

## **PMOC COMPREHENSIVE MONTHLY REPORT**

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

September 1 to September 30, 2016



PMOC Contract No. DTFT6014D00017

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

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Length of time on project: Five years on project for Urban Engineers

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## **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 3rd 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**

All construction is approximately 96.9% complete (overall project completion is approximately 92.1%) as of September 30, 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 is anticipated by the end of the fourth quarter 2016.
- 96th Street Station Finishes, Mechanical, Electrical, and Plumbing Systems and Ancillary Building and Entrances contract (Contract C2B). Efforts during this time frame focused on completing the installation and integration of the following systems: fire life safety; tunnel station smoke management; elevators; escalators; and heating, ventilation and air conditioning. Pre-Revenue Service Training is anticipated to start in October 2016, resulting in the start of Revenue Service on December 31, 2016.
- At the 86th Street Station (Contract C5B). Substantial Completion of all contract work was achieved on December 16, 2014. Contract closeout is ongoing.
- 86th Street Station Architectural and MEP (Contract C5C). Architectural finish work nears completion throughout the station. Installation of artwork began. Cleaning has begun at both the platform and public mezzanine areas. Level 3/4 testing continues throughout the station.
- 72nd Street Station Heavy Civil/Structural (Contract C4B). Achieved Substantial Completion on January 14, 2014. Contract closeout is underway.

- 72nd Street Station Finishes, MEP Systems, Ancillary Buildings and Entrances (Contract C4C). Escalators installation are complete in Entrances #1 and #2. At Entrance #3 all 5 elevator cabs have been delivered and installed. Level 3/4 testing is underway throughout the station.
- Rehabilitation of the 63rd Street Station (Contract C3). Architectural finishes in the 6th Mezzanine, Platform and Entrance #1 are approximately 98% complete. The focus now is on testing. Level 5 “Dry Run” Fire Alarm test was completed September 21, 2016, with no issues. However, the Final Fire Alarm test on September 27, 2016, was stopped because of issues with the system. The contractor is troubleshooting the problem and the test will be rescheduled.
- Track, Signal, Traction Power, and Communication Systems Contract (Contract C6). Installation of communications, traction power, and signal systems in all stations is ongoing. The major effort during this time period focused on the installation and subsequent integration of the fire alarm system with the other subsystems. Local area and wide area networks were completed at the 63rd, 72nd and 96th Street stations to allow installation testing and simulated integrated system testing to start on selected subsystems.

**d. Continuing and Unresolved Issues**

- MTACC’s schedule acceleration initiative has been fully implemented. The rate of construction has significantly increased. RSD will be achieved significantly earlier than if no action had been taken.
- AWOs continue to be generated at a significant rate. Forty (40) new AWOs were initiated this reporting period. Design changes may still pose a potential risk to the on-time completion of the project.
- Successful conclusion of system testing is “critical” to project completion. MTACC schedule forecasts are based on a very optimistic rate of successful test completion.
- Contractors are not availing themselves of the advance remaining work “observation lists” generated by NYCT inspections. An opportunity to reduce the overall duration required for punchlist type work is being largely ignored.

**e. New Cost and Schedule Issues**

- The Estimate-At-Completion (EAC) for contingency funds is significantly below the ELPEP agreement of \$45M. A significant expenditure (unforeseen at this time) could result in the need for supplemental funding above the current working budget of \$4.451B.
- Systems test schedules prepared by MTACC indicate there is no schedule “float” remaining. The risk of delay beyond the current December 30, 2016, RSD is significant.
- Significant schedule slippage was reported this period for Systems work. Delayed completion of this work has a significant risk of creating consequential project-level delays.

**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 generally demonstrated the technical capacity and capability to execute Phase 1 of the SAS project. With overall project completion at 92.1%, the Grantee has effectively managed the project during the construction phase and the start of the testing and commissioning phase. MTACC has demonstrated the effort and ability to respond to and resolve deficiencies.

**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 this reporting period 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 SAS Force Account Plan. The plan 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 New York City Transit (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 System Test Plan. 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 Systems 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:** Factory Acceptance Testing is ongoing with NYCT personnel performing test witnessing of selected equipment. Most FATs have been completed.

- **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 activity is ongoing. Some delays are occurring due to lack of availability of the Local Area Network (LAN).

- **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 activity is being impacted by the LAN not being available.

- **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:** No SIT activity has started.

- **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:** Final Systems Integration Testing has not started.

As a part of the schedule acceleration, test durations have been reduced and time available for testing has been compressed. Sequencing of tests has been revised that requires like systems to be tested in the three new stations almost concurrently. As a result, additional NYCT personnel to support this effort may be required.

## **h. Project Schedule**

During the 3Q2016, MTACC's schedule acceleration initiative was fully implemented at three new stations and throughout the project via the Systems Contract. The goal of this effort was to "substantially complete" construction on or about September 1, 2016 and provide additional schedule contingency for NYCT pre-revenue service startup activities. PMOC observations include:

- Although all construction was not completed by September 1, 2016, sufficient progress has been made to allow subsequent NYCT operational testing and training activities, using NYCT vehicles operating from the 63rd Street Station to the 96th Street Station to proceed concurrently with remaining construction work.
- NYCT has started its final testing and shake-out of all traction power, track and signal systems.
- MTACC has aggressively worked to mitigate delays and develop work-arounds to unavoidable situations. There is still a possibility of achieving the December 30, 2016 RSD; A partial opening of the stations may be needed, however.
- Opportunities to further compress the project schedule appear limited.
- MTACC must continue to resist changes in the work requested by end users and limit review and acceptance criteria to those contained within the construction contract documents.
- The PMOC is confident that all construction and testing can be completed within the risk-adjusted RSD of February 2018.

**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 still \$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 \$3,509,000,000. As of August 26, 2016, the Total Federal participation in the SAS Phase 1 Project of \$1,373,893,000 has been obligated.

MTA’s Estimate at Completion (EAC) and the PMOC’s analysis currently indicate that the SAS Phase 1 project can be completed within the limits of the Current Working Budget, assuming substantial completion of all construction and testing activities by December 30, 2016.

**Table 2: Project Budget/Cost Table**

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of September 30, 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	4,097.412	77.78
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	4,097.412	77.78
Total Federal	1,350.693	27.75	1,063.942	1,373.893*	1,350.693	24.60	1,204.934	22.87
Total FTA share	1,300.000	96.25	990.049	1,300.000	1,300.000	23.68	1,131.041	21.56
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	2,892.478	54.91
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 3<sup>rd</sup> Quarter 2016 have been summarized as follows:

Decrease	Increase
<ul style="list-style-type: none"> <li>▪ Implementation of MTACC’s schedule acceleration initiative has decreased the risk of significant delay to the scheduled December 30, 2016, Revenue Service Date.</li> <li>▪ NYCT’s schedule for pre-revenue operator training suggests there is significant contingency time available.</li> <li>▪ Installation of railroad systems (track, signals, traction power) is substantially complete and NYCT has commenced its pre-revenue activities for these systems.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Integration of the fire alarm system with the multiple life safety (fire control), access and communication systems has proven to be a major technical challenge that has not been completely resolved.</li> <li>▪ Available contingency funds have been reduced to a very low level, increasing the risk of a potential cost overrun.</li> <li>▪ There is virtually no schedule “float” remaining, increasing the risk of a schedule delay.</li> <li>▪ MTACC schedule forecasts for completion of systems testing are very optimistic. This increases the risk of a “delay” in completing this work.</li> </ul>

**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 give the FTA/PMOC greater insight into the risk, cost, and schedule elements of the project.

## **1.0 GRANTEE'S CAPABILITIES AND APPROACH**

### **1.1 Technical 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:

Test durations have been reduced and test sequencing now requires like systems to be tested in the three new stations almost concurrently.

Concerns and Recommendations:

There is concern that overall schedule compression may result in additional testing compression, resulting in incomplete testing or documentation of successful testing. The PMOC recommends an ongoing review of the short-term testing schedule against the approved testing plan to ensure completeness of test 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 September 30, 2016, New York City Transit (NYCT) Engineering Force account expenditures are \$72,291,881 of the \$95,400,000 budget. NYCT labor expenditures are \$17,861,081 of the \$25,600,000 budget.

Observation:

The Force Account requirements are documented in the SAS Force Account Plan. 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.

The Force Account budget appears to be adequate and has not changed in Revision 10 of the SAS Cost Estimate. The Force Account budget appears to be adequate and has not changed in Revision 10 of the SAS Cost Estimate. 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 ability of NYCT to supply force account personnel for the SAS project has been a concern and has been identified in the SAS Risk Register. Reduced demand as a result of the completion of other major capital projects has made additional resources available.

**d) Grantee's Approach to Safety and Security Plan**

Status:

During the 3Q2016 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 August 31, 2016, is 1.47 and 4.15, 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 13,967,290 hours. Total lost time injuries since project inception is 103 and other recordable injuries are 187. The total number of recordable injuries is 290 (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: None

**f) 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 Policies 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 3Q2016, 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 September 2016, the Second Avenue Subway Quality Management team continued to conduct Quality Meetings of the Contractor with 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, and participated in Preparatory Phase Meetings for numerous construction processes.

The following issues on the C2B, C3, 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:

- Inspection Checklists not submitted for the following mechanical and electrical work: dry fire stand pipe and wet stand pipe; domestic water piping; through penetration fire-stopping; duct work activities; pumps; fans and MCC and fan coil unit;
- Submittals of Quality Work Plans (QWPs) for approvals are delayed;
- Lack of scheduling and conducting Preparation Phase Meeting (PPM) for tree planting and elevator activities;
- Lack of supervision for all activities;
- Material receiving inspection is not available for review;
- Some electrical and mechanical issues are not documented and resolved. Some nonconformance reports (NCRs) are not written for nonconforming electrical and mechanical work that is documented on the Observation List;

- Water Leaks – Multiple locations are still leaking; and,
- Poor quality welds performed on site during assembly of stainless steel members at entrances #3 and #2 Canopy. It took the contractor 3 ½ months to initiate an NCR.

**C3:** There has been no effort to close nonconformance reports or enter Daily Inspection Reports into the CM System:

- No Daily Inspection Reports have been entered into the CM System since July 2016; and,
- No nonconformance reports have been closed since January 2016.

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

- Revise and Resubmit (R&R) submittals are delinquent (currently 21);
- The contractor was told to finalize its report on Bond Beams by September 7, 2016. The report has not been received; and,
- The contractor has not issued a close-out letter for high strength bolts although all bolts have all been installed and inspected.

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

- NCRs – concrete analysis (37 are open) is pending for past 3 months;
- Non-concrete NCRs (38) are not being resolved in a reasonable time;
- Field supervision is not sufficient, Examples are – stairs, electricals, hvac, plumbing, wall cladding, and architectural finishing;
- Checklists of many activities are delayed and not complete;
- Submittals (Revise and Resubmit) are pending for resubmission; and,
- Submittal of many as built drawings are pending.

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

<b>Contract Package C2B</b>	
<b>Status:</b>	Through September 30, 2016, a total of 180 NCRs have been issued. One hundred sixty-four (164) have been closed and 16 NCRs are open. In September 2016, five new NCR's were written and 23 were closed. The NCRs closed in September were for concrete that was out-of-specification. Eight (8) of the 16 open NCRs are for concrete that was out-of-specification.
<b>Observation:</b>	Bi-weekly Quality Management Meetings, as suggested by the PMOC, are being held. Submittal of Daily Inspection Reports is 1½ weeks behind.
<b>Concerns and Recommendations:</b>	Four of the nine open non-concrete NCRs are more than one year old. Several months ago, the PMOC had recommended that CTJV establish a target date for closure of each NCR. They have done this. However, every time the NCR log is issued, the dates continue to slip, thus they are unrealistic. The PMOC suggested that the SAS C2B and CTJV

	Quality Managers discuss each NCR and come up with realistic closure dates. New dates have been established and range from mid-July to mid-August 2016.
<b>Contract Package C3</b>	
<b>Status:</b>	Through September 30, 2016, a total of 131 NCRs have been issued. One hundred twenty (120) have been closed and eleven are still open. In September 2016, one new NCR was written and none were closed.
<b>Observation:</b>	Submittal of Daily Inspection Reports is nine weeks behind.
<b>Concerns and Recommendations:</b>	In the beginning of September 2016, the contractor's Quality Manager suddenly resigned. The contractor assigned an individual who had previously served as the Quality Manger on this contract to be his replacement. Although this individual is capable, no Daily Inspection Reports have been entered into the CM System since July 22, 2016. In addition, no nonconformance reports have been closed since January 2016. The PMOC recommends that MTACC's quality management resolve this situation with the contractor's management immediately.
<b>Contract Package C4C</b>	
<b>Status:</b>	Through September 30, 2016, a total of 253 NCRs have been issued. One hundred eighty-one (181) have been closed and 72 NCRs are still open. In September 2016, 10 NCRs were written and 15 were closed.
<b>Observation:</b>	Two hundred (200) of the 253 NCRs are for concrete that was out of specification. One of the ten NCRs generated in September 2016 were for concrete. Forty-four (44) of the remaining 72 open NCRs are for concrete that was out of specification. The contractor prepared a statistical concrete analysis and 12 of the 15 NCRs that were closed in September 2016 were for concrete that was out of specification. Submittal of Daily Inspection Reports is two weeks behind.
<b>Concerns and Recommendations:</b>	The PMOC is concerned that there are still 72 open NCRs and recommends that a target date be established for closure of each NCR.
<b>Contract Package C5C</b>	
<b>Status:</b>	Through September 30, 2016, 335 NCRs have been issued. One Hundred sixty (160) have been closed and 75 NCRs are still open. In September 2016, 12 new NCRs were written and 6 were closed.
<b>Observation:</b>	Thirty-seven (37) of the 75 NCRs that are open are for concrete that is out of specification. Submittal of Daily Inspection Reports is one week behind.
<b>Concerns and Recommendations:</b>	The PMOC recommended that the contractor prepare a concrete statistical analysis in September 2016 to close those NCRs that passed the 56-day break. The contractor's Program Manager then directed the contractor's Quality Manager, to prepare the analysis but he did not.

	The PMOC also continues to recommend that the contractor establish a schedule for closing the 38 non-concrete NCRs and devote the necessary effort to resolving the issues listed in the beginning of this section.
<b>Contract Package C6</b>	
<b>Status:</b>	Through September 30, 2016, a total of 72 NCRs have been issued. Fifty (50) NCRs have been closed and 22 are still open. In September 2016, no new NCRs were written and none were closed.
<b>Observation:</b>	Eleven (11) of the open concrete NCRs are for concrete that was placed beyond the 90 minute time limit. The cause for the concrete NCRs that were placed beyond the 90 minute time limit was due to trucks that were delayed getting to the site due to heavy traffic. A concrete statistical analysis was prepared and approved in September 2016 for the 11 open concrete NCRs and these should be closed in October 2016. Submittal of Daily Inspection Reports is current.
<b>Concerns and Recommendations:</b>	The PMOC has no concerns.

Concerns and Recommendations:

Discussed under each Contract Package

### 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.

**Table 1-1: Standard Cost Categories**

<b>Std. Cost Category (SCC)</b>	<b>Description</b>	<b>FFGA (January 2008)</b>	<b>FFGA Amended (March, 2015)</b>	<b>MTA's Current Working Budget (June, 2016)</b>
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	\$1,654,647,928
30	Support Facilities	\$0	\$0	\$0
40	Site Work & Special Conditions	\$276,229,000	\$793,118,232	\$878,871,887
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	\$1,187,398,615
90	Unallocated Contingency	\$555,554,000	\$544,441,174	\$46,384,602
Subtotal		\$4,050,000,000	\$4,758,000,000	\$4,451,000,000
Financing Cost		\$816,614,000	\$816,614,000	\$816,614,000
<b>Total Project</b>		<b>\$4,866,614,000</b>	<b>\$5,574,614,000</b>	<b>\$5,267,614,000</b>

Table 1-2 lists the associated grants in the Transit Award Management System (TrAMS) with respective appropriated, obligated, and disbursed amounts as of September 30, 2016.

**Table 1-2: Appropriated and Obligated Funds**

<b>Grant Number</b>	<b>Amount (\$)</b>	<b>Obligated (\$)</b>	<b>Disbursement (\$) through September 30, 2016</b>
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
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	\$140,991,990
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
<b>Total</b>	<b>\$1,373,892,821.00</b>	<b>\$1,250,508,200.00</b>	<b>\$1,204,934,190.00</b>

\*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, 2012 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.

Concerns and Recommendations: None.

### **1.2.6 Project Safety and Security**

Status:

The Lost Time Injury Rate and Recordable Injury Rate from the start of construction until August 31, 2016, are 1.47 and 4.15 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 13,967,290 hours. Total lost time injuries since project inception is 103 and other recordable injuries are 187. The total number of recordable injuries is 290 (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.

All construction contracts have been awarded and construction is 96.9% complete.

### **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. A meeting with FTA and MTACC will be scheduled to reconcile comments and generate a final report.



## **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**

Status:

All 10 construction contracts for the SAS Phase 1 Project have been awarded. Two contracts have been completed and closed-out. An additional three contracts have achieved Substantial completion and the close-out process is ongoing. Accomplishments during this reporting period on the eight open contracts are summarized as follows:

Observations:

Contract C-26005 (C2A) 96th Street Station Heavy Civil, Structural and Utility Relocation

- Substantial Completion was achieved on November 5, 2013, and;
- 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 is anticipated by the end of the 4Q2016.

### **Construction Progress near term Milestones**

During the 3Q2016 the Station Contractor's efforts were focused on completing equipment installation and starting integration testing of the critical systems required for Pre-Revenue Service Training. The critical systems are as follows:

- Fire Life Safety
  - Water Mist System: installation and pump control functional test completed; node testing to be performed as part of the Fire Alarm Integration Test;
  - Sprinkler System: installation and hydrostatic test completed; node testing to be performed as part of the Fire Alarm Integration Test;
  - Inergen System: installation and pipe pressure test completed; functional and discharge test required prior to node testing as part of the Fire Alarm Integration Test; and,
  - Dry Fire Standpipe: installation and hydrostatic test completed; acceptance and turnover pending completion of sound powered phones by the Systems contractor.
  
- Tunnel Station Smoke Management (TSSM) System
  - Axial Fans Ancillary #1: testing has progressed to the 100 hour test; and,
  - Axial Fans Ancillary #2; startup testing revealed a vibration issued with one of the fans which is being resolved.
  
- Elevators
  - Hydraulic Elevator (platform to mezzanine): installation completed; testing has progressed to controller testing which is scheduled to be completed October 7, 2016; and,
  - Hydraulic Elevator (Entrance #3 street to mezzanine): installation completed; testing has progressed to the completion of the hydraulic line pressure test.
  
- Escalators
  - Escalator Entrance #1 (Qty. 1): installation completed; testing has progressed to the skirt index test which is scheduled to start October 6, 2016 ;
  - Escalator Entrance #2 (Qty. 3): installation and brake testing has been completed for all escalators; ASMC mechanical testing to start the first week of October 2016;
  - Escalator Entrance #3 (Qty. 2): installation completed; testing has progressed to the skirt index test which is scheduled to start October 6, 2016; and,
  - Platform (Qty. 3): installation completed and skirt index testing of all escalators has started.
  
- HVAC
  - North: Air handling units, chillers, small/ large fans, fan coil units, chilled/condenser/glycol water pumps have been installed; water condenser pipes installed; pipe cleaning completed; condenser pipe pressure and chilled water pipe pressure tests completed; condenser/chilled water balancing and glycol balancing test to start October 1, 2016
  - South: Air handling units, chillers, small/ large fans, fan coil units, chilled/condenser/glycol water pumps have been installed; water condenser pipes

installed; pipe cleaning completed; condenser pipe pressure and chilled water pipe pressure tests completed; condenser/chilled water balancing and glycol balancing test to start October 1, 2016

Contract C-26006 – (C3) 63rdStreet Station Upgrade

▪ **General**

Four entrances are to be opened at 63rd St. and Third Avenue prior to December 2016, but only after code compliance and system safety approvals. The MTACC President will provide the opening date. [Ref: SAS-A18-Jun16]

The following chart identifies the work reported by the CCM as necessary to open the east side of the station to the public

<b>Work Item</b>	<b>Forecast Completion Date by contractor</b>	<b>Req'd to Open</b>
<b>Street Level</b>		
Install all stair entrance railings at street level	In progress – Just starting	X
Install limestone at top of plaza ancillary structure	Completed	
Demobilize from street		
Complete plaza leak remediation work and replace plaza lights, raise plaza plantings	Completed	
Complete sidewalk restoration at Lexington and 63rd street	Completed	
Complete / replace Entrance One boarder ceilings	Completed	
Install closure pieces at ancillary and aluminum soffits	In progress	
<b>Mezzanine 6</b>		
Perform corrective work at suspended ceiling	Completed	X
Complete installation of floor drains (AWO)	Completed	X
Complete all AFC railing/gate hardware	In progress: Only gate closure left	X
Install missing ceiling panels, beam soffits, and wall or column finishes	Completed	X
Complete all OL work at various rooms, inspect, and turn over	In progress	X

Work Item	Forecast Completion Date by contractor	Req'd to Open
Install escalator railings	Completed	X
Install pipe insulation for water mist and sprinkler	Completed	
Sovereign Grouting of Roof (AWO coming)	Completed	X
<b>Other Levels &amp; Systems</b>		
Complete installation of communication and UPS cooling, test, and commission the equipment	In progress	X
Test summer loop of HVAC	In progress now	
Perform remote shakedown of fans	Completed	
Complete Level 3 and 4 Testing of elevators	Completed	
Install elevator pit ladders (AWO)	Completed	X
Perform Lift Net test of escalators	Completed	X
Perform Level 5 testing of elevators	Completed	X
Perform Level 5 testing of escalators	Completed	X
Complete stair pressurization test	Completed	X
Perform testing of UPS	Pending Procedure review	X
Level 5 Test of Water Mist	Pending	X
Level 5 test of Inergen	Pending	X
Remove storage barricades and materials at Lexington Avenue end of station		
Perform NVD inspection		
Separations for Utility in stairs	In progress	X
Replace galvanized glycol piping in west HVAC room		
Complete tamper switch installations – six missing	Completed	X
Add / relocate Sprinklers as Required	In progress – complete by 9/24	
Complete missing exit sign conduit and boxes	Completed	

<b>Work Item</b>	<b>Forecast Completion Date by contractor</b>	<b>Req'd to Open</b>
<b>Platform Level Work</b>		
Complete installation of skins over service carrier	In progress	
Complete installation of porcelain panels over track	In progress	
Install elevator lobby ceilings and soffits	Completed	X
Install remaining ceiling and fins at platform ceilings		
Complete work on Link stairs	In progress	
Complete all railings on safety walks	In progress	
Complete all painting – tunnel areas		
Adjust platform rubbing boards to meet tolerances	In progress	
<b>General</b>		
Install all signage brackets and hangers	In progress	X
Provide all required SI reports		
Paint all fire stand pipe and sprinkler red	In progress	X
Close out all open NCR's		
Provide complete set of as-built drawings	In progress	
Submit all O&M Manuals	In progress	
Submit all test reports	In progress	
Complete all OL work	In progress	
Final cleaning	In progress	X
<b>AWO's</b>		
#288 – Special Light Fixture at Entrance #1 pylon	Completed	X

Contract C-26007 (C4B) 72nd Street Station Mining and Lining

Substantial Completion was achieved on January 14, 2014. Punchlist and contract closeout activities are ongoing.

Contract 26011 (C4C) 72ndStreet Station Finishes, MEP Systems Ancillary Buildings and Entrances

- **Ancillary #2/Entrance #2**
  - The terra cotta finish tile building facade installation continued on the east side of the structure and tile framing is complete on the south side; and,
  - At the Entrance #2, escalator work is complete.
- **Ancillary #1**
  - The incorrect tinted, vision glass has been removed and replaced with the correct tinted opaque glass;
  - All terra cotta wall tile exterior finish is approximately 95% complete; and,
  - Granite cladding of the exterior columns continues.
- **Mezzanine**
  - In the Public Mezzanine all Service Carrier lights have been installed and are illuminated;
  - Work continues in the Station Service Center; and,
  - Setting of granite floor tile nears completion in the Public Mezzanine.
- **Entrance #3 Elevator Bank**
  - All 5 Elevator cabs have been installed and are running; and,
  - Installation of exterior terra cotta wall tiles continue on the north, south, and west faces of the structure.
- **Entrance #1**
  - At the Entrance #1, framing for porcelain tile wall finish is being installed along the incline;
  - At the street Upper Mezzanine, wall tile cladding installation continues at interior and exterior entrance walls;
  - The final section of concrete sub-floor has been placed at the street Upper Mezzanine; and,
  - All 4 escalators have been installed.
- **Platform Level**
  - Water Mist piping is complete below the platforms, both sides;
  - Installation of the stainless steel open riser architectural stairs is complete;
  - Light fixture installation at the Service Carrier is complete and illuminated; and,
  - Signage installation is ongoing, including ADA Boarding signage.

Contract C-26008 (C5B): 86thStreet Station Cavern and Heavy Civil

- Substantial Completion was achieved on December 16, 2014. Contract closeout is ongoing.

## Contract C-26012 (5C) – 86thStreet Station Finishes, MEP Systems, Ancillary Buildings and Entrance

- **General**
  - North Shaft – Through September 30, 2016, the closure of the shaft was completed and street restoration resumed;
  - Finish work nears completion throughout the station; and,
  - The LAN/WAN networks have still not been installed at this station.
- **Ancillary #1**
  - The exterior tile and granite finish work has not begun, but is not needed for revenue service.
- **Ancillary #2**
  - The exterior tile and granite finish work has not begun, but is not needed for revenue service.
- **Mezzanine**
  - In the Public Mezzanine, the artists have begun installing artwork panels at the north end;
  - In the Public Mezzanine, granite tile installation is approximately 90% complete;
  - The glazing above the Public Mezzanine Service Carrier is complete;
  - AFC (Automatic Fare Collection) machine installations are complete in the north end of the Public Mezzanine;
  - Distribution of permanent power is complete throughout the Mezzanine. Permanent lights are operating; and,
  - Cleaning at the Mezzanine Level began September 30, 2016.
- **Entrance #1**
  - Wall framing for porcelain tile in the Entrance #1 Access Tunnel is complete. Arch light fixture installation is complete; and,
  - Ceiling finish work in Entrance #1 and up the escalator incline is complete.
- **Entrance #2**
  - Finish work is being completed at the Entrance #2 Mid-Level Mezzanine with installation of granite bases and porcelain tile wall cladding.
- **Platform Level**
  - Cleaning at the Platform Level, including the granite floor tiles, began and is ongoing;
  - Platform to Mezzanine escalator testing is complete; and,
  - Signage is complete at the platform level.

## Contract C-26009 (C6): Systems – Track, Power, Signals and Communications

During the 3Q2016 the Systems Contractor's efforts were focused on completing the installation and starting integration testing of the critical systems required for Pre-Revenue Service Training.

- **Track**
  - Track and third rail installation in all Zones has been completed.
- **Signal**
  - Signal installation and testing completed. In-service Bulletin issued.
- **63rd Street Station**
  - Communication Systems: Rooms: Contractor has completed the build out of the 4 communication rooms;
  - Signal Room(s): Build out and testing completed;
  - Circuit Breaker House: Work ongoing; and,
  - Fire Alarm Integration Test: On-going.
- **72nd Street Station**
  - Communication Rooms: Three (3) of five (5) communication rooms have been turned over. Work ongoing pending completion of survey report of stems other than the fire alarm;
  - Traction Power: Equipment has been delivered and installation is ongoing; and,
  - Pulling of signal cable from the tunnel to the Cable Termination Room was completed.
- **86th Street Station**
  - Communication and Signal Rooms: Contractor is awaiting room turnover;
- **96th Street Station**
  - Communication and Signal Rooms: Network and Public Address/Customer Information Sign (CIS) cabinets have been installed and rack to rack wiring is completed;
  - Communication: LAN and WAN completed and available for integration testing;
  - Traction Power Substation Rooms: Completed and is operational.

Concerns and Recommendations:

MTACC's schedule acceleration initiative has compressed the test activity such that it is a major concern of the PMOC. Mitigation plans need to be considered if there are test failures and regression testing needs to be performed.

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. No specific Grantee Actions are noted at this time. **[Ref: SAS-A19-Jun16]**



#### **2.1.4 Force Account (FA) Contracts**

Status:

As of September 30, 2016, New York City Transit (NYCT) Engineering Force account expenditures are \$72,291,881 of the \$95,400,000 budget. NYCT labor expenditures are \$17,861,081 of the \$25,600,000 budget.

NYCT has committed to have adequate force account personnel to support the construction, testing, and commissioning activities.

Observations:

Remaining budgets appear adequate to support the remaining activities of the project.

Concerns and Recommendations: None.

#### **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. 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.

Observation:

Station contractor's inability to complete the equipment installation and subsequent tests is having a major impact on the Systems Contractor's ability to integrate and test the interfaces.

Concerns and Recommendation:

Completion of system integration and acceptance testing must be completed prior to revenue operations. A meeting with FTA and MTACC will be scheduled to reconcile comments and generate a final report.

#### **2.2 Third-Party Agreements**

Status:

During the 3Q2016, the SAS Project Team continued its Interagency Coordination as defined in Section 12 of the SAS PMP.

Through September 30, 2016, \$59,132,965 of the \$91,586,273 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 awarded 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:

MTACC no longer maintains an Integrated Project Schedule (IPS). IPS update #115 (Data date March 1, 2016) was the last update issued by MTACC. As such, the current management of SAS Phase 1 generally resembles the management of five (5) independent (construction phase) projects. Construction/test progress is now provided by Netpoint fragnet schedules.

The last Netpoint fragnet schedules were based on a data date of September 2, 2016. Schedule management has evolved to the use of systems-based spreadsheets for tracking the progress of each test at each level through each station. The latest spreadsheets for TSSM, fire suppression, HVAC, elevators, escalators and systems for the SAS program were updated as of September 30, 2016.

**Table 4-1: Summary of Schedule Dates**

	FFGA (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

**Milestone Summary:** A report of updated remaining milestone schedule status was not provided this period.

**Testing Summary:** A summary of the testing updates grouped by station and communications-based system provided this period are included in the following table.

<b>Station Testing Summary</b>								
	<b>Lvl 3/4</b>		<b>Lvl 5</b>		<b>Lvl 6</b>		<b>% Comp.</b>	<b>Forecast Comp.</b>
<b>Tests</b>	<b>Req</b>	<b>Com</b>	<b>Req</b>	<b>Com</b>	<b>Req</b>	<b>Com</b>		
<b>96th Street Station</b>								
Elevators	42	23	11	0	8	0	38%	11/15/16
Fire Suppression	19	5	N/A		N/A		54%	11/4/16
HVAC	288	173	2	0	2	0	59%	11/11/16
TSSM	10	6	2	1	2	0	50%	10/11/16
<b>86th Street Station</b>								
Elevators	58	16	15	0	15	0	18%	12/23/16
Fire Suppression	19	6	N/A		N/A		32%	11/8/16
HVAC	256	146	2	0	2	0	56%	12/7/16
TSSM	10	4	2	0	2	0	29%	11/12/16
<b>72nd Street Station</b>								
Elevators	61	3	17	0	17	0	03%	12/1/16
Fire Suppression	18	6	N/A		N/A		33%	12/9/16
HVAC	250	89	2	0	2	0	35%	12/30/16
TSSM	10	7	2	0	2	0	50%	10/24/16
<b>63rd Street Station</b>								
Elevators	23	23	7	7	7	0	81%	10/14/16
Fire Suppression	23	23	N/A		N/A		100%	10/10/16
HVAC	167	160	2	2	3	3	96%	10/28/16
TSSM	10	10	2	2	2	2	100%	10/22/16

Communications Test Summary								
	Lvl 3/4		Lvl 5		Lvl 6		% Comp.	Forecast Comp.
Tests	Req	Com	Req	Com	Req	Com		
96th Street Station								
RMS	11	8	N/A		N/A		73%	10/24/16
CCTV	4	0	4	0	4	0	0%	11/22/16
CBDS	1	0	1	0	1	0	0%	11/5/16
Emergency Comm.	3	0	3	0	3	0	0%	11/22/16
Fire Alarm	4	1	4	0	5	0	8%	12/4/16
Intrusion	4	0	4	0	4	0	0%	11/1/16
Emergency Alarm	4	4	4	1	4	1	50%	11/5/16
Radio	7	1	10	1	10	1	11%	12/24/16
PA/CIS	4	0	4	0	4	0	0%	11/17/16
Cable	31	12	N/A		N/A		39%	10/6/16
Network	38	35	4	3	8	4	84%	10/25/16
Telephone	30	0	13	0	14	0	0%	10/28/16
Train Dispatch	1	0	1	0	1	0	0%	10/30/16
Fire Alarm Test					4	0	0%	1/1/17

**Source Schedule Comparison:**

MTACC no longer maintains an Integrated Project Schedule for SAS, Phase 1. As such, there is no comparison to be made between an IPS and individual contract-level source schedules. No contractor source schedules for IPS Update #115 were submitted by MTACC.

## 4.2 90-Day Look-Ahead

### Status:

The project is approximately 92.1% complete and is in the final stages of system testing and completion of architectural construction.

### Observations and Analysis:

Completion of life safety and vertical transportation systems testing activities is forecasted for multiple locations throughout the project site. Netpoint schedules generally do not include architectural finish activities.

Concerns and Recommendations: Refer to See Section 4.4 of this report.

## 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.

In general, completion of any outstanding station systems installation and testing will determine the completion date of individual stations and the overall project.

Concerns and Recommendations: Refer to Section 4.4 of this report.

### **Schedule Performance Indicators:**

#### **Activity Progress Monitoring:**

P6 schedules were used for this evaluation. These schedules are no longer being fully updated by the contractors. As such, this analysis has been discontinued.

#### **Earned Schedule Analysis**

The PMOC has attempted to develop performance metrics that can assist in evaluating MTACC’s schedule forecasts. In its periodic reports to the FTA, MTACC details the Budgeted Cost of Work Scheduled (BCWS) versus the Budgeted Cost of Work Performed (BCWP) for each active construction contract. At a summary level, the resulting “S-curves” compare planned versus actual performance and can identify and provide insight into performance trends and schedule forecasts. For each active construction contract, the following table compares the planned vs. actual monthly level of achievement in terms of value earned by completed construction work. This “earned value” can be used to estimate a variance in planned vs actual schedule performance. February 2016 is the latest month for which this information is available.



Value Earned			August-16				
	Contract \$ (x100K)	Plan \$ Earned	Actual \$ Earned	Plan Month for Actual \$ Earned	Months Ahead (+) or Behind (-)	Const Comp Date	Est. Const. Complete Date
C2B	\$324	\$324	\$308	Jul-15	-11.2	9/1/16	12/22/16
C3	\$176	\$176	\$173	Dec-13	-30.4	9/1/16	7/2/17
C4C	\$258	\$256	\$238	Jul-15	-11.7	9/1/16	12/27/16
C5C	\$208	\$208	\$182	Nov-15	-7.1	9/1/16	11/11/16
C6	\$261	\$261	\$230	Oct-15	-8.2	9/1/16	11/22/16
<b>TOTAL</b>	<b>\$1,227</b>	<b>\$1,225</b>	<b>\$1,131</b>	<b>Jul-15</b>	<b>-11.3</b>	<b>9/1/16</b>	<b>12/22/16</b>

Cost Variance = Plan \$ Earned – Actual \$ Earned

$$= \$1,225M - \$1,131M = \$94M$$

This summary level analysis suggests the following:

1. MTACC’s schedule acceleration initiative has maintained schedule over recent periods, but has not recovered time lost during the earlier periods, when progress was less than forecast.
2. Had the work progressed according to baseline “plans”, an additional \$94M worth of original contract work would have been performed as of August 31, 2016.
3. Construction represented by the remaining \$94M may be significant enough to limit the MTACC’s ability to fully open all stations by December 30, 2016.
4. During August 2016, none of the remaining contracts completed sufficient baseline construction to fully maintain the accelerated schedule.
5. By performing pre-revenue testing concurrently with remaining construction, MTACC has reduced the risk of extending construction and testing beyond the December 30, 2016, RSD.

#### 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 into late December 2016. As such, there is essentially no schedule

“float” remaining on the project. Combined with the fact that further schedule compression appears unlikely, the risk of some delay to the scheduled RSD of December 30, 2016 is high.

Evaluation of the “most critical path” suggests all necessary systems testing work will be completed in time to support a December 30, 2016, RSD. This analysis is limited to systems testing activities, which is the focus of MTACC’s schedule management effort.

The earned schedule analysis indicates the project may be capable of completing sufficient work to achieve the scheduled RSD. However, the nature and location of the remaining work may be significant in determining if opening a station or stations is feasible.

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. To date, PMOC cannot verify that this addendum has been issued.

FTA stated that it needs 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. **[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	FFGA Amended	MTA's Current Working Budget
		(January 2008)	(March, 2015)	(June, 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	\$1,654,647,928
30	Support Facilities	\$0	\$0	\$0
40	Site Work & Special Conditions	\$276,229,000	\$793,118,232	\$878,871,887
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	\$1,187,398,615
90	Unallocated Contingency	\$555,554,000	\$544,441,174	\$46,384,602
Subtotal		\$4,050,000,000	\$4,758,000,000	\$4,451,000,000
Financing Cost		\$816,614,000	\$816,614,000	\$816,614,000
<b>Total Project</b>		<b>\$4,866,614,000</b>	<b>\$5,574,614,000</b>	<b>\$5,267,614,000</b>

### Observation and Analysis:

Table 5-1 represents MTACC's most recent update, March 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.

### 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.

## 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 forecast to exceed the original FFGA by approximately 9% at completion and will be within the budget established by the amended FFGA.

<u>Estimate</u>	<u>Date</u>	<u>Construct</u>	<u>Eng./Prof Svs.</u>	<u>3rd Party Exp.</u>	<u>TA Exp.</u>	<u>Cont.</u>	<u>Total (1)</u>	<u>% FFG A</u>	
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% (5)	
CWB	Mar-16	\$2,674,494	\$681,643	\$562,086	\$132,881	\$402,296	\$4,453,400	110% (4)	
CTD	Sep-16	\$2,881,032	\$668,828	\$451,267	\$95,893		\$4,097,020	101%	
ETC(B)	Sep-16	\$82,646	<i>(construction - base contracts)</i>						0%
ETC(A)	Sep-16	\$84,186	<i>(AWO forecast to complete)</i>						0%
EAC	Sep-16	\$3,047,864	\$690,022	\$556,586	\$141,515		\$4,435,987	110% (2)	

\$15,013  
↑  
Est remaining contingency

Notes:

- (1) w/o any financing costs
- (2) Forecast cost growth since FFGA = 9%
- (3) Based on December 31, 2016 RSD;  
CTD as reported by MTACC through June 30, 2016
- (4) Assumes CWB includes all forecast soft cost increases
- (5) Amended FFGA includes commitment of \$708M local funding if necessary.

This comparison demonstrates that MTACC’s cost reporting and management processes and procedures are adequate for and responsive to the needs of the project. No new observations this period.

Concerns and Recommendations: None.

**5.2 Project Expenditures and Commitments:**

Status:

As of September 30, 2016, a summary comparison of the SAS Current Working Budget and expenditures is as follows:

Description	CWB	Expended	%
Base Construction	\$2,674,814,299	\$2,592,167,870	96.9%
Total Soft Cost	\$1,308,108,085	\$1,216,380,073	93.0%
Contingency	\$468,077,616	\$288,864,300	61.7%
<b>Subtotal</b>	\$4,451,000,000	\$4,097,421,243	92.1%

Observations:

Based upon financial expenditures reported by MTACC during September 2016, SAS Phase 1 is approximately 90.4% complete. The completion statuses of the active construction contracts through September 30, 2016, are based upon reported expenditures through that date, is as follows:

- C26002 (Tunnel Boring) – 100%;
- C26005 (96th Street Station) – 100%;
- C26010 (96th Street Station) – 96.6%;
- C26013 (86th Street Station) – 100%;
- C26008 (86th Street Station) – 99.6%;
- C26012 (86th Street Station) – 91.3%;
- C26006 (63rd Street Station) – 98.4%;
- C26007 (72nd Street Station) – 99.9%;
- C26011 (72nd Street Station) – 93.0%; and,
- C26009 (Systems) – 91.5%.

Aggregate Construction percentage Completion:

- 100% of all construction work is under contract;
- 96.9% of all base construction (not including AWOs) is complete; and
- 97.2% of all construction is complete. Using progress payments to estimate project completion introduces a lag of approximately one month.

Based upon cost data received from MTACC for March 2016:

- Value of construction in place this period = \$19,346,375;
- Estimated value of construction (base contract) remaining = \$82,646,429;
- Target construction completion = September 1, 2016; and,
- Number of Months remaining = 0

The PMOC notes that expenditures are generally representative of the level of completion of each project element.

Professional Service expenditures (as generally defined by SCC Category 80) during June 2016 totaled approximately \$8.5M. This rate of expenditure is generally within the range of cost anticipated by the current budget. At the current rate of expenditure, the existing budget should be sufficient to fund professional services into the 2Q2017.

Conclusions and Recommendations:

Refer to Sections 5.5 and 5.6, below.

**5.3 Change Orders**

Status:

As of September 30, 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
<b>C26002 (1)</b>	<b>100.00%</b>	<b>\$337,025,000</b>	<b>\$41,086,647</b>	<b>12.19%</b>	<b>\$41,086,647</b>	<b>12.19%</b>
C26005 (2A)	100.00%	\$325,000,000	\$47,615,409	14.65%	\$47,612,118	14.65%
C26010 (2B)	85.04%	\$324,600,000	\$63,299,694	19.50%	\$58,214,587	17.93%
C26006 (3)	94.71%	\$176,450,000	\$42,761,025	24.23%	\$30,483,188	17.28%
C26007 (4B)	99.93%	\$447,180,260	\$1,325,639	0.30%	\$1,325,639	0.30%
C26011 (4C)	73.36%	\$258,353,000	\$68,640,573	26.57%	\$41,534,934	16.08%
<b>C26013 (5A)</b>	<b>100.00%</b>	<b>\$34,070,039</b>	<b>\$6,525,471</b>	<b>19.15%</b>	<b>\$6,525,471</b>	<b>19.15%</b>
C26008 (5B)	99.63%	\$301,860,000	\$26,280,122	8.71%	\$21,586,813	7.15%
C26012 (5C)	64.84%	\$208,376,000	\$37,395,738	17.95%	\$29,293,626	14.06%
C26009(6)	69.51%	\$261,900,000	\$39,598,750	15.12%	\$26,184,210	10.00%
<b>TOTAL TO DATE</b>		<b>\$2,674,814,299</b>	<b>\$374,529,068</b>	<b>14.00%</b>	<b>\$303,847,233</b>	<b>11.36%</b>

**Bold type indicates completed contracts**

To date, approximately \$2,592,167,870 (96.9%) of all base contract construction work has been completed. As a percentage of work completed, the AWO exposure for these contracts is 14.0% and the executed AWO percentage is 11.4%. Based on performance to date, a forecast total of AWO expenditure in the range of approximately \$380M.

Observation and Analysis:

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

	<u>Executed AWOs</u>	<u>AWO Exposure</u>
<b>Sep-16</b>	\$303,847,233	\$374,529,068
<b>Aug-16</b>	\$296,651,203	\$367,440,496
Δ	\$7,196,030	\$7,088,572
Δ	2.43%	1.93%

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

Const. Pkg.	AWO Exposure			
	Sep-16	Aug-16	Period $\Delta$	Changes this Period
Completed Packages	\$47,612,118	\$ 47,612,118	\$0	Final values for Packages C1 and C5A as reported by MTACC.
C2A	\$47,615,409	\$ 47,615,409	\$0	No change reported this period.
C2B	\$63,299,694	\$ 63,021,985	\$277,709	Net increase is based on revised estimates for AWO #s 236, and initial estimates for AWO #s 246, 253, 257, 261, and 265.
C3	\$42,761,025	\$ 42,623,564	\$137,461	Net increase is based on revised estimates for AWO #s 223, 295, 307, 310, 319, 322, 323, 324, 325, 326, 329, and 330 and initial estimates for AWO #s 331 through 335.
C4B	\$1,325,639	\$ 1,325,639	\$0	No change reported this period.
C4C	\$68,640,573	\$ 67,692,096	\$948,477	Net increase is based on revised estimates for AWO #s 156, 182, 264, and 269 and initial estimates for AWO #s 261, and 273.
C5B	\$26,280,122	\$ 26,280,122	\$0	No change reported this period.
C5C	\$37,395,738	\$ 35,469,635	\$1,926,103	Net increase is based on revised estimates for AWO #s 152, 162, 175, 186, and 196 and initial estimates for AWO #s 132, 157, 171, 176, 180, 182, 183, 197, 198, 212, and 214.
C6	\$39,598,750	\$ 35,799,928	\$3,798,822	Net increase is based on revised estimates for AWO #s 92, 203, 206, 207, 208, 217, 222, and 224, and initial estimates for AWO # 198.
TOTAL	\$374,529,068	\$367,440,496	\$7,088,572	

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

Const. Pkg.	Executed AWOs			
	Sep-16	Aug-16	Period $\Delta$	Changes this Period
Completed Packages	\$47,612,118	\$ 47,612,118	\$0	Final values for Packages C1 and C5A as reported by MTACC.
C2A	\$47,612,118	\$ 47,612,118	\$0	No change reported this period.

Const. Pkg.	Executed AWOs			
	Sep-16	Aug-16	Period Δ	Changes this Period
C2B	\$58,214,587	\$ 56,960,587	\$1,254,000	Increase is based on execution of AWO #s 79, 192, 222, and 247.
C3	\$30,483,188	\$ 29,165,888	\$1,317,300	Increase is based on execution of AWO #s 276, 287, 293, 294, 296, 298, 302, 305, 308, 312, 316, 317, and 327.
C4B	\$1,325,639	\$ 1,325,639	\$0	No change reported this period.
C4C	\$41,534,934	\$ 37,315,004	\$4,219,930	Increase is based on execution of AWO #s 24, 231, 247, 250, 251, 252, 254, 259, 261, 262, 264, 270, 272, 274, 275, and 277.
C5B	\$21,586,813	\$ 21,586,813	\$0	No change reported this period.
C5C	\$29,293,626	\$ 28,921,826	\$371,800	Increase is based on execution of AWO #s 20, 161, 165, and 174.
C6	\$26,184,210	\$ 26,151,210	\$33,000	Increase is based on execution of AWO #s 222 and 224.
TOTAL	\$303,847,233	\$296,651,203	\$7,196,030	

A summary of AWOs initiated this period includes the following:

Contract	Description
C2B	A total of nine (9) AWOs were added this period. cursory inspection indicates eight (8) of these AWOs appear necessary to support start of revenue operations. One AWO may be questioned. MTACC has not assigned a value to any of these AWOs.
C3	A total of five (5) AWOs were added this period. cursory inspection indicates all AWOs appear necessary to support start of revenue operations. Preliminary estimate of the value of this work is less than \$1 million.
C4C	A total of eleven (11) AWOs were added this period. cursory inspection indicates ten (10) AWOs appear necessary to support start of revenue operations. MTACC has not assigned a value to all of these AWOs.
C5C	A total of eleven (11) AWOs were added this period. cursory inspection indicates all AWOs appear necessary to support start of revenue operations. MTACC has not assigned a value to all of these AWOs.
C6	A total of four (4) AWOs were added this period. cursory inspection indicates all AWOs appear necessary to support start of revenue operations. MTACC has not assigned a value to all of these AWOs.



MTACC, with support from NYCT, has generally demonstrated a disciplined and diligent approach to effectively negotiating additional work orders for a fair and reasonable price. Credits for deleted or reduced work scope are pursued aggressively.

Concerns and Recommendations: None at this time.

#### 5.4 Project Funding

Status:

Total Federal participation is currently \$1,373,892,821. Appropriated, obligated, and disbursed totals are shown in Table 5-3 below.

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

Grant Number	Amount (\$)	Obligated (\$)	Disbursement (\$) through September 30, 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
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	\$140,991,990
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
<b>Total</b>	<b>\$1,373,892,821.00</b>	<b>\$1,250,508,200.00</b>	<b>\$1,192,648,232.00</b>

\*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 September 2016 is \$4,097,412,244 of which \$2,892,478,054 is local funds and \$1,204,934,190 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:

Current forecasts indicate SAS Phase 1 can be completed within MTACC's CWB (\$4.451B) assuming all construction, testing, and user acceptance activities are complete on or around December 30, 2016. MTACC's last revision to this budget occurred in late 2015.

### 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.

Based on current information, MTACC's Current Working Budget of \$4.451B appears adequate, assuming no significant delays to project RSD are encountered.

## 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.

The independent analysis of contingency drawdown maintained by the PMO is generally consistent with that maintained by the SAS Project team and confirms it to be in compliance with the estimated minimum contingency balance of \$45,000,000.

### Observations and Analysis:

During 3Q2016, contingency changes included routine incorporation of AWOs into the individual projects and overall program reporting systems. Cost models maintained by both the PMOC and the SAS Project Team verify that the current contingency balance is greater than the Planned Balance and exceeds the ELPEP Required Balance.

	<b>Contingency Analysis</b>	
	<b>Current</b>	<b>@ Completion</b>
Phase 1 Budget	\$4,451,000,000	\$4,451,000,000
Construction Awards	\$2,674,814,299	\$2,674,814,299
Soft Cost Expended	\$1,207,669,341	\$1,207,669,341
Soft Cost Forecast to Complete	\$180,453,659	\$180,453,659
AWO	\$296,651,203	\$373,049,344
Total Contingency	\$91,411,498	\$15,013,357
Reserved Contingency	\$91,411,498	\$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:

This evaluation is based on a thorough review of construction contingency. Soft cost contingency is evaluated periodically and the analysis adjusted accordingly. At this time, it appears the total contingency is adequate to support completion of the Project.

## 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 delays have occurred. This risk remains a concern.
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.

<b>Management and Organizational Risks</b>	
<b>Risk</b>	<b>Status</b>
4. MTA code compliance reviews.	Code compliance staff has been supplemented and inspections are approximately 85% complete. Thousands of “observations” have been recorded in a database available to MTA and contractor personnel. To date, contractors have not taken advantage of these advance inspections to complete unfinished work and reduce final punchlists.
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.	<ul style="list-style-type: none"> <li>• NYCT’s schedule indicates adequate time is available for operator training.</li> <li>• NYCT’s schedule does not reference dispatch, station maintenance, or other similar staff which may require orientation and training.</li> <li>• This item remains open, but is not considered a major risk.</li> </ul>

<b>Technical and Coordination Risks</b>	
<b>Risk</b>	<b>Status</b>
1. Systems testing and acceptance	Two principal risks remain: <ul style="list-style-type: none"> <li>• Timely completion of all tests: MTACC’s schedule forecasts are based on a rate of successful test completion significantly greater than has been achieved to date.</li> <li>• Integration and testing of fire alarm and life safety systems: Integrating multiple systems with multiple control points continues to be a significant challenge.</li> </ul>
2. Permanent facility power.	While permanent facility power has been delivered to all stations, power distribution wiring is not complete. Critical computer equipment rooms remain without power to the protective cooling systems. Equipment damage due to overheating is a risk.
3. Traction Power	Supply of traction power to the third rail is not complete. However, adequate power is available for revenue service and NYCT reports any subsequent cut-in is not a significant problem.

<b>Technical and Coordination Risks</b>		
	<b>Risk</b>	<b>Status</b>
		This remains an open item but is currently not a significant risk.
4.	The development and approval of test procedures does not appear to be progressing satisfactorily. The risk that the project team will not be ready to test major elements of the project without delay appears to be significant.	Delays to development of Level 5 test procedures are identified in several station schedules. To date, none of these delays have been “critical” to station or project completion.
5.	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 that may be considered vital to station opening may not receive adequate, timely attention.

Conclusions

Significant risks remain for achievement of Revenue Service on December 30, 2016. Significant improvement in the rate of systems testing and acceptance appears to be needed.

**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 3rd Quarter 2016 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	NO. CLOSED	TOTAL
C2B (96th St. Station)	4,064	747	4,811
C3 (63rd St. Station)	4,559	2,961	7,520
C4C (72nd St. Station)	4,502	677	5,179
C5C (86th St. Station)	3,164	51	3,215
C6 (Systems and Track)	669	10	679
TOTAL	16,958	4,446	21,404

#### Observations:

The PMOC has noted the following:

1. Monthly monitoring indicates the number of new observations each month continues to exceed the number being closed.
2. 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.
3. 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.

Significant risks remain for both the successful execution of MTACC's accelerated construction schedule as well as overall achievement of Revenue Service on December 30, 2016.

## 7.0 LIST OF ISSUES AND RECOMMENDATIONS

Priority in Criticality column      1 – Critical 2– Near Critical

<b>Number with Date Initiated</b>	<b>Section</b>	<b>Issues/Recommendations</b>	<b>Criticality</b>
		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. The MTACC President will provide the opening date.	1	Oct-31-2016
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. No specific Grantee Actions are noted at this time.	1	Oct-31-2016
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	Oct-31-2016

## 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)		
96.9%	Percent Complete Construction at September 30, 2016		
94.5%	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
4,097 M	Amount of Expenditures at date of this report from Total Project Budget of \$4,451 M
92.1%	Percent Complete based on Expenditures at date of this report
\$99.6 M	Total Project Contingency remaining (allocated and unallocated contingency)

## APPENDIX C – LESSONS LEARNED

**There were no new Lessons Learned to report for 1<sup>st</sup> 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	3 <sup>rd</sup> 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**

<b>Project Overview</b>			
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		
<b>Project Plans</b>	<b>Version</b>	<b>Review by FTA</b>	<b>Status</b>
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.
<b>Safety and Security Authority</b>			
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

<b>Project Overview</b>		
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	
<b>SSMP Monitoring</b>	Y/N	<b>Notes/Status</b>
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.



<b>Project Overview</b>		
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

<b>Project Overview</b>		
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	

<b>Project Overview</b>		
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	To be covered as part of the testing in Systems Contract (C6)
Has the Grantee issued the final safety and security verification report?	N	To be covered as part of the testing in Contract (C6)
<b>Construction Safety</b>		
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 August 31, 2016 is 1.47 and 4.15 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	The Bureau of Labor Statistics (BLS) national Lost Time Injury Rate is 1.8 and the Recordable Injury Rate is 3.2.

<b>Project Overview</b>		
	worked since the project inception is 13,967,290 hours. Total lost time injuries since project inception is 103 and other recordable injuries are 187. The total number of recordable injuries is 290 (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?	<p>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.</p> <p>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.</p>	
Does the Grantee conduct site audits of the contractor's performance versus required safety/security procedures?	Y	
<b>Federal Railroad Administration</b>		
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	

<b>Project Overview</b>		
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**

<b>Project Status:</b>		<b>Original at FFGA</b>	<b>Current</b>	<b>ELPEP</b>
<b>Cost</b>	Cost Estimate	\$4,050M	\$4,451M	\$4,980M
<b>Contingency</b>	Unallocated Contingency	\$555.554M	\$100M	\$45M
	Total Contingency (Allocated plus Unallocated)	\$555.554M	\$100M (June 2016)	\$45M
<b>Schedule</b>	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
<b>Total Project Percent Complete</b>	Based on Expenditures	92.1%		
	Based on Earned Value	N/A		
<b>Major Issue</b>	<b>Status</b>	<b>Comments</b>		
<b>Project Testing and Commissioning</b>	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.		
<b>Accelerated Completion Schedule</b>	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.		
<b>Date of Next Quarterly Meeting:</b>		TBD		

All data based on September 30, 2016 reporting.