

PMOC MONTHLY REPORT

Second Avenue Subway Phase 1 (MTACC-SAS) Project

Metropolitan Transportation Authority

New York, New York

Report Period April 1 to April 30, 2014



PMOC Contract No. D1FT60-09-D-00007

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

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

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THIRD PARTY DISCLAIMER

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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. D1FT60-09-D-00007. Its purpose is to provide information and data to assist the FTA as it continually monitors the grantee's technical capability and capacity to execute a project efficiently and effectively, and hence, whether the grantee continues to be ready to receive federal funds for further project development.

This report covers the project management activities on the M1ACC (Capital Construction) Second Avenue Subway (SAS) Mega-Project managed by M1ACC and M1A as the grantee and financed by the FTA FFGA.

MONITORING REPORT

1.0 PROJECT STATUS

During April 2014, M1ACC 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 64.8% complete. Progress continued on the eight (8) active construction contracts and featured the following accomplishments:

- C-26005 (C2A) "96th Street Site Work and Heavy Civil" Substantial Completion was achieved on November 5, 2013. Punch list and submittal of contract closeout documentation is ongoing.
- C-26010 (C2B) "96th Street Station Civil, Architectural, and MEP". Completion of Milestone #5, work in the east and west tunnels south of the 96th Street Station, is still being forecasted for June 25, 2014. Delays in completion of the milestone are due to late turnover of the area by the C2A contractor, additional work order (AWO) activity, and C2B contractor delays.

- C-26006 (C3) “63rd Street Station Rehabilitation”. The focus of the work effort continues to be Area 5, the progress at Entrance #1 and meeting the milestones for turnover of rooms to the C6 contractor.
- C-26007 (C4B) “72nd Street Station Cavern Mining and Lining” Substantial Completion was achieved on January 14, 2014. Punch list and submittal of contract closeout documentation is ongoing.
- C-26011 (C4C) “72nd Street Station Architectural and MEP Systems”. Construction of the Mezzanine level continued from north to south. At the Platform level precast wall panels continued and are nearing completion. Erection of masonry walls at the North Mezzanine continued.
- C-26008 (C5B) “86th Street Station Cavern Mining and Lining”. Milestone #1, limited access to the C5C contractor was completed on April 15, 2014. Placement of concrete lining for the north cavern walls nears completion. Placement of the arch lining in the Public Cavern is complete. Arch concrete lining placement in the north Ancillary Cavern began.
- C-26012 (C5C) “86th Street Station Architectural and MEP”. The contractor began mobilization on April 15, 2014. Focus of the initial work is in the south tunnels with invert topping and conduit/bench construction. Full access to the site is still forecast for October 2014.
- C-26009 (C6) “Track, Power, Signals and Communication Systems”. Coordination meetings with Station Contractors (C2B, C3, C4C and C5C) are ongoing with access dates being solidified. Equipment delivery is ongoing with the majority of the equipment delivered. The first track slab concrete placement was completed. The Buy America issue associated with the pad and rubber boot of the LVT tie block was resolved with FTA granting of a non-availability waiver. System Test Plan Volumes I, Volume II and Volume III have been approved.

a. Procurement

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

b. Construction

As of April 30, 2014, there are eight (8) active construction contracts on the SAS Phase 1 Project. Construction progress on the active contracts during this period includes:

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

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

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

- S1 Area

- Waterproofing of walls from gridline 5 to 7 (completed)
- Rebar installation from gridline 5 to 7 (completed)
- Ancillary 1
 - Sewer installation (completed)
 - Waterproofing of walls (completed)
 - Rebar installation for wall concrete placements (completed)
 - Concrete placement for walls (ongoing)
- S2 Area (Roof Pours)
 - Rebar installation from gridline 16.5 to 22.5 (ongoing)
- Entrance 1
 - Demolition knockout panel /clean-up (completed)
 - Waterproofing (ongoing)
- S3 Area
 - Roof concrete placement from North to South (ongoing)
 - Platform work
 - Rebar installation for gridline 30 to 34 (completed)
 - Installation of FRE for low bench from gridline 30 to 36 (completed)
- Ancillary 2
 - Demolition of diaphragm slab (completed)
 - Concrete placement for walls (ongoing)
- Entrance 3
 - Installation of mezzanine roof shoring (completed)
 - Installation of roof rebar (ongoing)

Contract G 26006 (C3) 63rd Street Station Rehabilitation

- Surveying of the Deformation Monitoring Points (DMPs) is ongoing and will continue throughout the project. One DMP was reset at Entrance #1.
- The focus of the work effort is Area 5 and the progress at Entrance #1.
- **Area 5 (Reconstruction consists of 6 mezzanines and the deck plaza roof)**
 - Continued installation of brackets in elevator shafts (4) and continued installation of the rails.
 - Continued installation of conduits and mechanical duct work throughout.
 - Continued installation of plumbing and sprinklers throughout.
 - Completing Concrete Masonry Unit (CMU) wall erection.
- **Entrance #1**
 - The contractor completed installation of temporary steel shoring
 - Began demolition of existing beams & columns and ground floor walls.
- **Ancillary #2**

- Above grade work is intermittent due to the varying weather conditions and it is not on the critical path
- **Platforms**
 - Continuing with light fixtures and service carrier at the G4 (lower) platform
 - Continuing with rubbing boards at the G4 platform
 - Continuing with carriers, duct work, conduits to light fixtures, and ceiling panel framing at the G3 (upper platform).
- **Fan Halls**
 - Continuing installation of fans dampers, and sound attenuators in the West Fan Room Continuing with chiller piping
 - Continuing with installation of Building Management System (BMS) in both East & West Fan Rooms.
- **C6 Coordination**
 - A walk through of Signal Room 2189 by all respective parties took place April 30, 2014 in preparation of turnover of the space to the C6 contractor.

Contract G26007 (C4B) 72nd Street Station Cavern Mining and Lining

- Substantial Completion was achieved on January 14, 2014
- Ongoing contract efforts
 - Submission of As-Built documentation and Quality Control Records
 - Closeout of punchlist items identified during inspection by Maintenance of Way inspection
 - Third Party acceptance by Con-Ed, ECS and DEP-Sewer (completed)

Contract G26011 (C4C) 72nd Street Station – Station Finishes, MEP, Ancillary Buildings & Entrances

- **Ancillary #2/ Entrance #2:**
 - The interior and exterior walls are approximately 85% complete in Ancillary #2
 - Mobilization at Entrance #2 began April 25, 2014.
- **Main Cavern**
 - At the North Mezzanine continued with concrete topping placement of north end wall and erection of CMU walls and door frames.
 - At the South Mezzanine special inspections continued for concrete placements.
 - At the Platform level precast panel installation is ongoing and nearing completion.
- **G3/ G4 Tunnels:**
 - Coordination of the dry fire standpipe in the G3 and G4 Tunnels is took place April 24, 2014. Conduits & wiring continue in the G3 Tunnel.
- **Ancillary #1:**
 - Waterproofing has resumed in the lower mezzanine level.
- **Entrance #1:**

- The work is temporarily suspended until the rock assessment results are finalized

- **Schedule**

- Milestone #5 was achieved April 14, 2014. The date for Milestone #3 & #6 is July 14, 2014.

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

- The contractor has added a 3rd shift to the work schedule. All surface operations end at 10:00PM daily.
- The C5B/ C5C Project Office is relocating to 327 E 94th St., between 1st & 2nd Aves.
- Through April 31, 2014 permanent concrete placement was approximately 79.9% complete with completion still forecast for August 2014. Entrance #2 permanent concrete remains forecast for completion in November 2014. Percentages do not include mud slabs.
- Milestone #1, limited access to the C5C contractor, was achieved April 15, 2014 and the contractor has completed mobilization.
- **Main Cavern (North and South)**
 - Placement of the overall Cavern arch concrete reached approximately 71% complete. Wall and invert concrete placement is 100% complete.
- **Ancillary #1/ Ancillary #2**
 - Concrete arch placement is complete in the South Ancillary Cavern.
 - North Ancillary Cavern arch formwork was assembled and arch concrete placement began.
 - Continued installation of waterproofing of the walls in Ancillary #2 and began for rebar and concrete placement of the inverts.
- **Entrance #1**
 - Completed concrete placement of the incline and arches. Placement of walls, stairs, and slabs is ongoing.
 - The masons mobilized for erection of the walls.
- **Entrance #2**
 - Continued waterproofing along the incline walls and intermediate mezzanine.
 - Overall concrete placement is approximately 32% complete.
 -
 - In the Pump Room the invert is complete and placement of the concrete arch is 100% complete.

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

- The C5B/ C5C Project Office is relocating to 327 E 94th St., between 1st & 2nd Aves.
- The work proceeds from south to north, starting in the tunnels.

- The CSB Milestone #1 (limited access to the site for this contractor) was achieved on April 15, 2014. This contractor reports that they have completed mobilization into the area.
- MTACC accepted the contractor's logic for the Baseline Schedule and the cost-loaded data was under review
- ConEd continues to review the drawings for temporary power and discussions with the contractor and the Project Office are ongoing
- The current work focus is in the West Tunnel and the set-up for placing the invert topping
- The waterproofer (Wsko) is beginning work at the Cross Passage ways.
- Key material deliveries include the large rebar and the formwork for the mezzanine.

Contract G26009 (C6) Track, Power, Signals and Communication Systems

- First track slab concrete placement between 98th and 104th Street (Zone 1) was completed. Concrete placement of all slabs in both S1 and S2 tracks are anticipated to be completed by May 29, 2014.
- Installation of power, signal, communication and fiber optic cables from 98th Street to 104th Street (Zone 1) (completed).
- Installation of power, signal, communication and fiber optic cables from 87th Street to 92nd Street (Zone 2) in the S2 tunnel (ongoing). Once the S2 tunnel is completed contractor will move to the S1 tunnel and have all cables installed by May 2014.
- Procurement
 - Antenna cable (delivered)
 - Signal cable (majority delivered)
 - Comm cable (delivered)
 - Power cable 2000 MCM and 500 MCM (delivered)
 - Fiber optic cable (delivered)
 - Wayside tray 63rd Street (delivered)
 - Stops and layouts (delivered)
 - Wayside Signal Equipment (released and is in various stages of manufacturing)
 - Running rail (delivered)
 - LVT Blocks (delivered)
 - 3rd Rail partial delivery has been made and the balance will be delivered in January 2014.
 - SWP's #1 and #2 (delivered)
 - SWP #3 (delivered)
 - Guard Rail (due May 2014)

- IAC Factory Acceptance Testing of CCTV testing remains on hold pending MTA changes (AWO).
 - Simplex (Fire alarm for 63rd Street delivered)
 - MKJ –Factor Acceptance Testing of PACIS cabinets on hold
 - Meridian EA Alarm Boxes (delivered)
 - Balfour Grcuit Breakers and Rectifiers (delivered)
 - Transdyne (Power SCADA) equipment (delivered)
- Submittal Progress
 - Total projected submittals: 5,240
 - Total submitted to date: 3,229
 - Total projected to complete: 2,011
 - Percent Completed: 62%
 - Pending MTA response: 458

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

During April 2014, the Second Avenue Subway Quality Management team continued holding Quality Meetings and Quarterly Quality Oversight of the Contractor with CCM, MTACC, and PMOC participation. They participated in the job progress meetings, monitored quality matters in the field for each construction contract, reviewed and provided comments for Quality Work Plans, and participated in Preparatory Phase Sessions for numerous construction processes.

Observation:

- **Major Issues**

The major issues noted by the PMOC during March 2014 were:

- The excessive time that it takes to enter Daily Inspection Reports into the Contractor Management System (CMS) on the C2B and C5C
 - The large number of nonconformance reports (NCRs) on the C2B contract that could be closed
 - The contractors' Quality Managers on both the C2B and C5B contracts left in March 2014. Although there was limited overlap between the present Quality Managers and their replacements, the new Quality Managers are doing an acceptable job
- **Quarterly Quality Oversight (QOQs)**

MTACC revised the checklist that SAS uses to do quarterly quality oversight of its contractors. The number of elements was increased from 15 to 19, the numerical rating was simplified, and at the suggestion of the PMOC, the generic checklist was updated to reflect unique contractor requirements. The existing checklist was still used for the

QOOs that were conducted in April. The new checklist will be used for the first time on the C4C contract when the QOO is conducted in early May.

- **Project Quality Manual**

Revision 3 of the SAS Project Quality Manual (PQM) was issued in April 2009. The SAS Quality Manager will prepare a draft of Revision 4 to reflect the new MTACC QOO checklist requirements and other changes that have occurred since Revision 3 was issued. The PMOC expects to receive a draft of Revision 4 to review in May or June 2014.

- **C3 Subcontractor Nonconformance Reports (NCRs)**

The C3 contractor has written eight NCRs against one subcontractor. Two have been closed. Of the six open NCRs, five have been open for three to eight months.

Contract Packages C2A and C2B	
Status:	<p>On C2A through April 30, 2014, a total of 36 NCRs have been issued. 31 have been closed by both the contractor and SAS, 2 NCRs were voided, and 3 NCRs are still open. In April 2014, no new NCRs were written and one was closed.</p> <p>On C2B through April 30, 2014, a total of 35 NCRs have been issued. Eight have been closed and 27 NCRs are still open. In April 2014, no new NCRs were written and none were closed.</p> <p>The C2B quality manager is 2 ½ weeks behind in entering Inspection Daily Reports into the CMS System. The C2A contract is current.</p>
Observation:	<p>On the C2A contract, of the three open NCRs, two are for concrete that was out of specification as reported by the contractor's test lab. The contractor has prepared the necessary paperwork for closure and is awaiting final approval by AAJV (the designer of record) and the CCM. The third NCR repair disposition has been approved and the repair is in progress.</p> <p>On the C2B contract, of the 27 open NCRs, 22 are for concrete that was out of specification. The C2B contractor's Quality Manager prepared a statistical concrete analysis for the 15 NCRs that were documented on January 16, 2014. AAJV approved the analysis on March 31, 2014 but the NCRs remain open. The five open non-concrete NCRs have been open between six months and one year.</p>
Concerns and Recommendations:	<p>The PMOC is concerned that the C2B contractor is not managing NCRs. The contractor took until January 16, 2014 to document out of specification concrete that occurred from September-December 2013 and has made no effort to close the five non-concrete NCRs that have been open between six and twelve months. The PMOC is concerned that entry of Inspection Daily Reports on the C2B contract is 2 ½ weeks behind. The contractor's C2A/C2B Manager had agreed to provide</p>

	additional support based on the PMOC's previous concern and recommendation but to date this has still not been effective.
Contract Package C3	
Status:	Through April 30, 2014, a total of 78 NCRs have been issued. 66 have been closed and 12 NCRs are still open. In April 2014, one new NCR was written and none were closed. Entering of Inspection Daily Reports is current.
Observation:	Of the 12 open NCR's, 6 were written by the contractor or one of their subcontractors.
Concerns and Recommendations:	The PMOC is concerned that five of the six open subcontractor NCRs have been open for 3 to 8 months. Based on the PMOC's concern, the SAS C3 Quality Manager and the Contractor's Quality Manager have generated a plan to investigate/close each NCR and it is expected that many of the NCRs will be closed in May 2014.
Contract Package C4B	
Status:	Through April 30, 2014, a total of 122 NCRs have been issued. 118 have been closed and 4 NCRs are still open. In April 2014, no new NCRs were written and none were closed. Entering of Inspection Daily Reports is current.
Observation:	The contractor has done an effective job of documenting NCRs as the nonconforming condition occurs and closing them in a timely manner.
Concerns and Recommendations:	None.
Contract Package C4C	
Status:	Through April 30, 2014, a total of 16 NCRs have been issued. One has been closed and 15 NCRs are still open. In April 2014, five new NCRs were written and none were closed. All of the NCRs written in April were for concrete placement. Entering of Inspection Daily Reports is current.
Observation:	All 15 of the open NCRs are for concrete that was out of specification. The contractor is waiting for additional NCRs to be written before being able to perform the concrete analysis. It is expected that the analysis will be prepared in June 2014.
Concerns and Recommendations:	None.
Contract Package C5B	

Stat us:	Through April 30, 2014 a total of 73 NCRs have been issued. 49 have been closed and 24 NCRs are still open. In April 2014, five new NCRs were written and four were closed. Entering of Inspection Daily Reports into the CMS System is current.
Observati on:	Of the 24 open NCRs, 14 are for concrete that was out of specification. The SAS C5B Contractor's Quality Manager prepared a second statistical analysis that was approved by AAJV. The concrete NCRs that are open will be closed in May 2014.
Concerns and Reco mmendati ons:	None.
Contract Package C5C	
Stat us:	Through April 30, 2014 no NCRs have been issued. Entering of Inspection Daily Reports is two weeks behind in entering the into the CMS System
Observati on:	None.
Concerns and Reco mmendati ons:	The PMOC is concerned that entry of Inspection Daily Reports on the C5C contract is two weeks behind.
Contract Package C6	
Stat us:	Through April 30, 2014 a total of six NCRs have been issued. Four have been closed and two NCRs are still open. In April 2014, no new NCRs were written and none were closed. None of the six total NCRs were for concrete placement. Entering of Inspection Daily Reports is current.
Observati on:	None.
Concerns and Reco mmendati ons:	None.

Concerns and Recommendations:

Refer to previous section.

2.0 SCHEDULE DATA

Integrated Project Schedule (IPS) Update #93 was received on May 21, 2014 and is based on a data date of March 1, 2014. 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 continues to forecast the completion of all construction and NYCT Pre-Revenue Training & Testing activities by September 21, 2016, with approximately 102 calendar days (CD) or 73 work days (WD) of contingency when measured against MTA's target Revenue Service Date (RSD) of December 30, 2016.

Project Critical Path:

The most “critical” or longest schedule path that controls the completion of SAS Phase 1 is initiated by Activity C6TW-012 “Zone 1 Track S1 @96th –Install Bulkhead, Exp. Jts., Drainage, CDTs, Pour Concrete 3rd Rail Pads, Strip & Clean” and continues through the installation of the Trackwork in Zone 2 through Zone 7, 8 and 10 which is forecast to complete on September 3, 2015. This path then shifts to the installation of the wayside equipment at 86th Street which starts with Activity #C6C2-435 “Wayside @86th –Install Riser Boxes” and completes with Activity #C6C2-455 “Wayside @86th – MFA inspect and provide punch list, perform punch list work” on July 28, 2016. The completion of the wayside equipment punch list at 86th Street then ties to Substantial Completion of Contract 6 which finishes on August 18, 2016 and then ties into the “Proof of Operations Tests”, then completion of “Dispatch Tower Tests at 96th St. Station”, “Traction Power Operational Test”, “Route Familiarization and Equipment Training”, tying to an Operational Revenue Service Date (ORD) of September 20, 2016.

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

1. IPS logic involving C2B Milestone #5 – “Shared access @E & W Tunnels South of 96th St. Station (1225+25 and STA 1209+00)” has been revised. Previous logic required this milestone be achieved by the C2B contract or prior to the start of any trackwork within the C2B limits. C2B Milestone #5 must now be completed prior to the start of Activity # C6TW060 “Zone 6 SWP132A3 @96th – Set ties, rail, frogs, surface & align and rebar”. C2B Milestone #5 is currently forecast to complete on July 30, 2014. This revision is reportedly part of MTACC’s schedule mitigation strategy that will overcome the impact of previous delays to the start of track installation.
2. Construction of the mezzanine slab, stairs, benches and other appurtenances which must be completed in order to achieve C2B Milestone #5 are very broadly defined in the IPS. As such, an independent forecast of the likelihood of achieving this milestone within the time frame using only the IPS is not possible.
3. The PMOC notes that C2B Milestone #5A and the associated logic changes in the IPS are not contained within the C2B schedule upon which this update of the IPS is based. These changes to the IPS apparently represent a part of MTACC’s proposed strategy to mitigate the delays incurred however, documentation that this strategy has been agreed upon by the contractor and constitutes a legitimate mitigation plan is generally lacking.
4. The C6 schedule which supports Update #93 of the IPS also does not support the sequence of activities shown on the IPS #93 critical path.

Secondary Paths: Major secondary float paths of significance to the overall status of the project. It is noteworthy that there are now two independent +3 WD float paths, demonstrating the increasing schedule criticality of rail systems installation and testing to the overall project schedule:

- +3(1) WD:** This path branches off of the critical path with the completion of Act. # C6TW070 – Zone 7 S2 @72nd – Set ties, surface & align, thread & clip rails, install riser boxes, CDTs and rebar” which is forecast to complete on March 4, 2015. This initiates the start of wayside equipment installation at 72nd Street which starts with Activity #C6C4-290 “Wayside @72nd –Install Riser Boxes, Conduits, Tray” and

completes with Activity #C6C4-299 “Wayside @72nd – Perform Punchlist Work” on July 28, 2016. The completion of the wayside equipment punchlist at 72nd Street then ties to Substantial Completion of Contract 6 which finishes on August 18, 2016 and then ties into the “Proof of Operations Tests”, then completion of “Dispatch Tower Tests at 96th S. Station”, “Traction Power Operational Test”, “Route Familiarization and Equipment Training”, tying to an Operational Revenue Service Date (ORD) of September 20th, 2016.

+3(2) WD: This path is initiated by C5C Milestone #9 which provides access for the C6 Contractor to all traction power rooms at the north end of the 86th Street Station on March 18, 2015. Installation of equipment and cable is forecast to continue through June 10, 2016, at which time field testing, facility in-service testing and in-service testing starts and continues through July 29, 2016.

The manufacture and testing of switchgear for the traction power substation @86th Street is reportedly underway and is on a parallel +8 WD float path suggesting it will be available ‘just-in-time’ for the forecast start of installation on March 30, 2015.

+14 WD: NYCT Pre-Revenue Operation Activities scheduled to start on August 18, 2014 is unchanged this period.

+36(1) WD: This path is initiated by C5B construction of the north cavern concrete arch, which is scheduled to be complete on September 15, 2014. Completion of this work leads to C5B demobilization and handoff of the north station and tunnels to the C5C Contractor, exclusive of Entrance #2, on September 24, 2014. The path then follows construction of Ancillary 2 by the C5C Contractor through July 1, 2015. Throughout the period between September 25, 2014 and July 1, 2015, the IPS indicates numerous turnovers from C5C to C6 in the Ancillary 2 area for follow-on signal, traction power and communications system installation access as well as completion of architectural and MEP work by C5C.

+36(2) WD: This path involves construction of the mezzanine structural and vertical transportation systems at the 72nd Street Station and is initiated by Activity C4C-STA-MEZZ-1000-2 “Station Mezz – Section 9 thru 16” which is forecast to complete on May 23, 2014. The path continues thru the remainder of the mezzanine construction followed by elevator and escalator installation, testing and commissioning of all station systems, which is forecast to complete on 7/29/16.

+53 WD: There is only one activity on this “path, Substantial Completion for C4C. This is significant because it has experienced significant delay over the last two update periods. This path is initiated by station mezzanine construction, which is currently under way, followed by escalator installation, testing, inspection and system commissioning. The PMOC’s review of this path has identified several potential logic flaws which should be reviewed by the M’ACC.

+62 WD: This path is initiated by Act # C2B PROC-167 Order/ Manufacture/ Fabricate/ FAT/ Deliver Automatic Transfer Switches in Ancillary 2. Successor activities do not appear to be consistent with installation of electrical equipment. There also

does not appear to be a logic tie to the completion of structural work on the roof and mezzanine area prior to the start of MEP work on this path.

Milestone Summary: For contracts actively under construction, a tabulation of current schedule performance against contractual milestones is presented in Table 3. For the update period ending April 1, 2014:

- Milestones discussed in this section are those established by contract with the respective contractors. There are numerous other “non-contractual” milestones within the IPS that will be discussed as appropriate.
- Milestones forecast for completion over the next 90 days include:

Pkg	MS	Description	Ud #92	Float	Ud #93	Float	Var.
C2B	MS #5	Shared access @E & W Tunnels South of 96 th St Stn (1225+25 and 1209+00)	6/24/14	8	7/7/14	2	-13
C2B	MS#5A	Shared Access E & W Track to grid 11		0	7/30/14		
C3	#3c	Mezz. Level Comm Rms/ Sta Serv Ctr	05/27/14	340	05/27/14	337	0
C3	#4	Lwr/ Upr Platforms & Signal Rms	04/18/14	227	04/17/14	226	1
C4C	MS #2	Limited access thru 72nd Street Station 1172+40 - >1163+00	06/13/14	47	06/13/14	84	0
C4C	MS #5	Limited access south of 72nd Street Station 1163+00 -> 149+50	04/14/14	90	04/14/14	127	0
C4C	MS #6	Shared access south of 72nd Street Station 1163+00 -> 149+50	06/13/14	47	06/13/14	84	0

Schedule progress reported by MTRACC for milestones scheduled to be completed over the next 90 days was good over the current reporting period.

- Milestone #5A was added to C2B this period to assist in tracking the accelerated completion of work that will enable C6 to start track installation in this area.
- The initial turnover of workspace from C5B to C5C (Milestone #1) is under way. C5C is commencing work in the south portion of the 86th Street Station.
- The PMOC notes several instances where schedule float has changed disproportionately between IPS Update #92 and 93. This generally indicates “downstream” schedule logic changes. No such changes were documented in the Update #93 narrative report. Examples include C2B MS#8 and MS#9; C4C MS #2, MS#3, MS#5, MS#6 and MS#7; and all C6 milestones except 3A, 3B and 5C.
- IPS Update #93 identifies July 30, 2016 as the Substantial Completion date for the C4C contract. This is an additional 4 CD delay to the previously reported Substantial Completion date and a 256 CD delay to the contract Substantial Completion date of November 13, 2015. The schedule path controlling this delay involves station mezzanine

construction, which is currently under way, followed by escalator installation, testing inspection and system commissioning. A review of the schedule logic along this path is recommended. Completion of this work currently has 53 WD of schedule float measured against the current forecast completion of all construction on September 20, 2016.

Schedule Contingency: Via IPS Update #93, MFAACC continues to forecast 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 MFAACC's target RSD of December 30, 2016 and a 526 CD contingency when measured against the FTA Risk-Informed RSD of February 28, 2018. As previously noted, the PMOC considers this to be an extremely optimistic assessment of the schedule status, representing 100% mitigation of several major issues which are acknowledged to have potential to significantly impact the project schedule.

The PMOC does not completely agree with the MFAACC's interpretation and modeling of the current situation in the IPS. The C6 construction schedule does not appear to support Update #93 of the IPS. The C6 activity path that most closely aligns with the IPS critical path (track -> wayside equipment -> testing) is a -40 WD (56 CD ±) path. Both paths include the C6 Substantial Completion Milestone, providing a convenient point of comparison between the two schedules.

It is the opinion of the PMOC that the RSD should be expressed as a range of dates representing a risk-mitigated forecast and a risk-realized forecast based upon currently recognized, major schedule risks. Applying this approach to the current situation, the IPS critical path should be extended by 40 WD (56 CD) to estimate the impact of currently recognized risks:

IPS #93	RSD	Construction Complete	Contingency (measured against)	
			Dec. 30, 2016	Feb. 28, 2018
Risk-Mitigated	Dec. 30, 2016	Sept. 21, 2016	102 CD	525 CD
Risk-Realized	Dec. 30, 2016	Nov. 16, 2016	44 CD	469 CD

Schedule Comments:

IPS Update #93 continues the MFAACC recent practice of pre-emptive mitigation of delay. In effect, MFAACC assumes a successful mitigation without documenting and demonstrating the impact of an issue on the schedule. The PMOC notes this methodology is generally supported in the SAS Schedule Management Plan (SMP).

In the current instance, MFAACC has assumed the successful mitigation of delays to the start of track work at the north end of the project by acceleration C2B platform and mezzanine construction in the area to be completed by July 30, 2014 (C2B Milestone #5 A) and the acceleration of track installation by C6 through weekend delivery of material at 86th Street, track installation using double shifts and additional equipment. It is noted that a portion of this delay appears to be based on the contractor's preferential method of track installation coupled with an apparent misunderstanding of the schedule interface milestones with C2B.

The PMOC notes that other sources of project information do not support achievement of this effort within the time period required. AWOs supporting the additional work required were added this period. Discussions with the respective contractors suggest that the complete and detailed scope of these AWOs have not been determined, suggesting a significant lag prior to the start of any work, either through contract amendment or directive to proceed. The PMOC notes

that there is a significant difference between a viable and tangible schedule recovery plan and a delay mitigation concept that has yet to be fully defined, vetted and agreed upon by all involved parties. MFACC's current conceptual plan to mitigate track installation delays may ultimately recover some of the time lost; however, at this time, it does not appear that this concept has advanced to where implementation is imminent. Consequently, the PMOC considers it unlikely that MFACC will fully mitigate this delay as described. In such instances, the SMP indicates that the IPS will reflect the delay until such time as a recovery plan is fully developed and accepted.

This period, MFACC updated and enhanced portions of the IPS involving the delivery of permanent power to the three new stations. While some additional work may be required to finalize this effort, the information provided establishes delivery dates and need dates for each station that can be tracked and managed through completion. A summary of these dates includes:

Activity ID	Activity	Date/ CD
72LTCS1010 MEP	72 nd Street Station: System Commissioning (Start)	3/28/2016
72LPP1000	72 nd Street Station: Permanent Power Available	10/22/2015
	Δ (Calendar Days)	158
86LTCS1010 MEP	86 th Street Station: System Commissioning (Start)	10/2/2015
86LPP1000	86 th Street Station: Permanent Power Available	9/23/2015
	Δ (Calendar Days)	9
96LTCS1010 MEP	96 th Street Station: System Commissioning (Start)	12/14/2015
96LPP1000	96 th Street Station: Permanent Power Available	12/8/2015
	Δ (Calendar Days)	6

At both the 86th Street and 96th Street Stations, the forecast supply of permanent power is marginally before the corresponding need date. This amplifies the need to confirm the accuracy and completeness of the schedule information used in this forecast and to routinely update the status to timely delivery of permanent power to these stations.

This period, completion milestones for the signal system at each station were added to the IPS. Completion of all of these milestones allows the start of system wide signal systems testing prior to the start of revenue service.

ELPEP/SMP Compliance: Based on the current status of the IPS, SAS Phase 1, it is the PMOC's opinion that MFACC is not in full compliance 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).

- Forecast Revenue Service Date (RSD) and minimum schedule contingency:
 - ELPEP Requirement: February 28, 2018 (RSD)
 - ELPEP Requirement: 240 CD (measured against February 28, 2018)

IPS #93	RSD	Construction	Contingency (measured against)
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		Complete	Dec. 30, 2016	Feb. 28, 2018
Risk- Mitigated	Dec. 30, 2016	Sept. 21, 2016	102 CD	525 CD
Risk- Realized	Dec. 30, 2016	Nov. 16, 2016	44 CD	469 CD

- The risk-informed RSD and ELPEP required contingency have been maintained through this update using an estimated RSD based on a fully risk-realized schedule.
- Minimum Allowable Float; Real Estate Acquisition
 - ELPEP Requirement: 60 CD
 - N/A
- Minimum Allowable Secondary Float Path
 - ELPEP Requirement: 25 Calendar Days (approximately 18 WD).
 - There are several significant secondary float paths with Total Float (TF) < 25 CD
- Secondary Schedule Mitigation (critical path compression)
 - ELPEP Requirement: 125 CD
 - MTACC states it has a mitigation plan to recover delays to the start of track installation at the north end of the project.
 - PMOC evaluation suggests MTACC's position is premature. MTACC's "concept" to recover lost time is not a fully developed plan that has been accepted by all involved parties and is ready to be implemented

3.0 COST DATA

Based upon financial expenditures reported by the MTACC through April 30, 2014, SAS Phase 1 is approximately 64.8% complete. The completion status of the individual construction contracts through April 30, 2013, also based upon reported expenditures through that date, is as follows:

- C26002 (Tunnel Boring) – 100.0%
- C26005 (96th Street Station) – 99.8%
- C26010 (96th Street Station) – 37.3%
- C26013 (86th Street Station) – 100%
- C26008 (86th Street Station) – 89.3%
- C26012 (86th Street Station) – 3.0%
- C26006 (63rd Street Station) – 73.6%
- C26007 (72nd Street Station) – 98%
- C26011 (72nd Street Station) – 10.1%
- C26009 (Systems) – 25.7%

Aggregate Construction % Completion

- 100 % of all construction has been bid
- 100 % of all construction is under contract
- 64.2 % of all construction is complete

Based upon cost data received from MFACC for the period through April 30, 2014:

- Value of construction in place this period = \$36,361,631
- Estimated value of construction remaining = \$813,708,550
- Target construction completion = September 20, 2016
- Number of months remaining = 29.7

The estimated average rate of construction required to achieve target completion date is \$27,363,650 per month. The average progress (payments) achieved over the most recent six month period is \$33,137,012 per month. Based on a review of cost data for February 2014, it appears that adequate overall progress was made on the project to achieve the RSD of December 30, 2016.

Soft Cost expenditures (not including real estate, OCI P, etc.) reported this period by MFACC totaled \$5.52 M. This expenditure is consistent with the CWB. At the current rate of expenditure, the current budget will be sufficient through January 2017.

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 5 contains a summary of the updated EAC, which is currently \$4,243,089,299. At this time, Engineering Services appears to be the category most likely to see further increases over the CWB.

Based on the information available, this updated EAC continues to validate the reasonableness of the MFACC's Current Working Budget of \$4.451 B. 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 MFACC/ NYCT in April 2014 is summarized as follows:

	<u>Executed AWOs</u>	<u>AWO Exposure</u>
April 2014	\$122,751,618	\$186,679,823
March 2014	\$119,404,490	\$180,922,889
Δ	\$3,347,128	\$5,756,934
Δ	2.80 %	3.18 %

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

Const. Pkg	AWO Exposure \$			Changes this Period
	April-14	March-14	Period Δ	
C1	\$41,086,647	\$41,086,647	\$0	Final value as reported by MFACC
C2 A	\$54,806,324	\$53,638,724	\$1,167,600	Net increase based on initial estimates for

Const. Pkg	AWO Exposure \$			Changes this Period
	April-14	March-14	Period Δ	
				AWO # 155, 176 and 179.
C2B	\$18,193,166	\$18,273,617	\$(80,451)	Net decrease based on revised estimates for AWO # 21, 53, 64, 67 and 75 as well as initial estimates for AWO # 22, 61 and 80.
C3	\$11,256,410	\$10,919,018	\$337,392	Net increase based on revised estimates for AWO # 54, 99, 106, 113, 116, 121, 122, 126 and 136 as well as initial estimates for AWO # 137 through 143.
C4B	\$2,787,973	\$2,731,398	\$56,575	Net increase based on revised estimate for AWO # 87 as well as initial estimates for AWO # 86 and 91.
C4C	\$18,555,062	\$16,593,881	\$1,961,181	Increase is based on the initial estimate for AWO # 29 and a revised estimate for AWO # 38.
C5A	\$6,525,471	\$6,525,471	\$0	Final value as reported by MTACC
C5B	\$20,688,381	\$18,400,580	\$2,287,801	Increase is based on initial estimates for AWO # 47, 72, 78 and 90.
C5C	\$0	\$0	\$0	No change this period
C6	\$12,780,389	\$12,753,553	\$26,836	Increase is based on a revised estimate for AWO # 17 and an initial estimate for AWO # 50.
	\$186,679,823	\$180,922,889	\$5,756,934	

The changes in Executed AWO Value are summarized as follows:

Const. Pkg	Executed AWO \$			Changes this Period
	April-14	March-14	Period Δ	
C1	\$41,086,647	\$41,086,647	\$0	Final value as reported by MTACC
C2A	\$41,420,350	\$41,323,750	\$96,600	Net increase based on execution of AWO # 69, 144 and 176.
C2B	\$7,508,502	\$5,579,338	\$1,929,164	Net increase is based on execution of AWO # 20, 22, 25, 64, 67, 75 and 80.
C3	\$8,165,907	\$7,431,407	\$734,500	Increase based on execution of AWO # 56, 74, 91, 99, 108, 121 and 128.
C4B	\$5,035,109	\$5,240,513	\$(205,404)	Decrease based on execution of AWO # 86, 87 and 89.

Const. Pkg	Executed AWO \$			Changes this Period
	April-14	March-14	Period Δ	
C4C	\$582,029	\$364,661	\$217,368	Increase is based on execution of AWO # 32, 33, 36 and 39
C5 A	\$6,525,471	\$6,525,471	\$0	Final value as reported by MFACC
C5 B	\$9,293,272	\$9,235,672	\$57,600	Net increase based on the resolution and execution of AWO # 72, 73, 74, 75, 78, 79, 80, 83 through 88 and 90.
C5 C	\$0	\$0	\$0	No change this period
C6	\$3,134,331	\$2,617,031	\$517,300	Increase is based on execution of AWO # 13, 40 and 50.
	\$122,751,618	\$119,404,490	\$3,347,128	

As of April 30, 2014, the status of Additional Work Orders (AWOs) for each construction contract on Phase 1 of the Second Avenue Subway Project is summarized as follows:

Contract / (Package)	% Complete	Award	Exposure		Executed	
			\$	% of Award	\$	% of Award
C26002 (1)	100.00 %	\$337,025,000	\$41,086,647	12.19 %	\$41,086,647	12.19 %
C26005 (2A)	99.84 %	\$325,000,000	\$54,806,324	16.86 %	\$41,420,350	12.74 %
C26010 (2B)	37.26 %	\$324,600,000	\$18,193,166	5.60 %	\$7,508,502	2.31 %
C26006 (3)	73.63 %	\$176,450,000	\$11,256,410	6.38 %	\$8,165,907	4.63 %
C26007 (4B)	98.00 %	\$447,180,260	\$2,787,973	0.62 %	\$5,035,109	1.13 %
C26011 (4C)	10.11 %	\$258,353,000	\$18,555,062	7.18 %	\$582,029	0.23 %
C26013 (5A)	100.00 %	\$34,070,039	\$6,525,471	19.15 %	\$6,525,471	19.15 %
C26008 (5B)	89.29 %	\$301,860,000	\$20,688,381	6.85 %	\$9,293,272	3.08 %
C26012 (5C)	0.00 %	\$208,376,000	\$0	0.00 %	\$0	0.00 %
C26009(6)	25.70 %	\$261,900,000	\$12,780,389	4.88 %	\$3,134,331	1.20 %
TOTAL TO DATE		\$2,674,814,299	\$186,679,823	6.98 %	\$122,751,618	4.59 %

To date, approximately \$1,748,054,118 (65.4%) worth of all base contract construction work has been completed. As a % of work completed, the AWO exposure for these contracts = 10.68 and the executed AWO % = 7.02%. 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 MFACC 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 MFACC Current Working Budget, expenditures to date reported by MFACC and the current AWO Exposure Estimate, the PMOC estimates the current available contingency as follows:

Phase 1 Budget	\$	4,451,000,000
Construction Awards	\$	2,674,814,299
Soft Cost Expended	\$	1,024,916,349
Soft Cost Forecast to Complete	\$	283,191,736
AWO Exposure	\$	186,679,823
Available Contingency	\$	281,397,793
ELPEP Requirement	\$	180,000,000

Cost models calculated by both the PMOC and the SAS Project Team verify that the current contingency balance is greater than the Planned Balance and exceeds the ELPEP Required Balance.

4.0 RISK MANAGEMENT

Risk Mitigation Meeting # 36 was held on April 23, 2014 at MFACC headquarters at 2 Broadway. The following table identifies and discusses the status of the most significant risks presently identified on the project.

Rsk Description
<p>Risk CNS 4 (C6): Delay resulting from management of contractual interfaces during construction</p>
<p>Mitigation Strategy:</p> <ol style="list-style-type: none"> 1. The previously detailed mitigation strategy has not resulted in effective management of contractual interfaces. 2. It has been determine that the overall strategy remains sound; however significant improvements in implementation are required. 3. The status of milestones that are one to three months in the future will be reviewed at monthly risk management problems where additional effort is required.
<p>Risk C3, C2B, C4C, C5C and C6 Schedules: Construction contract delays that will extend Project Completion beyond the current RSD</p>

Rsk Description

Mitigation Strategy:

1. The previously detailed strategy of achieving significant schedule improvement by accelerating systems installation placed "on hold" for the immediate future.
2. Ongoing schedule improvement will focus on "targets of opportunity" where specific action directed to critical measurable schedule improvement.

Permanent (Station) Power:

Permanent facility power to 72nd, 86th, and 96th Street Stations may be delayed and result in subsequent delays to

Mitigation Strategy:

1. Obtain services of an experienced ConEd liaison engineer to facilitate design and review process.
2. Expedite contractor design and ConEd review processes where possible.
3. Development of detail schedule "fragnet" to identify schedule problems and monitor progress.
4. Expedite construction of supporting infrastructure at each station to minimize potential delay.
5. Advance scheduling and coordination of feeder "cut-in" to minimize delays

Risk C4C Entrance 1 (301 E 69th Street):

Work on Entrance 1 will be delayed due to delays in obtaining design approval from Owner for utility relocation

Mitigation Strategy:

1. Develop an alternate design (relocation from inside building to sidewalk) to reduce impacts to building utilities
2. Prepare a Technical Memo and submit to FTA for approval.
3. Develop and negotiate access agreements with affected property owners
4. Excavate/concrete and underpin the common wall via C4C
5. Exercise C4C options for Entrance # 1 in order to engage contractor's engineering and to provide time to develop staging plan

Risk COM2 (C6):

Frequent late changes to the communications systems could delay C6 and the RSD

Mitigation Strategy:

1. Confirm that previously agreed Communications design changes have been incorporated into the design. Re-
2. Future User Department requested changes shall go through the CCG/CCB approval process. A User Department required on the change request forms. The request will include cost and schedule impacts of the requested changes
3. Requested changes exceeding \$50,000 or having any schedule impact, must be presented to the Board by a User Department with substantiation of need provided.

Risk CNS 8 (C6)

Delayed Safety Certification results in delay to the RSD

Mitigation Strategy:

1. Develop a detailed plan for executing the work required to achieve certification of SAS Phase 1.
2. Implement that plan.

<u>Rsk Description</u>
3. Concern continues to be expressed regarding the role of NYSPTSBI in this process, primarily due to the lack and responsibilities of all parties
4. Internal meeting(s) to prepare the outline of the committee meeting with NYS.
5. There is concern that delays in finding a new Safety and Certification Manager will adversely impact this project
6. Hold Safety Certification Meeting with NYS representative in attendance.

It was generally agreed that the primary risks with which the project team is currently confronted involve schedule performance and schedule delay. At this time very few of the specific issues driving known potential delay scenarios are reflected in the Risk Register or discussed at the risk mitigation meetings. At this time in the project, specific delay issues need to be included in the risk management process, at the appropriate level of detail, to ensure prompt and complete mitigation actions are implemented. Going forward, risk management meetings will focus on the status of the management of specific interface milestones one to three months in the immediate future.

The MFACC has used the risk management process to assist in identifying potential cost/schedule risks to the project and develop mitigation strategies in a timely and effective manner. At this stage in the project lifecycle, it is necessary to refine the risk management process to include specific issues that may threaten project objectives, rather than exclusively the focus on general, high-level risks.

5.0 ELPEP

There were no ELPEP meetings held during April 2014. The next quarterly ELPEP meeting is currently scheduled for June 9, 2014. With respect to SAS, the current status of each of the main ELPEP components is summarized as follows:

- **Technical Capacity and Capability (TCC):** FTA has requested MFACC to update the Technical Capacity and Capability Plan. Completion of the update is pending resolution of coordination issues between the existing Change Control Committee (CCC) and the two newly established high level committees (MFA Chairman level and IRR/ Antrak management level). The revised TCC Plan is expected to be completed by mid-June 2014.
- **Schedule Management Plan (SMP):** MFACC's 1st Quarter 2014 ELPEP Compliance Checklist indicates MFACC is "in compliance" with its SMP.
- **Cost Management Plan (CMP):** MFACC's 1st Quarter 2014 ELPEP Compliance Checklist indicates MFACC is "in compliance" with its CMP.
- **Risk Mitigation Capacity Plan (RMCP) and Risk Management Plan (RMP):** MFACC's 1st Quarter 2014 ELPEP Compliance Checklist indicates MFACC is "in compliance" with its RMP.

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

6.0 SAFETY AND SECURITY

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

As of March 2014, a total of 8,020,236 construction hours have been logged on the project with 74 lost time and 213 recordable incidents documented. The total hours and incidents equates to a Lost Time Rate (LTR) of 1.85 and a Recordable Rate (REC) of 5.31. Both rates show a slight reduction from the previous month of 1.87 (LTR) and 5.46 (REC). The US Bureau of Labor Statistics (BLS) national rate (Heavy & Civil construction) for Lost Time and Recordable incidents are 1.7 and 3.2 respectively.

7.0 ISSUES AND RECOMMENDATIONS

Schedule Reliability

The PMOC is concerned about the reliability and usefulness of the IPS in forecasting the project RSD and as a tool in identifying schedule risk and potential mitigation strategies. Specific issues leading to this concern previously discussed in this report include:

- Inaccurate replication of contractor modeling of critical and near-critical path activities and acknowledged schedule risks in the IPS.
- The current technical capacity and capability of the MTAACC staff to manage a complicated schedule updating process.

As an example, the critical path in IPS Update #93 is not supported by either the C2B or C6 construction schedules. Incorporation of incomplete schedule modification "concepts" by MTAACC does not support the accurate depiction of the current status of the project schedule.

Permanent Power

The PMOC has previously documented SAS project team concerns regarding the time required to design, fabricate and install permanent station power facilities. IPS Update #93 contained significant enhancements pertaining to permanent power, and forecasts that permanent power will be available (albeit "just-in-time") to support facility system testing and commissioning. This issue remains "critical" to timely completion of the project and should be monitored closely over the next several update periods as a means of validating the schedule model and its forecasts.

APPENDIX A - ACRONYMS

AA	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
NA	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
SM	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	P MOC
Begin Construction	January 1, 2007	03/20/2007 A	03/20/2007 A
Construction Complete	December 31, 2013	September 21, 2016	October 2017
Revenue Service	June 30, 2014	December 30, 2016	February 2018

A = Actual

Table 2 - Schedule Contingency

IPS Update #	88	89	90	91	92	93
Data Date	11/1/13	12/1/13	01/1/14	02/1/14	03/1/14	4/1/14
	Contingency (CD)					
RSD=12/31/2016						
Risk Mitigated	102	102	102	102		
Risk Realized			20	-20		
RSD=02/28/2018						
Risk Mitigated	537	537	526	526		
Risk Realized			446	105		

Table 3 - Schedule Milestone Comparison

Pkg	MS	Description	Dates			Variance		Sch Float
			Adjusted (2)	Ud #92 (3)	Ud #93 (4)	Contract = (2) - (4)	Month = (3) - (4)	
C2B	MS #2	Shared site access @93rd Street shaft	03/22/14	10/15/14	11/4/14	-227	-20	563
C2B	MS #4	Shared access in East & West track- ways thru Sta (1238+50 - >1225+25); 97th -> 99th St Tunnel in 99th to 105th St Tunnels	09/21/14	1/20/15	2/10/15	-142	-21	81
C2B	MS #5	Shared access @East & West Tunnels South of 96th St Station (1225+25 and STA 1209+00)	02/20/14	6/24/14	7/7/14	-137	-13	8
C2B	MS#5A	Shared Access E & WTrack to grid 11			7/30/14			0
C2B	MS #6	Full access to Comms Rooms & Closets	08/21/14	1/2/15	12/31/14	-132	2	111
C2B	MS #7	Full access to Signals Rooms	08/21/14	1/2/15	12/31/14	-132	2	62
C2B	MS #8	Full access to Traction Power Rooms:	08/21/14	1/2/15	12/31/14	-132	2	111
C2B	MS #9	Full access to Station Service Centers	11/21/14	7/24/15	7/23/15	-244	1	209
C2B	MS #10	Complete all remaining Comms, Signal, & Traction Power work	09/21/14	4/28/15	5/28/15	-249	-30	416
C2B	SS	Substantial Completion	12/21/15	7/8/16	7/6/16	-198	2	127
C3	#3c	Compl Mezz Lvl's Comm Rms/ Sta Serv Ctr	04/15/13	05/27/14	05/27/14	-407	0	340
C3	#4	Compl Lwr/ Upr Platforms & Signal Rms	10/14/13	04/18/14	04/17/14	-185	1	227
C3	#4b	Compl Lwr/ Upr Platforms & Signal Rms	10/14/13	10/05/14	11/10/14	-392	-36	368
C3	SS	Substantial Completion	05/13/14	08/10/15	08/05/15	-449	5	64
C4C	MS #2	Limited access thru 72nd Street Station 1172+40 ->1163+00	01/13/14	06/13/14	06/13/14	-151	0	47
C4C	MS #3	Shared access thru 72nd Street Station 1172+40 ->1163+00	11/27/14	11/26/14	11/26/14	1	0	40
C4C	MS #5	Limited access south of 72nd Street Station 1163+00 -> 149+50	4/14/14	04/14/14	04/14/14	0	0	90
C4C	MS #6	Shared access south of 72nd Street Station 1163+00 -> 149+50	6/13/14	06/13/14	06/13/14	0	0	47
C4C	MS #7	Turnover of Communications Rooms to Systems Contractor	8/28/14	09/18/14	11/07/14	-71	-50	271

Pkg	MS	Description	Dates			Variance		Sch Float
			Adjusted (2)	Ud #92 (3)	Ud #93 (4)	Contract = (2) - (4)	Month = (3) - (4)	
C4C	MS #8	Turnover of Signal Rooms South of station to C6	7/15/14	07/11/14	07/11/14	4	0	353
C4C	MS #9	Complete all Signal Rooms except MS	9/29/14	09/30/14	10/06/14	-7	-6	40
C4C	MS #10	Complete north power rooms	2/25/15	10/31/14	10/29/14	119	2	188
C4C	MS #11	Complete south power rooms	03/24/15	11/26/14	11/26/14	118	0	169
C4C	MS #12	Full access @Station Service Center(s)	08/28/14	08/28/14	08/27/14	1	1	320
C4C	MS #13	Full access @Lubrication Room(s)	08/28/14	08/28/14	08/29/14	-1	-1	318
C4C	MS #14	Complete all remaining Comm Signal & Traction Power Rooms	08/28/14	08/28/14	08/29/14	-1	-1	318
C5B	#1	Compl All work South of Grid Line 15	03/04/14	04/15/14	04/15/14	-42	0	42
C5B	SS	Substantial Compl/ All Work w/o Ent. #2	09/04/14	10/08/14	09/24/14		14	36
C5B	SS	Substantial Compl/ All Work incl. Ent. #2	-	12/16/14	12/16/14		0	225
C5C	MS #1	Vehicle access thru 86th Street Station 1209+00 -> 1198+00	10/23/14	10/27/14		41935		
C5C	MS #2	Limited Access; Sta. 1209+00->1198+00	01/22/15	01/30/15		42026		
C5C	MS #3	Shared Access; Sta. 1209+00->1198+00	05/22/15	05/29/15		42146		
C5C	MS #4	Shared Access; Sta. 1198+00->1172+00	10/23/14	10/28/14		41935		
C5C	MS #5	Turnover of Comm Rooms	09/23/14	09/25/14		41905		
C5C	MS #6	Turnover of Comm Rooms	03/24/15	03/31/15		42087		
C5C	MS #7	Turnover of Signal Rooms	02/25/15	02/24/15		42060		
C5C	MS #8	Turnover of Signal Rooms	02/25/15	02/23/15		42060		
C5C	MS #9	Turnover Traction Power Rooms	02/26/15	02/27/15		42061		
C5C	MS #10	Turnover Traction Power Rooms	02/25/15	02/12/15		42060		
C5C	MS #11	Full access @Station Service Center(s)	03/24/15	03/25/15		42087		
C5C	MS #14a	Complete all remaining Comm Signal & Traction Power Rooms	09/23/14	09/25/14		41905		
C5C	MS#14b	Limited Access all locations	09/23/14	02/20/15		41905		
C6	#1	Completion of Signal Block Design	08/18/12			-23		
C6	#2A	Complete LAN - 96th St. Station	05/18/15	05/18/15	08/28/15	-102	-102	129
C6	#2B	Complete WAN - 96th St. Station	05/18/15	05/18/15	08/28/15	-102	-102	129

Pkg	MS	Description	Dates			Variance		Sch Float
			Adjusted (2)	Ud #92 (3)	Ud #93 (4)	Contract = (2) - (4)	Month = (3) - (4)	
C6	#3 A	Complete LAN - 86th St. Station	07/18/15	07/17/15	07/17/15	1	0	148
C6	#3 B	Complete WAN - 86th St. Station	07/18/15	07/17/15	07/17/15	1	0	148
C6	#4 A	Complete LAN - 72nd St. Station	02/18/15	02/18/15	04/10/15	-51	-51	286
C6	#4 B	Complete WAN - 72nd St. Station	02/18/15	02/18/15	04/10/15	-51	-51	286
C6	#5 A	Complete LAN - 63rd St. Station	04/18/14	04/17/15	03/26/15	-342	22	361
C6	#5 B	Complete WAN - 63rd St. Station	04/18/14	04/17/15	03/26/15	-342	22	361
C6	#5 C	Complete all 63rd St. Station work	04/18/14	05/04/15	05/04/15	-381	0	361
C6	SS	Substantial Completion	08/18/16	08/18/16	07/28/16	21	21	0

Notes:

1. All schedule dates based upon March 1, 2014 update (IPS Update #92)
2. Contract packages 1, 2A, 4B, 5A have completed all work
3. Milestones not shown have been completed

Table 4 - Project Budget/ Cost 

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of April 30, 2014	
	\$ Millions	% of Total	Obligated (\$ Millions)		TBD	\$ Millions	% of Total	\$ Millions
Grand Total Cost:	4,866.614	100	4,572.942		5,267.614	100	2,886.022	54.78
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	2,886.022	54.78
Total Federal:	1,350.693	27.75	1,063.942		1,350.693	24.60	855.799	16.24
Total FTA share:	1,300.000	96.25	990.049		1,300.000	23.68	781.906	14.84
5309 New Starts share	1,300.000	100	990.049		1,300.000	23.68	781.906	14.84
Total FHWA share:	50.693	3.75	73.893		50.693	0.96	73.893	1.40
CMAQ	48.233	95.15	71.433		48.233	0.88	71.433	1.35
Special Highway Appropriation	2.460	4.85	2.460		2.460	0.04	2.460	0.05
Total Local share:	2,699.307	55.47	3,509.000**		**3,509.000	63.92	2,030.223	38.54
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 MTA'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	\$2,904,814,299
Engineering Services Subtotal	\$622,862,000	\$650,000,000
Third Party Expenses	\$554,086,273	\$557,500,000
TA Expenses	\$131,160,085	\$130,775,000
Contingency	\$308,077,343	
Executive Reserve	\$160,000,000	
Subtotal	\$4,451,000,000	\$4,243,089,299

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

Std Cost Category (SCC)	Description	FFGA	MFA's Current Working Budget (December 31, 2013)
10	Guideway & Track Elements	\$612,404,000	\$642,478,000
20	Stations, Stops, Terminals, Intermodal	\$1,092,836,000	\$1,277,642,000
30	Support Facilities	0	\$0
40	Site Work & Special Conditions	\$276,229,000	\$524,561,000
50	Systems	\$322,707,000	\$250,134,000
60	ROW Land, Existing Improvements	\$240,960,000	\$281,500,000*
70	Vehicles	\$152,999,000	0**
80	Professional Services	\$796,311,000	\$1,026,608,085
90	Unallocated Contingency	\$555,554,000	\$448,076,915
Subtotal		\$4,050,000,000	\$4,451,000,000
Financing Cost		\$816,614,000	\$816,614,000
Total Project		\$4,866,614,000	\$5,267,614,000

Table 8 -- Core Accountability Items – April 2014

Project Status:		Original at FFGA	Current*	ELPEP**
Cost	Cost Estimate	\$4,050 M	\$4,451 M	\$4,980 M
Contingency	Unallocated Contingency	\$555.554 M	\$281 M	\$180 M
	Total Contingency (Allocated plus Unallocated)	\$555.554 M	\$281 M (Apr. 2014)	\$180 M
Schedule	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
Total Project Percent Complete	Based on Expenditures	64.8 %		
	Based on Earned Value	N A		
Major Issue	Status	Comments		
Design Changes Requested by NYCT Operations	Open	<p>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</p>		

		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 MFA’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	

* MFA’s Current Working Budget

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

Schedule data based upon IPS Update #91; Data Date = 4/01/2014

Financial data based upon MFA’s reporting through 4/28/2014