PMOC MONTHLY REPORT

Second Avenue Subway Phase 1 (MTACC-SAS) Project

Metropolitan Transportation Authority

New York, New York

Report Period January 1 to January 31, 2014

PMOC Contract No. DTFT60-09-D-00007

Task Order No. 7, Project No. DC-27-5235, Work Order No. 1

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

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THIRD PARTY DISCLAIMER

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For projects funded through an FTA Full Funding Grant Agreements (FFGA) program, FTA and its Project Management Oversight Contractor (PMOC) use a risk-based assessment process to review and validate a project sponsor's budget and schedule. This risk-based assessment process is a tool for analyzing project development and management. Moreover, the assessment process is iterative in nature; any results of an FTA or PMOC risk-based assessment represent a "snapshot in time" for a particular project under the conditions known at that same point in time. The status of any assessment may be altered at any time by new information, changes in circumstances, or further developments in the project, including any specific measures a 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 current 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. DTFT60-09-D-00007. 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 managed by MTACC and MTA as the grantee and financed by the FTA FFGA.

MONITORING REPORT

1.0 PROJECT STATUS

During January 2014, MTACC continued advancing SAS, Phase 1 to meet a Revenue Service Date (RSD) of December 30, 2016 within its Current Working Budget (CWB) of $4.451B (exclusive of financing). The overall project is approximately 62.3% complete. Progress continued on the eight (8) active construction contracts and featured the following accomplishments:

- The SAS Project Executive has accepted a position on another project and will be transitioning out of SAS for the next several months. The current Deputy Program Manager will assume the role of Project Executive. No negative impact to project performance as a result of this staff change is anticipated.
- C-26005 (C2A) "96th Street Site Work and Heavy Civil" Substantial Completion was achieved on November 5, 2013. Punch list and submittal of contract closeout documentation is ongoing.
- C-26010 (C2B) "96th Street Station Civil, Architectural, and MEP" Completion of Milestone 5 work in the east and west tunnels south of the 96th Street Station has slipped

to June 25, 2014. The contract completion date for this milestone was February 21, 2014.

- C-26006 (C3) “63rd Street Station Rehabilitation”. The contract focus in the existing station is on the installation of permanent architectural finishes. The Gantry Crane at the 6th Mezzanine has been removed and work in the elevator shafts began. Mechanical and electrical work continued.
- C-26007 (C4B) “72nd Street Station Cavern Mining and Lining” Substantial Completion was achieved on January 14, 2014. Punch list and submittal of contract closeout documentation is ongoing.
- C-26011 (C4C) “72nd Street Station Architectural and MEP Systems”. Concrete work at multiple locations made available through Milestone #1 including Ancillary 2 and Entrances 2 and 3. Mobilization and preliminary work at Ancillary #1 and Entrance #1 have also started.
- C-26008 (C5B) “86th Street Station Cavern Mining and Lining”. Waterproofing in the Entrance #2 incline is complete. Placement of concrete lining for both the cavern walls and the southeast tunnel arch nears completion. Placement of the arch lining in the Public Cavern is underway. The start of arch lining placement in the south Ancillary Cavern will begin in February 2014.
- C-26012 (C5C) “86th Street Station Architectural and MEP”. Mobilization continues and the contractor is continuing with submittals and purchasing. Site access for construction activity remains early April 2014 with full access still forecast for October 2014.
- C-26009 (C6) “Track, Power, Signals and Communication Systems” Conduits and cables installation from 96th Street to 105th Street is ongoing. Equipment delivery is ongoing with the majority of the equipment delivered.

a. Procurement

Procurement of construction contractors for SAS – Phase 1 is complete. Contract C-26005 (96th Street Site Work and Heavy Civil) and Contract C-26007 (72nd Street Station Cavern Mining and Lining) achieved Substantial Completion on November 5, 2013 and January 14, 2014 respectively and are both currently in closeout.

b. Construction

As of January 31, 2014, there are eight (8) active construction contracts on the SAS Phase 1 Project. Construction progress on the active contracts during this period includes:

Contract C-26005 (C2A) 96th Street Site Work and Heavy Civil

- Substantial Completion was achieved on November 5, 2013. Punch list and submittal of contract closeout documentation is ongoing. Punch list activity is scheduled to be completed by March 3, 2014.

Contract C-26010 (C2B) 96th Street Station Civil, Architectural, and MEP

- Milestone 5 which has a contract completion date of February 21, 2014 is the next near term milestone. The Contractor's latest schedule update (#12) shows a June 25, 2014 completion of Milestone 5. Milestone 5 calls for the completion of all work in the east and west tunnels south of 96th Street Station (between STA. 1225+25 and STA. 1209+00) so "Shared Access" to the C-26009 (C6) Track, Power, Signals and Communication Systems contractor can be provided.
  - Work in progress includes mezzanine wall and roof concrete placement.
- Ancillary #1
  - Four week look-ahead work effort includes: waterproofing of installation and waterproofing of walls and sewer installation.
- Ancillary #2
  - Four week look-ahead work effort includes: removing of bracing and demolition of diaphragm slab; shotcreting of walls and waterproofing of walls.
- Entrance #1 and #2
  - Four week look-ahead work effort includes: waterproof of roof slabs.
- Entrance #3
  - Four week look-ahead work effort includes: rebar and form installation for invert.

Contract C-26006 (C3) 63rd Street Station Rehabilitation

- Surveying of the Deformation Monitoring Points (DMPs) is ongoing and will continue throughout the project. 1 DMP was reset at Entrance #1.
- Area 5 (Reconstruction consists of 6 mezzanines and the deck plaza roof)
  - Began installation of brackets & rails in Elevator Shafts #1 &#2.
  - Continued installation of conduits throughout.
  - Continued installation of mechanical ductwork at Upper 4th Mezzanine, 3rd & 6th Mezzanines.
  - Began installation of sprinkler, water mist and permanent fire standpipe.
- Entrance #1
  - The contractor is awaiting direction/approval of several Additional Work Orders (AWO) to install temporary steel shoring in Zones #1 - #3, resume selective demolition, and excavate/install new sewer.
  - Began storefront demolition.
- Ancillary #2
  - Above grade work is ongoing.
- Platforms
  - Continued with installation of column cladding and ceiling panels.
  - Completing light fixture installation on service carriers on Lower Platform.

- Completing installation of rubbing boards on Lower Platform.
- Completing CMU for shafts at the Upper Platform.
- Continued with installation of UPSC Carriers, light plate and ductwork on Upper Platform.

- Fan Plants
  - In the East Fan Room continued installation of communications & power conduit, Variable Frequency Drives (VFDs) and lighting.
  - Continued installing chiller piping, communications & power conduit, VFDs and lighting.
- C6 Coordination
  - The C6 contractor completed work in Signal Room 2189, installing support steel racks, and turned the room back over to this contractor the last week of December 2014. Per the MOU agreement, this contractor will install plaster drop ceiling, complete other work and turn back the 3 signal rooms to the C6 contractor in 3 months (4/1/14). In the interim, CBTC 2187 is being used for storage of C6 equipment until turnover of signal rooms is complete.

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

- Substantial Completion was achieved on January 14, 2014.
- Punch list and submittal of contract closeout documentation is ongoing.

Contract C-26011 (C4C) 72nd Street Station – Station Finishes, MEP, Ancillary Buildings & Entrances

- Ancillary 2/ Entrance 2: Waterproofing top slab at Lower Mezzanine & rebar installation at the invert slab are in progress. The installation of drainage pipe in the slab at the Lower Mezzanine will begin the second week of February followed by the pouring of the Lower Mezzanine slab & lower mezzanine interior and exterior walls.
- Station North of 71st Street: Placing of the concrete for pour #5 occurred, while the placing of concrete for pour #6 is planned for the second week of February. The forms from these pours will be used on pours in Station South of 71st Street. The surveying and beginning of concrete masonry units is scheduled to being in the second week of February.
- Station South of 71st Street: Station South of 71st Street and Ancillary #1/Entrance #1 were turned over to the C4C contractor from the C4B contractor. Forming of pour #7 is in progress using stripped forms from Station North pour #5. Stripped forms from pour #6 Station North will be used to form pour #8at Entrance #1, drift #9) which is scheduled to be formed and poured the last week of February.
- Entrance 3: Placing of concrete pour #4 (mezzanine level) and stripping of the forms was completed. Pour #5 (mezzanine level) was also poured and stripping of the forms is in progress.
- Take Over Access 2 Sites & Yards: The area has been turned over to the C4C contractor from the C4B contractor. This significantly enhanced access to Entrance #3 for

deliveries. The area is being mobilized and installation of temporary utilities and temporary power is in progress; surveying, asbestos abatement will follow.

- Ancillary #1: Mobilization of the site and setting up of access has begun. This will be followed by the installation of temporary utilities.
- Entrance #1: Structural & Environmental surveying of an existing building & setting up of MPT & fence around 1322 2nd Avenue is in progress. This will be followed by relocation utilities for the Garage & 1322 2nd Ave basement all leading up to the underpinning of 1322 2nd Ave (scheduled for the 2nd week in March). Additionally, partial demolition & miscellaneous removals to support asbestos abatement operation is in progress.

Contract C-26008 (C5B) 86th Street Station Cavern Mining and Lining

- Work continues with 2 shifts. All surface operations end at 10:00PM daily.
- Through January 31, 2014 the overall excavation was 100% complete.
- Permanent concrete placement was approximately 52.5% complete with completion still forecast for August 2014. Entrance #2 permanent concrete is forecasted for completion in November 2014.

  - **Schedule**
    - The previous delay in achieving Milestone #1 was mitigated this period by approximately 5 work days (WD). Delivery and erection of the Ancillary Arch form has been a key element in this delay; this formwork was delivered and assembled this period.
  - **Main Cavern (North and South)**
    - The concrete wall placements continued in the Cavern, moving south to north and were approximately 86% complete. The work in the deep sump pit at the north end of the cavern was completed and all remaining cavern invert slab placement was completed.
    - Placement of the Public Cavern arch concrete continued and was approximately 10% complete.
  - **Ancillary #1/Ancillary #2**
    - Continued clearing out of the Ancillary #1 area, which includes removing the temporary access stair, fans, gantry, etc. By March 2014 everything in the cavern and tunnel will be cleared from E. 85th St. south.
    - Began placing mud mats on the Ancillary #2 decks.
  - **Entrance #1**
    - Continued work at Entrance #1 included the removal of underpinning steel and the placement of permanent concrete columns, beams, slabs and stairs.
    - Placement of invert slabs along the escalator incline is complete and installation of waterproofing and reinforcing steel for the remaining structural concrete slabs, walls, and arches continued and was approximately 17% complete.

- **Entrance #2**
  - Muck removal and placement of mudmats is complete. Work continued with installation of waterproofing and began placing structural concrete inverts.
- **Option #1 (Lining the south, east tunnel and mining the Cross Passageways)**
  - In the Pump Room erection of structural concrete walls are complete and waterproofing and placement of the arch was 22% complete.
  - In the East Tunnel concrete lining continued from north (cavern) to south (73rd St), south of the Pump Room and was approximately 98% complete. Concrete topping on the invert slab, where needed, is approximately 27% complete.

Contract C-26012 (C5C) 86th Street Station Finishes, MEP Systems, Ancillary Buildings & Entrances

- During January 2014 the progress meetings began to be held bi-weekly.
- The Schedule Presentation was held on January 17, 2014 and the Quality Kick-Off Meeting was held on January 29, 2014.
- During January 2014 the contractor continued to focus on submittals and pre-mobilization engineering and planning. Field engineering has uncovered clearance issues with slabs and future escalators. This under review with the Project Office and designer.
- The contractor has submitted the temporary power plan to ConEd for approval. Temporary power to the site for this contract is expected to be complete June 2014. In the interim, discussions are underway with the C5B to share their temporary power.
- Limited access to the site remains April 2014 and full access to the site remains October 2014.

Contract C-26009 (C6) Track, Power, Signals and Communication Systems

- Electrical: Contractor currently has 26 craft electricians (includes 6 supervisors and 1 warehouseman) on the job. Due to coordination issues on the 63rd Street Station platform, the C6 Contractor stated that they have no available work to perform. Piece meal work is being performed in the four signal room because of outstanding AWOs.
- Installation of power, signal, communication and fiber optic cables form 96th Street to 105th Street is ongoing.
- Civil (Rail Welding): Rail welding operation is now complete with the exception of the rail closure welds.
- Civil (63rd Street Area): No available work.
- Civil (96th Street Area): Currently no craft works are at 96th Street.
- Procurement
  - Antenna cable (delivered)
  - Signal cable (majority delivered)
  - Communication cable (delivered)

- Power cable -2000MCM and 500MCM (delivered)
- Fiber optic cable (delivered)
- Wayside tray 63rd Street (delivered)
- Wayside Signal Equipment 96th Street (released and in various stages of manufacturing)
- Stops and layouts (delivered)
- Simplex (material for 63rd Street was delivered)
- Running rail (delivered)
- LVT Blocks (19,062 including 1,709 spares were delivered)
- 3rd rail (delivered)
- SWP's #1 and #2 (delivery)
- SWP #3 (due February 2014)
- Meridian EA Alarm Boxes (delivered)
- Balfour Circuit Breakers and Rectifiers (delivered)
- Transdyne (Power SCADA) equipment (delivered)

- Submittal Progress
  - Total projected submittals: 4,591
  - Total submitted to date: 2,845
  - Total projected to complete: 1,746
  - Pending MTA response: 207

c. Quality Assurance and Quality Control (QA/QC)

Implementation of the Quality Management System as defined in the contract specification is ongoing. Quality control activities are being performed by the contractors per their Contractor's Quality Plans (CQPs). The MTACC's SAS Quality Managers and Project Quality Managers are performing quality assurance activities. The PMOC attends Monthly Quality Management Meetings and Quarterly Quality Oversights on each SAS contract.

Major Issues

- The major issues noted by the PMOC during January 2014 were:
  - The excessive time that it still takes to submit Daily Inspection Reports on the C2B and C5 contracts
  - The C3 and C4C contractors have still not completed the statistical evaluation of concrete strength test results that will enable them to close out concrete nonconformance reports (NCRs

Project Quality Manual

- Revision 3 of the SAS Project Quality Manual (PQM), issued in April 2009, has been revised by the SAS Quality Manager. However, MTACC is revising their quality system to utilize 19 quality elements instead of the present 15. Until this is official and the MTACC Quarterly Quality Oversight (QQO) checklists are revised, Revision 4 cannot be issued. This may take several months since the MTACC QQO rating system is also being modified.

Analysis of Concrete Strength

- C4B Contract: An analysis of concrete strength results was performed on the C4B project. This document contains a statistical evaluation of concrete strength test results to demonstrate compliance with the contractual acceptance criteria for all cast-in-place concrete placed under Contract C4B. Based on this analysis, the Engineer of Record agreed that the concrete NCRs that are open can be closed.
- C2A/C2B Contracts: The C2A contractor prepared its analysis and the Engineer of Record requested additional information. The C2A contractor expects to resubmit the requested information in mid-February 2014. Once its analysis is approved, C2B will submit their analysis to the Engineer of Record.
- C3 Contract: As mentioned above, the C3 contractor has still not completed the statistical evaluation of concrete strength test results that will enable it to close out concrete nonconformance reports (NCRs).
- C4C Contract: As mentioned above, the C4C contractor has still not completed the statistical evaluation of concrete strength test results that will enable it to close out concrete nonconformance reports (NCRs).
- C5B Contract: The C5B contractor prepared its analysis and the Engineer of Record requested additional information. The C5B contractor supplied the requested information and the Engineer of Record is expected to approve their analysis in February 2014.

Contract Packages C2A and C2B	
Status:	On C2A, through January 31, 2014, a total of 36 NCRs have been issued. 30 have been closed by both the contractor and MTACC, 2 NCRs were voided, and 4 NCRs are still open. In January 2014, no new NCRs were written and none were closed. On C2B, through January 31, 2014, a total of 29 NCRs have been issued. Eight have been closed and 21 NCRs are still open. 15 NCRs were written in January 2014, all for concrete nonconformances that occurred from July 10, 2013 through December 15, 2013. Inspection Daily Reports are current on the C2A contract and on the C2B contract, they are still 2 ½ weeks behind in entering them into the

	CMS System.
Observation:	On the C2A contract, of the four open NCRs, two are for concrete that was out of specification as reported by the contractor's test lab. These will be closed once the Engineer of Record approves C2A's concrete analysis which is expected to be submitted in mid-January 2014. On the C2B contract, the contractor had been delinquent in not writing NCRs at the time of the nonconformance and was directed to write them at the December 4, 2013 Monthly Quality Management Meeting. It took them 1 ½ months to issue the 15 NCRs all of which were opened on January 16, 2014. The C2B concrete analysis will be prepared and submitted once C2A's concrete analysis is approved.
Concerns and Recommendations:	The PMOC is concerned that entry of Inspection Daily Reports on the C2B contract is still 2 ½ weeks behind and that the contractor still has not prepared NCRs for nonconformances that occurred after December 15, 2013.
Contract Package C3	
Status:	Through January 31, 2014, a total of 74 NCRs have been issued. 44 have been closed and 30 NCRs are still open. In January 2014, five new NCRs were written and one was closed. None of the new NCRs were for concrete placement. Entering of Inspection Daily Reports is current.
Observation:	Of the 30 open NCRs, 19 are for concrete that was out of specification.
Concerns and Recommendations:	The PMOC is concerned that only one NCR has been closed since October 18, 2013 and that the SAS C3 Contractor's Quality Manager has not prepared the statistical analysis that will enable the concrete NCRs to be closed. The PMOC recommends that the requested analysis be completed and that effort be expended to close the eleven NCRs that are not concrete related.
Contract Package C4B	
Status:	Through January 31, 2014, a total of 121 NCRs have been issued. 92 have been closed and 29 NCRs are still open. In January 2014, three new NCRs were written and five were closed. One of the NCRs written

	in January was for concrete placement and one of the closed NCRs was for out of specification concrete. Entering of Inspection Daily Reports is current.
Observation:	Of the 29 open NCRs, 27 are for concrete that was out of specification. The contractor is waiting for the cylinder break results before these NVRs can be closed.
Concerns and Recommendations:	None at this time.
Contract Package C4C	
Status:	Through January 31, 2014, a total of eleven NCRs have been issued. One has been closed and ten NCRs are still open. In January 2014, three new NCRs were written and none were closed. All three of the NCRs written in January were for concrete placement. Entering of Inspection Daily Reports is current.
Observation:	All ten of the open NCRs are for concrete that was out of specification.
Concerns and Recommendations:	The PMOC is concerned that the SAS C4C Contractor's Quality Manager has not prepared the statistical analysis that will enable the concrete NCRs to be closed.
Contract Package C5B	
Status:	Through January 31, 2014, a total of 61 NCRs have been issued. 23 have been closed and 38 NCRs are still open. In January 2014, twelve new NCRs were written and three were closed. Entering of Inspection Daily Reports is 2 ½ weeks behind in entering them into the CMS System.
Observation:	Ten of the twelve NCRs written in January 2014 were for concrete that was out of specification since July 2013. The contractor had been delinquent in not writing NCRs at the time of the nonconformance. Of the 38 open NCRs, 32 are for concrete that was out of specification. The SAS C5B Contractor's Quality Manager submitted their statistical analysis on January 29, 2014. When approved by the Engineer of Record, this will enable the 32 concrete NCRs to be closed once the cylinder breaks are satisfactory.
Concerns and Recommendations:	The PMOC remains concerned that entry of Inspection Daily Reports is still 2 ½ weeks behind.

Contract Package C6	
Status:	Through January 31, 2014, a total of five NCRs have been issued. Four have been closed and one NCR is still open. In January 2014, no new NCR's were written and none were closed. None of the five total NCRs were for concrete placement. Entering of Inspection Daily Reports is current.
Observation:	None.
Concerns and Recommendations:	None at this time.

Concerns and Recommendations:

Refer to previous section.

2.0 SCHEDULE DATA

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 #90 was received on February 14, 2014 and is based on a Data Date of January 1, 2014. This submission contained the ".XER" schedule files for the IPS and the latest contractor schedule updates of the active construction contracts. The narrative report for IPS Update #90 was not received. The IPS forecasts the completion of all construction and NYCT Pre-Revenue Training & Testing activities by September 21, 2016, with approximately 102 calendar days (CD) or 73 work days (WD) of contingency when measured against MTACC's target Revenue Service Date (RSD) of December 30, 2016.

Project Critical Path: The most "critical" or longest schedule path that controls the completion of SAS Phase 1 is initiated by Activity C6P6-435, "Survey of Tunnel Alignment – North of 96th Street" which is forecast to be complete on February 25, 2014. Completion of this work allows the start of Activity C6TW-011 "Zone 1 Track S1 @ 96th – Set Ties, Thread & Clip Rails, Surface & Align, Install Riser Boxes Rebar and Conduit" and continues through the installation of the Trackwork in Zone 1 through Zone 7 which is complete by May 8, 2015. This path then shifts to the installation of the wayside equipment at 72nd Street which starts with Activity #C6C4-290 "Wayside @72nd – Install Riser Boxes, Conduits, Tray" and completes with Activity #C6C4-299 "Wayside @72nd – Perform Punchlist Work" on August 18, 2016. The completion of the wayside equipment punchlist at 72nd Street then ties to Substantial Completion of Contract 6 which finishes on August 18, 2016 and then ties into the "Proof of Operations Tests", then completion of "Dispatch Tower Tests at 96th St. Station", "Traction Power Operational Test", "Route Familiarization and Equipment Training", tying to an Operational Revenue Service Date (ORD) of September 20th, 2016.

This path was modified for this update but remains substantively the same a previous updates. Update #89 indicated this path has +23 days of schedule float, all of which were lost due to time required by MTACC to resolve clearance problems.

The PMOC has several concerns with respect to this depiction of this work in the IPS:

1. Summary activities within the IPS and their logical relationships deviate substantially from the same work depicted in the C6 construction schedule for a portion of the IPS critical path. MTACC has emphasized the importance of replicating the contractors' schedules within the IPS. The following summarizes the variances noted for these critical path activities:

Activity Description	Source	Start	Finish
Install Riser Boxes @ 72nd	IPS #90	5/11/15	5/22/15
	C6 #17	4/30/15	5/14/15
Install Wayside Eq.	IPS #90	5/25/15	10/26/16
	C6 #17	9/22/15	1/26/16
Local Cables	IPS #90	10/27/15	2/10/16
	C6 #17	1/26/16	5/12/16
Terminate, Tag, Test, Bond Cables	IPS #90	2/11/16	6/30/16
	C6 #17	5/12/16	10/11/16
Punchlist	IPS #90	7/1/16	7/28/16
	C6 #17	10/12/16	11/9/16

   At this time, MTACC does not agree with and has not incorporated delays modeled in the C6 schedule in the IPS. While it is common for contractors to inflate schedule impacts, project history as well as general experience suggest that some form of compromise will eventually be achieved. The PMOC acknowledges that modeling "reality" in these situations is a major challenge.

2. Track installation in the IPS generally proceeds from the northern to the southern end of the project, with critical track installation occurring within the limits of the 86th Street Station between June 25, 2014 and August 11, 2014. The relationship between milestone Activity # C5C S590 , Station Ready for Track Installation, has not been made. Based on this activity, the C5C station area will not be ready for trackwork installation until March 31, 2015. Schedule logic should be reviewed to determine if construction is modeled accurately in this area.

3. The PMOC remains concerned that no signal system test activities are included after completion of field installation and the start of revenue service.

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

+ 9 WD: This path involves construction of the mezzanine and Ancillary #2 at the 72nd Street Station and is initiated by Activity C4C-ANC2-LM-10001-1 "Anc. #2 Lower Mezz, WP, Rebar, Slab & Wall" which is forecast to complete on February 3, 2014. The path continues thru the Structural Build out of the 1st Upper Mezzanine, 2nd Upper Mezzanine, Sub Basement and Basement Levels as well as the MEP installation of Ancillary 2 Mezzanine Level, which allows construction of the Signal Rooms (# 5103, 5105, 5106 & 5109) located in Ancillary 2 to start in early August 2014. Completion of these rooms, which is forecast for September 29, 2014, satisfies C4C Milestone #9 and transfers the Signal Rooms to the C6 Contractor.

This path then follows signal system installation through the 72nd Street Station signal rooms which is forecast to complete on January 21, 2016, at which time, testing of the system begins and continues through July 15, 2016.

+ 9 WD: This path consists of the remaining track work no on the TF=0 float path. This path starts on May 12, 2015 and is completed on July 15, 2016 with the energizing of the 3rd Rail at 63rd and 96th Street Station areas on July 15, 2016.

+23/26 WD: NYCT Pre-Revenue Operation Activities scheduled to start on August 18, 2014 is unchanged this period. Float on this path remains unchanged this update period.

+23 WD: This path is initiated by C2B, Milestone #7 which provides for full access to signal rooms throughout the 96th Street Station on December 11, 2014. The IPS indicates the C6 Contractor to be scheduled to start work in the signal rooms on November 13, 2014. Installation work in the rooms continues through April 27, 2016, at which time testing of the equipment of the rooms starts and should complete by July 7, 2016. Following testing of the room equipment, the signal system, including track circuits undergoes In Service System Integrated Testing, which is completed on August 18, 2016.

The PMOC notes that the IPS logic allows work in the signal rooms to start approximately one month in advance of the access milestone. Based on experience to date, this appears to be overly optimistic or incorrect logic that should be modified.

+37 WD: This path is initiated by C5C, Milestone #9 which provides access for the C6 Contractor to all traction power rooms at the north end of the 86th Street Station on March 18, 2015. Installation of equipment and cable is forecast to continue through June 10, 2016, at which time field testing, facility in-service testing and in-service testing starts and continues through July 29, 2016.

The PMOC notes that the IPS forecasts energizing the tracks in the 86th Street Station Area on July 15, 2016 (Act # 86ENTS1200). There is no logical relationship between the traction power work on the +37 WD float path and energizing the track. Logic between traction power and signal systems appear to have been comingled.

+58 WD: This path is initiated by C5B construction of the south cavern arch, which is scheduled to be complete on April 11, 2014. Completion of this work leads to C5B demobilization and handoff of the south station and tunnels to the C5C Contractor on May 5, 2014. The path then follows construction of Ancillary 1 by the C5C Contractor through February 27, 2015, at which time portions of Ancillary #1 are turned over to the C6 Contractor via C5C, MS#9.

The PMOC notes that the specific work necessary to achieve C5C MS#9 is not detailed in the IPS. Full detailing of the work necessary to achieve C5C MS#9 is a necessary step in expediting and coordinating the turnover process.

Milestone Summary: For contracts actively under construction, a tabulation of current schedule performance against contractual milestones is presented in Table 3. Based on these milestones, the PMOC notes that Contract C4B achieved Substantial Completion on January 11, 2014.

Closeout activities are in progress. Turnovers to the follow-up C4C Contractor have proceeded in a timely and efficient manner.

- For C4B, C4C and C5B the IPS reflects the Contractor's Milestone forecast dates as of January 1, 2014.
- For C5C, the IPS is based on and reflects the Contract Access and Milestone dates.
- For C2B, C3 and C6, the IPS does not reflect a significant number of the Contractor's Milestone forecast dates as of January 1, 2014. Typically this is a result of contractor time extension requests with which MTACC either does not agree or is in the process of evaluating and negotiating.
- The C5B partial turnover of the 86th Street Station and adjacent tunnels is a critical milestone, currently forecast for May 2, 2014. Achieving this milestone will allow the C5C Contractor to actively begin field work.

ELPEP/SMP Compliance: 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). The PMOC recognizes the complexity of the recent updating process, but considers full compliance to be conditional upon completion and validation of this effort.

- Forecast Revenue Service Date (RSD)
  - ELPEP Requirement: February 28, 2018
    - Current Forecast: December 30, 2016
  - IPS Update #90 does not account for several significant risks that may impact the project RSD. Preliminary evaluation of these risks suggest they will not extend the RSD beyond the February 28, 2018 ELPEP requirement.
- Minimum schedule contingency (measured against February 28, 2018 RSD)
  - ELPEP Requirement: 240 CD
    - Current Forecast: 537 CD
  - IPS Update #90 represents an optimistic assessment of schedule contingency. Incorporation of known risks will not reduce project contingency below the ELPEP requirement at this time.
- Minimum Allowable Float; Real Estate Acquisition
  - ELPEP Requirement: 60 CD
    - All real estate access agreements pertaining to C4C, Entrance #1 have been executed. There are no pending real estate acquisitions that can impact the project schedule.
- Minimum Allowable Secondary Float Path
  - ELPEP Requirement: 25 Calendar Days (approximately 18 WD).
    - Current Forecast: Indeterminate

- There is one independent secondary float path with Total Float (TF) =9 WD (approximately 13 WD). PMOC notes that satisfaction of this requirement may not be consistent with maintaining the project budget.

- Secondary Schedule Mitigation (critical path compression)
  - ELPEP Requirement: 125 CD
    - Current Forecast: Schedule mitigation efforts are under review.
  - Evaluation of the C6 Contractor's schedule acceleration/mitigation proposal is currently "on-hold" pending better definition and clarification of other project schedule issues. Adequate time is available to implement an acceleration initiative similar to that developed for systems installation and testing and achieve significant schedule compression.

Schedule Contingency: Via IPS Update #90, MTACC forecasts all Phase 1 construction and pre-revenue testing to be complete on September 21, 2016. This results in 102 CD (73 WD) of contingency when measured against the MTACC's target RSD of December 30, 2016 and a 526 CD contingency when measured against the FTA Risk-Informed RSD of February 28, 2018. As previously noted, the PMOC considers this to be an optimistic assessment of the schedule status, representing 100% mitigation of several major issues which are acknowledged to have potential to significantly impact the project schedule.

For example, signal system installation at 72nd Street Station is a prominent part of the IPS #90 critical path with TF=0. The C6 Contractor's schedule for these same work activities indicate a 57 WD (approximately 80 CD) delay measured against the same completion milestone. In IPS #90, MTACC has intentionally chosen to discount the C6 Contractor's schedule extension and maintain the previous RSD.

The PMOC does not agree with MTACC's decision to discount the C6 Contractor's schedule analysis from the IPS, but also acknowledges that the C6 Contractor's position may be overstated for a variety of reasons. This situation becomes more difficult when the extended period of time required to resolve such differences between MTACC and the contractors is considered.

Using this example, the PMOC proposes that the RSD calculated by the IPS be expressed as a range representing a completely risk-mitigated forecast and a completely risk-realized forecast. Using this approach the RSD calculated by IPS #90 would be expressed as follows:

IPS #90	RSD	Construction Complete	Contingency (measured against)	
			Dec. 30, 2016	Feb. 28, 2018
Risk-Mitigated	Dec. 30, 2016	Sept. 21, 2016	102 CD	526 CD
Risk-Realized	Dec. 30, 2016	Dec. 10, 2016	20 CD	446 CD

Schedule Comments:

The PMOC notes that within the IPS the transition between rail system installation → component testing → system testing in several instances appears to be unclear or incomplete. Additional refinement in this area appears to be needed.

Reconciliation of contractor schedules with grantee expectations and opinions into a realistic schedule status assessment and forecast is a major challenge. Additional work is needed to develop a consistent methodology to incorporate realistic schedule risks into a comprehensive schedule update and forecast.

MTACC has expressed concern over the potential schedule impact of delay in availability of permanent power since August 2013. To date, MTACC has been unable to obtain the necessary information to accurately demonstrate the matter in a schedule format. This problem remains a potential "game changer" and is not represented in the IPS.

3.0 COST DATA

Based upon financial expenditures reported by the MTACC through January 31, 2014, SAS Phase 1 is approximately 62.3 % complete. The completion status of the individual construction contracts through January 31, 2013, also based upon reported expenditures through that date, is as follows:

- C26002 (Tunnel Boring) – 100.0%
- C26005 (96th Street Station) – 99.7%
- C26010 (96th Street Station) – 32.1%
- C26013 (86th Street Station) – 100%
- C26008 (86th Street Station) – 78.8%
- C26012 (86th Street Station) – 0%
- C26006 (63rd Street Station) – 67.3%
- C26007 (72nd Street Station) – 97.8%
- C26011 (72nd Street Station) – 5.5%
- C26009 (Systems) – 19.4%

Aggregate Construction % Completion:

- 100% of all construction has been bid.
- 100% of all construction is under contract
- 61.1% of all construction is complete

Based upon cost data received from MTACC for the period through January 31, 2014:

- Value of construction in place this period = $41,768,247
- Estimated value of construction remaining = $908,668,116
- Target construction completion = September 20, 2016
- Number of months remaining = 31.7

The estimated average rate of construction required to achieve target completion date is $29,105,939 per month. The average progress (payments) achieved over the most recent six month period is $39,670,256 per month. Based on a review of cost data for January 2014, it

appears that adequate overall progress was made on the project to achieve the RSD of December 30, 2016.

Soft Cost expenditures (not including real estate, OCIP, etc.) reported this period by MTACC totaled $5.31M. This expenditure is consistent with the CWB.

Estimate-At-Completion (EAC): The SAS Project Team has extended its risk-based contingency forecasting effort to the development of an EAC for all construction. The project EAC is a combination of the risk-based approach for construction cost and traditional estimating for soft costs. Table 6 contains a summary of the updated EAC, which is currently $4,266,375,000. This update includes the updated construction EAC and all revisions included in Revision 10 of the Project Cost Estimate.

Based on the information available, this updated EAC continues to validate the reasonableness of the MTACC's Current Working Budget of $4.451B. Based upon current information, this effort suggests the project can be built within the limits of the Current Working Budget.

Cost Growth: The value of AWOs reported by MTACC/NYCT in January 2014 is summarized as follows:

	Executed AWOs	AWO Exposure
January 2014	$116,852,952	$171,163,562
December 2013	$116,337,561	$154,898,573
Change	$515,391	$16,264,989
% Change	.44%	10.50%

The changes in AWO Exposure for each construction contract are summarized as follows:

Const. Pkg.	AWO Exposure $			Changes this Period
	Jan.-14	Dec.-13	Period Δ	
C1	$41,086,647	$41,086,647	$0	Final value as reported by MTACC.
C2A	$53,985,573	$51,521,892	$2,463,681	Net increase is based on revisions to the estimated value of AWOs # 143 and 144 as well as initial estimates for AWO # 160 and 172.
C2B	$17,776,492	$19,926,179	($2,149,686)	Net decrease is based on revised estimates for AWO # 20, 21, 49, 63, 65 and 69.
C3	$9,526,295	$11,489,827	$(1,963,532)	Net decrease is based on revised estimates for AWO # 46, 49, 54, 68, 75,85, 95, 96, 112 and 114 as well as initial estimates for AWO # 101, 115, 117, 118, 119 and 120. Also included is an adjustment for Cost-to-Cure AWOs that were previously (incorrectly) included.
C4B	$3,670,008	$3,721,582	($51,574)	Decrease is based on the initial estimate for AWO # 87.
C4C	$14,5532,184	$221,969	$14,31,215	Increase is based on initial estimates for AWO # 10, 26 and 28 as well as a revised estimate

Const. Pkg.	AWO Exposure $			Changes this Period
	Jan.-14	Dec.-13	Period Δ	
				for AWO # 13.
C5A	$6,525,471	$6,525,471	$0	Final value as reported by MTACC.
C5B	$12,245,573	$10,774,895	$1,470,678	Increase is based on initial estimates for AWO # 40, 48 and 86.
C5C	$0	$0	$0	No change this period.
C6	$11,794,319	$9,630,112	$2,164,207	Net increase is based on initial estimates for AWO # 17 and 35 as well as revised estimates for AWO # 16, 23 and 34
	$171,163,562	$154,,898,573	$16,264,989	

The changes in Executed AWO Value are summarized as follows:

Const. Pkg.	Executed AWO $			Changes this Period
	Jan.-14	Dec.-13	Period Δ	
C1	$41,086,647	$41,086,647	$0	Final value as reported by MTACC.
C2A	$41,121,070	$41,121,070	$0	No change this period.
C2B	$4,957,630	$4,924,800	$32,750	Increase is based on the execution of AWO # 48.
C3	$7,040,157	$8,331,515	$(1,291,,358	Net decrease is based on execution of AWO # 20, 77, 94 and 104. Also included is an adjustment for Cost-to-Cure AWOs that were previously (incorrectly) included.
C4B	$5,240,513	$5,004,513	$236,000	Increase is based on the execution of AWO # 42 and 80.
C4C	$147,661	$32,062	$115,999	Increase is based on execution of AWO # 11, 13, 26 and 28.
C5A	$6,525,471	$6,525,471	$0	Final value as reported by MTACC.
C5B	$9,235,672	$7,937,172	$1,298,500	Increase is based on the execution of AWO # 55, 83, 84, 85 and 86.

Const. Pkg.	Executed AWO $			Changes this Period
	Jan.-14	Dec.-13	Period Δ	
C5C	$0	$0	$0	No change this period.
C6	$1,498,131	$1,374,231	$123,900	Increase is based on the execution of AWO # 23.
	$116,852,952	$116,337,581	$515,391	

As of January 31, 2014, the status of Additional Work Orders (AWOs) for each construction contract on Phase 1 of the Second Avenue Subway Project is summarized as follows:

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)	99.66%	$325,000,000	$53,985,573	16.61%	$41,121,070	12.65%
C26010 (2B)	32.05%	$324,600,000	$17,776,492	5.48%	$4,957,630	1.53%
C26006 (3)	67.32%	$176,450,000	$9,526,295	5.40%	$7,040,157	3.99%
C26007 (4B)	97.77%	$447,180,260	$3,670,008	0.82%	$5,240,513	1.17%
C26011 (4C)	5.50%	$258,353,000	$14,553,184	5.63%	$147,661	0.06%
C26013 (5A)	100.00%	$34,070,039	$6,525,471	19.15%	$6,525,471	19.15%
C26008 (5B)	78.83%	$301,860,000	$12,245,573	4.06%	$9,235,672	3.06%
C26012 (5C)	0.00%	$208,376,000	$0	0.00%	$0	0.00%
C26009(6)	19.38%	$261,900,000	$11,794,319	4.50%	$1,498,131	0.57%
TOTAL TO DATE		$2,674,814,299	$171,163,562	6.40%	$116,852,952	4.37%

To date, approximately $1,596,023,701 (59.7%) worth of all base contract construction work has been completed. As a % of work completed, the AWO exposure for these contracts = 9.24% and the executed AWO % = 7.30%. Based on performance to date, a forecast of total AWO expenditure of approximately $200M appears reasonable. This compares favorably with the $229M AWO contingency contained in the MTACC CWB. The PMOC continues to recommend that all AWOs be critically reviewed, evaluated and documented on a contemporaneous basis to determine if compensable responsibility exists for some of these expenditures.

ELPEP/CMP Compliance: The SAS Project Team maintains an EAC for all construction cost, which is updated monthly. Revision #10 of the Project Cost Estimate, which includes a complete forecast of remaining soft cost has been prepared and incorporated into the project CWB. It is the opinion of the PMOC that SAS Phase 1 is in substantial compliance with the metrics, deliverables and intangible goals enumerated for Cost Management in the Enterprise Level Project Execution Plan (ELPEP), dated January 15, 2010 (Section IV. b, page 8) and as further described by the Cost Management Plan (CMP).

Cost Contingency: Based upon the MTACC Current Working Budget, expenditures to date reported by MTACC and the current AWO Exposure Estimate, the PMOC estimates the available contingency as follows:

Phase 1 Budget	$	4,451,000,000
Construction Awards	$	2,674,814,299
Soft Cost Expended	$	1,005,643,318
Soft Cost Forecast to Complete	$	302,464,767
AWO Exposure	$	171,163,562
Available Contingency	$	296,914,054
ELPEP Requirement	$	122,778,000

Cost models calculated 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.

4.0 RISK MANAGEMENT

Risk Registers for active construction contracts were updated during December 2013. The following table identifies the most significant risks presently identified on the project.

<table>
<tr><th>Risk Description</th><th colspan="3">Mitigation Summary</th></tr>
<tr><td colspan="2">Risk CNS 4 (C6):
Delay resulting from management of contractual interfaces during construction.</td><td colspan="2">Risk Type</td></tr>
<tr><td colspan="2"></td><td>Cost</td><td>Schedule</td></tr>
<tr><td>Mitigation Strategy:
1. Develop Detailed Contract interface Management Plan.
2. Provide an organization that is capable of identifying interface issues and resolving them in a timely manner to support the schedule.
3. Interface management position descriptions and responsibilities.
4. A detailed process for interface management and status reporting. As a minimum, this includes a detailed work list of items to be completed in chronological order to meet the required interface date.
5. Interface management meetings on a bi-weekly basis.</td><td colspan="3">Current Status:
1. Complete.
2. Interface Manager started work on August 5, 2013. Additional staff is being added.
3. Complete
4. Complete
5. The interface management effort has had a positive impact through improved definition of interface requirements, development of detailed tasks required to execute turnovers and prompt elevation of significant problem issues.
6. Replacement of the Interface Manager and staffing of several field coordinator positions is a high priority. The Deputy CM has temporarily assumed the lead in this effort.</td></tr>
</table>

Risk Description	Mitigation Summary		
Risk C3, C2B, C4C, C5C and C6 Schedules: Construction contract delays that will extend Project Completion beyond the current RSD.		**Risk Type**	
		Cost	**Schedule**
Mitigation Strategy: 1. Develop TAC paper to identify potential schedule acceleration options. 2. Refine schedule acceleration options within MTACC and with contractor(s) as appropriate. 3. Solicit contractor cost proposals for preferred schedule acceleration options. **4.** Negotiate and implement.	**Current Status:** 1. Complete. 2. Complete. 3. The SAS project team will continue to evaluate the C6 Contractor's proposal for schedule acceleration Concerns regarding the project schedule, equitable distribution of risk and flexibility of implementation of this effort have delayed this effort. **4.** Evaluation of the Contractor's proposal to accelerate construction of Entrance #2 at the 86th Street Station is ongoing.		
Permanent (Station) Power: Permanent facility power to 72nd, 86th, and 96th Street Stations may be delayed and result in subsequent delays to equipment testing and commissioning.		**Risk Type**	
		Cost	**Schedule**
Mitigation Strategy: 1. Obtain services of an experienced ConEd liaison engineer to facilitate design and review process. 2. Expedite contractor design and ConEd review processes where possible. 3. Development of detail schedule "fragnet" to identify schedule problems and monitor progress. 4. Expedite construction of supporting infrastructure at each station to minimize potential delay. **5.** Advance scheduling and coordination of feeder "cut-in" to minimize delays	**Current Status:** 1. Complete. 2. For 72nd and 96th St. Stations, development of 60% submittals are underway. Submittal of 30% design for 86th Street Station (C5C) is pending. 3. Based on current schedules, it appears some acceleration of infrastructure construction to support permanent power will be required. **4.** "Cut-in" coordination with ConEd will occur when construction schedules are fully developed and within ConEd planning window. **5.** Development of a comprehensive schedule model of this issue has been delayed. While individual mitigation activities are continuing, the inability to fully quantify this risk is a concern.		
Buy America Delay resulting from resolution of MTA's request for a non-availability waiver for the LVT Pad and Boot.		**Risk Type**	
		Cost	**Schedule**

Risk Description	Mitigation Summary
Mitigation Strategy: 1. Request waiver of Buy America requirement for this item based upon "non-availability". 2. Options include: a. MTACC's position accepted – no changes required. b. Request rejected – exclude FTA funding & use local funding only. **c.** Request rejected – develop alternative with compliant materials.	**Current Status:** 1. On September 11, 2013, MTACC transmitted its request for a "non-availability" waiver for the LVT Pad and Boot. 2. MTACC's waiver request was posted in the Federal Register for a 30-day comment period on December 17, 2013. This period expired on January 17, 2014 with no known comments having been received. 3. No formal response has been received. 4. Informal discussions continue.
Risk C4C Entrance 1 (301 E 69th Street): Work on Entrance 1 will be delayed due to delays in obtaining design approval from Owner for utility relocation in the building.	**Risk Type** **Cost** / **Schedule**
Mitigation Strategy: 1. Develop an alternate design (relocation from inside building to sidewalk) to reduce impacts to building utilities. 2. Prepare a Tech memo and submit to FTA for approval. 3. Develop and negotiate access agreements with affected property owners 4. Excavate/concrete/adit and underpin the common wall via C4C. **5.** Exercise C4C options for Entrance # 1 in order to engage contractor's engineering and to provide time to develop an underpinning design and construction staging plan.	**Current Status:** 1. In progress. 2. Complete. 3. Access agreements with affected adjacent property owners have been obtained and work is progressing. 4. Periodic monitoring to verify effective mitigation will occur.

Risk Description	Mitigation Summary	
Risk COM 2 (C6): Frequent late changes to the communications systems could delay C6 and the RSD.	**Risk Type**	
	Cost	**Schedule**
Mitigation Strategy: 1. Confirm that previously agreed Communications design changes have been incorporated into the design. Resolve any outstanding issues. 2. Future User Department requested changes shall go through the CCG/ CCB approval process. A User Department representative's approval signature is required on the change request forms. The request will include cost and schedule impacts of the requested change. **3.** Requested changes exceeding $50,000 or having any schedule impact, must be presented to the Board by a User Department representative with substantiation of need provided.	**Current Status:** 1. MTACC has reported that this item has been completed. 2. CCG/CCB review and approval process appears to be having a positive effect on limiting the number of User Department requests for design changes. 3. Monitoring of the effectiveness of the risk mitigation strategy is ongoing.	
Risk C3 Entrance 1 (200 E 63rd Street): Work on Entrance 1 will be delayed due to delays in design approval from Owner for utility relocation in the building at 200 E 63rd Street.	**Risk Type**	
	Cost	**Schedule**
Mitigation Strategy: 1. Develop schematic design of all utility relocations. 2. Determine the means of access to utilities in the area between the station structure and existing building structure. 3. Submit design package to building owner. 4. Obtain owner's approval and building permits. **5.** Commence construction.	**Current Status:** 1. Complete 2. Complete 3. Complete 4. Complete 5. Critical gas line and meter relocation was completed in December 2013. This risk will be periodically monitored.	

Risk Description	Mitigation Summary	
Risk CNS 8 (C6) Delayed Safety Certification results in delay to the RSD	**Risk Type**	
	Cost	**Schedule**
Mitigation Strategy: 1. Develop a plan to show how the safety certification will be organized and implemented. 2. Identify a candidate for Safety Certification Manager. 3. Develop preliminary training program for respective contract CM's, office engineers, etc. that will assure that all parties involved in the safety certification process are aware of their responsibilities. 4. Develop EDMS workflow to manage approvals and to store electronic documents. 5. Work with A/A JV IT to set up an EDMS file for the safety certification process. 6. Contact OSS/NYCT to commence the process of obtaining documentation from NY State on the acceptability of the safety certification process. 7. Schedule Safety Certification training for C6 and C2B Contracts. 8. Internal meeting(s) to prepare the outline of the committee meeting with NYS. 9. Hold Safety Certification Meeting with NYS representative in attendance.	**Current Status:** 1. Complete 2. Complete 3. Complete. 4. Complete 5. Complete 6. Complete 7. Complete 8. Complete 9. NYSPTSB role has been confirmed to be one of oversight and verification of the MTACC/NYCT certification process. Their role will not impact the RSD. 10. Lack of precedent and explicit definition of the roles and responsibilities of all parties has resulted in an ongoing lack of confidence in the mitigation of this risk. 11. There is concern that delays in finding a new Safety and Certification Manager will adversely impact this process. 12. Review of MTACC's updated SSMP and further efforts to define roles and responsibilities should address this issue..	

The December 2013 update of the Risk Registers for the active construction contracts now identify station testing and commissioning to be a significant risk (at each station) based upon:

- Possible lack of NYCT resources.
- Introduction of NYCT "wishlist" changes
- Scope changes due to changing standards, particularly safety items.

The PMOC notes that items # 2 and 3 are very similar to the current risk (COM 2) involving user requested scope changes to the communications system. Further application of this mitigation strategy should be useful in mitigating late scope change requests for other systems.

The availability of NYCT resources to support testing and commissioning activities for station and rail systems is a risk that must be actively managed. MTACC has previously engaged NYCT in preliminary scheduling of testing and commissioning activities. This type of coordination must continue, particularly when considering any schedule changes or acceleration initiatives. Dedicating select schedule contingency to the testing and commissioning phase may also be a prudent means of recognizing and managing these risks.

The MTACC has used the risk management process to assist in identifying potential cost/schedule risks to the project and develop mitigation strategies in a timely and effective manner. Ongoing efforts to engage construction managers in more active participation in the process will be beneficial.

5.0 ELPEP

There were no ELPEP meetings held during January 2013. The next quarterly ELPEP meeting is currently scheduled for March 20, 2014. With respect to SAS, the current status of each of the main ELPEP components is summarized as follows:

- **Technical Capacity and Capability (TCC):** MTACC's 4th Quarter 2013 ELPEP Compliance Audit indicates it is "in compliance" with its TCC Plan. FTA has recommended this plan be updated; and this effort is in progress.
- **Schedule Management Plan (SMP)**: MTACC will reissue the SMP incorporating corrective actions developed during its internal audit. MTACC's 4th Quarter 2013 ELPEP Compliance Checklist indicates MTACC is "in compliance" with its SMP.
- **Cost Management Plan (CMP)**: MTACC will reissue the CMP incorporating corrective actions developed during its internal audit. MTACC's 4th Quarter 2013 ELPEP Compliance Checklist indicates MTACC is "in compliance" with its CMP.
- **Risk Mitigation Capacity Plan (RMCP) and Risk Management Plan (RMP)**: MTACC will reissue the RMP incorporating corrective actions developed during its internal audit. MTACC's 4th Quarter 2013 ELPEP Compliance Checklist indicates MTACC is "in compliance" with its RMP.

The SAS Project Team has implemented the principles and requirements embodied in the ELPEP. The procedural changes instigated 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.

6.0 SAFETY AND SECURITY

Implementation of the Safety Requirements as specified in Section 01 11 50 of the General Requirements for each construction contract is ongoing. The contractors' safety management held tool box meetings, trained new employees, monitored the work areas individually and with the CCM Safety and OCIP representatives, and promptly investigated safety incidents. Safety Oversight by the CCM continued with Quarterly Assessments of selected contractors and sharing of Lessons Learned during the project wide monthly Safety Meeting. Site visits by MTA's office of Risk Management is ongoing.

As of December 31, 2013, a total of 7,470,611 construction hours have been logged with 72 lost time and 203 recordable incidents documented. The total hours and incidents equates to a lost time rate (LTR) of 1.93 and a recordable rate (REC) of 5.43. The US Bureau of Labor Statistics

(BLS) national rate (Heavy & Civil construction) for lost time and recordable incidents are 2.0 and 3.5 respectively.

7.0 ISSUES AND RECOMMENDATIONS

Schedule Reliability

MTACC has made significant progress in resolving previously identified deficiencies in the IPS. The PMOC has expressed concern that the cut-in of the C6 construction schedule to the IPS may have compromised some of the activities and logical relationships in the testing and commissioning phase, particularly involving railroad systems. Clarification of the IPS during the testing and commissioning phase is anticipated over the next several updates.

Schedule Recovery/Acceleration

The SAS Project Team's efforts to improve the project schedule currently involve two major efforts:

- Reduce the duration of systems installation and testing.
- Reduce the remaining duration of work at 86th Street Station, Entrance #2.

MTACC is currently evaluating the C5B Contractor's proposal to accelerate the work at Entrance #2. MTACC has also decided to defer the negotiation of a schedule acceleration agreement with the C6 Contractor until such time as the schedule and system status can be better defined. The PMOC concurs with this decision and notes that adequate time remains to develop and implement a schedule acceleration initiative.

Construction Management

The PMOC notes that several senior CM positions have recently become available. While the MTACC does have interim staffing in place to cover these positions, the PMOC notes the extended duration required to fill other positions recently and is concerned that these positions will go vacant for an extended period.

Permanent Power

The PMOC has previously documented SAS project team concerns regarding the time required to design, fabricate and install permanent station power facilities. One element of the mitigation strategy for this risk was to develop a detailed schedule "fragnet" representing all activities involved in delivering permanent power to the affected stations. Without this effort, it is difficult to assess the actual magnitude of this risk. The PMOC continues to recommend the complete modeling of this issue be expedited as an aid to thoroughly understanding the magnitude of any problem and determine if any mitigating actions are possible.

Low Vibration Track (LVT) Buy America Decision

On September 11, 2013, MTACC submitted its "Request for Non-Availability Waiver for Low Vibration Track System" to the FTA in accordance with 49 C.F.R. §661.7(c). MTACC's waiver request was posted in the Federal Register for a 30-day comment period on December 17, 2013. This period expired on January 17, 2014 with no known comments having been received. As of the writing of this report, there has been no formal decision regarding this request.

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APPENDIX A - ACRONYMS

A/A	AECOM/Arup
AFI	Allowance for Indeterminates
ARRA	American Recovery and Reinvestment Act
AWO	Additional Work Orders
BA	Budget Adjustment
CCM	Consultant Construction Manager
CD	Calendar Days
CMP	Cost Management Plan
CSSR	Contact Status Summary Report
CIL	Central Instrument Location
CPRB	Capital Program Review Board
CPP	Contract Packaging Plan
CWB	Current Working Budget
CY	Cubic Yards
DCB	Detailed Cost Breakdown
DMP	Deformation Monitoring Points
EAC	Estimate at Completion
ELPEP	Enterprise Level Project Execution Plan
EPC	Engineering-Procurement-Construction
FFGA	Full Funding Grant Agreement
FTA	Federal Transit Administration
GO	General Outage
IPS	Integrated Project Schedule
MO	Month
MPT	Maintenance Protection of Traffic
MTA	Metropolitan Transportation Authority
MTACC	Metropolitan Transportation Authority – Capital Construction
N/A	Not Applicable
NOA	Notice of Award
NTP	Notice to Proceed
NYCT	New York City Transit

NYSPTSB	New York State Public Transportation Safety Board
OSS	NYCT Office of System Safety
PE	Preliminary Engineering
PEP	Project Execution Plan
PMOC	Project Management Oversight Contractor (Urban Engineers)
PMP	Project Management Plan
PQM	Project Quality Manual
QA	Quality Assurance
RAMP	Real Estate Acquisition Management Plan
RMCP	Risk Mitigation Capacity Plan
RMP	Risk Management Plan
ROD	Revenue Operations Date
ROW	Right of Way
RSD	Revenue Service Date
SAS	Second Avenue Subway
SCC	Standard Cost Category
SMP	Schedule Management Plan
SOE	Support of Excavation
SSCC	Safety and Security Certification Committee
SSOA	State Safety Oversight Agency
SSPP	System Safety Program Plan
TBD	To Be Determined
TBM	Tunnel Boring Machine
TF	Total Float (Schedule)
TCC	Technical Capacity and Capability
VE	Value Engineering
WBS	Work Breakdown Structure
WD	Work Days

APPENDIX B – TABLES

Table 1 - Summary of Schedule Dates

	FFGA	Forecast Completion	
		Grantee	PMOC
Begin Construction	January 1, 2007	03/20/2007A	03/20/2007A
Construction Complete	December 31, 2013	August 30, 2016	October 2017
Revenue Service	June 30, 2014	December 30, 2016	February 2018

A = Actual

Table 2 - Schedule Contingency

IPS Update #	74	77	80	83	86	87	88
Data Date	09/01/12	12/01/12	3/1/13	6/1/13	9/1/13	10/1/13	11/1/13
Contingency (CD)							
RSD=12/31/2016	No	90	90	109	102	102	102
RSD=02/28/2018	Report	513	513	530	537	537	537

Table 3 – Schedule Milestone Comparison

			Dates			Variance		Sch.
Pkg	MS	Description	Adjusted (2)	Ud #89 (3)	Ud #90 (4)	Contract = (2) - (4)	Month = (3) - (4)	Float (87)
C2B	MS #2	Complete work & provide shared site access @ 93rd Street shaft	03/22/14	9/10/14	9/11/14	-173	-1	**601**
C2B	MS #4	Complete work & provide shared access in East & West track-ways thru Sta (1238+50 ->1225+25); 97th -> 99th St Tunnel in 99th to 105th St Tunnels	09/21/14	12/11/14	1/6/15	-107	-26	**55**
C2B	MS #5	Complete work & provide shared access @ East & West Tunnels South of 96th St Station (1225+25 and STA. 1209+00)	02/20/14	2/21/14	2/21/14	-1	0	**88**
C2B	MS #6	Complete work & provide full access to Comms Rooms & Closets	08/21/14	12/2/14	12/10/14	-111	-8	**201**
C2B	MS #7	Complete work & provide full access to Signals Rooms	08/21/14	12/2/14	12/10/14	-111	-8	**23**
C2B	MS #8	Complete work & provide full access to Traction Power Rooms:	08/21/14	12/2/14	12/10/14	-111	-8	**172**
C2B	MS #9	Complete work & provide full access to Station Service Centers	11/21/14	6/22/15	6/30/15	-221	-8	**393**
C2B	MS #10	Complete all Comms, Signal , & Traction Power work in remaining areas not identified in Milestones 1 through 9	09/21/14	2/26/15	4/23/15	-214	-56	**441**
C2B	SS	Substantial Completion	12/21/15	6/3/16	6/13/16	-175	-10	**144**
C3	#3c	Compl Mezz Lvls Comm Rms/Sta Serv Ctr	04/15/13	07/31/14	05/27/14	-407	65	**483**
C3	#4	Compl Lwr/Uppr Platforms & Signal Rms	10/14/13	03/31/14	03/31/14	-168	0	**79**
C3	#4b	Compl Lwr/Uppr Platforms & Signal Rms	10/14/13	07/31/14	09/12/14	-333	-43	**406**
C3	#5	Compl All work Anc #2 in Park'g Garage	08/30/13	12/30/13	12/30/2013A	122	0	**-**
C3	SS	Substantial Completion	05/13/14	06/15/15	08/18/15	-462	-64	**40**

			Dates			Variance		Sch.
Pkg	MS	Description	Adjusted	Ud #89	Ud #90	Contract = (2) - (4)	Month = (3) - (4)	Float
			(2)	(3)	(4)			(87)
C4B	SS	Substantial Compl/All work South GL 17	12/03/13	12/30/13	1/14/2014A	-42	-15	-
C4C	MS #1	Provide vehicle access thru 72nd Street Station 1172+40 -> 1163+00	02/13/14	02/14/14	02/14/14	-1	0	**157**
C4C	MS #2	Provide limited access thru 72nd Street Station 1172+40 ->1163+00	01/13/14	06/13/14	06/13/14	-151	0	**90**
C4C	MS #3	Provide shared access thru 72nd Street Station 1172+40 ->1163+00	11/27/14	11/26/14	11/20/14	7	6	**92**
C4C	MS #4	Provide vehicle access south of 72nd Street Station 1163+00 ->149+50	2/13/14	02/14/14	02/14/14	-1	0	**157**
C4C	MS #5	Provide limited access south of 72nd Street Station 1163+00 -> 149+50	4/14/14	04/14/14	04/14/14	0	0	**133**
C4C	MS #6	Provide shared access south of 72nd Street Station 1163+00 -> 149+50	6/13/14	06/09/14	06/12/14	1	-3	**91**
C4C	MS #7	Provide full access turnover of Communications Rooms to Systems Contractor	8/28/14	08/27/14	09/17/14	-20	-21	**325**
C4C	MS #8	Provide full access turnover of Signal Rooms South of station to Systems Contractor	7/15/14	07/08/14	07/11/14	4	-3	**372**
C4C	MS #9	Comp. work in all Signal Rooms except M8	9/29/14	09/29/14	09/29/14	0	0	**9**
C4C	MS #10	Comp. work in north power rooms	2/25/15	10/17/14	10/29/14	119	-12	**253**
C4C	MS #11	Comp. work in south power rooms	03/24/15	10/16/14	11/26/14	118	-41	**234**
C4C	MS #12	Complete work, provide full access @ Station Service Center(s)	08/28/14	09/29/14	08/26/14	2	34	**340**
C4C	MS #13	Complete work, provide full access @ Lubrication Room(s)	08/28/14	08/21/14	08/28/14	0	-7	**338**
C4C	MS #14	Complete work in all remaining Comm, Signals & Traction Power Rooms	08/28/14	10/08/14	08/28/14	0	41	**338**
C5B	#1	Compl All work South of Grid Line 15	03/04/14	04/22/14	05/02/14	-59	-10	**58**

			Dates			Variance		Sch.
Pkg	MS	Description	Adjusted	Ud #89	Ud #90	Contract = (2) - (4)	Month = (3) - (4)	Float
			(2)	(3)	(4)			(87)
C5B	SS	Substantial Compl/All Work incl. Ent. #2	-	02/10/15	02/26/15		-16	**173**
C6	#2A	Complete LAN - 96th St. Station	05/18/15	05/18/15	05/18/15	0	0	**331**
C6	#2B	Complete WAN - 96th St. Station	05/18/15	05/18/15	05/18/15	0	0	**331**
C6	#3A	Complete LAN - 86th St. Station	07/18/15	07/17/15	07/17/15	1	0	**146**
C6	#3B	Complete WAN - 86th St. Station	07/18/15	07/17/15	07/17/15	1	0	**146**
C6	#4A	Complete LAN - 72nd St. Station	02/18/15	02/18/15	02/18/15	0	0	**414**
C6	#4B	Complete WAN - 72nd St. Station	02/18/15	02/18/15	02/18/15	0	0	**414**
C6	#5A	Complete LAN - 63rd St. Station	04/18/14	10/03/14	11/03/14	-199	-31	**461**
C6	#5B	Complete WAN - 63rd St. Station	04/18/14	10/03/14	11/03/14	-199	-31	**461**
C6	#5C	Complete all 63rd St. Station work	04/18/14	11/13/14	12/15/14	-241	-32	**461**
C6	SS	Substantial Completion	08/18/16	08/18/16	07/15/16	34	34	**9**

Notes:

1. All schedule dates based upon January 1, 2014 update (IPS Update #90)
2. Contract packages 1 and 5A have completed all work and follow-on activities are proceeding w/o impact.
3. Contract package 5C; no variances with contract milestones to date.
4. Dates followed by an "A" signify an actual completion on that date.

Table 4 - Project Budget/Cost

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of January 31, 2013	
	$ Millions	% of Total	Obligated ($ Millions)	TBD	$ Millions	% of Total	$ Millions	% of Total
Grand Total Cost:	4,866.614	100	4,572.942		5,267.614	100	2,771.790	52.61
Financing Cost	816.614	16.78			816.614	15.50		
Total Project Cost:	4,050.000	83.22	4,572.942		4,451.00	84.50	2,771.790	52.61
Total Federal:	1,350.693	27.75	1,063.942		1,350.693	24.60	817.193	15.51
Total FTA share:	1,300.000	96.25	990.049		1,300.000	23.68	743.300	14.11
5309 New Starts share	1,300.000	100	990.049		1,300.000	23.68	743.300	14.11
Total FHWA share:	50.693	3.75	73.893		50.693	0.96	73.893	1.40
CMAQ	48.233	95.15	71.433		48.233	0.88	71.433	1.35
Special Highway Appropriation	2.460	4.85	2.460		2.460	0.04	2.460	0.05
Total Local share:	2,699.307	55.47	3,509.000**		**3,509.000	63.92	1,954.597	37.10
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 amounts obtained from the Transportation Electronic Award Management (TEAM) system and MTACC's Grant Management Department.

** Current MTA Board approved budget.

Table 5 - Estimate at Completion

Category	Current Working Budget	EAC Forecast
Total Construction	$2,728,172,492	$2,953,100,000
Engineering Services Subtotal	$576,541,264	$625,000,000
Third Party Expenses	$534,800,000	$557,500,000
TA Expenses	$125,160,085	$130,775,000
Contingency	$321,104,648	
Executive Reserve	$160,000,000	
Subtotal	$4,451,000,000	$4,266,375,000

Table 6 - Allocation of Current Working Budget to Standard Cost Categories

Std. Cost Category (SCC)	Description	FFGA	MTA's Current Working Budget (September 30, 2013)
10	Guideway & Track Elements	$612,404,000	$642,478,000
20	Stations, Stops, Terminals, Intermodal	$1,092,836,000	$1,277,642,000
30	Support Facilities	0	$0
40	Site Work & Special Conditions	$276,229,000	$524,561,000
50	Systems	$322,707,000	$250,134,000
60	ROW, Land, Existing Improvements	$240,960,000	$281,500,000*
70	Vehicles	$152,999,000	0**
80	Professional Services	$796,311,000	$1,026,608,085
90	Unallocated Contingency	$555,554,000	$448,076,915
Subtotal		$4,050,000,000	$4,451,000,000
Financing Cost		$816,614,000	$816,614,000
Total Project		**$4,866,614,000**	**$5,267,614,000**

* Includes $47M Cost-to-Cure.

** FTA Region II has accepted MTACC/NYCT's assertion that recent services reductions will provide ample spare vehicles for the SAS Phase I Project.

Table 7 -- Core Accountability Items – January 2014				
Project Status:		**Original at FFGA**	**Current***	**ELPEP****
Cost	Cost Estimate	$4,050M	$4,451M	$4,980M
Contingency	Unallocated Contingency	$555.554M	$296M	$122M
	Total Contingency (Allocated plus Unallocated)	$555.554M	$296M (Dec. 2014)	$122M
Schedule	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
Total Project Percent Complete	Based on Expenditures	62.3%		
	Based on Earned Value	N/A		

Major Issue	Status	Comments
Design Changes Requested by NYCT Operations	Open	A significant number of changes to the design continue to be "requested" by NYCT Operations long after the formal completion of the project design. These changes have primarily affected the Systems (C6) Contract, where the approved AWOs will substantially increase project cost. The schedule impact of the changes added to date has not been determined. To date, the SAS Project Team's ability to resist the incorporation of these requests appears limited. Total construction is approximately 55% complete and the schedule for achieving the RSD of December 30, 2016 is challenging. At some point, the MTA will have to enforce a "no

		more design changes" if the project is to achieve its schedule (and cost) performance objectives.
Construction Contract Management and Coordination	Open	The SAS Project team has yet to demonstrate that it can closeout a contract or execute the turnover of work areas between contractors in a timely and efficient manner. Construction staff does not appear to be pro-actively planning and expediting the MTA's responsibilities and obligations necessary to accomplish these key activities. The PMP does not adequately address this aspect of construction management. The PMOC recommends the SAS Project Team develop detailed processes and procedures to guide its construction staff through their responsibilities in the closeout and turnover phases of the project and formally incorporate these measures in Revision 9 of the PMP.
Organization	Open	The PMOC is concerned that organization changes within the SAS Project Management Team are not addressing the root cause of management problems and may actually be causing some confusion within the team regarding roles and responsibilities.
Date of Next Quarterly Meeting:		TBD

* MTACC's Current Working Budget
** Enterprise Level Project Execution Plan (ELPEP), reflecting median level of risk mitigation

Schedule data based upon IPS Update #XX; Data Date = 12/01/2014

Financial data based upon MTACC reporting through 1/31/2014