

## **PMOC MONTHLY REPORT**

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

Metropolitan Transportation Authority

New York, New York

Report Period February 1 to February 29, 2012

Rev. 2



PMOC Contract No. DTFT60-09-D-00007

Task Order No. 2, Project No. DC-27-5115, Work Order No. 03

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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.

For projects funded through FTA Full Funding Grant Agreements (FFGA) program, FTA and its Project Management Oversight Contractor (PMOC) use a risk-based assessment process to review and validate a project sponsor's budget and schedule. This risk-based assessment process is a tool for analyzing project development and management. Moreover, the assessment process is iterative in nature; any results of an FTA or PMOC risk-based assessment represent a "snapshot in time" for a particular project under the conditions known at that same point in time. The status of any assessment may be altered at any time by new information, changes in circumstances, or further developments in the project, including any specific measures a sponsor may take to mitigate the risks to project costs, budget, and schedule, or the strategy a sponsor may develop for project execution.

Therefore, the information in the monthly reports may change from month to month, based on relevant factors for the 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**

MTACC reported the final design phase of the SAS Project as 100% complete in late November 2010. During February 2012, the Design Consultant's (A/A) activities consisted of the review of contractor's submittals, response to RFI's, and support of the ongoing construction activities. These functions are generally proceeding in accordance with the Integrated Project Schedule (IPS), Current Working Budget (CWB) and applicable management plans.

#### **a. Procurement**

Updates to Construction Procurement, which occurred during February 2012 include:

- **C-26010 (C2B): 96<sup>th</sup> Street Station Civil, Architectural, MEP** – Construction contractors are currently preparing bids for this package. Bids were originally scheduled to be received on February 7, 2012 and previously extended to February 29, 2012. This period, the Bid Date was extended to April 5, 2012 based upon the addenda packages distributed and the bidders' request for additional time to prepare their bids. There are

currently nine (9) Addendums to the bid documents. Fifty-four contractors and suppliers have received copies of the bid documents.

- **C-26009 (C6): Transit & Rail Systems** – This procurement is complete. The Preconstruction Meeting was held on February 7, 2012. Substantial completion is August 2016 (Notice of Award [NOA] +55 months).
- **Future Procurements:** – The 72<sup>nd</sup> Street Station Finishes & MEP Package, C26011 (C4C) is scheduled for advertisement on July 26, 2012. Early procurement and technical “dustoff” activities required for Authorization to Advertise are anticipated to start in late April/early May 2012. The 86<sup>th</sup> Street Station Finishes & MEP Package, C26012 (C5C) is scheduled for advertisement on December 12, 2012.

The MTA and the State of New York must resolve the state funding of the 2012-2014 Capital Plan in order for packages C2B, C4C and C5C to move into construction. The PMOC is concerned that a lack of local funding will delay the award of one or more of these packages, ultimately resulting in schedule delays and additional costs to the project.

## **b. Construction**

As of February 29, 2012, there are six (6) active construction contracts on the SAS project. Significant construction progress during this period includes:

- **Contract C-26002(C1) – TBM tunnels from 92nd Street to 63rd Street**
  - Work progressing for Substantial Completion on March 9, 2012 and closure of all punch list items by March 16, 2012. Rework/repair of nonconforming items and completion of the 78<sup>th</sup> Street pump room are the majority of the effort remaining.
- **Contract C-26005 (C2A) 96th Street Station Heavy Civil, Structural and Utility Relocation**
  - **Cap Beams and Decking System Construction (Westside)**
    - Installation of Cap Beam and Decking at the NW corner of 97<sup>th</sup> St. ongoing.
  - **Entrance 1 Utility Conflict, Slurry Wall and Secant Pile Work**
    - Gas: Continued excavation and pipe installation (projected completion March 14, 2012).
    - Slurry Wall: Continued guide wall work – completed south wall: began rebar cage for panel P105; will continue north side after gas work is completed.
  - **Entrance 2 Utility Conflict and Slurry Wall Work**
    - Gas: Excavation and pipe installation continuing (projected completion March 15, 2012).
    - Slurry Wall: Guide wall excavation, forming and placing of concrete is continuing. Rebar cage completed for panel P204.
- **Ancillary 1 Utility Conflict**

- High rock issue: Easement below the Waterford might be required. Options are being investigated by MTACC.
- Con Ed: Pulling of the cables is projected to start on March 20, 2012; feeder (#43) outage is planned for the end of May; installation of the new transformer is scheduled for mid-May.
- Guide wall: Installation is approximately 95% complete; south wall will be completed after the old transformer is removed.
- Secant Piles: 16 out of the 121 piles have been poured.
- **CTJV's phased transition to Stage 5 (Area North of 97<sup>th</sup> St.)**
  - Stage 5A traffic switched to Westside of 2<sup>nd</sup> Ave.
  - Utility work continued with the installation of the 48" water main.
  - Excavation for the secant piles and slurry wall guide wall is continuing.
- **Turnover of Launch (S3 to CTJV)**
  - Turnover walkthrough for de-watering system and utilities (electric) occurred on February 13, 2012. The mud-slab was accepted by CTJV on February 10, 2012. Complete turnover is anticipated by March 15, 2012.
- **Contract C-26006 (C3) 63rd Street Station Upgrade**
  - Surveying of the DMPs is ongoing. DMP installation at Ancillary #1 is scheduled for March 14, 2012.
  - Continued with formwork in the West Fan Plant Shaft.
  - Scraped and primed walls in the East Fan Plant.
  - Continued with concrete demolition in multiple Area 5 mezzanines.
  - Continued temporary and permanent structural steel fabrication & installation.
  - Continued with crack repair at tracks G3/G4.
  - Continued installation of temporary and permanent link stair steel.
  - Continued with relocation of existing conduit and services for future demolition.
  - Began steel erection at the platform level elevator pit.
- **Contract C-26007 (C4B) 72<sup>nd</sup> Street Station Mining and Lining**
  - Total Rock Excavation is approximately 170,000 BCY (71% of project).
    - Main Station Cavern Excavation between 69<sup>th</sup> and 72<sup>nd</sup> Street – Excavation of Bench ongoing
    - North Crossover at 73<sup>rd</sup> Street – Excavation completed
    - G4/S2 Cavern –Excavation of East Slash ongoing
    - Stub Cavern at 63<sup>rd</sup> Street – Excavation ongoing

- Mapping, shotcrete, and rock bolt installation ongoing
- Ancillary 1 (69<sup>th</sup> Street Southwest corner) Support of Excavation – SOE in Northeast corner of Passageway, installation of tiebacks ongoing
- Submittals –Support of Excavation Design (Ancillary 1 and 2) ongoing
- **Contract C-26008 (C5B) 86<sup>th</sup> Street Station Cavern & Heavy Civil**
  - The temporary utility trench is ongoing along 2<sup>nd</sup> Ave.
  - Completed building surveys.
  - Began line drilling in the north area.
  - Began erection of steel framing for the north muck station.
  - Began receiving steel for the south muck station.
  - Continued with the utility trench between 83<sup>rd</sup> and 86<sup>th</sup> Streets.
  - Working at Ancillary #2 in preparation for Con Ed work.
  - Continued with demolition of the Gothic Building (Ancillary #1).
  - Continued with mini-pile installation on 86<sup>th</sup> Street.
  - Continued with hydrant installation on 86<sup>th</sup> Street.
  - MTACC and the contractor meet weekly (Wednesdays) to review environmental requirements and submittals. The contractor’s Community Air Monitoring Program (CAMP) will be discussed at a March meeting.
  - The first test blast will take place in the south open cut and is scheduled for April 2, 2012. Readings will be taken and adjustments made as needed.

The initial phase of the work continues to go smoothly with no noted issues. The beginning of blasting in the north shaft continues to be projected for April 2012 and the south shaft in May 2012. This is earlier than the June 2012 contract date but later than the January date discussed in the pre-bid meeting. The PMOC will continue to monitor how the start of blasting affects the project milestones.

- **Contract C-26009 (C6) Systems – Tracks, Signals, Traction Power and Communications**
  - Contractor preparing contract submittals – Ongoing
  - Quality and Safety Kick Off meetings were held

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

MTACC continues to verify that the construction contractors are implementing their Quality Management Systems as specified in the General Requirements (Section 01 43 00). Contractors’ Quality Work Plans, Test and Inspection Plans, control of non-conforming hardware, action item closure, supplier auditing systems, hold point inspections and preparatory phase meetings are being monitored.

## 2.0 SCHEDULE DATA

Integrated Project Schedule (IPS) Update #67 was received on March 3, 2012 and is based on a Data Date of February 01, 2012. Update #67 contained a narrative report, a schedule variance report, a schedule revision log and “PDF” versions of several schedule reports. Project schedule completion milestone dates remained essentially unchanged for this period. MTACC forecasts completion of all construction and NYCT Pre-Revenue Training & Testing by October 25, 2016, with 80 calendar days (57 WD) of contingency when measured against MTACC’s target Revenue Service Date (RSD) of December 30, 2016.

A summary of the schedule status of each active contract includes:

- Contract C-26002 (C1): east bore concrete lining installation will be completed in early March 2012. Substantial Completion is forecast for March 20, 2012.
- Contract C-26005 (C2A): the forecast Substantial Completion date remains June 6, 2013. All west side decking was completed on February 17, 2012.
- Contract C-26006 (C3): work continues in several areas and all milestones are currently on or ahead of schedule.
- Contract C-26007 (C4B): experienced 10 CD of schedule slippage this period, with the current Substantial Completion date forecast as December 5, 2013.
- Contract C-26008 (C5B): submitted Revision 4 of its Baseline Schedule. MTA anticipates acceptance of this schedule in March 2012 and subsequent incorporation in the IPS.
- Contract C-26009 (C6), is mobilizing and developing its initial submittals.

**Project Critical Path:** The project critical path has changed slightly from the January 2012 Monthly Report. It begins with the C5B fabrication-delivery-installation of the Muck Conveyance System (ACT. # C5B S110a). It then travels directly into South Cavern Excavation from the South Shaft, continuing through completion of C5B South Cavern mining and concrete operations (C5B Milestone No. 1). Upon achieving MS #1 in early March 2014, the critical path shifts to start and completion of Contract C5C mezzanine and platform concrete work, followed by the start of concrete work in early September 2014, then shifting to 1<sup>st</sup> and 2<sup>nd</sup> fix work in 86<sup>th</sup> Street Station south Ancillary (No. 1), where it is handed over to C6 in April 2015. The critical path continues into C6 Systems Signal and Traction Power work for the next six (6) months within the 86<sup>th</sup> Street Station, followed by Integrated Testing of the Traction Power system beginning in mid-December 2015. Upon completion, this area is handed over for Pre-Revenue Operations Testing beginning in late June 2016 and is forecast to complete by October 25, 2016. The MTACC’s forecast RSD remains as December 30, 2016.

As previously noted the critical path has been relatively unchanged for several months, due to the fact that it spans the schedules of individual construction packages that are not yet active and; therefore, not updated each month. The pending incorporation of the C5B and C6 construction schedules will improve the accuracy and reliability of the critical path forecasts contained in the IPS.

**Secondary Paths:** Construction involving the 86<sup>th</sup> Street Station (C5B -> C5C -> C6) occupies all secondary float paths between +1 and +75 calendar days (CD) (except as noted below). Major secondary float paths of significance to the overall status of the project include the following:

**+20 WD:** NYCT Pre-Revenue Operation Activities, scheduled to start on September 15, 2014.

**+75 WD:** This path extends through the construction of the 96<sup>th</sup> Street Station (C2A -> C2B -> C6). It is initiated by Stage 5 (95<sup>th</sup> to 97<sup>th</sup> Streets) slurry wall installation, forecast for completion on approximately July 25, 2012. Following C2A deck installation, excavation and concrete invert construction this path moves to the C2B Station Finishes package in June 2013. Systems installation (C6) at the 96<sup>th</sup> Street Station is forecast to start on September 2, 2014 and continue through October 7, 2015, at which time this path merges with the integrated system testing (critical) path.

C2A work also initiates major secondary paths with +87,+97,+121 days of float, reinforcing the conclusion that the 96<sup>th</sup> Street Station is currently the “second most critical” element of the project.

**+82 WD:** C6 contractor mobilization and preconstruction submittals. This preliminary schedule forecasts the completion of C6 preconstruction engineering and submittals by late 2012.

**+96 WD:** Cost to Cure @ 301 East 69<sup>th</sup> Street and 1322 2<sup>nd</sup> Avenue. The start of construction of C4B, Entrance #1 is controlled by two building modifications/utility relocations. Recent reports suggest potential delays to this work.

**+97 WD:** Procurement and award of Construction Contract C2B.

**Quarterly Milestone Tracking:** The first tabulation of milestone schedule performance for the 1<sup>st</sup> Qtr. 2012 is contained in the accompanying Table 3. Milestones not completed have been “carried over” into this Quarter’s tracking log. A summary of schedule performance based on these milestone activities includes the following:

**Summary**

# Calendar Days Elapsed this Qtr.	31 CD
Average Δ from Baseline - all activities	8.73 CD
Average Δ from Baseline - completed activities	3.60 CD
Average Δ from Baseline - ongoing activities	17.75 CD

**1<sup>st</sup> Qtr. 2012 Milestone Summary**

# Activities Forecast this Qtr.	20
# Activities forecast to complete this Qtr.	14
# Activities completed this Qtr.	1
# Activities on/ahead of schedule	8
# Activities behind schedule	11

**Carryover Milestone Summary**

# Activities Carried Over	13
# Activities forecast to complete this Qtr.	6

# Activities completed this Qtr.	4
# Activities on/ahead of schedule	4
# Activities behind schedule	7

Four activities were added for C5B that were not “baselined” in the January 1, 2012 update. These activities are not included in the summaries above and are included for information only. Several current vs. baseline variances are noted that approximately equal the elapsed time to date, suggesting little to no progress this period. This is cause for concern and should be investigated further.

**ELPEP/SMP Compliance:** In the opinion of the PMOC, SAS Phase 1 is in compliance with the metrics, deliverables and beneficial outcomes expressed in the Enterprise Level Project Execution Plan (ELPEP), dated January 15, 2010, 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 Allowable Float; Real Estate Acquisition
  - ELPEP Requirement: 60 CD
  - Current Forecast: All Real Estate Takings were completed as of November 1, 2011.
- Minimum Allowable Secondary Float Path
  - ELPEP Requirement: 25 Calendar Days
  - Current Forecast: 105 CD (75 WD) through construction and fit-out of the 96<sup>th</sup> Street Station
- Secondary Schedule Mitigation (critical path compression)
  - ELPEP Requirement: 125 CD
  - Current Forecast: Several opportunities are under consideration by the SAS Project Team that will improve the schedule primary and/or secondary paths. These opportunities are discussed in the next section of this report.
- Minimum Schedule Contingency along the Critical Path
  - ELPEP Requirement: 240 CD measured against the “risk-informed” target RSD of February 28, 2018
  - Current Forecast: 503 CD
  - Note: MTACC has maintained its target RSD of December 30, 2016. IPS Update #66 identifies 80 CD (57 WD) of float measured against this target.

In addition to the metrics above, the MTACC continues to demonstrate that it is using the IPS to actively plan, organize, direct and control individual packages and the overall project, and to provide reliable forecasts of the SAS Revenue Service Date (RSD) and other major

accomplishments. These beneficial outcomes are significant components of ELPEP/SMP compliance.

### **Schedule Improvement Opportunities:**

The SAS Project Team continues to evaluate potential opportunities to compress the schedule critical or near-critical path(s). The ELPEP defines this as “Secondary Schedule Mitigation”. Each opportunity requires careful evaluation of the additional cost and risk incurred in exchange for schedule compression. Alternatives to schedule compression currently under active consideration include:

1. Transfer of Mezzanine and Platform Concrete at the 86<sup>th</sup> Street Station from C5C (Finish Contract) to C5B (Mining/Heavy Civil Contract).
2. Adjustment of the 86<sup>th</sup> Street Station blasting restraint date from June 4, 2012 to early April 2012. This 30 to 45 CD gain will partially offset the delayed award of Contract C5B. Proposals for this acceleration have been received from the contractor and are under evaluation.
3. Construction of Ancillary Nos. 1 and 2 at the 86<sup>th</sup> Street Station using multi-shift vs. single shift operations. The construction schedule is currently based on single-shift operations, resulting in durations of 164 WD and 200 WD, respectively.
4. Reduction of the time period dedicated to Integrated Systems Testing in Contract C6. This possibility was discussed during contract negotiations. With the award of the contract now complete, this scenario will be investigated more thoroughly.

As part of this effort, a two-day schedule workshop is scheduled for early March 2012 to critically review the preconstruction schedules for the finish packages. This effort will seek to verify the optimal duration for each of the finish packages and adjust the current duration if necessary.

**Schedule Contingency:** IPS Update #67 forecasts all Phase 1 construction and pre-revenue testing to be complete on October 12, 2016. This results in an 80 CD (57 WD) contingency when measured against the MTA target RSD of December 30, 2016 and a 503 CD contingency when measured against the FTA Risk-Informed RSD of February 28, 2018. These contingency values have been reasonably constant over recent months due to the fact that critical path currently spans construction packages that are not yet active.

### **3.0 COST DATA**

Based upon financial expenditures reported by the MTACC during February 2012, SAS Phase 1 is approximately 36.0 % complete. The completion status of the active construction contracts through January 2012, also based upon reported expenditures through that date, is as follows:

- C26002 (Tunnel Boring) – 93.2%
- C26005 (96<sup>th</sup> Street Station) – 58.5%
- C26013 (86<sup>th</sup> Street Station – Sitework) – 99.8%
- C26008 (86<sup>th</sup> Street Station – Heavy Civil) – 7.22%

- C26006 (63<sup>rd</sup> Street Station) – 11.1%
- C26007 (72<sup>nd</sup> Street Station) – 33.5%
- C26009 (Systems – Track, Power, Signals and Communications) – 0.0%

Aggregate Construction % Completion:

- 67.8% of all construction work is under contract.
- 48.22% of construction of active contracts (not including C6) is complete.
- 28 % of all construction is complete.

Based upon cost data received from MTACC for February 2012:

- Value of construction in place this period = \$14,823,535
- Estimated value of construction remaining = \$1,950,600,210
- Target construction completion = 8/1/2016
- Number of months remaining = 56
- Rate of construction required to achieve target completion date = \$36,122,226/month

Using cost data for February 2012, it appears that insufficient overall progress was made on the project during this period to achieve current schedule goals. Several issues must be considered when evaluating this data:

1. Progress was not reported this period for C4B or C5B. Last period, these two projects “earned” over \$20 million. This shortfall should correct itself next period, with correspondingly higher contributions from these two packages.
2. As C1 and C5A wind down, they no longer make a significant contribution to the calculated progress of the project. Their contribution to overall progress has not yet been replaced. The effect of procurement delays to C5B and C6 are now being realized in slower-than-planned progress to the overall project.
3. As much as a three-month lag appears to be built into this evaluation. C5A was declared substantially complete on November 16, 2011. It was not until February 2012 that payments to the contractor reflected that status.

Based on the adjustments noted above, SAS continues to make progress that appears to support the RSD of December 30, 2016. Progress is anticipated to be at the lower end of the acceptable range for the next several months, as C5B and to a lesser extent, C6, mobilize and begin to make progress.

The PMOC is concerned that if construction progress does not increase significantly in the near future, the project will suffer unanticipated delays due to “stacking” of work later and later in the schedule and be extremely vulnerable to any delay through multiple concurrent critical paths. Significant delays in procurement of C2B, or any of the other finish packages will exacerbate this trend and significantly increase the risk of delays to project completion.

**Estimate-At-Completion:** The SAS Project Team has extended its risk-based contingency forecasting effort to the development of an EAC for all construction. To date, this effort is

limited to construction cost only. 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 \$4,270,812,883.

**Cost Growth:** For the period ending February 29, 2012, total Additional Work Order (AWO) exposure was reported to be \$80,661,169, an increase of \$4,165,686 (5.45%) over the \$76,495,483 exposure reported for period ending January 31, 2012. Executed AWOs as documented on AWO tracking logs totaled \$62,315,047, a decrease of \$258,966 from the \$62,574,013 reported for the period ending January 31, 2012.

The change in AWO Exposure was primarily driven by the following:

1. Contract C4B: Increases to the Exposure Value of AWO #19 (MTACC Directive to Blast Prior to 1900 HRS) and #28 (North & South Crossover Cavern Changes) combined with several other smaller changes resulted in a net increase of \$3,576,948.
2. Contract C5B: Increases in the Exposure Value of AWO # 2 (Additional Sewer Work on 86<sup>th</sup> Street), # 9 (Furnishing Advanced Wet Scrubber Systems for Blasting Dust Control) and # 13 (Expose Connection to Sewer Service to 250 E. 87<sup>th</sup> Street) resulted in a net increase of \$907,915.
3. Contracts C5A and C2A: Reductions in the Exposure Value of several AWOs with a cumulative value of (\$412,510).

The change in Executed AWO Value was primarily driven by the following:

1. Contract C1: Execution of AWOs with net value of (\$416,000).
2. Contract C4B: Execution of AWOs with net value of (\$230,000).
3. Contract C5A: Execution of AWOs with net value of \$226,767.

**ELPEP/CMP Compliance:** Based on the current conditional approval of the CMP, the PMOC has identified several areas where supplemental efforts may be required in order for the MTACC and the SAS Project Team to be considered fully compliant:

- **AWO Processing:** The Cost Management Plan (CMP) references and incorporates MTACC's Procedure AD.11, Construction Contract Modification Approval, and thereby NYCT's Project Management Procedure PMP207, Processing Construction Additional Work Orders, by reference. In accordance with PMP207, maximum AWO processing duration should not exceed 90 calendar days. There has been no measureable improvement in this situation to date.
- **Financial Reporting (EAC):** Contract and project level EAC Reporting for construction has commenced.
- **Tracking Scope Moves:** The opportunity to evaluate the proposed method of tracking cost and schedule revisions due to scope revisions and transfers has not occurred to date.
- **Retained Risk Updates:** The monthly updating of retained risk has been implemented. This update is reported in the monthly risk report, which is also newly implemented.

**Cost Contingency:** During February 2012, no 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. Changes this period were limited to routine incorporation of AWOs into the individual project and overall program reporting systems.

The PMOC has updated its contingency drawdown and utilization model to reflect these changes. The current contingency balance is greater than the Planned Balance and exceeds the ELPEP Required Balance.

Required Balance (ELPEP):	\$ 220,000,000
Planned Contingency Balance:	\$ 340,738,669
Actual Contingency Balance (PMOC):	\$ 397,473,162
Actual Contingency Balance (MTA-Jan/2012):	\$ 399,814,000

#### 4.0 RISK MANAGEMENT

Risk Mitigation Meeting No. 13 was held on February 29, 2012. Recent risk management activities reviewed include:

- Comments received on the Contract 2B Risk Analysis have been addressed. Final report should be issued the first week of March 2012.
- Updated Risk Registers on February 16, 2012.
- Completed January EAC forecast for monthly budget presentation.
- Incorporated MTACC and PMOC comments to Risk Management Plan. Expect to resubmit the first week of March 2012.

Risks reviewed and updated during this meeting include:

- 1) **Contract Interfaces (Risk CNS 4 (C6))**: Managing contractual interfaces during construction. The interfaces between C1 & C2A/C4B/C5B and C5A & C5B have been effectively managed and have not resulted in contractual disputes or disruptions in the work. Concern over the interfaces among C2B, C4C and C5C is the focus of this risk.

To date, the focus of this effort has been the identification of interfaces and the development of tools and procedures to track the relevant schedule activities associated with the interface. There is general agreement that the initial development of these tools has been successful. Updating and refinement of these tools is expected as the overall effort continues.



- 2) **Systems Integration and Testing (Risk TRP 4 (C6))**: The systems testing schedule has been inserted in the C2B bid documents and will be inserted in the bid documents for subsequent finish packages so the coordination requirements and work prioritization is clear. No further action is considered necessary in the near future.

- 3) **System Safety Certification (Risk CNS 8 (C6))**: Future steps in completing the certification process do not appear to be clearly understood by the Project Team. This may be due to a lack of available experience regarding the certification of a new start project. The Safety and Security Management Plan, prepared by DHA in May 2007 provides a general description of the certification process, and identifies Safety and Security Certification Committee (SSCC) which is responsible for the management of the certification process. The PMOC recommends elevating the management of this risk to the SSCC which will provide regular updates to the Risk Manager regarding the status of this risk. The PMOC also recommends that the SSCC becomes familiar with the FTA's Handbook for Transit Safety and Security Certification which explains the safety and security certification methodology, provides a brief description of each step and presents sample forms to support the certification process.
- 4) **Shop Drawing Processing (Risk ID TBD)**: Flow charts and key liaisons for this process have been identified; the process has been explained in detail to the involved parties. Nonetheless some delays in processing have been noted. These involve contracts and submittals where NYCT review is not required. An "in-depth" tabulation of processing time was to have been prepared for this meeting. It was not available. A complete investigation of delays incurred to date will be performed and presented at the next meeting.
- 5) **Geotechnical Risk (Risk 89 (C5B))**: There are differing site conditions during cavern mining. Further discussion and evaluation of this risk will be deferred until C5B commences blasting and excavation operations. To date, this risk has not been realized at C4B; rock quality at C5B is generally anticipated to be better than at C4B.
- 6) **Cost-To-Cure Utility Relocations (Risk C4B 77 and C4B C14)**: Relocating utilities that service buildings adjacent to Entrance No. 1 (301 East 69<sup>th</sup> Street, 1322 Second Avenue) may delay construction at this location. Current forecast of seven (7) months to complete the work will not adversely impact on the C4B schedule; however, the process of dealing with building owners through design and construction has many opportunities for additional delay. Transferring this work to the C4C Package may have to be considered.

In the PMOC's opinion, the SAS Project Team is actively working to avoid and contain the effect of retained risks and controlling the overall growth of the total project cost.

## 5.0 ELPEP

No ELPEP meetings were held in February 2012. 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 Revision 8 SAS PMP and is monitoring and verifying implementation and compliance with this plan.
- **Schedule Management Plan (SMP)**: The PMOC continues to monitor and verify SAS substantial compliance with the SMP. The process of transferring the compliance verification process to the MTACC is discussed below.
- **Cost Management Plan (CMP)**: FTA conditional approval of the Cost Management Plan, including five (5) Candidate Revisions was provided on September 1, 2011. The PMOC is monitoring and verifying compliance with this plan.

- **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. A follow-up meeting to discuss these comments was held on February 3, 2012. Resubmission of this plan is anticipated in early March 2012.
- **Conformance and Compliance Demonstration:** MTACC submitted and updated Compliance Report and Monitoring Checklist on February 29, 2012. No progress was reported during February 2012.

The SAS Project Team has implemented the majority of 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.

## 6.0 SAFETY AND SECURITY

The Lost Time Accident Rate and OSHA Recordable Accident Rate from the start of construction until January 31, 2012 are 2.19 and 5.00, respectively. The Lost Time Accident Rate is below the national average of 2.2 and the Recordable Accident Rate is above the national average of 4.2. A total of 3,197,145 construction hours have been accumulated on the project since its inception with 35 lost time injuries and 45 recordable injuries logged. The majority of the lost time accidents (16) and recordable accidents (31) are on the C1 Tunnel Boring contract. The C1 Contractor has logged 1,875,897 hours of the 3,197,145 total hours accumulated on the SAS Phase 1 Project.

## 7.0 ISSUES AND RECOMMENDATIONS

**Local Funding:** Availability of local funding is still a major concern to the timely and cost-efficient completion of Phase 1 of the SAS Project. With the award of Contract 6 on January 18, 2012, insufficient local funds remain to award the C2B contract. This contract is now scheduled to be awarded on April 5, 2012. Without resolution of New York State funding of its commitments to the 2012-2014 MTA Capital Program, funding shortfalls may also impact the award of the station finish packages (C4C, and C5C). The PMOC recommends investigation and development of contingency plans (including but not limited to scope transfers) to minimize the impact of funding delays to the extent possible.

**Multi-Contract Coordination:** MTACC is aware that management of the contract interfaces is one of the keys to executing this project successfully. To date, interfaces between contract packages have been managed effectively, albeit on a somewhat ad hoc basis. The SAS Project Team has identified interfaces and developed tools that should assist in managing this challenge. The tools are important but, to date, an overall strategy for interface management has not been formalized. The number of interfaces and potential for delay is extremely large and the associated technical and administrative issues varied. The PMOC recommends development of a generalized interface management process that will leverage staff resources effectively and allow senior management to focus on problematic or critical interface issues.

**Technical Submittal Processing:** Recent Risk Management meetings have started to focus on the timely processing of technical submittals as a significant construction cost/schedule risk. As initially identified, this risk involved those submittals requiring both NYCT and the Design

Consultant's (A/A) review and approval. Discussions at the February 29, 2012 Risk Management Meeting indicate this risk is currently being realized for submittals involving only the Design Consultant. Timely processing of submittals is a basic obligation of the MTACC; the 20 days allowed in the construction contract should be more than adequate for all but the most complicated submittals. The PMOC recommends the SAS Project Team define the specific source and extent of this problem, and identify and implement the means by which improvement in this metric can be achieved.

**Third Party Utility Payables:** The budget for 3<sup>rd</sup> Party Construction (Utility Relocations) is \$75.3 million. To date, payments for this work total are approximately \$21.7 million. The current status of construction suggests a great deal more utility relocation work has been accomplished. The PMOC recommends this apparent disparity in progress vs. payments should be investigated to better understand its cause and avoid financial "surprises" later in the project.

**Safety Certification:** The safety certification process has been identified as a risk to project completion. The effort made to date to understand the process and start the implementation of the process has been disappointing. The PMOC recommends convening the Safety and Security Certification Committee identified in the Safety and Security Management Plan and, in a workshop environment, establish a schedule of activities for this effort that will support the overall project.

**Construction Impacts:** Incidents involving the collateral effects of blasting on the C4B construction contract have impacted construction operations and several million dollars in potential additional construction cost. The PMOC recommends that MTACC critically evaluate the "lessons learned" to date on this contract and, to the extent possible, use this experience to minimize the collateral impacts for the C5B contract and the remainder of the C4B contract.

**Compliance Demonstration:** During February 2012, very limited progress was made in defining and resolving the means by which MTACC will monitor and report on ELPEP compliance. Rather than developing position papers and "throwing them over the wall" for numerous review and comment cycles, the PMOC recommends that MTACC, FTA and any other affected parties meet in a workshop type format to collaboratively review the MTACC's recent submittal and resolve the manner by which ELPEP compliance will be monitored and reported upon.

## APPENDIX A - ACRONYMS

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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
DCB	Detailed Cost Breakdown
DMP	Deformation Monitoring Points
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
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
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
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

**Table 2 - Schedule Contingency**

IPS Update #	61	62	63	64	65	66	67
Data Date	08/01/11	09/01/11	10/01/11	11/01/11	12/01/11	01/01/12	02/01/12
Contingency (CD)							
RSD=12/31/2016	67	67	67	67	67	80	80
RSD=02/28/2018	490	490	490	490	490	503	503

**Table 3 - 1<sup>st</sup> Quarter 2012 Schedule Milestone Comparison**

Contract	Act.	Description	Tracking Milestone Dates		
			Baseline	Current	Δ
<b>3rd Qtr 2011 Tracking Milestones (Carryover)</b>			<b>1-Jul-11</b>	<b>1-Feb-12</b>	
C4B	72C1185	Excavate Top Heading Area 2	30-Jun-12	7-Feb-12	-144
C6	PR40	Award Systems Contract	27-Oct-11	18-Jan-12	A 83
<b>4th Qtr 2011 Tracking Milestones</b>			<b>1-Oct-11</b>	<b>1-Feb-12</b>	
C1	S6A40	Compl West Tunnel Concrete	5-Jan-12	27-Jan-12	A 22
	S9A10	Complete East Tunnel Concrete	29-Feb-12	20-Mar-12	20
C2A	A117	Complete ANC #1 Secant Piles	11-Jul-12	11-Jul-12	0
	4S210	Compl Deck Inst'l South - West Side	27-Feb-12	10-Feb-12	A -17
C2B	PR25d	Open Bids	6-Feb-12	5-Apr-12	59
	PR40	Award C2B Contract	30-Apr-12	1-Jun-12	32
C3	LP025	Complete Demo – Lower Platform	31-May-12	20-Jul-12	50
	UP040	Complete Demo – Upper Platform	11-Apr-12	23-May-12	42
C4B	72C1225	Excavate Cavern Bench	9-May-12	17-Apr-12	-22
	HST1000	Compl Horseshoe Tun'l 155+94->152+94	20-Mar-12	10-Jan-12	A -70
	NCC1000	North Crossover Excavate	4-May-12	25-Apr-12	-9
<b>1st Qtr 2012 Tracking Milestones</b>			<b>1-Jan-12</b>	<b>1-Feb-12</b>	
C1	S9140	Exc Pump Room #16 East	26-Jan-12	24-Feb-12	29
	999	Substantial Completion	20-Mar-12	20-Mar-12	0
C2A	4N210	Compl Deck - West Side (97th St Intersection)	17-Feb-12	17-Feb-12	A 0
	5N200	Start SW East Side 97-99 (Incl Guide Walls)	20-Feb-12	20-Feb-12	0
	5S200	Start SW East Side 95-97 (Incl Guide Walls)	19-Mar-12	19-Mar-12	0
	6S235	Start Invert Inst. 93rd -> 95th Streets	8-Feb-12	2-Apr-12	54
	E113	Compl. Guidewalls @ Entrance #1	28-Mar-12	6-Mar-12	-22
	E225	Compl. Guidewalls @ Entrance #2	30-Mar-12	30-Mar-12	0
C3	005	Complete Sub/App Struct. Steel Shop Dwgs	20-Jul-12	20-Jul-12	0
	A1010	Begin Demo - Ancil #1	2-May-12	1-Jun-12	30
	EN105	Begin Structural Work - Ent #1	22-May-12	20-Jun-12	29
	MZB05	Compl. Asbestos/Lead Abatement - Fan Plant	27-Mar-12	10-Apr-12	14
	010	Begin Elevator Fab	7-Mar-12	15-Mar-12	8
	LP025	Complete Demo - Lower Platform	20-Jun-12	20-Jul-12	30
C4B	SCC1000	South Crossover Excavate	31-Jul-12	7-Aug-12	7
	A2C1045	Ancil 2 - Compl SOE/Decking/Excavation	4/4/2012	3-Apr-12	-1
	G3S11060	G3 TBM F/P/S Tunnel Invert	28-Mar-12	5-Apr-12	8
	C4B AR17	Access to Entrance #1	3-Jan-12	1-Feb-12	29
	ETA1000	Ent #2 Adit Excavation Complete	11-Jan-12	9-Feb-12	29
	E3C1010	Ent #3 Bldg Demo Complete	29-Mar-12	27-Mar-12	-2
C5B	S110a	Complete Installation of Mucking Sys-South	N/A	25-Apr-12	
	S110a	Complete Installation of Mucking Sys-North	N/A	10-Apr-12	
	S150	Begin Blast/Mining Ops (North)*	N/A	11-Apr-12	
	S110b	Begin Blast/Mining Ops (South)*	N/A	26-Apr-12	

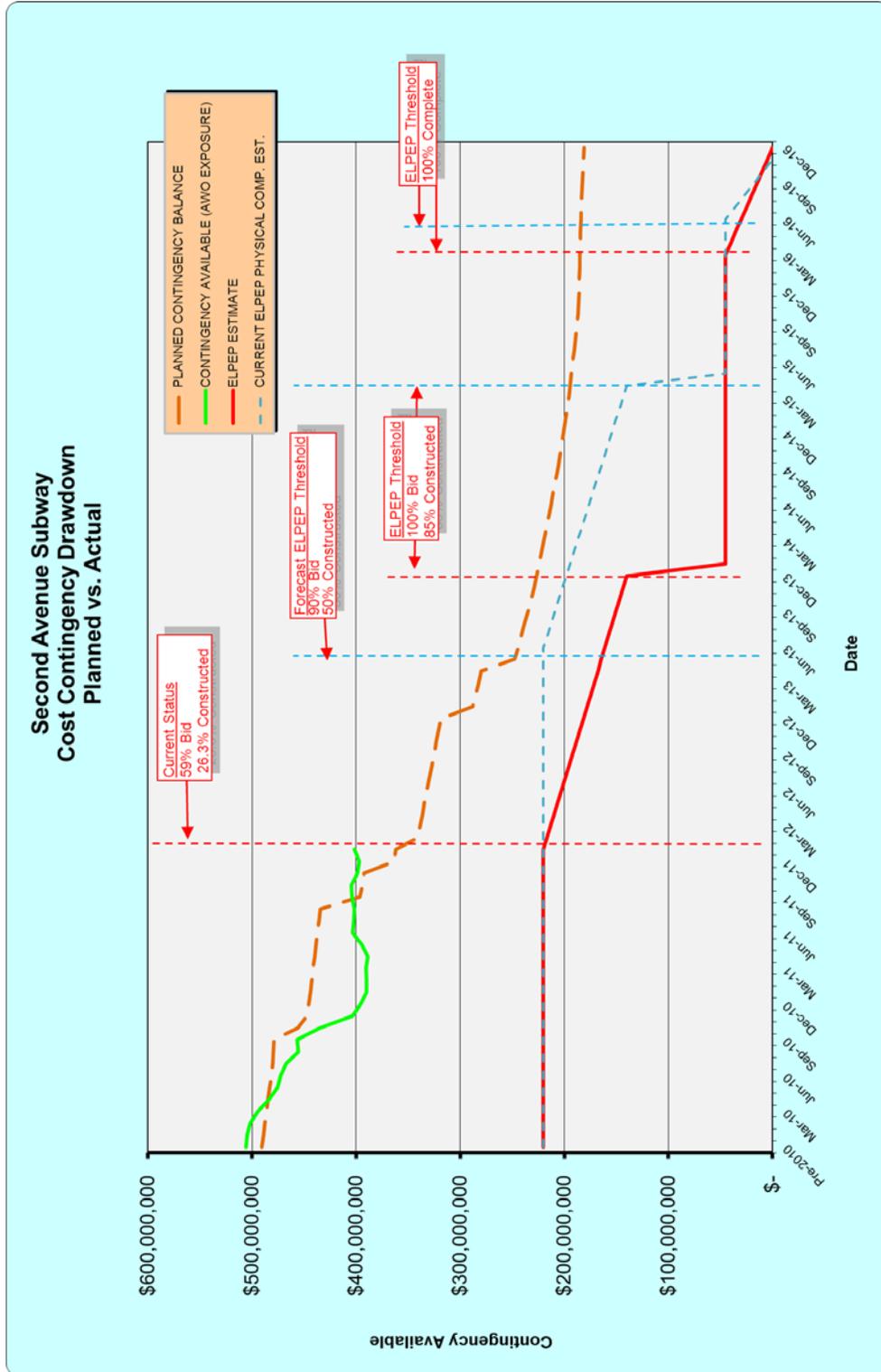
**Table 4 - Project Budget/Cost** 

	FFGA			FFGA Amend	MTA Current Working Budget (CWB)		Expenditures as of February 29, 2012	
	(\$ Millions)	% of Total	* Obligated (\$ Million)	TBD	\$ Millions	% of Total	\$ Millions	% of Total
<b>Grand Total Cost:</b>	<b>4,866.614</b>	<b>100</b>	<b>4,375.76</b>		<b>5,267.614</b>	<b>100</b>	<b>1,604.024</b>	<b>30.45</b>
Financing Cost	816.614	16.78			816.614	15.55		
<b>Total Project Cost:</b>	<b>4,050.000</b>	<b>83.22</b>	<b>4,375.76</b>		<b>4,451.000</b>	<b>84.50</b>	<b>1,604.024</b>	<b>30.45</b>
<b>Total Federal:</b>	<b>1,350.693</b>	<b>27.75</b>	<b>866.760</b>		<b>1,350.693</b>	<b>25.64</b>	<b>526.918</b>	<b>10.00</b>
<b>Total FTA share:</b>	<b>1,300.000</b>	<b>96.25</b>	<b>792.867</b>		<b>1,300.000</b>	<b>24.68</b>	<b>515.806</b>	<b>9.80</b>
5309 New Starts share	1,300.000	100	792.867		1,300.000	24.68	515.806	9.80
<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>11.112</b>	<b>0.20</b>
CMAQ	48.233	95.15	71.433		48.233	0.92	8.652	0.16
Special Highway Appropriation	2.460	4.85	2.460		2.460	0.04	2.460	0.04
<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>66.61</b>	<b>1,077.106</b>	<b>20.45</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.

**Table 5 - Contingency Drawdown**



**Table 6 - Estimate @ Completion**

Description	Budget	Forecast		
	Current Working Budget	PMOC EAC Forecast	MTA EAC Forecast	Notes
<b>Total Construction</b>	\$2,728,172,492	\$3,009,900,001	\$3,017,174,596	
<b>Engineering Services Subtotal</b>	\$576,541,264	\$591,338,287	→	
<b>Third Party Expenses</b>	\$534,800,000	\$534,800,000	→	
<b>TA Expenses</b>	\$124,500,000	\$127,500,000	→	
<b>Contingency</b>	\$326,986,244		→	
<b>Executive Reserve</b>	\$160,000,000		→	
<b>Subtotal</b>	\$4,451,000,000	\$4,263,538,288	\$4,270,812,883	

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

Std. Cost Category (SCC)	Description	FFGA	MTA's Current Working Budget
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
Subtotal		\$4,050,000,000	\$4,451,000,000
Financing Cost		\$816,614,000	\$816,614,000
<b>Total Project</b>		<b>\$4,866,614,000</b>	<b>\$5,267,614,000</b>

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

\*\* FTA has not approved the removal of the vehicles from the scope of work.

<b>Table 8 - Core Accountability Items</b>				
<b>Project Status:</b>		<b>Original at FFGA:</b>	<b>Current*:</b>	<b>ELPEP**:</b>
<b>Cost</b>	Cost Estimate	\$4,050M	\$4,451M	\$4,980M
<b>Contingency</b>	Unallocated Contingency	\$555.554M	\$207M	\$510M
	Total Contingency (Allocated plus Unallocated)	\$555.554M	\$400M	\$510M
<b>Schedule</b>	Revenue Service Date	June 30, 2014	December 30, 2016	February 28, 2018
<b>Total Project Percent Complete</b>	Based on Expenditures	36.0%		
	Based on Earned Value	N/A		
<b>Major Issue</b>		<b>Status</b>	<b>Comments</b>	
<b>Availability of local funding</b>		Unknown at this time	Further construction awards cannot be made until NYS funding of the current capital plan is resolved.	
<b>Date of Next Quarterly Meeting:</b>		TBD		

\* MTA's Current Working Budget

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

All data based on February 28, 2012 reporting