTA further define the requirements for a possible "Revenue Service Demonstration," which could involve opening a portion of the line early. The definition of requirements will help to confirm the feasibility and timing of the proposed demonstration.

With excavation and the main structural shell completed at YBM and UMS, the significant risks associated with excavation affect only CTS.

The PMOC notes that the Resident Engineers (REs) are challenged to address the high volume of open contractor change requests requiring merit determination, completion of negotiations for merited changes, and completion of the necessary paperwork to execute changes that have been negotiated. The PMOC also notes that program management staff are challenged to keep up with contract claims administration and execution of approved contract changes.

The PMOC notes that the potential cost increases for the project, as indicated in SFMTA's trend summary report have increased by about $1.86 million from September 2017 to October 2017. The PMOC also notes that project management costs will likely increase due to the extended duration of the project and these costs are not included in SFMTA's current forecast. However the forecasts for total potential cost increases remain well below the available cost contingency.

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APPENDICES

A. PROJECT STATUS

Full Funding Grant Agreement (FFGA)

The FFGA was signed on October 11, 2012.

Design

Design is complete.

Construction

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

Contract 1251 (UR #2). This completed contract included the relocation of utility lines within the footprint of the proposed Union Square/Market Street (UMS) Station 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 and construction of the tunnel portal, retrieval shaft, and five cross-passages. Final completion has been achieved, and financial close out is underway. San Francisco Municipal Transportation Agency (SFMTA) is still working to reach resolution on the amounts that are due to the stations contractor to cover extra costs related to non-conforming work by the tunnel contractor. *The station contractor's claimed extra costs include extra work to accommodate voids around the tunnel lining in the Chinatown Station (CTS) station area. The excavation of the station cavern around the tunnel was impacted by the presence of voids that may have been caused by the tunnel contractor's work. SFMTA has initiated a technical review of the possible causes of the voids. The tunnel contractor's compensation may be adjusted depending on the results of this study.* Repairs for leaks at the portal were completed, but were not completely effective. Coordination of access to the tunnel for the leak repair work with ongoing station construction is underway.

It appears likely that this contract will close out with a final cost less than $2 million over the original contract value, with change orders of less than 1% of the contract amount, which is very good cost control performance compared to typical infrastructure projects.

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 Light Rail Transit (LRT) between 4th and King streets and the tunnel portal, and all LRT track and systems components. *As of the end of August 2017, the construction of the Stations and Surface, Track, and Systems Contract was 59.43% complete based on cost and 61.69% complete based on the value of completed construction.*

The contractor and SFMTA have been establishing "Big Hairy Audacious Goals" (BHAGs) as a means of encouraging focus and collaboration between the contractor and agency project team members to maintain and enhance schedule performance. The BHAGs are established for critical path and other important activities in the schedule and are defined so as to be difficult to achieve.

Thus far, few of the identified BHAGs have been achieved and there is little evidence that the BHAGs have been effective in arresting schedule delays.

Union Square/Market Street Station (UMS): The *latest* BHAGs for this work package include:

- *Submittal of plans for 2017 Winter Walk by October 1, 2017. The draft plan was submitted on schedule by the contractor.*
- *Complete Ellis Street granite curb and crosswalk by September 15 and street pavement by October 1. As of October 19, street paving work was still underway. SFMTA hopes to have all of the Ellis Street surface work complete by the construction moratorium in late November.*
- *Bay Area Rapid Transit (BART) elevator at the Powell Street area ready to install by September 1. This work had not been completed as of October 19.*
- *Complete utility work at Geary and O'Farrell streets by November 21. Necessary actions to complete the work were identified and completion on time appears feasible.*

The invert slab for the large Heating, Ventilation, and Air Conditioning (HVAC) shaft in the North Concourse area is complete. Walls in this area will be placed after some issues with the location of piles forming the north headwall (placed by the tunnel contractor) are addressed by the designer. Work is well underway to complete the final wall finishes and encasement of structural members at the platform and mezzanine levels of the main station box.

Chinatown Station (CTS): *The previous BHAG for this station was to complete excavation of the platform cavern by September 30. The southern portion of the platform cavern was completed on September 28, but excavation of the center drift of the northern portion of the platform cavern will extend into early November. The SFMTA scheduling team established a best case completion date of January 31, 2018 for excavation of the crossover cavern and a BHAG has been established with that target date for completion of the crossover cavern.*

In the opinion of the Project Management Oversight Contractor (PMOC), SFMTA and the contractor demonstrated effective collaboration to arrest ongoing schedule delays by advancing the crossover cavern work ahead of the baseline schedule.

Yerba Buena/Moscone Station (YBM): *The current BHAGs for YBM station include:*

- *Complete all structural concrete work in the headhouse by November 30. The invert and concourse level decks are complete. The mezzanine and surface level decks remain to be completed. SFMTA and Tutor Perini Corporation (TPC) are addressing some conflicts between the temporary struts and the permanent work for the mezzanine level.* ***In the opinion of the PMOC, it is unlikely that all structural work will be completed at the YBM headhouse by the end of November.***
- *Complete utility work at 4th and Folsom by October 31. The current lookahead schedule indicates that work on the Auxiliary Water Supply System (AWSS) line at this location will extend well into November.*

- *Complete utility work at 4th and Howard by November 30. The current lookahead schedule shows that work to tie in the force main sewer at the southeast corner of 4th and Howard streets will be completed November 3. Follow-on work is not shown on the schedule.*
- *Install escalators by October 15.*

Surface, Track, and Systems (STS): The *current* BHAGs for this work package include:

- Complete all utility work and pavement restoration from King Street through the Bryant Street/4th Street intersection to the tunnel portal by November 30.
- Complete all track installation on 4th Street by December 31, 2017.

No conflicts with surface trackwork remain along 4th Street from King Street to Townsend Street. Three communication conduits need to be moved out of the track slab/track drain area between Townsend and Bluxome streets. These conflicts should be removed prior to the end of October. Seven separate conflicts involving gas, water, communication, and power facilities remain to be resolved between Brannan and Bryant streets. Solutions for most of the conflicts have been identified, but it will be challenging to complete all of the relocations prior to the BHAG date. ***In the opinion of the PMOC, SFMTA continues to effectively address the remaining utility issues along 4th Street, with the number of outstanding issues continuing to decline.***

In the tunnel section of the project work is underway in both tunnels to install the track between YBM and UMS. The lookahead schedule indicates that rail will be installed through UMS in late November-early December. Installation of the tunnel walkway is underway between YBM and UMS.

Third Party Agreements Including Utilities, Railroads, Other Agencies, Etc.

Bay Area Rapid Transit (BART)

SFMTA is coordinating with BART for the completion and acceptance by BART of shared facilities at the south end of the UMS station.

California Department of Transportation (Caltrans)

SFMTA needs an Encroachment Permit to install electrical and traffic signal equipment at the I-280 off ramp. SFMTA delivered the permit application materials to Caltrans and is working to address Caltrans' comments on the application. *Caltrans has requested a traffic management plan and other documentation from the project environmental report, and SFMTA is working to assemble the requested information.*

CPUC

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/Federal Transit Administration (FTA) Quarterly Progress Review Meetings (QPRM).

The FLSC is working to approve items on the certifiable items list for the Stations Contract. Rail crossing permits from CPUC are required for the at-grade portion of the project alignment. CPUC has provided the permits but they will need to be extended as the permits call for the crossings to be in operation before the scheduled completion of the Central Subway Project (CSP) project.

San Francisco Public Utilities Commission (SFPUC)

Coordination is ongoing for the installation of new water and sewer facilities along 4th Street.

San Francisco Department of Public Works (SFDPW)

SFDPW will provide stamped and sealed drawings for proposed sidewalk repairs along 4th Street at the interface of new sidewalk with existing sidewalk that was planned to be retained.

San Francisco Parks and Recreation Department

No updates to report.

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.

Status of Vehicle Design, Procurement, Testing, and Integration

Vehicle design and fabrication is underway by Siemens Corporation for four Light Rail Vehicles (LRVs) for the Central Subway, 20 LRVs for near-term fleet expansion, and 151 LRVs for fleet replacement. Options for up to 85 additional vehicles are available for fleet expansion. The vehicle design process is complete, and the assembly process is reported to be ahead of schedule. SFMTA had received six cars as of August 3, which satisfies the vehicle requirement for operation of the CSP. Documentation of the test results has been provided to CPUC, which is expected to approve the use of the new vehicles in revenue service. The first two lots of spare parts have been received and the supplier delivered the final drafts of the maintenance manuals. *SFMTA indicates that the new cars will be placed in revenue service by the end of 2017.*

Real Estate

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

Labor Relations and Policies

Appendix G of the Project Monthly Report details the Small Business Enterprise (SBE) goals and actual participation on each contract as of June 30, 2017. SFMTA contract goals range from 6% to 30% on each of the contracts. The majority of the contracts have met these goals to date.

Compliance with Applicable Statutes, Regulations, Guidance, and FTA Agreements

The 1300 contractor had previously raised the possibility of Buy America compliance issues with cooling equipment for the three underground stations. In the case of the cooling equipment, the contract specifications for the Variable Refrigerant Flow (VRF) cooling units identify four manufacturers that are all foreign, and the contractor has not been able to identify a domestic supplier that can meet the specifications. SFMTA has indicated that it intends to seek a waiver of Buy America requirements for this equipment, citing examples from other FTA-funded projects where waivers were granted by FTA for similar equipment.

B. PROJECT MANAGEMENT PLAN AND SUB-PLAN IMPLEMENTATION

Project Management Plan (PMP)

SFMTA delivered an update of the PMP in April 2017.

Environmental Assessment/Mitigation Plan/Archaeological Plans

The PMOC received the First Quarter 2017 Mitigation Monitoring Reporting Program (MMRP) update from SFMTA on July 27, 2017. *The second quarter 2017 plan is due.*

Real Estate Acquisition Management Plan (RAMP)

SFMTA submitted 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.

Quality Assurance/Quality Control (QA/QC) Program Plan

See section F.

Safety and Security Management Plan (SSMP)

See section H.

Risk and Contingency Management Plan (RCMP)

See section I.

C. PROJECT MANAGEMENT CAPABILITY AND CAPACITY

Agency Staff

SFMTA's latest monthly progress report indicates that the Construction Management (CM) staff for the 1300 Contract continues to be understaffed by five of the planned 30 positions. ***The PMOC notes that the Resident Engineers (Res) are challenged to address the high volume of open contractor change requests requiring merit determination, completion of negotiations for merited changes, and completion of the necessary paperwork to execute changes that have been negotiated. The PMOC also notes that program management staff are challenged to keep up with contract claims administration and administration of approved contract changes.***

In the opinion of the PMOC, the number of vacancies on the project team could cause challenges in meeting the management demands of the project. *The PMOC supports SFMTA's intent to add CM staff with building and transit systems experience as the project transitions away from heavy civil construction.*

The PMOC will continue to monitor the SFMTA's progress in clearing the backlog of pending change orders. *The PMOC notes that only two small contract changes have been executed since May 2017 (four months) despite the large volume of pending changes that have been determined by SFMTA to be merited.* The PMOC identified an action item for SFMTA to include metrics for the time needed to progress identified potential contract changes and change order requests from the contractor through the various stages of resolution.

The 1300 Contract includes a Dispute Review Board (DRB) as a resource for helping to achieve resolution of contract disputes. *SFMTA and the contractor have been presenting unresolved issues to the DRB as a means to help achieve resolution.*

Contractor Staff

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

D. PROJECT COST STATUS

Project Cost Control Systems

SFMTA continued to maintain the Trend Log and logs of Change Order Requests (COR), Proposed Contract Changes (PCC), Notices 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 or has submitted a claim. **In the opinion of the PMOC, the trend log tracking should include the amount of time that has passed from the initial identification of the trend. An action item has been identified for SFMTA's response.**

The most recent versions of the Trend Log and Trend Summary documents are dated October 18, 2017. The Trend Summary indicates that 75 contract modifications had been executed for the 1300 Contract. The total value of executed CMods was $8,121,714. The NOPC log dated October 16, 2017 indicates that there are now 74 potential claims. The Claim log shows that 56 of these potential claims have been certified and submitted by the contractor and two have been resolved and will be addressed through contract modifications. The submitted claims total $25.35 million in extra costs.

Note that tables 2 and 3 reflect the project status as of the end of August 2017 and show substantially different values for potential contract changes because pending contract changes in tables 2 and 3 include only SFMTA-initiated PCCs and contractor CORs that have been

determined to have merit. Claims and denied CORs are not included in the cost forecast in tables 2 and 3.

Project Cost (*as of August 31, 2017*)

Cost estimate: $1.5783 billion.

Total contingency: $75.63 million (minimum contingency is $60 million), unchanged from July.

Actual Cost (AC): *$1,114,097,352, an increase of $19.26 million from July (70.59% of the total project budget)*.

Current funding level: $1,329,794,000 (84.3% of the total project budget).

Earned Value (EV): *$1,126,662,176, an increase of $11.76 million from July.*

Cost Performance Index (CPI): *1.01.*

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.

Project Cost Trends

SFMTA tracks potential changes in project cost, calling these potential changes "trends." Trends include all potential changes in the contract 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 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, with the value reflecting SFMTA's assessment of the likelihood that the change would ultimately be approved through the contract dispute resolution process.

Table 2 summarizes the trends for the two construction contracts that have not attained financial close out. The remaining contingency, less identified trends, represents about *54%* of the potential left to spend for Contract 1252.

SFMTA significantly increased its forecast of the potential cost impact of trends for the 1300 Contract between its July and August monthly progress reports. SFMTA estimated the total cost impact of potential contract changes at $19.94 million in July and $28.9 million in August.

After potential changes are accounted for, there was only $3.38 million in allocated contingency remaining for Contract 1300 at the end of August. ***The resulting contingency of 1.0% of potential remaining spending after potential changes are accounted for is likely insufficient and there is a significant likelihood that additional contingency will need to be allocated to this contract prior to completion*****. However, unallocated contingency and excess contingency for other elements of the program are likely sufficient to allow on-budget completion of the CSP**.

Table 3 shows the overall budget, trends, and contingency status for the entire Central Subway program. *The Budget Forecast Variance, which reflects the total remaining contingency after the cost of trends is accounted for, is 11.2% of the potential remaining spending. In the opinion of the*

PMOC, this contingency should be sufficient to provide reasonable confidence in an on-budget completion of the project.

Table 2 - Contract, Budget, and Trends for Active Construction Projects[1]

	1252 – Tunnel	1300 Stations, STS
Original Contract	233,584,015	839,676,400
Approved Contingency	2,329,485	40,000,000
Extra Budget for Non-Project Costs	6,173,508	
Approved Budget	235,913,500	879,676,400
Approved Changes	1,494,770	7,726,806
Current Contract (1252 does not include non-project costs)	235,078,785	847,403,206
Remaining Contingency	834,715	32,273,194
Potential Changes (PCCs and merited CORs)	20,000	*28,896,064*
Estimate at Completion	235,098,785	*876,299,270*
Contingency Less Trends	814,715	*3,377,130*
Spent to Date	233,589,322	*525,906,747*
Potential Left to Spend	1,509,463	*350,392,523*
Contingency Less Trends as % of Potential Cost to Complete	54.0%	*1.0%*

[1] *As reported in the August 2017* Central Subway Project Monthly Progress Report – SFMTA (reformatted by the PMOC).

Table 3 - Budget and Contingency Status for Central Subway Project

SFMTA Central Subway Project, Budget, Costs and EAC by SCC August 31, 2017		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
		$	$	$	%	$	$	$	%	$	$	$	$
10	**Guideway and Track Elements**	**315,926,081**	**(30,698,202)**	**285,227,879**	**-10%**			**240,834,007**	84%	**44,393,872**			
10.02	Guideway: At Grade, Semi-exclusive	2,395,143	464,857	2,860,000	19%			707,500	25%	2,152,500			
10.06	Guideway: Underground cut and cover	74,407,195	(4,590,788)	69,816,407	-6%			62,704,677	90%	7,111,730			
10.07	Guideway: Underground tunnel	224,933,257	(23,592,511)	201,340,746	-10%			170,980,314	85%	30,360,432			
10.09	Track: Direct fixation	7,293,157	(532,068)	6,761,089	-7%			3,822,916	57%	2,938,173			
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%			2,618,600	59%	1,831,037			
20	**Stations, Stops, Terminals, Intermodal**	**432,698,735**	**154,358,532**	**587,057,267**	**36%**			**350,566,026**	60%	**236,491,241**			
20.01	At-grade station	774,913	6,827,944	7,602,857	881%			1,588,488	21%	6,014,369			
20.02	Aerial station, stop, shelter, mall, terminal, platform		2,901,013	2,901,013	NA			-	0%	2,901,013			
20.03	Underground station	412,084,888	142,766,672	554,851,560	35%			344,494,279	62%	210,357,281			
20.07	Elevators, escalators	19,838,934	1,862,903	21,701,837	9%			4,483,259	21%	17,218,578			
40	**Sitework and Special Conditions**	**232,551,627**	**(18,255,597)**	**214,296,030**	**-8%**			**199,749,885**	**93%**	**14,546,145**			
40.01	Demolition, clearing, earthwork	8,887,028	3,468,587	12,355,615	39%			11,938,516	97%	417,099			
40.02	Site utilities, utility relocation	29,562,587	30,862,739	60,425,326	104%			65,126,747	108%	(4,701,421)			
40.03	Haz. Material, contam'd soli removal, ground water treatment	2,957,442	4,576,686	7,534,128	155%			4,763,103	63%	2,771,025			
40.04	Environmental mitigation	3,146,216	(2,023,317)	1,122,899	-64%			612,590	55%	510,309			
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%			2,897,093	30%	6,893,902			
40.07	Automobile, van, bus accessways, including roads and parking lots	11,919,550	(5,340,451)	6,579,099	-45%			4,298,389	65%	2,280,7			
40.08	Temporary facilities and other construction indirect costs	158,790,820	(45,009,283)	113,781,537	-28%			107,407,016	94%	6,3			
50	**Systems**	**108,429,774**	**(13,087,948)**	**95,341,826**	**-12%**			**27,803,972**	**29%**	**67,53**			
50.01	Train control and signals	37,447,116	(9,319,177)	28,127,939	-25%			7,408,919	26%	20,719,0			
50.02	Traffic signals and crossing protection	3,013,232	9,549,297	12,562,529	317%			10,593,610	84%	1,968,91			
50.03	Traction power supply	20,379,634	1,085,439	21,465,073	5%			8,073,250	38%	13,391,823			
50.04	Traction power distribution	16,239,951	(3,798,838)	12,441,113	-23%			1,533,189	12%	10,907,924			
50.05	Communications	28,545,305	(16,514,719)	12,030,586	-58%			195,003	2%	11,835,583			
50.06	Fare collection system and equipment	2,804,536	3,295,464	6,100,000	118%			-	0%	6,100,000			
50.07	Central Control		2,614,586	2,614,586	NA			1	0%	2,614,585			
Subtotal (10 - 50)		**1,089,606,217**	**92,316,785**	**1,181,923,002**	**8%**	**1,146,595,092**	**35,327,910**	**818,953,890**	**69%**	**362,969,112**	**356,557,268**	**1,175,511,158**	**6,411,844**
60	**ROW, Land, Existing Improvements**	**37,398,029**	**(5,151,708)**	**32,246,321**	**-14%**	**32,246,321**	**-**	**30,732,020**	**95%**	**1,514,301**	**1,514,301**	**32,246,321**	**-**
60.01	Purchase or lease of real estate	33,798,029	(3,732,219)	30,065,810	-11%	30,065,810	-	28,322,590	94%	1,743,220	1,514,301	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)
70	**Vehicles**	**26,385,653**	**-**	**26,385,653**	**0%**	**13,309,000**	**13,076,653**	**4,310,495**	**16%**	**22,075,158**	**8,998,505**	**13,309,000**	**13,076,653**
70.01	Light Rail Vehicles	26,385,653	-	26,385,653	0%	13,309,000	13,076,653	4,310,495	16%	22,075,158	8,998,505	13,309,000	13,076,653
80	**Professional Services**	**361,568,360**	**(32,829,239)**	**328,739,121**	**-9%**	**310,518,042**	**18,221,079**	**260,100,948**	**79%**	**68,638,173**	**50,417,094**	**310,518,042**	**18,221,079**
80.01	Preliminary Engineering	46,317,094	**(114,420)**	46,202,674	0%	46,202,674	-	46,202,675	100%	(1)	-	46,202,675	(1)
80.02	Final Design	86,053,240	(24,734,909)	61,318,331	-29%	61,318,331	-	61,199,308	100%	119,023		61,318,331	-
80.03	Project Management for Design and Construction	191,025,800	(88,107,410)	102,918,390	-46%	89,012,545	13,905,845	68,956,288	67%	33,962,102	25,151,322	94,107,610	8,810,780
80.04	Construction Administration and Management	15,495,521	78,558,172	94,053,693	507%	91,096,881	2,956,812	72,000,325	77%	22,053,368	14,001,490	86,001,815	8,051,878
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	78,823	6,419,019	380,981
80.06	Legal, Permits, Review Fees by Other Agencies	7,242,340	970,264	8,212,604	13%	8,212,604	-	4,537,366	55%	3,675,238	3,215,114	7,752,480	460,124
80.07	Surveys, Testing, Investigation, Inspection	234,036	699,064	933,100	299%	933,100	-	864,790	93%	68,310	16,032	880,822	52,278
80.08	Start up	8,400,329	(100,000)	8,300,329	-1%	6,941,907	1,358,422	-	0%	8,300,329	7,835,290	7,835,290	465,039
Subtotal (10 - 80)		**1,514,958,258**	**54,335,839**	**1,569,294,097**	**4%**	**1,502,668,455**	**66,625,642**	**1,114,097,353**	**71%**	**455,196,744**	**417,487,168**	**1,531,584,521**	**37,709,576**
90	Unallocated Contingency	63,341,742	(54,335,839)	9,005,903	-86%		9,005,903		0%	9,005,903			9,005,903
Total Project Costs (10 - 100)		**1,578,300,000**	**-**	**1,578,300,000**	**0%**		**75,631,545**	**1,114,097,353**	**71%**	**464,202,647**	**417,487,168**	**1,531,584,521**	**46,715,479**

SCC Breakdown of Forecast Construction Costs Not Available

[2]Data reported in the *August 2017* Central Subway Project Monthly Progress Report – SFMTA (reformatted by the PMOC).

Change Order Control

SFMTA continues to estimate that CMods with a net increase in contract value of only $20,000 will be executed as part of contract close out for the 1252 Contract. Based on the expected final contract value, change orders for the base work are forecast to represent less than 1% of the original contract amount. This represents exceptionally good change order control compared to typical infrastructure projects.

SFMTA is maintaining its management tools for tracking potential contract changes for the 1300 Contract. *The latest CN1300 Trend Summary is dated October 18, 2017. This report shows that 75 contract modifications have been approved for a net increase in the contract value of $8,121,714, which is up $395,000 from September 20. CORs (generated by the contractor) that have been determined to have merit and PCCs (generated by SFMTA) have a combined potential cost impact of $28,452,638 in increased contract value, an increase of $1.49 million since September 20. SFMTA expects to settle the outstanding CORs for less than the overall cost currently claimed by the contractor. SFMTA also expects to receive $6,021,134 in non-project funds to cover the cost of these pending contract changes. The net impact of the CORs and PCCs on the potential project cost is $22.43 million.*

An additional 670 items are being tracked in the Trend Log. Of these, SFMTA judged 312 items to be without merit and denied them. A further 269 items have been voided and are carried at no cost. There are 74 items covered by certified claims and NOPCs by the contractor ($25.36 million total exposure, $200,000 greater than last month), and 15 items are "open" or "new" and awaiting a determination of merit.

The potential exposure of the project to additional costs from the denied items, NOPCs, claims, and open items is $32.44 million, which, when added to the $22.43 million in increased project costs from merited contract changes, yields a possible exposure of the project to additional costs for the 1300 Contract of $54.87 million. This compares to the remaining contingency for the project of $75.63 million. **In the opinion of the PMOC, the available cost contingency for the CSP remains sufficient to address potential cost increases. The PMOC notes that the forecast of overall project costs is now more accurate since SFMTA is recognizing that some extra costs will be reimbursed by non-project funds**.

The Trend Log shows the following trend items with 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 - $1,880,379
4. # 61 - Delays to installation of tangent piles at UMS - $1,082,380
5. # 160 - Conflicting duct bank at UMS - $581,837
6. # 176 - UMS Garage underpinning requirements - $732,157

7. # 192 - 12-inch waterline at UMS, added scope - $336,236
8. # 193 - Utility conflicts with sewer line installation at UMS - $744,465
9. # 239 - Changes in construction sequence for UMS Garage - $500,000
10. # 246 - UMS art glass installation requirements - $382,978
11. # 272 - Obstructions to jet grout placement at UMS - $2,062,420
12. # 341 - Change in track switch machine manufacturer at STS - $391,909
13. # 399 - Additional monitoring instruments at CTS - $429,777
14. # 466 - Extra work to prepare existing tunnel - $431,423
15. # 498 - Additional traffic control requirements at 4th and King - $675,001
16. # 524 - Changed requirements for pre-loading of UMS concourse level struts - $1,319,593
17. # 526 - Incomplete interface design at STS - $300,001
18. # 528 - Additional traffic control requirements for STS work package - $1,032,302
19. # 537 - Cost of changes to the design of CTS to accommodate the plaza requested by the community - $4,618,428 (paid from non-project funds)
20. # 543 - Change in construction sequence at CTS - $250,001
21. # 580 – Missing conduit between manholes at UMS - $250,001
22. # 636 – Changes in emergency vent design (all stations) - $500,001
23. # 644 - Contractor-claimed change in contract requirements for pre-loading permanent struts at UMS - $1,853,352
24. *#695 – Change in scope for slip-lining of 78" sewer on 4th Street - $828,956 (new)*
25. #715 - Soil nail and shotcrete wall changes in Union Square Garage - $1,365,378
26. # 775 - Extra demolition at Union Square Garage - $288,022 (new)
27. # 814 - Changes to electrical service locations for streetlights on 4th Street - $282,638 (new)
28. # 840 - Change in drain piping details at UMS - $332,252
29. # 892 - Temporary drainage at Union Square Garage ramps - $292,754
30. # 942 - Change in automatic train control system for reverse running - $400,001
31. # 968 - Design changes for UMS vertical drainage slots - $603,910
32. # 1022 - Claim for extra costs and time due to extremely hard ground claimed by TPC during the coring for the Sequential Excavation Method (SEM) mining work - $862,720
33. # 1032 - Escalator raceways at UMS - $492,065

34. # 1099 - Extra costs for SEM excavation at CTS due to tunnel segments being 5 feet long - $4,404,329
35. # 1117 - Extra costs due to concrete obstruction at CTS south platform cavern - $583,623
36. # 1175 - Time impacts due to power pole conflict during demolition at CTS - $3,516,164
37. # 1211 - Time impacts from extended submittal reviews and substitution request procedures - $3,021,262
38. # 1217 - Claimed delays to SEM work at the platform invert due to compensation grout exclusion zone requirements in the contract specifications - $900,889
39. # 1276 - Estimated extra costs of proposed scope increase to provide sidewalk bulb-outs at 4th and Bryant and 4th and Harrison - $1,402,706 (paid from non-project funds)
40. # 1299 - Claimed extra costs for a schedule delay to the train control subcontract - $2,000,001
41. # 1311- Claimed extra costs for delays to the CTS south platform center drift excavation due to restrictions caused by compensation grouting - $675,952
42. # 1373 - Extra costs for jet grouting complications at Macy's basement at UMS - $599,421
43. # 1378 - General claimed extra costs for SEM work at CTS - $5,457,322
44. # 1424 - Extra work due to changes in form-savers and couplers at roof to wall connection at YBM - $305,906
45. *#1479 – Large volume of water inflow at end of probe - $300,000 (new)*

The PMOC notes that there was only one new trend with cost in excess of $250,000 in the current month.

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 - ($1,833,869)
2. Deletion of the Air Replenishment System (ARS) - ($4,689,000)
3. Replace specified Closed Circuit Television (CCTV) equipment with alternate for all stations - ($1,600,000)

Funding

Federal, state, and local project funding and expenditures are shown in Table 4. The awarded funding now represents 84.3% of the project budget.

Table 4 - Project Funding

Source	Committed ($1,000)	Awarded ($1,000)
Federal		
New Starts	942,200	769,196
Congestion Mitigation	41,025	41,025
Federal Subtotal	983,225	810,221
State		
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
State Subtotal	471,100	395,598
Local		
Prop. K Sales Tax	123,975	123,975
Local Subtotal	123,975	123,975
Project Total:	**1,578,300**	**1,329,794**

E. PROJECT SCHEDULE STATUS

SFMTA prepared an update of the master program schedule in September representing progress on the project through August 2017. The contractor has submitted revised schedule updates through July 2017, but SFMTA rejected the contractor's latest schedule updates because the contractor failed to make requested corrections to schedule logic and also manipulated the schedule to cause the critical path to change. The contract does not allow the contractor to make changes to the durations of activities or work sequence in the baseline schedule without review and concurrence by SFMTA.

As of the end of August 2017, the project was 349 days late, based on the projected Revenue Service Date (RSD) of December 10, 2019. The projected substantial completion date for the 1300 Contract remained June 26, 2019, which is 502 days later than the original date (February 9, 2018). *There have been no changes to these milestone dates over the past four schedule updates.*

The contractor has been executing critical path work on the crossover cavern in advance of the completion of the platform cavern. Advancing this work while the platform cavern excavation is still underway allowed the RSD to be maintained, despite excavation production rates that continued to be lower than assumed in the baseline schedule for the platform cavern. The contractor has been working two 12-hour shifts and 6 days per week at CTS to reduce the impacts of lower than planned production rates for the ongoing SEM mining work for the platform cavern.

TPC continues to issue major delay claims and NOPCs for CTS and the other work packages. SFMTA and TPC have been addressing the claims through the DRB process. The schedule for installation and testing of the train control system is the subject of major delay claims that may impact the project critical path. SFMTA has requested an updated schedule from the train control supplier, which has not been received.

The PMOC is concerned that resolution of the outstanding claims will be challenging because the parties' respective positions are far apart. ***The PMOC is further concerned that TPC has refused to develop a recovery schedule as required per contract.***

The critical path for the construction work continues to flow through the construction of CTS, but analysis by the PMOC indicates that there are other lines of work that are influencing the RSD for the project. Schedule risks related to CTS work and the other near-critical lines of work may further extend the project completion date. SFMTA is conducting a risk assessment of the schedule to establish a range of possible construction completion dates and start dates for revenue service. SFMTA will also identify mitigation measures to reduce the potential effects of the major risks.

SFMTA and TPC have been establishing BHAGs as a way to focus the project team's attention on advancing project work and to encourage teamwork among SFMTA and TPC staff to removing barriers to completion of the work.

Table 5 shows the latest BHAGs and the status for each work package in the 1300 Contract.

Table 5 - Interim BHAGs for CTS Construction Progress

Milestone	Target Date	Actual Date	*Status*
CTS			
Complete platform cavern excavation	September 30, 2017	*November 2017*	*South cavern complete, north cavern still underway*
Complete crossover cavern	*January 31, 2018*	*TBD*	*Best case forecast is 1/3/18*
UMS			
Complete utilities and street restoration in Ellis Street	*October 1, 2017*	*TBD*	*Late, work forecast to extend into November*
Complete utilities in Geary Street and O'Farrell Street	*November 21, 2017*	*TBD*	*In progress*
Submit Winter Walk Plan	October 1, 2017	*October 1, 2017*	*Draft complete*
BART Powell Street elevator ready to install	September 1, 2017	*TBD*	*Late, submittals not complete*
YBM			
Escalators ready to install	*October 15, 2017*	*Unknown*	*Not on lookahead schedule*
Complete utilities at Folsom Street	*October 31, 2017*	*TBD*	*Late – work extending into November*
Complete utilities at Howard Street	*November 2017*	*TBD*	*Completion date unknown*
Complete headhouse roof slab	*November 30, 2017*	*TBD*	*Addressing conflicts at mezzanine level*
STS			
Complete all utility work along 4th Street	*November 30*	TBD	*In progress, multiple utility conflicts continue to delay work*
Complete track installation on 4th Street	*December 31, 2017*	TBD	*Utility conflicts delaying portions of the work*

In the opinion of the PMOC, setting of BHAGs has limited effectiveness, in part due to the inconsistent treatment of BHAG by the Resident Engineering teams for the work packages. BHAGs were actively discussed for the UMS package at the weekly status meeting, while there was no mention of BHAGs during the CTS, YBM meetings, and STS meetings.

The PMOC and SFMTA convened a schedule workshop on July 26 and 27, 2017 with the objective of agreeing on an approach to establishing a reliable forecast of the project RSD. *The PMOC issued a report documenting the results of the workshop and identifying action items relative to the schedule. SFMTA and the PMOC reviewed the status of the action items on October 17. The current status of the action items is as follows:*

1. Confirm the schedule currently shown for Gap Breaker availability on 9/19/2018 relative to Gap Breaker activities that occur later (UMS. 34. 21. 0505 through UMS. 34. 21. 1545) and STS (STS. 26. 05. 2120). Make any required corrections to the schedule to accurately reflect the availability of the Gap Breaker. *Schedule has been corrected. CLOSED.*

2. Review and confirm schedule for procurement of Advanced Train Control System (ATCS) hardware, software, and testing. The ATCS supplier is preparing an update of its schedule, *which is pending. The master schedule will be updated when the revised ATCS schedule is received. OPEN.*

3. Fix schedule logic and errors in task status:

    a. Remove lags with long duration from the schedule and replace with appropriate logic ties to controlling activities.

    b. Correct misallocation of activities among work packages.

    c. Correct logic to reflect completed work in the tunnel that is out of sequence compared to the baseline schedule.

    d. Correctly show the completion of activities associated with 2016 and 2017 Chinese New Year Parades (should be 100% complete).

    e. Change Mobilization activities from Task Dependent to Level of Effort type.

    f. Change work calendar assignment for activities inappropriately assigned to the Chinatown moratorium calendar.

    All of these corrections have been provided to TPC, but TPC refuses to incorporate them in its ongoing schedule updates. *SFMTA has implemented them and is maintaining a parallel schedule to the contractor's schedule. CLOSED.*

4. Improve accuracy of completion status of activities in schedule updates. Corrections have been identified and will be implemented. No impact to the project completion date is expected. *CLOSED.*

5. Evaluate opportunities to revise the sequence of tasks to reduce overall project duration. Work with the contractor to implement changes in work sequence that will save time. SFMTA evaluated options for revising the work sequence. The most promising

opportunity appears to be advancing work that would allow ATCS testing to commence sooner. This would likely not impact the overall completion date, but it could help to streamline the testing work and might support an early service start (Revenue Service Demonstration). SFMTA noted that TPC has been resistant to making changes to the sequence of work. *SFMTA has incorporated improvements in its schedule updates and will work with the contractor to implement them as the subject work arises during progress of the work. CLOSED.*

6. Evaluate the benefits, feasibility, and cost of allowing trackwork to advance through UMS while construction of upper level floors is underway. If effective and feasible, work with contractor to implement required contract modifications. SFMTA analyzed the possible benefits of advancing track installation through UMS and found that this would not have a significant impact on the project completion date unless combined with ATCS testing schedule changes. *SFMTA is monitoring the contractor's progress in advancing the trackwork in the tunnels and believes that TPC can continue to the trackwork through UMS. The lookahead schedule indicates trackwork will be placed through UMS in early December. OPEN.*

7. Evaluate the benefits, feasibility, and cost of advancing the completion of traction power and station power supplies at YBM. If effective and feasible, work with contractor to implement required contract modifications. SFMTA found that the completion date for traction power at YBM could be moved up 3.5 months. This would not impact the overall project completion date but it could support the early start of testing, which could help to reduce the duration of later testing activities. It also could support the Revenue Service Demonstration. *This strategy appears to be achievable and SFMTA will work with the contractor to implement it as the affected work comes up in the sequence of construction at YBM. OPEN.*

8. Define the scope and confirm the schedule for Building Systems Startup and Testing at each station. Determine if some of the work can start sooner than indicated in the current schedule. SFMTA is working with TPC to justify the durations of this work at each station. TPC is resisting changing the durations. In the PMOC's opinion, much of the work that would be in this activity will be completed under other activities in the schedule. If this is the case, when the work packages reach these tasks, there will be little to do and the durations will be much shorter than indicated in the schedule. *SFMTA has requested that TPC provide more detail for the building start-up and testing activities. OPEN.*

9. Prepare an updated "base case" (as distinguished from baseline) schedule for completion of the project. This updated schedule would incorporate changes resulting from all of the previous action items. SFMTA is working to incorporate all of the appropriate schedule refinements to create the updated base case schedule, which will be maintained in parallel with TPC's schedule. *Completed. CLOSED.*

10. Identify and quantify remaining significant schedule risks. This will be accomplished at the routine project risk mitigation meetings. This *has been completed* through the CSP

Risk Mitigation meeting process. *SFMTA provided an updated risk register to the PMOC. Individual risk will be applied to a simplified project schedule to assess potential schedule impacts. CLOSED.*

11. Conduct a risk assessment to identify a reasonable range for the RSD recognizing the schedule risks. *SFMTA has initiated the Monte Carlo schedule analysis. OPEN.*

12. If SFMTA intends to pursue a Revenue Service Demonstration, prepare a plan that identifies the work that must be complete in order to start such a demonstration. Identify a range of dates by which the required work is likely to be complete. SFMTA does intend to pursue a Revenue Service Demonstration and is identifying what work will need to be complete, including staff training, to implement such a demonstration. *SFMTA has initiated discussion with Muni operations on the requirements for the potential demonstration. OPEN.*

The PMOC supports SFMTA's planned approach to identifying a range for the RSD for the project. The PMOC encourages SFMTA to complete its assessment according to the dates shown in Table 8.

Project Schedule Data

Earned Value (EV): *$1,126,662,176, an increase of $11.76 million from July.*

Planned Value (PV): *$1,446,661,369, a planned increase of $12.05 million from July.*

Schedule Performance Index (SPI): 0.78. SPI is a measure of schedule efficiency on a project. It is the ratio of earned value to planned value. 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 earned value and planned value. The current value of *0.78* indicates that the project is significantly behind schedule**.**

Table 6 shows the status of the schedule milestones established for the project.

Table 6 - Schedule Milestones

	(P = Planned Date, A = Actual Date, F = Forecast Date)
Preliminary Engineering (PE):	Authorized in July 2002 (A)
Record of Decision:	Issued November 26, 2008 (A)
Final Design (FD):	Authorized in January 2010 (A)
FFGA Request:	Submitted September 2011 (A)
FFGA Executed:	October 11, 2012 (A)
Ground Breaking: (Utility Relocation Contract)	February 9, 2010 (A)
Tunnel excavation complete (hole through):	June 2, 2014 (SB); June 11, 2014 (NB) (A)
Cross passages complete:	December 20, 2014 (P); April 15, 2015 (A)
Tunneling substantial completion:	April 15, 2015 (A)

	(P = Planned Date, A = Actual Date, F = Forecast Date)
Station construction Notice to Proceed (NTP):	June 17, 2013 (A)
Station construction substantial completion:	February 24, 2018 (P); June 26, 2019 (F)
RSD:	December 26, 2018 (P); December 10, 2019 (F)

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, held on February 24 through 27, 2009. The FTA recommended schedule contingency for the current stage of the project is 6.0 months. As noted above, the current schedule reflects *nearly 12 months* of negative buffer float.

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 (underway)
CTS Headhouse Structural Concrete/Remove Bracing
CTS Install Mechanical, Electrical, and Plumbing (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 December 10, 2019)

Three Month Look-ahead

The following activities are planned over the next three months:

1300 Contract

UMS

Complete utility placement, backfill, and paving of Ellis Street, Geary Street, and O'Farrell Street

Complete emergency exit stairs at O'Farrell Street

Continue exterior finishing work at the plaza level of the Union Square Garage and the north entrance

Continue below-grade construction in the north concourse fan plant

Complete encasement of permanent walers in the main station box

Install elevator in the BART annex

Construct the mezzanine level floor slab in the station box

Continue construction of interior walls in the south concourse

CTS

Complete excavation of the station platform cavern

Continue excavation of the crossover cavern, *completion possible in January 2018*

Conduct final compensation grouting program for adjacent buildings

YBM

Complete interior walls at the concourse level of the headhouse

Start and complete construction of the mezzanine floor slab in the headhouse

Continue construction of stairs within the station box and emergency egress stairs

Continue M/E/P rough-in and interior work mezzanine and concourse levels

Continue interior wall construction and M/E/P rough-in at the platform level

Complete utilities in 4th Street above the station box and restore the street pavement

Complete street work on Clementina Street

Install escalators

STS

Complete utility work and street restoration along 4th Street

Complete construction of the trackway and installation of track along 4th Street

Install track from YBM to UMS

Construction tunnel walkways between the portal and UMS

The PMOC expects to attend the following meetings:

- Weekly Management (November 13, 2017 and January 5, 2018)
- Weekly Contract 1300 Construction Progress Meetings November 14/15, 2017 and January 6/7, 2018)
- Weekly Configuration Management Board (CMB) (November 15, 2017 and January 7, 2018)
- CSP PMOC Status Meetings (November 14, 2017 and January 6, 2018)
- FTA/QPRM (November 16, 2017)

F. QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC Plan Implementation

The 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 Contractor Non-conformance Report (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 averse to quality are corrected. In the event that the contractor does not issue a CNCR, SFMTA may issue a Non-conformance Notice (NCN) where non-conforming work is identified by SFMTA's quality assurance staff.

The quality concerns for the 1300 Stations Contract identified in the SFMTA *August* monthly report were unchanged from the previous month and included:

- As is typical to similar projects, work performed prior to receipt of approval status of required submittals/Requests for Information (RFI) remains a potential area of concern.
- Also as is typical, timely identification and response to construction problems such as too little concrete cover for reinforcing steel due to close proximity of adjacent objects remains a challenge.

As of September 26, TPC's Quality Manager had filed 319 CNCRs (nine new since the last report). Nine new items were under review, 25 other items had responses identified but not yet approved, the proposed responses to 11 items were disapproved, and 19 items had approved responses that were not yet implemented. In addition, 217 items were closed (nine more than in late August) and 38 items had been voided. A few open and disapproved items at UMS were identified as critical to resolve to allow work to progress.

G. AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE

There are no ADA issues for the project at this time.

H. SAFETY AND SECURITY

Safety and Security Management Plan

An updated 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 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 with the next PMP update.

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 started to address the station construction items in 2016. *As of September 11, 2017, 125 of the 1660 items on the Safety*

and Security Conformance Checklist were approved, 25 items were under review by the committee, and 15 items required follow-up responses from the SFMTA construction team. The San Francisco Fire Department (SFFD) regularly attends the now combined FLSC and SSCRC meetings. The SFFD will continue to coordinate with the Stations Construction Project to identify issues of importance during construction.

Construction Safety

The 1300 Contract is maintaining an excellent safety record, with a total of six recordable and four lost time incidents since the project start. *No recordable incidents occurred in the month of June 2017.* The performance metrics relating to accidents per working hour are well below the OSHA goals for similar construction. The current accident records for the 1300 Contract are shown in Table 7.

Table 7 - Construction Safety Data

Through June 2017	No. of Incidents	Incident Rate[1]	Goal
1300 Contract			
OSHA Recordable Accidents	6	*0.48*	<3.4
Job Transfer/Restricted Duty Incidents	0	0	NA
Lost Time Incidents	1	*0.08*	<1.6
Total Incidents	7	*0.56*	NA
Hours Worked	*2,521,722*		

[1]OSHA incident rate = incidents x 200,000/hours worked.

I. PROJECT RISK, RISK MANAGEMENT, AND RISK MITIGATION

The PMOC received RCMP Revision 3 on April 30, 2013. The outgoing PMOC provided its final Spot Report to FTA on July 19, 2013. SFMTA submitted a CSP "Contingency Management – Schedule 2012 Update" on May 22, 2013. SFMTA provided a further update of the schedule risk assessment in June 2015 that recommended a reduction of the minimum schedule contingency after demobilization of the tunnel work to 4.0 months. The updated risk assessment was conducted on the approved baseline schedule for the 1300 Contract without updates to reflect the then status of the construction work and the accumulated construction delays.

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 risk to the project is the potential for further delays to the construction of the stations, which cannot be mitigated or recovered, resulting in further delays to the RSD. *SFMTA has recently subdivide this general schedule risk into several more specific risks. At the latest Risk Mitigation meeting on October 5, 2017, these new risks were evaluated. The risk mitigation report from that meeting includes the following information regarding these newly-identified risks:*

- *Risk 248 – Mining production rate at CTS is less than assumed in the construction schedule (rating 25 – very high). The contractor has been maintaining the planned production rate for the past several weeks.*

- *Risk 253 – Inadequate contractor resources to complete scheduled work (rating 6 – medium). Resources for mechanical, electrical, and plumbing (M/E/P) work are the current primary concern. The M/E/P work will be staggered in time, with YBM first, UMS next, and CTS last. The staggering of work will help to limit the need for M/E/P resources.*
- *Risk 249 – Inability to recover time through parallel, rather than sequential, work activities (rating 7 – medium). SFMTA's scheduling staff are evaluating the potential for parallel work.*
- *Risk 251 – The current construction schedule does not include all activities required for completion of the work. Inclusion of all activities may cause further schedule delays (rating 8 – medium). TPC's scheduler has recently identified activities required to complete upcoming work are missing. SFMTA is researching the schedule to determine if activities that appear to be missing are actually imbedded in other activities.*
- *Risk 252 – The risk that the time allocated to certain activities is inadequate to complete them (rating 5 – low). SFMTA will be monitoring progress on activities in an attempt to identify shortfalls in production early.*

SFMTA has started the process of applying these newly-identified risks to the program schedule in order to establish a range of likely construction completion dates and revenue service dates. SFMTA has developed a simplified, high level schedule with a manageable number of activities. SFMTA will apply the identified risks to this schedule through Monte Carlo simulation over the next few weeks. SFMTA is targeting completion of the schedule risk assessment prior to the November QPRM.

In the opinion of the PMOC, SFMTA is taking an appropriate approach to identifying and quantifying the potential impacts of the remaining schedule risks to the project. The outcome of the SFMTA risk assessment is expected to be a range of likely RSDs for the project.

A list of the top risks discussed at the August 2017 Risk Mitigation Meeting is included in Appendix D.

J. ACTION ITEMS

Table 8 on the following page shows the current action items for SFMTA.

Table 8 - SFMTA Action Items for Central Subway Project

Category	NO.	ACTION	DATE OPENED	DUE DATE	DATE CLOSED	COMMENTS
S, RA	**166**	Update schedule risks based on recovery schedule	12/10/15	10/31/17	*10/17/17*	*CLOSED*
S	**169**	Review and address logic errors and acceleration strategies in the schedule	6/23/16	10/31/17	10/17/17	*CLOSED*
S	**171**	Provide a range of dates for the Revenue Start Date	6/23/16	1/31/18		Based on results of 166, 169, and a quantitative risk assessment
CH	**174**	Revise trend tracking process to include the amount of time that has passed since the trend was originally identified.	3/24/17	TBD		
S	**177**	Develop plan, confirm feasibility of "Revenue Service Demonstration"	7/27/17	TBD		SFMTA identifying requirements for the demonstration

(Note: All closed items are removed a month after being closed. Changes to open items since last update are indicated in *italics.*)

Category Key: C – Cost; FMP – Fleet Management Plan; IRP – Independent Review Panel; PMP –Project Management Plan; QA – Quality Assurance; RA – Risk; RE – Real Estate; S – Schedule; SC – Scope; SS – Safety; T – Tech. Cap. & Cap.; CH – Change Mgmt.

APPENDIX A. LIST OF ACRONYMS

AC	Actual Cost
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ARS	Air Replenishment System
ATCS	Advanced Train Control System
AWSS	Auxiliary Water Supply 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
CCTV	Closed Circuit Television
CFR	Code of Federal Regulations
CLIN	Contract Line Item Number
CM	Construction Management
CMB	Configuration Management Board
CMod	Contract Modification
CNCR	Contractor Non-Conformance Report
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
DF	Designated Function
DRB	Dispute Review Board
EV	Earned Value
FD	Final Design
FEIR	Final Environmental Impact Report
FEIS	Final Environmental Impact Statement
FFGA	Full Funding Grant Agreement
FLSC	Fire and Life Safety Committee
FMP	Fleet Management Plan
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HVAC	Heating, Ventilation, and Air Conditioning
IRP	Independent Review Panel
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
MOU	Memorandum of Understanding
MPS	Master Project Schedule
Muni	Common Public Reference to SFMTA
NCN	Non-conformance Notice
NCR	Non-conformance Report
NEPA	National Environmental Policy Act
NOPC	Notice of Potential Claim
NTP	Notice to Proceed
O&M	Operations & Maintenance
OHA	Operational Hazard Analysis
OP	Oversight Procedure
PCC	Proposed Contract Changes
PE	Preliminary Engineering
PHA	Preliminary Hazard Analysis
PMOC	Project Management Oversight Contractor
PMP	Project Management Plan
PTMISEA	Public Transportation Modernization, Improvement, and Service Enhancement Account
PV	Planned Value
QA/QC	Quality Assurance/Quality Control
QPRM	Quarterly Progress Review Meeting
QTR	Quarter
RAMP	Real Estate Acquisition Management Plan
RAP	Rail Activation Plan
RCMP	Risk and Contingency Management Plan
RE	Resident Engineer
RFI	Request for Information
ROD	Record of Decision
RSD	Revenue Service Date
SBE	Small Business Enterprise
SCIL	Safety Certifiable Item List
SCP	Safety Certification Plan
SEIS	Supplemental Environmental Impact Statement
SEM	Sequential Excavation Method
SEPP	Security and Emergency Preparedness Plan
SFDPW	San Francisco Department of Public Works

SFFD	San Francisco Fire Department
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water Department
SIT	Systems Integration Test
SOP	Standard Operating Procedure
SPI	Schedule Performance Index
SSCP	Safety and Security Certification Plan
SSCRC	Safety and Security Certification Review Committee
SSCVR	Safety and Security Certification Verification Report
SSMP	Safety and Security Management Plan
SSO	State Safety Oversight
SSP	System Security Plan
SSPP	System Safety Program Plan
STS	Surface, Track, and Systems
TBD	To Be Determined
TBM	Tunnel Boring Machine
TPC	Tutor Perini Corporation
TSA	Transportation Security Administration
TVA	Threat and Vulnerability Analysis
U.S.C.	United States Code
UMS	Union Square/Market Street Station
VRF	Variable Refrigerant Flow
YBM	Yerba Buena/Moscone Center Station
YOE	Year of Expenditure

APPENDIX B. SAFETY AND SECURITY CHECKLIST

Central Subway Project Overview			
Project mode (Rail, Bus, BRT, Multimode)	Light Rail Transit		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Construction		
Project Delivery Method (Design/Build, Design/Build/ Operate/Maintain, CM/GC, etc.)	Design-Bid-Build		
Project Plans	*Version*	*Review by FTA/FRA*	**Status**
Safety and Security Management Plan	**2014**	**2011**	Revision 1 Update submitted to FTA 02/25/2011. Not submitted to 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 (SSP) or Security and Emergency Preparedness Plan (SEPP)	**2009**		Not submitted to FTA. Not submitted to FRA.
Construction Safety and Security Plan	**2012**		Health and Safety. Construction Safety Standards Revision 3, June 27, 2012.
Safety and Security Authority	*Y/N*		**Notes/Status**
Is the grantee 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

Central Subway Project Overview			
Project mode (Rail, Bus, BRT, Multimode)	Light Rail Transit		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Construction		
Project Delivery Method (Design/Build, Design/Build/ Operate/Maintain, CM/GC, etc.)	Design-Bid-Build		
Project Plans	*Version*	*Review by FTA/FRA*	**Status**
Has the oversight agency reviewed and approved the grantee's SSPP as per 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.
Has the oversight agency reviewed and approved the grantee's Security Plan or SEPP as per Part 659.21?	Y		See above.
Did the oversight agency participate in the last Quarterly Program Review Meeting?	Y		
Has the grantee submitted its safety certification plan (SCP) 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 revised in November 2011 was submitted to the CPUC and was approved. CPUC attends monthly certification review meetings conducted by SFMTA.
Has the grantee implemented security directives issues by the Department Homeland Security, Transportation Security Administration?	N/A		Currently, there are no TSA 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.

Central Subway Project Overview			
Project mode (Rail, Bus, BRT, Multimode)	Light Rail Transit		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Construction		
Project Delivery Method (Design/Build, Design/Build/ Operate/Maintain, CM/GC, etc.)	Design-Bid-Build		
Project Plans	*Version*	*Review by FTA/FRA*	**Status**
SSMP Monitoring			
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.
Grantee reviews 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 grantee 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 grantee 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 grantee established staffing requirements, procedures, and authority for safety and security activities throughout all project phases?	Y		
Does the grantee 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 grantee allocated sufficient resources to oversee or carry out safety and security activities?	Y		

Central Subway Project Overview			
Project mode (Rail, Bus, BRT, Multimode)	Light Rail Transit		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Construction		
Project Delivery Method (Design/Build, Design/Build/ Operate/Maintain, CM/GC, etc.)	Design-Bid-Build		
Project Plans	*Version*	*Review by FTA/FRA*	**Status**
Has the grantee 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 grantee implement regularly scheduled meetings to track to resolution any identified hazards and/or vulnerabilities?	Y		
Does the grantee 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 (1300) work package status meetings. The status of safety and security certifications is reviewed at weekly project management meetings.
Does the grantee ensure the conduct of preliminary hazard and vulnerability analyses? Please specify analyses conducted.	Y		
Has the grantee ensured the development of safety design criteria?	Y		Design is complete and construction is underway.
Has the grantee ensured the development of security design criteria?	Y		Design is complete and construction is underway.
Has the grantee 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.

Central Subway Project Overview			
Project mode (Rail, Bus, BRT, Multimode)	Light Rail Transit		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Construction		
Project Delivery Method (Design/Build, Design/Build/ Operate/Maintain, CM/GC, etc.)	Design-Bid-Build		
Project Plans	*Version*	*Review by FTA/FRA*	**Status**
Has the grantee verified conformance with safety and security requirements in equipment and materials procurement?	Y		Safety and Security Conformance checklists have been prepared for each of the construction contracts. All certifiable elements of the Tunnel work have been certified and accepted by SFMTA Safety. Certification reviews are underway for the stations contract.
Has the grantee verified construction specification conformance?	Y		This is on-going as construction progresses and verified through the Safety and Security Certification process
Has the grantee identified safety and security critical tests to be performed prior to passenger operations?	N		Currently being developed.
Has the grantee verified conformance with safety and security requirements during testing, inspection, and start-up phases?	N		Project is in construction, with RSD more than 2 years in the future.
Does the grantee evaluate change orders, design waivers, or test variances for potential hazards and/or vulnerabilities?	Y		
Has the grantee ensured the performance of safety and security analyses for proposed work-arounds?	N/A		Currently no work-arounds have been identified.

Central Subway Project Overview			
Project mode (Rail, Bus, BRT, Multimode)	Light Rail Transit		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Construction		
Project Delivery Method (Design/Build, Design/Build/ Operate/Maintain, CM/GC, etc.)	Design-Bid-Build		
Project Plans	*Version*	*Review by FTA/FRA*	**Status**
Has the grantee demonstrated through meetings or other methods, the integration of safety and security in the following: - Activation Plan and Procedures - Integrated Test Plan and Procedures - Operations and Maintenance Plan - Emergency Operations Plan	*In Process*		Second draft of Rail Activation Plan has been completed. An Integration Matrix has been implemented for all disciplines including safety and security concerns.
Has the grantee issued final safety and security certification?	N		Project is in the construction phase.
Has the grantee issued the final safety and security verification report?	N		Project is in the construction phase.
Construction Safety			
Does the grantee have a documented/implemented Contractor Safety Program with which it expects contractors to comply?	Y		Health and Safety Construction Safety Standards Revision 3, June 27, 2012.
Does the grantee's contractor(s) have a documented companywide safety and security program plan?	Y		
Does the grantee'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.
Provide the grantee's OSHA statistics compared to the national average for the same type of work?	Y		Provided in the Central Subway Monthly Progress Report.

Central Subway Project Overview			
Project mode (Rail, Bus, BRT, Multimode)	Light Rail Transit		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Construction		
Project Delivery Method (Design/Build, Design/Build/ Operate/Maintain, CM/GC, etc.)	Design-Bid-Build		
Project Plans	*Version*	*Review by FTA/FRA*	**Status**
If the comparison is not favorable, what actions are being taken by the grantee to improve its safety record?	N/A		Statistics are favorable. No action needed.
Does the grantee conduct site audits of the contractor's performance versus required safety/security procedures?	Y		Safety walks are routinely conducted at each construction site.
Federal Railroad Administration			
If shared track: has grantee submitted its waiver request application to FRA? (Please identify specific regulations for which waivers are being requested.)	N/A		No shared track. No waivers are anticipated.
If shared corridor: has grantee specified specific measures to address shared corridor safety concerns?	N/A		
Is the CHA underway?	N/A		
Other FRA required Hazard Analysis – Fencing, etc.?	N/A		
Does the project have Quiet Zones?	N		
Does FRA attend the Quarterly Review Meetings?	N		

N/A = Not applicable.

APPENDIX C. PROJECT MAP AND OVERVIEW

CENTRAL SUBWAY PROJECT: Project Overview and Map

Date:	*October 16, 2017*
Project Name:	Central Subway Project (CSP) New Starts Light Rail Transit
Grantee:	San Francisco Municipal Transportation Agency (SFMTA)
FTA Regional contact:	Mr. Jeffrey S. Davis
FTA Headquarters contact:	Ms. Kim Nguyen

Scope

Description:	The CSP will extend the Third Street Light Rail line from the Caltrain station at Fourth and King streets to Chinatown. It was incorporated in the FEIS/FEIR on the Third Street Light Rail project published in December 1998, but FTA did not include the CSP in the Record of Decision (ROD) issued in March 1999. A ROD for the CSP, however, was issued by FTA on November 26, 2008, and the U.S. Department of Transportation and FTA determined that the requirements of the National Environmental Policy Act (NEPA) of 1969 were satisfied for the CSP. The environmental record for the CSP is included in the Final Supplemental Environmental Impact Statement (SEIS), Volume II, dated July 11, 2008 and the Final SEIS, Volume I, dated September 23, 2008. These documents present the detailed statement required by NEPA and U.S.C. 5324 (b). SFMTA requested authority to enter Preliminary Engineering (PE) in March 2002 and submitted a Project Management Plan (PMP) in June 2002. FTA approved entry into PE in July 2002. Approval to enter Final Design (FD) was granted by FTA on January 7, 2010. The Full Funding Grant Agreement (FFGA) was signed on October 11, 2012.
Guideway:	The length of the CSP will be 1.7 miles of double-tracked line.
Stations:	The CSP includes three subway stations and one surface station.
Additional Facilities:	The CSP does not include any ancillary facilities.
Vehicles:	The CSP Service Plan dated October 2009 clarified that four vehicles will be required.
Ridership:	43,521 Average Weekday Boardings are projected in 2030.

Schedule

07/02	Approval Entry to PE	2016	Estimated Rev Ops at Entry to PE
01/10	Approval Entry to FD	2018	Estimated Rev Ops at Entry to FD
10/11/12	FFGA	2018	Estimated Rev Ops at FFGA
12/10/2019			Revenue Operations Date at date of this report

71.4% *Percent Complete Based on Progress* (*August 2017 data*)

Cost

$764 million	Total Project Cost ($YOE) at Approval Entry to PE
$1,578 million	Total Project Cost ($YOE) at Approval Entry to FD
$1,578 million	Total Project Cost ($YOE) at FFGA signed
$TBD million	Total Project Cost ($YOE) at Revenue Operations
$1,578 million	Total Project Cost ($YOE) at date of this report including $0.00 in Finance Charges
$1,114.1 million	Amount of Expenditures at date of this report from Total Project Budget of $1,578 million
70.6%	Percent Complete based on Expenditures at date of this report
$9.00 million	Unallocated Contingency remaining
$*75.63 million*	Total Project Contingency (allocated and unallocated contingency as reported by CSP)
$60 million	Minimum Total Project Contingency revised on September 5, 2012 PMOC review of Contingency Management Plan

	AT HOLD POINTS	QTR	Minimum Contingency Levels	Revised Levels
1A	Hold Point 1a – Tunnels 100% designed February 2011 (Actual)	1Q11	280	280
1B	Hold Point 1b – CTS 100% designed June 2012 (Actual)	4Q11	250	240
1C	Hold Point 1c – 40% Bid (Tunnel and CTS)	2Q12	225	200
1D	Hold Point 1d – FFGA Award October 2012 (Actual)	3Q12	-	180
2	Hold Point 2 – Commence CTS / UMS construction (Actual June 17, 2013)	2Q13	160	160
3	Hold Point 3 – Demobilize Tunnels *(Actual April 15, 2015)*	*2Q15*	140	140
4	Hold Point 4 – Stations to platform levels (CTS / YBM) November 2016	4Q16	60	60
5	Hold Point 5 – Complete CTS / Tunnels systems inst. April 2018	2Q18	25	25
RSD	PMOC / FTA RSD	4Q19		
CURRENT TOTAL CONTINGENCY *$75.63 Million*				


central T subway
Lombard St.
COIT TOWER
Columbus Ave.
Washington Square Park
Union St.
TUNNEL ONLY - NO SERVICE
Broadway
Broadway Tunnel
The Embarcadero
Washington St.
Ferry Building
T CHINATOWN
Stockton St.
Kearny St.
Montgomery St.
Battery St.
EMBARCADERO
California St.
Leavenworth St.
Bush St.
Post St.
FUTURE TRANSBAY TERMINAL
FOLSOM
MONTGOMERY
UNION SQUARE/ MARKET STREET
J K L M N T
Market St.
Mission St.
1st St.
N
POWELL
Howard St.
2nd St.
Folsom St.
Harrison St.
BRANNAN
Golden Gate St.
4th St.
I-80
YERBA BUENA/ MOSCONE
5th St.
3rd St.
2ND ST. AND KING
CIVIC CENTER
7th St.
6th St.
4TH ST. AND BRANNAN
AT&T BALLPARK
King St.
4TH AND KING/BERRY N T
Bryant St.
Brannan St.
Caltrain
Townsend St.
MISSION ROCK
UCSF
UCSF MISSION BAY
LEGEND
T Third Phase 2
T Third Phase 1
Muni Metro
Caltrain
BART

APPENDIX D. TOP PROJECT RISKS

The Project Risk Register was updated in 2016. Top risks and selected risks that had not been reviewed in several months were discussed at the August 2017 meeting as noted below.

Top Risks Discussed in the Previous Month:

#52 – The risk of settlement of older utilities above the CTS cross-cut cavern and platform cavern excavations. The ground above and near the excavation is extensively instrumented, and daily meetings are being held to review the recorded data from the instruments. Some settlement of subsurface utilities has been detected. Gate valves have now been installed on the water lines above the excavation. These allow immediate shut-off of water in the event of a failure in one of the lines or ground settlement that could damage the lines and cause a leak. SFMTA is negotiating the cost of these valves with SFWD.

#205 – The risk that the prolonged process for approval and execution of CMods results in bad blood between SFMTA and the contractor. CMods are now being processed more quickly and the backlog of unresolved changes is being reduced. SFMTA continues to try and streamline the CMod process. The largest sources of delay are extra time required to establish merit by SFMTA REs and delays in receipt of formal price proposals from the contractor for merited changes.

#229 – Risk that acceptance testing takes longer than planned, resulting in delays to the RSD. A more detailed schedule for testing is included in the updated RAP. Some testing may be advanced at YBM, as that station will be completed earlier than the other subway stations.

#230 – Insufficient time for Muni Operations involvement in commissioning results in delays and an impact to the RSD. Muni Operations and Management are reviewing the RAP. CSP staff has started more intensive coordination with Muni staff to plan and schedule the necessary tasks.

#232 – Unable to recover accumulated delays, resulting in late RSD. This risk has occurred and the RSD is very likely to be delayed. A schedule containment workshop was held in July 2017. More specific schedule risks will identified and evaluated in order to establish a range of likely project completion dates.

#234 – This risk that the contractor's proposed alternative SEM excavation method would cause subsidence will continue to be monitored until all SEM operations are completed. Settlement that is occurring is within the expected range and compensation grouting has been completed to arrest the settlement.

#238 – This risk is that the Quality Program may be ineffective in processing the nonconformance issues causing schedule impacts. The process of tracking and processing the NCR through improved tracking logs is continuing. The CNCR log is being updated as appropriate. CNCRs are being identified timely and processed appropriately. The rating of this risk has been reduced.

#36 – Risk of damage to adjacent buildings from compensation grouting at UMS. This very low risk can be retired once the invert slab is placed in the UMS station box and the temporary struts are removed.

#103 – Risk that obtaining required permits will take longer than planned. SFMTA still needs an encroachment permit from Caltrans for work at the I-80 off-ramp on 4th Street. The application has been submitted and SFMTA is answering questions from Caltrans regarding the application

#115 – Risk of water intrusion at the station headwalls due to non-conforming work by the tunnel contractor that has been accepted by the stations contractor. This risk is low but remains until dewatering equipment is decommissioned at all of the stations.

#100 – Risk that late delivery of long-lead items results in delayed completion of the project. This risk will remain until escalators and elevators are delivered.

Discussion to begin identifying more specific schedule risks followed the review of existing risks. More detail will be developed at the next risk mitigation meeting.

APPENDIX E. ROADMAP TO REVENUE OPERATIONS

Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT				
Description	**Estimated Start Date**	**Estimated Completion Date**	**Actual Completion Date**	**Notes**
Testing				
Finalize/update Systems Integration Test (SIT) Plan	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Prepare Schedule for Testing	1/1/2017	3/1/2017	3/21/2017	Initial testing, commissioning, and start-up schedule has been completed.
Finalize Test Procedures	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Conduct System Integrated Testing with trains, including procedures and reports	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Complete Testing Reports	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Operating Plan, Rules, and Training				
Finalize Operating Plan	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Finalize/revise SOPs, manuals, and rulebook as applicable	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Operations Manuals	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Staffing and Operations Plan	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Training of O&M personnel	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Emergency response plan, training, and drills	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Vehicle Maintenance Plan, Equipment, Facilities, and Training				
Rail Fleet Management Plan	TBD	TBD	TBD	

Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT				
Description	**Estimated Start Date**	**Estimated Completion Date**	**Actual Completion Date**	**Notes**
Maintenance Schedules and Procedures	TBD	TBD	TBD	The LRV fleet is being replaced and expanded through a separate project. The CSP requires an expansion of the fleet of four vehicles.
Spare Parts Requirements	TBD	TBD	TBD	The LRV fleet is being replaced and expanded through a separate project. The CSP requires an expansion of the fleet of four vehicles.
Maintenance Manuals	TBD	TBD	TBD	The LRV fleet is being replaced and expanded through a separate project. The CSP requires an expansion of the fleet of four vehicles.
Maintenance Training	TBD	TBD	TBD	The LRV fleet is being replaced and expanded through a separate project. The CSP requires an expansion of the fleet of four vehicles.
Facility and Right-of-way Maintenance Plan, Equipment, Facilities, and Training				
Maintenance Schedules and Procedures	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
Spare Parts Requirements	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
Maintenance Manuals	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
Maintenance Training	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
Pre-Revenue Operations				
Finalize and/or update RAP and/or Pre-Revenue Operations Plan	4/2/2015	4/2017	4/27/2017	The second draft with additional detail and a schedule for testing and pre-revenue activities was submitted with the 2017 update of the PMP.
Implement Rail Activation Committee	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
Shadow operations	NA	NA	NA	Project will be operated by the established MUNI operations division.

Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT				
Description	**Estimated Start Date**	**Estimated Completion Date**	**Actual Completion Date**	**Notes**
Develop/revise SSPP & Security Plan (approved by State Safety Oversight (SSO))	*Ongoing*	10/31/2015	10/31/2015	CPUC triennial review conducted in October 2015 concluded that SFMTA "has a comprehensive System Safety Program Plan (SSPP) and has made significant progress in executing that plan."
FTA Office of Safety & Security Readiness Review	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
PMOC OP-54 Readiness for Revenue Operations Review Report, Phase I	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
Conduct Operational Hazard Analysis (OHA) and resolve other hazards/ vulnerabilities	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
Pre-Revenue Operations	TBD	TBD	TBD	Project is in construction, with RSD 2+ years in the future.
Public Outreach				
Develop Safety Outreach Plan	TBD	TBD	TBD	Project is in construction, with RSD *2*+ years in the future.
Provide Community Outreach	TBD	TBD	TBD	Project is in construction, with RSD *2*+ years in the future.
Grand Opening Plan	TBD	TBD	TBD	Project is in construction, with RSD *2*+ years in the future.
Construction Close Out				
Close Out of Non-Conformance Reports	Ongoing	09/24/2019	TBD	NCRs are tracked and closed prior to follow-on work. Final closure of NCRs expected as of final completion date of 1300 Contract.
Punch List Complete	12/17/2018	09/24/2019	TBD	Punch list completion expected at final completion of 1300 Contract.
Certificates of Occupancy/Substantial Completion	TBD	06/26/2019	TBD	

Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT				
Description	**Estimated Start Date**	**Estimated Completion Date**	**Actual Completion Date**	**Notes**
Safety, Security, and Fire-life Safety Certifications				
Update/Finalize SSMP			2/18/2014	Revision 2 completed.
Finalize and/or update SCIL and SSCP			10/10/2008	Revision 0.
Implement Safety and Security Certification Committee			8/1/2010	Committee meets monthly to review certifiable items.
Implement Fire Life Safety Committee			8/1/2010	
Preliminary Hazard Analysis (PHA)				Need dates.
Threat and Vulnerability Analysis (TVA)				Need dates.
Design Criteria Reflecting Safety and Security Requirements	NA	NA	NA	Design is complete and construction is underway.
Review status of quality non-conformances	Ongoing	09/24/2019	TBD	
Close Out of non-safety critical items	Ongoing	Ongoing	TBD	
Close Out of safety critical items	Ongoing	Ongoing	TBD	
Complete Safety & Security Certification Verification Report (SSCVR)	TBD	10/11/2019		60 days before RSD - Check against latest regulations.
Document Workarounds/Open Items List	TBD	TBD	TBD	
Verify emergency drills, tabletops, training, etc. are completed	TBD	TBD	TBD	
SSO final certification/signature	TBD	11/19/2019		21 days before RSD - Check against latest regulations.
Third Party and Agency Agreements				
Third Party/Agency Agreements Necessary for Revenue Service	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.
Third Party/Agency Approvals Necessary for Revenue Service	TBD	TBD	TBD	Project is in construction, with RSD *2+* years in the future.

Roadmap to Revenue Operations - Central Subway Project, San Francisco Municipal Transportation Agency – DRAFT				
Description	**Estimated Start Date**	**Estimated Completion Date**	**Actual Completion Date**	**Notes**
Revenue Service				
Target Revenue Service Date	-	12/10/2019		Current forecast RSD. Recovery schedule to be prepared.
FFGA Revenue Service Date	-	12/23/2018		

APPENDIX F. LESSONS LEARNED

LL#	Date	Phase	Category	Subject	Lesson Learned
1	09-30-10	FD	Management	Consultant Contracts	The project must have a full understanding of the agency and other approving governmental authorities to avoid delay of contract approval and consequential delay of the Master Project Schedule (MPS).
2	09-30-10	FD	Cost	Staffing Plan	The project staffing plan needs to be formulated during PE and updated at least quarterly during FD to manage Standard Cost Category 80 costs and monitor design production.
3	09-30-10	FD	Scope	Letter of No Prejudice (LONP)	A defined scope of grantee and PMOC responsibilities needs to be provided for content and acceptability of LONP requests.
4	09-30-10	FD	Management	SSMP	FD consultants should be trained, shortly after mobilization, in the format and their responsibility regarding the System Safety Consultant.
5	10-30-10	FD	Cost	Baseline Cost Estimate (BCE) Update	The BCE should be updated with current costs as soon as they are known by the project to allow mitigation of cost contingency usage.
6	02-21-12	FD	Management	Program Controls	Program Controls system/software selected for use for the duration of the project should be in place and functional prior to approval to enter FD. Doing so will avoid a transition during FD that could create a lag in timely reporting of cost and schedule status.
7	02-21-12	FD	Management	Risk Mitigation	Oversight Procedure (OP) 40 needs to be revised to establish minimum requirements for secondary mitigation at different phases of the project, similar to those for cost and schedule contingency. The PMOC recommends 5% of project cost at Entry into FD and 3% at execution of an FFGA.

LL#	Date	Phase	Category	Subject	Lesson Learned
8	02-21-12	FD	Scope	Third Party Agreements	All third party agreements need to be identified as soon as possible, but no later than 65% design completion. This includes leases, both temporary and permanent; MOUs; and licenses, specifically for preconstruction property surveys and settlement monitoring instruments (especially important for underground construction). These third party agreements need to be secured no later than the advertisement date of the construction that they affect. Third party agreements need to be tracked by the project continuously, reported monthly, and updated in a third party agreement matrix submitted quarterly to FTA.
9	02-21-12	FD	Cost	Cost Estimating Procedures	During the preliminary design phase, the project should establish the cost estimating procedures, format, and software to be used by all estimating entities for the entire duration of the project.
10	02-21-12	FD	Cost	Allocated Cost Contingency	In the BCE submitted to FTA for Entry into FD, the project should identify percentages of allocated cost contingency contained in the BCE that are apportioned for design risk, market risk, and construction risk.
11	02-28-12	FD	QA	Design Management Action Log	Design Management should develop a matrix as a tracking tool to document, track, and close out known elements that are missing from design submission packages.
12	08-15-12	FD	Environmental Mitigations	MMRP	Numerous mitigations identified in the MMRP are to be handled by incorporating specific design details and/or statements in the contract drawings and technical specifications. The grantee should note on the MMRP the relevant drawings and/or technical specifications.

LL#	Date	Phase	Category	Subject	Lesson Learned
13	08-31-12	FD	Management	Risk Contingency Levels and Hold Points	It became apparent, during the monitoring of the cost contingency drawdown curve for the project that the contingency levels and hold points no longer represented the current stage of project development and risk reduction/contingency usage related to project development. The project advanced through 100% project design; however, the project did not receive credit for the cost contingency usage established by the risk model. The PMOC recognized this deficiency and participated with the grantee in developing a cost contingency drawdown that reflects current project development and reduced risk.
14	06-30-13	Const.	Management	Change Order Process	Perform an audit of the project's procedures related to Change Orders and processing. The project should train staff and inform contractor of their obligations in the process.
15	1-30-14	Const.	Management	Independent Review Panel (IRP) Decision-makers	At the request of SFMTA, the American Public Transportation Association (APTA) formed a panel of geotechnical and tunnel experts to perform a peer review of the BART Undercrossing. Prior to crossing under the BART tunnels, the Independent Review Panel (IRP), contractor, SFMTA, and BART representatives convened at predetermined tunnel boring machine (TBM) locations to discuss the TBM progress and determine whether the tunneling should proceed. It is critical that decision makers from each organization attend these meetings. It was noted that BART Senior Management did not attend and instead deferred decisions to lower level staff.
16	6-30-14	Const.	Bid documents	Pre-Classification for Soil and Groundwater Disposal	Soils and groundwater generated from construction activities should be pre-classified with appropriate sampling and testing required by potential disposal facilities. Coordinate with the disposal facilities to get materials accepted.

LL#	Date	Phase	Category	Subject	Lesson Learned
17	4-10-15	Const.	Quality Control/Safety	Monitoring of Soil Conditions during Underground Construction	There was a breach of the excavation of frozen ground during construction of a cross passage between the twin bored tunnels followed by water and soil flowing into the tunnels, resulting in subsidence of the ground above and damage to underground utilities. Apparently the flow of materials into the tunnels went on for quite some time before the problem was detected and actions could be taken to arrest the flow. The construction site was not staffed when the breach started and there was no external warning system in place to notify the contractor or the agency of the condition. When the safety and structural integrity of a construction site depends on maintain soil conditions with the use of mechanical systems, the site should be continuously staffed or monitoring devices at the site should be continuously monitored from a remote location to assure that the expected soil conditions are maintained.
18	4-10-15	Const.	Environmental	Archeological Data Recovery Protocols	Sensitive archeological materials were uncovered during the excavation of the roof area at YBM. The Program Manager took immediate action to notify the appropriate state officials and implemented protocols for protection of the materials. The most likely descendent of the remains was quickly identified and a representative was engaged and brought to the site to supervise the ongoing excavation. The quick action to involve the appropriate parties resulted in satisfactory handling of the artifacts with minimal delays to the construction schedule.

LL#	Date	Phase	Category	Subject	Lesson Learned
19	5-11-15	Const.	Quality Control	Use of Latest Design Information for Field Inspection	After two roof pours were completed, it was discovered that required reinforcing steel was missing. Changes to the arrangement of the reinforcing steels were made as part of the submittal review and response process. Notes from the designer were included on the approved shop drawings but not in the contract design drawings. Field inspectors were using only the design drawings to confirm the proper installation of reinforcing steel prior to concrete placement. In the future, the latest design information, including submittals and related designer notes, will be used to inspect reinforcing steel prior to concrete placement.
20	9-28-15	Const.	Schedule	Maintenance of Updated Construction Schedule and Master Program Schedule	SFMTA was unable to obtain an acceptable baseline schedule from the station construction contractor for over a year. Then, SFMTA could not obtain acceptable updated status schedules from the contractor for another 8 months. As a result, the construction status and completion date could not be accurately determined for the first 20 months of the contract. This made schedule control impossible. SFMTA finally created its own schedule updates for the first 12 months of the construction contract using the pay applications and 4-week look-ahead schedules from the contractor. Lesson learned – owners should aggressively assert the need for accurate schedule updates from contractors and should withhold payment if such updates are included in the contract terms or specifications and are not forthcoming. If schedule updates are not received within the first few months of the project, the owner should create its own updates for the purpose of progress monitoring and schedule control.

LL#	Date	Phase	Category	Subject	Lesson Learned
21	11-30-15	Const.	Construction Planning	Installation of Special Trackwork in Operating Systems	SFMTA needed to install special trackwork to provide the connection to the new alignment for Central Subway portion the T Third LRT line. The original plan was to install the special trackwork at the intersection in eight extended weekend shutdowns. Working with the contractor, the plan was revised to accomplish the necessary trackwork installations in two shutdowns. After considering the outcome of the first shutdown, where a portion of the special trackwork did not fit properly and needed adjustment during the shutdown, SFMTA decided to pre-assemble the second, more complex, special trackwork assembly at an off-site facility. The assembly was completed and the resulting track was surveyed to confirm the geometry and to assure that the assembly would fit into the existing field conditions. While conducting the assembly and disassembly of the track components, the contractor identified an approach that would reduce the time required to reassemble the trackwork in the field. As a result of the pre-planning and assembly of the complex trackwork, the final assembly was completed without the need for field adjustments and in less time than planned. This was an effective approach to mitigate the risks associated with the installation of complex custom track components in an operating transit line.
22	3-1-17	Const.	Legal/Claims	Preparation for Mediation	A contractor for advance utility relocation issued a multi-million-dollar claim for extra costs due to delays and unforeseen conditions. SFMTA believed the claim had no justification. After several years, the claim was referred for mediation prior to going to trial. The contractor made a very compelling presentation regarding the extra costs. However, due to careful preparation by SFMTA management, the agency was able to provide specific and detailed rebuttals to the contractor's major arguments. The mediation resulted in a settlement for less than 15% of the original claim amount. SFMTA chose to accept the settlement amount, recognizing that the costs to pursue the claim in court would likely exceed the settlement value.

APPENDIX G. CONTRACT STATUS

The following sections provide the status of ongoing contracts associated with the CSP. Note that the DBE participation percentages are updated by SFMTA on a quarterly basis. The current values are through June 2017.

Contract No.	***1250***	
Contract Description:	**UR #1 (YBM)**	
Status:	Completed June 2011.	
Cost:	Original Contract Value	$9,273,939
	Approved Change Orders	$2,694,211
	Current Contract Value	$11,968,150
	Expended to Date	$11,968,150
	% Expended	100%
	SBE Participation	97%
Schedule:	NTP issued January 2010. Substantial completion in June 2011.	
Issues or Concerns:		

Contract No.	**1251**	
Contract Description:	**UR #2 (UMS)**	
Status:	Work is complete.	
Cost:	Original Contract Value	$16,832,550
	Approved Change Orders	$3,962,031
	Current Contract Value	$20,794,581
	Expended to Date	$20,794,581
	% Expended	100%
	SBE Participation	87%
Schedule:	NTP issued January 2011. Substantial completion in August 2012.	
Issues or Concerns:	Final total cost claim by contractor has been settled.	

Contract No.	**1252**	
Contract Description:	**Tunnels**	
Status:	Final completion achieved. Financial close out underway.	
Cost:	Original Contract Value	$233.58 million
	Approved Change Orders	$8.26 million
	Current Contract Value	$241.84 million
	Expended to Date	$234.88 million; $6.2 million is paid from non-project funds
	% Expended	97.1%
	SBE Participation	5.8%
Schedule:	Final completion achieved May 15, 2015.	
Issues or Concerns:	None.	

Contract No.	**1277**	
Contract Description:	**Pagoda Palace Demolition**	
Status:	Construction is complete; contract is in close out.	
Cost:	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%
Schedule:		
Issues or Concerns:	None.	

Contract No.	**1300**	
Contract Description:	**Three subway stations (YBM, UMS, and CTS) and STS**	
Status:	Mass excavation complete at one station and well underway at two other stations.	
Cost:	Original Contract Value	$839.68 million
	Approved Change Orders	$7.73 million
	Current Contract Value	$847.40 million
	Expended to Date	$501.39 million
	% Expended	59.2%
	SBE Participation	19.9%
Schedule:	NTP issued June 17, 2013. Substantial Completion planned February 2018 and forecast June 2019.	
Issues or Concerns:	The work on this contract is behind schedule.	

Contract No.	**CS-155-1**	
Contract Description:	**Design Package 1 for Contracts 1250, 1251, and 1252. PB/Telemon**	
Status:	Design is complete. Construction support is nearly complete for Contract 1252.	
Cost:	Original Contract Value	$5,795,000 (includes exercised options)
	Approved Change Orders	$2,145,159
	Current Contract Value	$7,940,159
	Expended to Date	$7,937,601
	% Expended	100.0%
	SBE Participation	30.2%
Schedule:		
Issues or Concerns:		

Contract No.	**CS-155-2**	
Contract Description:	**Design Package 2 for UMS, CTS, and YBM. CSDG prime**	
Status:	Designs are complete for all of the station contracts. Construction support of Contract 1300 is underway.	
Cost:	Original Contract Value	$35,428,038
	Approved Change Orders	$1,626,722
	Current Contract Value	$37,054,760
	Expended to Date	$36,570,001
	% Expended	98.7%
	SBE Participation	35.5%
Schedule:		
Issues or Concerns:		

Contract No.	**CS-155-3**	
Contract Description:	**Design Package 3 for STS. HNTB-B&C Prime**	
Status:	Design is complete. Construction support of Contract 1300 is underway.	
Cost:	Original Contract Value	$16,822,238
	Approved Change Orders	$312,814
	Current Contract Value	$17,232,252
	Expended to Date	$14,365,430
	% Expended	83.4%
	SBE Participation	24.5%
Schedule:		
Issues or Concerns:		

Contract No.	**CS-149**	
Contract Description:	**Central Subway Partnership (Project Manager/Construction Manager)**	
Status:	On-going.	
Cost:	Original Contract Value	$85,139,092
	Approved Change Orders	$0
	Current Contract Value	$85,139,092
	Expended to Date	$62,684,498
	% Expended	73.6%
	SBE Participation	32.6%
Schedule:		
Issues or Concerns:		

Contract No.	**CS 156**	
Contract Description:	**Project Controls Consultant**	
Status:	On-going.	
Cost:	Base Contract Value	$17,112,873
	Approved Change Orders	$0
	Current Contract Value	$17,112,873
	Expended to Date	$9,820,243
	% Expended	57.4%
	SBE Participation	29.1%
Schedule:		
Issues or Concerns:		