

PMOC MONTHLY REPORT

Second Avenue Subway Phase 1 (MTACC-SAS) Project

Metropolitan Transportation Authority

New York, New York

Report Period October 1 to October 31, 2013



PMOC Contract No. DTFT60-09-D-00007

Task Order No. 4, Project No. DC-76-5020, Work Order No. 01

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

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THIRD PARTY DISCLAIMER

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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, Task Order No. 002. Its purpose is to provide information and data to assist the FTA as it continually monitors the grantee's technical capability and capacity to execute a project efficiently and effectively, and hence, whether the grantee continues to be ready to receive federal funds for further project development.

This report covers the project management activities on the MTACC (Capital Construction) Second Avenue Subway (SAS) Mega-Project managed by MTACC and MTA as the grantee and financed by the FTA FFGA.

MONITORING REPORT

1.0 PROJECT STATUS

During October 2013, 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 58.5% 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" Remaining Milestone #1 and #2 work will be transferred to the C-26010 (C2B) contract. This will allow Substantial Completion to be achieved on November 5, 2013. Punch list and documentation submittal activity will be ongoing.
- C-26010 (C2B) "96th Street Station Civil, Architectural, and MEP" Reconstruction work in the existing tunnels north of 99th Street (Milestone #1) was completed and access was provided to the C26009 (C6) contractor. Ongoing work involves construction of station walls and mezzanine between 92nd and 95th Streets.

- C-26006 (C3) “63rd Street Station Rehabilitation” Concrete and masonry work is nearing completion. Architectural, mechanical and electrical work continued throughout the station. Ancillary #1 is substantially complete (Milestone #6). Ancillary #2 work in the existing garage is continuing.
- C-26007 (C4B) “72nd Street Station Cavern Mining and Lining” Work is on pace to support the forecast Substantial Completion date of January 2, 2014 four days before the Station contractor’s need date.
- C-26011 (C4C) “72nd Street Station Architectural and MEP Systems” Mobilization and pre-construction activities are underway. Site access to the north cavern for construction activities will be provided as of September 16, 2013.
- C-26008 (C5B) “86th Street Station Cavern Mining and Lining”. Blasting is 98% complete. Installation of concrete invert slabs is complete in the southeast tunnel and continues in the north cavern. Placement of concrete lining for both the cavern walls and the southeast tunnel arch continues.
- C-26012 (C5C) “86th Street Station Architectural and MEP”. Mobilization continues. Site access for construction activity is remains for early April 2014 with full access still forecast for October 2014.
- C-26009 (C6) “Track, Power, Signals and Communication Systems” The contractor made the first delivery of the running rail which will be stored in the existing tunnels from 99th Street to 105th Street. Work at the 63rd Street Station is ongoing and includes installation of services carriers, conduits, cable trays and equipment.

a. Procurement

Procurement of construction contractors for SAS – Phase 1 is complete.

b. Construction

As of October 31 2013, 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

- Milestone #1 work which will be transferred to the C-26010 (C2B) Station Contract is associated with Ancillary 2 and includes shotcreting from the mezzanine to the roof and removal of the guidewall.
- Milestone #2 work which will be transferred to the C-26010 (C2B) Station Contract is associated with Ancillary 1 and includes shotcreting from the mezzanine to the roof and removal of the guidewall. In addition the slurry wall knock-out panel work, column and beam encasement work, and guidewall removal at Entrance #1 will be transferred.
- Transfer of the remaining work will allow Substantial Completion to be achieved on November 5, 2013 with punch list work and documentation submittals ongoing.

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

- Milestone #1 was achieved with the contractor providing access to the C6 Systems Contractor for rail delivery.
- Milestone #2 work as reported by the contractor as being delayed due to negotiation of an additional work order associated with waterproofing.
 - Ancillary #1 work in progress includes the building of the cast in place (CIP) wall from the invert to the mezzanine which is approximately 50.0% complete.
 - Mezzanine slab pours (93rd to 95th Street is approximately 63.6% complete.

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

- Surveying of the Deformation Monitoring Points (DMPs) is ongoing and will continue throughout the project. 1 DMP was reset at Entrance #1.
- Area 5 (Reconstruction consists of 6 mezzanines and the deck plaza roof)
 - Emphasis this period continues to be completion of the erection of CMU (concrete masonry unit) walls. Floor topping at the 1st, 2nd, 6th and 4th Lower Mezzanines is continuing. Priming and painting of CMU walls continues throughout.
 - Completion of the 6th Mezzanine CMU walls is needed for the mobilization of the elevator contractor, scheduled for December 2013.
- Entrance #1
 - Completed building out the Gas Meter Room and are continuing connections of new gas service to building tenants in designated clusters of units.
- Ancillary #1
 - The work at Ancillary #1 is substantially complete and the Project Office has advised the PMOC that the keys to the building were “turned over” to the building owner on October 31, 2013.
- Ancillary #2
 - Completed micro piles and began forming/placing cast-in-place concrete walls. The contractor began working extended hours to complete Milestone #5 – “Completion of all work within the underground parking garage...” by the end of November 2013 schedule.
- Platforms
 - Completed Stairs S41 & S43/S44 on the G3 platform.
 - The focus of work on the G4 (lower) platform is moving to the installation of architectural finishes.
- Fan Plants
 - Continued with installation of fans in the East and West Fan Rooms.
- C6 Coordination
 - The schedule for temporary turnover of the 1st Mezzanine Signal Room 2189 for the C6 contractor to install some support steel remained November 4, 2013. After they complete their initial work they will turn back over to C3 contractor. Milestone #4A, Completion of all signal rooms (3) is scheduled for January 13, 2014.

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

- Milestone #1 was completed and turned over to the 72nd Street Station contractor. Contractor's current scheduled update (#36) shows Substantial Completion on January 2, 2014, four days before Station contractor need date.
- Final Concrete Liner – approximately 91.0% complete.
- Main Cavern – Rebar installation and permanent concrete placement of the arch near the 69th Street shaft is ongoing.
- G4/S2 Cavern – Rebar installation was completed and installation of the concrete forms was started. Concrete placement to begin on November 8, 2013.
- G3/S1 Cavern – Low bench installation was completed. High bench installation is ongoing.
- Horseshoe Tunnel – Low bench installation is ongoing.
- 72nd Street Shaft – Street level gas installation was completed. Steam pipe installation is in process.
- 69th Street Muck House – Restoration of the street will be completed after Substantial Completion due to seasonal restriction per General Terms and Conditions.

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

- Ancillary2/ Entrance 2 – Mobilization of the site, creating access for manpower & material; monitoring of geotechnical instrumentation, arrival of equipment.
- Entrance 3 – Mobilization of the site, installation of pressure relief drainage, waterproofing.
- Street/Utility Work – Visual inspection and cleaning of sewers on site (72nd and 2nd Ave); reorganization of water treatment plant layout; set up MEP for gas/water main installation adjacent to manhole 72-1; sawcut and excavate for installation of gas and water mains (72nd and 2nd Ave.); install gas main.

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

- Work continues with 2 shifts. All surface operations end at 10:00PM daily.
- Through October 25, 2013 the overall excavation was approximately 98% complete and forecast completion is December 2013. This remaining excavation is the work at Entrance #2.
- Permanent concrete placement was approximately 32.4% complete with completion forecast for August 2014.
 - **Main Cavern (North and South)**
 - In the north Cavern the trenching, laying of underslab pipe and placement of invert slab and waterproofing continues. Installation of rebar, waterproofing along the cavern walls is ongoing ahead of setting the forms and placing concrete wall lining.
 - **Schedule**

- Through October 31, 2013 the contractor's schedule update shows the overall project at -101 days. The delays generally are focused on Entrance #2 and the Pump Room work in the southeast tunnel.
- The contractor has submitted, for MTACC review, a proposal for acceleration at Entrance #2. The proposal recovers 16 weeks, using double shifts weekends at a cost of approximately \$5 million.
- Blasting at Entrance #2 will be complete the end of November 2013.
- **Ancillary #1/Ancillary #2**
 - Smooth shotcreting began at Ancillary #1 in preparation for turnover of the area to the C5C contractor.
 - Ancillary #2 continues to be a support/laydown area for the project.
- **Entrance #1**
 - Approximately 33% of waterproofing is complete at Entrance #1. Concrete column encasement and placing of concrete slabs is ongoing.
 - The contractor has begun removal of temporary mini-piles and 1st floor supports.
- **Entrance #2**
 - At Entrance #2 rock excavation continues with both mechanical excavation and blasting. The contractor made the first breakthrough to the cavern access at the escalator incline.
- **Option #1 (Lining the south, east tunnel and mining the Cross Passageways)**
 - In the Pump Room concrete placement of all invert sections is complete and erection of structural concrete walls is underway.
 - In the East Tunnel waterproofing continued and invert slab is complete. Concrete lining of the tunnel arch began and was 22% complete through October 25, 2013.

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

- The first Project Progress Meeting was held on October 29, 2013. These meetings will be held monthly through the end of 2013 and then switch to bi-weekly.
- During October 2013 the contractor focused on submittals and procurement. The Contract C5C project office will be at E. 94th St. and 2nd Ave.
- The Quality Kick-off Meeting will be held once the Quality Plan is approved and the Safety Kick-Off Meeting will be held on a date closer to the site access date for onsite work to begin.
- Limited access to the site remains April 2014 and full access to the site remains October 2014.

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

- Electrical: Electrical crew completed available work in three communication rooms at the 63rd Street Station. The electrical crew is currently working in warehouse preparing the EA Alarms at 96th Street and getting ready to install conduits and cables for negative work at 96th Street as well as fiber optic cables, communication cables and signal cables.
- Civil (Yard Work): Contractor completed the welding of the section of rail from north of the 86th Street Station to south end of the 96th Street Station. Welding of the rail from the northern part of the project (96th Street to 102nd Street) is expected to be completed early November 2013.
- Civil (63rd Street Area): Punch list work within the G) limit was completed for the G3/G4 track. In the extended limit area of the GO miscellaneous punch list work remains to be completed. This work is scheduled to be complete during the 63rd Street GO In-Service later in the project.
- Procurement
 - Antenna cable (manufactured and in storage at the vender's warehouse)
 - Signal cable (due by December 2013)
 - Communication cable (completed)
 - Power cable -2000MCM and 500MCM (delivered)
 - Fiber optic cable (delivered)
 - Wayside tray 63rd Street (delivered)
 - Stops and layouts (delivered)
 - Simplex (material for 63rd Street was delivered)
 - Running rail (delivered)
 - LVT Blocks (13,321 delivered)
 - 3rd Rail (in manufacturing and expected to be delivered in December 2013)
 - SWP's (final delivery scheduled for December 2013)
 - Meridian EA Alarm Boxes (delivered)
 - Balfour Circuit Breakers and Rectifiers (due by December 2013)
- Submittal Progress
 - Total projected submittals: 4,520
 - Total submitted to date: 2,604
 - Total projected to complete: 1,938
 - Pending MTA response: 426

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

Implementation of the Quality Management System as defined in the contract specification is ongoing. Quality control activities are being performed by the contractors per their Contractor's Quality Plans (CQPs). The MTACC's SAS Quality Managers and Project Quality Managers are

performing quality assurance activities. The PMOC attends Monthly Quality Management Meetings and Quarterly Quality Oversight on each SAS contract.

The major issues noted by the PMOC during October 2013 were the excessive number of nonconformance reports that are still open on the C4B and C5B contracts and delinquent submittal of Inspection Daily Reports on the C2B, C4B, and C5B contracts. On the entire SAS project, only one NCR was written in October 2013. There are 118 open NCRs on all SAS contracts combined and none were closed. The PMOC is extremely concerned that the contractors are not documenting nonconforming conditions and not making an effort to close those that can be. The PMOC is also concerned that the SAS Quality Managers on each contract are not paying close enough attention to nonconformances. The PMOC has discussed this situation with the SAS Quality Manager who committed to address the PMOC's concern.

The PMOC remains concerned that at some Monthly Quality Management Meetings, the contractor's Project/Construction Manager and/or a representative from the SAS Construction Management office did not attend the meeting. The SAS and contractor's quality managers interact on a daily basis and the purpose of the Monthly Quality Management Meetings are to raise quality issues that require project/construction management decisions. The PMOC has requested that the SAS Quality Manager have the SAS Executive Officer stress the importance of contractor project/construction management attending the Monthly Quality Management Meetings.

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

On the C4B contract, Waiver # CWR-016 was granted to increase the allowable concrete placement time to 120 minutes. However, there were many instances where the placement time exceeded 120 minutes resulting in nonconformance reports being issued. An analysis of concrete strength results was performed on the C4B project and a draft document entitled "Statistical Evaluation of CIP Concrete Strength Results", dated October 15, 2013, was issued. This document contains a statistical evaluation of concrete strength test results to demonstrate compliance with the Contractual acceptance criteria for all cast-in-place concrete placed under Contract C4B. Based on this analysis, the designer of record, AAJV, approved a waiver to increase the allowable time to 150 minutes. This waiver is now being reviewed by MTACC's Chief Engineer and after his approval, it will take effect. When this happens, 32 C4B nonconformance reports can be closed out. The other SAS contracts will then be directed to perform a similar analysis and request a waiver to increase the allowable time to 150 minutes.

Contract Packages C2A and C2B	
Status:	On C2A, through October 31, 2013, a total of 36 NCRs have been issued. 26 have been closed and 10 are still open. No new NCR's were written in October and since work has been completed, no more are expected to be written. No NCRs were closed in October. Only three of

	<p>the ten open NCRs are related to concrete placement.</p> <p>Daily Inspection Reports on the C2A contract are current and since work has been completed, no more Daily Reports will be written.</p> <p>On C2B, through October 31, 2013, a total of 14 NCRs have been issued. Five have been closed and nine are still open. No NCRs were written in October. No NCRs have been closed since July. Only one of the nine open NCRs is related to concrete placement.</p> <p>The C2B contract is still two weeks behind in submitting their Daily Inspection Reports.</p>
Observation:	<p>The PMOC has been expressing its concern that it was taking too long to submit their Daily Inspection Reports. The C2B contractor is still two weeks behind. The C2A Quality Manager is being assigned to the C2B contract to assist the C2B Quality Manager and it is expected that the backlog will be reduced to the contractual requirement of one week.</p>
Concerns and Recommendations:	<p>The PMOC is concerned that there are still ten open NCRs on C2A and that no NCRs have been closed on C2B since July. The PMOC recommends that effort be expended to close the open NCRs on both contracts. The PMOC will continue to monitor the time it takes to submit Daily Inspection Reports on the C2B contract.</p>
Contract Package C3	
Status:	<p>On the C3 contract, through October 31, 2013, a total of 55 NCRs have been issued. Forty (40) have been closed and 15 are still open. One new NCR was written in October. This was not for concrete placement. No NCRs were closed in October 2013. Submission of Daily Inspection Reports is current.</p>
Observation:	<p>Twelve (12) of the open 15 NCRs are for concrete placement, 7 of which exceeded the allowable time to place the concrete. Following analysis and approval of a waiver, these 7 can be closed.</p>
Concerns and Recommendations:	<p>The PMOC is concerned that only one NCR has been written since the beginning of September and that none have been closed since August.</p>

Contract Package C4B	
Status:	On the C4B contract, through October 31, 2013, a total of 98 NCRs have been issued. Forty two (42) have been closed and 56 are still open, 32 of which exceeded the allowable 120 minutes. No new NCRs were written in October and none were closed. Submission of Daily Inspection Reports is one month behind.
Observation:	A waiver increasing the allowable time to 150 minutes was approved by the designer of record, AAJV. When approved by MTACC's Chief Engineer, 32 NCRs can be closed.
Concerns and Recommendations:	The PMOC is concerned that 24 NCRs will still be open after the ones relating to placement time are closed since substantial completion is forecast for January 4, 2014. The PMOC is also concerned that Daily Inspection Reports are still one month behind.
Contract Package C5B	
Status:	On the C5B contract, through October 31, 2013, a total of 42 NCRs have been issued. Sixteen (16) have been closed and 26 are still open. No new NCRs were written in October 2013 and none were closed. Submission of Daily Inspection Reports is one month behind.
Observation:	Of the 26 open concrete NCRs, 21 are for concrete placement, 8 of which have two or more parameters out-of-spec. Only two (2) NCRs are for time placement alone so even if a waiver is approved, 19 NCRs will still be open.
Concerns and Recommendations:	The PMOC is concerned that there are 26 open NCRs and that none have been closed since the middle of August. The PMOC is also concerned that Daily Inspection Reports are one month behind.
Contract Package C6	
Status:	On the C6 contract, through October 31, 2013, a total of four (4) NCRs have been issued. Two have been closed and two are still open. No NCRs were written in October and none were closed.
Observation:	The C6 Contractor's Quality Manager is documenting NCRs as they occur.
Concerns and Recommendations:	The C6 Contractor's Quality Manager has taken the proper action and the PMOC has no concerns at this time.

2.0 SCHEDULE DATA

Integrated Project Schedule (IPS) Update #87 was received on November 5, 2013 and is based on a data date of October 1, 2013. This update contained a “.PDF” schedule report for all remaining work, the “.XER” schedule files for the IPS and individual contracts as well as a narrative report. The IPS forecast for the completion of all construction and NYCT Pre-Revenue Training & Testing activities is unchanged this period and remains September 20, 2016, with 73 working days (approximately 101 calendar days (CD)) of contingency when measured against MTACC’s target Revenue Service Date (RSD) of December 30, 2016.

Issues that affect or may affect the IPS that occurred during October 2013 include the following:

- MTACC is in the process of recasting the IPS in an effort to enhance its accuracy and reliability. Update #87 reflects a partial incorporation of these enhancements, which include summarizing the C6 construction schedule and incorporating the C4C and C5C construction schedules. There are defects and flaws contained within Update #87 that limit its usefulness. MTACC is aware of these flaws and has committed to correcting them in IPS Update #88 of the IPS.
- Additional enhancements to the IPS include “fragnets” describing and integrating the steps necessary to provide permanent station power to the 96th, 86th and 72nd Street Stations. There is some concern that the extensive design activity, subsequent approval process by ConEd and fabrication processes required for electrical equipment was not completely represented in the preliminary IPS construction schedules prepared by MTACC. In addition, some clarification as to when permanent power is required will also be documented in this effort.
- IPS Update #87 is constrained such that the calculated completion date cannot exceed the MTACC target RSD of December 30, 2016. In this condition, when the schedule calculations result in dates that exceed December 30, 2016, negative float values result. For the first time, the SAS IPS contains negative float values of as much as -70 WD. The PMOC is concerned that IPS Update #87 actually forecasts the completion of all work much later than indicated, with a significant reduction in schedule contingency.
- This period, the C6 construction schedule has been summarized and cut-in to the IPS. The contractor’s planned work sequence has been accurately replicated (in summary form), however to accomplish this goal, numerous new schedule constraints were introduced. These constraints have the effect of disrupting the normal calculation of schedule float. As such, while the forecast sequence of construction in the IPS should be reasonable accurate, the schedule float calculation may be seriously flawed. Schedule float is the core of “critical path” scheduling. Without an accurate float calculation, schedule priorities cannot be identified. The impact of these changes on active milestones is illustrated in Table 3.

Project Critical Path: As noted earlier, Update #87 of the IPS is an incomplete “work-in-progress”, wherein schedule float calculations may be misleading or otherwise not representative of the relative criticality of certain groups of activities due to the excessive use of constraint dates. In reviewing the impact of this situation on Update #87, the PMOC is concerned that the resulting “critical” and “near-critical” paths may be inaccurate and misleading.

Based on Update #87, the most “critical” or longest schedule path that controls the completion of SAS Phase 1 has changed this month and consists of the following elements:

- This path begins at the 72nd Street Main Cavern with activity C4B 72CN1605 and continuing until all concrete work in the South Cavern is completed, currently forecast for December 31, 2013.
- The “most critical” path (TF=36 WD) then shifts to 72nd St Station MEP / Finishes work (C4C) and includes structural, architectural and MEP construction for Ancillary #1 until the signal relay room is made available to the C6 Contractor in November 2014.
- At this time, the critical path (TF=0) includes signal system installation at the 72nd Street Station through January 21, 2016 at which time signal system testing commences, with a forecast completion date of July 28, 2016. The critical path transitions to the “Proof of Operations Tests”, then completion of “Dispatch Tower Tests at 96th Street Station”, “Traction Power Operational Test”, “Route Familiarization and Equipment Training”, tying to a Revenue Service Date (RSD) of September 20, 2016. Adding the current contingency of 73 WD results in a December 30, 2016 project completion date.

The schedule float “jumps” at each contractual handoff as a result of the one month (+/-) buffer that MTACC has inserted between each contract. Based on experience to date, this buffer is typically consumed by punchlist and contractual turnover activities and will not result in any float gains.

Secondary Paths: In the schedule narrative report accompanying IPS Update #87, MTACC identifies one major “near critical” path which consists of the following elements:

- This path begins with the C6 Contractor’s access to the existing tunnels north of the 96th Street Station (TF = 23 WD). This is the area where running rail and accessories has been delivered and is being welded into installation-ready lengths. Rail installation starts with activity C6TW-010 “Installation of Trackwork in Zone 1” on November 26, 2013. Completion of track installation allows the start of wayside signal equipment at two instances on this path. The first occurs at the forecast completion of track installation in Zone 7 at the 72nd Street area on February 4, 2015. The second occurs at the completion of track installation in Zone 10 at the 86th Street area, forecast for July 31, 2015.
- The installation of the wayside equipment at 86th Street is forecast to complete on August 9, 2016 (TF=30 WD). The wayside equipment at 72nd Street is forecast to complete on August 18, 2016 (TF=24 WD). The completion of the wayside equipment punchlist at both locations ties to the Substantial Completion of Contract 6 on August 18, 2016, followed by the NYCT “Proof of Operations Tests”, “Dispatch Tower Tests at 96th Street Station”, “Traction Power Operational Test”, “Route Familiarization and Equipment Training”, resulting in the Revenue Service Date (RSD) of September 20, 2016.

The PMOC notes that there are at least six (6) schedule constraints introduced by MTACC in the summarization of the C6 track installation activities which are reportedly necessary to replicate the sequence of installation within the C6 Contractor’s construction schedule. Consequently, float values on this path are essentially meaningless. IPS Update #87 may accurately replicate the contractors’ proposed construction sequence, but its use as a tool to identify the relative schedule importance of various activities or paths of activities is extremely limited. Until this reconfiguration of the IPS is complete and some degree of reasonableness in the calculation of

schedule float is established, the PMOC considers further evaluation of “near-critical” paths based on schedule float to be of little value in management of the project.

Milestone Summary: For contracts actively under construction, a tabulation of current schedule performance against contractual milestones is presented in Table 4. Based on these milestones, the PMOC notes the following:

- C2A, MS#1 was achieved on September 23, 2013.
- C2B, MS#1 was achieved on September 21, 2013.
- C3, MS #3b is on track to complete on or about its forecast completion date of November 5, 2013.
- C3, MS#5 is on track to complete on or about its forecast completion date of December 23, 2013.
- For C2A, C4B, C5B and C6; the IPS reflects the Contractor’s Milestone forecast dates.
- For C2B; the IPS does not reflect the Contractor’s Milestone forecast dates for MS Nos. 2 through 9. The IPS was updated to reflect MTACC’s position with respect to these milestones.
- For C3; the IPS does not reflect the Contractor’s Substantial Completion forecast date of October 1, 2014. The Contractor’s Schedule has been evaluated and MTACC is not in agreement with the schedule details which prolong the contract duration. MTACC has reported it is engaging the contractor in negotiations to resolve several schedule disputes on this project.
- For C4C and C5C; the IPS is based on and reflects the Access and Milestone dates per the Contract Documents.
- During this update period, both C4B and C5B contractors maintained schedule, with only minor variances in milestone forecast dates when compared to the previous reporting period.
- Section 3 of the MTACC schedule narrative indicates no change this reporting period for C6 Milestone #4A/4B. The IPS indicates this milestone has slipped from forecast completion of February 18, 2015 (Update #86) to a revised forecast of June 29, 2015 (Update #87). This discrepancy should be resolve in Update #88.
- Update forecasts for C2A milestones suggest that no progress was made during the current update period.

ELPEP/SMP Compliance: Based on the current status of the IPS, SAS Phase 1 cannot be considered compliant with the metrics, deliverables and intangible goals enumerated in the Enterprise Level Project Execution Plan (ELPEP), dated January 15, 2010 (Section IV. b, page 8) and as further described by the Schedule Management Plan (SMP). The PMOC recognizes this update to be a work in progress and adequate corrections should be implemented in Update #88 to restore compliance:

- Forecast Revenue Service Date
 - ELPEP Requirement: February 28, 2018
 - Current Forecast: December 30, 2016

- The RSD has been maintained this update although virtually all contingency has been consumed. Refer to comments regarding negative float.
- Minimum schedule contingency (measured against February 28, 2018 RSD)
 - ELPEP Requirement: 240 CD
 - Current Forecast: 424 CD
 - ELPEP float requirement against risk-adjusted completion date was maintained although significantly reduced. Refer to comments regarding negative float.
- Minimum Allowable Float; Real Estate Acquisition
 - ELPEP Requirement: 60 CD
 - Current Forecast: Indeterminate.
 - Due to concerns over the accuracy and reliability of schedule float calculations, the PMOC has no confidence in the float values indicated in the IPS.
- Minimum Allowable Secondary Float Path
 - ELPEP Requirement: 25 Calendar Days (approximately 18 WD).
 - Current Forecast: Indeterminate
 - There was a significant increase in secondary paths with float less than 25 CD. PMOC concern over the accuracy and reliability of float calculations is again noted.
- Secondary Schedule Mitigation (critical path compression)
 - ELPEP Requirement: 125 CD
 - Current Forecast: Schedule mitigation efforts are under review.
 - Evaluation of the C6 Contractor's schedule acceleration/mitigation proposal is ongoing.

Schedule Contingency: Via IPS Update #87, MTACC forecasts all Phase 1 construction and pre-revenue testing to be complete on September 20, 2016. This results in 102 CD (73 WD) of contingency when measured against the MTACC's target RSD of December 30, 2016 and a 526 CD contingency when measured against the FTA Risk-Informed RSD of February 28, 2018. As previously noted, the PMOC is concerned over certain scheduling techniques used in the reformulation of this update of the IPS and the accuracy of the information, including schedule contingency, contained therein.

Schedule Comments: There are several issues of concern involving the IPS:

- The MTACC's excessive use of schedule constraint dates in the reformulation of the IPS contradicts good scheduling practice and suggests an uncoordinated approach to the task. To be useful, the IPS must present a reasonable estimate of schedule float for the various project elements. Considerable additional effort will be required to correct these errors, recompile and reintegrate a summarized version of the C6 construction schedule into the IPS that is usable.
- Unresolved schedule disputes at the 63rd Street Station continue to compromise the information contained in the schedule and the coordination of work with other

contractors. Recognizing that the C3 Contractor has been less-than-cooperative in resolving these matters, MTACC needs to aggressively attempt to resolve these issues and develop a meaningful schedule going forward.

- Delayed incorporation of C4C and C5C construction schedules in the IPS. Notice-Of-Award was provided for these contracts on February 14, 2013 and June 12, 2013 respectively. To date, the IPS has not been updated with construction schedule information from either of these contracts.
- Development of detailed schedule information and logical relationships regarding the permanent station power system(s) is a potentially critical item. Detail within the IPS for this work needs to be enhanced so that ongoing developments can be completely evaluated and understood.

To some extent, the SAS Project Team has used the IPS in developing “work-around” solutions to several issues that could have resulted in a delay to the RSD. The PMOC is concerned that, due to the issues noted above, the current IPS is compromised to the point that it may be of limited or negligible value in making subsequent decisions of this nature.

3.0 COST DATA

Based upon financial expenditures reported by the MTACC through October 31, 2013, SAS Phase 1 is approximately 58.5 % complete. The completion status of the individual construction contracts through October 31, 2013, also based upon reported expenditures through that date, is as follows:

- C26002 (Tunnel Boring) – 100.0%
- C26005 (96th Street Station) – 98.8%
- C26010 (96th Street Station) – 26.0%
- C26013 (86th Street Station) – 100%
- C26008 (86th Street Station) – 69.1%
- C26006 (63rd Street Station) – 60.9%
- C26007 (72nd Street Station) – 94.4%
- C26011 (72nd Street Station) – 2.2%
- C26009 (Systems) – 14.2%

Aggregate Construction % Completion:

- 100% of all construction has been bid.
- 100% of all construction is under contract
- 59.8% of all construction is complete

Based upon cost data received from MTACC for the period through October 31, 2013:

- Value of construction in place this period = \$51,541,772
- Estimated value of construction remaining = \$1,012,530,621
- Target construction completion = September 20, 2016

- Number of months remaining = 34.7

The estimated average rate of construction required to achieve target completion date would be \$29,176,238 per month. The average progress (payments) achieved over the most recent six month period is \$47,827,745 per month. Based on a review of cost data for October 2013, it appears that adequate overall progress was made on the project to achieve the RSD of December 30, 2016.

Soft Cost expenditures (not including real estate, OCIP, etc.) reported this period by MTACC totaled \$12.5M. This value is significantly higher than average and includes over \$7M in design engineering costs. The PMOC is concerned that design costs exceeding the Revision 10 budget modifications will be incurred.

Estimate-At-Completion (EAC): The SAS Project Team has extended its risk-based contingency forecasting effort to the development of an EAC for all construction. The project EAC is a combination of the risk-based approach for construction cost and traditional estimating for soft costs. Table 6 contains a summary of the updated EAC, which is currently \$4,229,491,101. This update includes the updated construction EAC and all revisions included in Revision 10 of the Project Cost Estimate.

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

Cost Growth: The value of AWOs reported by MTACC/NYCT in October 2013 is summarized as follows:

	<u>Executed AWOs</u>	<u>AWO Exposure</u>
October 2013	\$112,382,536	\$150,314,749
September 2013	\$113,287,435	\$145,967,333
Change	\$(904,899)	\$4,347,416
Change	(.80)%	2.98%

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

Const. Pkg.	AWO Exposure \$			Changes this Period
	Oct.-13	Sept.-13	Period Δ	
C1	\$41,086,647	\$41,184,443	\$(97,796)	Adjusted final value as reported by MTACC.
C2A	\$50,492,565	\$50,347,699	\$144,866	Net increase is based on the revised exposure estimate for AWO # 151 and new exposure values for AWO # 159 and 163.

Const. Pkg.	AWO Exposure \$			Changes this Period
	Oct.-13	Sept.-13	Period Δ	
C2B	\$18,570,405	\$14,474,582	\$4,095,823	Net increase is based on decreases in exposure value for AWO # 18 and 33 as well as initial estimates for AWO # 15, 38, 44, 45, 46, 47, 48, 49 and 50,
C3	\$10,589,180	\$10,075,943	\$513,237	Net increase is based on estimate revisions to AWO # 42, 62, 64, 72, 74, 75, 76, 79, 82, 83, 88, 89, 91, 94 and initial estimates for AWO # 97 through 103.
C4B	\$2,632,804	\$2,665,231	\$(32,427)	Net decrease is based on revised estimates for AWO # 53, 77, 82 and 83 as well as the initial estimate for AWO # 84.
C4C	\$117,263	\$117,263	\$0	No change this period.
C5A	\$6,525,471	\$6,525,471	\$0	Final value as reported by MTACC.
C5B	\$9,569,649	\$9,917,605	\$(347,956)	Net decrease is based on a revised estimate for AWO # 55 and initial estimates for AWOs # 69, 73, 74, 75, 78 and 79.
C5C	\$0	\$0	\$0	No change this period.
C6	\$10,730,765	\$10,659,096	\$71,669	Net increase is based on revised estimates for AWOs # 2, 3 and 8 as well as new estimates for AWOs # 23, 25, 26, 27 and 28.
	\$150,314,749	\$145,967,333	\$4,347,416	

The changes in Executed AWO Value are summarized as follows:

Const. Pkg.	Executed AWO \$			Changes this Period
	Oct.-13	Sept.-13	Period Δ	
C1	\$41,086,647	\$41,184,443	\$(97,796)	Adjusted final value as reported by MTACC.
C2A	\$40,746,797	\$40,724,479	\$22,318	Increase is based on the execution of AWO # 160.
C2B	\$2,073,943	\$4,811,943	\$(2,738,000)	Decrease is based on resolution of AWO # 7 and 18,
C3	\$7,084,596	\$6,476,232	\$608,364	Increase is based on resolution of AWO # 34, 44, 47, 50, 58, 59, 63, 69 and 81.
C4B	\$5,013,513	\$4,413,862	\$599,651	Net increase is based on resolution of AWOs # 53, 72, 75, 77, 82, 83 and 84.
C4C	\$42,062	\$19,788	\$22,274	Increase is based on resolution of AWO # 4.

Const. Pkg.	Executed AWO \$			Changes this Period
	Oct.-13	Sept.-13	Period Δ	
C5A	\$6,525,471	\$6,525,471	\$0	Final value as reported by MTACC.
C5B	\$7,837,276	\$7,814,276	\$23,000	Increase is based on resolution of AWO # 75.
C5C	\$0	\$0		No change this period.
C6	\$1,972,234	\$1,316,941	\$655,290	Net increase is based on resolution of AWOs # 2, 3, 7, 25 and 27.
	\$112,382,536	\$113,287,435	\$(904,899)	

As of October 31, 2013, the status of Additional Work Orders (AWOs) 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)	98.78%	\$325,000,000	\$50,492,565	15.54%	\$40,746,797	12.54%
C26010 (2B)	25.95%	\$324,600,000	\$18,570,405	5.72%	\$2,073,943	0.64%
C26006 (3)	60.86%	\$176,450,000	\$10,589,180	6.00%	\$7,084,596	4.02%
C26007 (4B)	94.44%	\$447,180,260	\$2,632,804	0.59%	\$5,013,513	1.12%
C26011 (4C)	2.24%	\$258,353,000	\$117,263	0.05%	\$42,062	0.02%
C26013 (5A)	100.00%	\$34,070,039	\$6,525,471	19.15%	\$6,525,471	19.15%
C26008 (5B)	69.07%	\$301,860,000	\$9,569,649	3.17%	\$7,837,276	2.60%
C26012 (5C)	0.00%	\$208,376,000	\$0	0.00%	\$0	0.00%
C26009(6)	15.95%	\$261,900,000	\$10,730,765	4.10%	\$1,972,231	0.75%
TOTAL TO DATE		\$2,674,814,299	\$150,314,749	5.62%	\$112,382,536	4.20%

To date, approximately \$1,555,582,719 (58%) worth of all base contract construction work has been completed. As a % of work completed, the AWO exposure for these contracts = 9.66% and the executed AWO % = 7.22%. Based on performance to date, a forecast of total AWO expenditure of approximately \$200M appears reasonable. This compares favorably with the \$229M AWO contingency contained in the MTACC CWB. The PMOC continues to recommend that all AWOs be critically reviewed, evaluated and documented on a contemporaneous basis to determine if compensable responsibility exists for some of these expenditures.

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

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

Phase 1 Budget	\$	4,451,000,000
Construction Awards	\$	2,674,814,299
Soft Cost Expended	\$	973,140,484
Soft Cost Forecast to Complete	\$	334,967,601
AWO Exposure	\$	150,314,749
Available Contingency	\$	317,762,867
ELPEP Requirement	\$	151,944,444

As of September 31, 2013, MTACC estimated the available contingency to be \$353,870,874. The variance is based upon the PMO's use of the AWO Exposure versus MTACC's use of executed AWOs. Cost models calculated by both the PMOC and the SAS Project Team verify that the current contingency balance is greater than the Planned Balance and exceeds the ELPEP Required Balance.

4.0 RISK MANAGEMENT

The Monthly Risk Mitigation Meeting for October 2013 was conducted on October 31, 2013. Recent risk management activities included:

- Conducted Risk Mitigation Meeting No. 29 on September 27, 2013.
- Produced and published SAS Monthly Risk Report No. 19 (September 2013) on October 24, 2013.
- Completed updating of C6 risks associated with testing and commissioning activities.
- Significant risks reviewed and updated during this period include:

<u>Risk</u>	<u>Discussion Summary</u>
<p>Risk CNS 4 (C6) Problems related to managing the contractual interfaces during construction may result in delays and related claims.</p>	<p>The interface manager is working with CM and contractor staffs to clarify requirements and expectations associated with interim milestone turnovers of work spaces. Significant variations in expectations or contract requirements are being resolved as appropriate in advance of the milestone.</p> <p>Readiness for upcoming milestones as well as the overall interface management process is under continual review by</p>

<u>Risk</u>	<u>Discussion Summary</u>
	senior management.
<p>Risk COM 2 (C6)</p> <p>Continuous and potentially late changes to the communications systems could delay C6 and the RSD.</p>	<p>The strategy for managing this risk is unchanged. These mitigation strategies are being monitored continuously to verify effective implementation.</p> <p>The backlog of communications submittals requiring review has decreased, suggesting some degree of success in managing this risk.</p>
<p>Risk C3, C2B, C4C, C5C and C6 Schedules</p> <p>There is the risk that the Project schedule will be delayed beyond the present revenue service date.</p>	<p>The SAS project team is continuing to evaluate the C6 Contractor’s proposal for schedule acceleration. Partial or staggered implementation may be an option, and dependent on the progress of predecessor work activities.</p> <p>It is understood that any acceleration agreement must involve an equitable distribution of risk between contractor and MTACC. The ability to achieve the handoff milestones between finish contractor and the systems contractor are the key element in this effort.</p>
<p>Permanent (Station) Power</p>	<p>Mitigation strategy is summarized as follows:</p> <ul style="list-style-type: none"> • MTACC has obtained the services of an experienced ConEd liaison engineer who will assist in several areas including on-board reviews with suppliers before submittal to ConEd and expediting ConEd’s review process. • An expedited ConEd 60% review and release of the design to allow start of fabrication. • Expedite construction of supporting infrastructure to minimize potential delay. • Advance scheduling and coordination of feeder “cut-in” to minimize delays <p>All of these strategies are currently being implemented.</p>
<p>Risk CNS 8 (C6)</p> <p>Delayed Safety Certification delays RSD</p>	<p>Recent conversations with the NYS Public Transportation Safety Board have confirmed their role to be one of oversight and verification of the MTACC/NYCT certification process. Their role will not impact the RSD.</p>
<p>Buy America</p>	<p>There is no update with respect to the resolution of this issue. C6 start of track installation is currently November 26, 2013. It is currently unclear how much schedule float is available to this work.</p> <p>Risks associated with the resolution of the LVT Block “Buy America” issue may cause significant delay to the project.</p>

<u>Risk</u>	<u>Discussion Summary</u>
	<p>MTACC’s waiver request has been submitted. Risks identified include:</p> <ul style="list-style-type: none"> • Extended delay in evaluation and granting of the waiver • Rejection of the waiver request.

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

The PMOC has previously reported on the issue with turning over the Han Garage (Ancillary #1) back to the owner. The lessee of the garage continues to seek compensation from MTA over their claim that this contractor damaged the existing garage elevator. The Project Office advised the PMOC that the contractor’s consultant has inspected the elevator and prepared a report noting the age and wear and tear on the existing elevator. As of this report the Project Office has advised they have “turned over the keys” to the garage owner as of October 31, 2013. All MTACC payments for use of the garage are complete. The garage owner is still pursuing the damage claim against MTA.

5.0 ELPEP

There were no ELPEP meetings held during October 2013. With respect to SAS, the current status of each of the main ELPEP components is summarized as follows:

- **Technical Capacity and Capability (TCC):** There are revisions to the Change Control Committee (CCC) processes that are being considered that will affect the TTC Plan and that these potential changes are currently in the review/discussion stage. The PMOC has completed its review of SAS PMP Rev. 9 and is reviewing these comments with FTA-RII to finalize the comment details. FTA expects to send the final comments to MTACC in the near future.
- **Schedule Management Plan (SMP):** The MTACC internal audit may identify necessary revisions to the SMP. The SAS final audit report was not received during October 2013 as previously forecast. The SAS 3rd Quarter 2013 ELPEP Compliance Checklist indicates MTACC is “in compliance” with its SMP.

The PMOC notes that the SAS Integrated Project Schedule (IPS) is currently undergoing a major “reconstruction” to better incorporate construction schedules and to correct and improve upon shortcomings and inaccuracies that have been identified over recent updates. The SAS 3rd Quarter 2013 ELPEP Compliance Checklist does not address this effort. Update #87 is a “work-in-progress”. Full implementation of this effort is required before the SAS IPS can be considered fully ELPEP compliant.

- **Cost Management Plan (CMP):** The MTACC internal audit may identify necessary revisions to the CMP. The SAS final audit report was not received during October 2013 as previously forecast. The SAS 3rd Quarter 2013 ELPEP Compliance Checklist indicates MTACC is “in compliance” with its CMP. The PMOC concurs with this assessment.

- **Risk Mitigation Capacity Plan (RMCP) and Risk Management Plan (RMP):** The MTACC internal audit may identify necessary revisions to the RMP. The SAS final audit report was not received during October 2013 as previously forecast. The SAS 3rd Quarter 2013 ELPEP Compliance Checklist indicates MTACC is “in compliance” with its RMP. The PMOC concurs with this assessment.

The SAS Project Team has implemented the principles and requirements embodied in the ELPEP. The procedural changes instigated by the ELPEP have become an integral part of the management of the project and gives the FTA/PMOC greater insight into the risk, cost and schedule elements of the project.

6.0 SAFETY AND SECURITY

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

As of September 30, 2013, a total of 6,909,630 construction hours have been logged with 65 lost time and 188 recordable incidents documented. The total hours and incidents equates to a lost time rate (LTR) of 1.88 and a recordable rate (REC) of 5.44. Both rates continue a downward trend from previous months. The US Bureau of Labor Statistics (BLS) national rate (Heavy & Civil construction) for lost time and recordable incidents are 2.0 and 3.5 respectively.

7.0 ISSUES AND RECOMMENDATIONS

Schedule Reliability

In the opinion of the PMOC that significant deficiencies remain within the IPS which compromise its overall reliability and usefulness. The current IPS Update (#87) represents a partial implementation of the IPS reconfiguration discussed in Section 2.0 of this report. The partial implementation of the IPS reconfiguration has created an interim product with no more reliability than the schedule it replaces. With benefit of hindsight, the PMOC notes that a “shadow IPS” built-up using all the reconfigured construction schedules should have been fully completed and tested prior to release for general use. The methodology used to summarize the C6 schedule in Update #87 was flawed, it failed to conform to generally accepted scheduling practice and resulted in a product of questionable reliability and usefulness.

The PMOC recommends prompt resolution of the issue relative to the IPS noted in this report combined with thorough review and testing of the final product to verify the reasonableness of the results.

Schedule Recovery/Acceleration

The SAS Project Team’s efforts to develop schedule acceleration alternatives to either recover lost time or accelerate the project RSD appear to have become focused on the Contract 6 plan to double-shift its installation and testing activities. All or portions of this approach may be effective in accomplishing this goal; however the PMOC is concerned that:

- The SAS project team has effectively abandoned the search for other means to achieve the same goal.
- The acceleration proposal is not sufficiently flexible to be responsive to the different scenarios that may exist two years hence.
- The IPS and C6 Contractor's schedule may require additional review to thoroughly evaluate the C6 Contractor's proposal.

The PMOC recommends that the SAS Project Team continue efforts to identify and evaluate other means of schedule improvement and further evaluate the current acceleration proposal.

Quality Management

As previously reported, there are numerous open NCRs on the active construction contracts regarding the excessive time required to deliver concrete and exceedances of specified air entrainment percentage. The initial NCRs were not resolved in a timely manner, resulting in the placement of significant quantities of concrete that does not conform to project specifications.

In an attempt to resolve this issue after-the-fact, MTACC has directed the contractors affected by these NCRs to perform a statistical evaluation of the concrete test results as described in ACI 214 as a means of determining its suitability for service. Compressive strength of the concrete is the acceptance criteria evaluated in this analysis for both time-of-delivery and air entrainment variances. It is the opinion of the PMOC that this issue illustrates fundamental malfunction of the SAS Quality Management effort.

The initial NCRs were not resolved in a timely manner, essentially forcing a determination of "accept-as-is". Given that compressive strength is the acceptance criteria, it is unclear why any "statistical analysis" is needed. The acceptability of compressive strength is intuitively obvious through the lack of NCRs documenting variances with specified requirements.

The C4C contractor has reportedly been directed to perform this type of "statistical analysis" to demonstrate that its anticipated nonconformances should be considered acceptable. In other words, the nonconformance must first be realized and then dispositioned via a somewhat questionable analysis rather than actively resolving the matter before-the-fact.

The PMOC is concerned that the questionable procedures and logic employed in managing and reconciling this issue represent significant nonconformance with the approved QMS, a lack of NYC construction experience, and ineffectiveness in the approach to construction contract management. The PMOC recommends a complete review of quality management procedures, including a documented "lessons learned" analysis detailing how this matter should have been handled as well as the application of these "lessons learned" to the C4C and C5C construction contracts.

Construction Management

The PMOC is concerned that shortcomings in construction management capability are becoming a significant risk to successful completion of the project. Issues observed by the PMOC in the normal course of events include:

- Varying staff performance capabilities are normal and to be expected. However, the SAS CM organization does not appear to have the ability to coach, mentor, or otherwise compensate for individual weaknesses. CM performance appears to be solely dependent

on the specific abilities and strengths of individuals assigned to the respective construction contracts.

- Advance planning and expediting. The ability to identify, plan and expedite activities necessary to achieve a goal that is several months in the future is frequently lacking. This is a key element of managing intra-contract interfaces.
- Information and experience gained on one contract does not seem to be communicated or shared among all CM staff. This lack of synergy and coordination limits the opportunity to resolve known issues in advance and generally assist in expediting construction progress.
- Enforcement of contract schedule requirements do not appear to be a significant priority and typically requires senior management direction before any action is initiated.

The PMOC recommends a review of CM performance and procedures combined with a re-emphasis on the management processes and procedures where deficiencies in execution are found.

Permanent Power

Concerns over the time required to design, fabricate and install permanent station power facilities have been expressed for several months. To date, this issue has not been adequately modeled in sufficient detail to demonstrate the actual extent of any potential problem. The PMOC recommends the complete modeling of this issue be expedited to allow management to thoroughly understand the magnitude of any problem and determine if any mitigating actions are possible.

Low Vibration Track (LVT) Buy America Decision

On September 11, 2013, MTACC submitted its “Request for Non-Availability Waiver for Low Vibration Track System” to the FTA in accordance with 49 C.F.R. §661.7(c). As of the writing of this report, there has been no formal decision regarding this request.

IPS Update #87 indicates track installation is forecast to start on November 26, 2013; initial track installation activities have 11 WD of schedule float. The start date is consistent with previous IPS updates; however the float value has changed substantially with this update.

Irrespective of the “real” float value, this issue represents a significant cost and schedule risk to the successful completion of SAS Phase 1 and resolution needs to be expedited to the greatest extent possible.

APPENDIX A - ACRONYMS

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

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

APPENDIX B – TABLES

Table 1 - Summary of Schedule Dates

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

A = Actual

Table 2 - Schedule Contingency

IPS Update #	74	77	80	83	84	85
Data Date	9/1/2012	12/1/2012	3/1/2013	6/1/2013	7/1/2013	8/1/13
Contingency (CD)						
RSD= 12/31/2016	No	89	89	109	102	102
RSD= 2/28/2018	Report	513	513	533	526	526

Table 3 – Float Comparison, Active Milestones

Pkg	MS	Description	Dates		Variance	Sch.	Sch.
			Ud #86 (3)	Ud #87 (4)	Month = (3) - (4)	Float (Ud #86)	Float (Ud #87)
C2A	#2	96 th Tunnel Inv. 92-95, Anc. #1	09/10/13	10/28/13	-48	48	28
C2A	#2	96 th Tunnel Ent #1	10/02/13	10/28/13	-26	31	105
C2A	SS	Completion of all work, including Entrance #3.	10/02/13	10/28/13	-26	119	20
C2B	SS	Substantial Completion	3/10/16	3/10/16	0	85	85
C3	#3b	Conduits @ Mezzanine Level	10/11/13	11/05/13	-25	185	18
C3	#3c	Compl Mezz Comm. Rms/Sta. Serv. Ctr.	02/04/14	03/04/14	-28	109	148
C3	#4	Compl Lwr/Uppr Platforms & Signal Rms	01/09/14	01/13/14	-4	218	53
C3	#4b	Compl Lwr/Uppr Platforms & Signal Rms	04/02/14	05/01/14	-29	153	106
C3	#5	Compl All work Anc. #2 in Parking Garage	11/25/13	12/23/13	-28	314	288
C3	#6	Complete work @ Ancillary #1	09/20/13	10/07/13	-17	352	339
C3	SS	Substantial Completion	01/15/15	01/15/15	0	33	25
C4B	SS	Substantial Compl/All work South GL 17	01/02/14	01/02/14	0	24	54
C5B	#1	Compl All work South of Grid Line 15	03/27/14	03/28/14	-1	32	2
C5B	SS	Substantial Compl/All Work North GL 15 (w/0 Ent. #2)	08/29/14	08/29/14	0	28	-34
C5B	SS	Substantial Compl/All Work incl. Ent. #2	02/06/15	02/04/15	2	66	189
C6	#2A	Complete LAN - 96th St. Station	05/18/15	05/18/15	0	124	162
C6	#2B	Complete WAN - 96th St. Station	05/18/15	05/18/15	0	124	162
C6	#3A	Complete LAN - 86th St. Station	07/17/15	07/17/15	0	0	155
C6	#3B	Complete WAN - 86th St. Station	07/17/15	07/17/15	0	0	155
C6	#4A	Complete LAN - 72nd St. Station	02/18/15	06/29/15	-131	0	184
C6	#4B	Complete WAN - 72nd St. Station	02/18/15	06/29/15	-131	0	184
C6	#5A	Complete LAN - 63rd St. Station	09/05/14	09/05/14	0	64	54
C6	#5B	Complete WAN - 63rd St. Station	09/05/14	09/05/14	0	64	54
C6	#5C	Complete all 63rd St. Station work	09/05/14	09/05/14	0	64	54
C6	SS	Substantial Completion	08/18/16	08/18/16	0		0

Table 4 – Schedule Milestone Comparison

Pkg	MS	Description	Dates			Variance		Sch.
			Adjusted (2)	Ud #86 (3)	Ud #87 (4)	Contract = (2) - (4)	Month = (3) - (4)	Float (87)
C2A	#1	96 th Tunnel Exc, Inv. 97-99, Anc. #2	07/15/13	09/23/13	9/23/13A	70	0	-
C2A	#2	96 th Tunnel Inv. 92-95, Anc. #1	07/15/13	09/10/13	10/28/13	-105	-48	28
C2A	#2	96 th Tunnel Ent #1	07/15/13	10/02/13	10/28/13	-105	-26	105
C2A	SS	Completion of all work, including Entrance #3.	07/15/13	10/02/13	10/28/13	-105	-26	20
C2B	MS #1	Complete work 99th to 105th Streets; provide shared access at 102nd St access shaft	09/21/13	9/20/13	9/21/13A	0	1	-
C2B	MS #2	Complete work & provide shared site access @ 93rd Street shaft	03/22/14	3/21/14	3/21/14	1	0	363
C2B	MS #3	Complete work & provide limited access @ E&W Trackways thru Sta. (1238+50 and 1225+25), & 99th to 105th St Tunnel and 'Exclusive Access @ Rail Shaft	10/21/13	10/21/13	10/21/13	0	0	202
C2B	MS #4	Complete work & provide shared access in East & West track-ways thru Sta. (1238+50 ->1225+25); 97th -> 99th St Tunnel in 99th to 105th St Tunnels	09/21/14	10/2/14	10/2/14	-11	0	135
C2B	MS #5	Complete work & provide shared access @ East & West Tunnels South of 96th St Station (1225+25 and STA. 1209+00)	02/20/14	2/21/14	2/21/14	-1	0	92
C2B	MS #6	Complete work & provide full access to Comm. Rooms & Closets	08/21/14	8/21/14	8/21/14	0	0	248
C2B	MS #7	Complete work & provide full access to Signals Rooms	08/21/14	8/21/14	8/21/14	0	0	89
C2B	MS #8	Complete work & provide full access to Traction Power Rooms:	08/21/14	8/21/14	8/21/14	0	0	165
C2B	MS #9	Complete work & provide full access to Station Service Centers	11/21/14	11/21/14	11/21/14	0	0	208
C2B	MS #10	Complete all Comm., Signal, & Traction Power work in remaining areas not identified in Milestones 1 through 9	09/21/14	1/28/15	1/28/15	-129	0	31
C2B	SS	Substantial Completion	12/21/15	3/10/16	3/10/16	-80	0	85
C3	#3a	Compl Mezz Comm. Rms/Sta. Serv. Ctr.	04/15/13	7/22/13A	7/22/13A	-98		-

Pkg	MS	Description	Dates			Variance		Sch.
			Adjusted (2)	Ud #86 (3)	Ud #87 (4)	Contract = (2) - (4)	Month = (3) - (4)	Float (87)
C3	#3b	Conduits @ Mezzanine Level	04/15/13	10/11/13	11/05/13	-204	-25	18
C3	#3c	Compl Mezz Comm. Rms/Sta. Serv. Ctr.	04/15/13	02/04/14	03/04/14	-323	-28	148
C3	#4	Compl Lwr/Uppr Platforms & Signal Rms	10/14/13	01/09/14	01/13/14	-91	-4	53
C3	#4b	Compl Lwr/Uppr Platforms & Signal Rms	10/14/13	04/02/14	05/01/14	-199	-29	106
C3	#5	Compl All work Anc. #2 in Parking Garage	08/30/13	11/25/13	12/23/13	-115	-28	288
C3	#6	Complete work @ Ancillary #1	07/09/12	09/20/13	10/07/13	-455	-17	339
C3	SS	Substantial Completion	05/13/14	01/15/15	01/15/15	-247	0	25
C4B	SS	Substantial Compl/All work South GL 17	12/03/13	01/02/14	01/02/14	-30	0	54
C5B	#1	Compl All work South of Grid Line 15	03/04/14	03/27/14	03/28/14	-24	-1	2
C5B	SS	Substantial Compl/All Work North GL 15 (w/0 Ent. #2)	09/04/14	08/29/14	08/29/14	6	0	-34
C5B	SS	Substantial Compl/All Work incl. Ent. #2	-	02/06/15	02/04/15		2	189
C6	#2A	Complete LAN - 96th St. Station	05/18/15	05/18/15	05/18/15	0	0	162
C6	#2B	Complete WAN - 96th St. Station	05/18/15	05/18/15	05/18/15	0	0	162
C6	#3A	Complete LAN - 86th St. Station	07/18/15	07/17/15	07/17/15	1	0	155
C6	#3B	Complete WAN - 86th St. Station	07/18/15	07/17/15	07/17/15	1	0	155
C6	#4A	Complete LAN - 72nd St. Station	02/18/15	02/18/15	06/29/15	-131	-131	184
C6	#4B	Complete WAN - 72nd St. Station	02/18/15	02/18/15	06/29/15	-131	-131	184
C6	#5A	Complete LAN - 63rd St. Station	04/18/14	09/05/14	09/05/14	-140	0	54
C6	#5B	Complete WAN - 63rd St. Station	04/18/14	09/05/14	09/05/14	-140	0	54
C6	#5C	Complete all 63rd St. Station work	04/18/14	09/05/14	09/05/14	-140	0	54
C6	SS	Substantial Completion	08/18/16	08/18/16	08/18/16	0	0	0

Notes:

1. All schedule dates based upon October 1, 2013 update (IPS Update #87)
2. Contract packages 1 and 5A have completed all work and follow-on activities are proceeding w/o impact.
3. Contract packages 4C and 5C; no variances with contract milestones to date.
4. Dates followed by an "A" signify an actual completion on that date.

Table 5 - Project Budget/Cost 

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of October 31, 2013	
	\$ Millions	% of Total	Obligated (\$ Millions)	TBD	\$ Millions	% of Total	\$ Millions	% of Total
Grand Total Cost:	4,866.614	100	4,572.942		5,267.614	100	2,635.424	50.03
Financing Cost	816.614	16.78			816.614	15.50		
Total Project Cost:	4,050.000	83.22	4,572.942		4,451.00	84.50	2,635.424	50.03
Total Federal:	1,350.693	27.75	1,063.942		1,350.693	24.60	783.714	14.88
Total FTA share:	1,300.000	96.25	990.049		1,300.000	23.68	709.821	13.48
5309 New Starts share	1,300.000	100	990.049		1,300.000	23.68	709.821	13.48
Total FHWA share:	50.693	3.75	73.893		50.693	0.96	73.893	1.40
CMAQ	48.233	95.15	71.433		48.233	0.88	71.433	1.35
Special Highway Appropriation	2.460	4.85	2.460		2.460	0.04	2.460	0.05
Total Local share:	2,699.307	55.47	3,509.000**		**3,509.000	63.92	1,851.710	35.15
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 6 - Estimate at Completion

Category	Current Working Budget	EAC Forecast
Total Construction	\$2,728,172,492	\$2,905,450,429
Engineering Services Subtotal	\$576,541,264	\$625,000,000
Third Party Expenses	\$534,800,000	\$557,500,000
TA Expenses	\$125,160,085	\$130,775,000
Contingency	\$321,104,648	
Executive Reserve	\$160,000,000	
Subtotal	\$4,451,000,000	\$4,229,491,010

Table 7 - Allocation of Current Working Budget to Standard Cost Categories

Std. Cost Category (SCC)	Description	FFGA	MTA's Current Working Budget (June 30, 2013)
10	Guideway & Track Elements	\$612,404,000	\$638,107,000
20	Stations, Stops, Terminals, Intermodal	\$1,092,836,000	\$1,294,629,000
30	Support Facilities	0	\$0
40	Site Work & Special Conditions	\$276,229,000	\$534,865,000
50	Systems	\$322,707,000	\$265,792,000
60	ROW, Land, Existing Improvements	\$240,960,000	\$281,500,000*
70	Vehicles	\$152,999,000	0**
80	Professional Services	\$796,311,000	\$973,000,000
90	Unallocated Contingency	\$555,554,000	\$463,107,000
Subtotal		\$4,050,000,000	\$4,451,000,000
Financing Cost		\$816,614,000	\$816,614,000
Total Project		\$4,866,614,000	\$5,267,614,000

* Includes \$47M Cost-to-Cure.

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

Table 8 -- Core Accountability Items -- October 2013

Project Status:		Original at FFGA	Current*	ELPEP**
Cost	Cost Estimate	\$4,050M	\$4,451M	\$4,980M
Contingency	Unallocated Contingency	\$555.554M	\$317.7M	\$151M
	Total Contingency (Allocated plus Unallocated)	\$555.554M	\$317.7M (July 2013)	\$151M
Schedule	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
Total Project Percent Complete	Based on Expenditures	58.5%		
	Based on Earned Value	N/A		
Major Issue	Status	Comments		
Design Changes Requested by NYCT Operations	Open	A significant number of changes to the design continue to be "requested" by NYCT Operations long after the formal completion of the project design. These changes have primarily affected the Systems (C6) Contract, where the approved AWOs will substantially increase project cost. The schedule impact of the changes added to date has not been determined. To date, the SAS Project Team's ability to resist the incorporation of these requests appears limited. Total construction is approximately 55% complete and the schedule for achieving the RSD of December 30, 2016 is challenging. At some point, the MTA will have to enforce a "no		

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

* MTACC’s Current Working Budget

** Enterprise Level Project Execution Plan (ELPEP), reflecting median level of risk mitigation

Schedule data based upon IPS Update #87; Data Date = 10/01/2013

Financial data based upon MTACC reporting through 10/31/2013