

## 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, 2013*



PMOC Contract No. D1FT60-09-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**

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

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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, 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 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 2013, 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). Contract close-out is ongoing for construction contracts C-26002 (C1) "TBM Tunneling Boring" and C-26013 (C5A) "86<sup>th</sup> Street Excavation, Utility Relocation and Road Decking" and is anticipated to be completed during the 2<sup>nd</sup> Quarter 2013. The overall project is approximately 51.7% complete. Progress continued on the seven (7) active construction contracts and featured the following accomplishments:*

- *C-26005 (C2A) "96<sup>th</sup> Street Site Work and Heavy Civil" Overall contract is approximately 93.0% complete. Installation of invert slab continues in the main station area, south of 95<sup>th</sup> Street and north of 97<sup>th</sup> Street. Mass excavation and related work continues at all entrances and ancillaries.*
- *C-26010 (C2B) "96<sup>th</sup> Street Station Civil, Architectural, and MEP" Overall contract is approximately 82% complete. Demolition work in the existing tunnel completed and the installation of high and low benches started.*

- C-26006 (C3) “63<sup>rd</sup> Street Station Rehabilitation” Overall contract is approximately 45.7% complete. Area 5 structural steel is substantially complete and the focus has switched to completing mezzanine concrete slab work. Work at Entrance #1 and Ancillary #1 is ongoing. Work at the fan rooms and track areas continue.
- C-26007 (C4B) “72<sup>nd</sup> Street Station Cavern Mining and Lining” Overall contract is approximately 77.3% complete. Structural concrete installation is ongoing in the main cavern, crossovers, ancillaries and entrances.
- C-26011 (C4C) “72<sup>nd</sup> Street Station Architectural and MEP Systems” Mobilization and pre-construction activities are under way.
- C-26008 (C5B) “86<sup>th</sup> Street Station Cavern Mining and Lining” Overall contract is approximately 50.1% complete. Excavation via both mechanical means and blasting continues at all locations on the project. Total rock excavation is approximately 82.8% complete. This is the primary work activity in progress for this contract. Option #1 work began in the south tunnels.
- C-26009 (C6) “Track, Power, Signals and Communication Systems” Overall contract is approximately 7.6% complete. Field Surveys for Signals, Track, and Traction Power continues in the existing 63<sup>rd</sup> St., 72<sup>nd</sup> St., and 96<sup>th</sup> St., Station areas. Preparation of Key Submittals continues.

**a. Procurement**

Bids were received for construction package C-26012: 86<sup>th</sup> Street Station Finishes & MEP Package (C5C) – on April 10, 2013. Bids received by MTACC are summarized as follows:

- |   |                                     |
|---|-------------------------------------|
| 1. 86 <sup>th</sup> Street Constructors, JV | \$208,376,000 (APPARENT LOW BIDDER) |
| 2. Skanska – Rail works, JV                 | \$258,780,000                       |
| 3. EE Cruz – Tully Construction             | \$259,561,000                       |
| 4. CCA Civil-Haza Construction              | \$265,000,000                       |
| 5. Judlau Construction                      | \$268,000,000                       |

The apparent low bid compares favorably to the MTACC Engineer’s Estimate of \$256,112,000. MTACC has established a target date of June 5, 2013 for the award of this contract package.

C5C is the final construction package to be procured under the Second Avenue Subway – Phase 1 Project.

**b. Construction**

As of April 30, 2013, there are seven (7) active construction contracts on the SAS Phase 1 Project. Contracts C1 and C5A are still in the close out process. Construction progress on the active contracts during this period includes:

- **Contract C-26005 (C2A) 96<sup>th</sup> Street Site Work and Heavy Civil**
  - **Launch Box**
    - Concrete invert slab placement continued in the launch box: 16 of 37 completed (43.2%)

- *PVC waterproofing ongoing*
- **Mass Excavation ongoing**
  - *Total mass excavation completed: 124,662 out of 131,223 BCY (95.0%)*
    - *Main Station: 95,361 out of 95,361 BCY (100.0% complete)*
    - *Ancillary #1: 10,149 out of 13,520 BCY (75.0% complete)*
    - *Ancillary #2: 10,935 out of 11,633 BCY (94.0% complete)*
    - *Entrance #1: 883 out of 2,208 BCY (40.0% complete)*
    - *Entrance #2: 1,481 out of 2,961 BCY (50.0% complete)*
    - *Entrance #3: 5,540 out of 5,540 BCY (100.0% complete)*
- **Ancillary #1 ongoing work**
  - *Excavation, installation of wale brackets, bracing and diaphragm slab*
  - *Pressure grout of secant piles toes*
  - *Cut and remove steel core beams*
- **Ancillary #2 ongoing work**
  - *Excavation, form/rebar and place plenum exterior walls*
  - *Instll plumbing and pour inverts*
- **Entrance #1 ongoing work**
  - *De mo/sawcut existing slurry wall to EL 94*
  - *Instll bracing at Tier 2 at EL 96*
  - *Excavate to Tier 3*
- **Entrance #2 ongoing work**
  - *Finish installation of wale brackets at EL 96*
  - *Remove concrete blocks and demo debris*
  - *Instll bracing at Tier 2 at EL 96*
  - *Excavate to Tier 3*
- **Entrance #3 ongoing work**
  - *Clean area*
  - *Form/rebar/pour cast in place walls on north and south side*
- **Contract G26010 (C2B) 96th Street Station Civil, Architectural, and MEP**
  - **Tracking of Long Lead Items**
    - *CTJV provide long lead item list and M/ACC/CCM replied with comments*
  - **Existing Tunnel (99<sup>th</sup> –105<sup>th</sup> Streets)**
    - *Asbestos abatement completed*
    - *Demolition of existing benches completed*
    - *Concrete placement for high and low benches started*

- *Structural steel repairs ongoing*
- **Launch Box**
  - *Six inverts completed*
- **Contract G26006 (C3) 63rd Street Station Rehabilitation**
  - *Work proceeds with 2 shifts.*
  - *Surveying of the Deformation Monitoring Points (DMPs) is ongoing and will continue throughout the project.*
  - **Schedule**
    - *Previously the PMOC reported on the schedule slippage for Milestone #3 from the April 2014 original date to the contractor's forecast of approximately November 2013. During April 2013 the Project Office has reported to the PMOC that the Communication Rooms will be complete by July 15, 2013, allowing access to the C6 contractor while other Milestone #3 components are being completed*
    - *Another schedule delay being mitigated by MTACC and the contractor is the completion date for Entrance #1. The contractor has previously forecast a completion date of September 2015 for this work. MTACC has been working with the contractor to move this date back to November 2014, and has reported to the PMOC that this date will likely be agreed to for January 2014.*
  - **Structural Steel (Area 5)**
    - *The structural steel in Area 5 is substantially complete.*
  - **Area 5 (Reconstruction consists of 6 mezzanines and the deck plaza roof)**
    - *Continued with concrete floor slab placements at the 4<sup>th</sup> & 6<sup>th</sup> Mezzanines.*
    - *Completed door frame installation for Communication Rooms.*
    - *Continued with intumescent painting of 1<sup>st</sup> & 2<sup>nd</sup> Mezzanine steel.*
    - *Continued with CMU walls on 1<sup>st</sup> Mezzanine.*
  - **Entrance #1**
    - *Continued excavation of exterior piers and began excavation of interior piers.*
    - *Began placement of concrete for exterior piers, once per week*
  - **Ancillary #1**
    - *At Ancillary #1 the focus of work is in the basement plenum for mwork erection for air and piping transfer to/from the station from the cooling tower.*
    - *Continued to review the mitigation measures required and obtain permits to clean, sanitize, and remove the gas tanks (2) and oil/water separator discovered in the basement during plenum excavation*
  - **Platforms**
    - *Continued acoustical spray on G4 in Areas 2 & 5.*

- *Water leaks along the Upper ( G3) Flat form continue to prevent continuation of irumescant painting*
- *Continued with installation of water mist on G3 & G4.*
- *Began installation of wall acoustical board on G3.*
- **Fan Hants**
  - *Continued installation of cold water return piping in West Fan Room*
  - *Completed concrete topping in West Fan Room Communications Room*
  - *Continued installation of conduit for power to equipment in the East Fan Room*
  - *Continued with installation dampers & silencers in East Fan Room*
- **Contract G 26007 ( C4B) 72nd Street Station Cavern Mining and Lining**
  - **Rock Excavation**
    - *Rock excavation completed (1,041 cy from Entrance #1 will be removed as part of Contract G 26011( C4C))*
  - **Concrete Phase**
    - *Main Cavern*
      - *58 wall panels complete; 11 remaining*
    - *South Crossover*
      - *Wall panel installation to begin during May 2013*
    - *North Crossover*
      - *Remaining work benches currently planned for June 2013*
    - *63rd Street Stub Cavern*
      - *All concrete work completed*
    - *G4 TBM Tunnel*
      - *Wall/arch pours completed*
      - *Bench work in progress*
    - *G3S1 Cavern*
      - *North and South end wall rebar work is in progress*
    - *G4S2 Cavern*
      - *Cavern invert pours completed*
    - *Ancillary #1*
      - *Mud mat installation nearing completion and inverts in drifts #7 and 8 are under way, with completion planned by mid- May 2013*
    - *Ancillary #2 and Entrance #2*

- *Mud mat installation nearing completion and inverts in drifts #1 thru #4 are in process. Completion planned by early May 2013*
- *Entrance #3*
  - *Mud mat installation nearing completion and invert drift #5 is in process with completion planned by mid-May 2013*
- **Contract G26011 (C4C) 72nd Street Station – Station Finishes, MEP, Ancillary Buildings & Entrances**
  - *The Original location of the 72<sup>nd</sup> Street Station Entrance #1 was identified to be within the ground level and basement of the existing 301 East 69<sup>th</sup> Street building. A design could not be achieved that would accommodate the residents' concerns while satisfying MTA's requirements with respect to constructing, operating and maintaining an entrance at this location. A Design Modification locating Entrance #1 within a widened sidewalk alongside 301 East 69<sup>th</sup> Street, (south-east corner of Second Avenue & 69<sup>th</sup> Street) rather than inside the building was proposed. All parties agree with the design modification and MTA agreed to move forward with the proposed modification as outlined in Technical Memorandum #11.*
- **Contract G26008 (C5B) 86th Street Station Cavern Mining and Lining**
  - *Work was reduced to 2 shifts. All surface operations end at 10:00PM daily.*
  - **Schedule**
    - *During April 2013, the contractor submitted updated durations for work at the south cavern and MTAACC is reviewing. The north end of the cavern is proceeding with a 13 day delay because the intermediate bench has not been reached. Entrance #1 is approximately 3 weeks behind due to the mud slab not having been placed yet. The MTAACC scheduler believes much of this delay can be made up and that mitigation is available to start the concrete work on time. Entrance #2 has an approximate 6 week delay.*
  - **North Shaft Area/South Open Cut Area**
    - *Continuing with excavation and lowering the "bench" in the Public Cavern.*
    - *The Alimak in the North Shaft was removed and excavation resumed at the bottom bench.*
    - *Muck removal and shotcreting is ongoing. At the South Open Cut excavation has reached the bottom bench, exposing the full access to the south tunnels.*
  - **Ancillary #1/ Ancillary #2**
    - *Rock excavation at the Ancillary #1 portion of the South Open Cut continued to the intermediate bench.*
    - *Continued rock excavation and muck removal at the cavern access to Ancillary #2.*
  - **Entrance #1**



➤ *Completed demolition of the street level slab. Continued rock removal and began preparations for waterproofing in the access tunnel.*

○ **Entrance #2**

➤ *NYDOB approved for the contractor to excavate the 60' to 70' test pits under the western end of the Yorkshire street shed. This work is under way. The MPT on the east side of E 86<sup>th</sup> St. has been expanded to allow more cut & cavern excavation once it begins.*

○ **Option #1 (Lining the south, east tunnel)**

➤ *During April 2013 the contractor began blasting for the tunnel cross passage.*

○ **Rock Excavation Summary (as of the week ending April 26, 2013)**

*\*As reported to the PMOC by the M/ACC C-26008 Project Office*

➤ *Total rock (estimated) for complete project – 154,623 BCY*

➤ *Total rock excavated to date – 128,062 BCY (82.8%)*

➤ *Summary by Area:*

- *North Cavern – 55,686 BCY (total); 45,852 BCY (to date); 82.3%*
- *South Cavern – 54,302 BCY (total); 51,295 BCY (to date); 94.5%*
- *Ancillary #1 – 11,725 BCY (total); 10,904 BCY (to date); 93%*
- *Ancillary #2 – 4,830 BCY (total cut & cover); 4,830 BCY (to date); 100%*
- *Ancillary #2 – 7,480 BCY (total from cavern); 6,143 BCY to date; 82.1%*
- *Entrance #1 – 1,990 BCY (total from cut & cover); 1,990 BCY to date; 100%*
- *Entrance #1 – 1,800 BCY (total from cavern); 1,800 to date; 100%*
- *Entrance #2 – 14,237 BCY (total from cut & cover); 2,675 BCY to date; 18.8%*
- *Entrance #2 – 2,573 BCY (from cavern); 2,573 BCY; 100%*

➤ *The tracking of total rock excavation (actual) from April 6, 2012 through April 26, 2013 vs. planned excavation shows the cumulative rock excavation production to date is progressing below the baseline schedule by approximately 12,000 BCY. This reduction in progress from previous reports can be attributed to the delays in rock excavation production at the cut & cover for Entrance #2.*

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

○ *Field Surveys for Signals, Track and Traction Power continue in the existing 63<sup>rd</sup> St., 72<sup>nd</sup> St. and 96<sup>th</sup> St. Station areas*

○ *Coordination and Systems Integration Meeting with Station Contractors is ongoing*

○ *Ongoing installation of conduit in substation and tray brackets at 63<sup>rd</sup> St. Station*

- *Installation and removal of insulation joints on tracks G3 and G4 at the 63<sup>rd</sup> St. Station has started*
- *Delivery of rail and rail fasteners for LVT completed*
- *Submittal Progress:*
  - *Communication (1280 total): 582 submitted, 402 approved*
  - *Track (126 total): 108 submitted, 61 approved*
  - *Traction Power (123 total): 100 submitted, 78 approved*
  - *Signals (333 total): 263 submitted, 202 approved*
  - *Ongoing submission of various Safe Work Plans and Quality Work Plans for field activities continues*

**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 (CQP). 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 the first quarter of 2013 were delinquent submittals of Inspection Daily Reports on the C2A and C2B contracts and out of specification conditions for concrete on the C3 and C4B contracts. Inspection Daily Reports are now being submitted in a timely manner. The SAS Deputy Project Executive directed that each week one NCR be generated for all instances where air entrainment, slump, and/or time to place concrete were out of specification during that week. As a result, 5 NCRs on the C3 contract and 7 NCRs on the C5B contract pertaining to concrete were generated in April. Details are provided in the following matrix:

<b>Contract Package C1</b>	
<b>Status:</b>	<p>There were 40 NCRs written on the C1 contract. 16 of the involved concrete installation involving the following structural elements:</p> <ul style="list-style-type: none"> <li>• Invert Slab – seven NCRs</li> <li>• Slurry wall – five NCRs</li> <li>• Concrete Tunnel Liner Arch – four NCRs</li> </ul>
<b>Observation:</b>	<p>Of the 40 NCRs written on the C1 contract, two related to the slurry wall are still open. A survey was performed by the C2B contractor in March 2013 and the results were forwarded to AAJV for review and action. The two NCRs are expected to be closed in May 2013.</p> <p>The status of the 16 involving concrete installation is as follows:</p> <ul style="list-style-type: none"> <li>• Invert Slab – None of the seven NCRs are still open</li> <li>• Slurry wall – Two of the five NCRs are still open</li> <li>• Concrete Tunnel Liner Arch – None of the four NCRs are still open</li> </ul>

<b>Concerns and Recommendations:</b>	Contract C1 has been Substantially Complete since March 2012. The Contractor has demobilized and has a limited presence on site. The SAS Project Team continues to emphasize the closure of the remaining NCRs and has reduced the number of open NCRs to two. The PMOC recommends that the SAS Project Team continue their efforts to close these remaining two NCRs.
<b>Contract Packages C2A and C2B</b>	
<b>Status:</b>	<p>On C2A through April 30, 2013, a total of 23 NCRs have been issued. 11 have been closed by both the contractor and MIACC. 12 NCRs are still open. About seven NCRs that have been open for more than five months were expected to be resolved in April but are now planned to be closed in May. Before these old NCRs could be closed, the contractor had to wait until mass excavation was complete or nearly completed in order to see the slurry wall panels. The contractor's Quality Manager reported that several more NCRs will be closed in May.</p> <p>On C2B through April 30, 2013, a total of 5 NCRs have been issued. One has been closed and 4 NCRs are still open.</p> <p>The contractor was behind in submitting their Daily Inspection Reports on both contracts. Based on a concern raised by the PMOC, the SAS Quality Manager stressed that the C2A/C2B contractor must submit Inspection Daily Reports within a week of being written.</p>
<b>Observation:</b>	The contractor has eliminated the backlog of Inspection Daily Reports.
<b>Concerns and Recommendations:</b>	<p>Although there are many open NCRs on C2A, the PMOC believes that the SAS C2A Quality Manager and the C2A Contractor Quality Manager are managing this issue effectively.</p> <p>The PMOC recommends the contractor continue to provide additional support as needed so that the Inspection Daily Report issue does not recur.</p>
<b>Contract Package C3</b>	
<b>Status:</b>	Through April 30, 2013 a total of 37 NCRs have been issued. 8 of these were issued in April 2013. 35 have been closed by both the contractor and MIACC, including 6 of the 8 that were issued in April. The remaining 2 were closed by the contractor and are awaiting closure by MIACC.
<b>Observation:</b>	5 of the 8 NCRs that were generated in April 2013 involved concrete parameters that were out of specification – two involved entrained air entrainment, two pertained to slump, and one referred to time exceeding

	<p>the two-hour requirement for placing the concrete.</p> <p>As nonconformances are identified and documented, both the contractor and MFACC address them in an expeditious manner.</p>
<b>Concerns and Recommendations:</b>	The PMOC is satisfied that SAS Project Management has elevated this issue and recommends that the contractor continue to document all instances when concrete parameters are out of specification.
<b>Contract Package C4B</b>	
<b>Status:</b>	Through April 30, 2013, a total of 39 NCRs have been issued. 7 of these were issued in April 2013. 26 have been closed by both the contractor and MFACC. None were closed in April 2013 and 13 NCRs are open.
<b>Observation:</b>	All 7 of the NCRs that were generated in April 2013 involved concrete parameters that were out of specification – six involved entrained air content and one pertained to slump.
<b>Concerns and Recommendations:</b>	The PMOC is satisfied that SAS Project Management directed that each week one NCR be generated for all instances where air entrainment, slump, and/or time to place concrete were out of specification during that week.
<b>Contract Package C5B</b>	
<b>Status:</b>	Through April 30, 2013 a total of 15 NCRs have been issued. 14 have been closed by both the contractor and MFACC. 1 NCR is open. No NCRs were generated in April 2013 and of the 14 that have been closed, 4 were closed in April.
<b>Observation:</b>	<p>It is the PMOC's opinion that the Quality System is functioning properly on this contract at this time.</p> <p>As nonconformances are identified and documented, both the contractor and MFACC address them in an expeditious manner.</p>
<b>Concerns and Recommendations:</b>	None at this time.

## 2.0 SCHEDULE DATA

*Integrated Project Schedule (IPS) Update #81 was received on May 3, 2013 and is based on a Data Date of April 1, 2013. This update contained a “PDF” schedule reports for all remaining work, the “XER” schedule files for the IPS and individual contracts as well as a narrative report. The IPS still reflects the forecasted completion of all construction and NYCT Pre-Revenue Training & Testing activities by October 4, 2016, with 90 calendar days (CD) or 64 work days (WD) of contingency when measured against MTAACC’s target Revenue Service Date (RSD) of December 30, 2016.*

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

- *The 90 Day Preliminary Schedule for Contract C-26011, 72<sup>nd</sup> St Station MEP & Finishes (C4C), has been submitted and accepted. Development of the detailed baseline schedule is under way.*
- *The bid opening for Construction Package Contract C-26012, 86<sup>th</sup> St. Station MEP & Finishes (C5C), bid Opening was postponed from April 3<sup>rd</sup>, 2013 to April 10<sup>th</sup>, 2013. As previously noted, the IPS currently reflects a bid opening date of April 29<sup>th</sup>, 2013 to provide schedule contingency for the procurement process. The IPS reflects a contract award date of June 5<sup>th</sup>, 2013; the time period between bid opening and contract award is based on past project experience.*
- *On April 29, 2013, final agreement to the MTA Independent Engineer’s proposal to compress the Integrated Systems Testing period via the simultaneous testing of Signal and Traction Power systems was accepted. The resulting 9 WD increase in schedule contingency should be incorporated in Update #82 of the IPS.*
- *Final development of the C-26010 “96<sup>th</sup> St... Station MEP/ Finishes; Final Utilities & Site Restoration (C2B) schedule continues. Incorporation in Update #82 of the IPS is currently forecast.*
- *Contract Milestones #1, #2 and Substantial Completion for Contract Package C2A have slipped over this update period and further schedule slippage appears likely. MTAACC recently negotiated a revised Substantial Completion date with the Contractor of July 15, 2013. The impact of this slippage on flow on Contract C2B is unknown at this time.*
- *Substantial variances between current contract and current forecast milestone and substantial completion dates exist for Contracts C3, C4B and C5B. Based on the MTAACC’s RSD and analysis, the delays experienced by these contracts do not yet affect the overall RSD.*
- *C2B and C6 Milestone dates were unchanged this period. MTAACC is considering a proposal to accelerate the system testing and commissioning activities that may add 10 – 20 WD of schedule contingency to the IPS.*

**Project Critical Path:** The most “critical” or longest schedule path that spans between the current data date of April 1, 2013 and the project completion date (RSD) has changed this update, and consists of the following elements:

1. *The initial portion of this path involves the Shop Drawing Submission and Approval Process as well as the Fabrication and Manufacturing of Traction Power Substation*

*Equipment for the 86<sup>th</sup> Street Station. Submission of technical information is constrained such that it cannot start until September 3, 2013. Given the significance of this work to the overall project schedule, it is unclear why the start of this activity is being “constrained.”*

2. *The second portion of the critical path involves traction power component installation and system testing at the 86<sup>th</sup> Street Station, which is scheduled for completion on August 17, 2016. NYCT “Proof of Operation” testing is concurrent with Traction Power System Testing and also is scheduled for completion on August 17, 2016. All third party construction will be completed as of August 18, 2016, when the C6 Package is scheduled for completion. NYCT operational testing including dispatch tower testing, proof of route familiarity and new systems and equipment familiarization are the final activities for SAS, Phase 1, with scheduled completion on October 3, 2016. Adding the current schedule contingency of 64 WD results in the target RSD of December 30, 2016.*

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

- +1 WD:** *This path is initiated by the equipment design (shop drawings), manufacture and delivery of the traction power substation and associated control equipment at the 96<sup>th</sup> Street Station. It then follows the installation of the traction power system at the 96<sup>th</sup> Street Station through its local and integrated test activities. This path joins the critical path on May 18, 2016 with the start of Proof of Operation testing.*

*The PMOC is concerned about the schedule “lags” during the equipment design (shop drawing) phase of this work. It is unclear why the submission of DC breaker layouts is delayed 5 months beyond the completion of its predecessor, DC breaker schematics.*

*The PMOC recognizes that the IPS is not a “production” schedule, and the usual concerns regarding the use of schedule lags are not completely applicable. However, for “near critical” paths, excessive periods of no activity created by lags should be replaced with documentable work activities and defensible schedule logic. This comment was made in the December 2012 PMOC Monthly Report and has not been acted upon to date.*

- +12 WD:** *This path originates with C4B concrete construction in the northern portion of the 72<sup>nd</sup> Street Station Main Cavern followed by similar work in the southern part of the Main Cavern. C4B Substantial Completion is now forecast for 2/11/14, which is 60 CD later than the current adjusted contract substantial completion date. Following the handoff to C4C architectural and MEP work will be performed in Ancillary #1 until 11/1/14, at which time Ancillary 1 will be turned over to the C6 Contractor for systems installation. From Ancillary #1, the C6 Contractor will install signal equipment throughout the 72<sup>nd</sup> Street Station area until completion of Operational Testing on 7/20/16.*

*The PMOC notes that since IPS Update #76 ((DD=11/1/12), the turnover of Ancillary #1 for systems installation from C4C to C6 has lost 87 CD (approximately 120 WD) of schedule float over a 150 WD time period. This has been a result of*

*delays to the C4B construction. Improved schedule performance from the C4B contract is necessary to avoid impacting follow on contracts C4C and C6.*

**+17 WD:** *This path is initiated by the “design” of the communications system at the 96<sup>th</sup> Street Station, which is reportedly under way. The original duration of the “design” activity exceeds two years and the successor “installation” activity has a duration of 235 WD. M/ACC has committed to providing a better breakdown of communication activities. Following design and installation of hardware and software, local and integrated testing is scheduled to start on January 12, 2015 and is forecast to complete approximately 18 months, completing on July 13, 2016, followed by integrated system and proof of operation testing.*

*There was no change to this path this update period. It is not possible to verify the status of an activity when its scope is indeterminate and its duration excessive. This lack of definition can be found with numerous activities throughout the systems portion of the IPS.*

**+18 WD:** *This path involves procurement activities for the C5C construction package, which is currently in progress. C5C procurement currently has 18 WD of schedule float and concludes with the contract award on June 5, 2013. A schedule “lag” of 447 WD connects the C5C contract award to C5C MS#9, Complete Work in all Traction Power Rooms (North). C5C MS#9 initiates Activity #C6AR86-06, which is the C6 contractual “full access” date to traction power rooms at the north end of the 86<sup>th</sup> Street Station. This milestone defines a time period during which the C5C contractor will construct necessary elements of the 86<sup>th</sup> Street Station to support follow-on C6 installation activities and serves to constrain subsequent C6 work activities so they cannot start before March 18, 2015. This “lag” will be replaced with the actual C5C construction schedule when it is available. This path merges with the critical path after construction of traction power rooms on March 18, 2015. This path is unchanged this period.*

**+23 WD:** *NYCT Pre-Revenue Operation Activities scheduled to start on August 18, 2014 and is unchanged this period.*

**+22 WD:**

**+25 WD:** *These two paths involve the shop drawing development, manufacture, and installation and testing of signal equipment at the 86<sup>th</sup> and 96<sup>th</sup> Street Stations, respectively. Both paths contain lags of excessive duration between the manufacture of room equipment and the manufacture of wayside equipment. Field installation activities at 96<sup>th</sup> Street begin on March 17, 2015; at 86<sup>th</sup> Street the installation work starts on September 29, 2015. Installation and testing of both locations are scheduled to complete in mid-June 2016, followed by integrated testing and system operation.*

*The PMOC notes that the IPS does not contain any activities or milestones for factory testing and acceptance activities. These are typically high-profile activities that may be of interest to a wide variety of stakeholders. The IPS would be a good way to track and communicate these events. The PMOC recommends the SAS Project Team utilize some routine method of identifying tracking and reporting on these critical dates.*

+42 WD

+43 WD: These two paths involve excavation and structural concrete construction at the South Cavern (+42) and Entrance #1 (+43) of the 86<sup>th</sup> Street Station. The south cavern path follows rock excavation in the south cavern, followed by concrete liner installation and waterproofing in the north cavern. C5B handoff of the south tunnels to C5C is forecast for April 15, 2014. At Entrance #1, C5B will complete all excavation, structural and architectural concrete and is scheduled to hand this area off to C5C on September 12, 2014. These paths are the “most critical” paths currently associated with the C5B contract.

+44 WD: This path is initiated via Activity C6AR63-4: C3/G4 Track through 63<sup>rd</sup> Street “Shared Access” which is currently forecast for June 18, 2014. This C6 milestone controls the start of signal system installation and testing throughout the 63<sup>rd</sup> Street Station area. This path extends continuously from its start through pre-operational testing in May 2016 and is preceded by the substantial completion of C3 at Entrance #1, (+77 WD of schedule float) which is currently forecast for December 4, 2014. A negative schedule lag allows the system installation work to supersede the schedule logic and start before the completion of its predecessor activities.

The PMOC notes that the access constraint between Entrance #1 and the C3/G4 trackside work does not appear to be a “true” physical constraint. Rather than neutralizing this logic through the use of negative lags, MFACC should clarify the relationship in that area with the affected contractors and utilize more conventional schedule logic to model the activities and relationships in that area at that time.

**Other Float Paths:** The following list summarizes significant project issues that currently have more than 44 WD of schedule float.

- +77 Rainbow Hardware, Excavation Stage 7A MS#2 handoffs to C2A
- +97 Procure/Deliver/Instal Concrete Ties (including LVT) and Track
- +128 Handoff C5B→C5C @Entrance #2
- +200 C4C – Entrance #1 Design & Construction
- +234 Permanent Power Available

**Milestone Summary:** For contract actively under construction, a tabulation of current schedule performance against contractual milestones is presented in Table 3. Based on these milestones, the PMOC notes the following:

- Contract C2A Milestones #2 and Substantial Completion (SC) experienced significant delays this period. Milestone #2 delays are attributed to additional work associated with underpinning and protection of Rainbow Hardware. Available schedule float suggests no delay to overall project; however delays in handoffs to C2B may result in additional cost.
- Contract 3, all milestones experienced significant delay this period. Four of five milestones experienced delay greater than the duration of the update period. MFACC previously reported delays impacting Milestone #3 had been resolved. The PMOC questions the float value associated with Milestones #5 and #6 and is concerned that these values are excessive, indicating incorrect logical relationships with successor activities.



- *Contract C4B incremental delays to both milestones continued this period, resulting in significant variances with contractual milestone obligations. If this trend is not reversed, the PMOC is concerned that C4B Substantial Completion may become a component of the overall project critical path*
- *Contract C5B milestones shown do not include Entrance #2, which is an area that is currently experiencing significant delay. Delays this period to Substantial Completion exceeded twice the duration of the update period, suggesting a very significant problem or potentially some manipulation of the schedule.*

*Although the overall IPS maintained the RSD and float contingency through Update #81, each of the active construction contracts experienced substantial delay. Significant variances (>30 CD) between current contractual milestone dates and current forecast dates are found for each active construction contract. If current trends in schedule performance continue, the PMOC is concerned that the RSD will be adversely impacted in the near future.*

**ELPEP/SMP Compliance:** In the opinion of the PMOC, SAS Phase 1 remains in substantial 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). Specifically:

1. Forecast Revenue Service Date
  - ELPEP Requirement: February 28, 2018
    - Current Forecast: December 30, 2016
2. Minimum schedule contingency (measured against February 28, 2018 RSD)
  - ELPEP Requirement: 240 CD
    - Current Forecast: 513 CD
3. Minimum Allowable Float; Real Estate Acquisition
  - ELPEP Requirement: 60 CD
    - Current Forecast: All Real Estate Takings are complete as of November 1, 2011.
    - Cost to Cure Activities - Current Forecast:
      - *63rd Street Station – Entrance #1; TF = +77 WD*
      - *42nd Street Station – Entrance #1; TF = +200 WD.*
4. Minimum Allowable Secondary Float Path
  - ELPEP Requirement: 25 Calendar Days (approximately 18 WD).
  - *Current Forecast: Independent float paths with float less than 25 CD (18 WD) include:*
    - *Traction power system procurement and installation @ 96<sup>th</sup> Street Station (+1 WD).*
    - *C4B cavern excavation (+12 WD)*

- *Communication system design, manufacture and installation at 96<sup>th</sup> Street Station (+17 WD).*
- *C5C contract or procurement (+18 WD).*

*It is not economically feasible to accelerate these multiple independent schedule paths in order to conform to this section of ELPEP.*

5. Secondary Schedule Mitigation (critical path compression)

- ELPEP Requirement: 125 CD

➤ Current Forecast: Schedule mitigation efforts are in progress.

***Schedule Contingency:*** *IPS Update #81 continues to forecast all Phase I construction and pre-revenue testing to be complete on October 3, 2016. This results in an 90 CD (64 WD) contingency when measured against the MFACC's target RSD of December 30, 2016 and a 513 CD contingency when measured against the FTA Risk-Informed RSD of February 28, 2018.*

**Schedule Comments:**

1. *The IPS frequently does not provide adequate time for construction contract final inspections, cleanup, punchlist development, closeout and similar activities the necessarily precede substantial completion. The resulting risk of "delay" to substantial completion and potentially to turnover of areas or systems to follow-on contractors appears high.*
2. *The use of schedule lags of excessive duration instead of activities with reasonably developed durations and logical relationships near the critical path continues to be a concern. The PMOC recommends replacement of all such lags with activities and appropriate schedule logic that facilitates the understanding of schedule-related issues affecting related activities.*
3. *Approximately 20% of all active activities within the IPS appear to have excessive float values. This typically indicates incomplete development of logical relationships with successor activities. The result may be the "underestimation" of the criticality of an activity or group of activities and unanticipated delays and coordination problems. The PMOC recommends a review of the successor activities and logic for activities with a float value exceeding 400 WD.*

*In this section, the PMOC has identified specific weaknesses within the SAS IPS. By addressing these issues, the MFACC will enhance the accuracy and reliability of the forecasts generated by the IPS as well as its overall usefulness as a tool support construction phase planning and control.*

**3.0 COST DATA**

*Based upon financial expenditures reported by the MFACC through April 30, 2013, SAS Phase I is approximately 51.7 %complete. The completion status of the active construction contracts through April 30, 2013, also based upon reported expenditures through that date, is as follows:*

- C26002 (Tunnel Boring) – 97.0%
- C26005 (96<sup>th</sup> Street Station) – 93.0%
- C26010 (96<sup>th</sup> Street Station) – 82%

- C26013 (86<sup>th</sup> Street Station) – 100 %
- C26008 (86<sup>th</sup> Street Station) – 50.1 %
- C26006 (63<sup>rd</sup> Street Station) – 45.7 %
- C26007 (72nd Street Station) – 77.3 %
- C26009 (Systems) – 7.6%

Aggregate Construction % Completion

- 100 % of all construction has been bid
- 91 % of all construction is under contract
- 55.6 % of active construction contracts are complete
- 51.3 % of all construction is complete

Based upon cost data received from MIACC for the period through April 30, 2013:

- Value of construction in place this period = \$34,815,358 MO
- Estimated value of construction remaining = \$1,302,909,337
- Target construction completion = August 18, 2016
- Number of months remaining = 39.7

It is noted that no progress payments were reported for CSB for the current reporting period, reducing the estimated progress made to date.

Average rate of construction required to achieve target completion date = \$34,031,627/ MO  
 The average progress (payments) achieved over the most recent six month period is \$47,340,890.  
 Based on a review of cost data for April 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, OCI P, etc.) reported this period by MIACC totaled \$6.58M. Based upon the available reporting, if soft cost expenditures continue at their current rates, there will be insufficient funds within the respective soft cost categories to fund the estimated 39.7 month remaining duration of the project. Revision 10 to the project cost estimate should address this forecast shortfall and will be incorporated in this report when finalized.

**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 current EAC, which is currently \$4,258,029,477. This update includes the updated construction EAC and some input from draft Revision 10 of the Project Cost Estimate, but is not necessarily the final adjustment that will be made based upon this update.

Based on the information available, this updated EAC continues to validate the reasonableness of the MIACC'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 MTA/ACC NYCT in April 2013 is summarized as follows:

	<u>Executed AWOs</u>	<u>AWO Exposure</u>
<i>April 2013</i>	\$94,275,695	\$132,233,246
<i>March 2013</i>	\$94,266,811	\$126,455,562
<i>Change</i>	\$ 8,884	\$5,777,684
<i>Change</i>	.010%	4.65%

The changes in AWO Exposure are summarized as follows:

Const. Pkg	AWO Exposure \$			Changes this Period
	March-13	April-13	Period Δ	
C1	\$53,095,231	\$53,095,231	\$0	No change. Close-out negotiation of outstanding AWOs in progress.
C2A	\$48,395,294	\$48,395,294	\$0	No change this period
C2B	\$1,213,542	\$1,975,123	\$761,581	Net increase based on initial valuation of AWOs #2 and 22 as well as revisions to the estimated valuation of AWOs #13 and 14. Seven new AWOs were added that do not have an estimated cost exposure. Nine of twenty-two AWOs for this contract do not have an estimated cost exposure.
C3	\$6,617,278	\$7,016,210	\$398,932	Increases in the valuation of AWOs # 35, 41, 43, 46, 47 and 51. Initial valuation of new AWOs # 52, 53, 54 and 55 as well as a decrease in valuation of AWOs # 45, 48 and 50.
C4B	\$1,290,518	\$5,069,738	\$3,779,220	Net increase based upon the initial valuation of AWO # 50 and decreases in the estimated value of AWO # 53 and 69.
C4C	\$0	\$0	\$0	No AWO exposure to date.
C5A	\$6,388,055	\$6,525,471	\$137,416	Increase is based on the initial valuation of AWO # 77.
C5B	\$8,245,361	\$8,024,584	\$-220,777	Decrease is based on reductions to the estimated value of AWOs #14, 15, 35 and 41. Seven AWOs were added this period, none of which have an estimated value. Twenty-one of sixty AWOs do not have an estimated value.
C5C	\$0	\$0	\$0	No AWO exposure. Bid Phase
C6	\$1,210,283	\$2,131,595	\$921,312	Net increase based on initial valuation of AWOs # 3, 11, 14 and 15 as well as an increase in the estimated valuation of AWO #2 and decreases in the estimated valuation of AWOs # 7, 8 and 10.
	\$126,455,562	\$132,233,246	\$5,777,684	

The changes in Executed AWO Value are summarized as follows:

Const. Pkg	Executed AWO \$			Changes this Period
	March-13	April-13	Period Δ	
C1	\$45,212,443	\$45,212,443	\$0	No change this period. Close-out negotiation of outstanding AWOs in progress.
C2A	\$35,363,514	\$35,363,514	\$0	No change this period
C2B	\$120,073	\$37,073	\$-83,000	Net decrease based of the execution of AWOs # 11 and 13.

Const. Pkg	Executed AWO \$			Changes this Period
	March-13	April-13	Period Δ	
C3	\$3,056,430	\$3,097,230	\$40,8000	Net decrease based on resolution and execution of AWOs #31, 33 and 15 (credit).
C4B	\$3,904,332	\$3,920,332	\$16,000	Increase based on execution of AWO # 68
C4C	\$0	\$0	\$0	No AWOs executed to date.
C5A	\$4,285,471	\$4,148,055	\$ 137,416	Reduction based on elimination of AWO #77.
C5B	\$2,055,188	\$2,227,688	\$172,500	Increase based on execution of AWOs #14, 15, 41 and 53.
C5C	\$0	\$0	\$0	No AWOs executed to date.
C6	\$269,360	\$269,360	\$0	No change this period
	\$94,266,811	\$94,275,695	\$8,884	

As of April 30, 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)	97.0%	\$337,025,000	\$53,095,231	15.75%	\$45,212,443	13.42%
C26005 (2A)	93.0%	\$325,000,000	\$48,395,294	14.89%	\$35,363,514	10.88%
C26010 (2B)	8.2%	\$324,600,000	\$1,975,123	0.61%	\$37,073	0.01%
C26006 (3)	45.7%	\$176,450,000	\$7,016,210	3.98%	\$3,097,230	1.76%
C26007 (4B)	77.3%	\$447,180,260	\$5,069,738	1.13%	\$3,920,332	0.88%
C26011 (4C)	0.0%	\$258,353,000	\$0	0.00%	\$0	0.00%
C26013 (5A)	100.0%	\$34,070,039	\$6,525,471	19.15%	\$4,148,055	12.18%
C26008 (5B)	50.1%	\$301,860,000	\$8,024,584	2.66%	\$2,227,688	0.74%
C26009(6)	7.6%	\$261,900,000	\$2,131,595	0.81%	\$269,360	0.10%
<b>TOTAL</b>		\$2,466,438,299	\$132,233,246	5.36%	\$94,275,695	3.82%

To date, approximately \$1,371,904,962 (55.62%) worth of awarded construction work has been completed. As a % of work completed, the AWO exposure for these contracts = 9.22% and the executed AWO % = 6.87%. 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 notes that the forecast "closeout AWOs" for contract packages C1 and C5A may reduce this forecast. 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:** Section 5.4 of the Cost Management Plan (CMP) discusses Project-Level EAC Forecasting. It is noted in this section that soft costs are included in this report, which is to be produced on a monthly basis. 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 is currently out for

*comment. Soft costs will become a part of a total project EAC upon formal acceptance of Revision #10.*

**Cost Contingency:** *During April 2013, contingency changes were limited to routine incorporation of AWOs into the individual project and overall program reporting systems. No other significant changes in the SAS construction program have been reported that materially affected the forecast cost contingency baseline against which the current contingency balance is measured.*

*Contingency changes associated with the award of the CSC construction contract and Revision 10 (Soft Costs) of the Project Cost estimate will be incorporated upon their respective formal approval.*

*The PMOC has updated and adjusted its contingency drawdown and utilization model to reflect changes made this period. Models maintained 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. The MTACC and FTA agreed the ELPEP “50% Constructed/90% Bid” milestone was effectively achieved in March 2013. Consequently the required contingency balance will be reduced each month, based on achieving the “85% Constructed/100% Bid” milestone in approximately 18 months.*

	<b><u>March 2013</u></b>	<b><u>April 2013</u></b>
Required Balance (ELPEP):	\$220,000,000	\$210,278,000
Planned Contingency Balance:	\$282,457,737	\$279,712,095
Actual Contingency Balance (PMOC):	\$405,935,333	\$400,157,649
Actual Contingency Balance (MTACC):	\$392,055,000	TBD

#### **4.0 RISK MANAGEMENT**

*During April 2013, the SAS Project Team continued its focus on those risks identified in the various referenced analysis reports which still required mitigation action and new risks that are showing significant impact due to the February 2013 risk analysis performed on the updated Risk Register, version February 2013, as well as risks identified at various Project meetings. Updates to the pre and post award cost and schedule contingency budgets are being made reflective of the mitigation actions being implemented. Mitigation strategies for Interface Management, User Department changes and schedule recovery risks are being developed in more detail.*

#### **5.0 ELPEP**

*There were no ELPEP meetings held during April 2012. With respect to SAS, the current status of each of the main ELPEP components is summarized as follows:*

- **Technical Capacity and Capability (TCO):** The PMOC completed its review of the SAS PMP. MTACC has addressed all FTA PMOC comments and reissued the PMP as Revision 8.1. Candidate Revisions for the next PMP update are being developed with an updated PMP anticipated by June 2013.
- **Schedule Management Plan (SMP):** The PMOC continues to monitor and verify SAS substantial compliance with the SMP.

- **Cost Management Plan (CMP):** The PMOC continues to monitor and verify SAS substantial compliance with the CMP.
- **Risk Mitigation Capacity Plan (RMCP) and Risk Management Plan (RMP):** On February 2, 2012, the FTA PMOC consolidated comments on the SAS Risk Management Plan were forwarded to the MTA. PMOC recommendations regarding approval were forwarded to FTA.
- **Conformance and Compliance Demonstration:** A Compliance Checklist was distributed and reviewed at the ELPEP Meeting of September 12, 2012.

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.*

*As of March 31, 2013 a total of 5,595,242 construction hours have been logged with 60 lost time and 154 recordable incidents documented. The total hours and incidents equates to a lost time rate of 2.14 and a recordable rate of 5.50. The US Bureau of Labor Statistics (BLS) national rate (Heavy & Civil construction) for lost time and recordable incidents is 2.0 and 3.5 respectively.*

Security – No security concerns have been noted during this reporting period.

## 7.0 ISSUES AND RECOMMENDATIONS

***Design Changes Requested by NYCT Operations:*** 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 50% 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:*** The SAS Project team has yet to demonstrate that it can close out a contract or execute the turnover of work areas between contractors in a timely and efficient manner. Construction staff does not appear to be proactively 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.

**Schedule Performance:** The most recent schedule update period covered construction progress through March 31, 2013. MFACC reported no delay to the IPS RSD or available schedule contingency during that period, however individual contract milestones incurred significant delays (refer to Table 3), some of which were greater than the 31 calendar day update period. At the contract level, schedule delays experienced to date have been substantial. MFACC has maintained the overall IPS schedule through creative resequencing and optimistic forecasts. The PMOC is concerned that maintaining the RSD without substantial actual improvement in schedule performance is unlikely.

## APPENDIX A - ACRONYMS

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AA	AECOM Ar up
AFI	Allowance for Indeter minates
ARRA	Ameri can Recovery and Rei nvest ment Act
AWO	Additi onal Work Orders
BA	Budget Adj ust ment
CCM	Consult ant Constructi on Ma nager
CD	Cal endar Days
CMP	Cost Manage ment Plan
CSSR	Cont act Status Summary Report
CIL	Central Instru ment Locati on
CPRB	Capit al Program Revi ew Board
CPP	Contract Packagi ng Plan
CWB	Current Worki ng Budget
CY	Cubi c Yards
DCB	Det ailed Cost Breakdown
DMP	Defor mati on Monitori ng Poi nts
EAC	Esti mate at Compl eti on
ELPEP	Enterpri se Level Project Executi on Plan
EPC	Engi neeri ng-Procure ment- Constructi on
FFGA	Full Fundi ng Grant Agree ment
FTA	Federal Transit Admi ni strati on
GO	General Out age
IPS	Integrat ed Project Schedule
MO	Month
MPT	Mai ntenance Protecti on of Traffic
MTA	Metropolitan Transportati on Authority
MTACC	Metropolitan Transportati on Authority – Capit al Constructi on
NA	Not Applicabl e
NOA	Notice of Award
NTP	Notice to Proceed
NYCT	New York Cty 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)
PPM	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



**Table 3 - 1st Quarter 2013 Schedule Milestone Comparison**

Pkg	MS	Description	Dates			Affected Pkg	Variance		Sch Float
			Adjusted (2)	Upd #80 (3)	Upd #81 (4)		Contract = (2) - (4)	Month = (3) - (4)	
C2 A	#1	99th to 97th Street; surface and underground work complete including Ancillary #2	07/15/13	07/18/13	07/26/13	C2 B	-11	-8	122
C2 A	#2	92nd to 95th Street; surface and underground work complete including Ancillary #1, Entrances 1 & 2	07/15/13	07/10/13	08/22/13	C2 B	-38	-43	77
C2 A	SS	Completion of all remaining work - 95th to 97th Streets including Entrance #3.	07/15/13	07/18/13	08/22/13	C2 B	-38	-35	177
C3	#3	Completion of all Work on the Mezzanine levels associated with the installation of conduits, race ways, and other installations necessary to allow for cable pulling related to communications work	04/15/13	12/23/13	02/18/14	C6	-309	-57	91
C3	#4	Completion of all Work on the Lower and Upper Platforms. Completion of all Signals Rooms.	10/14/13	01/06/14	02/20/14	C6	-129	-45	185
C3	#5	Completion of all work within the underground parking garage at 188 East 64th Street	08/30/13	08/30/13	09/09/13		10	-10	381
C3	#6	Complete work @ Ancillary #1	07/09/12	06/13/13	07/10/13		-366	-27	422
C3	SS	Substantial Completion	05/13/14	10/30/14	12/04/14	C6	-205	-35	77
C4 B	#1	Completion of Ancillary #2 shaft & adits, availability of cavern from Grid Line 17 north, west of Entrance #2 adit	06/25/13	08/01/13	08/19/13	C4 C	-55	-18	91
C4 B	SS	Substantial Completion	12/03/13	02/05/14	02/11/14	C4 C	-70	-6	12
C5 B	#1	Complete all Station Cavern work south of Grid Line 15 and all surface work south of 85th Street centerline.	03/04/14	03/17/14	03/18/14	C5 C	-14	-1	42
C5 B	SS	Substantial Completion	09/04/14	09/17/14	12/02/14	C5 C	-89	-76	128

Notes:

1. All schedule dates based upon April 1, 2013 update (IPS Update #81)
2. Contract packages 1 and 5A have completed all work and follow on activities are proceeding w/o impact.
3. Contract packages 2B, 4C, 5C and 6, no variances with contract milestones to date.

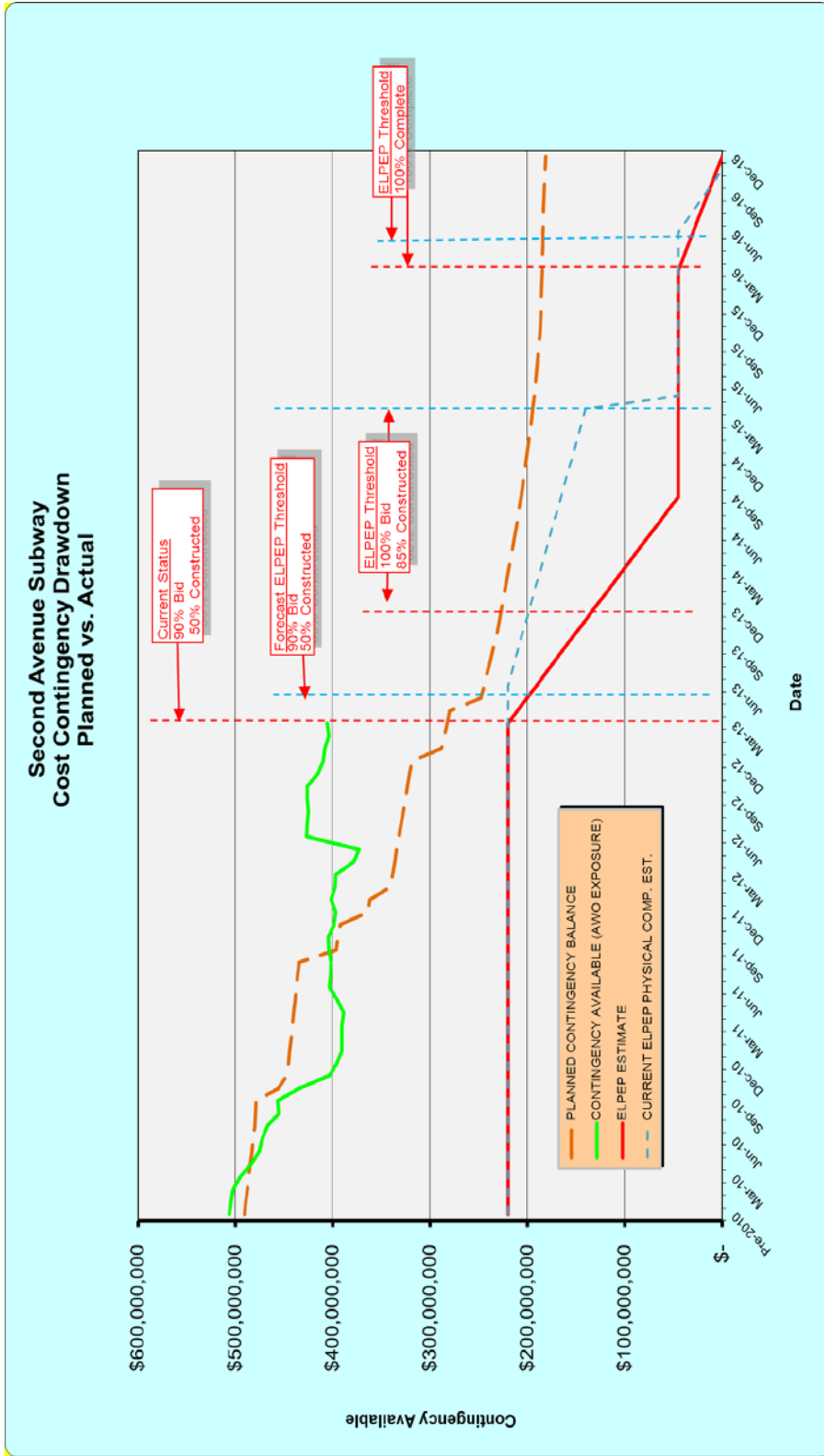
**Table 4 - Project Budget/ Cost** 

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of April 30, 2013	
	\$ Millions	% of Total	Obligated (\$ Millions)	TBD	\$ Millions	% of Total	\$ Millions	% of Total
<b>Grand Total Cost:</b>	<b>4,866.614</b>	<b>100</b>	<b>4,572.942</b>		<b>5,267.614</b>	<b>100</b>	<b>2,302.928</b>	<b>43.72</b>
Financing Cost	816.614	16.78			816.614	15.50		
<b>Total Project Cost:</b>	<b>4,050.000</b>	<b>83.22</b>	<b>4,572.942</b>		<b>4,451.00</b>	<b>84.50</b>	<b>2,302.928</b>	<b>43.72</b>
<b>Total Federal:</b>	<b>1,350.693</b>	<b>27.75</b>	<b>1,063.942</b>		<b>1,350.693</b>	<b>24.60</b>	<b>701.676</b>	<b>13.32</b>
<b>Total FTA share:</b>	<b>1,300.000</b>	<b>96.25</b>	<b>990.049</b>		<b>1,300.000</b>	<b>23.68</b>	<b>627.783</b>	<b>11.92</b>
5309 New Starts share	1,300.000	100	990.049		1,300.000	23.68	627.783	11.92
<b>Total FHWA share:</b>	<b>50.693</b>	<b>3.75</b>	<b>73.893</b>		<b>50.693</b>	<b>0.96</b>	<b>73.893</b>	<b>1.40</b>
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
<b>Total Local share:</b>	<b>2,699.307</b>	<b>55.47</b>	<b>3,509.000**</b>		<b>**3,509.000</b>	<b>63.92</b>	<b>1,601.252</b>	<b>30.40</b>
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 - Contingency Drawdown**



**Table 6 - Estimate at Completion**

<b>Category</b>	<b>Current Working Budget x</b>	<b>PMOC EAC Forecast</b>
<b>Total Construction</b>	\$2,728,172,492	\$2,952,369,392
<b>Engineering Services Subtotal</b>	\$576,541,264	\$622,000,000
<b>Third Party Expenses</b>	\$534,800,000	\$552,500,000
<b>TA Expenses</b>	\$125,160,085	\$131,160,085
<b>Contingency</b>	\$321,104,648	
<b>Executive Reserve</b>	\$160,000,000	
<b>Subtotal</b>	\$4,451,000,000	\$4,258,029,477

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

<b>Std Cost Category (SCO)</b>	<b>Description</b>	<b>FFGA</b>	<b>MTA's Current Working Budget</b>
10	Guideway & Track Elements	\$612,404,000	\$728,617,000
20	Stations, Stops, Terminals, Intermodal	\$1,092,836,000	\$1,276,632,000
30	Support Facilities	0	\$562,000
40	Site Work & Special Conditions	\$276,229,000	\$537,621,000
50	Systems	\$322,708,000	\$247,627,000
60	ROW Land, Existing Improvements	\$240,960,000	\$292,000,000*
70	Vehicles	\$152,999,000	0**
80	Professional Services	\$796,311,000	\$885,941,000
90	Unallocated Contingency	\$555,554,000	\$482,000,000
<b>Subtotal</b>		<b>\$4,050,000,000</b>	<b>\$4,451,000,000</b>
<b>Financing Cost</b>		<b>\$816,614,000</b>	<b>\$816,614,000</b>
<b>Total Project</b>		<b>\$4,866,614,000</b>	<b>\$5,267,614,000</b>

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

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



**Table 8 -- Core Accountability Items -- April 2013**

<b>Project Status:</b>		<b>Original at FFGA</b>	<b>Current*</b>	<b>ELPEP**</b>
<b>Cost</b>	Cost Estimate	\$4,050 M	\$4,451 M	\$4,980 M
<b>Contingency</b>	Unallocated Contingency	\$555.554 M	\$388 M	\$210 M
	Total Contingency (Allocated plus Unallocated)	\$555.554 M	\$400 M (April 2013)	\$210 M
<b>Schedule</b>	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
<b>Total Project Percent Complete</b>	<i>Based on Expenditures</i>	51.7%		
	Based on Earned Value	N A		
<b>Major Issue</b>	<b>Status</b>	<b>Comments</b>		
<i>Design Changes Requested by NYCT Operations</i>	Open	<p><i>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 50% 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</i></p>		

		<i>more design changes” if the project is to achieve its schedule (and cost) performance objectives.</i>
<b><i>Construction Contract Management and Coordination</i></b>	Open	<i>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 proactively 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.</i>
<b>Date of Next Quarterly Meeting:</b>	TBD	

\* MFA’s Current Working Budget

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

*Schedule data based upon IPS Update #81; Data Date = 4/01/2013*

*Financial data based upon MFA’s reporting through 4/30/2013*