

PMOC MONTHLY REPORT

Second Avenue Subway Phase 1 (MTACC-SAS) Project

Metropolitan Transportation Authority

New York, New York

Report Period May 1 to May 31, 2015



PMOC Contract No. DTFT6014D00017

Task Order No. 2, Project No. DC-27-5287, Work Order No. 1

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

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THIRD PARTY DISCLAIMER

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

For projects funded through 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. DTFT6014D00017. 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 May 2015, 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 77.2% complete. Substantial completion has been achieved on three of the eight active construction contracts. Progress this reporting period featured the following accomplishments:

- C-26005 (C2A) "96th Street Site Work and Heavy Civil" Substantial Completion was achieved on November 5, 2013. Mitigation of water leaks is ongoing with good results being noted from the grouting process. Delivery of "As-Built" documentation is pending final signal off by contractor.
- C-26010 (C2B) "96th Street Station Civil, Architectural, and MEP". Milestone 6, 7 and 8 were partially completed; select rooms were turned over to the C6 contractor.
- C-26006 (C3) "63rd Street Station Rehabilitation". The focus of the work effort continues to be Area 5 and Entrance #1. The C6 contractor continues work at the site. At Entrance#1 installation of escalators continues. The fans (east & west fan rooms) will be

started June 8, 2015. The glass canopies for street stair Entrances #3 & #4 will be delivered in July 2015.

- C-26007 (C4B) “72nd Street Station Cavern Mining and Lining” Substantial Completion was achieved on January 14, 2014. Contract closeout is underway.
- C-26011 (C4C) “72nd Street Station Architectural and MEP Systems”. Ancillary Building #2 above grade construction has reached the third floor. At Ancillary Building #1 work has reached street level and placement of the street level slab began. At the Entrance #3 Elevator Shaft, perimeter walls have reached the street level.
- C-26008 (C5B) “86th Street Station Cavern Mining and Lining”. Substantial Completion of all contract work was achieved on December 16, 2014. During May 2015 the contractor began sandblasting the Entrance #2 incline walls to correct deficiencies in the concrete architectural finish. This is a punchlist item.
- C-26012 (C5C) “86th Street Station Architectural and MEP”. At Ancillary #1 construction has reached the top level of the underground portion of the building and placement of the street level roof deck is ongoing. Escalator installation continues in Entrance #2.
- C-26009 (C6) “Track, Power, Signals and Communication Systems”. Installation of signals, traction power, communication equipment and cables is ongoing throughout the various station and tunnel zones. Majority of equipment has been procured.

a. Procurement

Procurement of construction contractors for SAS – Phase 1 is complete. Three construction contracts are currently in the closeout process.

b. Construction

As of May 31, 2015, 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.
- Mitigation of water leaks is impacting the final closeout of the contract.

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

- Station Area 1 Grid Line (GL) 1-8 (91st to 93rd Street)
Work at the mezzanine level continued with conduit routing, wire pulling, installation of water mist zone valves and sprinkler seismic bracing. Platform level work consisted of conduit routing, painting and installation of doors and hardware for various milestone rooms.
- Station Area 2 GL 8-18 (93rd to 95th Street)

Conduit routing, wire pulling, installation of acoustic board, and raceway in service carrier continues at the platform level. Installation of Escalators E01 and E02 with its associated motors and equipment is ongoing at the platform level as well.

- Station Area 3 GL 18-36 (95th to 99th Street)

Work at the mezzanine level continued with conduit routing, wire pulling, installation of water mist zone valves and sprinkler seismic bracing. Platform level work consisted of conduit routing, installation of sanitary and storm drains, cable tray in service carrier and installation of elevator framing steel.

- Ancillary 1 GL 8-9.5 (Northeast corner 2nd Ave. and 93rd St.)

Ongoing street level work consisted of placement of upper roof walls, erecting shoring for upper roof (5th floor), FRP upper roof slab, and FRP parapet walls. Installation of ductwork and CMU walls around hatch opening is ongoing at the mezzanine level. CMU wall installation is ongoing at the invert level.

- Ancillary 2 GL 28-29.5 (Southwest corner 2nd Ave. and 97th St.)

Contractor continued working at the street, mezzanine and invert levels. Ongoing work includes FRP of walls and slabs, and installation of CMU walls.

- Entrance 1 GL 13-14 (Southwest Corner 2nd Ave. and 94th St.)

Escalator pad and plinth concrete placement was completed. Delivery and installation of escalator scheduled to start early June 2015.

- Entrance 2 GL 13-14 (Northeast Corner 2nd Ave. and 94th St.)

FRP for parapet and plinth completed. Installations of CMU wall to tie into mezzanine public area curb to start early June 2015.

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

- Surveying of the Deformation Monitoring Points (DMPs) is ongoing and will continue throughout the project. There has been no instrument monitoring issues to date during the construction at Entrance #1 or the new street Entrance #4.

- The focus of the work effort remains at Area 5 and the progress at Entrance #1.

- **Area 5 (Reconstruction consists of mezzanines and the deck plaza roof)**

- In Area 5 inspections are underway in Mezzanines #1 & #4.
- Elevator entrances are complete on the 6th Mezzanine.
- Continued installation of conduit and pulling cable on the 6th Mezzanine.
- Piping in the Elevator Shafts is complete and wiring continues.

- **Entrances (#1, #2, #3 & #4)**

- At Entrance #1 Kone continued with escalators installation.
- At Entrance #1 MEP work continued.
- At Entrance #2 the hydraulic elevator kiosk will be delivered the week of June 14, 2015.
- Granite cladding is being delivered for street Entrances #3 & #4 the end of June 2015. The new glass canopies will be delivered in July 2015.

- **Fan Plants (East & West)**

- The start-up of the fans will be Thursday, June 8, 2015.

- **Platforms**

- Began installation of the stone bases and pavers in the Elevator Lobbies at the G-4 platform.
- Continued installation of porcelain track wall tiles and top stainless steel band on the G3 & G4 platforms.
- Continued installation of ceiling panels and column cladding on the G3 & G4 platforms.

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

- Continued placing the Third Floor slab. Continued with conduit, electrical equipment and conduit in the sub-basement and basement in the Facility Power Rooms.
- Began removal of the formwork for the completed arch at Entrance #2 incline. Completed the initial colors mockup for wall, floor finishes and lighting in the Entrance #2 Mezzanine Lobby.

- **Ancillary #1**

- 100% of the street deck has been removed at Ancillary #1 and perimeter walls have reached the street level. Began placing the street level slab.
- Continued placement of Basement walls and continuing with ductwork, conduit and CMU walls along the access passageway.

- **Cavern Mezzanine (Public, North & South)**

- At the North & South Mezzanines continuing MEP installation in Fan/Chiller rooms.
- Continuing installation of electric equipment & conduit in the North & South EDR rooms.
- Continued installing the precast fascia panels in the North Mezzanine.
- In the Public Mezzanine continued installing ceiling acoustical panels and service carrier framing.

- **Platform**

- Fit-out in the Escalator Machine Rooms is ongoing on the Platform.
- Continued installation of Mezzanine to Platform Escalators #1, #2 & #3.
- Completed installing horizontal framing for the trackwall tiles.

- **Entrance #1:**

- Work is near complete with rock removal in the garage. Placement of invert slab, walls and arch continue at the mezzanine level. At the street sand walls are complete and waterproofing is ongoing on the street slab.

- Began installation of structural steel shoring for the penetration through the existing building foundation.
- **Entrance #3 (Elevator Bank)**
 - At Entrance #3 Elevator Shaft the lining of the walls has reached street level.

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

- Substantial Completion of all contract work was achieved on December 16, 2014.

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

- **General**
 - The 87th S. Shaft will remain open until the end of July 2015 to allow for continued deliveries by the C6 contractor.
 - The focus of the work effort is completing the street level “roof” at Ancillary #1.
- **Cavern (Public, North & South)**
 - In the North Mezzanine concrete curbs are ongoing and ceiling installation is underway in the North Upper Mezzanine.
 - Completing CMU walls in the South Mezzanine.
 - Mechanical and conduit work is ongoing in the Public Cavern.
- **Entrance #1**
 - Continuing with conduit installation in the upper rooms.
- **Entrance #2**
 - The subcontractor continues installation of the trusses and treads for the “short run” escalators at Entrance #2.
 - The C5B contractor (Skanska-Traylor) began sandblasting of the architectural finish walls on the incline to correct deficiencies determined by NYCT architects in the finish.
- **Ancillary #1**
 - The work has reached the top level of the underground portion of the building. Placement of the street level roof deck began and is ongoing. The contractor has continued working 6 days, 2 weekday shifts in this area.
- **Ancillary #2**
 - Continued with waterproofing to the street level, slab placement and wall erection. This work is advancing slowly, as it is not currently a schedule priority.
- **South Tunnels**
 - Punchlist work is complete in the East & West Tunnels. The contractor has completed grouting to control the leaks in the tunnel(s).

- **Platform**

- Completed installation of the frame for the ADA Accessible Mezzanine to Platform Elevator.

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

- **Track:**

- A total of 8,780 LF out of 22,000 LF of track has been installed.
- Concrete placement for third rail pads ongoing Zone 3.
- Installation of contact rail (Zone 2) ongoing.
- Track installation has been re-sequenced that shows all track work completed in March 2016 and third rail completed in May 2016. This would remove track work from the critical path.

- **Communication:**

- Network FIAT ongoing.
- Installation of brackets and antenna cable (Zone 10) ongoing.
- Equipment installation in communication rooms ongoing.

- **Signal**

- Installation of line and local cables, conduits and wayside signal equipment is ongoing.
- 147 CIR breakdown testing is ongoing
- Cable termination of CIH panels ongoing.

- **Power**

- Rack, bracket, conduit and cable installation in the traction power rooms is ongoing.
- Installation of conduits and wayside signal equipment is ongoing.

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

Status:

During May 2015, 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 Meetings for numerous construction processes.

Observations:

Project Quality Manual (PQM): The SAS Quality Manager prepared a draft of Revision 3 to the PQM that reflects the new MTACC QO checklist requirements and other changes that have occurred since the last revision was issued. The PMOC received a draft of Revision 3 to review and returned comments to the SAS Project Quality Manager. A Final Draft of Revision 3 was sent to the PMOC for review.

Daily Inspection Reports: At the end of May 2015, the following contractors were behind in entering their Daily Inspection Reports into the Contractor Management System (CMS):

Contractor	Weeks Behind
2B	3
C5C	3

C4C Contractor: The C4C contractor hired a new Quality Manager in November 2014. C4C Contractor Management stated that entry of Daily Inspection Reports and generation of nonconformance reports (NCRs) in the required time frame would improve. Entry of Daily Inspection Reports and generation of NCRs have been current for the past five months.

C5C Contractor: Besides being three weeks behind in submitting Daily Inspection Reports and not following its approved nonconformance reporting system, the C5C contractor is not implementing its approved Contractor's Quality Plan (CQP). Among the requirements that have not been followed are:

- Work is being performed without approved Quality Work Plans (QWPs)
- Preparatory Phase Meetings are not held
- NCRs are not being issued and those that are, do not get closed
- Mock-up work is proceeding without approval
- Mechanical/electrical/plumbing (MEP) hold point inspections are being bypassed
- Electrical issues have not been documented on nonconformance reports (NCRs)
- External quality audits are not performed

A Quality Management Meeting with the contractor's upper management is scheduled for June 4, 2015.

Contract Package C2B	
Status:	Through May 31, 2015, a total of 107 NCRs have been issued. 42 have been closed and 65 NCRs are still open. In May 2015, 6 new NCRs were written and none were closed.
Observation:	Of the 65 open NCRs, 44 are for concrete that was out of specification. A concrete analysis was prepared on May 6, 2015. When approved by the designer of record, over 30 NCRs will be closed. Entry of Daily Inspection Reports into CMS is three weeks behind. Bi-weekly Quality Management Meetings, as suggested by the PMOC, are still being held.
Concerns and Recommendations:	Many NCRs that have been written have been open for many months. The contractor's management has promised additional help to the contractor's Quality Manager beginning in June 2015.

Contract Package C3	
Status:	Through May 31, 2015, a total of 105 NCRs have been issued. 95 have been closed and 10 NCRs are still open. In May 2015, 2 new NCRs were written and none were closed.
Observation:	Entry of Daily Inspection Reports into CMS is current.
Concerns and Recommendations:	The PMOC has no concerns.
Contract Package C4C	
Status:	Through May 31, 2015, a total of 123 NCRs have been issued. 30 have been closed and 93 NCRs are still open. In May 2015, 7 NCRs were written and one was closed.
Observation:	84 of the 93 open NCRs are for concrete that was out of specification. Six of the seven NCRs generated in May were for concrete that failed. The contractor has performed two concrete analyses, one for each of its suppliers. One concrete analysis was approved by the Designer of Record and the next concrete analysis was submitted on April 28, 2015. Submittal of Daily Inspection Reports is current.
Concerns and Recommendations:	The PMOC has discussed the open concrete NCRs with the SAS C4C Quality Manager and the contractor's C4C Quality Manager and they have stated that once the second concrete analysis is approved, many of the open concrete NCRs will be closed.
Contract Package C5C	
Status:	Through May 31, 2015, 53 NCRs have been written and entered in CMS. 38 have been assigned a number but have been identified either "not issued" or "not submitted in CMS". Of the 53 that have been issued, 10 have been closed and 43 NCRs are still open. Of the 43 still open, 33 have been identified as "statistical analysis to be submitted". In May 2015, 1 new NCR was written and none were closed. In the past 2½ months only one NCR was closed.
Observation:	Submittal of Daily Inspection Reports is 3 weeks behind. When an NCR is written, it should be issued and entered into CMS immediately. Bi-weekly Quality Management Meetings, as suggested by the PMOC, are still being held.
Concerns and Recommendations:	In February 2015, the PMOC recommended that all NCRs be issued and entered into CMS immediately and that the contractor establish a schedule to close the non-concrete NCRs. This has still not occurred. The contractor's Quality Manager has stated that he cannot keep up with the workload. The PMOC recommended that MTACC Quality Management resolve this issue. A meeting with the CM's Office and the contractor's Management was held in May 2015 but no improvement has been made. At the request of the PMOC, the contractor's upper

	management has been requested to attend the June 4, 2015 Quality Management Meeting. Additional PMOC concerns are listed in the front of this section.
Contract Package C6	
Status:	Through May 31, 2015, a total of 36 NCRs have been issued. 17 have been closed and 19 NCRs are still open. In May 2015, two new NCRs were written and none were closed. Entry of Daily Inspection Reports into CMS is current.
Observation:	17 of the open NCRs are for concrete placement that is out of specification. The contractor submitted Waiver #23 to extend the time of concrete placement from 90 minutes to 120 minutes. The Designer of Record will not approve this waiver. The contractor has prepared an analysis of concrete strength, was requested to provide additional information, and is in the process of updating the analysis.
Concerns and Recommendations:	The PMOC has no concerns.

Concerns and Recommendations:

Refer to previous section.

2.0 SCHEDULE DATA

Status:

The Integrated Project Schedule (IPS) is a management level schedule that integrates all ten construction packages along with design, procurement, startup and other support activities. IPS Update #106 was received on June 1, 2015 and is based on a Data Date of May 1, 2015. This update contains the “.XER” schedule files for the IPS and active construction contracts as well as a narrative report.

It is noted that IPS Update #106 does not include an approved schedule update from the C2B Contract. MTACC’s preliminary update has been used in lieu of an approved update.

There are several significant changes included within Update #106:

- This period SAS Primary Schedule Contingency decreased from 35 WD (49 CD) to 31 WD (43 CD). This decrease is attributable to a slip in the Contract 6 Substantial Completion date caused by delays submitting (AWO 35) Riser Diagrams and Layouts for Fire Alarms at 86th Street. As a result of the revised and accepted schedule, the Overall Critical path runs through the fire alarm system at the 86th St. Station.
- In its narrative report accompanying IPS Update #106, MTACC notes that the Mitigation Plan agreed to with the 96th St Contractor to recover 53 CDs of the delay is included in the IPS; however, full recovery remains incomplete and awaits the Contractors detailed recovery plan.

IPS Update #106 forecasts the completion of all construction and NYCT Pre-Revenue Training & Testing activities on November 17, 2016, with approximately 43 calendar days (CD) or 31

work days (WD) of contingency, resulting in a forecast Revenue Service Date (RSD) of December 30, 2016.

Schedule contingency based on IPS Update #106 is summarized as follows:

	Dates	Contingency (CD)	
MTACC Completion	11/17/2016	43	MTACC Contingency
MTACC RSD	12/31/2016	184	Additional Contingency
ELPEP Threshold	7/3/2017	240	Minimum ELPEP Contingency
FTA RSD	2/28/2018	467	TOTAL

Observations:

Project Critical Path:

MTACC’s schedule narrative identifies five independent float paths as “critical”. Each of these paths has no more than 15 WD of schedule float. The PMOC concurs with MTACC’s evaluation of the relative importance of these paths and for consistency, will follow the same reporting format.

1st Critical Path (TF=0): The longest continuous path involves Contract C6 Fire Alarm Equipment submittal and approval which was forecasted to be complete on May 29, 2015. This work is the result of C6 AWO #35, which impact the fire alarm system at all stations. Manufacture and delivery of this equipment to the project site should be complete by September 22, 2015. The path then continues through panel installation, wiring and device installation throughout the 86th Street Station through March 1, 2016. Installation is followed by Fire Alarm Field Installation Acceptance Testing (FIAT), Facility Integrated Systems Testing (FIST) and Final Systems Integrated Testing (FSIT) at 86th Street Station through August 26, 2016. NYCT Pre Revenue Service and System Wide Operational & Train Tests then proceed until November 17, 2016. The Critical Path then completes with 31 WD (43 CD) of Schedule Contingency leading to a RSD date of December 30, 2016.

2nd Critical Path (TF=5): This path is initiated by structural construction and waterproofing of Entrance #3 at the 96th Street Station, which is forecast to extend through August 31, 2015. Follow-on construction of the elevator enclosure, access trim and machine room equipment extends the path through May 12, 2016. The path then follows Elevator Field Installation Acceptance Test (FIAT), Simulated Integrated Systems Test (SIST) and Final Systems Integrated Test (FSIT) at 96th Street Station through November 10, 2016. The path ends with 96th Street Station Substantial Completion on November 10, 2016 and ties to the primary critical path at Phase 1 Construction Complete on November 17, 2016. The schedule then completes with the same 31 WD (43 CD) of Schedule Contingency leading to a RSD date of December 30, 2016.

3rd Critical Path (TF=12): This path involves signal system installation at the 72nd Street Station. The path is initiated by the C4C Contractor’s achievement of its Milestone #8, which

provides the C6 Contractor with access to signal rooms at the south end of the station. This milestone was forecasted to be completed on May 1, 2015. The path follows equipment and panel installation, relay installation, wiring and termination through January 4, 2016. The path then follows Field Installation Acceptance Test (FIAT), Facilities Integrated Systems Test (FIST) and Final Systems Integrated Test (FSIT) through October 4, 2016 and ties to Revenue Service with 12 WD (17 CD) of float. The Critical Path then completes with the same 31 WDs (43 CDs) of Schedule Contingency leading to a RSD date of December 30, 2016.

4th Critical Path (TF=23): This path extends through construction of Ancillary #2 at the 96th Street Station. The path is initiated by structural construction of the lower roof level slab and through 4th level parapet walls, forecast to complete on October 1, 2015. From that date, the path follows mechanical installation of fans and ducts for tunnel ventilation, electrical power and lighting installation through October 7, 2016, which is the forecast date of C2B Substantial Completion. C2B Substantial Completion ties directly to SAS Phase 1 Completion on November 17, 2016.

This path is one of several “near-critical” paths solely controlled by the C2B Contractor, with no component of this work performed by the Systems (C6) Contractor. Float values for this path have varied significantly during 2015. On February 18, 2015, MTACC reported it had agreed with the C2B Contractor to accelerate the Ancillary 2 path by 53 CD. Subsequent IPS updates indicate the results of this effort are mixed.

- IPS Update #102 DD=1/1/2015: +11
- IPS Update #103, DD=2/1/2015: +44
- IPS Update #104 DD=3/1/2015: +26
- IPS Update #105 DD=4/1/2015: +12
- IPS Update #106 DD=5/1/2015: +23 (Preliminary)

The C2B Contractor did not include this acceleration in its May 1, 2015 schedule update, which is the reported reason for MTACC’s disapproval of the update.

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

+37 WD: This path involves trackwork and 3rd Rail installation throughout the project. Trackwork was previously a project critical path. The path is initiated by ongoing track installation work in Zone 3, followed by 3rd Rail installation in Zone 3 which is forecast to complete on August 26, 2015. The path then follows track installation through Zones 4, 7, 8, 10 and 11. Track installation is followed by termination of negative current return cables, FIAT, FIST and SIST of the traction power system, forecast for completion on August 10, 2016. This path joins the project critical path with Substantial completion of the C6 Contract.

+50 WD: This path represents procurement, installation and testing of permanent power equipment at the 86th Street Station. Following the forecast “Permanent Power Available” date of December 3, 2015, the path follows component and system testing of mechanical and electrical equipment throughout the station.

+66 WD: This path represents delivery and installation of equipment required for permanent power at the 72nd Street Station. Following the “Permanent Power Available” date

of December 1, 2015, this path merges with numerous other paths involving the testing and acceptance of equipment throughout the station.

+68 WD: This path represents the construction of Entrance #1 at the 72nd St. Station. Structural underpinning is forecast to complete on January 1, 2016. The path then follows finish construction, which is concurrent with escalator installation through testing and commissioning. All work at Entrance #1 is forecast to be complete by September 16, 2016. This path gained 28 WD of schedule float this period.

+138 WD: This path represents procurement, installation and testing of permanent power equipment at the 96th Street Station. Following the forecast “Permanent Power Available” date of November 4, 2015, the path follows component and system testing of mechanical and electrical equipment throughout the station.

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

1. Status of Milestones forecast to complete this update period (04/01/15 to 04/30/15):

Pkg.	MS	Description	UD #105 Forecast	Status	UD #106 Forecast
C2B	7A	Full access to Signals Rooms	04/08/15	Incomplete	5/08/15
C2B	8A	Full access to Traction Power Rooms:	04/08/15	Incomplete	05/08/15
C5C	2	Limited Access; Sta. 1209+00- >1198+00	04/14/15	Incomplete	05/04/15
C5C	5	Turnover of Comm. Rooms	04/17/15	Complete	04/16/15A
C4C	12	Full access @ Station Service Center(s)	04/24/15	Incomplete	05/29/15
C5C	14b	Limited Access all locations	04/30/15	Incomplete	05/21/15

2. Milestones forecast to complete during previous update period (03/01/15 to 03/31/15)

Pkg.	MS	Description	UD #104 Forecast	UD #105 Forecast	UD #106 Forecast
C2B	4	Shared access in East & West track-ways thru Sta (1238+50 - >1225+25); 97th -> 99th St Tunnel in 99th to 105th St Tunnels	03/02/15	Complete	-
C4C	7B	Complete Work Ancillary #1	03/02/15	05/14/15	05/29/15
C2B	6A	Full access to Comms Rooms &	03/09/15	Complete	-

		Closets			
C2B	8A	Full access to Traction Power Rooms:	03/09/15	04/08/15	05/08/15
C5C	5	Turnover of Comm. Rooms	03/18/15	04/17/15	04/16/15A
C4C	12	Full access @ Station Service Center(s)	03/31/15	04/24/15	05/29/15

3. Milestones scheduled for completion during the next update period (05/01/15 to 05/31/15).

			UD# 106	
Pkg	MS	Description	Date	Float
C5C	2	Limited Access; Sta. 1209+00->1198+00	05/04/15	150
C2B	7A	Full access to Signals Rooms	05/08/15	95
C2B	8A	Full access to Traction Power Rooms:	05/08/15	148
C2B	10	Complete all remaining Comms, Signal , & Traction Power work	05/14/15	233
C3	4c	Compl Lwr/Uppr Platforms & Signal Rms	05/14/15	57
C5C	10	Turnover Traction Power Rooms	05/15/15	79
C5C	10A	Room-to-Room Conduit Ready	05/15/15	145
C5C	11	Full access @ Station Service Center(s)	05/20/15	247
C5C	14b	Limited Access all locations	05/21/15	380
C5C	9	Turnover Traction Power Rooms	05/21/15	37
C5C	9A	Room-to-Room Conduit Ready	05/21/15	141
C4C	12	Full access @ Station Service Center(s)	05/29/15	31
C4C	7B	Complete Work Ancillary #1	05/29/15	32

4. 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 #105	UD #106	Variance
C6	5C	Complete all 63rd St. Station work	04/08/16	06/16/16	69
C4C	10	Complete north power rooms	05/28/15	07/31/15	64
C4C	12	Full access @ Station Service Center(s)	04/24/15	05/29/15	35
C2B	7A	Full access to Signals Rooms	04/08/15	05/08/15	30
C2B	8A	Full access to Traction Power Rooms:	04/08/15	05/08/15	30
C2B	9	Full access to Station Service Centers	10/14/15	11/13/15	30
C5C	7	Turnover of Signal Rooms	05/07/15	06/02/15	26
C5C	7A	Room-to-Room Conduit Ready	05/07/15	06/02/15	26
C5C	8	Turnover of Signal Rooms	05/07/15	06/02/15	26
C5C	8A	Room-to-Room Conduit Ready	05/07/15	06/02/15	26
C5C	6	Turnover of Comm. Rooms	07/06/15	07/31/15	25
C5C	6A	Room-to-Room Conduit Ready	07/06/15	07/31/15	25
C2B	7B	Full access to Signals Rooms	07/24/15	06/24/15	-30
C2B	7C	Full access to Signals Rooms	07/24/15	06/24/15	-30
C6	3A	Complete LAN - 86th St. Station	03/01/16	01/22/16	-39
C6	3B	Complete WAN - 86th St. Station	03/01/16	01/22/16	-39
C6	2A	Complete LAN - 96th St. Station	02/16/16	12/30/15	-48
C6	2B	Complete WAN - 96th St. Station	02/16/16	12/30/15	-48
C6	4A	Complete LAN - 72nd St. Station	03/08/16	01/15/16	-53
C6	4B	Complete WAN-72nd St. Station	03/08/16	01/15/16	-53

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

Pkg	MS	Description	UD #105	UD #106	Variance
C2B	7C	Full access to Signals Rooms	16	234	218
C2B	8A	Full access to Traction Power Rooms:	15	148	133
C5C	9A	Room-to-Room Conduit Ready	28	141	113
C2B	9	Full access to Station Service Centers	143	254	111
C2B	7A	Full access to Signals Rooms	15	95	80
C2B	7B	Full access to Signals Rooms	16	95	79
C5C	7A	Room-to-Room Conduit Ready	10	86	76
C5C	8A	Room-to-Room Conduit Ready	10	86	76
C5C	7	Turnover of Signal Rooms	10	84	74
C5C	8	Turnover of Signal Rooms	10	84	74
C4C	10	Complete north power rooms	20	91	71
C6	5A	Complete LAN - 63rd St. Station	201	266	65
C6	5B	Complete WAN - 63rd St. Station	201	266	65
C5C	10A	Room-to-Room Conduit Ready	90	145	55
C5C	3	Shared Access; Sta. 1209+00- >1198+00	79	124	45
C6	4A	Complete LAN - 72nd St. Station	86	127	41
C6	4B	Complete WAN - 72nd St. Station	86	127	41
C5C	2	Limited Access; Sta. 1209+00- >1198+00	110	150	40
C6	2A	Complete LAN - 96th St. Station	105	143	38
C6	2B	Complete WAN - 96th St. Station	105	143	38
C5C	6A	Room-to-Room Conduit Ready	34	71	37

Pkg	MS	Description	UD #105	UD #106	Variance
C5C	9	Turnover Traction Power Rooms	0	37	37
C2B	10	Complete all remaining Comms, Signal , & Traction Power work	198	233	35
C2B	6B	Full access to Comms Rooms & Closets	99	134	35
C2B	6C	Full access to Comms Rooms & Closets	99	134	35
C6	3A	Complete LAN - 86th St. Station	100	134	34
C6	3B	Complete WAN - 86th St. Station	100	134	34
C6	5C	Complete all 63rd St. Station work	144	99	-45
C3	4c	Compl Lwr/Uppr Platforms & Signal Rms	259	57	-202

6. Milestones with excessive float values are listed in the following table.

Pkg	MS	Description	UD# 106	
			Date	Float
C5C	14b	Limited Access all locations	05/21/15	380
C6	5A	Complete LAN - 63rd St. Station	06/16/15	266
C6	5B	Complete WAN - 63rd St. Station	06/16/15	266
C2B	9	Full access to Station Service Centers	11/13/15	254
C5C	11	Full access @ Station Service Center(s)	05/20/15	247
C2B	7C	Full access to Signals Rooms	06/24/15	234
C2B	10	Complete all remaining Comms, Signal , & Traction Power work	05/14/15	233
C2B	8B	Full access to Traction Power Rooms:	06/24/15	214
C2B	8C	Full access to Traction Power Rooms:	06/24/15	214
C3	SS	Substantial Completion	02/19/16	184
C4C	7A	Complete Work in all Comm Rooms	03/01/16	182
C5C	2	Limited Access; Sta. 1209+00->1198+00	05/04/15	150

			UD# 106	
Pkg	MS	Description	Date	Float
Example: Based on this information, C6, MS#5A & 5B can be achieved as late as 6/22/16 (266 WD later than the currently scheduled date of 06/16/15 with no impact to the RSD.				

Schedule Contingency: As of IPS Update #106 there are 43 CD (31 WD) contingency between the calculated completion of all work on November 17, 2016 and MTACC target RSD of December 30, 2016. The project schedule lost 6 CD of contingency over this latest reporting period.

ELPEP/SMP Compliance: MTACC considers the IPS and the associated schedule management procedures to be in compliance with the ELPEP and Schedule Management Plan. Elsewhere in this report, 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: Minimum 25 Calendar Days (approximately 18 WD) of schedule float for all secondary “near-critical” paths.
 - Numerous secondary float paths with Total Float (TF) <= 25 CD. Many of these paths have multiple subsidiary paths branching off the independent paths.
 - Compliance with this requirement is not 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.

Schedule Performance Indicators:

In an effort to corroborate the IPS forecast the PMOC has reviewed schedule performance to date in an effort to develop performance metrics that can assist in evaluating CPM schedule forecasts.

Based on its review of active construction contractors’ schedules, the PMOC notes that more than 50% of the actual duration of construction activities exceeds their respective planned durations. This metric suggests there is significant risk in actually achieving schedules developed for this project.

In its periodic reports to the FTA, MTACC details the Budgeted Cost of Work Scheduled (BCWS) versus the Budgeted Cost of Work Performed (BCWP) for each active construction contract. At a summary level, the resulting “S-curves” compare planned versus actual performance and can identify and provide insight into performance trends and schedule forecasts. For each active construction contract, the following table compares the planned vs. actual monthly level of achievement in terms of value earned by completed construction work. This “earned value” can be used to estimate a variance in planned vs actual schedule performance. April 2015 is the latest month for which this information is available.

Value Earned April-15					
	Contract \$ (x100,000)	Plan	Actual	Plan Month for Actual Invoice \$	Months Ahead (+) or Behind (-)
C2B	\$ 324	\$ 293	\$ 215	Jul-14	-9.1
C3	\$ 176	\$ 176	\$ 156	Mar-13	-25.4
C4C	\$ 258	\$ 224	\$ 135	Sep-14	-7.1
C5C	\$ 208	\$ 135	\$ 81	Dec-14	-4.0
C6	\$ 261	\$ 197	\$ 141	Dec-14	-4.0
TOTAL	\$ 1,227	\$ 1,025	\$ 729	Sep-14	-7.1

The PMOC notes the following:

- This evaluation uses base contract values only. AWOs can be considered a partial cause of the variances indicated.
- Schedule float is also not considered. The significant schedule delay to contract C3 does not pose a risk to achieving the RSD.
- Current schedule analysis suggests the possibility that the C2B contract could independently delay the RSD. Successful completion of the C6 contract is necessary to achieve RSD. Consequently, this analysis suggests the possibility of a 4 to 9.1 month delay to the RSD unless schedule performance is significantly improved.
- Between June 2014 and May 2015, this methodology identifies a generally increasing negative variance. This trend is consistent with “stacking” activities later in the schedule and the observed increase in “near-critical” paths and reduction in overall schedule float.

Concerns and Recommendations:

Based on the PMOC’s review of IPS Update #106:

- As noted in the narrative report accompanying IPS Update #106, major milestone variances between latest IPS and contractor schedule updates are limited to Contract C2B:

MS #		IPS #106	C2B	Var. (CD)
007A	Full access to Signals Rooms	05/08/15	11/05/15	128
010	Complete all remaining Comms, Signal , & Traction Power work	05/14/15	12/14/15	152

Although the MTACC narrative states this work will be completed by the date indicated in the IPS, the PMOC remains concerned about ability to achieve schedule goals at the 96th Street Station.

- One milestone of the six scheduled for completion this period was actually achieved.
- Of the 46 active milestones, thirteen are forecast for completion during the next update period (May 2015).
- In addition to the critical and near-critical paths previously described, the PMOC notes that there are numerous paths with less than 40 WD of float involving almost all trades and all locations at the 96th Street Station. The risk of project-level delay due to construction delay at this station remains a concern.
- Of the 11 active schedule milestones experiencing significant schedule variance, 10 of these variances delayed the milestone completion. This is part of a general trend where construction generally takes longer than forecast by the IPS and respective project schedules.
- The PMOC notes frequent instances where a milestone experiences a schedule delay and a significant increase in schedule float while the schedule end date remains essentially unchanged. This counterintuitive circumstance may indicate downstream schedule revisions (reducing duration, eliminating logic ties) at either the contract or IPS level that may not be sustainable.

3.0 COST DATA

Based upon financial expenditures reported by the MTACC through May 31, 2015 SAS Phase 1 is approximately 77.2% complete. The completion status of the individual construction contracts through May 31, 2015, also based upon reported expenditures through that date, is as follows:

- C26002 (Tunnel Boring) – 100.0%
- C26005 (96th Street Station) – 100.0%
- C26010 (96th Street Station) – 68.6%
- C26013 (86th Street Station) – 100%
- C26008 (86th Street Station) – 99.3%
- C26012 (86th Street Station) – 39.3%
- C26006 (63rd Street Station) – 88.8%
- C26007 (72nd Street Station) – 99.9%
- C26011 (72nd Street Station) – 54.3%
- C26009 (Systems) – 54.6%

Aggregate Construction % Completion:

- 100% of all construction has been bid.
- 100% of all construction is under contract
- 81.1% of base contract construction (excluding AWOs) is complete

- 82.2% of all construction is complete

Based upon cost data received from MTACC for the period through May 31, 2015:

- Value of construction in place this period = \$30,617,719
- Estimated value of construction remaining = \$347,358,578 (base contract only)
- Target construction completion = November 17, 2016
- Number of months remaining = 17.6

Soft Cost expenditures (not including real estate, OCIP, etc.) reported this period by MTACC totaled \$4.71M. This expenditure is approximately equal to that anticipated by the CWB. CM and Engineering Force Account services are the major soft cost expenditures. At current expenditure levels, the available budget should be sufficient through 2016 with some reserve remaining for post-construction activities. Significant construction delays beyond December 2016 may require additional contingency transfer.

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

	<u>Executed AWOs</u>	<u>AWO Exposure</u>
May-15	\$185,112,578	\$216,992,292
Apr-15	<u>\$182,513,498</u>	<u>\$216,577,769</u>
Δ	\$2,599,080	\$414,523
Δ	1.42%	0.19%

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

Const. Pkg.	AWO Exposure			
	May-15	Apr-15	Period Δ	Changes this Period
Completed Packages	\$47,612,118	\$47,612,118	\$0	Final values for Packages C1 and C5A as reported by MTACC.
C2A	\$47,615,409	\$47,615,409	\$0	No change reported this period.
C2B	\$31,893,591	\$32,464,935	-\$571,344	Net decrease is based on revised estimates for AWO # 84, 88, 122, 131, 135, 141 and initial estimates for AWO # 130, 158 and 163.
C3	\$23,783,320	\$23,173,151	\$610,169	Net increase is based on revised estimates for AWO # 148, 159, 160, 166, 168, 171, 177, 180, 184, 188, 193, 196, 197, 201, 202, 203, 204, 206, 207 and initial estimates for AWO # 210, 212, 214, 215, 216, 217, 218 and 220.

Const. Pkg.	AWO Exposure			
	May-15	Apr-15	Period Δ	Changes this Period
C4B	\$1,325,639	\$1,325,639	\$0	No change reported this period.
C4C	\$27,662,484	\$27,449,961	\$212,523	Net increase in exposure is based on revised estimates for AWO # 113, 128, 137, 141, 146 and initial estimates for AWO # 112 and 116.
C5B	\$21,633,017	\$21,633,017	\$0	No change reported this period.
C5C	\$7,844,101	\$7,780,905	\$63,196	Net increase is based on revised estimates for AWO # 14, 15, 63, 72 and initial estimates for AWO # 27, 71, 81, 85 and 100.
C6	\$7,622,613	\$7,522,634	\$99,979	Net increase is based on revised estimates for AWO # 29, 46, 72, 86 and initial estimates for AWO # 67, 76, 78, 80, 83, 85, 87 and 88.
	\$216,992,292	\$216,577,769	\$414,523	

The changes in Executed AWO Value are summarized as follows:

Const. Pkg.	Executed AWOs			
	May-15	Apr-15	Period Δ	Changes this Period
Completed Packages	\$47,612,118	\$47,612,118	\$0	Final values for Packages C1 and C5A as reported by MTACC.
C2A	\$47,615,409	\$47,615,409	\$0	No change reported this period.
C2B	\$24,337,819	\$24,263,073	\$74,746	Net increase is based on execution of AWO # 108, 131, 136, 140, 143, 144, 147 and 148.
C3	\$14,569,549	\$13,474,549	\$1,095,000	Increase is based on execution of AWO # 142, 150, 170, 172, 178, 185, 186, 192 and 199.
C4B	\$1,325,639	\$1,325,639	\$0	No change reported this period.
C4C	\$23,595,435	\$22,814,212	\$781,223	Increase is based on execution of AWO # 90, 96, 109, 110, 113, 122, 125, 126, 140, 141, 143 and 146.
C5B	\$17,823,553	\$17,820,303	\$3,250	Net increase is based on execution of AWO # 103 and 104.

Const. Pkg.	Executed AWOs			
	May-15	Apr-15	Period Δ	Changes this Period
C5C	\$1,414,524	\$1,249,300	\$165,224	Net increase is based on execution of AWO # 31, 33, 63, 68, 72, 77, 89 and 93.
C6	\$6,818,532	\$6,338,895	\$479,637	Increase is based on execution of AWO # 42, 74, 76 and 88.
	\$185,112,578	\$182,513,498	\$2,599,080	

As of May 31, 2015, 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)	100.00%	\$325,000,000	\$47,615,409	14.65%	\$47,615,409	14.65%
C26010 (2B)	68.58%	\$324,600,000	\$31,893,591	9.83%	\$24,337,819	7.50%
C26006 (3)	88.84%	\$176,450,000	\$23,783,320	13.48%	\$14,569,549	8.26%
C26007 (4B)	99.93%	\$447,180,260	\$1,325,639	0.30%	\$1,325,639	0.30%
C26011 (4C)	54.12%	\$258,353,000	\$27,662,484	10.71%	\$23,595,435	9.13%
C26013 (5A)	100.00%	\$34,070,039	\$6,525,471	19.15%	\$6,525,471	19.15%
C26008 (5B)	99.25%	\$301,860,000	\$21,633,017	7.17%	\$17,823,553	5.90%
C26012 (5C)	39.30%	\$208,376,000	\$7,844,101	3.76%	\$1,414,524	0.68%
C26009(6)	54.57%	\$261,900,000	\$7,622,613	2.91%	\$6,818,532	2.60%
TOTAL TO DATE		\$2,674,814,299	\$216,992,292	8.11%	\$185,112,578	6.92%

To date, approximately \$2,170,184,079 (81.1%) worth of all base contract construction work has been completed. As a % of work completed, the AWO exposure for these contracts = 10.00% and the executed AWO % = 8.53%.

The PMOC notes a 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 \$267M, which is significantly above the \$229M AWO contingency contained in the MTACC CWB.

MTACC maintains an AWO forecast which includes input from its Risk Registers. The MTACC AWO EAC Forecast through April 30, 2015 is \$315,420,983. This value is somewhat greater than the PMOCs AWO forecast and will be used as part of the overall contingency/EAC analysis.

Cost Contingency: Based upon the MTACC Current Working Budget, expenditures as of May 31, 2015 reported by MTACC and the current AWO Exposure analyses; the PMOC has developed the following contingency analysis:

Contingency Analysis

	<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	\$1,107,785,476	\$1,107,785,476
Soft Cost Forecast to Complete	\$200,322,609	\$271,347,726
AWO Exposure	\$216,992,292	\$315,420,983
Total Contingency	\$251,085,324	\$81,631,516
Reserved Contingency	\$160,000,000	\$81,631,516
Available Contingency	\$91,085,324	

Transfer from Reserved Contingency = \$78,368,484

Notes:

- (1) Forecast to complete includes increases in OCIP, A/E & CM Services, Engineering Testing and FOC installation.
- (2) AWO Exposure @ Completion incorporates MTACC “risk-informed” forecast through April 2015.
- (3) Total Contingency = budget balance after forecast expenditures.
- (4) Final Contingency Balance reflects current forecast transfer of \$78,368,484 from “Reserved Contingency
- (5) Minimum Available Contingency required by ELPEP is approximately \$143,076,923.

Conclusions based upon this analysis include:

- The project can be completed within the current MTACC CWB of \$4.451B.
- Current forecast indicates it will be necessary to utilize approximately 50% of funds from the “Executive” or “Reserved” Contingency in order to cover forecast project costs.
- Current available contingency of approximately \$251.1M is greater than ELPEP-required minimum.

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

Status

Major risks challenging the SAS Project Team at this time are all primarily schedule related. The Project maintains individual Risk Registers for each active contract. The resulting cost and

schedule contingency curves are consistent with the previous discussions contained within this report.

Observation and Analysis:

For several months, MTACC has reported that the SAS Contract Risk Registers and Risk Analysis were performed in late December 2014, and that results of this analysis were reviewed with MTACC Executive Management in March 2015. To date, the resulting schedule and cost contingency forecast curves have not been released.

The Project's major schedule/risk items are presented below along with the management efforts to manage and mitigate each risk:

Track Installation Delay: Installation of track and related work was previously on the project's primary critical path. Resequencing of the work mitigated previous delays and according to IPS Update #106, has currently resulted in 37 WD of schedule float on this path.

Progress on review and approval of alignment submittals for Zones 5 and 6 and access to these areas currently supports the schedule for concreting Zones 5 and 6. The Project expects that contractor will meet the plan to place concrete in Zones 5 and 6.

Track installation has been delayed due to the slow progress in approval of technical submissions. Resolution of conflicting survey data has delayed the review and approval of final alignment submittals. Installation of track work has been on the SAS Primary Critical Path (CP); delays to trackwork submittals has consumed project-level schedule contingency although the forecast RSD has been maintained. Several mitigation measures have been identified and are being implemented:

MTACC and the Systems Contractor continue to hold bi-weekly meetings to resolve track work issues and expedite the submittal development and review process.

72nd Street Station Entrance 1: In December 2014, MTACC and the 72nd Street Station Contractor executed a change order to accelerate construction at 72nd Street Station Entrance 1 from January 27, 2017 to September 16, 2016. Problems with rock excavation have been encountered, but generally mitigated through a combination of activity resequencing and multi-shift work efforts. The work is currently on schedule and gained 28 WD of schedule float over the most recent update period.

Facility Power: Timely availability of permanent facility power at the new stations is necessary to ensure the timely completion of system installation, testing and commissioning activities. The current IPS indicates that all stations will be energized by December 2015. All contractors reportedly support this date.

Currently, room access and infrastructure construction issues appear to have been resolved and the actual supply, installation and approval of the equipment by Con-Ed control the achievement of this effort.

There is some concern regarding the capability of the 96th Street Station Contractor to achieve the current schedule. Water leakage issues are being addressed but appear to continue to affect some construction activities. MTACC continues to conduct bi-weekly meetings to status and address facility power issues for each of the new stations.

Conclusions

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.

5.0 ELPEP

The most recent ELPEP Quarterly Review Meeting was held on April 6, 2015. The next ELPEP Quarterly Review Meeting with MTACC, FTA-RII, SAS and ESA projects and the PMOC is scheduled for June 11, 2015. With respect to SAS, the current status of each of the main ELPEP components is summarized as follows:

- **Technical Capacity and Capability (TCC):** PMOC comments for both SAS and ESA have been consolidated and forwarded to FTA.
- **Schedule Management Plan (SMP):** MTACC's position is that the SAS management processes remain ELPEP compliant.
- **Cost Management Plan (CMP):** PMOC comments for both SAS and ESA have been consolidated and forwarded to the FTA. MTACC's position is that the SAS management processes remain ELPEP compliant.
- **Risk Mitigation Capacity Plan (RMCP) and Risk Management Plan (RMP):** MTACC's position is that the SAS management processes remain ELPEP compliant.

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

Each construction contractor continued implementation of the Safety Requirements as specified in Section 01 11 50 of the General Requirements. During May 2015 each contractor participated in OSHA's National Safety Stand-down week of activities. These activities included training, demonstrations and tool box talks, on various safety topics including fall protection, tool safety, and respirator safety. CCM Safety and OCIP representatives 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 continued during the month.

As of April 30, 2015 a total of 10,639,165 construction hours have been logged on the project with 91 lost time and 257 recordable incidents documented. The total hours and incidents equates to a Lost Time Rate (LTR) of 1.71 and a Recordable Rate (REC) of 4.83. The LTR is below and the REC is above the US Bureau of Labor Statistics (BLS) national rate (Heavy & Civil construction) of 1.8 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. An electronic data management system is being utilized as a depository for the objective evidence documenting the inspection/testing of a

certifiable item. Technical Working Group meetings are held monthly with each station contractor and the system contractor to review the status of the process.

7.0 ISSUES AND RECOMMENDATIONS

Schedule Performance: MTACC is actively managing the project schedule and working to mitigate major delays in an effort to maintain the RSD. The PMOC notes that summary level evaluations and indicators of schedule performance to-date generally do not support the MTACC's assertion that the project is "on schedule". The risk of significant delay to the project RSD remains a concern.

Quality Management: The PMOC has observed select instances where concerns over schedule performance may have been prioritized over work product conformance to project requirements. In a situation where schedule is becoming an overriding concern, this is common. The PMOC will closely monitor quality management issues over the upcoming periods to verify that achieving specified project quality remains a high priority.

Safety and Security Certification: MTACC/SAS continues to conduct monthly overall SSC update meetings and individual contract monthly SSC meetings. The PMOC is concerned about the timely submission of the "Body of Evidence" associated with the certifiable items. The PMOC will continue to monitor the process during the monthly meetings.

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 (March 2015)	Forecast Completion	
		Grantee	PMOC
Begin Construction	January 1, 2007	March 20, 2007A	March 20, 2007A
Construction Complete	August, 2016	November 17, 2016	October 2017
Revenue Service	February 28, 2018	December 30, 2016	February 2018

A = Actual

Table 2 - Schedule Contingency

IPS Update #	101	102	103	104	105	106
Data Date	12/1/14	1/1/15	2/1/15	3/1/15	4/1/15	5/1/15
	Contingency (CD)					
RSD=12/31/2016						
Risk Mitigated	87	69	38	38	49	43
Risk Realized	87	69	38	38	49	43
RSD=02/28/2018						
Risk Mitigated	511	492	461	461	473	467
Risk Realized	511	492	461	461	473	467

Table 3 – Schedule Milestone Comparison

Pkg	MS	Description	Dates			Variance		Sch. Float 106	Float Δ
			Adjusted	UD #105	UD #106	Contract	Month		
C2B	6B	Full access to Comms Rooms & Closets	08/21/14	06/24/15	06/24/15	-307	0	134	35
C2B	6C	Full access to Comms Rooms & Closets	08/21/14	06/24/15	06/24/15	-307	0	134	35
C2B	7A	Full access to Signals Rooms	08/21/14	04/08/15	05/08/15	-260	30	95	80
C2B	7B	Full access to Signals Rooms	08/21/14	07/24/15	06/24/15	-307	-30	95	79
C2B	7C	Full access to Signals Rooms	08/21/14	07/24/15	06/24/15	-307	-30	234	218
C2B	8A	Full access to Traction Power Rooms:	08/21/14	04/08/15	05/08/15	-260	30	148	133
C2B	8B	Full access to Traction Power Rooms:	08/21/14	06/24/15	06/24/15	-307	0	214	4
C2B	8C	Full access to Traction Power Rooms:	08/21/14	06/24/15	06/24/15	-307	0	214	4
C2B	9	Full access to Station Service Centers	11/21/14	10/14/15	11/13/15	-357	30	254	111
C2B	10	Complete all remaining Comms, Signal , & Traction Power work	09/21/14	05/14/15	05/14/15	-235	0	233	35
C2B	SS	Substantial Completion	12/21/15	10/21/16	11/10/16	-325	20	5	-10
C3	4c	Compl Lwr/Uppr Platforms & Signal Rms	10/14/13	05/20/15	05/14/15	-577	-6	57	-202
C3	SS	Substantial Completion	05/13/14	02/16/16	02/19/16	-647	3	184	1
C4C	7A	Complete Work in all Comm Rooms		03/01/16	03/01/16	-42430	0	182	6
C4C	7B	Complete Work Ancillary #1		05/14/15	05/29/15	-42153	15	32	2
C4C	10	Complete north power rooms	2/25/15	05/28/15	07/31/15	-156	64	91	71
C4C	12	Full access @ Station Service Center(s)	08/28/14	04/24/15	05/29/15	-274	35	31	-12
C4C	SS	Substantial Completion w/o Ent. #1	11/13/15	09/16/16	09/16/16	-308	0	63	6
C4C	SS	Substantial Completion - Ent. #1	10/07/16	09/16/16	09/16/16	21	0	44	4
C5C	2	Limited Access; Sta. 1209+00->1198+00	01/22/15	04/14/15	05/04/15	-102	20	150	40
C5C	3	Shared Access; Sta. 1209+00->1198+00	05/22/15	05/27/15	06/09/15	-18	13	124	45
C5C	5	Turnover of Comm. Rooms	09/23/14	04/17/15	4/16/2015A	-205	-1	X	-17
C5C	6	Turnover of Comm. Rooms	03/24/15	07/06/15	07/31/15	-129	25	41	7
C5C	6A	Room-to-Room Conduit Ready	03/24/15	07/06/15	07/31/15	-129	25	71	37
C5C	7	Turnover of Signal Rooms	02/25/15	05/07/15	06/02/15	-97	26	84	74
C5C	7A	Room-to-Room Conduit Ready		05/07/15	06/02/15	-42157	26	86	76

Pkg	MS	Description	Dates			Variance		Sch. Float 106	Float Δ
			Adjusted	UD #105	UD #106	Contract	Month		
C5C	8	Turnover of Signal Rooms	02/25/15	05/07/15	06/02/15	-97	26	84	74
C5C	8A	Room-to-Room Conduit Ready	02/25/15	05/07/15	06/02/15	-97	26	86	76
C5C	9	Turnover Traction Power Rooms	02/26/15	05/28/15	05/21/15	-84	-7	37	37
C5C	9A	Room-to-Room Conduit Ready	02/26/15	05/28/15	05/21/15	-84	-7	141	113
C5C	10	Turnover Traction Power Rooms	02/25/15	05/15/15	05/15/15	-79	0	79	-8
C5C	10A	Room-to-Room Conduit Ready	02/25/15	05/15/15	05/15/15	-79	0	145	55
C5C	11	Full access @ Station Service Center(s)	03/24/15	05/26/15	05/20/15	-57	-6	247	0
C5C	14b	Limited Access all locations	09/23/14	04/30/15	05/21/15	-240	21	380	-12
C5C	15	Comp. Permanent Power		12/28/15	01/05/16	-42374	8	100	-1
C5C	SS	Substantial Completion	05/31/16	08/24/16	08/12/16	-73	-12	68	12
C6	2A	Complete LAN - 96th St. Station	05/18/15	02/16/16	12/30/15	-226	-48	143	38
C6	2B	Complete WAN - 96th St. Station	05/18/15	02/16/16	12/30/15	-226	-48	143	38
C6	3A	Complete LAN - 86th St. Station	07/18/15	03/01/16	01/22/16	-188	-39	134	34
C6	3B	Complete WAN - 86th St. Station	07/18/15	03/01/16	01/22/16	-188	-39	134	34
C6	4A	Complete LAN - 72nd St. Station	02/18/15	03/08/16	01/15/16	-331	-53	127	41
C6	4B	Complete WAN - 72nd St. Station	02/18/15	03/08/16	01/15/16	-331	-53	127	41
C6	5A	Complete LAN - 63rd St. Station	04/18/14	06/16/15	06/16/15	-424	0	266	65
C6	5B	Complete WAN - 63rd St. Station	04/18/14	06/16/15	06/16/15	-424	0	266	65
C6	5C	Complete all 63rd St. Station work	04/18/14	04/08/16	06/16/16	-790	69	99	-45
C6	SS	Substantial Completion	08/18/16	10/27/16	10/24/16	-67	-3	0	0

Table 4 - Project Budget/Cost 

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of May 30, 2015	
	\$ Millions	% of Total	Obligated (\$ Millions)	3/17/2015	\$ Millions	% of Total	\$ Millions	% of Total
Grand Total Cost:	4,866.614	100	4,572.942	5,574.614	5,267.614	100	3,436.24	65.23
Financing Cost	816.614	16.78		816.614	816.614	15.50		
Total Project Cost:	4,050.000	83.22	4,572.942	4,758.000	4,451.00	84.50	3,436.24	65.23
Total Federal:	1,350.693	27.75	1,063.942	1,373.893*	1,350.693	24.60	1,082.314*	20.54
Total FTA share:	1,300.000	96.25	990.049	1,3000.000	1,300.000	23.68	1,008.421	19.14
5309 New Starts share	1,300.000	100	990.049	1,3000.000	1,300.000	23.68	1,008.421	19.14
Total FHWA share:	50.693	3.75	73.893	73.893	50.693	0.96	73.893	1.40
CMAQ	48.233	95.15	71.433	71.433	48.233	0.88	71.433	1.35
Special Highway Appropriation	2.460	4.85	2.460	2.460	2.460	0.04	2.460	0.05
Total Local share:	2,699.307	55.47	3,509.000**	3,384.107	3,509.000 **	63.92	2,353.927	44.69
State share	450.000	16.67	100.000		450.000	8.20		
Agency share	2,249.307	83.33	1,145.782		3,059.000	55.72		
City share	0	0			0	0		

* Obligated and expended amounts obtained from the Transportation Electronic Award Management (TEAM) system and MTACC's Grant Management Department.

** Current MTA Board approved budget.

Table 5 - Estimate at Completion

Category	Current Working Budget	EAC Forecast
Total Construction	\$2,674,814,299	\$2,990,235,282.00
Engineering Services Subtotal	\$622,862,000	\$684,157,000.00
Third Party Expenses	\$554,086,273	\$562,086,000.00
TA Expenses	\$131,160,085	\$132,890,202.00
Contingency	\$468,077,343	
Total	\$4,451,000,000	\$4,369,368,484

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

Std. Cost Category (SCC)	Description	FFGA (January 2008)	FFGA Amended (March, 2015)	MTA's Current Working Budget (December, 2014)
10	Guideway & Track Elements	\$612,404,000	\$195,346,781	\$622,478,000
20	Stations, Stops, Terminals, Intermodal	\$1,092,836,000	\$1,666,605,679	\$1,277,642,000
30	Support Facilities	\$0	\$0	\$0
40	Site Work & Special Conditions	\$276,229,000	\$793,118,232	\$524,561,000
50	Systems	\$322,707,000	\$250,379,966	\$250,134,000
60	ROW, Land, Existing Improvements	\$240,960,000	\$281,500,000	\$281,500,000
70	Vehicles	\$152,999,000	\$0	\$0
80	Professional Services	\$796,311,000	\$1,026,608,168	\$1,185,742,929
90	Unallocated Contingency	\$555,554,000	\$544,441,174	\$308,942,010
Subtotal		\$4,050,000,000	\$4,758,000,000	\$4,451,000,000
Financing Cost		\$816,614,000	\$816,614,000	\$816,614,000
Total Project		\$4,866,614,000	\$5,574,614,000	\$5,267,614,000

Table 7 -- Core Accountability Items				
Project Status:		Original at FFGA	Current*	ELPEP**
Cost	Cost Estimate	\$4,050M	\$4,451M	\$4,980M
Contingency	Unallocated Contingency	\$555.554M	\$251.1M	\$143M
	Total Contingency (Allocated plus Unallocated)	\$555.554M	\$251.1M (May 2015)	\$143M
Schedule	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
Total Project Percent Complete	Based on Expenditures	77.2%		
	Based on Earned Value	N/A		
Major Issue		Status	Comments	
Construction Schedule Delay		Open	Achieving the current RSD of December 31, 2016 is the major risk issue on the project. Over recent periods, there has been a general inability to maintain planned construction schedule progress. Consistently delayed achievement of milestone dates and other schedule commitments may ultimately impact the project 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 #106; Data Date = 05/1/2015

Financial data based upon MTACC reporting through 05/31/2015