

## **PMOC MONTHLY REPORT**

### **Second Avenue Subway Phase 1 (MTACC-SAS) Project**

Metropolitan Transportation Authority

New York, New York

*Report Period January 1 to January 31, 2013*



PMOC Contract No. DTFT60-09-D-00007

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

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

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## **THIRD PARTY DISCLAIMER**

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Therefore, the information in the monthly reports may change from month to month, based on relevant factors for the current month and/or previous months.

## **REPORT FORMAT AND FOCUS**

This monthly report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT60-09-D-00007, Task Order No. 002. Its purpose is to provide information and data to assist the FTA as it continually monitors the grantee's technical capability and capacity to execute a project efficiently and effectively, and hence, whether the grantee continues to be ready to receive federal funds for further project development.

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

## **MONITORING REPORT**

### **1.0 PROJECT STATUS**

*During January 2013, MTACC continued advancing SAS, Phase 1 to meet a Revenue Service Date (RSD) of December 30, 2016 within its Current Working Budget (CWB) of \$4.451B (exclusive of financing). 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 1<sup>st</sup> Quarter 2013. Progress continued on the six (6) active construction contracts and featured the following accomplishments:*

*C-26005 (C2A) "96<sup>th</sup> Street Site Work and Heavy Civil" Mass excavation and installation of struts and walers beneath the precast panels continued and is approximately 56% complete.*

*C-26010 (C2B) "96<sup>th</sup> Street Station Civil, Architectural, and MEP" continued preliminary work in the existing tunnel north of 99<sup>th</sup> Street by completing asbestos survey and remediation of the same. In late January, 2013, MTACC conditionally accepted the contractor's Detailed Baseline Schedule.*

C-26006 (C3) “63<sup>rd</sup> Street Station Rehabilitation” continued steel fabrication and erection in Area 5. Forecast completion of this work has slipped to mid-March 2013. Concrete work has started at several locations.

C-26007 (C4B) “72<sup>nd</sup> Street Station Cavern Mining and Lining” Total rock excavation for the contract is approximately 97% complete. Concrete and waterproofing installation is ongoing at the Main Cavern, North Crossover and G4 Cavern.

C-26008 (C5B) “86<sup>th</sup> Street Station Cavern Mining and Lining” Total rock excavation is approximately 40% complete. This is the primary work activity in progress for this contract. Delays to work at Entrance #2 have been experienced and are likely to continue over the near-term due to interference with building owner’s scaffolding.

C-26009 (C6) “Track, Power, Signals and Communication Systems” Mobilization and submittal activities continue.

The overall project is approximately 48.3% complete. The remaining two construction contracts will be awarded during 2013.

#### **a. Procurement**

Construction contract award for the C-26011 (C4C) “72<sup>nd</sup> Street Station Architectural, MEP and Finishes Package” is scheduled for February 4, 2013.

Construction documents were made available to interested contractors for the 86<sup>th</sup> Street Station Architectural, MEP and Finishes Package, C-26012 (C5C), on December 24, 2012. Receipt of bids is currently scheduled for March 13, 2013.

#### **b. Construction**

As of January 31, 2013, there are six (6) 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) 96th Street Site Work and Heavy Civil**
  - **Launch Box**
    - Invert slab concrete placement continued in the launch box: 9 of 37 completed (24.3%)
    - PVC waterproofing for pours 1 and 6 completed
  - **Mass Excavation ongoing**
    - Total mass excavation completed: 88,438 out of 131,223 BCY (67.0%)
      - Main Station: 71,520 out of 95,361 BCY (75.0% complete)
      - Ancillary #1: 5,138 out of 13,520 BCY (38.0% complete)
      - Ancillary #2: 7,294 out of 11,633 BCY (63.0% complete)
      - Entrance #1: 580 out of 2,208 BCY (26.0% complete)
      - Entrance #2: 740 out of 2,961 BCY (25.0% complete)
      - Entrance #3: 3,166 out of 5,540 BCY (57.0% complete)

- *Total MGP excavation completed: 6,435 out of 6,500 tons (99.0%)*
- **Ancillary #1 ongoing work**
  - *2<sup>nd</sup> jet grouting of both South and North closures were completed on 1/23/13*
  - *K-bracing started on 1/28/13*
- **Ancillary #2 ongoing work**
  - *Excavation to elevation 80*
  - *Installation of bracing at cast in place wall*
  - *Installation of walers*
- **Entrance #1 ongoing work**
  - *Installation of micropiles at Entrance #1 completed*
  - *Jet grout between secants and slurry wall (2 locations)*
- **Contract C-26010 (C2B) 96<sup>th</sup> Street Station Civil, Architectural, and MEP**
  - *Baseline Schedule Revision R6.2 was conditionally approved on 1/25/13*
  - **Tracking of Long Lead Items**
    - *The contractor will provide a spreadsheet of long lead items by 2/8/13 and will identify any potential Buy America concerns*
  - **Entrance 2 ongoing work**
    - *Secant pile installation (8 out of 8 completed)*
    - *Concrete Piers (10 out of 10 completed)*
    - *Relocation of utilities in preparation for sheet piling*
  - **Launch Box ongoing work**
    - *Shotcrete of South wall*
    - *Installation of temporary lighting*
    - *Removal of struts and wales*
    - *Cleaning of slab and pouring of mud mat*
    - *Waterproofing*
    - *Installation of rebar/form and pouring of concrete invert (first pour is scheduled for 2/5/13)*
  - **North Tunnel ongoing work**
    - *102nd Street Fan Room lead abatement (south of 102nd Street) is scheduled to start on 2/11/13*
    - *Bench demo and clean-up*
- **Contract C-26006 (C3) 63rd Street Station Rehabilitation**
  - *Surveying of the Deformation Monitoring Points (DMPs) is ongoing and will continue throughout the project.*

- **Schedule**

- *During this period the Project Office reported that the schedule has suffered additional delays. Causes include utility relocation redesign and DOT/DEP permits for the SOE wall at Entrance #1; anticipated delays in completion of Area 5 steel erection from mid-February to mid-March 2013, and delay in the start of steel erection at Ancillary #1 caused by hurricane “Sandy”.*
- *The Project Office reported that the three street closures along E. 63<sup>rd</sup> St. between Lexington and Park Ave. will begin the weekend of February 9, 2013. This is to accommodate setting the mobile crane and delivery and erection of Ancillary #1 steel. There will be 2 shifts both Saturday and Sunday.*

- **Structural Steel (Area 5)**

- *The contractor’s upper management and MTACC upper management continue to meet on the schedule and increasing production, particularly steel fabrication.*
- *Starting with the week ending November 30, 2012, the Area 5 steel erection schedule was re-baselined from a December 15, 2012 completion date to February 16, 2013. The current progress has resulted in the Project Office reporting to the PMOC that the new forecast is early to mid-March 2013.*
- *As of January 26, 2013, the “Tracking Log” prepared by the Project Office indicates that 625 pieces had been installed versus 704 planned (88%), and represents 77.6% of the total steel pieces to be installed (805).*

- **Area 5 (Reconstruction consists of 6 mezzanines and the deck plaza roof)**

- *Continued with temporary and permanent structural steel fabrication and erection at the 4th & 5th Mezzanines.*
- *Completed 1<sup>st</sup> Mezzanine floor slab placement.*

- **Entrance #1**

- *Access problems to the building have been resolved.*
- *The contractor began preparations to begin utility work in early February 2013.*

- **Ancillary #1**

- *The 3 weekend street closures on 63rd St. between Lexington and Park Avenues have been re-scheduled for February 9, 2013, from the previously scheduled January 2013 date, due to Hurricane Sandy.*
- *Completed piles, pile caps and floor openings for the upcoming steel column erection.*

- **Platforms**

- *Continued with service carrier and conduit installation at the G3 and G4 level.*
- *Completed track acoustical board at the G4 platform.*
- *Completed new concrete for the G3 and G4 platforms.*

- **Fan Plants**
  - *Continued with installation of ductwork and fans in the West Fan Room.*
  - *Continued with water mist and sprinkler lines in West Fan Room.*
  - *Continued installation of conduit for power to equipment in the East Fan Room.*
  - *Continued duct and pipe work in the East Fan Room.*
- **Contract C-26007 (C4B) 72nd Street Station Cavern Mining and Lining**
  - **Rock Excavation**
    - *The Contractor has excavated 176,387 Bank Cubic Yards (95.5%) total to date. Main cavern excavation is complete.*
    - *Ancillary #1: The Contractor is at a depth of 87 feet from the top of decking (87.0% complete). Approximately 13 feet remain. Blasting is scheduled to continue through February, 2013.*
    - *Ancillary #2: The Contractor is at a depth of 81 feet from the top of decking (90.0% complete). Approximately 9 feet remain. Blasting is scheduled to continue through February, 2013.*
    - *Entrance #3: The Contractor is at a distance of 77 feet from the top of decking (86.0% complete). Approximately 13 feet remain. Blasting is scheduled to continue through February, 2013.*
  - **Concrete Phase**
    - *North Cross: Rebar installation and concrete placement for the arch is ongoing.*
    - *Main Cavern: Wall pours ongoing at the north end. Concrete invert ongoing at the south end. Waterproofing ongoing.*
    - *Stub Cavern: Rebar installation of arch is complete. Concrete placement to commence second week in February 2013.*
  - **Building Remediation (Additional Work Request)**
    - *Two buildings remaining (1405 2<sup>nd</sup> Avenue and 259 E. 71<sup>st</sup> Street).*
- **Contract C-26008 (C5B) 86<sup>th</sup> Street Station Cavern Mining and Lining**
  - *Work continued with 3 shifts. All surface operations end at 10:00PM daily.*
  - **North Shaft Area/South Open Cut Area**
    - *Completed the “breakthrough” between the north and south caverns. Completed the caverns top heading, rock bolting and the initial shotcrete placement. Continued with excavation and lowering the cavern “bench”.*
  - **Ancillary #1**
    - *Rock excavation at the Ancillary #1 portion of the South Open Cut continues to be temporarily leveled off at approximately Elevation 90.*

- **Ancillary #2**
  - *Continued with blasting in the open cut at Ancillary #2. Continued blasting in the cavern and made the initial “breakthrough” between the cavern and vertical open cut excavation.*
- **Entrance #1**
  - *Continued blasting and rock excavation in the Access Tunnel for Entrance #1. An 8’ separation will be established between the building excavations and cavern blasting/excavations. The remaining rock will be mined mechanically from the cavern.*
  - *Continued mechanical rock breakup, excavation and rock bolting. Work is at approximately Elevation 121.*
- **Entrance #2**
  - *Work at Entrance #2 continued to be delayed due to the impasse with the building owner (Yorkshire Towers) over access due to interference with the building construction street scaffolding.*
  - *At the Elevator Shaft, one more blast will take place from the street. Blasting will continue at the elevator access from the cavern. An 8’ separation will be established between the shaft and cavern excavations. The remaining rock will be mined mechanically from the cavern while the MPT is maintained above.*
- **Rock Excavation (for the week ending January 18, 2013)**

*\*As reported to the PMOC by the MTACC C-26008 Project Office*

  - *Total rock (estimated) for complete project – 154,623 BCY*
  - *Total rock excavated to date – 88,438 BCY (57%)*
  - *Summary by Area:*
    - North Cavern – 55,686 BCY (total); 35,637 BCY (to date); 64%*
    - South Cavern – 54,302 BCY (total); 39,419BCY (to date); 72.6%*
    - Ancillary #1 – 11,725 BCY (total); 6,041 BCY (to date); 51.5%*
    - Ancillary #2 – 4,830 BCY (total cut & cover); 2,806 BCY (to date); 58.1%*
    - Ancillary #2 – 7,480 BCY (total from cavern); 1,182 BCY to date); 15.8%*
    - Entrance #1 – 1,990 BCY (total from cut & cover); 715 BCY to date; 35.9%*
    - Entrance #1 – 1,800 BCY (total from cavern); 275 to date; 15.3%*
    - Entrance #2 – 14,237 BCY (total from cut & cover); 917 BCY to date; 6.4%*
    - Entrance #2 – 2,573 BCY (from cavern); 1,446 BCY; 56.2%*
  - *The tracking of total rock excavation (actual) from April 6, 2012 through January 18, 2013 vs. planned excavation shows the cumulative rock excavation production to date has moved ahead of the baseline schedule.*



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

- Contractor delivered 298 pieces of 78 feet (115-lb) rail and fasteners at NYCT - Linden Yard.
- Performed joint survey for asbestos prior to removal of signal equipment at 63<sup>rd</sup> Street.
- Review of shop drawings from the 63<sup>rd</sup> Street Station contractor is ongoing. Over 2,500 drawings reviewed. The design consultant (AA) is responding to CSJV comments.
- Ongoing review of 63<sup>rd</sup> Street Station and 96<sup>th</sup> Street Station Contractor's shop drawings for coordination and to avoid conflicts during field installation.

**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. *Quality issues during January 2013 include:*

<b>Contract Package C1</b>	
<b>Status:</b>	There were 40 NCRs written on the C1 contract. 16 of them involved concrete installation involving the following structural elements: <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>	Of the 40 NCRs written on the C1 contract, four are still open. <i>The two related to the slurry wall will be closed pending as-built survey data from the C2B contractor. The remaining two will be closed since there was a successful walk through in January. All four open NCRs should be closed in February or March 2013.</i> The status of the 16 involving concrete installation is as follows: <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 four. The PMOC recommends that the SAS Project Team continue their efforts to close these remaining four NCRs.
<b>Contract Package C2B</b>	
<b>Status:</b>	1. <i>In some instances Quality Work Plans (QWPs) were being submitted by the contractor's quality manager after the work had started.</i>



	2. <i>The contractor was behind in submitting their Daily Inspection Reports.</i>
<b>Observation:</b>	<p>1. <i>At the January 16, 2013 Monthly Quality Management Meeting, the SAS C2B Quality Manager emphasized that QWPs must be submitted by the SAS contractor and approved by the SAS Project Office prior to the commencement of work.</i></p> <p>2. <i>The SAS Quality Manager stressed that the C2B contractor must submit Inspection Daily Reports within a week of being written.</i></p>
<b>Concerns and Recommendations:</b>	<p>1. <i>Submittal of QWPs after work has started occurred at the beginning of this contract and has not recurred since. This issue is closed but the PMOC will monitor the process and reopen it if warranted.</i></p> <p>2. <i>The PMOC is concerned that the contractor is delinquent in submitting daily reports on both the C2A and C2B contracts. This situation occurred earlier on the C2A contract and the C2A contractor management added additional administrative support to alleviate this problem. The PMOC recommends that they do so again and continue to provide additional support as needed so that this problem does not recur.</i></p>
<b>Contract Package C4B</b>	
<b>Status:</b>	<i>The independent test lab for the C4B contractor did not follow the ASTM reporting format when submitting concrete break reports, e.g., the reports did not identify concrete mix identification and failures after seven days.</i>
<b>Observation:</b>	<i>To assure consistency in reporting, a representative from the C4B's independent test lab attended the January 29, 2013 Monthly Quality Management Meeting and he agreed to follow the ASTM reporting format when submitting concrete break reports.</i>
<b>Concerns and Recommendations:</b>	<i>The PMOC was concerned that it took many months for a representative from the C4B's independent test lab to attend a Monthly Quality Management Meeting. Since the representative agreed to follow the ASTM reporting format, this issue is closed but the PMOC will monitor the process and reopen the issue if warranted.</i>
<b>Contract Package C3</b>	
<b>Status:</b>	<i>Through January 31, 2013, a total of 28 NCRs had been issued. 23 have been closed by both the contractor and MTACC. 5 NCRs are open.</i>
<b>Observation:</b>	<i>It is the PMOC's opinion that the Quality System is functioning properly on this contract at this time.</i>
<b>Concerns and Recommendations:</b>	<i>None at this time.</i>



<b>Contract Package C5B</b>	
<b>Status:</b>	<i>Through January 31, 2013 a total of 10 NCRs had been issued. 9 have been closed by both the contractor and MTACC. 1 NCR is open.</i>
<b>Observation:</b>	<i>It is the PMOC's opinion that the Quality System is functioning properly on this contract at this time.</i>
<b>Concerns and Recommendations:</b>	<i>None at this time.</i>

## 2.0 SCHEDULE DATA

*Integrated Project Schedule (IPS) Update #78 was received on January 28, 2013 and is based on a Data Date of January 1, 2013. This update contained ".PDF" schedule reports for all remaining work, the critical/longest path, variance tabulation between Updates # 77 and 78, summary schedule and ".XER" schedule files for the IPS and all active construction contracts. 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 MTACC's target Revenue Service Date (RSD) of December 30, 2016.*

*During January 2013, the following changes in the Integrated Project Schedule include:*

- *MTACC conditionally approved the C2B baseline construction schedule. This schedule will now be updated to reflect out-of-sequence progress made possible through cooperation with C2A and C2B access delays currently forecast by the C2A schedule.*
- *C2A Interim Milestone 1 and Substantial Completion maintained schedule when compared to last period, however Milestone 2 did experience approximately 10 CD of slippage which is considered to be responsibility of the Contractor to recover.*
- *No further delay was reported for C3 Interim Milestones #3 and #4, however additional delays were reported for C3 Interim Milestone #6 (Ancillary #1 – 43 CD) and Substantial Completion (12 CD).*
- *C4B Interim Milestone #1 recovered seven (7) CD this period but is still reported as approximately 4.5 MO behind schedule. Substantial Completion was delayed by ten (10) CD this period and is reported as approximately 3.5 MO behind schedule.*
- *C5B Interim Milestone #1 recovered twelve (12) CD this period and is reported as eight (8) CD behind schedule. Substantial Completion was delayed by twelve (12) CD this period and is reported as 26 CD behind schedule.*
- *Procurement activities for contracts C4C and C5C were reported as "on schedule" this period.*

**Project Critical Path:** The most "critical" or longest schedule path that spans between the current data date of January 1, 2013 and the project completion date (RSD) consists of three distinct elements:

1. *The initial portion of this path involves procurement activities for the C5C construction package, which is currently in progress. This portion of the critical path has a float of 19*

*WD and concludes with the contract award on May 24, 2013. It is noted that the C5C procurement schedule concluding with the award of C5C on May 24, 2013 includes approximately 6 weeks of float, resulting in a reasonably high level of confidence that this date will be achieved.*

2. 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 C6 milestone constrains subsequent C6 work activities so they cannot start before March 18, 2015.
3. The final portion of this path involves traction power installation and 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:

**+7 WD:** *This path is initiated by the design, 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” between completion of traction power design and the start of equipment manufacture. It is unclear why manufacture of DC breakers at the 86<sup>th</sup> Street CBH controls the start of manufacture of traction power equipment at the 96<sup>th</sup> Street Station.*

*It is understood 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 is initiated by construction of main cavern (south) inverts, walls and arches, electrical bench and end walls at the 72<sup>nd</sup> Street Station by the C4B contractor. This work is currently underway and is scheduled to complete by February 7, 2014, at which time, the area will be “handed-off” to the C4C contractor for architectural and MEP equipment installation. On November 13, 2014 signal system installation will start throughout the 72<sup>nd</sup> Street Station and continue through signal system testing until July 4, 2016, at which time the work will be made available to NYCT for operational testing.*

*Minimal progress on invert construction resulted in the heavy/civil construction portion of this path losing approximately 19 days of float this reporting period. The start of signal system installation (C6C4 SG60) is now scheduled to start on November 6, 2014, 6 CD later than previously reported. The C4C and C6 portions of this path were previously reported at part of a +18 WD float path.*

**+17 WD:** *This path is initiated by the “design” of the communications system at the 96<sup>th</sup> Street Station, which is reportedly underway. During this reporting period, the completion date was delayed from January 16, 2015 to February 16, 2015. No analytical basis for this delay has been provided. The original duration of this activity exceeds two years. Given the fact that MTACC provided a complete design for the SAS project, it is unclear what design activities remain that require this extraordinary time period.*

*Following design, installation of hardware and software is forecast to require approximately 18 months, completing on May 16, 2016 and followed by integrated system and proof of operation testing.*

*The PMOC is extremely concerned that the lack of definition and excessive duration of certain IPS activities near the critical path such as described here compromises the value and usefulness of the IPS. The PMOC recommends the IPS be reviewed for similar activities and they be replaced with defined, meaningful activities and logic that are useful in the management of the project.*

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

**+31 WD:** *This path follows the phased construction of Entrance 32 for the 86<sup>th</sup> Street Station, located on the northeast corner of Second Avenue at 86<sup>th</sup> Street. Heavy civil construction is currently being performed via the C5B contract. This area will be turned over to the C5C contractor for architectural and MEP construction on October 15, 2014. C5C will complete its work and turn the area over to C6 for traction power work on February 18, 2015. At this time, this path joins the critical path of the project, described above.*

*Work currently being performed by the building owner at Second Avenue and 86<sup>th</sup> Street (Yorkshire Tower) is a potential source of delay. To date, the C5B contractor has worked around the obstruction as best as possible. The work lost over 58 CD of schedule float as a result of delay and schedule resequencing to address the current obstruction.*

**+38 WD:** *The detail design and development of signal system shop drawings controls the start of the +40 WD and the +8 WD paths. After completion of signal system detailing and approval on June 18, 2013, the start of equipment manufacture is staggered in the following order; 63<sup>rd</sup> St. → 72<sup>nd</sup> St. → 96<sup>th</sup> St. → 86<sup>th</sup> St. Development and review of system shop drawings is currently in progress, with equipment delivery for 86<sup>th</sup> St. currently scheduled for November 8, 2013. This path follows the signal system installation at 86<sup>th</sup> Street through testing and the substantial completion of the C6 Contract. This path joins the critical path on June 24, 2016 with the handoff to*

*NYCT for operational testing, including dispatch tower testing, proof of route familiarity and new systems and equipment familiarization.*

**+39 WD:** *Provide access and completion of “cost-to-cure” work at 63<sup>rd</sup> Street Station. Completion of all “cost-to-cure” work is currently scheduled for July 24, 2013, followed by completion of Entrance #1 construction, Entrance #3 construction and completion of construction package C3 on October 22, 2014. Subsequent to C3 Substantial Completion, this path goes through three milestones and one activity:*

- 1. Install Track @ 63<sup>rd</sup> Street Station (C6C3 TK20) will be performed by the C6 Contract and scheduled to start immediately upon completion of C3. The completion of this activity does not appear to be logically connected to any other schedule activity, resulting in a schedule “open end”. This is a potential concern in that it indicates the C6 trackwork can be performed anytime between October 22, 2014 and December 30, 2016 with no adverse impact to the project schedule. It also suggests there is no logical or preferential relationship with track installation or related systems installation activity throughout the project. An “open end” may also result in artificially high schedule float calculations.*
- 2. G3/G4 Track through 63<sup>rd</sup> Street “Shared Access” (C6AR63-4). This C6 milestone controls the start of signal system installation and testing throughout the 63<sup>rd</sup> Street Station area and is preceded by the substantial completion of C3. This path currently has +43 CD of schedule float and extends continuously from its start through pre-operational testing in May 2016. A schedule lag of -88 CD now allows this activity to start in advance of the C3 Substantial Completion date. The schedule currently suggests that C3 delays at Entrance #1 will not impact C6. If this is the case, the existing schedule relationships should be modified to reflect the revised understanding. The PMOC believes the use of negative lags in a situation such as this is inappropriate.*
- 3. Traction Power rooms @ 63<sup>rd</sup> Street Station “Full Access” (C6AR63-5). This milestone (June 18, 2014) requires the prior Substantial Completion of the C3 package, which is currently for October 22, 2014. The forecast delays to C3 are not being allowed to impact this follow-on C6 activity as a result of a -88 CD lag, similar to that discussed above. The same situation appears to exist for Activity C6AR63-6 A” Other Areas @ 63<sup>rd</sup> Street “Shared Access”.*

*Apparently the MTACC believes it can recover these delays and the affected C6 work will be able to proceed unimpacted. However, the current project understanding and conditions do not yet support this position. The PMOC is concerned that “adjustments” of this nature distort the IPS and compromise its value. The resultant lack of “transparency” is contrary to the conditions and intent of the ELPEP and Schedule Management Plan. The PMOC recommends these schedule “adjustments” be resolved as part of the next IPS update.*

**+40 WD:** *86<sup>th</sup> Street Station, south cavern excavation. This path follows rock excavation in the south cavern, followed by concrete liner installation and waterproofing in the north cavern. C5B Substantial Completion and handoff of all remaining work areas to C5C*

will occur on October 1, 2014. C5C will prepare and handoff traction power work areas to C6 on February 18, 2015, at which time this path merges with the project critical path.

**Milestone Summary:** A tabulation of current schedule performance against contractual milestones is presented in the following table.

Pkg	MS	Description	Dates		Affected Pkg.	Var (CD) (5) = (2) - (4)	Sch Float	Notes
			Contract (1)	Forecast (4)				
C1	#1	<b>Complete TBM Run #1</b>	12/18/09	N/A		N/A		Work complete.
C1	SS	<b>Substantial Completion; complete TBM Run #2 and all concrete work</b>	07/20/10	N/A		N/A		Follow-on contracts proceeding w/o impact.
C2A	#1	99th to 97th Street; surface and underground work complete including Ancillary #2	12/07/11	07/15/13	C2B	-128	103	MTACC and Contractor have reached tentative agreement on delays to Substantial Completion through July 15, 2013. Cost of delay is TBD.
C2A	#2	92nd to 95th Street; surface and underground work complete including Ancillary #1, Entrances 1 & 2	08/07/12	06/24/13	C2B	-321	85- >137	
C2A	SS	Completion of all remaining work - 95th to 97th Streets including Entrance #3.	01/07/13	07/15/13	C2B	-84	141	
C3	#1	<b>Completion of all work on the G3 trackway area and existing vent shaft connection to street level</b>	01/13/13	N/A	C4B	N/A	N/A	Contract Milestones have been superseded. C3/C4B MOU provided C4B access to these areas in June 2012.
C3	#2	<b>Completion of all work on the G4 trackway area limits</b>	01/13/13	N/A	C4B	N/A	N/A	
C3	#3	Completion of all Work on the Mezzanine levels associated with the installation of conduits, raceways, and other installations necessary to allow for cable pulling related to communications work	04/15/13	11/27/13	C6	-226	134	Driven primarily by structural steel delay. Structural steel forecast completion = mid-February 2013.
C3	#4	Completion of all Work on the Lower and Upper Platforms. Completion of all Signals Rooms.	10/14/13	12/09/13	C6	-56	181	Driven primarily by structural steel delay. Structural steel forecast completion = mid-February 2013.
C3	#5	Completion of all work within the underground parking garage at 188 East 64th Street	08/30/13	08/30/13		0	324	



Pkg	MS	Description	Dates		Affected Pkg.	Var (CD) (5) = (2) - (4)	Sch Float	Notes
			Contract (1)	Forecast (4)				
	#6	Complete work @ Ancillary #1	07/09/12	06/13/13		-339	344	Delayed start of work (11/28/12) due to access agreement with parking garage owner.
C3	SS	Substantial Completion	05/13/14	10/22/14	C6	-162	399	Driven by delays to Entrance #1. Delay impacts "unimpeded access" for C6 @ track level.
C4B	#1	Completion of Ancillary #2 shaft & adits, availability of cavern from Grid Line 17 north, west of Entrance #2 adit	04/30/13	08/15/13	C4C	-51	88	Out-of-sequence work by Contractor has distorted the evaluation of schedule progress. Schedule variance currently not considered significant.
C4B	SS	Substantial Completion	10/31/13	02/10/14	C4C	-69	18	
C5A	#1	<b>North Shaft - complete.</b>	<b>05/07/10</b>	<b>N/A</b>	<b>C4B</b>	<b>N/A</b>		Work complete.
C5A	#2	<b>South Shaft - complete</b>	<b>12/08/10</b>	<b>N/A</b>	<b>C4B</b>	<b>N/A</b>		Follow-on contract proceeding w/o impact.
C5A	SS	<b>Substantial Completion</b>	<b>02/08/11</b>	<b>N/A</b>	<b>C4B</b>	<b>N/A</b>		
C5B	#1	Complete all Station Cavern work south of Grid Line 15 and all surface work south of 85th Street centerline.	03/04/14	03/12/14	C5C	-8	44	Variances within measureable schedule accuracy. Rate of progress improving. Progress delays to be evaluated.
C5B	SS	Substantial Completion	09/04/14	10/01/14	C5C	-27	31	
Notes:								
1.	All schedule dates based upon January 1, 2013 update (IPS Update #78)							
2.	For contract packages not shown - no variance between forecast and contract dates							
3.	Information in BOLD indicates that the Milestone is closed							

**Quarterly Activity Tracking:** The initial tabulation of select schedule activity performance for the 4<sup>th</sup> Qtr. 2012 is contained in the accompanying Table 3. Activities not completed this Quarter will be "carried over" into the 1<sup>st</sup> Quarter 2013 tracking log. A summary of schedule performance includes the following:

Summary	
# Calendar Days Elapsed	92
Average $\Delta$ from Baseline - all activities	97
Average $\Delta$ from Baseline - completed activities	72
Average $\Delta$ from Baseline - ongoing activities	118
Average Monthly $\Delta$	12



<i>Number Activities Sampled</i>	42
<i>Number Activities Completed</i>	19
<b>4th Qtr. Activity Summary</b>	
<i># Activities Forecast this Qtr.</i>	20
<i># Activities forecast to complete this Qtr.</i>	18
<i># Activities completed this Qtr.</i>	6
<i># Activities on/ahead of baseline</i>	0
<i># Activities behind baseline</i>	14
<i>Average <math>\Delta</math> from Baseline (CD)</i>	37
<i>Average Monthly <math>\Delta</math> (CD)</i>	20
<i>Avg TF - Open Activities</i>	156

Based on the sampling of activities in Table 3, the PMOC notes the following:

- *Several C3 activities tracked via Table 3 were delayed and/or reported virtually no progress during this reporting period. This includes the development and approval of structural steel shop drawings. This project continues to experience substantial delays involving multiple work activities.*
- *Both outstanding construction procurements (C4C, C5C) maintained schedule during this period.*
- *Six of eighteen activities originally forecast to complete during the 4<sup>th</sup> Quarter were actually completed. An additional 9 of these activities are forecast to complete in January 2013.*
- *Preconstruction engineering and procurement activities are predominant on C6 at this time. These activities are of such long duration and minimal detail that they do not add any value to this report.*

*This sampling of schedule activities suggests that schedule performance for the month of December 2012 (reporting period) appears to have been adequate to achieve overall project schedule goals. This sampling is based on a limited number of activities and is one component of the overall review and evaluation of the SAS Phase 1 schedule.*

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

- **Forecast Revenue Service Date**
  - ELPEP Requirement: February 28, 2018
    - Current Forecast: December 30, 2016
- **Minimum schedule contingency (measured against February 28, 2018 RSD)**
  - ELPEP Requirement: 240 CD
    - Current Forecast: 513 CD

- 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 = 39 WD*
- Minimum Allowable Secondary Float Path
  - ELPEP Requirement: 25 Calendar Days (approximately 18 WD)
    - *Current Forecast: Independent float paths for signal system procurement and installation (+7 WD), C4B construction (+12 WD) and communication system “design” at 96<sup>th</sup> Street Station (+17 WD.)*
- Secondary Schedule Mitigation (critical path compression)
  - ELPEP Requirement: 125 CD
    - Current Forecast: Schedule mitigation efforts are in progress.

The MTACC has demonstrated that it uses the IPS to actively plan, organize, direct and control individual packages and the overall project, and to provide reliable forecasts of the SAS RSD and other major project milestones.

*The PMOC considers the reporting and updating procedures previously discussed to be significant issues that do not support development of the specific deliverables or the intangible goals established by the ELPEP. The PMOC recommends a review and clarification of the procedures involved and a clarification of the manner by which potential schedule impacts and delays will be reported for the remainder of the project.*

**Schedule Contingency:** IPS Update #78 continues to forecast all Phase 1 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 MTACC’s target RSD of December 30, 2016 and a 513 CD contingency when measured against the FTA Risk-Informed RSD of February 28, 2018.

### 3.0 COST DATA

*Based upon financial expenditures reported by the MTACC through January 31, 2013, SAS Phase I is approximately 48.3 % complete. The completion status of the active construction contracts through January 31, 2013, also based upon reported expenditures through that date, is as follows:*

- C26002 (Tunnel Boring) – 97.0%
- C26005 (96th Street Station) – 87.9%
- C26010 (96<sup>th</sup> Street Station) – 4.3%
- C26013 (86th Street Station) – 100%
- C26008 (86<sup>th</sup> Street Station) – 42.8%
- C26006 (63<sup>rd</sup> Street Station) – 35.5%

- C26007 (72nd Street Station) – 67.7%
- C26009 (Systems) – 5.4%

Aggregate Construction % Completion:

- 82% of all construction work is under contract
- 56.4% of active construction contracts are complete
- 46.1% of all construction is complete

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

- Value of construction in place this period = \$57,142,614/MO
- Estimated value of construction remaining = \$1,456,787,235
- Target construction completion = August 18, 2016
- # Months remaining = 42.6

Average rate of construction required to achieve target completion date = \$33,398,440/MO

Soft Cost expenditures (not including real estate, OCIP, etc.) reported this period by MTACC totaled \$4.95M. Assuming this rate of expenditure to be reasonably constant over the remainder of the project, no additional contingency transfers to soft cost categories will be required, although some budget redistribution within soft cost categories may be necessary.

The average progress (payments) achieved over the most recent six month period is \$45,664,785. Based on a review of cost data for January 2013, it appears that the project continues to experience a significant increase in construction progress and that adequate overall progress was made on the project to achieve the RSD of December 30, 2016.

**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. [REDACTED]

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

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

	<u>Executed AWOs</u>	<u>AWO Exposure</u>
January 2013	\$91,475,896	\$124,334,884
December 2012	<u>\$91,370,538</u>	<u>\$122,923,781</u>
Change	\$ 105,358	\$1,411,103
Change	.12%	1.15%



The change in AWO Exposure was driven by the following:

1. *Contract C2A: Estimated AWO exposure for this contract increased by \$691,653 as a result of the initial valuation of AWOs #128, 131 and 133 as well as reductions the estimated valuation of AWOs #113, 124, 127, 134 and 138.*
2. *Contract C2B: Estimated AWO exposure for this contract increased by \$371,249 as a result of the initial evaluation of AWO # 9.*
3. *Contract C3: Estimated AWO exposure for this contract increased by \$290,181 as a result of the initial valuation of AWO # 31, 32, 33 and 34 as well as adjustments to the valuation of AWO # 12, 21, 27, 28, 29 and 30.*
4. *Contract C5B: Estimated AWO exposure for this contract increased by \$260,542 as a result of the initial valuation of AWOs #16, 17, 19, 20, 25 and 39 as well as an adjustment in the estimated value of AWO # 38.*

The change in Executed AWO Value was minimal, totaling \$105,358 for all active contracts.

As of January 31, 2013, the status of Additional Work Orders (AWOs) on Phase 1 of the Second Avenue Subway Project is summarized as follows:

Contract / (Package)	% Complete	Award	Exposure		Executed	
			\$	% of Award	\$	% of Award
C26002 (1)	97.00%	\$337,025,000	\$53,095,231	15.75%	\$45,212,443	13.42%
C26005 (2A)	87.90%	\$325,000,000	\$48,280,643	14.86%	\$35,137,212	10.81%
C26010 (2B)	4.30%	\$324,600,000	\$973,972	0.30%	\$0	0.00%
C26006 (3)	35.50%	\$176,450,000	\$5,235,547	2.97%	\$1,128,890	0.64%
C26007 (4B)	67.70%	\$447,180,260	\$1,458,508	0.33%	\$3,827,732	0.86%
C26013 (5A)	100.00%	\$34,070,039	\$6,717,318	19.72%	\$4,285,471	12.58%
C26008 (5B)	42.75%	\$301,860,000	\$8,043,763	2.66%	\$1,614,788	0.53%
C26009(6)	5.40%	\$261,900,000	\$269,360	0.10%	\$269,360	0.10%
<b>TOTAL</b>		\$2,208,085,299	\$124,074,342	5.62%	\$91,475,896	4.14%

To date, approximately \$1,245,970,064 (56.43%) worth of awarded construction work has been completed. As a % of work completed, the AWO exposure for these contracts = 9.96% and the executed AWO % = 7.34%. Based on performance to date, a forecast of total AWO expenditure of approximately \$200M appears reasonable. This compares favorably with the \$229M AWO contingency contained in the MTACC CWB. The PMOC notes that AWO expenditures for certain construction contract packages are trending above established budget values and industry "standards". 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 is in the process of

*preparing Update #10 of the Project Cost Estimate, which will include a complete reforecast of remaining soft cost.*

**Cost Contingency:** *During January 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.*

*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.*

Category	Percentage	Percentage	Percentage
Very good	10%	10%	10%
Good	20%	20%	20%
Fair	30%	30%	30%
Poor	40%	40%	40%
Very poor	50%	50%	50%

## 4.0 RISK MANAGEMENT

*Risk Mitigation Meeting No. 22 was held on January 30, 2013. Recent risk management activities included:*

- *Risk Mitigation Meeting No. 21 on December 20, 2012.*
- *Completed C5C Risk Workshop.*
- *Started update of the Risk Register. The Register will be completely updated by February 6, 2013.*

*Risks reviewed and updated during Meeting No. 22 include:*

- 1) *System Safety Certification (Risk CNS 8 (C6)):*
- 2) *Schedule risk C5B, C2B, C4C, C5C and C6*
- 3) *Interim Openings for 63<sup>rd</sup> Street Station*
- 4) *Risk C4B Entrance #1 (301 East 69<sup>th</sup> Street)*
- 5) *C3 Entrance #1 (200 East 63<sup>rd</sup> Street)*
- 6) *Processing of Communication Submittals*
- 7) *Meeting DBE Goals*
- 8) *Interface among Trades*

*The risks considered at Risk Meeting No. 22 are essentially the same risks which have been reviewed at these meetings for the past several months. In the PMOC's opinion, the SAS Project Team is actively managing retained risks and generally achieving a moderate to high level of*

mitigation of the overall growth of project cost. However, recent Risk Mitigation Meetings suggest that:

1. At this time there is some uncertainty in determining process and selection criteria through which the “next generation” of risks are identified and elevated for additional assessment, evaluation and response planning.
2. There is also some confusion as to the scope of the Risk Mitigation Meeting; a detailed evaluation and discussion of specific risk or a management status review of major risk and the actions being taken to manage same.
3. There continues to be limited participation from construction field staff at these meetings.

Several of the project implementation procedures provide guidance and direction in this area:

- The SAS Project Management Plan - Rev 8.1, Section 6.1.2 describes the Risk Management Process. The Risk Manager is identified as a facilitator of the process, from Identification through Management; however there are no specific procedures identified or referenced. Support for the Risk Manager and the resources performing the Identification, Assessment or Management of various risks are vaguely defined by terms such as “a group of experienced individuals”.
- The SAS Risk Management Plan, Section 5.5 states in part; “The Quantitative Risk Analysis will provide a list of the most significant risks affecting the contingency requirements allowing a treatment plan to be developed for each of these risks. These risks are retained by the Project, either fully or partially.....” In Section 5.8, this Plan further states; “Monthly Risk Mitigation meetings are held to monitor, update and define strategies to follow on risk treatments. The SAS meetings are facilitated by the Project Risk Manager and the attendees include, but are not limited to, the Program Executive, Deputy Program Executive, Construction Manager, Design Manager, Utility Coordinator, and optional staff directly involved in the mitigation or identification of a specific risk on the meeting agenda. The agenda for the Monthly Mitigation Risk Meeting are driven by the set of priority risks that exist at that time as determined by risk analysis results, qualitative assessment or as directed by the Project Risk Manager/Project Senior Management.”
- Section 5.2.5 of MTACC Project Procedure AD.19 – Risk Management states in part that “Within 1 week of distributing the updated project Risk Register, the Risk Manager should convene a monthly risk review meeting to summarize the updated register and discuss top risks in terms of cost, schedule, and timing of occurrence as well as the associated mitigation strategies.”

In an effort to add value and maintain compliance with the applicable project the PMOC recommends incorporation of steps similar to those in the following list in the Risk Mitigation effort:

1. Each update of the Risk Register should seek to clarify and add detail to risks that were previously ill- defined or lacking in detail
2. As part of the register update process, additional risks should be solicited from individual project construction management staffs as well as senior project management personnel.

3. *After the register is updated, priority risks should be identified by the Risk Manager based upon potential cost and schedule impact.*
4. *Priority risks should be distributed to Risk Mitigation Meeting attendees for review prior to the Risk Mitigation Meeting. The relationship between this group and the Risk Assessment Committee, referenced in the Risk Management Plan is unclear.*
5. *Priority risks will be reviewed at the monthly Risk Mitigation Meeting and any necessary follow-up activity identified. Adjustment of potential cost/schedule consequences and probability may also be considered.*
6. *If follow-up is required for any priority risk, the manner by which the follow-up effort will be executed will be determined.*

## 5.0 ELPEP

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

- **Technical Capacity and Capability (TCC):** 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 early 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 MTACC. 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 contractor's safety management held tool box meetings, trained new employees, monitored the work areas individually and with the Consultant Construction Manager (CCM) Safety and OCIP representatives, and promptly investigated safety incidents. Safety Oversight by the CCM continued with Quarterly Assessments of selected contractors and sharing of Lessons Learned during the project wide monthly Safety Meeting.*

*Since the start of construction 4,973,631 hours have been logged with 52 lost time and 135 recordable incidents documented. The total hours and incidents equates to a lost time rate of 2.09 and a recordable rate of 5.43. The US Bureau of Labor Statistics (BLS) national rate (Heavy & Civil construction) for lost time and recordable incidents is 2.2 and 3.8 respectively. Although the recordable rate of 5.43 is above the BLS national it has been trending downward for the last six months.*

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

## **7.0 ISSUES AND RECOMMENDATIONS**

**Multi-Contract Coordination:** The draft results of the C4C Risk Analysis reinforce the opinion that that management of the contract interfaces is one of the keys to achieving the project cost and schedule goals. The SAS Project Team has identified contract interfaces and developed tools that should assist in managing these interfaces. However, problems encountered to date at the C1/C2A primary interface involve scope of work and quality of work issues. The PMOC recommends that project procedures involving correction of defective work, punch list development and construction scope control be reviewed and enhanced as required to support this critical element of the project.

### **Risk Management and Mitigation:**

**Safety Certification:** The safety certification process has been identified as a risk to project completion. The PMOC has previously expressed concern that consistent progress would not be achieved until adequate, dedicated resources were available to coordinate the efforts.

*Subsequently a Safety and Security Certification Manager was added to the CCM Core Project Staff to manage the SAS Safety Certification process.*

*The process of updating and revising the SAS Project's System Safety Management Plan has commenced to provide more detail and accurately reflect the project's management of the Safety and Security Certification Program during the construction, testing and pre-revenue operation phases. This action also serves to assist with the inclusion of Safety and Security Certification activities into the contract and project schedule.*

Now that staffing is complete for this effort, the PMOC recommends the Safety and Security Certification Committee hold regular meetings to direct and monitor the progress of this work.

**Schedule Monitoring – Contract C6:** *Preconstruction engineering and equipment procurement are the primary activities on this package at this time. Schedule activities representing this work are of such long duration and general scope that they are not useful in monitoring progress or identifying problem issues. The PMOC recommends supplemental reporting be developed for those activities of this type that are either “near-critical” or traditionally problematic.*

**Schedule Performance: Contract C3:** *This issue continues to be a concern as delays continue and the project's ability to achieve its initial milestone turnover of areas to the C6 contractor appears to be in serious jeopardy. Since the November 30, 2012 re-baseline of Area 5 steel completion to February 2013, this work area has realized further schedule slippage.*

**Schedule Management and Reporting:** *The PMOC is concerned that, in select cases, the IPS is being manipulated in such a way as to mask and conceal the result of schedule delays encountered on individual packages on the overall project schedule. Refer to the discussion of*



*the +39 CD Secondary Path in Section 2.0 of this report for an example. In this instance, it is likely the MTACC believes it can overcome the impact of these delays and maintain the project schedule however; the method chosen to adjust the schedule, combined with the absence of a narrative explanation of the situation represents a significant flaw in the overall schedule reporting methodology. The PMOC recommends the SAS Schedule Management Plan be updated to better document and describe the manner by which “potential delays” to the IPS will be managed and reported upon in the monthly updates.*

**Risk Management and Mitigation:** *The SAS Project Team has used the risk management process to identify, mitigate and manage retained project risks. At present, the scope of this effort and its integration into the overall project management would benefit from a “mid-course” review and adjustment to ensure its continued contribution to the project.*

## **APPENDIX A - ACRONYMS**

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

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

## APPENDIX B – TABLES

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**Table 1 - Summary of Schedule Dates**

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

A = Actual

**Table 2 - Schedule Contingency**

IPS Update #	71	74	75	76	77	78
Data Date	06/01/12	09/01/12	10/01/12	11/1/12	12/1/12	1/1/13
Contingency (CD)						
RSD=12/31/2016	90	No	90	90	90	90
RSD=02/28/2018	513	Report	513	513	513	513

**Table 3 – 4<sup>th</sup> Quarter 2012 Schedule Milestone Comparison**

			Milestone Updates				
Pkg.	Act.	Description	Baseline	M-3	BL	Month	TF
<b>4th Qtr 2011 Tracking Milestones (Carryover)</b>			<b>1-Oct-11</b>	<b>1-Jan-13</b>			
C3	LP025	Complete Demo – Lower Platform	31-May-12	14-Dec-12 A	197	0	-
<b>1st Qtr 2012 Tracking Milestones (Carryover)</b>			<b>1-Jan-12</b>	<b>1-Jan-13</b>			
C3	005	Complete Sub/App Struct. Steel Shop Dwgs	20-Jul-12	27-Feb-13	222	28	60
	A1010	Begin Demo - Ancil #1	2-May-12	28-Nov-12 A	210	-23	-
	EN105	Begin Structural Work - Ent #1	22-May-12	5-Aug-13	440	-140	39
	MZB05	Compl. Asbestos/Lead Abatement - Fan Plant	27-Mar-12	14-Dec-12 A	262	7	-
	010	Begin Elevator Fab	7-Mar-12	3-Jan-13	302	0	172
C4B	C4B ENT1200A	Contractor (Start) Cost to Cure Work	2-Mar-12	1-Feb-13	336	0	224
<b>2nd Qtr 2012 Tracking Milestones</b>			<b>1-Apr-12</b>	<b>1-Jan-13</b>			
C2A	E105	Relocate MEP @ Rainbow Hardware (AWO98)	25-Jun-12	2-Jan-13	191	30	141
C3	MZC01/MZC05	Asbestos/Lead Abatement & Demo-Lower Mezz	27-Apr-12	27-Nov-12 A	214		-
	MZ5001/010/015	Lead Abatement/Demo - M1->M6	10-Jul-12	8-Jan-13	182	32	68
C4B	72C1430	Start Main Cavern Invert F/R/P/S (Start)	24-Jul-12	3-Dec-12 A	132	-4	-
<b>3rd Qtr 2012 Tracking Milestones</b>			<b>1-Jul-12</b>	<b>1-Jan-13</b>			
C2A	A126	Exc. Upper Level/Install Decking-Accil. #1	27-Sep-12	30-Nov-12 A	64	0	-
C3	UP001	Demo Upper Platform (Complete)	19-Aug-12	13-Jan-13	147	35	92
	MZC15	Structural Work Lower Mezz (Complete)	10-Sep-12	8-Jan-13	120	32	108
	MZ5020	Structural Work 2nd Mezz (Complete)	11-Oct-12	11-Jan-13	92	30	110
C4B	NCC1055	North X-Over Invert F/R/P/S (Complete)	9-Oct-12	12-Oct-12 A	3	-	-
C4C	25d	Bid Opening	27-Nov-12	18-Dec-12 A	21	-	-
C5B	S110b	South Cavern Exc. -	12-Sep-12	28-Nov-12 A	77	-	-



			Milestone Updates				
Pkg.	Act.	Description	Baseline	M-3	BL Δ	Month Δ	TF
		Dev. & Top Heading (Complete)					
	S150	North Cavern Exc. - Dev & Top Heading (Complete)	12-Oct-12	14-Nov-12 A	33	-	-
	E245	Ent #2 South SOE/Decking (Complete)	27-Sep-12	5-Oct-12 A	8	-	-
	E120	Ent #1 Underpinning (Complete)	13-Sep-12	27-Oct-12 A	44	-	-
C5C	20k	Authorization to Advertise	27-Nov-12	21-Dec-12 A	24	0	-
<b>4th Qtr 2012 Tracking Milestones</b>			<b>1-Oct-12</b>	<b>1-Jan-13</b>			
C2A	6S235	Pour Invert + Embedded MEP 93-95 (MS#2)	28-Dec-12	9-Jan-13	12	22	145
	A126	Exc. Upper Level/Inst. Decking; Anc. #1	8-Nov-12	30-Nov-12 A	22	-	-
	M2-STA	Milestone 2 - 92nd - 95th Complete	28-Dec-12	9-Jan-13	12	22	145
	A129	Inst. Tier 2 Bracing & Exc to Tier 3 - St 6A	27-Dec-12	1-Feb-13	36	23	85
C2B	403	Complete Tunnel Lead Abatement	16-Nov-12	2-Jan-13	47	5	125
	415	Fireproof Steel	21-Feb-13	1-May-13	69	29	180
C3	LP010	Conc Stairs & Wall - Lowe Platform Area 6	30-Nov-12	9-Jan-13	40	22	362
	UP045	Reframe Steel/Construct Platform	29-Nov-12	5-Feb-13	68	27	334
	MZB25	Structural Work-East Fan Plant	20-Dec-12	29-Jan-13	40	20	253
C4B	72CN1430	Main Cavern North Stn Invert F/R/P/S	4-Dec-12	16-Nov-12 A	-18	-	-
	G3S11140	G3/S1 Cavern II Wall F/R/P/S	13-Dec-12	3-Jan-13	21	30	86
	NCC1070	North Crossover Wall F/R/P/S	30-Nov-12	30-Jan-13	61	15	108
	G4T1020	G4 TBM Tunnel Invert F/P/S	4-Dec-12	9-Jan-13	36	-1	18
C4C	25d	Bid	27-Nov-12	18-Dec-12 A	21	0	-

			Milestone Updates					
					BL	Month		
Pkg.	Act.	Description	Baseline	M-3		Δ	Δ	TF
		Opening(w/contingency)						
C5B	S150	North Cavern Exc - Dev. & Top Heading	5-Nov-12	14-Nov-12	A	9	-	-
	XP1S110	South Cross Passage-Conc Lining	13-Dec-12	5-Feb-13		54	60	220
C5C	20j	Final Sign Off - DM	16-Nov-12	30-Nov-12	A	14	-	-
	20m	Advertise (for bids)	4-Dec-12	31-Dec-12	A	27	-3	-
C6P	150	Traction Power SS & CBH Design	23-Nov-12	29-Jan-13		67	32	7
C6T	160	Track & SWP Design	4-Jan-13	25-Apr-13		111	22	113

**Table 4 - Project Budget/Cost** 

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of January 31, 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>2,150.341</b>	<b>40.82</b>
<b>Financing Cost</b>	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>2,150.341</b>	<b>40.82</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>660.833</b>	<b>12.54</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>586.940</b>	<b>11.14</b>
5309 New Starts share	1,300.000	100	990.049		1,300.000	23.68	586.940	11.14
<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>1,489.508</b>	<b>28.28</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 MTACC's Grant Management Department.

\*\* Current MTA Board approved budget.



[REDACTED]

[REDACTED]




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

Std. Cost Category (SCC)	Description	FFGA	MTA's Current Working Budget (12/31/12_
10	Guideway & Track Elements	\$612,404,000	\$638,107,000
20	Stations, Stops, Terminals, Intermodal	\$1,092,836,000	\$1,294,629,000
30	Support Facilities	0	\$0
40	Site Work & Special Conditions	\$276,229,000	\$534,865,000
50	Systems	\$322,708,000	\$265,792,000
60	ROW, Land, Existing Improvements	\$240,960,000	\$281,500,000
70	Vehicles	\$152,999,000	0**
80	Professional Services	\$796,311,000	\$973,000,000
Subtotal		\$4,050,000,000	\$4,451,000,000
Financing Cost		\$816,614,000	\$816,614,000
Total Project		\$4,866,614,000	\$5,267,614,000

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

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

Table 8 -- Core Accountability Items				
Project Status:		Original at FFGA	Current*	ELPEP**
Cost	Cost Estimate	\$4,050M	\$4,451M	\$4,980M
Schedule	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
Total Project Percent Complete	Based on Expenditures	48.3%		
	Based on Earned Value	N/A		
Major Issue		Status	Comments	
Organization and Staffing		Open	Certain relationships on the current Org. Chart do not reflect actual structure and function of project team. Need to fill two open positions ASAP.	
Safety and Security Certification		Closed	Detailed planning and organizational prep for safety & certification process needs to continue. Current lack of dedicated staff may impede progress.	
Date of Next Quarterly Meeting:		TBD		

\* MTACC's Current Working Budget

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

*Schedule data based upon IPS Update #78; Data Date = 1/01/2013*

*Financial date based upon MTACC reporting through 1/31/2013*