PMOC COMPREHENSIVE MONTHLY REPORT

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

December 1 to December 31, 2015

PMOC Contract No. DTFT6014D00017

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

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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. 002. 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 new ADA accessible stations will be constructed. The Second Avenue Subway will reduce overcrowding and delays on the Lexington Avenue line, improving travel for both city and suburban commuters, and provide better access to mass transit for residents of the far East Side of Manhattan. Stations will have a combination of escalators, stairs, and, in compliance with the Americans with Disabilities Act, elevator connections from street-level to station mezzanine and from mezzanine to platforms.

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

2. CHANGES DURING 4th Quarter 2015

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 throughout the construction phase of the project.

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 90.4% complete (overall project completion is approximately (84.3%) as of December 31, 2015. Summary progress for each contract is as follows:

- 96th Street Station Heavy Civil/Structural (Contract C2A) achieved Substantial Completion on November 5, 2013. Final volume of as-built drawings has been delivered. Contract closeout is ongoing;
- The 96th Street Station Finishes, Mechanical, Electrical, and Plumbing Systems and Ancillary Building and Entrances contract (C2B). Installation of permanent utilities on the west-side of 2nd Avenue is ongoing and is progressing well. Mitigation measures are being investigated to have all construction activity completed by September 30, 2016;
- At the 86th Street Station (Contract C5B). Substantial Completion of all contract work was achieved on December 16, 2014. Contract closeout is ongoing. Punchlist work, consisting of correcting the architectural finish in escalators inclines has been completed.
- 86th Street Station Architectural and MEP (Contract C5C). Architectural finishes continue throughout. MEP work continues in FPR, TPSS, Communication and electrical distribution rooms towards a March 2016 permanent power energization date.
- 72nd Street Station Heavy Civil/Structural (Contract C4B). Achieved Substantial Completion on January 14, 2014. Contract closeout is underway;
- The 72nd Street Station Finishes, MEP Systems, Ancillary Buildings and Entrances (Contract C4C). Fans have been delivered at set in place in Ancillary #2. The Ancillary #1 concrete structure has reached the roof and the parapet installation began. At Entrance #3 erection of the above grade structure continued.

- Rehabilitation of the 63rd Street Station (Contract C3). Architectural finishes in the 6th Mezzanine and Entrance #1 continued towards completion. Street restoration is complete and the restoration of the 63rd St/3rd Ave Plaza continues.
- The Track, Signal, Traction Power, and Communication Systems Contract (C6) continued installation of communications, traction power and signal systems in all station areas. Accelerated installation of the track and crossovers at the 72nd and 96th Street Stations has resulted in the critical path no longer being driven by track installation.

d. Continuing and Unresolved Issues

- Unresolved AWOs and the impact of the associated revisions to the work have always been problematic, but are becoming increasingly "critical".
- Access constraints at 87th Street have been addressed. The shaft is the primary access point for the delivery of equipment to and the removal of refuse from the various subsurface work areas. SAS Project Management has rescheduled activities at the 86th Street Station to allow the shaft to remain open to support the access requirements of all contractors.

e. New Cost and Schedule Issues

- If successful, MTACC's schedule "acceleration initiative" will advance the completion of all construction and testing activities from November 28, 2016 to November 3, 2016. The cost of adding this one month of schedule contingency is still to be determined.

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 84.3% 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 and supporting various test activities.

While some delays in technical submittal processing have been noted, the Design Engineering Consultant has generally provided adequate support to the project during the construction phase in a timely fashion. Design Engineering Consultant support is projected and 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. In support of the initiative to accelerate the schedule, NYCT has agreed to provide dedicated personnel, co-located with the project team, in order to address test and commissioning issues in a timely manner.

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 Phase 1 SAS 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 program 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 C-26012) 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 will be conducted in five phases: Pre-Installation Phase, Installation Phase, Integration Phase, Post-Station Construction Substantial Completion Phase, and System Acceptance Phase. Each phase will have 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.
- **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 with the installation of equipment at each station.
- **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 has started at the 63rd Street Station.
- **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; and,

- **System Acceptance Phase:** Final Systems Acceptance Testing 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 Programs 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 Acceptance Testing has not started.

The PMOC's previous concern about MTACC's process for the verification and validation of functional requirements has been addressed. Functional requirements as identified in the various sections of the specification are traceable to specific steps in the test procedures.

h. Project Schedule

During the 4th Quarter 2015 progress was made in advancing the project to a timely completion. MTACC continues to forecast a Revenue Service Date (RSD) of December 30, 2016.

- MTACC introduced its accelerated schedule initiative, which increases the chances of achieving the December 30, 2016 RSD goal;
- The overall project's record of achieving timely completion of intermediate construction goals (milestones) has not been satisfactory. Over the past twelve months, the project schedule has been maintained through resequencing and compression of downstream activities to overcome slower than planned construction progress;
- MTACC has diligently managed numerous construction delays encountered to date and prudently invested in schedule mitigation efforts rather than passively incurring delay costs. However the PMOC has noted situations where that other scheduled work activities have been deferred so contractors can pursue the more lucrative fast-tracked work opportunities. This has limited the overall effectiveness of the MTACC's schedule management efforts;
- 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. In support of the accelerated schedule initiative MTACC Management has made the commitment to minimize these changes, except in situations related to systems safety or fire and life safety. Additional work resulting from discretionary changes or subjective acceptance criteria can result in serious schedule delays late in a project; and,
- Despite these challenges, the PMOC believes that all construction 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	November 3, 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). The MTA Board has approved Local Funds totaling $3,509,000,000. Total Federal participation in the SAS Phase 1 Project is $1,373,893,000 of which $1,250,508,000 has been obligated. On March 17, 2015, the NYMTA and the FTA executed an amendment to the FFGA for Phase 1 of the SAS Project. With the execution of the amendment the restrictions on the distribution of funds from Grant NY-03-0408-9 were lifted.

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 within the overall time frame identified in the current Integrated Project Schedule (IPS). This evaluation does not include any additional cost that are part of MTACC's schedule acceleration initiative.

Table 2: Project Budget/Cost Table

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of December 31, 2015	
	$ 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	3,753.919	71.26
Financing Cost	816.614	16.78		816.614	816.614	15.50	3,753.919	71.26
Total Project Cost	4,050.000	83.22	4,572.942	4,758.000	4,451.00	84.50	3,468.732	65.85
Total Federal	1,350.693	27.75	1,063.942	1,373.893*	1,350.693	24.60	1,145.176	21.74
Total FTA share	1,300.000	96.25	990.049	1,3000.000	1,300.000	23.68	1,071.283	20.34
5309 New Starts share	1,300.000	100	990.049	1,3000.000	1,300.000	23.68	1,071.283	20.34
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	2,608.743	49.52
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 Transportation Electronic Award Management (TEAM) 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 4th Quarter 2015 have been summarized as follows:

Decrease	Increase
• MTACC's schedule acceleration initiative should decrease the risk of delay to the scheduled December 30, 2016, Revenue Service Date. • MTACC has devoted additional staff resources exclusively to the SAS Project to assist in expediting review and acceptance of work in the field and implementing contract modifications.	• Achieving the desired architectural finishes at the escalator inclined arches; Contracts C4C and C5C. Remedial work impacts escalator installation and site access for contractor workforce.

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

There was no ELPEP Quarterly Review Meeting held during the 4th Quarter 2015. The next ELPEP Quarterly Review Meeting with MTACC, FTA-RTI, SAS and ESA projects and the PMOC is scheduled for January 21, 2016. 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 PMP;
- **Schedule Management Plan (SMP)**: MTACC's position is that the SAS management processes remain ELPEP compliant. The PMOC is developing comments to MTACC's recently submitted Schedule Management Plan, Revision 2, dated October 2015;
- **Cost Management Plan (CMP)**: 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;
- **Risk Mitigation Capacity Plan (RMCP) and Risk Management Plan (RMP)**: MTACC's position is that the SAS management processes remain ELPEP compliant; and,
- **ELPEP Requirements:** The SAS Project Team has implemented the principles and requirements embodied in the ELPEP. The procedural changes triggered by the ELPEP have become an integral part of the management of the project and gives the FTA/PMOC greater insight into the risk, cost, and schedule elements of the project.

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1.0 GRANTEE'S CAPABILITIES AND APPROACH

1.1 Technical Capacity and Capability

1.1.1 Organization, Personnel Qualifications and Experience

Status:

Approximately 30 additional NYCT force account personnel have been added to support the accelerated construction, testing and commissioning activities.

Observation:

The SAS project team's technical capability has been enhanced with the additional force account personnel and should provide timely resolution of challenges encountered during the current phase of the project.

Concerns and Recommendations:

None.

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

a) Adequacy of Project Management Plan and Project Controls

Status:

Refer to "ELPEP SUMMARY" for any updated information.

Observation:

Refer to "ELPEP SUMMARY" for any updated information.

Concerns and Recommendations:

Refer to "ELPEP SUMMARY" for any updated information.

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

Status:

MTACC continues to utilize the ELPEP and its various sub-plans in management of the FFGA. A collaborative effort with FTA-RII and the MTACC to update the original ELPEP document, dated January 15, 2010, to reflect the current status of the SAS projects' scope, schedule and budget baselines is in progress.

Observation:

None.

c) Grantee's Approach to Force Account Plan

Status:

As of December 31, 2015, New York City Transit (NYCT) Engineering Force account expenditures are $60,526,981 of the $95,400,000 budget. NYCT labor expenditures are $12,888,269 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. In order to support the SAS project as it transitions into the testing and commissioning phase, additional NYCT force account personnel will be required.

Concerns and Recommendations:

The ability of NYCT to supply force account personnel for the SAS project is of concern and has been identified in the SAS Risk Register. There are three major capital projects currently vying for NYCT force account personnel. MTACC is currently developing a mitigation strategy. It is recommended that the strategy be expedited and presented to the FTA/PMOC.

d) Grantee's Approach to Safety and Security Plan

Status:

During the 4th Quarter 2015 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 of incidents, and performing quarterly safety audits. First aid, recordable and lost time incidents are reported, investigated and corrective action taken to address deficiencies and negative trends. The Lost Time Injury Rate and Recordable Injury Rate from the start of construction until November 30, 2015 is 1.67 and 4.52, 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 11,979,890 hours. Total lost time injuries since project inception is 100 and other recordable injuries are 171. The total number of recordable injuries is 271 (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), 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 construction 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

During the 4th Quarter 2015, MTA continued its grant management process by issuing monthly financial reports and updating the Transportation Electronic Award Management (TEAM) System to reflect disbursements from the active grants and status of pending grants. Starting in January 2016 grant management will be via the Transit Award Management System (TrAMS) which will replace TEAM.

b) Uniform Property Acquisition and Relocation Act of 1970

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

c) Local Funding Agreements

All local funds required for the SAS Phase 1 Project have been allocated. Funds totaling $2.964 billion were allocated in MTA's 2000-2004 and 2005-2009 Capital Plans. The balance of $1.487 billion to complete SAS Phase 1 was budgeted in the 2010-2014 Capital Plan. On April 28, 2010, the MTA Board approved the 2010-2014 Capital Plan. The Capital Program Review Board (CPRB) approved the plan on June 1, 2010. The MTA Board and CPRB approved amendments (latest July 2013) to the 2010-2014 Capital Plan and retained the $1.487 billion to complete SAS Phase 1.

1.2 Project Controls

1.2.1 Scope Definition and Control

Status:

During the 4th Quarter 2015, 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. 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 December 2015, the Second Avenue Subway Quality Management team continued to conduct Quality Meetings and Quarterly Quality Oversights 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.

Observations:

Project Quality Manual (PQM): The SAS Quality Manager prepared Revision 3 to the PQM that reflects the new MTACC QQO checklist requirements and other changes that have occurred since the last revision was issued. The PMOC is completing its review of the Final Draft and will return comments to the SAS Quality Manager in January 2016.

C2B: The C2B Contractor Quality Manager is not able to meet the dates he has committed to complete action items since he does not have sufficient staff capacity. Among the actions that keep slipping are:

- Preparation of a concrete statistical analysis is late;
- A Special Inspection Matrix has not been updated;
- Submittal of certifications from the Special Inspection Agency for completed work have not been received;
- Nonconformance reports that have been open for more than six months have not been closed and ; and,
- Submittal of Daily Inspection Reports is two weeks behind.

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

- Preparation of new submittals is behind schedule;
- Return of submittals that were sent back to the contractor are delayed;
- There is insufficient supervision for field activities;
- Performance of external Quality Audits are behind schedule;
- Preparation of a concrete statistical analysis is late;
- Record drawings at 50% completion has been delayed;
- Work is not ready for NYCT inspection;
- Preparation of a concrete statistical analysis is late;
- Submittal of Daily Inspection Reports is two weeks behind; and,
- The contractor's Quality Manager witnessed factory acceptance tests (FAT) for two weeks, further delaying some of the above issues.

Contract Package C2B	
Status:	Through December 31, 2015, a total of 141 NCRs have been issued. Ninety (90) have been closed and 51 NCRs are still open. In December 2015, four new NCRs were written and none were closed. Thirty-six (36) of the open NCRs are for concrete that was out-of-specification.
Observation:	Bi-weekly Quality Management Meetings, as suggested by the PMOC, are still being held. Submittal of Daily Inspection Reports is 2 weeks behind. The majority of the NCRs were for concrete that was placed beyond the 90 minute time limit.
Concerns and Recommendations:	Thirteen (13) of the open 15 non-concrete NCRs have been open more than six months. The contractor has established closure dates that are not realistic. The PMOC recommends that a realistic schedule for closure of the open NCRs be established. The contractor should then make an effort to meet these dates. The PMOC also recommends that effort be devoted to resolving the other issues listed in the beginning of this section.
Contract Package C3	

Status:	Through December 31, 2015, a total of 125 NCRs have been issued. Ninety-nine (99) have been closed and 26 are still open. In December 2015, 1 new NCR was written and one was closed.
Observation:	Eighteen (18) of the open 26 NCRs are due to concrete that was out of specification. Submittal of Daily Inspection Reports is current. The majority of the NCRs were for concrete that was placed beyond the 90 minute time limit.
Concerns and Recommendations:	The PMOC has no concerns at this time.
Contract Package C4C	
Status:	Through December 31, 2015, a total of 205 NCRs have been issued. One hundred fifty-two (152) have been closed and 53 NCRs are still open. In December 2015, nine NCRs were written and eight were closed.
Observation:	One hundred seventy-three (173) of the 205 NCRs are for concrete that was out of specification. Seven of the nine NCRs generated in December were for concrete. Submittal of Daily Inspection Reports is current. The majority of the NCRs were for concrete that was placed beyond the 90 minute time limit.
Concerns and Recommendations:	The PMOC encouraged the contractor to close concrete NCRs that had an approved statistical analysis and 32 closed NCRs in November and 7 in December were for concrete. Thirty-seven (37) of the remaining 53 open NCRs are for concrete that was out of specification. The PMOC recommends that another concrete statistical analysis be performed and submitted.
Contract Package C5C	
Status:	Through December 31, 2015, 157 NCRs have been issued. Sixty-nine (69) have been closed and 88 NCRs are still open. In December 2015, 12 new NCRs were written and two were closed.
Observation:	Forty-six (46) of the 88 NCRs that are open are for concrete that is out of specification. Submittal of Daily Inspection Reports is two weeks behind. The majority of the NCRs were for concrete that was placed beyond the 90 minute time limit.
Concerns and Recommendations:	The PMOC continues to recommend that the contractor establish a schedule for closing the 42 non-concrete NCRs and recommends that effort be devoted to resolving the issues listed in the beginning of this section.
Contract Package C6	

Status:	Through December 31, 2015, a total of 48 NCRs have been issued. Thirty-nine (39) NCRs have been closed and nine are still open. In December 2015, five new NCRs were written and two were closed.
Observation:	The contractor submitted Waiver #23 to extend the time of concrete placement from 90 minutes to 120 minutes. The Designer of Record did not approve this waiver and subsequently requested the contractor to prepare and submit an analysis of the concrete strength. Based on the results of the analysis, 15 concrete NCRs have been closed. Six of the nine open NCRs are for concrete that is out of specification. Submittal of Daily Inspection Reports is current.
Concerns and Recommendations:	The PMOC has no concerns.

Concerns and Recommendations:

As 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, 2007 A	March 20, 2007 A
Construction Complete	August 2016	November 3, 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

Std. Cost Category (SCC)	Description	FFGA (January 2008)	FFGA Amended (March, 2015)	MTA's Current Working Budget (September, 2015)
10	Guideway & Track Elements	$612,404,000	$195,346,781	$622,478,000
20	Stations, Stops, Terminals, Intermodal	$1,092,836,000	$1,666,605,679	$1,277,642,000
30	Support Facilities	$0	$0	$0
40	Site Work & Special Conditions	$276,229,000	$793,118,232	$524,561,000
50	Systems	$322,707,000	$250,379,966	$250,134,000
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	$1,185,742,929
90	Unallocated Contingency	$555,554,000	$544,441,174	$308,942,010
Subtotal		$4,050,000,000	$4,758,000,000	$4,451,000,000
Financing Cost		$816,614,000	$816,614,000	$816,614,000
Total Project		**$4,866,614,000**	**$5,574,614,000**	**$5,267,614,000**

Table 1-2 lists the associated grants in the Transportation Electronic Award Management (TEAM) System with respective appropriated, obligated, and disbursed amounts as of December 31, 2015.

Table 1-2: Appropriated and Obligated Funds

Grant Number	Amount ($)	Obligated ($)	Disbursement ($) through December 31, 2015
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	$81,233,681
NY-03-0408-10***	$123,384,621	0	0
NY-17-X001-00	$2,459,821	$2,459,821	$2,459,821
NY-36-001-00****	$78,870,000	$78,870,000	$78,870,000
NY-95-X009-00	$25,633,000	$25,633,000	$25,633,000
NY-95-X015-00	$45,800,000	$45,800,000	$45,800,000
Total	**$1,373,892,821.00**	**$1,250,508,200.00**	**$1,145,175,881.00**

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

Observation:

Total project distribution is $3,753,919,117 of which $2,608,743,236 is local funds and $1,145,175,881 is federal funds.

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. Publishing of monthly reports that document project risk management activities continues.

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.

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:

Safety – The Lost Time Injury Rate and Recordable Injury Rate from the start of construction until November 30, 2015 is 1.67 and 4.52, 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 11,979,890 hours. Total lost time injuries since project inception is 100 and other recordable injuries are 171. The total number of recordable injuries is 271 (sum of lost time injuries and recordable injuries).

Security – Implementation of the Contractor's Site Security Plans is ongoing. No security concerns noted during this reporting period.

Observation:

Data published by MTACC's Office of Quality, Safety, Site Security, and Certification shows the Lost Time Injury Rate to be below the national average for the last twelve months and the Recordable Injury Rate to be above the national average for the last twelve months. The Recordable Injury Rate is trending downward.

Concerns and Recommendations: None

1.3 FTA Compliance

Status:

MTACC remains compliant with all 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 on March 17, 2015.

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

The Amended FFGA was executed in March 2015.

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

All construction contracts have been awarded and construction is 90.3% complete.

1.3.2 Readiness for Revenue Operations

Status:

No change this period.

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 construction and test activities.

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 and third-party agency design changes during the construction phase continues as a significant risk to the overall project schedule. The SAS project staff has committed to minimize and prioritize the design changes to ensure that only necessary changes are incorporated and that their impact to construction cost and schedule is 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 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 G-26005 (C2A) 96th Street Station Heavy Civil, Structural and Utility Relocation

- Substantial Completion was achieved on November 5, 2013 and;
- The final volume of the "As Built" documents was submitted and contract closeout is ongoing.

Contract G-26010 (C2B) 96th Street Station Concrete, MEP/Finishes, Utilities, and Restoration

- **Station Area:** The Contractor continued the resolution of punchlist items associated with Milestone 10 which included; installation of conduits and grounding, pulling of cables; and water damage repairs. MEP activity throughout the area includes: installation of platform wall panel steel framing, installation of lighting fixtures, pulling of wires for power and communication systems, installation of dry fire standpipe, domestic water piping, water mist and inergen sprinkler systems, and installation of platform service carrier;
- **Ancillary #1 (NE corner 2nd Ave. and 93rd St.):** On going MEP activities include: conduit and fixture installation, installation of 4 axial fans for tunnel ventilation at the platform level, installation of plumbing pipe at upper platform, and installation of curtain wall supports;
- **Ancillary #2 (SW corner 2nd Ave. and 97th St.):** On going MEP activities include: conduit and fixture installation, duct installation at the floor and mezzanine levels, installation of the 2 cooling towers at the 4th floor level, installation of the fan coil unit and variable frequency drives at the 2nd floor level;
- **Entrance #1 (SW corner 2nd Ave. and 94th St.):** Architectural work is ongoing. Mechanical and electrical tasks associated with installation of the escalator E06 are continuing. Installation of balustrades, handrails, and steps are nearing completion. Conduit and fixtures are being installed;
- **Entrance #2 (NE corner 2nd Ave. and 94th St.):** Architectural work is ongoing. Mechanical and electrical tasks associated with installation of the escalators E07, E08 and E09 are continuing. Installation of balustrades, handrails, and steps is nearing completion. Conduit and fixtures are being installed; and,
- **Roof Level (92nd and 93rd Streets, 96th and 97th Streets):** The installation of all utilities nearing completion. Backfilling and street restoration is ongoing. Curb and asphalt installation is progressing on the west-side of 2nd Avenue.

Contract C-26006 – (C3) 63rd Street Station Upgrade

- **Area 5**
  - At the 6th Mezzanine porcelain tile cladding of the beams and walls neared completion. Stainless Steel column cladding and installation of Arts-N-Transit mosaic tile feature walls is complete.
  - Elevator cab and travelling cable installation is complete.
  - Installation of granite paving is complete in the Lower 6th Mezzanine.
- **Entrances (#1, #2, #3 & #4):**
  - At Entrance #1 the contractor has completed installation of the aluminum/glass storefront system and escalators, and is continuing with finish ceiling tiles in the entrance and escalator incline.
  - At Entrance #2 glazing of the headhouse nears completion.
  - At Entrances #3 and #4 exterior granite cladding is complete and interior wall tiles, granite base and stair tread nosings, and rails are complete.
- **G3 & G4 Platforms**:

- The Elevator Lobby elevator doors and frame installation is complete,
- The operable window frames and glass installations are complete.

- **Site:**
  - The Plaza restoration work continued. Granite clad planters facing installation continues.
  - Final street asphalt paving restoration has been completed.

- **Contract C6 Coordination:**
  - System testing continues throughout the station. The C6 contractor has advised that it plans to activate the network in a preliminary (unapproved) status to allow for LAN/ WAN and other system testing.

Contract G-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) 72nd Street Station Finishes, MEP Systems Ancillary Buildings & Entrances

- ***Ancillary #2/ Entrance #2***
  - 2 Cooling Towers have been set in place on the roof.
  - The installation of the channel supports for the architectural terra cotta building stone continued.
  - Fans have been delivered and set in place.
  - The contractor is continuing with sub-basement and basement level FPR electrical work.

- **Entrance #2**
  - Temporary cross beams for the escalators hoisting have been set in place.

- ***Ancillary #1***
  - Through December 2015 the final 5th Floor and roof were completed and erection of parapet walls began.
  - MEP work continued in the sub-basement and basement FRP rooms.

- **Mezzanine**
  - The damaged bullet resistant glass in the Station Service Center (SCC) has been replaced.
  - Construction in the Public Mezzanine of the W30 walls framing nears completion.
  - At the North & South Mezzanine MEP installation in Fan/ Chiller rooms is ongoing. Installation of the C1A ceiling panels is approximately 99% complete in the North Mezzanine.

- ***Entrance #3 Elevator Bank***

- Placement of the concrete walls for the upper street level structure continues.
- Bracing of the structural steel framing in the elevator bank shaft are complete.

- **Entrance #1**
  - The street access stairs to the upper mezzanine level are complete.
  - The street escalator has been set in place.
  - In the escalator incline the first arch/ wall concrete placement was completed and advances up the incline.

- **Platform Level**
  - Continuing with installation of the mezzanine to platform elevator.
  - Installation of the track wall tile is complete.
  - Installation of the tactile platform edge is complete.
  - Installation of Platform pavers is approximately 90% complete. Installation of the platform edge rubbing boards is complete.

- **C6 Coordination**
  - The C6 contractor continues with conduit, bus runs and terminations in the TPSS, FPR and various Communications and EDR rooms.
  - The contractor is advancing trackwork, third rail and signals through the station from south to north.

Contract G-26008 (C5B): 86th Street Station Cavern & Heavy Civil

- Substantial Completion was achieved on December 16, 2014. Contract closeout is ongoing; and
- The contractor has completed the remedial work to correct the architectural finish on the incline in Entrance #1.

Contract G-26012 (5C) – 86th Street Station Finishes, MEP Systems, Ancillary Buildings & Entrance

- **Ancillary #1**
  - At the above grade portion of Ancillary #1 wall and slab placement has advanced to the roof and preparations are underway to begin erecting parapet walls
  - MEP continues in FPR, TPSS, Communication and EDR rooms.

- **Ancillary #2**
  - Work continued with waterproofing, walls and slab construction up towards street level. The contractor continues to utilize 2 shifts in this zone.

- **Mezzanine**
  - Framing for the W30 walls nears completion;
  - Masonry erection is approximately 90%- 95% throughout;
  - Factory Acceptance Test (FAT) of the 8 axial fans is complete;
  - Mechanical and conduit work is ongoing in the Public Cavern and North Mezzanine;

- MEP work continues on the 1st, 2nd and 3rd Upper Mezzanines; and,
- Facility Power Room (FPR) wiring to switchgear is ongoing in both the north and south FPRs.

- **Entrance #1**
  - The FAT for the escalators is complete; and,
  - A revised MPT Plan is being prepared for E. 83rd St. and 2nd Ave. to allow for access to Entrance #1 to bring in the trusses for the long incline escalators.

- **Entrance #2**
  - Escalator installation is ongoing. This work has been proceeding very slowly and the contractor is increasing manpower to 5 crews; and,
  - Components for the street to mezzanine elevator have been delivered.

- **Platform Level**
  - Work in the machine rooms of the mezzanine to platform escalator continues;
  - Installation of main and branch conduits, including LAN & WAN continued in the Platform ceiling and Mezzanine Levels;
  - Service carrier installation work is ongoing on the Platform level;
  - Installation of doors & hardware is approximately 50% complete on the north and south platform rooms;
  - Installation of platform edge rubbing boards was completed on the northbound and southbound tracks; and
  - Installation of the porcelain tile trackwall cladding continues.

- **Site**
  - Utility work along 2nd Ave. between E. 82nd & E. 83rd Sts. was completed.

- **Schedule**
  - The new accelerated schedule is scheduled to begin January 4, 2016. This extends the work effort to 10 hours per day, 6 days per week and 2 shifts in both Ancillaries #1 and #2.

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

Track

- Track installation in Zones 12, 1, 2, 3, 5, 6, and 7 has been completed;
- Major procurements are completed and materials delivered to the project;
- Work is on-going in Zone 4 and Zone 8 (crossovers south and north of the 72nd Street Station respectively); and
- Track installation in Zones 10 and 11 will be accelerated to support the current CPM schedule and is expected to be completed by April 10, 2016, and May 2, 2016, respectively.

63rd Street Station

- Comm. Rooms: Contractor has completed the build out of the 4 communication. FIAT testing has resumed;
- Signal Room(s): Build out and testing completed;
- Wayside Installation: 98.0% complete;
- Circuit Breaker House: The upper level room has been built out as far as possible. Contractor is waiting for turnover of lower rooms (basement) of Circuit Breaker House in order to start cable pulling operations; and,
- Mezzanine Local Antenna Cable (area 5): Work commenced and has progressed up to but not including mezzanine 6. It has progressed as far as it can go.

72nd Street Station

- Tunnel Work (Zone 3): Contractor has completed the pulling of all fiber, communication, power and signal cables;
- Communication and Signal Rooms: Three of 5 communication rooms have been turned over. Equipment has been installed. Signal room has been turned over and equipment installed. CBH has been turned over and equipment installed. Cable pulling is ongoing;
- Traction Power: Equipment has been delivered and installation is ongoing; and,
- Pulling of signal cable from the tunnel to the Cable Termination Room was started.

86th Street Station

- Communication and Signal Rooms: Contractor is awaiting room turnover; and,
- Traction Power: Epoxy flooring has been reworked and equipment has been delivered. Pulling of rack to rack wire is ongoing.

96th Street Station

- Tunnel Work (Zone 2): All signal cable is pulled. Fiber and communication cable has gone as far as possible. Contractor needs Zone 11 rooms, conduits and tray to commence cable pulling in this area;
- Communication and Signal Rooms: Network and Public Address/Customer Information Sign (CIS) cabinets have been installed and rack to rack wiring is ongoing;
- Tunnel Work (Zone 1): Contractor completed all fiber, communication, power and signal cable pulling;
- Communication and Signal Rooms: Communication rooms are partially turned over and equipment installed; and,
- Traction Power Substation Room: Floor was repaired and subsequently passed hi-pot testing. The equipment was subsequently installed.

Concerns and Recommendations:

MTACC's schedule acceleration initiative should significantly increase the volume of work performed throughout the project.

2.1.4 Force Account (FA) Contracts

Status:

As of December 31, 2015, New York City Transit (NYCT) Engineering Force account expenditures are $60,526,981 of the $95,400,000 budget. NYCT labor expenditures are $12,888,269 of the $25,600,000 budget.

NYCT has committed to have the 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:

NYCT has developed a Concept of Operations Plan for the SAS Project. NYCT will validate SAS Phase 1 readiness during Pre-Revenue Service Operations Training and Testing scheduled from October 25, 2016 to December 15, 2016.

Observation:

The Technical Working Groups for Testing and Commissioning and Systems Safety Certification Program efforts are ongoing. Lessons Learned from the Testing and Commissioning of the Line 7 Extension Project are being implemented on the SAS Phase 1 Project.

Concerns and Recommendation:

The SAS Project Team needs to expedite the update of the Concept of Operations Plan to reflect how the stations will function with the deletion of the Customer Service Centers.

2.2 Third-Party Agreements

Status:

During the 4th Quarter 2015, the SAS Project Team continued its Interagency Coordination as defined in Section 12 of the SAS PMP.

Through December 31, 2015, $57,397,723 of the $91,586,000 Third-Party reimbursement budget (Rev. 10 Current Working Budget) has been spent.

Observation:

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

Concerns and Recommendation: None

2.3 Contract Packages and Delivery Methods

Phase 1 of the Second Avenue Subway is being delivered via ten separate construction packages. Each construction contract package utilizes the design-bid-build process based upon

a fixed price construction contract. Competitive procurements are based on NYCT standard procedures. There was no change to the procurement or delivery method for any of the construction packages during the 4Q2015.

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:

During the 4Q2015, MTACC Community Outreach activities included:

- Continued production of monthly newsletters updating residents and business owners on construction progress, major milestones achieved, and providing a forward looking schedule so the community will know what to expect as the project progresses. These newsletters are delivered electronically and via hard copy;
- The Community Outreach Team, in conjunction with the Manhattan Chamber of Commerce, produces a quarterly store report tracking the commercial vacancy on Second Avenue from 65th to 105th Streets. This report tracks store occupancy and allows comparisons over time and against other locations in the city;
- On October 21, 2015, the quarterly Construction Advisory Committee (CAC) meeting was held. Station area issues and project wide updates were discussed. Follow up reports were provided for stakeholders to share with their tenants/members;
- MTACC senior project management staff presented a SAS construction update to the Community Board 8 Second Avenue Subway Taskforce on September 24, 2015. This was part of a regular quarterly update that MTACC provides to CB8.

- In December 2015, SAS managers conducted quarterly Construction Advisory Committee (CAC) meetings in the Lexington Ave./63rd Street, 86th Street, and 96th Street Station areas. Station area issues and project wide updates are provided. Follow up reports are provided for stakeholders to share with their constituents.
- MTACC project executives conduct guided tours of the construction site on a periodic basis.

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 "ELPEP SUMMARY" 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:

MTACC has issued all the procedures required to effectively manage the SAS Phase 1 project.

Observations:

SAS Project team members have been trained in the various procedures issued by MTACC.

Concerns and Recommendations: None

4.0 PROJECT SCHEDULE STATUS

4.1 Integrated Project Schedule

Status:

The Integrated Project Schedule (IPS) is a management level schedule that integrates all ten construction packages along with design, procurement, startup and other support activities. IPS Update #113 is based on a Data Date of December 1, 2015.

IPS Update #113 is a hybrid schedule, consisting of the current status of work underway combined with forecasts and performance targets obtained from contractor summary schedules provided in their proposals as part of MTACC's "acceleration initiative". As such, IPS Update #113 may be considered a draft version of an accelerated schedule or MTACC's version of what an accelerated schedule might look like.

No narrative report or supporting contractor schedules were provided as part of this submittal.

IPS Update #113 forecasts the completion of all construction and NYCT Pre-Revenue Training & Testing activities by November 3, 2016. The available schedule contingency of 41 work days (WD) or 57 calendar days (CD) is then added, resulting in a forecast completion date of December 30, 2016. Table 4-1 presents a summary of schedule dates based on IPS Update #113.

Table 4-1: Summary of Schedule Dates

	FFGA (March 2015)	Forecast Completion	
		Grantee	PMOC
Begin Construction	January 1, 2007	March 20, 2007 A	March 20, 2007 A
Construction Complete	August, 2016	November 3, 2016	October 2017
Revenue Service	February 28, 2018	December 30, 2016	February 2018

Milestone Summary: A tabulation of current schedule performance against contractual milestones is presented in the following table.

Table 4-2: Schedule Milestone Performance

			Dates			Variance		Sch. Float 113	Float Δ
Pkg	MS	Description	Adjusted	UD#112	**UD#113**	Contract	Month		
C2B	6B	Full access to Comms. Rooms & Closets	08/21/14	11/30/15	**12/29/15**	-495	29	30	**27**
C2B	6C	Full access to Comms. Rooms & Closets	08/21/14	11/30/15	**12/29/15**	-495	29	30	**27**
C2B	7A	Full access to Signals Rooms	08/21/14	02/26/16	**02/26/16**	-554	0	2	**-6**
C2B	7B	Full access to Signals Rooms	08/21/14	02/26/16	**02/26/16**	-554	0	9	**1**
C2B	7C	Full access to Signals Rooms	08/21/14	02/26/16	**02/26/16**	-554	0	9	**-21**
C2B	8A	Full access to Traction Power Rooms:	08/21/14	11/16/15	**12/15/15**	-481	29	39	**28**

			Dates			Variance		Sch. Float	
Pkg	MS	Description	Adjusted	UD#112	**UD#113**	Contract	Month	113	Float Δ
C2B	8B	Full access to Traction Power Rooms:	08/21/14	11/16/15	**12/15/15**	-481	29	146	**-3**
C2B	8C	Full access to Traction Power Rooms:	08/21/14	11/16/15	**12/15/15**	-481	29	146	**-3**
C2B	9	Full access to Station Service Centers	11/21/14	12/21/15	**12/21/15**	-395	0	228	**-17**
C2B	10	Complete all remaining Comms, Signal, & Traction Power work	09/21/14	01/05/16	**01/15/16**	-481	10	138	**25**
C2B	SS	Substantial Completion	12/22/15	11/11/16	**10/14/16**	-297	-28	14	**3**
C3	SS	Substantial Completion	05/13/14	04/27/16	**04/28/16**	-716	1	135	**-18**
C4C	7A	Complete Work in all Comms. Rooms		03/16/16	**05/24/16**	-42514	69	113	**-64**
C4C	7B	Complete Work Ancillary #1		11/13/15	**12/21/15**	-42359	38	158	**-43**
C4C	12	Full access @Station Service Center(s)	08/28/14	11/20/15	**01/15/16**	-505	56	37	**-23**
C4C	SS	Substantial Completion w/o Ent. #1	11/13/15	11/28/16	**09/30/16**	-322	-59	35	**34**
C4C	SS	Substantial Completion - Ent. #1	10/07/16	09/15/16	**09/06/16**	31	-9	43	**-9**
C5C	6	Turnover of Comms. Rooms	03/24/15	11/18/15	**11/18/2015 A**	-239	0		
C5C	6A	Room-to-Room Conduit Ready	03/24/15	11/18/15	**11/18/2015 A**	-239	0		
C5C	11	Full access @Station Service Center(s)	03/24/15	01/06/16	**02/19/16**	-332	44	38	**-21**
C5C	15	Comp. Permanent Power		03/31/16	**03/31/16**	-42460	0	53	**-16**
C5C	SS	Substantial Completion	05/31/16	10/28/16	**08/30/16**	-91	-59	46	**26**
C6	2A	Complete LAN - 96th St. Station	05/18/15	03/03/16	**03/09/16**	-296	6	82	**-21**
C6	2B	Complete WAN - 96th St. Station	05/18/15	03/03/16	**03/09/16**	-296	6	82	**-21**
C6	3A	Complete LAN - 86th St. Station	07/18/15	04/20/16	**03/18/16**	-244	-33	86	**7**
C6	3B	Complete WAN - 86th St. Station	07/18/15	04/20/16	**03/18/16**	-244	-33	86	**7**
C6	4A	Complete LAN - 72nd St. Station	02/18/15	03/17/16	**03/14/16**	-390	-3	101	**-12**
C6	4B	Complete WAN - 72nd St. Station	02/18/15	03/17/16	**03/14/16**	-390	-3	101	**-12**
C6	5A	Complete LAN - 63rd St. Station	04/18/14	12/16/15	**01/15/16**	-637	30	150	**-27**
C6	5B	Complete WAN - 63rd St. Station	04/18/14	12/16/15	**01/15/16**	-637	30	150	**-27**
C6	5C	Complete all 63rd St. Station work	04/18/14	07/21/16	**04/22/16**	-735	-90	140	**48**
C6	SS	Substantial Completion	08/18/16	11/28/16	**11/03/16**	-77	-25	***0***	**0**

Milestone Summary: For contracts actively under construction, periodic progress of construction and schedule-related issues based on changes to contractual milestones includes the following.

1. Status of Milestones completed this update period (11/01/15 to 11/30/15):

Pkg	MS	Description	UD #112 Date	UD #113 Status
C5C	6	Turnover of Comm. Rooms	11/18/15	11/18/15 A
C5C	6A	Room-to-Room Conduit Ready	11/18/15	11/18/15 A

2. Milestones scheduled for completion during the next update period (12/01/15 to 12/31/15):

Pkg	MS	Description	UD #112 Date	UD #112 Float
C2B	8A	Full access to Traction Power Rooms:	12/15/15	39
C2B	8B	Full access to Traction Power Rooms:	12/15/15	146
C2B	8C	Full access to Traction Power Rooms:	12/15/15	146
C2B	9	Full access to Station Service Centers	12/21/15	228
C4C	7B	Complete Work Ancillary #1	12/21/15	158
C2B	6B	Full access to Comms Rooms & Closets	12/29/15	30
C2B	6C	Full access to Comms Rooms & Closets	12/29/15	30

3. Milestones with unusual schedule variances, generally defined as a forecast date change approximately equal to or exceeding the duration of the reporting period (30 CD) are listed in the following table:

Pkg	**MS**	**Description**	**UD #112**	**UD #113**	**Variance**
C4C	7A	Complete Work in all Comms. Rooms	03/16/16	05/24/16	69
C4C	12	Full access @Station Service Center(s)	11/20/15	01/15/16	56
C5C	11	Full access @Station Service Center(s)	01/06/16	02/19/16	44
C4C	7B	Complete Work Ancillary #1	11/13/15	12/21/15	38
C6	5A	Complete LAN - 63rd St. Station	12/16/15	01/15/16	30
C6	5B	Complete WAN - 63rd St. Station	12/16/15	01/15/16	30
C2B	8A	Full access to Traction Power Rooms:	11/16/15	12/15/15	29

Pkg	MS	Description	UD #112	UD #113	Variance
C2B	8B	Full access to Traction Power Rooms:	11/16/15	12/15/15	29
C2B	8C	Full access to Traction Power Rooms:	11/16/15	12/15/15	29
C2B	6B	Full access to Comms Rooms & Closets	11/30/15	12/29/15	29
C2B	6C	Full access to Comms Rooms & Closets	11/30/15	12/29/15	29
C6	SS	Substantial Completion	11/28/16	11/03/16	-25
C2B	SS	Substantial Completion	11/11/16	10/14/16	-28
C6	3A	Complete LAN - 86th St. Station	04/20/16	03/18/16	-33
C6	3B	Complete WAN - 86th St. Station	04/20/16	03/18/16	-33
C5C	SS	Substantial Completion	10/28/16	08/30/16	-59
C4C	SS	Substantial Completion w/o Ent. #1	11/28/16	09/30/16	-59
C6	5C	Complete all 63rd St. Station work	07/21/16	04/22/16	-90

4. Milestones with unusual float variances, generally defined as a forecast date change approximately equal to or exceeding the duration of the reporting period are listed in the following table:

Pkg	MS	Description	UD #112	UD #113	Variance
C4C	7A	Complete Work in all Comm Rooms	177	113	-64
C4C	7B	Complete Work Ancillary #1	201	158	-43
C6	5A	Complete LAN - 63rd St. Station	177	150	-27
C6	5B	Complete WAN - 63rd St. Station	177	150	-27
C4C	12	Full access @Station Service Center(s)	60	37	-23
C5C	11	Full access @Station Service Center(s)	59	38	-21
C6	2A	Complete LAN - 96th St. Station	103	82	-21
C6	2B	Complete WAN - 96th St. Station	103	82	-21
C2B	7C	Full access to Signals Rooms	30	9	-21
C2B	10	Complete all remaining Comms, Signal	113	138	25

Pkg	MS	Description	UD #112	UD #113	Variance
		& Traction Power work			
C5C	SS	Substantial Completion	20	46	26
C2B	6B	Full access to Comms Rooms & Closets	3	30	27
C2B	6C	Full access to Comms Rooms & Closets	3	30	27
C2B	8A	Full access to Traction Power Rooms:	11	39	28
C4C	SS	Substantial Completion w/o Ent. #1	1	35	34
C6	5C	Complete all 63rd St. Station work	92	140	48

Source Schedule Comparison:

No contractor source schedules for IPS Update #113 were submitted by MTACC.

Observations and Analysis:

- Program Contingency increased to 41 WD (57 CD) this period. This update can be considered MTACC's target for its schedule acceleration initiative. MTACC's ability to fully engage the remaining construction contractors in this effort has yet to be demonstrated.
- Two of nine milestones forecast for completion during this update period were achieved;
- Seven milestones are forecast for completion during the upcoming reporting period (12/01/15 to 12/31/15);
- Schedule and float variances between Updates #112 and #113 are attributable to changes made representing MTACC's schedule acceleration efforts.
- The large number of activities experiencing excessive schedule variance, both positive and negative, highlights the conflicting elements of Update #113 and MTACC's acceleration initiative. Specifically, MTACC's accelerated schedule goals require substantially higher, sustained rates of progress than have previously been achieved at a time when the rate of progress on the project has generally been declining.

4.2 90-Day Look-Ahead

Status:

Based on the Integrated Project Schedule (IPS) Update #113 (DD=12/01/15), major activities that can be anticipated to either start or complete over the upcoming 90 days include the following:

Table 4-3: 90-Day Look-Ahead Schedule

Activity ID	Start	Finish
C2B – 96th Street Station Concrete, Finishes & Utilities		
Install 4 Axial Fans for Tunnel Ventilation @Street Level-Ancillary 2		12/28/15
Permanent Power Available		01/15/16
Perform FIAT Test - Track Drainage Supv. System		02/01/16
Perform FIAT Test - Station Service Center	03/14/16	03/18/16
C3 – 63rd Street Station Rehab		
Conduct 1 &5 HR Test for East & West Tunnel vent Fans	02/09/16	02/17/16
Conduct (FIAT) ASME/ANSI-17.1 Test for Escalators	02/25/16	03/02/16
Conduct 7 Day Operation Test and Field Demonstration on HVAC Systems	03/02/16	03/10/16
Perform FIST – East &West AHUs	02/12/16	02/17/16
C4C—72nd Street Station Finishes		
Con Ed Inspect/Accept Perm Power (Anc#1)		02/08/16
Entrance 1, Escalator #6/7/8 - Incline Structural Wall/Ceiling MEP & Finishes		03/31/16
Ent #2 Street Level Finishes		04/18/16
Ent #2 Escalator #9, #10 &#11 - Truss Work (complete)		02/11/16
C5C – 86th St. Station Finishes & MEP		
Permanent Power available		03/31/16
Ancillary 2 Mechanical work - HVAC/AF/DC		03/07/16
Initial Inspections - 1st Mezzanine	02/26/16	03/10/16
Shop Test Escalators E05, E06, E07 (FAT)	12/01/15	01/11/16
C6 – Systems		
Signal Rooms @86th Street Station – multiple activities through period	12/30/15	03/22/16
Fire Alarm installation @86th Street Station – multiple activities through period	01/13/16	03/22/16
Police Radio System @96th Street Station – Mfg./FAT/Deliver	12/04/15	04/27/16
Fire Alarm @72nd Street Station – Wiring/Devices/Terminations	01/27/16	04/05/16

Observations and Analysis:

IPS Update #113 contains schedule forecasts that are based upon MTACC's overlay of contractor summary accelerated schedules on the existing IPS. As such, actual dates may vary significantly from dates shown above.

Concerns and Recommendations:

Refer to See Section 4.3 of this report for additional comments and recommendations.

4.3 Critical Path Activities

Status:

IPS Update #113 forecasts the completion of all construction and NYCT Pre-Revenue Training and Testing activities on November 3, 2016, with approximately 57 calendar days (CD) or 41 work days (WD) of contingency, resulting in a forecast Revenue Service Date (RSD) of December 30, 2016. Schedule contingency is summarized as follows:

	Dates	Contingency (CD)	
MTACC Completion	11/3/2016		
		57	MTACC Contingency
MTACC RSD	12/30/2016		
		185	Additional Contingency
ELPEP Threshold	7/3/2017		
		240	Minimum ELPEP Contingency
FTA RSD	2/28/2018		
		482	TOTAL

Observations and Analysis:

IPS Update #113 identifies a single "critical" schedule path with TF=0 and an additional five (5) independent schedule paths with total float less than or equal to ten (10) working days.

Critical Path (TF=0): The most critical path identified by IPS Update #113 involves installation and testing of railroad signal equipment at the 86th Street Station. This path is initiated by ongoing architectural construction within Ancillary #1, which is forecast to be complete on December 30, 2015, and will allow the start of signal equipment installation. The installation of signal equipment is forecast for completion on February 22, 2016 and is followed by local and system level testing, forecast for completion on November 3, 2016.

Secondary Paths: Other secondary float paths of significance to the overall status of the project include:

+2 WD: This path involves the completion of railroad signal system equipment at the 96th Street Station. This work is controlled by the achievement of C2B MS #7, which is currently delayed by C2B AWO #154, Changes to Dispatcher's Office. This AWO has been negotiated and the contract amendment is currently being processed. The impact of these changes is forecast to be resolved by February 26, 2016. Remaining equipment installation is forecast to be complete on March 22, 2016, and is followed by local testing, forecast to be complete on June 20, 2016. Upon completion of local testing, this path merges with the TF=0 path for remaining system level testing.

+6 WD: This path involves the fire alarm system installation at the 86th Street Station. The start of this work is currently delayed until the work represented by C6 AWO #35, Fire Alarm Design Changes, at all Stations is completed. The path then continues through panel, wiring and device installation throughout the 86th Street Station through March 22, 2016. Installation is followed by local testing at 96th Street,

which is forecast to be complete on August 18, 2016. At this time, the path merges with the TF=0 path for Pre-Revenue Operational Testing by NYCT.

+10 WD: There are three semi-independent float paths with +10 WD schedule float. Each path involves the supply, installation, testing and acceptance of the police radio system at the 72nd, 86th, and 96th Street Stations respectively. The equipment for all three stations should be available by April 27, 2016. Remaining installation work is forecast for completion by June 8, 2016, and local testing, punchlist and acceptance activities complete by August 18, 2016. At this time, the path merges with the TF=0 path for Pre-Revenue Operational Testing by NYCT.

+12 WD: This path involves CCTV installation and testing at the 96th Street Station. Completion of this work is currently April 15, 2016, and is currently delayed until the C2B Contractor can achieve its MS #7. This milestone is currently delayed until completion of work resulting from C2B AWO #154 (refer to the TF=2 path). Following completion of the work, local and system-level testing will occur from April 15, 2016, to July 4, 2016. This path then merges with the TF= +10 path for complete communications system testing, followed by pre-revenue service testing by NYCT.

+18 WD: This path involves installation of axial fans for tunnel ventilation followed by installation and testing of station lighting in Ancillary 2 at the 96th Street Station. Completion of fan installation is forecast for January 14, 2016, with installation and testing of lighting completion is forecast for August 22, 2016 followed by architectural construction throughout Ancillary #2. Completion of this work is forecast for October 11, 2016, and then ties to the C2B Substantial Completion date of October 14, 2016.

+22 WD: This path represents the remaining third-party testing and Con-Ed final inspection and acceptance of facilities required for permanent power at the 72nd Street Station. Following the "Permanent Power Available" date of February 8, 2016, this path merges with numerous other paths involving the testing and acceptance of equipment throughout the station.

+37 WD: This path represents remaining Con-Ed commissioning activities required for permanent power equipment at the 96th Street Station. Following the forecast "Permanent Power Available" date of January 15, 2016, the path follows component and system testing of mechanical and electrical equipment throughout the station.

+53 WD: This path represents the remaining installation, third-party testing and Con-Ed final inspection and acceptance of facilities required for permanent power at the 86th Street Station. Following the "Permanent Power Available" date of March 31, 2016, this path merges with numerous other paths involving the testing and acceptance of equipment throughout the station.

Concerns and Recommendations:

Update #113 can be considered a detailed description of MTACC's schedule acceleration goals. With respect to this accelerated schedule, three concerns are evident at this time:

- Achieving agreement regarding the schedule acceleration requires negotiation and agreement with the respective construction contractors. Achieving the desired

schedule acceleration at a total cost acceptable to MTACC is a major challenge and concern;

- MTACC's ability to achieve a comprehensive schedule acceleration plan within a reasonable time period is questionable. MTACC's "construction complete" goal is approximately ten months in the future. Time available for negotiation and agreement with contractors is limited; and,
- Actually achieving the accelerated construction schedule (assuming agreement by all parties) will require a sustained improvement in achievement and production that is significantly beyond recent levels of performance.

4.4 Compliance with Schedule Management Plan

Status:

Based on the current status of the IPS, SAS Phase 1 can be considered conditionally compliant with the metrics, deliverables and intangible goals enumerated in the Enterprise Level Project Execution Plan (ELPEP), dated January 15, 2010 (Section IV. b, page 8), and as further described by the Schedule Management Plan (SMP).

Observations and Analysis:

- Forecast Revenue Service Date (RSD) and minimum schedule contingency:
  - ELPEP Requirement: February 28, 2018 (RSD); and,
  - ELPEP Requirement: 240 CD (measured against February 28, 2018).
- Minimum Allowable Float; Real Estate Acquisition
  - ELPEP Requirement: 60 CD;
    - Current Forecast: All Real Estate takings are complete as of November 1, 2011, with the last "Title Vesting" occurring on October 25, 2011.
- Minimum Allowable Secondary Float Path
  - ELPEP Requirement: 25 Calendar Days (approximately 18 WD); and
  - There are multiple "critical paths" with TF less than or equal to 18 WD. It is not feasible to mitigate all the delays contributing to this condition within the restrictions of the project budget.
- Secondary Schedule Mitigation (critical path compression)
  - ELPEP Requirement: 125 CD; and,
  - MTACC has complied with the intent of this requirement through numerous acceleration initiatives documented in previous reports.

Observation: None

Concerns and Recommendations:

MTACC considers the IPS and the associated schedule management procedures to be in compliance with the ELPEP and Schedule Management Plan. The PMOC has identified those

areas where it believes current SAS schedule practices compromise the accuracy and usefulness of the IPS.

Schedule Performance Indicators:

In an effort to corroborate the IPS forecast the PMOC has reviewed schedule performance to date in an effort to develop performance metrics that can assist in evaluating CPM 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. November 2015 is the latest month for which this information is available.

Value Earned			November-15				
	Contract $ (x100,000)	**Plan**	**Actual**	**Plan Month for ES $**	**Months Ahead (+) or Behind (-)**	**Contract Comp Date**	**Est. Completion Date**
C2B	$324	$324	$276	Mar-15	-8.1	12/22/15	8/22/16
C3	$176	$176	$168	Jul-13	-28.4	5/13/14	9/12/16
C4C	$258	$255	$186	Jan-15	-10.6	9/16/16	8/1/17
C5C	$208	$192	$141	May-15	-6.1	5/31/16	12/1/16
C6	$261	$243	$186	Apr-15	-7.2	8/18/16	3/22/17
TOTAL	**$1,227**	**$1,190**	**$956**	**Feb-15**	-9.2	12/30/16	10/1/17

The PMOC notes the following:

- This evaluation uses base contract values only. AWOs can be considered a partial cause of the variances indicated. Schedule float is also not considered. The significant schedule delay to contract C3 does not pose a risk to achieving the RSD;
- Logical relationships between contracts are also not considered. It is possible that several of these individual contract delays could interact, forming a longer project-level delay;
- This analysis suggests C4C, C5C and C6 to be likely sources of project level delay. During November 2015, each of these contracts appears to have experienced additional delay; and,
- Through 2015, this analysis confirms the observation that actual construction progress is generally not achieving schedule goals.

Conclusions and Recommendations:

MTACC's schedule acceleration initiative must accomplish two things:

- Reverse the overall inability of the project to perform work in accordance with schedule goals; and,
- Improve schedule performance beyond that which is currently forecast.

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
10	Guideway & Track Elements
20	Stations, Stops, Terminals, Intermodal
30	Support Facilities
40	Site Work & Special Conditions
50	Systems
60	ROW, Land, Existing Improvements
70	Vehicles
80	Professional Services
90	Unallocated Contingency
Subtotal	
Financing Cost	
Total Project	

Observation and Analysis:

Table 5-1 represents MTACC's most recent update September, 2015 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) – 11/19/07;
- Enterprise Level Project Execution Plan (ELPEP) – 01/15/10;
- Amended FFGA (FFGA (R) – 03/17/15;
- MTACC Current Working Budget (CWB) – 11/15; and,
- Contemporaneous Estimate @ Completion (EAC) - 11/15.

Budget and forecast cost variances at these milestones are included in the following table. Exclusive of additional schedule acceleration cost, project final cost is forecast to exceed the original FFGA by approximately 8% at completion and will be within the budget established by the amended FFGA

Estimate	Date	Construct.	Eng./Prof. Svcs.	3rd Party Exp.	TA Exp.	Cont.	Total (2)	% FFGA	
FFGA	Jun-07	$2,360,000	$491,000	$626,000	$75,000	$498,000	$4,050,000	100%	
ELPEP	Oct-09	$2,791,066	$541,000	$747,000	$103,000	$490,934	$4,673,000	115%	
FFGA(R)	Mar-15	$2,848,815	$721,297	$626,000	$75,000	$486,887	$4,757,999	117%	(6)
CWB	Nov-15	$2,674,494	$678,643	$562,086	$132,881	$402,896	$4,451,000	110%	(4)
CTD	Nov-15	$2,567,768	$626,327	$443,027	$75,763		$3,712,885	92%	(5)
ETC(B)	Nov-15	$302,766	*(construction - base contracts)*					0%	
ETC(A)	Nov-15	$126,961	*(AWO forecast to complete)*					0%	
EAC	Nov-15	$2,997,495	$678,643	$562,086	$132,881		$4,371,105	108%	(3)
				Est remaining contingency =		$79,895			

Notes:

(1) All $ x 1000

(2) w/o any financing costs

(3) Forecast cost growth since FFGA = $321 M or 8%

(4) CWB based on December 31, 2016 RSD; IPS Update #112

(5) All costs are as reported by MTACC through Nov. 30, 2015. "Acceleration initiative" costs not included.

(4) Assumes CWB includes all forecast soft cost increases

(6) Amended FFGA includes commitment of $708 M 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 December 31, 2015, a summary comparison of the SAS Current Working Budget and expenditures is as follows:

Description	CWB	Expended	%
Base Construction	$2,674,814,299	$2,400,079,651	89.7%
Total Soft Cost	$1,308,108,085	$1,152,180,832	88.1%
Contingency	$468,077,616	$201,658,683	43.1%
Subtotal	$4,451,000,000	$3,753,919,166	84.3%

Observations:

Based upon financial expenditures reported by MTACC during December 2015, SAS Phase 1 is approximately 84.3% complete. The completion status of the active construction contracts through December 31, 2015, also based upon reported expenditures through that date, is as follows:

- C26002 (Tunnel Boring) – 100%;
- C26005 (96th Street Station) – 100%;
- C26010 (96th Street Station) – 88.3%;
- C26013 (86th Street Station) – 100%;
- C26008 (86th Street Station) – 99.6%;
- C26012 (86th Street Station) – 69.3%;
- C26006 (63rd Street Station) – 95.6%;
- C26007 (72nd Street Station) – 99.9%;
- C26011 (72nd Street Station – 74.4%; and,
- C26009 (Systems) – 71.5%.

Aggregate Construction % Completion:

- 100% of all construction work is under contract;
- 89.7% of all base construction (not including AWOs) is complete; and
- 90.4% 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 December 2015:

- Value of construction in place this period = $33,970,727;
- Estimated value of construction remaining = $274,734,648;
- Target construction completion = November 3, 2016; and,
- # Months remaining = 10.2.

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 December 2015 totaled approximately $7 M. 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 2 Q 2017.

Conclusions and Recommendations:

Refer to Section 5.5 and 5.6

5.3 Change Orders

Status:

As of December 31, 2015, the status of Additional Work Orders (AWOs) on Phase 1 of the Second Avenue Subway Project is summarized as follows:

Table 5-2: AWO Summary

Contract / (Package)	% Complete	Award	Exposure		Executed	
			$	% of Award	$	% of Award
C26002 (1)	**100.00%**	**$337,025,000**	**$41,086,647**	**12.19%**	**$41,086,647**	**12.19%**
C26005 (2A)	100.00%	$325,000,000	$47,615,409	14.65%	$47,615,409	14.65%
C26010 (2B)	85.04%	$324,600,000	$45,108,547	13.90%	$27,871,561	8.59%
C26006 (3)	94.71%	$176,450,000	$40,086,202	22.72%	$25,194,048	14.28%
C26007 (4B)	99.93%	$447,180,260	$1,325,639	0.30%	$1,325,639	0.30%
C26011 (4C)	73.36%	$258,353,000	$32,891,150	12.73%	$28,837,924	11.16%
C26013 (5A)	**100.00%**	**$34,070,039**	**$6,525,471**	**19.15%**	**$6,525,471**	**19.15%**
C26008 (5B)	99.63%	$301,860,000	$26,353,474	8.73%	$20,906,813	6.93%
C26012 (5C)	64.84%	$208,376,000	$10,331,524	4.96%	$5,200,439	2.50%
C26009 (6)	69.51%	$261,900,000	$17,040,350	6.51%	$8,304,685	3.17%
TOTAL TO DATE		$2,674,814,299	$268,364,413	10.03%	$212,868,636	7.96%

Bold type indicates completed contracts

To date, approximately $2,400,079,651 (89.7%) of all base contract construction work has been completed. As a percentage of work completed, the AWO exposure for these contracts is 10.03% and the executed AWO percentage = 7.96%. Based on performance to date, a forecast total of AWO expenditure for all base contract work in the range of $240M to $290 M appears reasonable.

Observation and Analysis:

The value of AWOs reported by MTACC/ NYCT in December 2015 is summarized as follows:

	Executed AWOs	AWO Exposure
Dec-15	$216,831,917	$268,364,413

Nov-15	$209,217,676	$258,620,440
Δ	$7,614,241	$9,743,973
Δ	3.64%	3.77%

The changes in AWO Exposure for each construction contract reported through December 2015 are summarized as follows:

Const. Pkg.	AWO Exposure			
	Dec-15	**Nov-15**	**Period Δ**	**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	$45,108,547	$44,204,965	$903,582	Net increase is based on revised estimates for AWO #s 73, 89, 126, 149, 161, 177, and 193 and initial estimates for AWO #s 150, 166, 170, 178, 179, 190, 191, 195, 205, and 211.
C3	$40,086,202	$36,744,963	$3,341,239	Net increase is based on revised estimates for AWO #s 42, 93, 165, 190, 227, 235, 239, 244, 250, 251, 254, 257, 258, and 259 and initial estimates for AWO #s 262 through 266.
C4B	$1,325,639	$1,325,639	$0	No change reported this period.
C4C	$32,891,150	$32,844,064	$47,086	Net increase is based on revised estimates for AWO #s 157, 168, and 169 and initial estimates for AWO #s 134, 178, and 202.
C5B	$26,353,474	$26,332,365	$21,109	Net increase is based on the initial estimate for AWO # 124.
C5C	$10,331,524	$9,734,083	$597,441	Net increase is based on revised estimates for AWO #s 56, 114, 122, and 131 and initial estimates for AWO #s 26, 102, 115, 116, 123, 142, and 144.
C6	$17,040,350	$12,206,834	$4,833,516	Net increase is based on revised estimates for AWO #s 52, 58, 70, 72, 87, 122, 123, 131, 132, 133, 137, 140, and 152 and initial estimates for AWO #s 102, 130, 135, 136, 138, 144, 148, 150, 154, 155, and 160.
	$268,364,413	$258,620,440	$9,743,973	

The changes in Executed AWO Values for each construction contract reported through December 2015 are summarized as follows:

Const. Pkg.	Executed AWOs			
	Dec-15	Nov-15	Period Δ	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	$31,834,842	$27,871,561	$3,963,281	Increase is based on execution of AWO #s 161, 171, 173, 188, 205, and 209.
C3	$25,194,048	$24,265,988	$928,060	Increase is based on execution of AWO #s 229, 236, 242, 248, 252, and 258.
C4B	$1,325,639	$1,325,639	$0	No change reported this period.
C4C	$28,837,924	$28,140,247	$697,677	Increase is based on execution of AWO #s 89, 120, 134, 147, 187, and 189.
C5B	$20,906,813	$19,406,813	$1,500,000	Increase is based on execution of AWO # 56.
C5C	$5,200,439	$4,995,439	$205,000	Increase is based on execution of AWO # 101.
C6	$8,304,685	$7,984,462	$320,223	Increase is based on execution of AWO #s 52, 58, 70, 72, 87, 122, 123, 132, 133, 140, 148, and 152.
	$216,831,917	$209,217,676	$7,614,241	

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 December 31, 2015
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	$81,233,681
NY-03-0408-10**	$123,384,621	0	0
NY-17-X001-00	$2,459,821	$2,459,821	$2,459,821
NY-36-001-00*	$78,870,000	$78,870,000	$78,870,000
NY-95-X009-00	$25,633,000	$25,633,000	$25,633,000
NY-95-X015-00	$45,800,000	$45,800,000	$45,800,000
Total	$1,373,892,821.00	$1,250,508,200.00	$1,145,175,881.00

* Denotes American Recovery and Reinvestment Act (ARRA) funds. ** Appropriated.

*** Grant issued to outline components of the Early Systems Work Agreement. **** Grant issued to explain the "Total Eligible" cost for the project

Total project distribution is $3,753,919,117 of which $2,608,743,236 are local funds and $1,145,175,881 are 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:

As noted in Section 5.1 of this report, forecast cost variance between original FFGA and MTACC's CWB is approximately $321M, an 8% increase. This forecast does not include the impact of any cost increases due to MTACC's current schedule "acceleration initiative".

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:

	FFGA	EAC	Variance	% FFGA
Construction	$2,360,000,000	$2,997,495,000	$637,495,000	127%
Eng./Prof. Services	$491,000,000	$678,643,000	$187,643,000	138%
3rd Party Expenses	$626,000,000	$562,086,000	-$63,914,000	90%
TA Exp.	$75,000,000	$132,881,000	$57,881,000	177%
Contingency	$498,000,000			
Total	$4,050,000,000	$4,371,105,000		

In terms of both percentage and actual cost, construction and engineering/professional services have been the major drivers of cost increase since development of the original FFGA. It is noted that during the evolution of these estimates there has been some reclassification of cost between 3rd Party Expense and TA Expense categories. A brief chronology demonstrates two primary sources of construction cost growth:

	Construction $	Variance	% Increase	
Base Construction FFGA	$2,360,000,000			
Base Construction Contracts (as-bid)	$2,674,494,000	$314,494,000	113%	Construction awards exceeded the FFGA estimated base construction cost by 13%
Construction EAC	$2,997,495,000	$323,001,000	112%	Net value of construction change orders (AWOs) is forecast at 12% MTACC estimates of AWO cost averaged 8%

Professional services costs consist solely of engineering design and construction management services.

	FFGA $	EAC	Variance	% Increase
A/E Services (Design & Construction)	$410,000,000	$497,657,000	$87,657,000	121%
Construction Management	$80,940,647	$170,485,925	$89,545,278	211%
Total	$490,940,647	$668,142,925		

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.

Professional Services are included in Section 8.0 of the FTA SCC. Using the current EAC forecast, soft costs are approximately 22.0 % of the project budget ($4.45B) and 22.5% of the EAC (approx. $4.37B). These percentages compare favorably to FTA documented averages (Reference TCRP 31, Managing Capital Costs of Major Federally Funded Transportation Projects) of about 24%. Adequate contingency remains to ensure the project will complete the project within the CWB.

Based on current information, MTACC's Current Working Budget of $4.451B appears reasonable. Future review will examine the impact of schedule acceleration costs on the project budget.

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 4th Quarter 2015, contingency changes included routine incorporation of AWOs into the individual project 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.

	Contingency Analysis	
	Current	@ Completion
Phase 1 Budget	$4,451,000,000	$4,451,000,000
Construction Awards	$2,674,814,299	$2,674,814,299
Soft Cost Expended	$1,152,180,832	$1,152,180,832
Soft Cost Forecast to Complete	$208,795,370	$226,952,370
AWO Exposure	$240,321,139	$323,000,000
Total Contingency	$174,888,360	$74,052,499
Reserved Contingency	$160,000,000	$74,052,499
Available Contingency	$14,888,360	
Transfer from Reserved Contingency =		$85,947,501

Total Contingency = budget balance after forecast expenditures.

Conclusions based upon this analysis include:

- The project can be completed within the current MTACC CWB of $4.451B;
- It will be necessary to transfer funds from the "Executive" or "Reserved" Contingency in order to cover forecast project costs; and
- Estimated contingency available at completion is currently forecast to be $74 million. Based on a usage rate, of approximately $3 million per month, the estimated future available contingency will be approaching the ELPEP minimum threshold of $45M.

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:

For several months, MTACC has reported that the SAS Contract Risk Registers were updated and a Risk Analysis performed in late December 2014. The results of this analysis were reviewed with MTACC Executive Management in March 2015. At the ELPEP Quarterly Meeting held on September 17, 2015, MTACC stated these results were expected to be available in late September/early October 2015. As of the writing of this report, the results have not been released.

Conclusions and Recommendations:

It is recommended that the updated risk registers and risk analysis results be released for review by the FTA and the PMOC.

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:

MTACC's schedule acceleration initiative can be considered a comprehensive effort to overcome further schedule erosion and increase schedule contingency at the end of the project. Implementation of this effort is underway. As noted in Section 5 of this Report, IPS Update #113 can be considered a detailed description of MTACC's plan and goals for this schedule delay mitigation strategy.

Observation and Analysis:

Risks with the potential to adversely impact MTACC's schedule acceleration initiative have been classified in categories. Mitigation strategies/actions discussed in each category are those developed by MTACC.

1. Major technical risks which include any design or construction problem directly affecting the successful installation of a project component. The SAS has demonstrated the capacity to successfully manage and resolve risks of this nature. Specific risks currently include.

a. Delays to fire alarm testing & commissioning.

Mitigation Strategies/ Actions:

- Designate an experienced MTACC staff member as the project-wide individual responsible for fire alarm issues. This individual will lead the identification and resolution of remaining technical issues, coordinate NYCT staff inspections and corrective actions, and ensure that project reporting accurately depicts Station/Systems activities to complete testing and commissioning; and,
- Develop and pre-negotiate contract allowance items for typical fire alarm adjustments that will inevitably be identified during final installation/testing such as adding devices, relocating devices, adding shrouds, etc. This will expedite completion removing the need to negotiate new change orders at the very end of the construction.

b. Delayed installation of Water Mist System issue (Buy America) at 72nd and 86th Street Stations

Mitigation Strategies/ Actions:

- Revise the schedule model logic requirement that water mist system be installed and functional in the TPSS room in order to operate the TPSS. This is not required and logic will be changed to show the water mist system must be operational 30 days prior to fire alarm test completion;
- Fragnets have been developed showing all interrelated activities so the Project can evaluate opportunities for improvement and monitor progress;
- Securiplex design has been expedited. Evaluate opportunities for subsequent equipment fabricate and delivery acceleration; and,
- Expedite the disposition and removal of existing Marioff equipment.

c. Risk: Delay in providing Traction Power – 86th Street Station

Mitigation Strategies/ Actions:

- The 86th Street Traction Power room has been damaged due to a water line leak. The Project has asked the Contractor to develop a schedule for completing the Traction Power rooms. Overtime hours may be used in his approach. The current plan is to have all four Traction Power rooms available by September 2016;
- Fragnets have been developed showing all interrelated activities. Fragnets capture the work that suffered one month delay in starting installation. Fragnets are continually updated; and,
- There is an opportunity to accelerate traction power equipment installation (6.5 months installation period as opposed to 9.5 months).

d. Risk: Delay in completing communications equipment & cabling installation at 86th Street Station

Mitigation Strategies/Actions:

- Accelerate completion of this work by working double shifts to assure work can be completed in the September 2015 to January 2016 time frame.

2. Organizational and systematic risks that may impact a large number of issues are:

a. Risk: Owner-driven design/scope changes (during construction)

Mitigation Strategies/Actions:

- Reduce the number of change orders needing to be addressed during construction by deferring those changes not involving life safety or otherwise directly impacting revenue service;
- Improve the efficiency (amount of time) for change order processing by assigning MTACC personnel to be responsible for changes on each open contract. Additional support has been provided to expedite completion of required tasks within the process; and
- Procure an on-call contractor (in progress) to do minor work Station/System (painting, patching, added signage, etc.) that existing contractors do not want to do.

b. Risk: Delays due to NYCT TA Resource (labor) availability

Mitigation Strategies/Actions:

- Work with NYCT and agree on dedicated NYCT resources to be located at site;
- NYCT will provide a dedicated staff of 30 that will be located adjacent to the Community Information Center, (fit out of office in progress) and report to one manager who will be responsible for coordinating their activities;
- Enhance technical support for NYCT testing and inspection tasks. Database to document and support NYCT observations has been created. It is based on the EDMS system and includes latest contract documents, contract sketches, etc.; and,
- Hire a Code Consultant (in progress) to augment NYCT Code Compliance Staff. A site tour was recently held with potential proposers. A contract is expected to be awarded by January 31, 2016.
- In addition to these risks, the PMOC considers the overall capability and readiness of the SAS Project Team (MTACC and its consultants and contractors) to implement an aggressive schedule acceleration initiative to be a significant risk.

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:

Via IPS Update #113, MTACC forecasts all Phase 1 construction and pre-revenue testing to be complete on November 3, 2016. This results in 57 CD (41 WD) of contingency when measured against MTACC's target RSD of December 30, 2016, and a 482 CD contingency when measured against the FTA Risk-Informed RSD of February 28, 2018.

Observations:

Major risks previously identified in the construction contractor's schedules and not represented in the IPS have been reconciled. As such, the current risk-mitigated forecast and a risk-realized forecast are equivalent. The RSD forecast by IPS #113 results in the following contingencies:

Table 6-1: Schedule Contingency

IPS Update #	104	107	110	111	112	113
Data Date	3/1/15	6/1/15	9/1/15	10/1/15	11/1/15	12/1/15
	Contingency (CD)					
RSD=12/30/2016						
Risk Mitigated	38	45	38	33	33	57
Risk Realized	38	45	38	33	33	57
RSD=02/28/2018						
Risk Mitigated	461	469	462	457	457	482
Risk Realized	461	469	462	457	457	482

Concerns and Recommendations:

The PMOC concerns regarding schedule are enumerated in Section 4.0 of this report.

7.0 LIST OF ISSUES AND RECOMMENDATIONS

Priority in Criticality column 1 – Critical 2– Near Critical

Number with Date Initiated	Section	Issues/ Recommendations	Criticality
SAS-1-Oct-15	2.1.3	Issue: Failure of the Station contractors to meet room turnover milestones has eroded the schedule contingency and impacted the Systems contractor. Status: Station Contractors are working as quickly as possible to meet room turnover milestones. Recommendations: The PMOC recommends that MTACC continue with its present mitigation efforts.	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
		No specific Grantee Actions are noted at this time.		

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, and 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)		
85.4	Percent Complete Construction at Sept. 30, 2015		
88.1%	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 Min Finance Charges
3,753 M	Amount of Expenditures at date of this report from Total Project Budget of $4,451 M
84%	Percent Complete based on Expenditures at date of this report
175 M	Total Project Contingency remaining (allocated and unallocated contingency)

APPENDIX C – LESSONS LEARNED

There were no new Lessons Learned to report for 4th Quarter for 2015

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

APPENDIX D – SAFETY AND SECURITY CHECKLIST

Project Overview			
Project mode (Rail, Bus, BRT, Multi mode)	Rail		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Design and Construction		
Project Delivery Method (Design/Build, Design/Build/Operate/Maintain, CMGC, etc.)	Design/Bid/Build		
Project Plans	**Version**	**Review by FTA**	**Status**
Safety and Security Management Plan	7041.01.007308-0	11/15/07	Approved by FTA
Safety and Security Certification Plan	7041.01.007308-0 Appendix D		Certification by New York State Public Transportation Safety Board (NYSPTSB)
System Safety Program Plan			
System Security Plan or Security and Emergency Preparedness Plan (SEPP)			
Construction Safety and Security Plan		N	Each active construction contractor's Construction Safety and Security Program Plan has been approved by MTACC
Safety and Security Authority			
Is the Grantee subject to 49 CFR Part 659 state safety oversight requirements?	Y		
Has the state designated an oversight agency as per Part 659.9?	Y		NYSPTSB
Has the oversight agency reviewed and approved the Grantee's SSPP as	Y		The NYSTB issued a letter of recertification

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

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

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

Project Overview		
Has the Grantee demonstrated through meetings or other methods, the integration of safety and security in the following: Activation Plan and Procedures Integrated Test Plan and Procedures Operations and Maintenance Plan Emergency Operations Plan	Y	Referenced plans are being developed as part of the Systems Contract (C6).
Has the Grantee issued final safety and security certification?	N	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 6
Construction Safety		
Does the Grantee have a documented/implemented Contractor Safety Program with which it expects contractors to comply?	Y	
Does the Grantee's contractor(s) have a documented company wide safety and security program plan?	Y	
Does the Grantee's contractor(s) have a site-specific safety and security program plan?	Y	Reference sections 011150 Safety Requirements and 011160 Security Requirements of the Contract Terms and Conditions
Provide the Grantee's OSHA statistics compared to the national average for the same type of work?	The Lost Time Injury Rate and Recordable Injury Rate from the start of construction until November 30, 2015 is 1.67 and 4.52, respectively. The Bureau of Labor Statistics (BLS) national Lost Time Injury Rate is 1.8 and the Recordable Injury Rate is 3.2. The cumulative construction	The Bureau of Labor Statistics (BLS) national Lost Time Injury Rate is 1.8 and the Recordable Injury Rate is 3.2.

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	hours worked since the project inception is 11,979,890 hours. Total lost time injuries since project inception is 100 and other recordable injuries are 171. The total number of recordable injuries is 271 (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?	Both rates decreased slightly from the last reporting period. Tool box meetings, stand-downs, increased training and monitoring of construction actives are being performed in order to highlight safety awareness.	
Does the Grantee conduct site audits of the contractor's performance versus required safety/security procedures?	Y	
Federal Railroad Administration		
If shared track: has Grantee submitted its waiver request application to FRA? (Please identify specific regulations for which waivers are being requested)	NA	
If shared corridor: has Grantee specified specific measures to address shared corridor safety concerns?	NA	
Is the Collision Hazard Analysis underway?	NA	
Other FRA required Hazard Analysis – Fencing, etc.?	NA	
Does the project have Quiet Zones?	NA	
Does FRA attend the Quarterly Review Meetings?	NA	

APPENDIX E – ON-SITE PICTURES

(To be transmitted in a separate file)

Appendix F -- Core Accountability Items				
Project Status:		**Original at FFGA**	**Current***	**ELPEP****
Cost	Cost Estimate	$4,050 M	$4,451 M	$4,980 M
Contingency	Unallocated Contingency	$555.554 M	$175 M	$45 M
	Total Contingency (Allocated plus Unallocated)	$555.554 M	$175 M (Dec. 2015)	$45 M
Schedule	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018

Total Project Percent Complete	Based on Expenditures	84%
	Based on Earned Value	N/A

Major Issue	Status	Comments
Project Testing and Commissioning	Open	MTACC's ability to test and commission a system the size of the SAS Phase 1 Project in a reasonable time frame is a major concern. Lessons Learned from testing and commissioning of the 7 Line Extension Project will be implemented on the SAS project.
Accelerated Completion Schedule	Open	MTACC's accelerated schedule initiative is intended to provide an additional moth of schedule contingency between construction completion and RSD. There are major challenges in implementing this accelerated schedule concept.
Date of Next Quarterly Meeting:		TBD

* MTACC's Current Working Budget

** 2010 Enterprise Level Project Execution Plan (ELPEP), reflecting medium level of risk mitigation, excluding finance cost.

All data based on November 30, 2015 reporting.