PMOC COMPREHENSIVE MONTHLY REPORT

Second Avenue Subway Phase 1 (MTACC-SAS) Project
Metropolitan Transportation Authority
New York, New York

December 1 to December 31, 2016

PMOC Contract No. DTFT6014D00017

Task Order No. 2, Project No. DC-27-5287, Work Order No. 3

Urban Engineers of New York, D.P.C., 2 Penn Plaza, Suite 1103, New York, New York 10121
PMOC Lead, E. Williamson, 212-736-9100; ejwilliamson@urbanengineers.com
Length of time on project: Five years on project for Urban Engineers

TABLE OF CONTENTS

Page No.

SECOND AVENUE SUBWAY (SAS)

THIRD PARTY DISCLAIMER 1

REPORT FORMAT AND FOCUS 1

MONITORING REPORT 1

EXECUTIVE SUMMARY 1

ELPEP SUMMARY 10

1.0 GRANTEE'S CAPABILITIES AND APPROACH 11

1.1 MANAGEMENT CAPACITY AND CAPABILITY 11

1.2 PROJECT CONTROLS 14

1.3 FTA COMPLIANCE 20

2.0 PROJECT SCOPE 22

2.1 STATUS & QUALITY: DESIGN/PROCUREMENT/CONSTRUCTION 22

2.2 THIRD-PARTY AGREEMENTS 24

2.3 CONTRACT PACKAGES AND DELIVERY METHODS 25

2.4 VEHICLES 25

2.5 PROPERTY ACQUISITION AND REAL ESTATE 25

2.6 COMMUNITY RELATIONS 25

3.0 PROJECT MANAGEMENT PLAN AND SUB-PLANS 28

3.1 PROJECT MANAGEMENT PLAN 28

3.2 PMP SUB PLANS 28

3.3 PROJECT PROCEDURES 28

4.0 PROJECT SCHEDULE STATUS 29

4.1 INTEGRATED PROJECT SCHEDULE 29

4.2 90-DAY LOOK-AHEAD 30

4.3 CRITICAL PATH ACTIVITIES 31

4.4 COMPLIANCE WITH SCHEDULE MANAGEMENT PLAN 31

5.0 BUDGET/COST 32

5.1 PROJECT COST MANAGEMENT AND CONTROL 32

5.2 PROJECT EXPENDITURES AND COMMITMENTS: 34

5.3 CHANGE ORDERS 35

5.4 PROJECT FUNDING 37

5.5 COST VARIANCE ANALYSIS 39
5.6 PROJECT CONTINGENCY 39
6.0 PROJECT RISK 41
6.1 INITIAL RISK ASSESSMENT 41
6.2 RISK UPDATES 41
6.3 RISK MANAGEMENT STATUS 41
6.4 RISK MITIGATION 41
6.5 COST AND SCHEDULE CONTINGENCY 42
7.0 LIST OF ISSUES AND RECOMMENDATIONS 44
8.0 GRANTEE ACTIONS FROM QUARTERLY AND MONTHLY MEETINGS 45

TABLES

TABLE 1: SUMMARY OF CRITICAL DATES 7
TABLE 2: PROJECT BUDGET/COST TABLE 8
TABLE 1-1: STANDARD COST CATEGORIES.... 18
TABLE 1-2: APPROPRIATED AND OBLIGATED FUNDS 18
TABLE 5-1: ALLOCATION OF FFGA AND CURRENT WORKING BUDGET TO STANDARD COST CATEGORIES.... 32
TABLE 5-2: AWO SUMMARY 35
TABLE 5-3: APPROPRIATED AND OBLIGATED FUNDS (FEDERAL).... 37

APPENDICES

APPENDIX A – LIST OF ACRONYMS
APPENDIX B – PROJECT OVERVIEW AND MAP
APPENDIX C – LESSONS LEARNED
APPENDIX D – SAFETY AND SECURITY CHECKLIST
APPENDIX E – ON-SITE PICTURES
APPENDIX F – CORE ACCOUNTABILITY ITEMS

THIRD PARTY DISCLAIMER

This report and all subsidiary reports are prepared solely for the Federal Transit Administration (FTA). This report should not be relied upon by any party, except FTA or the project sponsor, in accordance with the purposes as described below.

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

Therefore, the information in the monthly reports may change from month to month, based on relevant factors for the month and/or previous months.

REPORT FORMAT AND FOCUS

This monthly report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT6014D00017, Task Order No. 003. Its purpose is to provide information and data to assist the FTA as it continually monitors the Grantee's technical capability and capacity to execute a project efficiently and effectively, and hence, whether the Grantee continues to be ready to receive federal funds for further project development.

This report covers the project management activities on the MTACC (Capital Construction) Second Avenue Subway (SAS) Mega-Project, Phase One, managed by MTACC with MTA as the Grantee and financed by the FTA FFGA.

MONITORING REPORT

The contents of this report are cumulative in nature, and may reference or build upon topics discussed in previous reports. All comments received pertaining to previous reports have been incorporated in this report.

EXECUTIVE SUMMARY

1. PROJECT DESCRIPTION

The Second Avenue Subway project will include a two-track line under Second Avenue from 125th Street to the Financial District in lower Manhattan. It will also include a connection from Second Avenue through the 63rd Street tunnel to existing tracks for service to West Midtown and Brooklyn. Sixteen (16) new ADA accessible stations will be constructed. The Second Avenue Subway will reduce overcrowding and delays on the Lexington Avenue line, improving travel for both city and suburban commuters, and provide better access to mass transit for residents of the far East Side of Manhattan. Stations will have a combination of escalators, stairs, and, in compliance with the Americans with Disabilities Act, elevator connections from street-level to station mezzanine and from mezzanine to platforms.

Phase One of the project includes construction of new tunnels from 92nd Street and Second Avenue to 63rd Street and Third Avenue, with new stations along Second Avenue at 96th, 86th and 72nd Streets and new entrances to the existing Lexington Ave./63rd Street Station at 63rd Street and Third Avenue. New track and rail systems will extend from the 63rd Street Station through the new tunnels and previously constructed tunnels to 105th Street; facilitating intermediate service at the completion of Phase 1 between 96th Street and Brooklyn via the connection to the existing Broadway Line.

2. CHANGES DURING 4TH Quarter 2016

a. Engineering/Design Progress

The Design Consultant continues to provide contract administrative and technical support for ongoing construction contracts, develop design modifications as required, and provide technical support as the project transitions from the construction phase to integration and test phase.

Additional engineering support, provided both through the Designer of Record and Independent Consultant, has been procured to support the schedule acceleration initiative.

b. New Contract Procurements

Procurement of all design and construction services required for the execution of SAS, Phase 1 has been completed.

c. Construction Progress

- 96th Street Station Heavy Civil/Structural (Contract C2A) achieved Substantial Completion on November 5, 2013. NYCDEP inspections continue to delay the closeout of the contract. The inspections are being performed to verify the work as reflected on the revised "As-Built-Drawings". Closeout of the contract did not occur as anticipated by the end of the 4Q2016. The CM's efforts are ongoing to confirm a closeout date.
- 96th Street Station Finishes, Mechanical, Electrical, and Plumbing Systems and Ancillary Building and Entrances contract (Contract C2B) 98.6% complete. During the 4QT construction, integration and testing progress to a level that a Temporary Code Compliance Certificate for the 96th Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of unresolved work activities as note in Article 2.02 of Contract C-26010.
- 86th Street Station (Contract C5B). Achieved Substantial Completion on December 16, 2014. Contract closeout is ongoing.
- 86th Street Station Architectural and MEP (Contract C5C) 96.4% complete. During the 4QT construction, integration and testing progress to a level that a Temporary Code Compliance Certificate for the 86th Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017.

Substantial Completion has not been declared by the CM because of unresolved work activities as note in Article 2.02 of Contract C-26008.

- 72nd Street Station Heavy Civil/Structural (Contract C4B). Achieved Substantial Completion on January 14, 2014. Contract closeout is ongoing.
- 72nd Street Station Finishes, MEP Systems, Ancillary Buildings and Entrances (Contract C4C) 95.3% complete. During the 4QT 2016 construction, integration and testing progress to a level that a Temporary Code Compliance Certificate for the 72th Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of unresolved work activities as note in Article 2.02 of Contract C-26011.
- Rehabilitation of the 63rd Street Station (Contract C3) 99.8% complete. During the 4QT 2016 construction, integration and testing progress to a level that a Temporary Code Compliance Certificate for the 63rd Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of unresolved work activities as note in Article 2.02 of Contract C-26006.
- Track, Signal, Traction Power, and Communication Systems Contract (Contract C6) 98.8% complete. Installation of communications, traction power, and signal systems in all stations is ongoing. During the 4QT 2016 the integration and testing progress to a level such that a Temporary Code Compliance Certificate was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of ongoing testing of fire alarm and communication systems.

d. Continuing and Unresolved Issues

- Subsequent to Revenue Service, unresolved inspection observations, fire alarm and communication testing needs to be addressed. Items associated with the Temporary Code Compliance Certificate are documented in a TCO Requirement letter dated December 29, 2016.
- The scope of regression testing needs to be clearly defined to assure that there are no impacts on interfaces previously tested. New test procedures might be required.
- AWOs and design changes may still pose a cost risk to the project.

e. New Cost and Schedule Issues

- The Estimate-At-Completion (EAC) for contingency funds is significantly below the ELPEP agreement of $45M. As of August 2016 the remaining contingency

was approximately $18M. A significant expenditure (unforeseen at this time) could result in the need for supplemental funding above the current working budget of $4.451B.

- Cost associated with the resolution of the outstanding inspection observations, completion of unfinished construction and testing of the systems need to be evaluated. Addressing these issues while the system is operational will increase the cost.

f. Amended FFGA

- In March 2015, the Amended FFGA for Phase 1 of the Second Avenue Subway Project between the FTA and MTA was executed;
- The Amended FFGA established the Total Project Cost as $5,574,614,000 (including estimated financing cost); and,
- The Amended FFGA defined the Revenue Operations Date as occurring on or before February 28, 2018.

3. PROJECT STATUS SUMMARY AND PMOC ASSESSMENT

a. Grantee Technical Capacity and Capability

The Grantee has demonstrated the technical capacity and capability to execute Phase 1 of the SAS Project. As the project nears Revenue Service, transitioning of SAS Team Member to other projects can be expected.

b. Real Estate Acquisition

All real estate for the SAS Phase 1 Project has been acquired. Real estate acquisition and tenant relocation was performed in accordance with the approved SAS Real Estate Acquisition Management Plan and Relocation Plan. These plans address Title 49 CFR Part 24, which implements the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and FTA real estate requirements 5010.1C.

c. Engineering/Design

The final design phase of the project was completed in late November 2010. Construction phase support by the Design Engineering Consultant during the 4QT 2016 focused on review of submittals, technical assistance in resolving construction discrepancies, evaluation of user group requested changes, support for testing activities, and resolution of code compliance issues.

The Design Engineering Consultant is funded through December 2017.

d. Procurement

All design and construction services contracts required for the execution of SAS, Phase 1 have been procured.

e. Railroad Force Account (Support and Construction)

The force account requirements are documented in the Force Account Plan for Second Avenue Subway Construction Support Services. The plan explains the process for planning, estimating, coordinating and monitoring the project's force account for construction support services. As used in the plan, force account is defined as labor assigned to the SAS project by New York

City Transit (NYCT) to provide safety for the system and the traveling public during construction as well as to support other activities of contractors to extent required by their contracts with either MTACC or NYCT. The plan also gives a description and cost estimate of the NYCT services required for design of the track and signal elements of the system, construction support activities for each individual contract (general orders, work trains, and flagging support), and start-up and commissioning. As the project has transitioned from the construction phase to the integration and testing phase, NYCT has provided additional personnel to support this effort.

f. Vehicles

No additional vehicles will be procured for the SAS Phase 1 Project. MTA has previously demonstrated to FTA, and FTA has agreed, that the rolling stock needed for SAS Phase 1 operations can be provided from the existing fleet of NYCT.

g. Systems Testing and Start-Up

Due to the size and complexity of the project, it is crucial for the project to follow comprehensive systems integration and test programs to manage and monitor the testing of systems components and the integration and interconnectivity of the systems. Each Station MEP Contractor (C-26006, C-26010, C 26011 and C26012) will install, integrate and test the equipment via a Test Plan. Interconnectivity of systems in each station is under the scope of the C-26009 Systems Contractor. The C-26009 Systems Contractor has a Systems Integration Manager (SIM) supported by Systems Engineering Specialists (SES) who will coordinate the efforts of the Systems Contractor and the Stations MEP Contractors in the preparation of their Plans. Testing of the equipment provided by the C-26009 Systems contractor and the interconnectivity of the equipment installed by the Station MEP Contractors will be in accordance with a three volume Facilities System Test Program. Volume 1 is the Management Plan, Volume 2 is the Interface Control Plan, and Volume 3 is the System Test Procedures. Tests that will be performed include, but are not limited to, Factory Acceptance Tests (FAT), Field Installation Acceptance Test (FIAT), Facilities Integrated Systems Testing (FIST), and Systems Integrated Testing (SIT).

The System Test Program is a commissioning process that is designed to ensure that the project will meet the design requirements. The program spans the entire construction process beginning with the product and work submittal reviews and ending with the post-Substantial Completion review of the systems performance with the O&M staff. The program is being conducted in five phases**:** Pre-Installation Phase, Installation Phase, Integration Phase, Post-Station Construction Substantial Completion Phase, and System Acceptance Phase. Each phase has a unique set of deliverables from the Contractors Test Group.

- **Pre-installation Phase:** The focus of the Contractors Test Group during the pre-installation phase is to determine and document the systems performance requirements, plan the test process, and integrate the test schedule into the construction schedule. The SIM will develop the list of Contractors Test Group tasks and their durations to be included in the construction schedule. Factory Acceptance Testing (FAT) will be scheduled and performed with the Systems Test Engineer and User representatives as required. The Manufacturer/Vendor/ Contractor performing the FAT will submit the FAT procedures to the SIM, who

will review and forward them to the Engineer for approval. At the conclusion of FAT, the SIM will write an executive summary of the FAT results to submit along with the test data to the Engineer.

Status: FAT of the equipment has been completed. However, there is no indication that the SIM at each station has written an executive summary of the FAT results and the test data has been submitted.

- **Installation Phase:** The System Test Team's focus during the installation phase will be to document the systems installation progress, report and track deficiencies, and conduct and report on the Field Installation Acceptance Tests (FIAT). Key Contractors Test Group tasks will include development of individual System Test Plans, conduct site installation inspections, report on progress and deficiencies, attend progress meetings, track corrective actions, and update the integrated test schedule. Resequencing of equipment installation to mitigate delays is an ongoing process and is being effectively implemented;

  Status: FIAT of the equipment has been completed. Submittal of test reports is lagging.

- **Integration Phase:** During the systems integration phase, the Contractors Test Group will demonstrate that the systems work together in accordance with the design specifications. Facilities Integrated Systems Tests (FIST) will be conducted to confirm that the systems function together as a fully integrated system. Simulated Integrated System Testing (SIST) will be performed when necessary. FIST data, with an executive summary prepared by the SIM, will be submitted for approval to the Engineer.

  Status: FIST has been completed on the majority of the systems. However, there is no indication that the SIM at each station has written an executive summary of the FIST results and all test data has been submitted.

- **Post-Station Construction Substantial Completion Phase:** Systems Integrated Testing (SIT) will be conducted with the Station Construction contractor once the station construction project achieves Substantial Completion. SIT will confirm that the system functions properly in accordance with contract documents and will be witnessed by the Engineer or representative. At the conclusion of SIT, the SIM will prepare an executive summary and submit it along with SIT data to the Engineer for approval.

  Status: Modified SIT has been performed at the 72nd and 86th Street Stations. Fire alarm and communication system SIT is ongoing and projected to be completed subsequent to Revenue Service. However, there is no indication that the SIM at each station has written an executive summary of the FAT results and all test data has been submitted.

- **System Acceptance Phase:** Final Systems Integration Testing (FSIT) will occur after the Systems Substantial Completion milestone is achieved. All systems will be shown to be operating as designed and meeting all functional requirements and Contractor's Quality Program specifications. FSIT will be a collaborative effort of the Systems and Station Contractors and MTACC. At the conclusion of FSIT,

a final test report and as-built documentation will be submitted to the Engineer for approval.

Status: Substantial Completion has not been achieved. Modified testing has occurred. Final test report and as-built documentation is still outstanding.

The commissioning process noted in the Facilities System Program has been circumvented because of the acceleration to achieve Revenue Service on January 1, 2017. Modified testing of mechanical, fire alarm and systems have occurred. Submittal of test reports has been delayed.

h. Project Schedule

During the 4Q2016, MTACC's schedule acceleration progressed to the point that a Temporary Code Compliance Certificate was issued for each of the stations by the ADA and Code Compliance Chief and Principal Code Enforcement Official. The certificates authorize occupancy and use of the stations for Revenue Service. Pre Revenue Service ceremonial activities occurred on December 31, 2016. Revenue Service is scheduled for January 1, 2016.

- Although beneficial use of the stations has been achieved there is still construction activity that must occur to address inspection observations and code compliance issues. The scope of this effort is still being evaluated by the SAS Project Team.
- Integration and testing of selective components of the Fire Alarm and Communication Systems needs to be addressed by March 1, 2017 (reference Temporary Code Compliance Certificate letter dated December 29, 2016)

Table 1: Summary of Critical Dates

	FFGA (Amended March 2015)	Forecast Completion	
		Grantee	PMOC
Begin Construction	January 1, 2007	March 20, 2007A	March 20, 2007A
Construction Complete	August, 2016	September 1, 2016	October 2017
Revenue Service	February 28, 2018	December 30, 2016	February 2018

i. Project Budget/Cost

The Current Working Budget (Estimate Revision 10) for the SAS Phase 1 Project is $4,451,000,000 (exclusive of $816,614,000 financing cost). On March 17, 2015, the NYMTA and the FTA executed an amendment to the FFGA for Phase 1 of the SAS Project. The MTA Board has approved Local Funds totaling $4,451,000,000. The total federal participation in the SAS Phase 1 Project is $1,373,893,000 which has been obligated.

MTA's September 2016 Estimate at Completion (EAC) indicates that the SAS Phase 1 project can be completed within the limits of the Current Working Budget.

The PMOC's opinion is that the EAC needs to be revisited in light of the schedule acceleration, open inspection observations and the need to perform construction and testing activities while the transit system is operational.

Table 2: Project Budget/Cost Table

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of December 31, 2016	
	$ Millions	% of Total	Obligated ($ Millions)	3/17/2015	$ Millions	% of Total	$ Millions	% of Total
Grand Total Cost	4,866.614	100	4,572.942	5,574.614	5,267.614	100	4,201.642	79.76
Financing Cost	816.614	16.78		816.614	816.614	15.50		
Total Project Cost	4,050.000	83.22	4,572.942	4,758.000	4,451.00	84.50	4,201.642	79.76
Total Federal	1,350.693	27.75	1,063.942	1,373.893*	1,350.693	24.60	1,218.947	23.14
Total FTA share	1,300.000	96.25	990.049	1,300.000	1,300.000	23.68	1,218.947	23.14
5309 New Starts share	1,300.000	100	990.049	1,300.000	1,300.000	23.68	1,118.755	21.24
Total FHWA share	50.693	3.75	73.893	73.893	50.693	0.96	73.893	1.40
CMAQ	48.233	95.15	71.433	71.433	48.233	0.88	71.433	1.35
Special Highway Appropriation	2.460	4.85	2.460	2.460	2.460	0.04	2.460	0.05
Total Local share	2,699.307	55.47	3,509.000**	3,384.107	3,509.000**	63.92	2,982.695	56.62
State share	450.000	16.67	100.000		450.000	8.20		
Agency share	2,249.307	83.33	1,145.782		3,059.000	55.72		
City share	0	0			0	0		

* Obligated and expended amounts obtained from the FTA's Transit Award Management System and MTACC's Grant Management Department.

** Current MTA Board approved budget.

j. Project Risk

Major issues that have either increased or decreased the risk of project schedule and cost increases during the 4Q 2016 have been summarized as follows:

Decrease	Increase
▪ Implementation of MTACC's schedule acceleration initiative has decreased the risk of significant delay to the scheduled December 30, 2016, Revenue Service Date.	▪ The processes outlined in the Facilities System Test Program and the Safety and Security Certification Plan have been circumvented as a result of the acceleration. ▪ Integration and testing of the fire alarm and communication systems has proven to be a major technical challenge that has not been completely resolved. ▪ Resolution of inspection observations, AWOs and design changes could result in addition local funds being required. ▪ Available contingency funds have been reduced to a very low level, increasing the risk of a potential cost overrun.

MONTHLY UPDATE

The information contained in the body of this report is limited, in accordance with Oversight Procedure 25, to "inform the FTA of the most critical project occurrences, issues, and next steps, as well as professional opinions and recommendations". Where a section is included with no text, there are no new "critical project occurrences [or] issues" to report this month.

ELPEP SUMMARY

The most recent ELPEP Quarterly Review Meeting was held on March 3, 2016. The next ELPEP Quarterly Review Meeting with MTACC, FTA-RII, SAS and the ESA project, had been scheduled for June 16, 2016 but was deferred. With respect to SAS, the current status of each of the main ELPEP components is summarized as follows:

- **Technical Capacity and Capability (TCC):** MTACC has resolved all remaining FTA/PMOC comments and has issued the final revised PMP. MTACC is not planning any further updates to the SAS PMP;
- **Schedule Management Plan (SMP)**: MTACC's position is that the SAS management processes remain ELPEP compliant. The PMOC does not concur with this assessment. The PMOC notes that the ELPEP Conformance/Compliance checklist indicates the IPS is updated on a monthly basis. As noted at the March and April, 2016 Cost and Schedule Meetings, the SAS Project Team is no longer maintaining the IPS. Refer to Section 2.0 of this report for further discussion.
- **Cost Management Plan (CMP)**: The FFGA was amended in March 2015. The PMOC has requested MTACC to update its CWB to reflect the adjusted value. To date, MTACC has declined to do so. Comments on the ESA/SAS Cost Management Plan (CMP) were received on June 2, 2015. MTACC and the PMOC have held meetings to resolve remaining issues. MTACC's position is that the SAS management processes remain ELPEP compliant; and,
- **Risk Mitigation Capacity Plan (RMCP) and Risk Management Plan (RMP)**: MTACC's position is that the SAS management processes remain ELPEP compliant.

The SAS Project Team has implemented the principles and requirements embodied in the ELPEP. The procedural changes triggered by the ELPEP have become an integral part of the management of the project and gives the FTA/PMOC greater insight into the risk, cost, and schedule elements of the project.

The PMOC notes, however, that the Estimate-At-Completion (EAC) for contingency funds is significantly below the ELPEP agreement of $45M. As of December 2016 the unallocated contingency (Executive Reserve) was approximately $27M. The results of the current re-evaluation of the cost to complete the remaining construction, testing and final acceptance will likely exceed the remaining contingency.

1.0 GRANTEE'S CAPABILITIES AND APPROACH

1.1 Management Capacity and Capability

1.1.1 Organization, Personnel Qualifications and Experience

Status:

Additional NYCT force account personnel have been added to support the accelerated construction, testing, and commissioning activities.

Observation:

As the project nears Revenue Service, SAS Team members are transitioning to other activities or assignments. The budget for NYCT force account labor has been exceeded.

Concerns and Recommendations:

The PMOC recommends that a personnel assessment be performed to assure that staffing is adequate to address the required CM support to complete the construction work, ongoing testing and closeout activities.

1.1.2 Grantee's Work Approach, Understanding, and Performance Ability

a) Adequacy of Project Management Plan and Project Controls

Status:

Refer to the "ELPEP SUMMARY" section above for any updated information.

Observation:

Refer to the "ELPEP SUMMARY" section above for any updated information.

Concerns and Recommendations:

Refer to the "ELPEP SUMMARY" section above for any updated information.

b) Grantee's Approach to FFGA and other FTA/Federal Requirements

Status: No change in status this period.

Observation: None.

Concerns and Recommendations: None

c) Grantee's Approach to Force Account Plan

Status:

As of December 31, 2016, New York City Transit (NYCT) Engineering Force account expenditures are $78,360,950 of the $95,400,000 budget. NYCT construction direct labor expenditures have exceeded its budget. Expenditures are $25,678,856, $78,856 over the budget of $25,600,000.

Observation:

The Force Account requirements are documented in the SAS Force Account Plan for Second Avenue Subway Construction Support Services. The plan gives a description and a cost

estimate of the NYCT services required for the design of the track and signal elements of the system and to support construction activities for each individual contract. NYCT labor expenditures are for general orders, work trains, and flagging support.

In order to support the SAS project as it transitioned into the testing and commissioning phase, additional NYCT force account personnel were added.

Concerns and Recommendations:

The PMOC recommends that the budget is increased to assure ongoing support of the inspection and testing activities.

d) Grantee's Approach to Safety and Security Plan

Status:

During the 4Q2016 reporting period, the SAS Project Safety Team (CCM and OCIP representatives) continued its oversight of the construction contractors' Safety, Security and Health Programs by performing daily/weekly inspection of work areas, investigating incidents, and performing quarterly safety audits. First aid, recordable and lost time incidents are reported, investigated, and corrective action taken to address deficiencies and negative trends. The Lost Time Injury Rate and Recordable Injury Rate from the start of construction until November 30, 2016, is 1.43 and 4.04, respectively. The Bureau of Labor Statistics (BLS) national Lost Time Injury Rate is 1.8 and the Recordable Injury Rate is 3.2. The cumulative construction hours worked since the project inception is 14,718,791 hours. Total lost time injuries since project inception is 105 and other recordable injuries are 192. The total number of recordable injuries is 297 (sum of lost time injuries and recordable injuries).

The Monthly Project Wide Safety Meeting continues to be held the first Friday of each month. The safety performance of each construction contract is discussed and "Lessons Learned" from incidents/accidents are shared such that the total project can benefit. OCIP observations are being trended to focus uniform corrective action across the project.

Observation:

Section 4 of the PMP includes the required project Health and Safety Plan (HASP) that describes the responsibility and protocols to maintain a safe environment throughout the construction of the SAS Project. The Monthly Project Wide Safety Meeting is ongoing and is a good forum in providing "Lessons Learned" in order to promote safe practices across the entire project.

Section 4 of the PMP also outlines the Project Safety and Security Management Plan (SSMP) as required by 49 CFR Part 659, which includes the Safety and Security Certification Plan (SSCP) and the Systems Safety and Reliability Assurance Program Plan (SSRA).

Concerns and Recommendations: None

e) Grantee's Approach to Asset Management

Status:

The Station Contractors and the Systems Contractor continued population of the database which captures the identification, configuration, and installed location of the equipment.

Observation:

Identification and control of project assets is being coordinated among the Track, Power and Signals and Communications Systems Contractor (C6), the Station Contractors (C2B, C4C and C5C) and NYCT's Department of Subways.

Concerns and Recommendations:

The PMOC recommends a review of the database be performed to assure that the installed equipment configuration is being captured.

Grantee's Approach to Community Relations

Status:

MTACC continues its efforts to provide up-to-date information and improve community access to SAS project staff and provide transparency to the project. Additional details are contained within Section 2.6 of this report.

Observation:

MTACC's planned approach to community relations as set forth in detail in Section 12 of its Project Management Plan for SAS Phase 1 is generally focused on the pre-construction activities involving dissemination of project-related information to the affected community and public hearings to support the NEPA process.

MTACC's actual community relations effort during SAS Phase 1 has included establishment of a Community Information Center, numerous publications and sources of information, tours of the construction, and periodic outreach and information sharing meetings with affected stakeholders.

Conclusions and Recommendations:

The PMOC recommends the overall approach involved in this effort be formally documented as a "lesson learned" so that subsequent MTACC projects may share the insights and benefits of this effort.

1.1.3 Grantee's Understanding of Federal Requirements and Local Funding Process

a) Federal Requirements

The MTA has transitioned to the FTA's Transit Award Management System (TrAMS). System requirements are being met with respect to Grant Management.

b) Uniform Property Acquisition and Relocation Act of 1970

Real estate acquisition and tenant relocation has been completed in accordance with the approved SAS Real Estate Acquisition Management Plan and Relocation Plan. These plans address Title 49 CFR Part 24, which implements the Uniform Relocation Assistance and Real Property Acquisition Polices Act of 1970, as amended, and FTA real estate requirements 5010.1C.

c) Local Funding Agreements

All local funds required for the SAS Phase 1 Project have been allocated. Funds totaling $2.964 billion were allocated in MTA's 2000-2004 and 2005-2009 Capital Plans. The balance of $1.487 billion to complete SAS Phase 1 was budgeted in the 2010-2014 Capital Plan. On April

28, 2010, the MTA Board approved the 2010-2014 Capital Plan. The Capital Program Review Board (CPRB) approved the plan on June 1, 2010. The MTA Board and CPRB approved amendments (latest July 2013) to the 2010-2014 Capital Plan and retained the $1.487 billion to complete SAS Phase 1. In the amended FFGA, executed on March 31, 2015, the MTA agreed to provide additional State and local funding in the amount of $708,000,000 if necessary.

1.2 Project Controls

1.2.1 Scope Definition and Control

Status:

During 4Q2016, there has been no material change in the scope of the SAS Project. The scope of the SAS Project Phase 1 is formally defined by the FEIS, ROD, and the FFGA (amended). Using these documents as guides, the scope was further detailed in ten construction packages (contracts).

Observation:

The PMOC continues to monitor the scope of work to ensure compliance with the FEIS, ROD, FFGA, and other reference documents and plans. Several design changes and construction operation scenarios have required formal review and approval by the FTA.

The SAS Project Team continues to effectively manage the project scope to maintain compliance with governing documentation and provide a cost-effective final product.

Concerns and Recommendations: None

1.2.2 Quality

Status:

During 4Q2016, the Second Avenue Subway Quality Management Team continued to conduct Quality Meetings of the Contractor with Consultant Construction Manager (CCM), MTACC, and PMOC participation. The Quality Management Team participated in the job progress meetings, monitored quality matters in the field for each construction contract, reviewed and provided comments for Quality Work Plans, participated in Preparatory Phase Meetings for numerous construction processes, and spent considerable time evaluating and resolving observation reports.

The following issues on the C2B, C4C, and C5C contracts were discussed by the respective SAS Quality Managers at their Quality Management Meetings:

Observations:

C2B: There are still many issues on this contract that affect Quality. These include:

- Submittals of Quality Work Plans (QWPs) for approvals are delayed;
- Material receiving inspection data is not provided with Daily Inspection Reports;
- Electrical and mechanical issues are not documented and resolved. Mechanical and electrical issues are identified mostly by agency inspectors rather than by the contractor (Stations, MOW, etc.); and,
- Water Leaks – Multiple locations are still leaking. A total of 75 active leaks were reported as of December 31, 2016.

C4C: There are still many issues on this contract that affect Quality. These include:

- Non-concrete-related NCRs (28) are not being resolved in a reasonable time;
- Revise and Resubmit submittals pending are 349 at the end of December 2016, up from 327 at the end of October 2016.
- Bond Beams: The contractor has two bond beams remaining to be repaired. Also remaining is the special inspector's inspection reports of the repaired bond beams; and,
- The PMOC is concerned that the contractor's Quality Manager does not have enough support.

C5C: There are still many issues on this contract that affect Quality. These include:

- Non-concrete-related NCRs (20) are not being resolved in a reasonable time;
- Field supervision is not sufficient: Examples are stairs, electricals, HVAC, plumbing, wall cladding, and architectural finishing;
- The monthly Special Inspection Report for November 2016 has not been submitted as of the end of December 2016;
- Record Drawings at 50% completion have been delayed;
- Submittals (Revise and Resubmit) – currently 128 – are pending re-submission; and,
- As-built drawings are not being submitted as per contract milestones.

The following table depicts nonconformance report and daily inspection report statuses for each of the five (5) active SAS contracts:

Contract Package C2B	
Status:	Through December 31, 2016, a total of 183 NCRs have been issued. One hundred eighty (180) have been closed and 3 NCRs are open. In December 2016, no new NCR's were written and five were closed.
Observation:	Bi-weekly Quality Management Meetings, as suggested by the PMOC, are being held. Submittal of Daily Inspection Reports is three weeks behind.
Concerns and Recommendations:	The PMOC recommends that the contractor devote the necessary effort to resolving the issues listed in the beginning of this section.
Contract Package C3	
Status:	Through December 31, 2016, a total of 134 NCRs have been issued. One hundred thirty-three (133) have been closed and one is still open. In December 2016, no new NCRs were written and one was closed.
Observation:	Submittal of Daily Inspection Reports is six weeks behind.
Concerns and Recommendations:	The contractor did not submit any Daily Inspection Reports in December 2016 after having caught up in November 2016. The PMOC recommends that the contractor devote the necessary resources to consistently keep up to date in submitting these Reports.

Contract Package C4C	
Status:	Through December 31, 2016, a total of 256 NCRs have been issued. One hundred ninety-three (193) have been closed and 63 NCRs are still open. In December 2016, no NCRs were written and 11 were closed.
Observation:	Two hundred-three (203) of the 256 NCRs are for concrete that was out of specification. Thirty-five (35) of the remaining 63 open NCRs are for concrete that was out of specification. Submittal of Daily Inspection Reports is two weeks behind.
Concerns and Recommendations:	The 35 concrete NCRs should be closed in January 2017. The PMOC recommends that a target date and assigned individual be established for closure of the 28 non-concrete NCRs. The PMOC also recommends that the contractor devote the necessary effort to resolving the issues listed in the beginning of this section.
Contract Package C5C	
Status:	Through December 31, 2016, a total of 253 NCRs have been issued. Two hundred thirty-two (232) have been closed and 21 NCRs are still open. In December 2016, 7 new NCRs were written and 57 were closed.
Observation:	One of the 21 NCRs that are open is for concrete that is out of specification. Forty-two (42) of the 57 NCRs that were closed in December were for concrete. Submittal of Daily Inspection Reports is 5 weeks behind.
Concerns and Recommendations:	The PMOC recommended that the contractor prepare a concrete statistical analysis in July 2016 to close those NCRs that passed the 56-day break. The contractor committed the analysis to be completed in early December. This was accomplished and the NCRs were closed. The PMOC continues to recommend that the contractor establish a schedule for closing the 20 non-concrete open NCRs and devote the necessary effort to resolving the issues listed in the beginning of this section.
Contract Package C6	
Status:	Through December 31, 2016, a total of 76 NCRs have been issued. Seventy (70) NCRs have been closed and six are still open. In December 2016, two new NCRs were written and three were closed.
Observation:	Submittal of Daily Inspection Reports is current.
Concerns and Recommendations:	The PMOC has no concerns at this time.

Concerns and Recommendations:

The PMOC is concerned that the contractors are beginning to remove quality staff while much work remains. Additional concerns and recommendations are shown individually above.

1.2.3 Project Schedule

Status:

A summary of project schedule information is as follows:

	FFGA (Amended March 2015)	Forecast Completion	
		Grantee	PMOC
Begin Construction	January 1, 2007	March 20, 2007A	March 20, 2007A
Construction Complete	August 2016	September 01, 2016	October 2017
Revenue Service	February 28, 2018	December 30, 2016	February 2018

MTACC established December 30, 2016, as its target Revenue Service Date (RSD) and bases its schedule and schedule contingency reporting on this target. Based on risk assessment, FTA/PMOC identified February 28, 2018, as its target RSD with the condition that a minimum 240 CD of contingency be maintained against this target through September 30, 2016. To date, the MTACC criteria has been the more stringent and has therefore been the basis of routine schedule and schedule contingency reporting.

Observation/Concerns and Recommendations: None

1.2.4 Project Budget and Cost

Status:

Total project cost in the approved amended FFGA ($5,574,614,000) and Current Working Budget (CWB), which is based on Revision 9 to the Project Cost Estimate, are allocated into the Standard Cost Categories (SCC) as shown below in Table 1-1. MTACC's 4Q2016 update not issued as of December 31, 2016.

Table 1-1: Standard Cost Categories

Std. Cost Category (SCC)	Description	FFGA (January 2008)	FFGA Amended (March, 2015)	MTA's Current Working Budget (September 2016)
10	Guideway & Track Elements	$612,404,000	$195,346,781	$189,310,484
20	Stations, Stops, Terminals, Intermodal	$1,092,836,000	$1,666,605,679	$1,659,830,395
30	Support Facilities	$0	$0	$0
40	Site Work & Special Conditions	$276,229,000	$793,118,232	$880,457,220
50	Systems	$322,707,000	$250,379,966	$212,886,484
60	ROW, Land, Existing Improvements	$240,960,000	$281,500,000	$281,500,000
70	Vehicles	$152,999,000	$0	$0
80	Professional Services	$796,311,000	$1,026,608,168	$1,198,669,050
90	Unallocated Contingency	$555,554,000	$544,441,174	$28,346,367
Subtotal		$4,050,000,000	$4,758,000,000	$4,451,000,000
Financing Cost		$816,614,000	$816,614,000	$816,614,000
Total Project		**$4,866,614,000**	**$5,574,614,000**	**$5,267,614,000**

Table 1-2 lists the associated grants in the Transit Award Management System (TrAMS) with respective appropriated, obligated, and disbursed amounts as of December 31, 2016.

Table 1-2: Appropriated and Obligated Funds

Grant Number	Amount ($)	Obligated ($)	Disbursement ($) through December 31, 2016
NY-03-0397	$4,980,026	$4,980,026	$4,980,026
NY-03-0408	$1,967,165	$1,967,165	$1,967,165
NY-03-0408-01	$1,968,358	$1,968,358	$1,968,358
NY-03-0408-02	$24,502,500	$24,502,500	$24,502,500
NY-03-0408-03*	0	0	0
NY-03-0408-04**	0	0	0

Grant Number	Amount ($)	Obligated ($)	Disbursement ($) through December 31, 2016
NY-03-0408-05	$167,810,300	$167,810,300	$167,810,300
NY-03-0408-06	$274,920,030	$274,920,030	$274,920,030
NY-03-0408-07	$237,849,000	$237,849,000	$237,849,000
NY-03-0408-08	$197,182,000	$197,182,000	$197,182,000
NY-03-0408-09	$186,566,000	$186,566,000	$155,005,067
NY-03-0408-10	$123,384,621	$123,384,621	0
NY-17-X001-00	$2,459,821	$2,459,821	$2,459,821
NY-36-001-00***	$78,870,000	$78,870,000	$78,870,000
NY-95-X009-00	$25,633,000	$25,633,000	$25,633,000
NY-95-X015-00	$45,800,000	$45,800,000	$45,800,000
Total	**$1,373,892,821**	**$1,373,892,821**	**$1,218,947,267**

*Grant issued to outline components of the Early Systems Work Agreement. **Grant issued to explain the "Total Eligible" cost for the project. *** Denotes American Recovery and Reinvestment Act (ARRA) funds.

Observation:

Grant NY-03-0408-10 for $123,384,621 represents the full New Starts FFY 2013 allocation of $106,578,687 published in the Federal Register on October 16, 201210 as well as the full FFY 2014 allocation of $16,805,934 published in the Federal Register on March 10, 2014. Grant NY-03-0408-10 brings the total New Starts contributions to $1,300,000,000.

Concerns and Recommendations: None

1.2.5 Project Risk Monitoring and Mitigation

Status:

The SAS Project Team continued implementation of risk management techniques to identify, quantify, and manage risks that may impact the project cost or schedule. Efforts are directed to those risk issues that have potential to delay the project beyond its currently scheduled RSD.

Observation:

The SAS risk management process has been instrumental in the development of strategies and techniques to manage a variety of retained risks including inter-contract interfaces, safety and security certification, and submittal processing.

By implementing its schedule acceleration initiative, the SAS Project Management Team has focused its risk management effort on those risk issues with potential to delay the project beyond its currently scheduled RSD. Should Revenue Service occur on January 1, 2017, as planned, the SAS risk profile will likely change and new risks may be identified.

Concerns and Recommendations: None at the current time. The PMOC recommends that SAS review its risk profile should the system become operational as planned on January 1, 2017.

1.2.6 Project Safety and Security

Status:

The Lost Time Injury Rate and Recordable Injury Rate from the start of construction until November 30, 2016, are 1.43 and 4.04 respectively. The Bureau of Labor Statistics (BLS) national Lost Time Injury Rate is 1.8 and the Recordable Injury Rate is 3.2. The cumulative construction hours worked since project inception is 14,718,791 hours. Total lost time injuries since project inception is 105 and other recordable injuries are 192. The total number of recordable injuries is 297 (sum of lost time injuries and recordable injuries).

Security – Implementation of the Contractor's Site Security Plans is ongoing. Entrance into work areas and subsurface areas are being closely monitored.

Observation:

The Lost Time Injury Rate has been below the national average for the last twelve months and the Recordable Injury Rate has been above the national average for the last twelve months. Both rates are trending downward.

Concerns and Recommendations: None

1.3 FTA Compliance

Status:

MTACC remains compliant with FTA requirements.

Observation: None

Concerns and Recommendations: None

1.3.1 FTA Milestones Achieved

The key FTA milestone achieved was entry into the Full Funding Grant Agreement (FFGA) on November 19, 2007. The FFGA was subsequently amended and executed on March 31, 2015.

The ELPEP Hold Point, "90% Project Bid/50% Construction Complete", was achieved in March 2013.

The ELPEP Hold Point, "100% Project Bid/85% Construction Complete", was achieved in mid-2015.

Revenue Service, "On or before February 18, 2018", is currently forecast to occur on January 1, 2017.

1.3.2 Readiness for Revenue Operations

Status:

During May 2016, the FTA initiated a review of SAS's readiness for revenue operation. The readiness review was conducted by the PMOC in accordance with OP 54, Readiness for Revenue Operation. This process is intended to evaluate the adequacy, soundness, and timeliness of the MTACC-SAS's Systems Integration Testing; Project System Safety and Security Validation; Pre-Revenue Operation Plan and any required work-arounds; and Management Capacity and Capability.

The PMOC commenced collection of project documents in early May 2015 and started interviewing key NYCT and SAS staff on May 24, 2016. Interviews were completed by mid-June 2016. A draft report for review by FTA and MTA was transmitted to FTA in mid-July 2016. MTACC's comments were received on August 18, 2016. During subsequent meetings, comments were reconciled and a final report with recommendations was issued on October 26, 2017. On December 29, 2016 the three open recommendations were adequately addressed and the SAS Project Phase 1 was considered ready for Revenue Service.

Concerns and Recommendations: None

2.0 PROJECT SCOPE

2.1 Status & Quality: Design/Procurement/Construction

2.1.1 Engineering and Design

Status:

The design phase of SAS Phase 1 was completed in late November 2010. Engineering activities are currently focused on supporting systems integration and acceptance testing.

Observation:

The primary role of the design team currently includes:

- Construction Administration, (generally including shop drawing review), response to RFIs, provide design clarifications as needed, and technical support;
- Detail and document design changes as may be required; and
- Supporting AWO evaluation and resolution.

Concerns and Recommendations:

Incorporation of user-requested design changes during the systems integration and testing phase continues as a significant risk to the overall project schedule. The SAS project staff has attempted to minimize and prioritize the design changes to ensure that only necessary changes are incorporated and that the cost and schedule impacts are limited.

2.1.2 Procurement

Status:

Procurement of all design and construction services required for the execution of SAS Phase 1 has been completed.

Observations: None

Concerns and Recommendations: None

2.1.3 Construction

All construction is approximately 98.9% complete (overall project completion is approximately 94.4%) as of December 31, 2016. Summary progress for each contract is as follows:

- 96th Street Station Heavy Civil/Structural (Contract C2A) achieved Substantial Completion on November 5, 2013. NYCDEP inspections continue to delay the closeout of the contract. The inspections are being performed to verify the work as reflected on the revised "As-Built-Drawings". Closeout of the contract did not occur as anticipated by the end of the 4Q 2016. The CM's efforts are ongoing to confirm a closeout date.
- 96th Street Station Finishes, Mechanical, Electrical, and Plumbing Systems and Ancillary Building and Entrances contract (Contract C2B) 98.6% complete. During the 4QT construction, integration and testing progress to a level that a Temporary Code Compliance Certificate for the 96th Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31,

2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of unresolved work activities as note in Article 2.02 of Contract C-26010.

- 86th Street Station (Contract C5B). Substantial Completion was achieved on December 16, 2014. Contract closeout is ongoing.
- 86th Street Station Architectural and MEP (Contract C5C) 96.4% complete. During the 4QT construction, integration and testing progress to a level that a Temporary Code Compliance Certificate for the 86th Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of unresolved work activities as note in Article 2.02 of Contract C-26008.
- 72nd Street Station Heavy Civil/Structural (Contract C4B). Substantial Completion was achieved on January 14, 2014. Contract closeout is ongoing.
- 72nd Street Station Finishes, MEP Systems, Ancillary Buildings and Entrances (Contract C4C) 95.3% complete. During the 4QT 2016 construction, integration and testing progress to a level that a Temporary Code Compliance Certificate for the 72th Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of unresolved work activities as note in Article 2.02 of Contract C-26011.
- Rehabilitation of the 63rd Street Station (Contract C3) 99.8% complete. During the 4QT 2016 construction, integration and testing progress to a level that a Temporary Code Compliance Certificate for the 63rd Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the station on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of unresolved work activities as note in Article 2.02 of Contract C-26006 **[Ref: SAS-A18-Jun16]**.
- Track, Signal, Traction Power, and Communication Systems Contract (Contract C6) 98.8% complete. During the 4QT 2016 the integration and testing progress to a level such that a Temporary Code Compliance Certificate was issued for the stations with a matrix of outstanding testing, commissioning and inspection activities which need to be addressed . The certificate was issued on December 31, 2016 and authorized occupancy and use of the station. Ceremonial activities occurred at the stations on December 31, 2016 prior to the start of Revenue Service scheduled for January 1, 2017. Substantial Completion has not been declared by the CM because of ongoing testing of fire alarm and communication systems.

Concerns and Recommendations:

The PMOC is concerned about the availability of sufficient and qualified personnel to support the effort to complete the outstanding testing, commissioning, and inspection observations will be addressed in a timely manner. The increase in cost associated with the effort is also a concern.

On SAS, the project staff works with the contractors and NYCT to complete parallel testing and NYCT actively participates in all phases of the testing process. The Project Executive noted that the certification process is being streamlined to reduce the time required for NYCT sign-offs. SAS staff is working with MTACC Quality group on this initiative. It was reported that a System Safety Certification letter was issued on December 29, 2016 which addressed the Certifiable Items List. The PMOC has requested a copy of the letter. MTACC should obtain all test reports, material certifications, pictures, and inspection reports that serves as the body of evidence for each certifiable element. **[Ref: SAS-A19-Jun16]**

2.1.4 Force Account (FA) Contracts

Status:

As of December 31, 2016, New York City Transit (NYCT) Engineering Force account expenditures are $78,360,950 of the $95,400,000 budget. NYCT construction direct labor expenditure is $25,678,856.

Observations:

NYCT's force account budget of $25,600,000 for construction direct labor has been exceeded.

Concerns and Recommendations:

The PMOC recommends that the budget is increased to assure ongoing support of the inspection and testing activities.

2.1.5 Operational Readiness

Status:

During May 2016, the FTA initiated a review of SAS's readiness for revenue operation. The readiness review was conducted by the PMOC in accordance with OP 54, Readiness for Revenue Operation. This process is intended to evaluate the adequacy, soundness, and timeliness of the MTACC-SAS's Systems Integration Testing; Project System Safety and Security Validation; Pre-Revenue Operation Plan and any required work-arounds; and Management Capacity and Capability.

The PMOC commenced collection of project documents in early May 2015 and started interviewing key NYCT and SAS staff on May 24, 2016. Interviews were completed by mid-June 2016. A draft report for review by FTA and MTA was transmitted to FTA in mid-July 2016. MTACC's comments were received on August 18, 2016. During subsequent meetings, comments were reconciled and a final report with recommendations was issued on October 26, 2016. On December 29, 2016 the three open recommendations were adequately addressed and the SAS Project Phase 1 was considered ready for Revenue Service.

Concerns and Recommendations: None

2.2 Third-Party Agreements

Status:

During the 4QT 2016, the SAS Project Team continued its Interagency Coordination as defined in Section 12 of the SAS PMP.

Through December 31, 2016, $60,873.238 of the $91,586,000 Third-Party reimbursement budget (Rev. 10 Current Working Budget) has been spent.

Observation:

MTACC/NYCT has entered into cooperative force account agreements as needed with other agencies and utility providers to perform construction work for the Project. The Third-Party Agreement budget appears to be adequate to support the remaining construction.

Concerns and Recommendation: None

2.3 Contract Packages and Delivery Methods

Phase 1 of the Second Avenue Subway is being delivered via ten separate construction packages. Each construction contract package utilizes the design-bid-build process based upon a fixed price construction contract. Competitive procurements are based on NYCT standard procedures. All contracts have been award thus no changes have occurred to the procurement and delivery methods.

2.4 Vehicles

No change. No additional vehicles will be procured for the SAS Phase 1 Project.

2.5 Property Acquisition and Real Estate

Status:

Real estate acquisition and tenant relocation was performed in accordance with the approved SAS Real Estate Acquisition Management Plan and Relocation Plan. These plans address Title 49 CFR Part 24, which implements the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and FTA real estate requirements 5010.1C.

All real estate acquisitions required for the construction of SAS Phase 1 have been completed.

Observation: None

Conclusions and Recommendations: None

2.6 Community Relations

Status:

MTACC continues to expend a significant amount of effort in maintaining effective communication and good relations with the residential and business community affected by the Second Avenue Subway construction. These efforts have generally been effective in facilitating the resolution of adverse construction impacts and addressing the concerns of community stakeholder groups.

Observation:

MTA Capital Construction appreciates that work necessary to complete this project is going to be disruptive to the daily life of those living and working along the project alignment. In order to maintain a consistent and reliable flow of information to the community, MTACC has liaisons in each of the station areas to act as intermediaries between the project and the community. Some of the ways liaisons foster this communication is through:

- **Public workshops:** Workshops allow residents, employees and business owners to receive construction progress information and discuss quality of life and other issues directly with project representatives;
- **"Ask the Experts" sessions:** A gathering of experts from the project as well as numerous city agencies gives the public an opportunity to ask questions or raise issues about the project with the proper expert source;
- **Good Neighbor Initiative:** Dedicated staffers review each station area weekly and work directly with residents and city agencies to address sanitation, transportation and other quality of life issues. Daily emails are sent, notifying the public of changes to planned construction activities and upcoming underground blast activity;
- **Construction Advisory Committees (CAC):** Project staff and community stakeholders meet quarterly to discuss concerns and solutions regarding construction-related issues;

  There is a CAC for each station area (Lexington Av/63rd Street, 72nd Street, 86th Street, and 96th Street). CACs are comprised of co-op and condo board members, building managers, business owners, property owners who live in walk-ups not represented by boards, and community board members. MTA Capital Construction senior staff, community outreach personnel, contract managers, and representatives from elected official's offices and other city agencies also attend CAC meetings;

  The CAC meetings provide community stakeholders face-to-face access to construction managers, project executives, and MTA Capital Construction staff to discuss issues and work toward solutions. Issues identified at the public workshops are also addressed at the CAC meetings. CAC presentations, as well as newsletters and other information, are available on the SAS website;
- **Community Tours:** Station Area tours provide an opportunity for community members to observe firsthand the magnitude and progress of the construction taking place underground. More than 1000 members of the community have already visited the project's various sites. MTA Capital Construction executives typically lead these tours; and,
- **Community Newsletters:** Newsletters for each station area are distributed monthly. The newsletters are available online, in hardcopy (available in building lobbies and at local businesses), and are emailed to the SAS distribution list. They provide valuable information about construction updates and milestones, work hours, as well as photos and renderings of future station areas. All newsletters are available on the SAS website.

Conclusions and Recommendations:

MTACC's Community Outreach Program is very effective in providing project information to the community and responding to its concerns.

3.0 PROJECT MANAGEMENT PLAN AND SUB-PLANS

3.1 Project Management Plan

Status:

Refer to the "ELPEP SUMMARY" section above, for any updated information.

Observation: None.

Concerns and Recommendations: None.

3.2 PMP Sub Plans

Status:

Refer to "ELPEP SUMMARY" for any updated information.

Observations: None.

Concerns and Recommendations: None.

3.3 Project Procedures

Status:

At the FTA Quarterly Meeting held on April 21, 2016, MTACC noted that it has superseded various project procedures because the existing procedures were not responsive to the current schedule acceleration needs of SAS Phase 1.

Observations:

PMOC recommends MTACC update its project procedures based upon the "Lessons Learned" during the last year of SAS Phase 1.

Concerns and Recommendations: None

4.0 PROJECT SCHEDULE STATUS

4.1 Integrated Project Schedule

Status:

As of July 1, 2016, MTACC is no longer maintaining an Integrated Project Schedule (IPS). The project has transitioned into the integration and acceptance test phase and the MTACC's Program Control Manager provides weekly status updates (spreadsheets). Update 8 is the latest and has a data date of November 25, 2016.

Observations:

Milestone Summary**:** As a part of the "Schedule Acceleration Agreements", MTACC established revised milestones with the 72nd, 86th, and 96th Street Station Contractors and the Systems Contractor for the work involved. Remaining incomplete milestones are summarized and updated based on SAS Test Data Update 8 (data date November 25, 2016).

72nd Street Station			
MS	**Description**	**Acceleration Agreement Date**	**Current Forecast**
24	Complete all work and testing through FIST (L3/4) on the water mist system (except those portions of the system located within Entrance 1 escalator trusses).	07/01/16	12/22/16
25	Complete all work and testing of all elevators and escalators (except escalators at Entrance 1 and elevators at Entrance 3) through FSIT (Levels 5a/b), including 2 weeks dedicated to performing FSIT over the WAN in coordination with the C26009 Contractor (Level 5b).	09/30/16	11/21/16A
26	Complete all work and testing through FSIT (Levels 5a/b) for Escalators at Entrance #1 and Elevators at Entrance #3.	11/01/16	12/13/16A

86th Street Station			
MS	**Description**	**Acceleration Agreement Date**	**Current Forecast**
19	Complete all installation and testing through Level 5b.	09/01/16	TBD

96th Street Station			
MS	**Description**	**Acceleration Agreement Date**	**Current Forecast**
17	Complete Level 5a Testing for HVAC and Fire Suppression Systems	07/31/16	TBD
19	Complete Level 5b Testing for All Systems; Complete ALL Work	08/31/16	04/25/17

Systems			
MS	**Description**	**Acceleration Agreement Date**	**Current Forecast**
16	63rd Comms. Systems: Complete all work and pre-testing required to perform Field Installation Acceptance Tests	05/31/16	TBD
17	72nd Comms. Systems: Complete all work and pre-testing required to perform Field Installation Acceptance Tests	06/13/16	TBD
18	86th Comms. Systems: Complete all work and pre-testing required to perform Field Installation Acceptance Tests	06/27/16	TBD
19	96th Comms. Systems: Complete all work and pre-testing required to perform Field Installation Acceptance Tests	06/20/16	TBD
20	The Contractor shall complete all work and testing through Final Systems Integrated Testing of all systems over the Local Area Network (LAN) and overall Wide Area Network (WAN), such that the LAN/WAN networks are available for Final Systems Integrated Testing by the Station Contractors.	06/06/16	TBD
21	Complete all other work required to start Pre-Revenue Service Training	09/30/16	12/15/16A

4.2 90-Day Look-Ahead

Status:

Tests completion milestones were established to provide day to day insight into the integration and acceptance testing activities. Using the Weekly Test Date updates, SAS Program Control developed a test matrix that shows the number of tests and systems to be tested each week from October 21, 2016, to December 30, 2016, in order to complete the integration and acceptance testing of the critical systems required for revenue service. Weekly coordination meetings are being held to update the matrix, make adjustments, and commit additional resources as necessary. Commitments of resources are being made by the station contractors, its subcontractors, and NYCT

As of December 31, 2016 the overall project is approximately 94.4% complete. Construction is 98.9% complete and Revenue Service is scheduled for January 1, 2017.

Observations:

There will be remaining work items left to be completed after the start of Revenue Service on January 1, 2017. This observation is supported by the number of open inspection observations, code compliance issues and substantial completion not being recognized by the CMs at each station and ongoing integration testing by the systems contractor.

Concerns and Recommendations:

The PMOC recommends that the SAS Project Team evaluate the scope of work which will remain after Revenue Service and establish the schedule to complete the work and the associated budget. A revised project EAC should then be established.

4.3 Critical Path Activities

Status:

In the absence of an integrated schedule for the whole project, identifying a unique schedule "critical path" is not possible.

Concerns and Recommendations: None.

4.4 Compliance with Schedule Management Plan

Status:

As noted in both the SAS Project Management Plan, as well as the accompanying Schedule Management Plan, the Integrated Project Schedule (IPS) is the cornerstone of the overall project schedule management strategy. MTACC no longer utilizes the IPS methodology in managing the SAS project schedule. IPS Update #115 (DD=3/1/16) was the last such schedule published by MTACC.

Based on the above, the PMOC must conclude that MTACC is not in compliance with its Schedule Management Plan.

Observation: None

Conclusions and Recommendations (Schedule):

The tabular systems testing schedules currently used by MTACC indicate completion of some testing activities extending passed the scheduled Revenue Service date. As such, there is essentially no schedule "float" remaining on the project.

Volume 2 of the Facilities System Test Program identifies the System Acceptance Phase (SAP) as the period after substantial completion (completion of FAT, FIAT, SIST and FSIT), when systems and subsystems will be operated to demonstrate that all interfaces and systems are functioning as designed and intended. After successful completion of this phase, acceptance certificates are issued by NYCT. Tabular testing schedules currently used by MTACC do not indicate this testing. MTACC has stated an addendum to the Facilities System Test Program will be issued to clarify this matter.

No specific Grantee Actions are noted at this time. **[Ref: SAS-A20-Jun16]**

5.0 BUDGET/COST

Status:

The FFGA baseline budget (Jan 2008) and MTACC's current working budget (September 2015) are broken down into Standard Cost Categories in year of expenditure dollars as follows:

Table 5-1: Allocation of FFGA and Current Working Budget to Standard Cost Categories

Std. Cost Category (SCC)	Description	FFGA (January 2008)	FFGA Amended (March, 2015)	MTA's Current Working Budget (September, 2016)
10	Guideway & Track Elements	$612,404,000	$195,346,781	$189,310,484
20	Stations, Stops, Terminals, Intermodal	$1,092,836,000	$1,666,605,679	$1,659,830,395
30	Support Facilities	$0	$0	$0
40	Site Work & Special Conditions	$276,229,000	$793,118,232	$880,457,220
50	Systems	$322,707,000	$250,379,966	$212,886,484
60	ROW, Land, Existing Improvements	$240,960,000	$281,500,000	$281,500,000
70	Vehicles	$152,999,000	$0	$0
80	Professional Services	$796,311,000	$1,026,608,168	$1,198,669,050
90	Unallocated Contingency	$555,554,000	$544,441,174	$28,346,367
Subtotal		$4,050,000,000	$4,758,000,000	$4,451,000,000
Financing Cost		$816,614,000	$816,614,000	$816,614,000
Total Project		**$4,866,614,000**	**$5,574,614,000**	**$5,267,614,000**

Observation:

Table 5-1 represents MTACC's most recent update, September 2016, of its CWB for the FTA Standard Cost Categories. Revisions to the SCC allocations incorporate Revision 10 modifications to MTACC's CWB. MTACC converts the CWB to the SCC format quarterly.

MTACC's 4Q2016 update not issued as of December 31, 2016.

Conclusions and Recommendations:

MTACC continues to execute Phase 1 of the SAS Project within the constraints of its CWB. The PMOC will continue to monitor MTACC's conformance to its budget. SAS will need to re-evaluate the budget once Revenue Service has been established.

5.1 Project Cost Management and Control

Status:

The SAS Project Team accumulates and reports actual cost expenditures against MTACC's established cost categories on a monthly basis. The aggregate budget value of the cost categories equals the CWB of $4.451B. In general, MTACC cost categories correspond to individual contracts or groups of contracts for products or services supplied by a 3rd party

vendor. Values within the MTACC Cost Categories are mapped to the FTA Standardized Cost Categories on a Quarterly basis.

Observation:

Events that represent major project milestones or events for measuring cost variances include:

- Full Funding Grant Agreement (FFGA) – November 19, 2007;
- Enterprise Level Project Execution Plan (ELPEP) – January 15, 2010;
- Amended FFGA (R) – March 17, 2015;
- MTACC Current Working Budget (CWB) – June 6, 2016; and,
- Contemporaneous Estimate @ Completion (EAC) – September 2016.

Budget and forecast cost variances at these milestones are included in the following table. Project final cost is yet to be determined and will be based on the additional cost associated with the work subsequent to Revenue Service.

Estimate	Date	Construct	Eng./Prof Svcs.	3rd Party Exp.	TA Exp.	Cont.	Total (1)	% FFGA	
FFGA	Jun-07	$2,360,000	$491,000	$626,000	$75,000	$498,000	$4,050,000	100%	
ELPEP	Oct-09	$2,791,066	$541,000	$747,000	$103,000	$490,934	$4,673,000	115%	
FFGA(R)	Mar-15	$2,848,815	$721,297	$626,000	$75,000	$486,887	$4,757,999	117%	(
CWB	Mar-16	$2,674,494	$681,643	$562,086	$132,881	$402,296	$4,453,400	110%	
CTD	Dec-16	$2,645,691	$679,244	$766,173,	$110,534		$4,201,642	101%	
ETC(B)	Dec-16	$28,802	*(construction - base contracts)*					0%	
ETC(A)	Dec-16	$49,600	*(AWO forecast to complete)*					0%	
EAC	TBD								

Concerns and Recommendations: None

The PMOC recommends that the SAS Project Team evaluate the scope of work which will remain after Revenue Service and establish the schedule to complete the work and the associated budget. A revised project EAC should then be established.

5.2 Project Expenditures and Commitments:

Status:

As of December 31, a summary comparison of the SAS Current Working Budget and expenditures is as follows:

Description	CWB	Expended	%
Base Construction	$2,674,814,299	$2,645,691,334	98.9%
Total Soft Cost	$1,388,159,267	$1,244,050,625	89.6%
Contingency	$388,026,434	$311,900,440	80.4%
Subtotal	$4,451,000,000	$4,201,642,399	94.4%

Observations:

Based upon financial expenditures reported by MTACC during December 2016, SAS Phase 1 is approximately 94.4% complete. The completion status of the active construction contracts through December 31, 2016 are based upon reported expenditures through that date and are as follows:

- C26002 (Tunnel Boring) – 100%;
- C26005 (96th Street Station) – 100%;
- C26010 (96th Street Station) – 98.6%;
- C26013 (86th Street Station) – 100%;
- C26008 (86th Street Station) – 99.6%;
- C26012 (86th Street Station) – 96.4%;
- C26006 (63rd Street Station) – 99.8%;
- C26007 (72nd Street Station) – 100%;
- C26011 (72nd Street Station – 95.3%; and,
- C26009 (Systems) – 98.8%.

Aggregate Construction percentage Completion:

- 100% of all construction work is under contract;
- 98.9% of all base construction (not including AWOs) is complete; and
- 97.4% of all construction is complete.

Based upon cost data received from MTACC for December 2016:

- Value of construction in place 4Q2016 = $64,254,722;
- Estimated value of construction (base contract) remaining = $28,802,305;
- Target construction completion = TBD and,
- Number of Months remaining = 0

The remaining base contract work, in addition to the AWO exposure, indicates ongoing construction expenditures will occur subsequent to revenue service.

Conclusions and Recommendations:

Refer to Sections 5.5 and 5.6, below.

5.3 Change Orders

Status:

As of December 31, 2016 the status of Additional Work Orders (AWOs) on Phase 1 of the Second Avenue Subway Project is summarized as follows:

Table 5-2: AWO Summary

Contract / (Package)	% Complete	Award	Exposure		Executed	
			$	% of Award	$	% of Award
C26002 (1)	**100%**	**$337,025,000**	**$41,086,647**	**12.19%**	**$41,086,647**	**12.19%**
C26005 (2A)	100 %	$325,000,000	$49,774,000	15.32%	$47,615,409	14.65%
C26010 (2B)	98.6%	$324,600,000	$62,040,600	19.11%	$56,617,701	17.44%
C26006 (3)	99.8%	$176,450,000	**$33,334,378**	**18.89%**	**$33,334,378**	**18.89%**
C26007 (4B)	100%	$446859,600	$1,381,443	0.31%	$1,381,443	0.31%
C26011 (4C)	95.3%	$258,353,000	$63,923,840	24.74%	$58,076,396	22.48%
C26013 (5A)	**100%**	**$34,070,039**	**$6,525,471**	**19.15%**	**$6,525,471**	**19.15%**
C26008 (5B)	99.6%	$301,860,000	$30,186,000	10.00%	$22,163,816	7.34%
C26012 (5C)	96.4%	$208,376,000	$36,286,320	17.41%	$27,140,799	13.02%
C26009(6)	98.8%	$261,900,000	$36,952,000	14.11%	$17,948,379	6.85%
TOTAL TO DATE		$2,674,493,639	$361,490,699	13.52	$311,900,440	11.36%

Bold type indicates completed contracts

To date $2,645,591,334 (98.9%) of $2,674,493,639 base contract construction work has been completed. Remaining As a percentage of work completed, the AWO exposure for these contracts is 13.52% and the executed AWO percentage is 11.36%.

Observation:

The total remaining allocated AWO contingency for all contracts is $49,600,260.

Conclusion and Recommendation:

The total remaining project contingency is $76,525,995 (remaining allocated AWO contingency of $49,600,260 plus the Executive Reserve $26,925,735).

It is the PMOC's recommendation that the SAS Project Team perform a cost estimate to determine if the remaining allocated contingency and Executive Reserve is sufficient to resolve the inspection observations, code compliance issues, numerous non-negotiated AWOs, and letters directing the contractors to proceed.

The value of AWOs reported by MTACC/NYCT in December 2016 is summarized as follows:

	Executed AWOs	AWO Exposure
Dec-16	$311,900,440	$361,490,699
Nov-16	$301,877,764	$360,435,593
Δ	$10,022,676	$1,055,106
Δ	3.21%	.29%

The changes in AWO Exposure for each construction contract reported through December 2016 are summarized as follows:

Const. Pkg.	**AWO Exposure**			
	Dec-16	**Nov-16**	**Period Δ**	**Changes this Period**
Completed Packages	$47,612,118	$47,612,118	$0	252 AWOs are pending negotiation as of December 31, 2016
C2A	$49,774,000	$49,774,000	$0	
C2B	$62,040,600	$61,730,600	$310,000	
C3	$33,344,378	$32,589,272	$755,106	
C4B	$1,381,443	$1,381,443	$0	
C4C	$63,923,840	$63,923,840	$0	
C5B	$30,186,000	$30,186,000	$0	
C5C	$36,286,320	$36,286,320	$0	
C6	$36,952,000	$36,952,000	$0	
TOTAL	$361,500,699	$360,435,593	$1,055,106	

The changes in Executed AWO Values for each construction contract reported through December 2016 are summarized as follows:

Const. Pkg.	Executed AWOs			
	Dec-16	Nov-16	Period Δ	Changes this Period
Completed Packages	$47,612,118	$ 47,612,118	$0	26 AWOs were approved, awarded and negotiated in December 2016.
C2A	$47,615,409	$ 47,615,409	$0	
C2B	$56,617,701	$ 54,579,182	$2,038,519	
C3	$33,344,378	$33,041,493	$302,885	
C4B	$1,381,443	$1,381,443	$0	
C4C	$58,076,396	$ 54,128,995	$3,947,402	
C5B	$22,163,816	$ 22,163,816	$0	
C5C	$27,140,799	$24,080,799	$3,060,000	
C6	$17,948,379	$ 17,274,509	$673,870	
TOTAL	$311,900,440	$301,877,764	$10,022,676	

Concerns and Recommendations: None at this time.

5.4 Project Funding

Status:

Total Federal participation is currently $1,373,892,821. All funds have been appropriated and obligated. Grant status is shown in Table 5-3 below.

Table 5-3: Appropriated and Obligated Funds (Federal)

Grant Number	Amount ($)	Obligated ($)	Disbursement ($) through December 31, 2016
NY-03-0397	$4,980,026	$4,980,026	$4,980,026
NY-03-0408	$1,967,165	$1,967,165	$1,967,165
NY-03-0408-01	$1,968,358	$1,968,358	$1,968,358
NY-03-0408-02	$24,502,500	$24,502,500	$24,502,500
NY-03-0408-03***	0	0	0
NY-03-0408-04****	0	0	0
NY-03-0408-05	$167,810,300	$167,810,300	$167,810,300

Grant Number	Amount ($)	Obligated ($)	Disbursement ($) through December 31, 2016
NY-03-0408-06	$274,920,030	$274,920,030	$274,920,030
NY-03-0408-07	$237,849,000	$237,849,000	$237,849,000
NY-03-0408-08	$197,182,000	$197,182,000	$197,182,000
NY-03-0408-09	$186,566,000	$186,566,000	$155,005,067
NY-03-0408-10	$123,384,621	$123,384,621	0
NY-17-X001-00	$2,459,821	$2,459,821	$2,459,821
NY-36-001-00*	$78,870,000	$78,870,000	$78,870,000
NY-95-X009-00	$25,633,000	$25,633,000	$25,633,000
NY-95-X015-00	$45,800,000	$45,800,000	$45,800,000
Total	$1,373,892,821	$1,373,892,821	$1,218,947,267

*Grant issued to outline components of the Early Systems Work Agreement. **Grant issued to explain the "Total Eligible" cost for the project.
*** Denotes American Recovery and Reinvestment Act (ARRA) funds.

Total project distribution as of December 31, 2016 is $4,201,642,399 of which $2,982,695,132 is local funds and $1,218,947,267 is federal funds.

Observation and Analysis:

The New York State Legislature has agreed to fund the remaining three years of MTA's 2010 – 2014 Capital Program which will provide adequate funds to support the SAS Phase 1 Project's current working budget.

Concerns and Recommendations: None

5.4.1 Overall Project Funding

Refer to Section 5.2 of this Report.

5.4.2 Local Funding

Refer to Section 5.2 of this Report.

5.5 Cost Variance Analysis

Status:

MTACC's current Cost Estimate (October 2016) indicate SAS Phase 1 can be completed within the CWB ($4.451B).

Observation and Analysis:

A comparison of the SAS project budget used for development of the original FFGA (June 2007) and the MTACC's Current Working Budget (CWB) for the project is summarized in the following table:

Category	Current Working Budget	EAC Forecast	Variance	% CWB
Total Construction	$2,674,814,299	$3,047,863,643.00	$373,049,344	13.9%
Engineering Services Subtotal	$622,862,000	$690,022,317.00	$67,160,317	10.8%
Third Party Expenses	$554,086,273	$556,586,000.00	$2,499,727	0.5%
TA Expenses	$131,160,085	$141,514,683.00	$10,354,598	7.9%
Contingency	$468,077,343			
Total	$4,451,000,000	$4,435,986,643	$453,063,986	

In terms of both percentage and actual cost, construction and engineering/professional services have been the major drivers of cost increase on the project.

Conclusions and Recommendations:

Construction cost growth can generally be attributed to incomplete or over-optimistic estimating during Preliminary Engineering and underestimating the potential for cost growth during the later phases of design. A significant component of Professional Services cost growth has been the extension of the construction phase of the project by two years, necessitating significant contract increases for both design and construction management services. The acceleration of construction contractions to achieve the December 30, 2016 revenue service date has also contributed to the cost variance.

5.6 Project Contingency

Status:

The ELPEP requires MTACC to maintain specific contingency funds in accordance with the following "achievement driven" schedule:

- $220M through 90% Bid and 50% Construction;
- A linear reduction in contingency from $220M to $140M through 100% Bid and 85% Construction; and,
- $45M from 100% Bid and 85% Construction through Start Up and Pre-Revenue Operations.

Observations and Analysis:

During 4Q2016, contingency changes included routine incorporation of AWOs into the individual projects and overall program reporting systems. The PMOC notes, that the Estimate-At-Completion (EAC) for contingency funds is significantly below the ELPEP agreement of $45M. As of December 2016 the unallocated contingency (Executive Reserve) was approximately $27M. The results of the current re-evaluation of the cost to complete the remaining construction, testing and final acceptance will likely exceed the remaining contingency.

	Contingency Analysis	
	Current	**@ Completion**
Phase 1 Budget	$4,451,000,000	$4,451,000,000
Construction Awards	$2,674,814,299	$2,674,814,299
Soft Cost Expended	$1,244,050,626	$1,207,669,341
Soft Cost Forecast to Complete	$144,429,300	$180,453,659
AWO	$311,900,440	$361,500,699
Total Allocated Contingency	$49,600,000	0
Reserved Contingency	$26,925,735	$15,013,357

Total Contingency = budget balance after forecast expenditures.

MTACC has not published a forecast of soft cost expense required to forecast the accelerated construction schedule initiative.

Absent any significant delay beyond December 2016, the PMOC concludes that SAS Phase 1 can be completed within the current MTACC CWB of $4.451B;

Concerns and Recommendations:

The PMOC is concerned that the allocated and reserved contingencies might not be adequate to cover the cost associated with the outstanding AWOs, inspection observations and ongoing testing activities subsequent to Revenue Service. The PMOC recommends that a cost to complete be performed and additional local funds be provided as required.

6.0 PROJECT RISK

6.1 Initial Risk Assessment

No change this period.

6.2 Risk Updates

Status:

No Risk mitigation meeting was held this period.

Observation and Analysis:

At this stage of the Project, these risks are well understood by senior SAS managers and their mitigation is the focus of almost all project management activity. Project risks are a primary focus of virtually all meetings.

Conclusions and Recommendations:

None.

6.3 Risk Management Status

Status:

MTACC has utilized the risk management process to identify major risks to project performance and develop mitigation plans to address those risks.

Observation and Analysis: None.

Conclusions and Recommendations: None.

6.4 Risk Mitigation

Status:

Delays to MTACC's schedule acceleration initiative remain the principal risks on the project. This initiative has significantly improved the probability of a timely completion to the project, however, certain risks remain.

Observation and Analysis:

Risks involving MTACC's schedule acceleration initiative have been classified as either management and organizational risk or technical and coordination risk. Remaining risks within each of these categories are summarized as follows:

Management and Organizational Risks		
Risk		**Status**
1.	MTACC's ability to implement its schedule acceleration program through compression of construction schedules.	Problems associated with this risk have been successfully managed by the project staff.
2.	Design and scope changes requested by NYCT during the late stages of construction.	MTACC continues to manage and mitigate this risk. However, the number of AWOs initiated has been significant and could be a major cost risk to the project.
3.	Availability of NYCT staff to support testing, commissioning, and final acceptance of work performed by SAS contractors	NYCT staff has supported testing and acceptance of the work. Management of this risk has been successful to date.

Management and Organizational Risks		
Risk		**Status**
4.	MTA code compliance reviews.	Code compliance staff has been supplemented and inspections are approximately are ongoing. Thousands of "observations" have been recorded in a database available to MTA and contractor personnel. Code issues that must be corrected before Revenue Service have been addressed. A list of items that must be addressed 60 days after Revenue Service is being monitored. Temporary Code Compliance Certificates were issued for each station on December 31, 2016.
5.	MTACC's ability to manage the change order process in a timely manner to avoid contractor delay.	Additional personnel have been assigned to each active contract to expedite and support the management of technical risk and any associated contract modifications. To date, management of this risk has been successful.
6.	NYCT's ability to conduct its pre-revenue familiarization and testing activities within the time period provided by MTACC.	NYCT personnel have completed the training required to support SAS Revenue Service.

Technical and Coordination Risks		
Risk		**Status**
1.	Systems testing and acceptance	Integration and testing of the fire alarm and selective communication systems will not be completed at all the stations. Mitigation measures have been implemented and found acceptable by Code Compliance.
2.	MTACC's current schedule management process appears to focus only on the systems completion and testing work.	Other remaining work, including the "observations" generated from NYCT inspections must be address before final system acceptance.

Conclusions

No outstanding risk remains that would impact Revenue Service

6.5 Cost and Schedule Contingency

6.5.1 Cost Contingency

Status: Refer to Section 5.4 of this report.

6.5.2 Schedule Contingency

Status:

MTACC no longer utilizes the IPS methodology in managing the SAS project schedule. IPS Update #115 (DD=3/1/16) was the last such schedule published by MTACC. As such, there is no singular schedule contingency available for the project.

Observations:

Based on the tabular test schedules provided by MTACC, there appears to be no schedule contingency remaining on the project.

Concerns and Recommendations:

Lack of schedule contingency indicates the project is vulnerable to delay. However the limited volume and scope of remaining work suggests any delay will be of limited duration.

6.5.3 Compliance Reviews:

Status:

During the 4Q2016 inspection of the various areas of the stations and ancillary facilities continued. These inspections (Compliance Reviews) were performed by four (4) separate NYCT units: Stations, System Safety, Code Compliance and Maintenance of Way. Observations noted during these inspections are compiled electronically and made available to all parties almost immediately. A top-level status report of open and closed observations is shown in the following table.

CONTRACT	NO. OPEN [TOTAL]	NO. OPEN [CRITICAL TO RSD + 60 DAYS*]	NO. CLOSED	TOTAL ISSUED
C2B (96th St. Station)	3,263	511	3,959	7,222
C3 (63rd St. Station)	2,390	524	7,432	9,822
C4C (72nd St. Station)	6,924	677	4,424	11,348
C5C (86th St. Station)	3,729	557	3,770	7,499
C6 (Systems and Track)	730	173	619	1,349
TOTAL	**17,036**	**2,442**	**20,204**	**37,240**

Observations:

The PMOC has noted the following:

1. The General Contractors are not taking full advantage of the early notification of incomplete or deficient work. The majority of the observations appear to be related to work performed by subcontractors, which minimizes the General Contractor's effort in completing the work.
2. Correcting the problems noted on the Observation Lists represent a significant amount of work. While much of the work may be completed after RSD, the cost associated with the effort will be significantly higher.

Concerns and Recommendations: The PMOC is concerned that both the CM and the General Contractors at each station are not devoting enough effort to resolving and closing observations.

The PMOC recommends that additional resources be applied, by both the CMs and the contractors, to correct the problems in a timely manner.

7.0 LIST OF ISSUES AND RECOMMENDATIONS

Priority in Criticality column 1 – Critical 2– Near Critical

Number with Date Initiated	Section	Issues/Recommendations	Criticality
		See report sections for specific recommendations.	1

8.0 GRANTEE ACTIONS FROM QUARTERLY AND MONTHLY MEETINGS

Priority in Criticality column

1 – Critical

2 – Near Critical

Number with Date Initiated	Section	Grantee Actions	Criticality	Projected Resolution
SAS-A18-Jun16	2.1.3 Construction	Four entrances to open at 63rd St. and Third Avenue prior to December 2016, but only after code compliance and system safety approvals. A Temporary Code Compliance Certificate for the 63rd Street Station was issued. The certificate was issued on December 31, 2016 and authorized occupancy and use of the station.	1	Closed
SAS-A19-Jun16	2.1.3 Construction	On SAS, the project staff works with the contractors and NYCT to complete parallel testing and NYCT actively participates in all phases of the testing process. The Project Executive noted that the certification process is being streamlined to reduce the time required for the required NYCT sign-offs. SAS staff is working with MTACC Quality group on this initiative. It was reported that a System Safety Certification letter was issued on December 29, 2016 which addressed the Certifiable Items List. PMOC has requested a copy of the letter. MTACC should obtain all test reports, material certifications, pictures, and inspection reports that serves as the body of evidence for each certifiable element.	1	Apr-1-2017
SAS-A20-Jun16	4.0 Project Schedule Status	FTA stated that they need assurance that the processes managing the acceleration program are focused on achievement of critical milestones. The Project Executive will arrange a meeting with FTA and the PMOC to show how SAS will achieve this goal. No specific Grantee Actions are noted at this time.	1	Ongoing

APPENDIX A — LIST OF ACRONYMS

AFI	Allowance for Indeterminates
ARRA	American Recovery and Reinvestment Act
AWO	Additional Work Order
BCE	Baseline Cost Estimate
BFMP	Bus Fleet Management Plan
CCM	Consultant Construction Manager
CD	Calendar Day
CMAQ	Congestion Mitigation and Air Quality
CPM	Critical Path Method
CPRB	Capital Program Review Board
CR	Candidate Revision
CSJV	Comstock Skanska Joint Venture
CWB	Current Working Budget
DC	Design Consultant
DOB	New York City Department of Buildings
EAC	Estimate at Completion
ELPEP	Enterprise Level Project Execution Plan
FAT	Factory Acceptance Testing
FD	Final Design
FEIS	Final Environmental Impact Statement
FIAT	Field Installation Acceptance Test
FIST	Facilities Integrated Systems Test
FFGA	Full Funding Grant Agreement
FTA	Federal Transit Administration
GC	General Contractor
HASP	Health and Safety Plan
HLRP	Housing of Last Resort Plan
IFP	Invitation for Proposal
IFB	Invitation to Bid
IPS	Integrated Project Schedule
LF	Linear Feet
MEP	Mechanical, Electrical, Plumbing
MTACC	Metropolitan Transportation Authority – Capital Construction
N/A	Not Applicable
NEPA	National Environmental Policy Act
NTP	Notice to Proceed
NYCDEP	New York City Department of Environmental Protection
NYCT	New York City Transit
NYSPTSB	New York State Public Transportation Safety Board
OCIP	Owner Controlled Insurance Program
PE	Preliminary Engineering
PMOC	Project Management Oversight Contractor (Urban Engineers)
PMP	Project Management Plan
PQM	Project Quality Manual

RAMP	Real Estate Acquisition Management Plan
RFMP	Rail Fleet Management Plan
RFP	Request for Proposal
RMCP	Risk Mitigation Capacity Plan
RMP	Risk Management Plan
ROD	Record of Decision
ROD	Revenue Operations Date
RSD	Revenue Service Date
SAS	Second Avenue Subway
SCC	Standard Cost Category
SCIT	Systems Commissioning and Integration Testing
SES	Systems Engineering Specialists
SIM	Systems Integration Manager
SIST	Simulated Integrated System Testing
SIT	Systems Integrated Testing
SOE	Support of Excavation
SSCP	Safety and Security Certification Plan
SSMP	Safety and Security Management Plan
SSOA	State Safety Oversight Agency
SSRA	Systems Safety and Reliability Assurance Program Plan
SOE	Support of Excavation
SSMP	Safety and Security Management Plan
SSOA	State Safety Oversight Agency
SSPP	System Safety Program Plan
TEAM	Transportation Electronic Award Management System
TF	Total Float (schedule)
TBD	To Be Determined
TBM	Tunnel Boring Machine
TCC	Technical Capacity and Capability Plan
TIA	Time Impact Analyses
UNO	Unless Noted Otherwise
WBS	Work Breakdown Structure
WD	Work Day
YOE	Year of Expenditure

APPENDIX B—PROJECT OVERVIEW AND MAP

Project Overview and Map – Second Avenue Subway

Scope

Description: The project will connect Manhattan's Central Harlem area with the downtown financial district, relieving congested conditions on the Lexington Avenue line. The current project scope includes: tunneling; station/ancillary facilities; track; signal; electrical work; vehicle procurement; and all other subway systems necessary for operation. The current phase, Phase 1 of 4, will provide an Initial Operating Segment (IOS) from 96th Street to 63rd Street, and will connect with the existing Broadway Line that extends to Lower Manhattan and Brooklyn. Subsequent phases will extend the line northward to 125th Street and to the southern terminus at Hanover Square in Lower Manhattan.

Guideway: Phase 1 is 2.3 miles long, from 63rd Street to 105th Street. It is a two-track project that is below grade in tunnels and does not include any shared use track.

Stations: In Phase 1 there are: two new mined stations located at 72nd and 86th Streets, one new cut and cover station at 96th Street, and major modifications of the existing 63rd Street Station on the Broadway Line.

Support Facilities: There are no additional support facilities planned for Phase 1 of the project.

Vehicles: MTA envisions the need for eight-and-one-half train sets to satisfy the Phase 1 operating requirements (7) and to provide sufficient spares (1½).

Ridership Forecast: Upon completion of Phase 1, ridership is expected to be 191,000 per average weekday (MTA's Regional Travel Forecast Model).

Schedule

12/20/01	Approval Entry to PE	06/12	Estimated Rev Ops at Entry to PE
04/18/06	Approval Entry to FD	03/14	Estimated Rev Ops at Entry to FD
11/19/07	FFGA Signed	06/30/14	Estimated Rev Ops at FFGA
03//17/15	Amended FFGA Signed		
12/30/16	Revenue Operations Date at date of this report (MTACC schedule)		
98.9%	Percent Complete Construction at December 31, 2016		
94.4%	Percent Complete Time based on Rev Ops Date of December 30, 2016		

Cost ($)

3,839 M	Total Project Cost ($YOE) at Approval Entry to PE (w/o Financing Costs)
3,880 M	Total Project Cost ($YOE) at Approval Entry to FD (w/o Financing Costs)
4,866 M	Total Project Cost ($YOE) at FFGA signed (w/ $816 M Financing Costs)
4,451 M	Total Project Cost ($YOE) at Revenue Operations (w/o Financing Costs)
5,267 M	Total Project Cost ($YOE) at date of this report including $816 M in Finance Charges
4,202 M	Amount of Expenditures at date of this report from Total Project Budget of $4,451 M
94.4%	Percent Complete based on Expenditures at date of this report
$76.6	Total Project Contingency remaining (allocated and unallocated contingency)

APPENDIX C – LESSONS LEARNED

There were no new Lessons Learned to report for 4th Quarter for 2016

#	Date	Phase	Category	Subject	Lessons Learned
1	Oct-09	Construction	Schedule	Delays to excavation caused by adjacent fragile buildings	The PMOC recommended and MTACC adopted a plan to review the stability of all of the buildings affected by the Second Avenue Subway project. MTACC instructed the DC to review all the buildings along the project. Furthermore, they have the designer developing shoring plans for the fragile buildings and including this work in the future contracts. In this way the stabilization work cannot delay the contracts as it is part of the contract.
2	Nov-09	Construction	Schedule	3rd Party Utilities changed the size of an electric vault after construction began.	The PMOC recommended that MTACC get the utility companies to agree that once they have approved the plans, they cannot make major changes after award. MTACC's SAS Project Executive is meeting with the utilities to work out this problem.

APPENDIX D – SAFETY AND SECURITY CHECKLIST

Project Overview			
Project mode (Rail, Bus, BRT, Multimode)	Rail		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Design and Construction		
Project Delivery Method (Design/Build, Design/Build/Operate/Maintain, CMGC, etc.)	Design/Bid/Build		
Project Plans	**Version**	**Review by FTA**	**Status**
Safety and Security Management Plan	7041.01.007308-0	11/15/07	Approved by FTA
Safety and Security Certification Plan	7041.01.007308-0 Appendix D		Certification by New York State Public Transportation Safety Board (NYSPTSB)
System Safety Program Plan			
System Security Plan or Security and Emergency Preparedness Plan (SEPP)			
Construction Safety and Security Plan		N	Each active construction contractor's Construction Safety and Security Program Plan has been approved by MTACC.
Safety and Security Authority			
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		NYSPTSB
Has the oversight agency reviewed and approved the Grantee's SSPP as	Y		The NYSTB issued a letter of recertification

Project Overview		
per Part 659.17?		of the MTA New York City Transit's Systems Safety Program Plan for 2015 on October 27, 2015.
Has the oversight agency reviewed and approved the Grantee's Security Plan or SEPP as per Part 659.21?		
Did the oversight agency participate in the last Quarterly Program Review Meeting?	N	
Has the Grantee submitted its safety certification plan to the oversight agency?	N	Certification is within the scope of the C6 Systems Contract.
Has the Grantee implemented security directives issues by the Department Homeland Security, Transportation Security Administration?	Y	
SSMP Monitoring	Y/N	**Notes/Status**
Is the SSMP project-specific, clearly demonstrating the scope of safety and security activities for this project?	Y	
Grantee reviews the SSMP and related project plans to determine if updates are necessary?	Y	
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	
Does the Grantee maintain a regularly scheduled report on the status of safety and security activities?	Y	Activity included in the monthly and quarterly reports from the Grantee and is reported at each contractor's Job Progress Meeting.

Project Overview		
Has the Grantee established staffing requirements, procedures and authority for safety and security activities throughout all project phases?	Y	Responsibilities during the design and construction phases identified
Does the Grantee update the safety and security responsibility matrix/organizational chart as necessary?	Y	
Has the Grantee allocated sufficient resources to oversee or carry out safety and security activities?	Y	
Has the Grantee developed hazard and vulnerability analysis techniques, including specific types of analysis to be performed during different project phases?	Y	Included in Appendix F of the SSMP
Does the Grantee implement regularly scheduled meetings to track to resolution any identified hazards and/or vulnerabilities?	Y	Frequency to be increased
Does the Grantee monitor the progress of safety and security activities throughout all project phases? Please describe briefly.	Y	Nine active construction contracts are being monitored daily by the CCM with oversight being performed by the grantee.
Does the Grantee ensure the conduct of preliminary hazard and vulnerability analyses? Please specify analyses conducted.	Y	Hazard and Vulnerability Analysis
Has the Grantee ensured the development of safety design criteria?	Y	Included in SAS project Design Criteria Manual
Has the Grantee ensured the development of security design	Y	Included in SAS project Design Criteria

Project Overview		
criteria?		Manual
Has the Grantee ensured conformance with safety and security requirements in design?	Y	Ongoing part of design review process
Has the Grantee verified conformance with safety and security requirements in equipment and materials procurement?	Y	Verification is ongoing with the procurement of equipment by the Station Contractors (C3, C2B, C4C, and C5C) and the Systems Contractor (C6).
Has the Grantee verified construction specification conformance?	Y	Reference Section D3.4 Construction Criteria Conformance of the SSMP
Has the Grantee identified safety and security critical tests to be performed prior to passenger operations?	Y	Reference Section D3.2 Certification Items List of SSMP
Has the Grantee verified conformance with safety and security requirements during testing, inspection and start-up phases?	Y	Certifiable elements have been identified. Verification of requirement will be performed as part of the certification process which includes factory acceptance testing, installation testing and integration testing. Efforts are ongoing.
Has the Grantee evaluated change orders, design waivers, or test variances for potential hazards and /or vulnerabilities?	Y	Part of formal configuration control process. Efforts are ongoing.
Has the Grantee ensured the performance of safety and security analyses for proposed work-arounds?	NA	

Project Overview		
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	Y	Referenced plans are being developed as part of the Systems Contract (C6).
Has the Grantee issued final safety and security certification?	N	Interim System Safety Certification issued 12/29/2016.
Has the Grantee issued the final safety and security verification report?	N	To be covered as part of the testing in Contract (C6)
Construction Safety		
Does the Grantee have a documented/implemented Contractor Safety Program with which it expects contractors to comply?	Y	
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	Reference sections 011150 Safety Requirements and 011160 Security Requirements of the Contract Terms and Conditions
Provide the Grantee's OSHA statistics compared to the national average for the same type of work?	The Lost Time Injury Rate and Recordable Injury Rate from the start of construction until November 30, 2016, are 1.43 and 4.04 respectively. The Bureau of Labor Statistics (BLS) national Lost Time Injury Rate is 1.8 and the Recordable Injury Rate is 3.2. The cumulative construction	The Bureau of Labor Statistics (BLS) national Lost Time Injury Rate is 1.8 and the Recordable Injury Rate is 3.2.

Project Overview		
	hours worked since project inception is 14,718,791 hours. Total lost time injuries since project inception is 105 and other recordable injuries are 192. The total number of recordable injuries is 297 (sum of lost time injuries and recordable injuries).	
If the comparison is not favorable, what actions are being taken by the Grantee to improve its safety record?	The Lost Time Injury Rate has been below the national average for the last twelve months and the Recordable Injury Rate has been above the national average for the last twelve months. Both rates are trending downward. Tool box meetings, stand-downs, increased training and monitoring of construction actives are being performed in order to highlight safety awareness. Safety issues are being discussed during the bi-weekly Job Progress Meetings.	
Does the Grantee conduct site audits of the contractor's performance versus required safety/security procedures?	Y	
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)	NA	
If shared corridor: has Grantee specified specific measures to address shared corridor safety concerns?	NA	
Is the Collision Hazard Analysis underway?	NA	
Other FRA required Hazard Analysis – Fencing, etc.?	NA	

Project Overview		
Does the project have Quiet Zones?	NA	
Does FRA attend the Quarterly Review Meetings?	NA	

APPENDIX E – ON-SITE PICTURES

(To be transmitted in a separate file)

Appendix F -- Core Accountability Items				
Project Status:		**Original at FFGA**	**Current**	**ELPEP**
Cost	Cost Estimate	$4,050M	$4,451M	$4,980M
Contingency	Unallocated Contingency	$555.554M	$100M	$45M
	Total Contingency (Allocated plus Unallocated)	$555.554M	$100M (June 2016)	$45M
Schedule	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018

Total Project Percent Complete	Based on Expenditures	94.4%
	Based on Earned Value	N/A

Major Issue	Status	Comments
Project Testing and Commissioning	Open	MTACC's ability to test and commission a system the size of the SAS Phase 1 Project in a reasonable time frame is a major concern. Lessons Learned from testing and commissioning of the 7 Line Extension Project will be implemented on the SAS project.
Accelerated Completion Schedule	Open	MTACC's accelerated schedule initiative is intended to provide an additional month of schedule contingency between construction completion and RSD. Progress has significantly increased however delays have been realized. Impact to RSD is TBD.

Date of Next Quarterly Meeting:	N/A

All data based on December 31, 2016 reporting.