

PMOC MONTHLY REPORT

Second Avenue Subway Phase 1 (MTACC-SAS) Project

Metropolitan Transportation Authority

New York, New York

Report Period August 1 to August 31, 2014



PMOC Contract No. DTFT60-09-D-00007

Task Order No. 7, Project No. DC-27-5235, Work Order No. 2

Urban Engineers of New York, P.C., 2 Penn Plaza, Suite 1103, New York, New York 10121

PMOC Lead: Charles A. Halboth, PE, 212-736-9100; cahalboth@urbanengineers.com

Length of time on project: Three 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 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 August 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 69% complete. Progress continued on the eight (8) active construction contracts and featured the following accomplishments:

- C-26005 (C2A) "96th Street Site Work and Heavy Civil" Substantial Completion was achieved on November 5, 2013. The contract closeout process is ongoing.
- C-26010 (C2B) "96th Street Station Civil, Architectural, and MEP". Efforts are ongoing to accelerate Milestones 6, 7 and 8. These milestones provide access for the C6 Systems contractor to start installation of equipment in the communication, signal, and traction power rooms.
- C-26006 (C3) "63rd Street Station Rehabilitation". The focus of the work effort continues to be Area 5, the progress at Entrance #1 and meeting the milestones for turnover of rooms to the C6 contractor.

- C-26007 (C4B) “72nd Street Station Cavern Mining and Lining” Substantial Completion was achieved on January 14, 2014. Contract closeout.
- C-26011 (C4C) “72nd Street Station Architectural and MEP Systems”. Began construction of permanent stairs from the Mezzanine to Platform. At the Platform level installation of precast wall panels continued and construction of the platform deck is ongoing.
- C-26008 (C5B) “86th Street Station Cavern Mining and Lining”. Work effort is directed to meeting the near term milestone to turnover of the cavern area and provide full cavern access to the C5C contractor by September and October 2014 respectively.
- C-26012 (C5C) “86th Street Station Architectural and MEP”. Work continues in the south tunnels with conduit embedded bench construction. Continued erection of formwork and placement of mezzanine deck slabs. Full access to the site is still forecast for October 2014.
- C-26009 (C6) “Track, Power, Signals and Communication Systems”. Installation of signals, traction power, communication equipment and cables is ongoing throughout the various work zones. Re-sequencing of track installation in the various zones is being considered because of station contractors not meeting their access dates.

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 August 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.
- Submittal of contract closeout documentation is ongoing.

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

- Installation of traction power conduit in the main station has progressed to 80.0% complete (8,160 linear feet out of 10,200 linear feet installed).
- All 47 concrete roof slabs in the main station have been placed.
- Four hundred and fifty-four (454) of the 463 wales and struts in the main station have been removed.
- Approximately 66,800 square feet out of the 159,100 square feet of concrete masonry unit (CMU) walls in the main station and tunnels have been installed.
- Approximately 30.0% of the HVAC duct throughout the station has been installed.

- Waterproofing in the main station has progress to 98.0% complete (241,300 square feet out of 246,000 square feet installed).
- Approximately 90.0% of the platform in the main station has been installed.

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

- Surveying of the Deformation Monitoring Points (DMPs) is ongoing and will continue throughout the project. There have been no instrumentation issues during micro-pile installation at Entrance #1.
- The focus of the work effort remains Area 5 and the progress at Entrance #1.
- **Area 5 (Reconstruction consists of 6 mezzanines and the deck plaza roof)**
 - Continued setting traction elevator equipment in the Elevator Machine Rooms and the Elevator Shafts.
 - Continued installation of power & communication conduits throughout.
 - Continued erecting CMU walls on the 6th Mezzanine.
 - Continued finishes in Area 5 Lobbies.
- **Ancillary #2**
 - Erection of the above-grade structure is ongoing.
- **Entrance #1**
 - Continuing with excavation inside the building and installation of permanent piles.
- **Platforms**
 - Continued wall tile framing and ceiling panels at the G3 and G4 platforms.
 - Continued installation of platform pavers and room bases at the G4 (lower) platform.
- **Fan Rooms**
 - Continuing installation of chiller piping, communication & power conduits, Variable Frequency Drives and lighting in the West Fan Room.
 - Finalizing installation of Building Management System (BMS) in both East & West Fan Rooms.

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

- Substantial Completion was achieved on January 14, 2014
- Submittal of contract closeout documentation is ongoing.

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

- **Ancillary #1 and Ancillary #2**
 - The erection of the concrete walls and slabs is ongoing
- **Main Cavern**
 - Conduit installation continues in the Public Mezzanine.
 - Ductwork for the Smoke Management System continues the North Mezzanine.
 - At the South Mezzanine continued placement of inverted slab and walls.

- Began construction of permanent concrete stairs to the platform.
- **G3/G4 Tunnels**
 - Electrical work is nearing completion.
- **Platform**
 - Installation of conduit and construction of platform deck is ongoing.
 - Concrete curbs and CMU wall erection continues.
 - Precast wall panel erection is nearing completion.
- **Entrance #1:**
 - Excavation in the garage has broken through to the escalator incline.
- **Entrance #3**
 - Began removal of shotcrete installed to protect the existing building foundation.
- **Schedule**
 - Milestones #7, #12, and #13 (turnover of 16 rooms) was met August 29, 2014.

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

- **Main Cavern (North and South)**
 - Completed placement of the Cavern North End Wall.
 - The contractor's date for completion of Milestone #2 (full turnover to 5C) is September 12, 2014. The actual turnover is October 2014, minus Entrance #2.
- **Ancillary #2**
 - The last Addit Arch has been placed and form stripping is complete.
- **Entrance #1**
 - Masonry work was completed along with installation of electrical conduit.
- **Entrance #2**
 - Continued with rebar in the Elevator Shaft and working both the east and west wings of the entrance.
 - Completed the last segment of Entrance #2 escalator incline.

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

- The C5B/C5C Project Office is relocating to 327 E. 94th St., between 1st & 2nd Aves. As of the date of this report that move has not taken place.
- **Main Cavern**
 - Continuing with erection of formwork and placement of Mezzanine slab.
 - Preparing to start erection of the South Upper Mezzanine deck.
- **Ancillary #1**
 - The erection of concrete walls has begun in Ancillary #1.

- **South Tunnels**

- Work in the 3rd Cross Passageway continues.
- Construction of high & low benches and embedded conduit is ongoing.

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

- Electrical 63rd Street Communication and Signal Rooms: The contractor continues to be delayed in installing the fiber optic cable between communication Room 1399 and the other three communication rooms. The delay is due to the conduit work not being completed.
- Electrical 96th Street Tunnel Work (Zone 1): Installation of all cables (fiber optic, communication, power and signal) completed.
- Electrical 96th Street Tunnel Work (Zone 2): Installation of all cables (fiber optic, communication, power and signal) completed.
- Electrical 72nd Street Tunnel Work (Zone 3): Ninety-five (95.0) percent of all fiber, communication, power and signal cables have been pulled.
- Civil (North of 63rd Street Station (Zone 3 and 4): Rail welding for the G4 track started on 7/28/2014 and for the G3 track on 8/4/2014. The chopping operations for Zone 3 is still delayed because of the Station Contractor. An AWO will be required to compensate the contractor for double handling of the welded rail.
- Civil 96th Street South Tubes (Zone 2): Because of issues associated with the control point's use by the two surveyors to establish the profile, the contractor suspended alignment in Zone 2. Subsequent meeting has resulted in an action plan to mitigate the control point issue.
- Civil 96th Street (Zone 1): Tracks S1 and S2 are now complete. Contractor now plans to install cover board by mid-September 2014.
- Procurement
 - Antenna cable (delivered).
 - Signal cable (delivered).
 - Communication cable (delivered).
 - Power cable 2000MCM & 500MCM (delivered).
 - Fiber optic cable (delivered).
 - Wayside Tray 63rd (delivered).
 - Stops & Layouts (delivered).
 - Wayside Signal Equipment (released; various stages in manufacturing).
 - Running rail (delivered).
 - LVT Blocks (delivered).
 - 3rd Rail (delivered).
 - SWP's (delivered).
 - Guard Rail is now due in late August 2014.
 - ALU: Network, CCTV and IAC for 96th and 72nd Street Stations are due by September 18, 2014; 86th Street Station CCTV, Network and IAC will be delivered

- by October 31, 2014 (NYCT required to support the factory acceptance tests)
- Simplex (All Fire Alarm equipment for 63rd Street (delivered).
- MKJ: FAT Testing for PACIS Cabinets rescheduled for September 2014.
- Pinnacle: 63rd Street equipment for wireless radio is (delivered). Base stations have been approved and released.
- PRI (HVAC SCADA) is still awaiting design information from 63rd Streets contractor.
- Belfour Circuit Breakers & Rectifiers (delivered).
- Belfour Transformers (in storage in VA).
- Meridian: EA Alarm Boxes: (delivered).
- Meridian: EA Recorder: Keltran equipment due the end of September 2014.
- Transdyne (Power SCADA) (delivered).
- Submittal Progress
 - Total projected submittals: 5,726
 - Total submitted to date: 3,809
 - Total projected to complete: 1,917
 - Percent completed: 67%
 - Pending MTA response: 254

c Quality Assurance and Quality Control (QA/QC)

Status:

During August 2014, the Second Avenue Subway Quality Management team continued holding Quality Meetings and Quarterly Quality Oversight of the Contractor with CCM, MTACC, and PMOC participation. They 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 Sessions for numerous construction processes.

Observation:

Major Issues

The major issues noted by the PMOC during August 2014 include:

➤ Nonconformance Reports (NCRs)

Several contractors had been delinquent in issuing NCRs when the nonconformance occurred. Through the end of August 2014, the C4C and C5B contractors are still delinquent in issuing NCRs when the nonconformance is detected.

The SAS Program Executive has directed that NCRs for concrete that is out of specification be generated each week. The C4C contractor was two months behind in issuing nonconformance reports for concrete that was out of specification. The C5C contractor was four months behind. As of August 31, 2014, the C4C contractor is still one month behind while the C5C contractor is now current. The C5C contractor's Quality Manager has indicated that he will not prepare the required concrete statistical analysis until the contract is complete.

The C5B contractor is not documenting concrete failures on an NCR until concrete break results are obtained, months after the nonconformance occurs.

➤ Inspection Daily Reports

Past Monthly Reports identified a major issue that it took excessive time on several SAS contracts to enter Daily Inspection Reports into the Contractor Management System (CMS). During Monthly Quality Management Meetings, the PMOC stressed the importance to enter Daily Inspection Reports promptly. At the end of August 2014, all contractors are current with their entries.

➤ Project Quality Manual

Revision 3 of the SAS Project Quality Manual (PQM) was issued in April 2009. The SAS Quality Manager prepared a draft of Revision 4 to reflect the new MTACC QOQ checklist requirements and other changes that have occurred since Revision 3 was issued. The PMOC received a draft of Revision 4 to review. Comments will be returned to the SAS Project Quality Manager in September 2014.

Contract Package C2A	
Status:	Through August 31, 2014, a total of 36 NCRs have been issued. All 36 have been closed by both the contractor and SAS. In August 2014, no new NCRs were written and none were closed.
Observation:	The last three open NCRs on this contract were closed in June 2014. This is the last month for which the C2A contract will be reported.
Concerns and Recommendations:	None.
Contract Package C2B	
Status:	Through August 31, 2014, a total of 48 NCRs have been issued. 33 have been closed and 15 NCRs are still open. In August 2014, one new NCR was written and none were closed.
Observation:	Of the 15 open NCRs, 12 are for concrete that was out of specification. A concrete analysis was submitted and is awaiting approval from the designer of record. Entry of Inspection Daily Reports is current.
Concerns and Recommendations:	None.
Contract Package C3	
Status:	Through August 31, 2014, a total of 83 NCRs have been issued. 68 have been closed and 15 NCRs are still open. In August 2014, two new NCRs were written and none were closed.
Observation:	Of the 15 open NCR's, 5 were written by the contractor on one of their subcontractors. Four of these NCRs have been open 4 to 11 months.

	Entry of Inspection Daily Reports into CMS is current.
Concerns and Recommendations:	Only two C3 NCRs have been closed in the past 5 ½ months. The PMOC is concerned that 9 of the 15 open NCRs have been open for 6 to 12 months. The ESA C3 Quality Manager has stated that he and the C3 Contractor's Quality Manager will try to close the 5 subcontractor NCRs in September 2014.
Contract Package C4B	
Status:	Through August 31, 2014, a total of 122 NCRs have been issued. 122 have been closed and no NCRs are still open. In August 2014, no new NCRs were written and none were closed.
Observation:	The contractor has done an effective job of documenting NCRs as the nonconforming condition occurs and closing them in a timely manner. This is the last month for which the C4B contract will be reported.
Concerns and Recommendations:	None.
Contract Package C4C	
Status:	Through August 31, 2014, a total of 62 NCRs have been issued. Three have been closed and 59 NCRs are still open. In August 2014, 7 new NCRs were written and one was closed. All of the new NCRs were for concrete that was out of specification.
Observation:	53 of the 59 open NCRs are for concrete that was out of specification. The contractor has performed two concrete analyses, one for each of its suppliers. The concrete analyses are awaiting approval from the designer of record. Submittal of Inspection Daily Reports is current.
Concerns and Recommendations:	The PMOC is concerned that the contractor did not generate the out of spec NCRs that occurred in July until the end of August. The PMOC recommends that the NCRs be generated each week as directed by the SAS Program Executive.
Contract Package C5B	
Status:	Through August 31, 2014, a total of 86 NCRs have been issued. Of the 86 that have been issued, 68 have been closed and 18 NCRs are still open. In August 2014, six new NCRs were written and one was closed.
Observation:	Of the 18 open NCRs, 12 are for concrete that was out of specification. One NCR was written for concrete that failed over a four month period, from February to May 2014 and a second for concrete that failed over a two month period, from June to July 2014. The contractor's corrective action statement on the NCRs that "No corrective actions required. All concrete cylinder test results met the compressive strength requirement" is unacceptable. Entry of Inspection Daily Reports into CMS is current.

Concerns and Recommendations:	The PMOC is concerned that the contractor is not documenting concrete failures each week as directed by the SAS Program Executive and that corrective action is inadequate. The PMOC recommends that MTACC Quality management resolve this issue.
Contract Package C5C	
Status:	Through August 31, 2014, 15 NCRs have been issued. . Of the 15 that have been issued, 3 have been closed and 12 NCRs are still open. In August 2014, 12 new NCRs were written and 3 were closed.
Observation:	All twelve of the NCRs written in August 2014 were for concrete that was out of specification from May 18, 2014 to August 16, 2014. The Contractor's Quality Manager has stated that he will prepare the concrete statistical analysis at the end of the contract. Submittal of Inspection Daily Reports is current.
Concerns and Recommendations:	The PMOC is concerned that nonconformance reports for concrete that was out of specification in May, June, and July 2014 were not written until August 2014. Preparation of NCRs for out of specification concrete is now up to date and the PMOC recommends that the contractor continue to generate NCRs for out of specification concrete each week as directed by the SAS Program Executive. The PMOC has expressed their concern to the SAS C5C Quality Manager that the Contractor's Quality Manager will not prepare the concrete statistical analysis until the end of the contract. The Contractor's Quality Manager is the same person who prepared the original concrete statistical analysis on the C4B contract and it is surprising that he has taken this position.
Contract Package C6	
Status:	Through August 31, 2014, a total of eight NCRs have been issued. Six have been closed and two NCRs are still open. In August 2014, no new NCRs were written and none were closed. None of the eight total NCRs were for concrete placement. Entry of Inspection Daily Reports into CMS is current.
Observation:	The contractor has done an effective job of documenting NCRs as the nonconforming condition occurs and closing them in a timely manner.
Concerns and Recommendations:	None.

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 #97 was received on September 11,, 2014 and is based on a Data Date of August 1, 2014.

This update contained “.XER” schedule files for the IPS and current contract schedule updates. The IPS forecasts the completion of all construction and NYCT Pre-Revenue Training & Testing activities by September 20, 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:

There are two independent critical paths indicated in Update #97 of the SAS IPS.

Critical Path #1 is initiated by Activity C6TW-020 “Zone 2 Track S1 @ 86th – “Set ties, surface & align, thread & clip rails” and continues through the installation of the Trackwork in Zones 6, 3, 4, 5, 7, 8 and 10 which is forecast to complete on September 10, 2015. This path then shifts to the installation of the wayside equipment at 86th Street which starts with Activity #C6C2-435 “Wayside @86th – Install Riser Boxes” and completes with Activity #C6C2-455 “Wayside @86th – MTA inspect and provide punch list, perform punchlist work” on July 28, 2016. The completion of the wayside equipment punchlist at 86th Street then ties to C6 Substantial Completion for Revenue Service which is forecast for July 28, 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 20, 2016.

Critical Path #2 is initiated with ongoing construction of Signal Rooms (specifically Signal Cable Termination Room 2011 @ the south end of the station platform) at the 72nd Street Station. Construction of this area extends through C4C MS#9 (Complete Work in all Signal Rooms (except M8) which is now forecast for January 9, 2015. Over this update period, this milestone has experienced approximately 28 CD of delay. The PMOC notes that this was a critical path in the previous update and despite this delay, the project substantial completion date remains unchanged.

Following C4C MS#9, signal system installation and testing at the 72nd Street Station extend from January 12, 2015 through July 28, 2016 which is when integrated station testing is scheduled to complete and this path merges with **Critical Path #1** at Activity C6TC 23S, “Integrated Test and Comm of System & Station Complete”.

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

+3 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 and facility in-service testing starts and continues through August 1, 2016. This path then merges with the Critical Path at Activity # OPSTRAINS – “Perform Traction Power Operational Test” On August 5, 2016.

+8 WD: This path branches off of the critical path with the completion of Act. # C6TW-075 – Zone 7 S2 @ 72nd – Set ties, surface & align, thread & clip rails, install riser boxes, CDTs and rebar” which is forecast to complete on March 4, 2015. This initiates the start of wayside equipment installation at 72nd Street which starts with Activity #C6C4-495 “Wayside @72nd – Install Riser Boxes and completes with

Activity #C6C2-515 – MTA inspect and provide punch list” on July 19, 2016. This path then merges with the critical path at Activity C6TC-30A – “Substantial Completion for Revenue Service” on July 28, 2016.

- +14 WD:** NYCT Pre-Revenue Operation Activities scheduled to start on August 18, 2014 is unchanged this period.
- +15/19WD:** Construction of Ancillary 2 at 96th Street Station. This path begins with structural construction at the Upper Mezzanine Level, which is currently underway, and extends through construction of masonry and parapet walls on the fourth level, which is scheduled to complete on September 25, 2015. From that time, MEP work throughout Ancillary 2 controls this path. Installation work is scheduled to complete on June 2, 2016, at which point, Field Installation Acceptance Testing, Integrated System Testing and Commissioning control the path through August 24, 2016 and conclude with C2B Substantial Completion.
- +38 WD:** Utility installation, site restoration, and completion of Entrances 2 and 3 at 96th Street Station. This path starts with the completion of the 96th Street Station roof slab between 93rd and 95th Streets, currently scheduled for August 14, 2014. At this time construction of various utility services, including water mains, gas, electric and drainage starts and continues through July 28, 2016, followed only by C2B Substantial Completion. During this time, Entrances 2 and 3 are also completed. The PMOC notes this work is laid out in a very linear, start-to-finish manner, and some opportunities for overlapping activities and schedule compression may exist along this path.
- +39 WD:** Signal Room and Dispatcher’s Office at 96th Street Station. This path is initiated by the construction of masonry partition walls and architectural finishes at the mezzanine level between 93rd and 95th Streets. This work is currently underway and forecast to complete on December 26, 2014, thereby achieving C2B MS#4, which provides the Systems Contractor with full access to all signal rooms. Signal equipment is scheduled to start on December 29, 2014 and continue through April 12, 2016, at which time Acceptance and integrated System testing start and are forecast to complete on July 27, 2016. From this activity, this path merges with the critical path at Activity C6MS-999 “Substantial Completion”.and SASMS1350 “Implement Service/Opening Day”
- +43 WD:** Entrance #3 and Street Elevator at 96th Street Station. This path starts with the engineering and fabrication of the elevator at Entrance #3 which is currently underway and forecast for completion on August 25, 2015. From this time installation of the elevator and associated architectural items is schedule to occur; completing on June 23, 2016 and followed by testing, inspection and commissioning of the elevator. All work is scheduled for completion on July 21, 2016. This path then concludes with C2B Substantial Completion.

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. Milestones completed this period: None

2. Milestones forecast for completion during the period 8/1/14 through 11/1/14:

Pkg.	MS	Description	UD #97 Forecast	Float
C2B	MS #2	Shared site access @ 93rd Street shaft	10/29/14	155
C2B	MS#5A	Shared Access E & W Track to grid 11	08/01/14	27
C4C	MS #8	Turnover of Signal Rooms South of station to C6	10/09/14	58
C5B	SS	Substantial Compl/All Work w/o Ent. #2	09/12/14	135
C5C	MS #1	Vehicle access thru 86th Street Station 1209+00 -> 1198+00	10/29/14	99
C5C	MS #5	Turnover of Comm. Rooms	10/16/14	250
C5C	MS #14a	Complete all remaining Comm, Signal & Traction Power Rooms	10/13/14	493

Based on the activity description and forecast dates for turnover of communication, signal and traction power rooms, the PMOC concludes the forecast date for C5C MS 14a is erroneous and probably the result of faulty schedule logic.

3. Milestones with unusual schedule 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 #96	Ud #97	Variance
C2B	MS #2	Shared site access @ 93rd Street shaft	10/06/14	10/29/14	-23
C2B	MS #10	Complete all remaining Comms, Signal , & Traction Power work	7/30/15	6/01/15	59
C2B	SS	Substantial Completion	8/03/16	8/24/16	-21
C3	#3d	Mezz 6 & Platform Level Conduit & Station Fare Array	10/10/14	12/31/14	-82
C3	SS	Substantial Completion	10/19/15	01/08/16	-81
C4C	MS #7a	Turnover of Communications Rooms to Systems Contractor	11/24/14	12/30/14	-36
C4C	MS #9	Complete all Signal Roms except M8	11/11/14	01/09/15	-59
C4C	MS #10	Complete north power rooms	12/05/14	03/24/15	-109
C4C	MS #13	Full access @ Lubrication Room(s)	10/23/14	12/24/14	-62

Pkg	MS	Description	Ud #96	Ud #97	Variance
C4C	MS #14	Complete all remaining Comm, Signal & Traction Power Rooms	11/11/14	01/09/15	-59
C4C	SS	Substantial Completion w/o Ent. #1	05/04/16	05/28/16	-24
C5C	MS #4	Shared Access; Sta. 1198+00->1172+00	11/06/14	12/09/14	-33
C6	#3A	Complete LAN - 86th St. Station	08/19/15	07/17/15	33
C6	#3B	Complete WAN - 86th St. Station	08/19/15	07/17/15	33
C6	#4A	Complete LAN - 72nd St. Station	09/15/15	10/09/15	-24
C6	#4B	Complete WAN - 72nd St. Station	09/15/15	10/09/15	-24
C6	#5A	Complete LAN - 63rd St. Station	08/10/15	10/29/15	-80
C6	#5B	Complete WAN - 63rd St. Station	08/10/15	10/29/15	-80
C6	#5C	Complete all 63rd St. Station work	09/16/15	12/07/15	-82

4. Based on the PMOC's review of IPS Update #97:

- Significant milestone delays incurred this period appear limited to the C3 and C4C contracts and dependent activities and milestones within the C6 contract.
- There do not appear to be any milestones with float variance that cannot be explained as a result of schedule change to preceding activities.

Schedule Contingency: The critical path continues to be dominated by work activities performed by the systems (C6) contractor. IPS Update #97 incorporates C6 Update #24, both with a Data Date of August 1, 2014. The C6 schedule incorporates the current mitigation plan; as such, C6 Substantial Completion is August 18, 2016, a date which supports the MTACC's forecast RSD of September 20, 2016.

Based upon a reasonable degree of examination and analysis, it appears that previously reported delays have been mitigated through the C6 contract, which appears to now support MTACC's reported RSD of September 20, 2016.

Schedule Comments:

- There are 50 active milestones on the project. During this reporting period, 18 milestones exhibited a negligible schedule change, 28 exhibited a significant schedule slippage and 4 exhibited a gain or schedule improvement. This tabulation is consistent with recent updates and indicates a general delay of work to later time periods. This generally increases the project's risk of incurring future delay.

- It is noted that the C6 Contractor appears to be using C6 Milestone #5C to denote the completion of all work at 63rd Street Station; all work at this location is logically terminated at this milestone. This Milestone currently has a constrained finish date of July 20, 2015. The result is that all C6 work at 63rd Street station has significant negative float within the C6 contract schedule. This approach is not used in the MTACC IPS, where C6 Milestone #5C is currently forecast for completion on December 7, 2015. The PMOC recommends these different approaches be reconciled to ensure a complete understanding of project status by all involved parties.

ELPEP/SMP Compliance: Based on its periodic audits, 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.

- Forecast Revenue Service Date (RSD) and minimum schedule contingency:
 - ELPEP Requirement: February 28, 2018 (RSD)
 - 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).
 - Secondary float paths with Total Float (TF) =3 WD (approximately 4 CD), 3 WD (approximately 4 CD) and 15 WD (approximately 21 CD). PMOC notes that an increase in “near-critical” paths is likely as project completion nears and that satisfaction of this requirement may not be consistent with maintaining the project budget.
- Secondary Schedule Mitigation (critical path compression)
 - ELPEP Requirement: 125 CD
 - Mitigation opportunities will be pursued as they are identified.
 - Evaluation of the C6 Contractor’s comprehensive schedule acceleration/proposal is currently on hold.

Concerns and Recommendations:

Refer to specific issues discussed elsewhere in this section.

3.0 COST DATA

Based upon financial expenditures reported by the MTACC through August 31, 2014 SAS Phase 1 is approximately 69% complete. The completion status of the individual construction contracts through August 31, 2014, also based upon reported expenditures through that date, is as follows:

- C26002 (Tunnel Boring) – 100.0%

- C26005 (96th Street Station) – 99.8%
- C26010 (96th Street Station) – 46.3%
- C26013 (86th Street Station) – 100%
- C26008 (86th Street Station) – 96.7%
- C26012 (86th Street Station) – 9.3%
- C26006 (63rd Street Station) – 80.1%
- C26007 (72nd Street Station) – 99.9%
- C26011 (72nd Street Station) – 22.6%
- C26009 (Systems) – 36.1%

Aggregate Construction % Completion:

- 100% of all construction has been bid.
- 100% of all construction is under contract
- 69% of all construction is complete

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

- Value of construction in place this period = \$36,232,214
- Estimated value of construction remaining = \$659,115,017
- Target construction completion = September 20, 2016
- Number of months remaining = 24.7

The estimated average rate of construction required to achieve target completion date is \$26,680,555 per month. The average progress (payments) achieved over the most recent six month period is \$37,241,314 per month. Based on a review of cost data for August 2014, it appears that adequate overall progress was made on the project to achieve the RSD of December 30, 2016. It is noted that the forecast volume of work going forward is based on original contract work only. Significant additional work may alter this forecast.

Soft Cost expenditures (not including real estate, OCIP, etc.) reported this period by MTACC totaled \$4.61M. This expenditure is somewhat lower than anticipated by the CWB. At the current rate of expenditure, the current soft cost budget will be sufficient through March 2017.

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

	<u>Executed AWOs</u>	<u>AWO Exposure</u>
August 2014	\$133,248,078	\$198,039,518
July 2014	\$134,579,711	\$195,830,610
Δ	\$(1,331,633)	\$2,208,908
Δ	(.99)%	1.13%

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

Const. Pkg.	AWO Exposure			
	14-Aug	14-Jul	Period Δ	Changes this Period
Completed Packages	\$ 47,612,118	\$ 47,612,118	\$ -	Final values for Packages C1 and C5A as reported by MTACC.
C2A	\$ 54,112,659	\$ 54,112,659	\$ -	No change this period.
C2B	\$31,356,234	\$ 32,299,884	\$ (943,650)	Net decrease is based on initial estimates for AWO # 35, 36, 94, 98, 101, 103 and 104 as well as revised estimates for AWO # 54, 70, 71, 72, 85 and 102.
C3	\$13,173,661	\$ 12,796,799	\$ 376,862	Net increase is based on revised estimates for AWO # 54, 101, 129, 141, 143, 149, 156, 158, 159 and 160 as well as initial estimates for AWO # 161, 162 and 163.
C4B	\$1,422,944	\$ 1,469,478	\$ (46,534)	Decrease is based on the initial estimate for AWO # 93.
C4C	\$21,952,859	\$ 20,502,768	\$ 1,450,091	Net increase is based on revised estimates for AWO # 15, 29 and 34 as well as initial estimates for AWO # 20, 24, 49,54, 56, 61, 66, 67, 68, 69, 71, 72, 73 and 83.
C5B	\$ 20,579,489	\$ 20,579,489	\$ -	No change this period.
C5C	\$1,677,689	\$ 330,551	\$ 1,347,138	Net increase is based on initial estimates for AWO # 2 and 91 as well as a revised estimated for AWO # 5.
C6	\$6,151,864	\$ 6,126,864	\$ 25,000	Increase is based on the initial estimate for AWO # 53.
	\$ 198,039,518	\$ 195,830,610	\$ 2,208,908	

The changes in Executed AWO Value are summarized as follows:

Const. Pkg.	Executed AWOs			
	14-Aug	14-Jul	Period Δ	Changes this Period
Completed Packages	\$ 47,612,118	\$ 47,612,118	\$ -	Final values for Packages C1 and C5A as reported by MTACC.
C2A	\$43,054,872	\$ 42,739,350	\$ 315,522	Net increase is a result of the execution of AWO # 151, 154 and 178.

Const. Pkg.	Executed AWOs			
	14-Aug	14-Jul	Period Δ	Changes this Period
C2B	\$10,998,515	\$ 8,910,257	\$ 2,088,258	Net increase is based on execution of AWO # 32, 82, 85, 87, 94, 103 and 104.
C3	\$10,156,585	\$ 9,751,465	\$ 405,120	Increase is based on execution of AWO # 124, 131, 136 and 152
C4B	\$1,422,944	\$ 5,719,478	\$ (4,296,534)	Net decrease is based on execution of AWO # 64, 67, 85, 88, 92, 93, 95, 96 and 99.
C4C	\$972,140	\$ 891,140	\$ 81,000	Increase is based on execution of AWO # 46 and 71.
C5B	\$ 15,590,272	\$ 15,590,272	\$ -	No change this period.
C5C	\$235,000	\$ 185,000	\$ 50,000	Increase is based on execution of AWO # 11.
C6	\$3,205,631	\$ 3,180,631	\$ 25,000	Increase is based on execution of AWO # 53.
	\$ 133,248,078	\$ 134,579,711	\$ (1,331,634)	

As of August 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)	99.84%	\$325,000,000	\$54,112,659	16.65%	\$42,739,350	13.15%
C26010 (2B)	46.33%	\$324,600,000	\$32,299,884	9.95%	\$8,910,257	2.74%
C26006 (3)	80.55%	\$176,450,000	\$12,796,799	7.25%	\$9,751,465	5.53%
C26007 (4B)	99.94%	\$447,180,260	\$1,469,478	0.33%	\$5,719,478	1.28%
C26011 (4C)	22.58%	\$258,353,000	\$20,502,768	7.94%	\$891,140	0.34%
C26013 (5A)	100.00%	\$34,070,039	\$6,525,471	19.15%	\$6,525,471	19.15%
C26008 (5B)	96.72%	\$301,860,000	\$20,579,489	6.82%	\$15,590,272	5.16%
C26012 (5C)	9.31%	\$208,376,000	\$330,551	0.16%	\$185,000	0.09%
C26009(6)	36.11%	\$261,900,000	\$6,126,864	2.34%	\$3,180,631	1.21%
TOTAL TO DATE		\$2,674,814,299	\$195,830,610	7.32%	\$134,579,711	5.03%

To date, approximately \$1,893,095,687 (70.8%) worth of all base contract construction work has been completed. As a % of work completed, the AWO exposure for these contracts = 10.34% and the executed AWO % = 7.11%.

The PMOC notes an extremely high correlation between AWO exposure estimates and the final negotiated AWO value. Consequently, forecasting total AWO expenditures at completion based on the current AWO exposure values appear justified and reasonable. This forecast suggests the final AWO value will be approximately \$280M, which is significantly above the \$229M AWO contingency contained in the MTACC CWB. The PMOC considers this forecast to be conservative for the following reasons:

- This forecast assumes the RSD remains December 30, 2016.
- AWO exposure for C5C remains inexplicably low. Based on experience at the other stations, significant outstanding cost exposures exist for this contract.
- There remain a significant number of active AWOs for which there is no exposure estimate. As such, the value of these AWOs is not included in the PMOC forecast @ completion.
- The current soft cost budget appears insufficient for extended project operation beyond December 2016.

Cost Contingency: Based upon the MTACC Current Working Budget, expenditures as of August 31, 2014 reported by MTACC and the current AWO Exposure analyses; the PMOC has developed the following contingency analysis:

	<u>Contingency Analysis</u>		
	<u>Current</u>	<u>@ Completion</u>	
Phase 1 Budget	\$ 4,451,000,000	\$	4,451,000,000
Construction Awards	\$ 2,674,814,299	\$	2,674,814,299
Soft Cost Expended	\$ 1,047,131,472	\$	1,047,131,472
Soft Cost to Complete	\$ 260,976,613	\$	297,976,613
AWO Exposure	\$ 195,830,610	\$	276,695,214
Total Contingency	\$ 272,247,006	\$	154,382,402 (1)
Reserved Contingency	\$ 160,000,000	\$	154,382,402 (2)
Available Contingency	\$ 112,247,006	\$	-

Notes:

(1) Total Contingency = budget balance after forecast expenditures.

(2) Reflects \$5,617,598 transfer from “Reserved Contingency”.

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.

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).

4.0 RISK MANAGEMENT

Due to schedule conflicts, no Risk Mitigation Meeting was held in August 2014. The top risks identified in the July Risk Report include the following:

<u>Risk Description</u>	<u>Mitigation Summary</u>	
Risk CNS 4 (C6): Delay resulting from management of contractual interfaces during construction.	Risk Type	
	Cost	Schedule
Mitigation Strategy: <ol style="list-style-type: none"> The previously detailed mitigation strategy has not resulted in effective management of contractual interfaces. It has been determine that the overall strategy remains sound; however significant improvements in implementation are necessary. The status of milestones that are one to three months in the future will be reviewed at monthly risk management meetings to verify satisfactory progress or problems where additional effort is required. 	Current Status: <ol style="list-style-type: none"> An Interface Manager was added to the SAS Project Team to facilitate the turnover of station areas from to Station Contractors to the Systems Contractors. Coordination meetings are held each Friday to address access dates, scope requirements in the areas to be turned over and any mitigation actions if needed. Positive progress reported on achieving upcoming milestones. Revisions to process and personnel appear to have had a positive impact on the management of this risk. 	
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: <ol style="list-style-type: none"> The previously detailed strategy of achieving significant schedule improvement by accelerating systems installation and testing remains a valid, but will be placed “on hold” for the immediate future. Ongoing schedule improvement will focus on “targets of opportunity” where specific action directed to critical or near-critical work tasks will result in measurable schedule improvement. 	Current Status: <ol style="list-style-type: none"> Acceleration of specific “targets of opportunity” will be detailed as they are identified. Mitigation actions to recover delays encountered with track installation (C6) and to avoid additional delay of C2B Milestone #5 have been identified as “targets of opportunity” and are discussed in Technical Advisory Committee (TAC) Paper 2014/156 (Draft). Implementation has occurred. 	

<u>Risk Description</u>	<u>Mitigation Summary</u>	
<p>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.</p>	Risk Type	
	Cost	Schedule
<p>Mitigation Strategy:</p> <ol style="list-style-type: none"> 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 	<p>Current Status:</p> <ol style="list-style-type: none"> 1. Mitigation Strategy Items #1 and #2 continue. Cooperation and progress among all parties appears to be good. 2. Development of a detail schedule which models this issue is still incomplete. This risk was identified in August 2013. MTACC’s inability to develop a schedule and quantify the potential impacts suggests a significant deficiency in its management of this risk. 3. Revisions to schedule continue. This issue requires ongoing monitoring. 	
<p>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.</p>	Risk Type	
	Cost	Schedule
<p>Mitigation Strategy:</p> <ol style="list-style-type: none"> 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 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. 	<p>Current Status:</p> <ol style="list-style-type: none"> 1. Completed. 2. Complete. 3. Access agreements with affected adjacent property owners have been obtained and work is progressing. 4. Schedule to complete work within current schedule has been developed. There remains significant risk of delay to implementation of this schedule. 	

<u>Risk Description</u>	<u>Mitigation Summary</u>	
Risk COM 2 (C6): Frequent late changes to the communications systems could delay C6 and the RSD.	Risk Type	
	Cost	Schedule
Mitigation Strategy: <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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. 4. This risk is applicable to all major operating systems, not just the communications system. 	

<u>Risk Description</u>	<u>Mitigation Summary</u>	
Risk CNS 8 (C6) Delayed Safety Certification results in delay to the RSD	Risk Type	
	Cost	Schedule
Mitigation Strategy: <ol style="list-style-type: none"> 1. Develop a detailed plan for executing the work required to achieve certification of SAS Phase 1. 2. Implement that plan. 3. Concern continues to be expressed regarding the role of NYSPTSB in this process, primarily due to the lack of precedent and explicit definition of the roles and responsibilities of all parties 4. Internal meeting(s) to prepare the outline of the committee meeting with NYS. 5. There is concern that delays in finding a new Safety and Security Certification Manager will adversely impact this process. 6. Hold Safety Certification Meeting with NYS representative in attendance. 	Current Status: <ol style="list-style-type: none"> 1. MTACC has developed a detailed plan for executing the work required to achieve safety certification of SAS Phase 1. 2. There is concern regarding the change out of the Safety Certification Manager. 3. It has been confirmed that this process will not affect the RSD. 	

Additional issues identified over recent periods that may represent significant cost or schedule risk to the successful completion of the project include:

- Buy America challenge involving water mister system(s).
- Track profile and alignment revisions.
- Turnover of signal equipment rooms by station contractors

The PMOC recommends these issues be revisited periodically to confirm whether they should be elevated for additional review and evaluation.

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. At this stage in the project lifecycle, it is necessary to refine the risk management process to include specific issues that may threaten project objectives, rather than exclusively the focus on general, high-level risks.

5.0 ELPEP

The most recent ELPEP Quarterly Review Meeting was held on June 19, 2014. The next ELPEP Quarterly Review Meeting with MTACC, FTA-RIL, SAS and ESA projects and the PMOC is scheduled for September 25, 2014. With respect to SAS, the current status of each of the main ELPEP components is summarized as follows:

- **Technical Capacity and Capability (TCC):** FTA has requested MTACC to update the Technical Capacity and Capability Plan. Completion of the update is pending resolution of coordination issues between the existing Change Control Committee (CCC) and the two newly established high level committees (MTA Chairman Level and LIRR/Amtrak Management Level). As of July 31, 2014, the revised TCC Plan was not submitted.
- **Schedule Management Plan (SMP):** MTACC's 2nd Quarter 2014 ELPEP Compliance Checklist indicates MTACC is "in compliance" with its SMP.
- **Cost Management Plan (CMP):** MTACC's 2nd Quarter 2014 ELPEP Compliance Checklist indicates MTACC is "in compliance" with its CMP.
- **Risk Mitigation Capacity Plan (RMCP) and Risk Management Plan (RMP):** MTACC's 2nd Quarter 2014 ELPEP Compliance Checklist indicates MTACC is "in compliance" with its RMP.

In the fall of 2013, MTACC committed to an audit of ELPEP-related procedures. To date, any meaningful findings or recommendations from these audits have not been published and no changes to these procedures have been formally implemented.

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.

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, MTA's IEC and FTA's PMOC is ongoing.

As of July 2014, a total of 8,931,364 construction hours have been logged on the project with 80 lost time and 229 recordable incidents documented. The total hours and incidents equates to a Lost Time Rate (LTR) of 1.79 and a Recordable Rate (REC) of 5.13. The LTR and the REC showed a slight improvement from the previous month. The US Bureau of Labor Statistics

(BLS) national rate (Heavy & Civil construction) for Lost Time and Recordable incidents are 1.7 and 3.2 respectively.

Safety and Security Certification: Implementation of the Safety and Security Certification Requirements as specified in Section 01 77 12 of the General Requirements for each Station Contract and the System Contract is ongoing. During this reporting period the MTACC's Chief of Quality and System Certification Manager, SAS Systems Integration Manager (SIM), System Integrator (SI) for each contract, System Engineering Specialists (SES), SAS Quality Management, MTA's Independent Engineering Consultant (IEC) and the FTA's PMOC met on various occasions to address concerns related to configuration management and the certification process. Major concern is related to data sharing between the SI.

The Systems Integrator for the four station contracts (Dome-Tech) and the System Integrator for the Systems Contract (Railworks) are using different database software to manage the configuration of the hardware, firmware and software for their respective contracts. These databases will allow traceability of all system/sub-system specification requirements as well as specified interface control points and serve as a repository for test results from the Facilities System Test Program (FSTP). Objective evidence needed for validation of the certifiable elements/items will also be retained in the database.

The means by which this incompatibility can be reconciled are currently under investigation.

7.0 ISSUES AND RECOMMENDATIONS

Schedule Erosion: As noted in Section 2 of this report, milestones experiencing delay over recent periods significantly outnumber milestones where schedule forecasts are holding constant or improving. MTACC has managed to maintain its schedule to date by selective acceleration of delayed work and creative resequencing of downstream work activities. This approach will become increasingly difficult to implement. Without improvements in actual construction schedule execution to offset some of the delay, there is a significant risk of delay to the project RSD.

System Testing and Safety and Security Certification: Timely and efficient execution of these two elements of the project is critical. To date, the PMOC notes an apparent lack of coordination between the SAS Safety Certification Manager and the Systems Integration Manager. MTACC's Chief of Quality and Systems Certification Manager is also functioning as the SAS Systems Certification Manager. This is the third attempt to staff this position. Each of the previous attempts was less than successful. High level attention and effective leadership in the planning and execution of this work is required. The PMOC recommends that workshops be developed and held such that all individuals associated with testing and certification can fully understand the requirements and sequencing of this effort.

System Testing and Acceptance Schedule: MTACC continues to enhance the IPS with additional detail pertaining to testing and acceptance activities, with a goal of having this effort "complete" by the end of this year. This is a difficult task requiring cooperation and buy-in of both construction contractors and NYCT. There is substantial risk that this process will result in "discovery" of additional work required or schedule logic restrictions that may cause delay to the overall schedule.

C4C – Revisions to Entrance #1: This effort represented a major redesign and contract repackaging effort that was the result of stakeholder issues beyond the control of the MTACC.

At this time, a schedule has been cooperatively developed with the C4C contractor that will complete this work in time for the current December 30, 2016 RSD. The risk of delay to this work is substantial and considerable effort remains necessary to ensure this work is completed without delaying the RSD for the entire project.

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	September 21, 2016	October 2017
Revenue Service	June 30, 2014	December 30, 2016	February 2018

A = Actual

Table 2 - Schedule Contingency

IPS Update #	90	91	92	93	95	97
Data Date	01/1/14	02/1/14	03/1/14	4/1/14	6/1/14	8/1/14
	Contingency (CD)					
RSD=12/31/2016						
Risk Mitigated	102	102	102	102	102	102
Risk Realized	20	-20	44	44	52	102
RSD=02/28/2018						
Risk Mitigated	526	526	526	526	526	526
Risk Realized	446	425	446	446	478	526

Table 3 – Schedule Milestone Comparison

Pkg	MS	Description	Dates			Variance		Sch. Float	Sch. Float
			Adjusted (2)	Ud #96 (4)	Ud #97 (4)	Contract = (2) - (4)	Month = (3) - (4)		
C2B	MS #2	Shared site access @ 93rd Street shaft	03/22/14	10/06/14	10/29/14	-221	-23	172	155
C2B	MS #4	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	02/03/15	01/28/15	-129	6	86	90
C2B	MS#5A	Shared Access E & W Track to grid 11		07/31/14	08/01/14		-1	0	27
C2B	MS #6	Full access to Comms Rooms & Closets	08/21/14	12/16/14	12/26/14	-127	-10	121	113
C2B	MS #7	Full access to Signals Rooms	08/21/14	12/16/14	12/26/14	-127	-10	47	39
C2B	MS #8	Full access to Traction Power Rooms:	08/21/14	12/16/14	12/26/14	-127	-10	121	113
C2B	MS #9	Full access to Station Service Centers	11/21/14	07/09/15	07/14/15	-235	-5	101	97
C2B	MS #10	Complete all remaining Comms, Signal , & Traction Power work	09/21/14	07/30/15	06/01/15	-253	59	88	113
C2B	SS	Substantial Completion	12/21/15	08/03/16	08/24/16	-247	-21	34	19
C3	#3d	Mezz 6 & Platform Level Conduit & Station Fare Array		10/10/14	12/31/14		-82	230	179
C3	#4b	Compl Lwr/Uppr Platforms & Signal Rms	10/14/13	12/01/14	12/12/14	-424	-11	330	320
C3	SS	Substantial Completion	05/13/14	10/19/15	01/08/16	-605	-81	242	183
C4C	MS #3	Shared access thru 72nd Street Station 1172+40 ->1163+00	11/27/14	11/26/14	11/26/14	1	0	25	49
C4C	MS #7	Turnover of Communications Rooms to Systems Contractor	8/28/14	01/30/15	01/30/15	-155	0	192	194
C4C	MS#7A	Complete Work in all Comm Rooms		11/24/14	12/30/14		-36	247	223
C4C	MS #8	Turnover of Signal Rooms South of station to C6	7/15/14	10/09/14	10/09/14	-86	0	40	58
C4C	MS #9	Complete all Signal Roms except M8	9/29/14	11/11/14	01/09/15	-102	-59	19	0
C4C	MS #10	Complete north power rooms	2/25/15	12/05/14	03/24/15	-27	-109	164	92
C4C	MS #11	Complete south power rooms	03/24/15	11/19/14	11/26/14	118	-7	174	169
C4C	MS #12	Full access @ Station Service Center(s)	08/28/14	01/08/15	01/15/15	-140	-7	222	217
C4C	MS #13	Full access @ Lubrication Room(s)	08/28/14	10/23/14	12/24/14	-118	-62	250	240

Pkg	MS	Description	Dates			Variance		Sch. Float	Sch. Float
			Adjusted (2)	Ud #96 (4)	Ud #97 (4)	Contract = (2) - (4)	Month = (3) - (4)		
C4C	MS #14	Complete all remaining Comm, Signal & Traction Power Rooms	08/28/14	11/11/14	01/09/15	-134	-59	463	426
C4C	SS	<i>Substantial Completion w/o Ent. #1</i>	11/13/15	05/04/16	05/28/16	-197	-24	140	116
C4C	SS	<i>Substantial Completion - Ent. #1</i>	-	09/16/16	09/16/16		0		75
C5B	SS	<i>Substantial Compl/All Work w/o Ent. #2</i>	09/04/14	09/12/14	09/12/14	-8	0	135	135
C5B	SS	<i>Substantial Compl/All Work incl. Ent. #2</i>	-	12/23/14	01/15/15		-23	93	79
C5C	MS #1	Vehicle access thru 86th Street Station 1209+00 -> 1198+00	10/23/14	10/30/14	10/29/14	-6	1	98	99
C5C	MS #2	Limited Access; Sta. 1209+00->1198+00	01/22/15	01/21/15	01/29/15	-7	-8	208	202
C5C	MS #3	Shared Access; Sta. 1209+00->1198+00	05/22/15	03/19/15	03/12/15	71	7	167	172
C5C	MS #4	Shared Access; Sta. 1198+00->1172+00	10/23/14	11/06/14	12/09/14	-47	-33	92	70
C5C	MS #5	Turnover of Comm. Rooms	09/23/14	09/30/14	10/16/14	-23	-16	263	250
C5C	MS #6	Turnover of Comm. Rooms	03/24/15	03/23/15	03/27/15	-3	-4	166	161
C5C	MS #7	Turnover of Signal Rooms	02/25/15	02/13/15	02/04/15	21	9	97	105
C5C	MS #8	Turnover of Signal Rooms	02/25/15	02/13/15	02/04/15	21	9	97	105
C5C	MS #9	Turnover Traction Power Rooms	02/26/15	02/18/15	02/23/15	3	-5	22	20
C5C	MS #10	Turnover Traction Power Rooms	02/25/15	02/10/15	02/27/15	-2	-17	255	243
C5C	MS #11	Full access @ Station Service Center(s)	03/24/15	03/13/15	03/23/15	1	-10	362	356
C5C	MS #14a	Complete all remaining Comm, Signal & Traction Power Rooms	09/23/14	09/24/14	10/13/14	-20	-19	505	493
C5C	MS#14b	Limited Access all locations	09/23/14	02/13/15	02/25/15	-155	-12	406	399
C5C		Substantial Completion	05/31/16	05/31/16	05/31/16	0	0	78	78
C6	#2A	Complete LAN - 96th St. Station	05/18/15	09/07/15	09/17/15	-122	-10	126	118
C6	#2B	Complete WAN - 96th St. Station	05/18/15	09/07/15	09/17/15	-122	-10	126	118
C6	#3A	Complete LAN - 86th St. Station	07/18/15	08/19/15	07/17/15	1	33	168	191
C6	#3B	Complete WAN - 86th St. Station	07/18/15	08/19/15	07/17/15	1	33	168	191
C6	#4A	Complete LAN - 72nd St. Station	02/18/15	09/15/15	10/09/15	-233	-24	146	130
C6	#4B	Complete WAN - 72nd St. Station	02/18/15	09/15/15	10/09/15	-233	-24	146	130

Pkg	MS	Description	Dates			Variance		Sch. Float	Sch. Float
			Adjusted (2)	Ud #96 (4)	Ud #97 (4)	Contract = (2) - (4)	Month = (3) - (4)		
C6	#5A	Complete LAN - 63rd St. Station	04/18/14	08/10/15	10/29/15	-559	-80	242	184
C6	#5B	Complete WAN - 63rd St. Station	04/18/14	08/10/15	10/29/15	-559	-80	242	184
C6	#5C	Complete all 63rd St. Station work	04/18/14	09/16/15	12/07/15	-598	-82	242	184
C6	SS	Substantial Completion	08/18/16	08/18/16	08/18/16	21	0	23	23
Notes:									
1. All schedule dates based upon April 1, 2014 update (IPS Update #97)									
2. Contract packages 1, 2A, 4B 5A have completed all work.									
3. Milestones not shown have been completed.									

Table 4 - Project Budget/Cost 

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of August 31, 2014	
	\$ 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	3,062.831	58.14
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	3,062.831	58.14
Total Federal:	1,350.693	27.75	1,063.942		1,350.693	24.60	897.367	17.04
Total FTA share:	1,300.000	96.25	990.049		1,300.000	23.68	823.474	15.62
5309 New Starts share	1,300.000	100	990.049		1,300.000	23.68	823.474	15.62
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	2,165.464	41.10
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	\$2,674,814,299	\$ 2,951,509,513
Engineering Services Subtotal	\$622,862,000	\$655,000,000
Third Party Expenses	\$554,086,273	\$557,500,000
TA Expenses	\$131,160,085	\$130,775,000
Contingency	\$308,077,343	
Executive Reserve	\$160,000,000	
Subtotal	\$4,451,000,000	\$4,294,784,513

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

Std. Cost Category (SCC)	Description	FFGA	MTA's Current Working Budget (June 30,, 2014)
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

Table 8 -- Core Accountability Items				
Project Status:		Original at FFGA	Current*	ELPEP**
Cost	Cost Estimate	\$4,050M	\$4,451M	\$4,980M
Contingency	Unallocated Contingency	\$555.554M	\$272M	\$170.8M
	Total Contingency (Allocated plus Unallocated)	\$555.554M	\$272M (August 2014)	\$170.8M
Schedule	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
Total Project Percent Complete	Based on Expenditures	69%		
	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 have been “requested” by NYCT Operations long after the formal completion of the project design. To date, the SAS Project Team’s ability to resist the incorporation of these requests appears limited. Procedures have been established requiring Operating Departments to justify design changes. This issue is currently being managed adequately but continued monitoring is required.		
Construction Contract Management and Coordination	Open	Coordination of turnovers between independent prime construction contractors has significantly improved. Numerous turnovers remain. Successful management of inter-		

		contractual interfaces remains a critical issue for timely completion of this project.
Project Schedule Reliability	Open	The PMOC is concerned that information contained within the Integrated Project Schedule (IPS) does not accurately reflect project status and the transfer of information from contractor schedules to the MTACC IPS lacks transparency. MTACC project staff is reluctant to document delays in the IPS and demonstrate their impact on the overall RSD.
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 #91; Data Date = 8/1/2014

Financial data based upon MTACC reporting through 8/1/2014