

## **PMOC MONTHLY REPORT**

### **Second Avenue Subway Phase 1 (MTACC-SAS) Project** Metropolitan Transportation Authority New York, New York

December 1 to December 31, 2010



**PMOC Contract No. DTFT60-09-D-00007**

Task Order No. 2, Project No. DC-27-5115, Work Order No. 02

OPs Referenced: OP20-OP26, OP33, OP34, OP37, OP40, OP41, OP53, OP54

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Length of time on project: 1 year

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## **EXECUTIVE SUMMARY**

### **PROJECT DESCRIPTION**

The Second Avenue Subway project will include a two-track line along Second Avenue from 125th Street to the Financial District in lower Manhattan. It will also include a connection from Second Avenue through the 63rd Street tunnel to existing tracks for service to West Midtown and Brooklyn. Sixteen new ADA accessible stations will be constructed. The Second Avenue Subway will reduce overcrowding and delays on the Lexington Avenue line, improving travel for both city and suburban commuters, and provide better access to mass transit for residents of the far East Side of Manhattan. Stations will have a combination of escalators, stairs, and, in compliance with the Americans with Disabilities Act, elevator connections from street-level to station mezzanine and from mezzanine to platforms.

Phase One of the project will include tunnels from 105th Street and Second Avenue to 63rd Street and Third Avenue, with new stations along Second Avenue at 96th, 86th and 72nd Streets and new entrances to the existing Lexington Ave./63rd Street Station at 63rd Street and Third Avenue.

### **COST BASELINE**

FFGA \$4.87 billion (Federal = \$1.35; Local = \$3.52 billion including financing cost of \$817 million).

### **SCHEDULE BASELINE**

Key Milestones:

- |   |                   |
|---|-------------------|
| ▪ Preliminary Engineering (PE):             | December 2001     |
| ▪ Final EIS Record Of Decision (ROD):       | July 8, 2004      |
| ▪ FFGA:                                     | November 19, 2007 |
| ▪ Final Design:                             | April 2006        |
| ▪ Original FFGA Revenue Service Date (RSD): | June 30, 2014     |
| ▪ Current MTA RSD:                          | December 30, 2016 |
| ▪ Current FTA/PMOC RSD:                     | February 2018     |

### **COMPLETION STATUS**

*A summary of the completion status of the four (4) active construction contracts as of December 31, 2010 is as follows:*

- C26002 (Tunnel Boring) – 79.70%
- C26005 (96th Street Station) – 26.30%
- C26013 (86th Street Station) – 51.75%
- C26007 (72nd Street Station) – 0.63%

*Aggregate Construction % Completion:*

- 32.75% of active construction contracts are complete
- 12.76% of all construction is complete

**PROGRESS AND ISSUES**

*Contract C-26002 completed base contract Tunnel Boring Machine (TBM) mining activities for the west bore. TBM progress this period averaged approximately 58 LF/WD. Contract C-26007 is mobilizing and will commence initial excavation activities in January 2011. During January 2011, it is anticipated that C-26006 (63<sup>rd</sup> Street Station Upgrades) will be awarded and that bids will be received for C-26008 (86<sup>th</sup> Street Station Cavern Excavation/Heavy Civil).*

*Key Issues to be monitored during the upcoming period:*

- *Startup of the ground freeze system at the northern limit of the C-26002 East Bore. The installation of the system is complete. Remaining tasks include final inspection and charging of the system and coordination with the actual progress of the TBM in the West Tunnel will determine when the actual freeze of the ground starts.*
- *The bid opening for Contract C-26008 (86<sup>th</sup> Street Station Cavern Excavation/Heavy Civil) is scheduled for January 11, 2011.*
- *Coordination of TBM Mining Runs w/72nd Street Station excavation and blasting operations.*
- *Community outreach and formal approval of the proposed 72nd Street Station Muck House & Mucking System.*

**MONTHLY UPDATE**

The information contained in the body of this report is limited, in accordance with Oversight Procedure 25, to “inform the FTA of the most critical project occurrences, issues, and next steps, as well as professional opinions and recommendations.” Where a section is included with no text, there are no new “critical project occurrences [or] issues” to report this month.

## ELPEP SUMMARY

### Status:

*As of the end of December 2010, MTACC continued to work with the FTA to produce Management Plans and to demonstrate compliance with the Enterprise Level Project Execution Plan (ELPEP). As reported previously, the original schedule for accomplishment of portions of the ELPEP implementation has consistently not been met; however, progress continues to be made in several key areas. A significant contribution to the delays in implementing the ELPEP has been the requirement for intermediate deliverables by the MTACC to establish mutual and complete understanding of the concepts and requirements of the ELPEP, which in many cases differed from the original MTACC interpretation of the ELPEP. October 12, 2010 marked the official goal for complete implementation of the ELPEP, which has not been achieved as of this writing. The PMOC projects that the full implementation of the ELPEP will require several more months of cooperative effort between the FTA and MTACC. This month, the Technical Capacity & Capability (TCC) Implementation Plan revised PMP was reported to be in the approval process. This has resulted in a delay to the projected completion date from December 2010 to January 2011. MTACC will issue the final revision, with a separate copy sent to FTA with changes tracked electronically. On December 7, 2010, MTACC submitted an update to their SMP to include the items in the October 26, 2010, FTA SMP acceptance letter. The PMOC and FTA have reviewed these changes and have comments to be discussed with MTACC in early January 2011. FTA PMOC comments to MTACC's revised draft Cost Management Plan were discussed on December 2<sup>nd</sup>. A follow-up meeting to discuss forecasting was held on December 15. During this meeting, ESA and SAS teams demonstrated to FTA and the PMOC the processes that are currently in development to incorporate the elements of forecasting required by the ELPEP into their procedures. Additional meetings to review the remainder of the FTA PMOC CMP comments individually with ESA and SAS project teams have been scheduled for early January 2011. At the December ELPEP meetings, there was a discussion of the method for MTACC to demonstrate ELPEP compliance, or risk mitigation capacity; however, there has not been any additional intermediate materials submitted this month.*

Based on the ELPEP effective date of January 15, 2010, the following items continue to be overdue:

- MTA will finalize the Cost and Cost Contingency Management Plan for the SAS project in conformance with ELPEP requirements.
- MTA completing the implementation of the PMP Revision Process.
- MTA will demonstrate a functioning process for achieving the traceability of contract package scope from the design basis documentation through pre-construction planning into the contract package cost estimate, and schedule through a contract package level WBS or functional equivalent for one active SAS contract package (4B). MTA will provide the FTA with a plan to demonstrate similar ELPEP conformance on all other un-awarded contract packages for both projects except for construction risk mitigation capacity.

### Observation:

*Based on ELPEP requirements, the overall progress remains behind schedule; however, in December 2010, the MTACC continued the approvals process for the TCC PMP review and*

*PMP update. Revisions were made to the Schedule Management Plan, and implementation of key processes required by the ELPEP related to cost forecasting and traceability were demonstrated during CMP comments review.*

*The MTACC and FTA continue to participate in a cooperative process to produce and approve the deliverables described in the ELPEP. The bi-weekly ELPEP progress meetings continue to serve to review progress and look-ahead to upcoming milestones. Because of the limited number of days available for meetings this month, they were also used as venues for review of Retained Risk meeting observations and Cost Management Plan comments, as well as discussion of Risk Mitigation Capacity submissions. This month, the SAS Project Team has continued to be proactive in the support of the ELPEP implementation effort.*

Concerns and Recommendations:

- *The PMOC has recommended that the MTACC develop their proposed method to demonstrate compliance with the ELPEP requirements for risk mitigation capacities. MTACC has begun developing the intermediate deliverable, which is a description of its procedures that could then be verified; however, limited progress was observed this month.*
- *The PMOC comments to the draft CMP have resulted in many desirable process changes that will improve the project estimating and budget forecasting and traceability.*
- *The FTA and PMOC have provided comments to the SAS procedure for implementing a Retained Risk Program, which has been endorsed by ESA. The recommended next step to review, with each project team, their strategy to implement the program including the items identified by the PMOC has been accomplished, this month, and the projects have begun implementing these strategies.*
- *The PMOC has expressed concerns regarding the availability of cost and schedule information as well as other project files. MTACC has made a commitment to work to improve PMOC access to files for review.*

**Table 1: Project Budget/Cost Table**

	FFGA			FFGA Amendments	MTA's Current Working Budget (CWB)		Expenditures as of December 31, 2010	
	(\$ Millions)	(%) Grand Total Cost	Obligated (\$ Million)	TBD	(\$ Millions)	(%) Grand Total Cost	(\$ Millions)	% of Grand Total Cost
<b>Grand Total Cost:</b>	<b>4,866.614</b>	<b>100</b>	<b>3,592.911</b>		<b>5,489.614</b>	<b>100</b>	<b>1,102.690</b>	<b>20.08%</b>
<b>Financing Cost</b>	816.614	16.78			816.614	14.88		
<b>Total Project Cost:</b>	<b>4,050.000</b>	<b>83.22</b>	<b>3,592.911</b>		<b>4,673.000</b>	<b>85.12</b>	<b>1,102.690</b>	<b>20.08</b>
<b>Total Federal share:</b>	<b>1,350.693</b>	<b>27.75</b>	<b>628.911</b>		<b>1,350.693</b>	<b>24.60</b>	<b>289.406</b>	<b>5.27</b>
<b>Total FTA share:</b>	<b>1,300.000</b>	<b>96.25</b>	<b>600.818</b>		<b>1,300.000</b>	<b>94.62</b>	<b>278.294</b>	<b>5.07</b>
5309 New Starts share	1,300.000	100	600.818		1,300.000	94.62	278.294	5.07
<b>Total FHWA share:</b>	<b>50.693</b>	<b>3.75</b>	<b>28.093</b>		<b>50.693</b>	<b>5.38</b>	<b>11.112</b>	<b>.20</b>
CMAQ	48.233	95.15	25.633		48.233	96.67	8.652	.16
Special Highway Appropriation	2.460	4.85	2.460		2.460	3.33	2.460	.04
<b>Total Local share:</b>	<b>2,699.307</b>	<b>55.47</b>	<b>2,964.000</b>		<b>3,322.307</b>	<b>60.52</b>	<b>813.284</b>	<b>14.81</b>
State share	450.000	16.67	100.000		450.000	13.54		
Agency share	2,249.307	83.33	1,145.782		2,872.307	86.46		
City share	0	0			0	0		

Data for this table was obtained from the Transportation Electronic Award Management (TEAM) system and MTACC's grant management department.

**Table 2: Summary of Critical Dates**

	FFGA	Forecast Completion	
		Grantee	PMOC
Begin Construction	January 1, 2007	03/20/2007A	03/20/2007A
Construction Complete	December 31, 2013	May 23, 2016	October 2017
Revenue Service	June 30, 2014	December 30, 2016(1)	February 2018*

(1) SAS Phase 1 Integrated Project Schedule, Revision 3, Update #53, data date of December 1, 2010.

\* From ELPEP



## **1.0 GRANTEE'S CAPABILITIES AND APPROACH**

### **1.1 Technical Capacity and Capability**

#### **1.1.1 Organization, Personnel Qualifications and Experience**

##### **a) Grantee's Organization**

###### Status:

*The SSA Program Management Team organizational structure was revised to more effectively support construction. The project is concluding final design and is transitioning to construction.*

###### Observation:

*The management team is an integrated project organization utilizing personnel from MTACC, NYCT, PB Americas (Consultant Construction Management (CCM)) and DHA (Design Consultant). There are five primary functional groups: Design Services Management; Construction; Construction Support; Budget, Administration and Accounts; and Program Control.*

###### Concerns and Recommendations:

*The PMOC has reservations about the Quality Manager reporting to the Program Manager of Construction Support. In the initial organizational structure, the Quality Manager reported to the Program Manager (Level II). This reporting arrangement was consistent with the General Principles Section (3.1.1) of the FTA Quality Assurance Quality Control Guidelines. As indicated in Section 3.1.1, the Manager (Director) of Quality should report to senior management (the manager responsible for the implementation of the capital project). The advantages of such a structure are: the responsible management for the Grantee can be confident that appropriate attention is being paid to quality and that FTA funds are being used wisely; quality is highly visible within capital projects of the grantee; and QA activities are coordinated so that duplicate planning, training, and oversight activities are eliminated. PMOC recommends that the Quality Manager report to the Vice President/Deputy Program Executive.*

##### **b) Staff Qualifications**

###### Status:

*Key individuals continue to meet the qualifications defined in Section 2.3.1 of the SAS PMP.*

###### Observation:

*The project team has substantial knowledge and experience in all relevant technical disciplines as a result of working on various capital projects.*

###### Concerns and Recommendations:

*None*

##### **c) Grantee Staffing Plan**

###### Status:

*Design: DMJM+Harris and ARUP, (DHA), the Design Consultant, continued the reduction of its staff to coincide with the completion of final design. DHA is providing construction phase support services.*

Construction Consultant Management: *Construction Managers have been assigned to construction contracts 1, 2A, 3, 4A/B, 5A and 5B. Under the revised organizational structure, the Construction Managers report to the Program Director Construction.*

Observation:

*Adequate staffing appears to be in place to support the project.*

Concerns and Recommendations:

*None.*

PMOC will continue to periodically review the plan to ensure that key staff is available in accordance with the needs of the project and that absences do not adversely impact or hinder the execution of the project.

**d) Grantee's Physical Resources**

Status:

With the reduction in the design staff, efforts are underway to relocate the Project office from 20 Exchange Place to 2 Broadway.

Observation:

*In the PMOC's opinion, the relocation of the Project office will have no adverse effect on the project.*

Concerns and Recommendations:

*None*

**e) History of Performance, Adequacy of Management Systems**

Status:

The SAS Project has not been executed in compliance with the cost and schedule elements of the Full Funding Grant Agreement (FFGA). The project is trending over budget and behind schedule. In the FFGA, the Baseline Cost Estimate (BCE) is \$4.050 billion (excluding financing cost) and the Revenue Operations Date is June 30, 2014. The MTA has proposed a revised baseline cost estimate (RBCE) of \$4.673 billion based on its risk range evaluation of \$4.522 to \$4.993 billion. The MTA is also proposing a Revenue Service Date (RSD) of December 31, 2016.

Observation:

The BCE represented the estimated total project cost when the FFGA was awarded in November 2007. The Revenue Operations Date (ROD) is the terminology used in the FFGA for when the SAS project will be operational. It is the same as the RSD, which is the terminology used in the Enterprise Level Project Execution Plan (ELPEP) effective date January 15, 2010.

Based on the assumption that the new management processes and medium level of mitigation measures noted in the ELPEP will be implemented, the PMOC projects that the SAS project team should be able to achieve the Estimated Total Project Cost (ETPC) of \$4.804 billion and RSD of February 2018.

Concerns and Recommendations:

*The PMOC will continue monitoring the implementation of the risk mitigation strategies. (See Section 6.4 for details).*

**1.1.2 Grantee's Work Approach, Understanding, and Performance Ability**

**a) Adequacy of Project Management Plan and Project Controls**

Status:

*During the 4<sup>th</sup> Quarter, various workshops continued with the MTA, FTA, and PMOC in order to implement the required management processes and strategies described in the ELPEP. The integration of these into the SAS PMP is on-going. Cost Management and Cost Contingency Plans have been developed and issued as drafts. PMOC has provided comments for each draft and is meeting with MTACC to resolve open issues. The approval process for PMP updates based on the Candidate revisions is ongoing.*

Observation:

Integration of the ELPEP requirements into the SAS PMP will allow the MTACC to more effectively manage the SAS project. It will also give the FTA/PMOC a greater level of assurance that the SAS project can proceed through the construction phases and be delivered to the start-up phase consistent with the estimated total project cost and schedule.

Concerns and Recommendations:

*The PMOC is concerned that the approval process might not be completed in time to support an amended to the FFGA. Update of the plans should be a high priority and recourses should be made available to do so.*

**b) Grantee's Approach to FFGA and other FTA/Federal Requirements**

Status:

MTACC continues to utilize the ELPEP and its various sub-plans in management of the FFGA.

Observation:

Efforts are underway to amend the FFGA because the baseline cost and schedule have been exceeded.

Concerns and Recommendations:

See section 1.1.2 a.

**c) Grantee's Approach to Community Relations, Asset Management, and Force Account Plan**

Status:

*Community Relations – As part of its community relations program, MTACC performs extensive public and community outreach. During the 4<sup>th</sup> Quarter, MTACC prepared and posted on-site schedules describing construction work for each of the active construction contracts. MTACC continued to field questions via the field office telephone, SAS Hotline and MTA web mail regarding all aspects of the project. They also sent notification e-mails to elected officials and Community Boards 8 and 11 regarding significant upcoming work and meet with the Second*

*Avenue Business Association. The community relations representative continued to support the bi-weekly job progress meetings and made known any concerns of the community that needed to be addressed. A task force has been formed called “The Good Neighbor Initiative”. It is intended to increase sidewalk width and cleanliness, standardize the look of construction barriers, paint barriers, increase the use of signage and improve overall cleanliness of work zone areas.*

*Asset Management – Identification and control of project assets will be coordinated between the System Contractor (Contract 6) and NYCT’s Department of Subways. Development of the plan is on-going.*

*Force Account – The Force Account requirements are documented in the SAS Force Account Plan. The plan gives a description and a cost estimate of the NYCT services required for the design of the track and signal elements of the system and to support construction activities for each individual contract. As of December 31, 2010, \$142,637 of the \$33,000,000 Force Account budget has been expended.*

Observation:

*Responses to community and business concerns are timely. The project recognizes that more community buy-in is needed to minimize the probability of community distress. SAS Asset Management Plan must be integrated with NYCT’s Property Management System. SAS Force Account Plan adequately addresses the efforts required by NYCT personnel.*

Concerns and Recommendations:

None

**d) Grantee’s Approach to Safety and Security**

Status:

Safety – Each construction contractor continued to implement its Safety Program in compliance with Section 011150 of the General Requirements Section of the Contract.

Security – Each construction contractor continued to implement its Site Security Plan in compliance with Section 011160 of the General requirements of the Contract. The section specifies requirements for the security of the work including: site and office security, and transportation and protection of explosives.

The MTA initiated a comprehensive review of its infrastructure to determine how to protect its customers and key assets from a terrorist incident. Security experts define critical vulnerabilities and determine appropriate protective strategies. The result of these efforts was the implementation of a multi-faceted program including operating and capital investments. The capital investments included hardening vulnerable assets and implementing the networks and equipment necessary to conduct targeted surveillance, control access, stop intrusion and provide command and control system to support incident response. MTA began implementing these investments in the 2000-2004 Capital Program and will continue to progress this program and subsequent programs using Federal funds. (Reference: Proposed MTA Capital Program 2010-2014, dated September 23, 2009).

Observation:

*Each construction contractor is proactive in implementing its safety program. Weekly tool box meetings are being conducted to keep the workforce informed on various safety topics. Safety concerns identified by CCM safety personnel and the OCIP representative are quickly addressed by the contractors. When an incident occurs, root cause analysis is performed to assure that the actual cause has been identified and positive corrective actions implemented to prevent recurrence. The year to date (as of November 30, 2010) OSHA Lost Time Rate is 2.30 and the OSHA Recordable Accident Rate is 5.28. Both rates are above the national average of 2.2 and 4.2 respectively.*

Due to the sensitive nature of the security effort, the proposed 2010-2014 Capital Program identifies a single budgetary reserve of \$250M which will be used to progress the next group of projects. (Reference: Proposed MTA Capital Program 2010-2014, dated September 23, 2009).

Concerns and Recommendations:

None

**1.1.3 Grantee's Understanding of Federal Requirements and Local Funding Process  
Federal Requirements**

**a) Uniform Property Acquisition and Relocation Act of 1970**

Real estate acquisition and tenant relocation is being performed in accordance with the approved SAS Real Estate Acquisition Management Plan and Relocation Plan. These plans address Title 49 CFR Part 24, which implements the Uniform Relocation Assistance and Real Property Acquisition Polices Act of 1970, as amended, and FTA real estate requirements 5010.1C.

**b) Local Funding Agreements**

*Local funds totaling \$813,283,755 have been spent as of December 31, 2010. MTA's approved 2000-2004 and 2005-2009 Capital Programs included \$1,050 million and \$1,914 million respectively for SAS Phase 1. The proposed 2010-2014 Capital Program budgets \$1,487 million to complete the SAS Phase 1 project.*

**1.1.4 Scope Definition and Control**

Status:

The scope of the SAS Project is defined by the FEIS, ROD and the FFGA.

The scope was originally subsequently allocated into six construction contract packages. The project scope was subsequently reallocated into eleven construction packages. In early 2010, in response to delays in property acquisition, the scope of work for the 72<sup>nd</sup> Street Station was consolidated into two packages instead of three, resulting in ten contract packages for the project.

MTACC has proposed the elimination of the vehicle procurement from the scope of the project. The rationalization for the elimination of the vehicle is presented in the revised NYCT Fleet Management Plan.

Observation:

The process of utilizing the Configuration Control Board (CCB), the change control process, the Technical Advisory Committee (TAC) and issuing Technical Memorandums is effective in managing scope changes and transfers between construction packages.

Concerns and Recommendations

None

**1.1.5 Quality**

Status:

*PB continued the following Quality Assurance oversight activity efforts for each construction contract: review and approval of contractor's Quality Work Plans; review of the contractor's Quality Management System (internal audit of contractors and external audit of subcontractors); participation in Preparatory Phase Sessions for construction processes; bi-weekly quality meetings with contract's management; and monitoring the control of non-conforming material.*

Observations:

*The Quality Management Program implemented by MTACC on the SAS Project full meets the requirements outlined in the FTA's QA/QC Guidelines. Each construction contractor is required to have a Contractor's Quality Program which meets General Requirements-Section 014300 of the Contract Terms and Conditions. The section defines the responsibilities of the contractor in the management of quality in all phases of the Project, including the activities of Subcontractors and Suppliers, to achieve an end product conforming to the Contract Documents.*

Concerns and Recommendations:

None

**1.1.6 Project Schedule**

Status:

A summary of project schedule information is as follows:

	FFGA	Forecast Completion	
		Grantee	PMOC
Begin Construction	January 1, 2007	03/20/2007A	03/20/2007A
Construction Complete	December 31, 2013	May 23, 2016	October 2017
Revenue Service	June 30, 2014	December 30, 2016	February 2018

Observations:

*The project has experienced delays beyond the current FFGA Revenue Service Date of June 30, 2014 that realistically cannot be recovered. Over the last six months, the MTACC has updated and upgraded the Integrated Project Schedule in a manner which significantly improves the reliability of the forecast dates. The updating process has included TBM forecasts based upon*

*actual production rates previously achieved and incorporation of MTA testing and commissioning activities for all operating systems.*

*TBM production has generally been less than planned. TBM mining is the start of an independent “near-critical” path with only 6 WD of float.*

**Conclusions and Recommendations:**

*MTACC continues to actively manage the schedule in an effort to mitigate additional delays and potentially recover some of the previous delay time, as well as take advantage of opportunities to develop additional schedule contingency (float).*

*TBM mining directly impacts the cavern mining/excavation for contracts C4B and C5B. Active management of the cavern excavation process by MTACC can mitigate some additional TBM delay. TBM progress is extremely variable from period to period and this situation must be monitored closely. Additional contingency plans (if any are available) should also be considered.*

**1.1.7 Project Budget and Cost**

**Status:**

Total project cost in the approved FFGA is \$4,866,614 million and is allocated into the Standard Cost Categories (SCC) as shown below in Table 1-1.

**Table 1-1: Standard Cost Categories**

<b>Standard Cost Category (SCC) #</b>	<b>Description</b>	<b>Year of Expenditure \$000</b>
10	Guideway & Track Elements	612,404
20	Stations, Stops, Terminals, Intermodal	1,092,836
30	Support Facilities: Yards, Shops, Admin Bldgs.	0
40	Site Work & Special Conditions	276,229
50	Systems	322,707
60	ROW, Land, Existing Improvements	240,960
70	Vehicles	152,999
80	Professional Services	796,311
90	Unallocated Contingency	555,554
Subtotal		4,050,000
Financing Cost		816,614
Total Project		4,866,614

Table 1-2 lists the associated grants in the Transportation Electronic Award Management (TEAM) System with respective appropriated and obligated amounts as of *December 31, 2010*.

**Table 1-2 Appropriated and Obligated Funds**

<b>Grant Number</b>	<b>Amount (\$)</b>	<b>Obligated (\$)</b>	<b>Disbursement (\$) thru <i>December 31, 2010</i></b>
NY-03-0397	\$4,980,026	\$4,980,026	\$4,980,026
NY-03-0408	\$1,967,165	\$1,967,165	\$1,967,165
NY-03-0408-01	\$1,968,358	\$1,968,358	\$1,968,358
NY-03-0408-02	\$24,502,500	\$24,502,500	\$24,502,500
NY-03-0408-03	0	0	0
NY-03-0408-04	0	0	0
NY-03-0408-05	\$167,810,300	\$167,810,300	\$166,005,776
NY-03-0408-06	\$274,920,030	\$274,920,030	0
NY-17-X001-00	\$2,459,821	\$2,459,821	\$2,459,821
NY-36-001-00*	\$78,870,000	\$78,870,000	\$78,870,000
NY-95-X009-00	\$25,633,000	\$25,633,000	\$8,652,432
NY-95-X015-00	\$45,800,000	\$45,800,000	0
<b>Total</b>	<b>\$628,911,200.00</b>	<b>\$628,911,200.00</b>	<b>\$289,406,078.00</b>



\* Denotes American Recovery and Reinvestment Act (ARRA) funds

A total of \$1,102,689,833 has been expended on the project through *December 31, 2010*, of which \$408,811,469 has been spent on design and \$374,417,187 on construction (MTACC’s monthly financial input).

Observation:

Local funds totaling \$813,283,755 (\$1,102,689,833 - \$289,406,078) have been spent as of *December 31, 2010*. MTA’s approved 2000-2004 and 2005-2009 Capital Programs included \$1,050 million and \$1,914 million respectively for SAS Phase 1. The proposed 2010-2014 Capital Program budgets \$1,487 million to complete the SAS Phase 1 project.

Concerns and Recommendations:

None

**1.1.8 Project Risk Monitoring and Mitigation**

Status:

*Risk monitoring and mitigation is ongoing and being performed per the SAS Risk Management Program, which is documented in the PMP. Monthly meetings are being held to address priority risks. Through November 2010, the project has held eight Risk Mitigation Meetings. A Risk Register has been developed and maintained on the Project since late 2002. The present Risk Register is being updated to include Risk Mitigation Meeting proceedings as of November 2010.*



Observation:

*SAS Project Management is being proactive in its efforts to monitor and mitigate risk. From the initial Risk Mitigation and through all subsequent meetings held to date, the Project has been focusing on those risks that DHA indicated in its December 2009 Risk Analysis Report as the risks that contribute the most to the contingency requirements.*

Concerns and Recommendations:

None

### **1.1.9 Project Safety**

Status:

Each construction contractor continued to implement its Safety Program in compliance with Section 011150 of the General Requirements Section of the Contract. *The year to date (as of November 30, 2010) OSHA Lost Time Rate is 2.30 and the OSHA Recordable Accident Rate is 5.28. Both rates are above the national average of 2.2 and 4.2 respectively.*

Observation:

*Each construction contractor is proactive in implementing its safety program. Weekly tool box meetings are being conducted to keep the workforce informed on various safety topics. Safety concerns identified by CCM safety personnel and the OCIP representative are quickly addressed by the contractors. When an incident occurs, root cause analysis is performed to assure that the actual cause has been identified and positive corrective actions implemented to prevent recurrence.*

Concerns and Recommendations:

None

### **1.2 FTA Compliance Documents**

Status:

No change this period.

All documents required for approval of a FFGA were issued. As the project has advanced through different phases of development, decisions have been made, which requires the PMP and sub-plans to be updated. [Ref: SAS-A17-Aug08]

**Note:** Throughout this report, any [Ref: SAS-XX] refers to the table in Section 7.0 and any [Ref: SAS-AXX] refers to the table in Section 8.0.

#### **1.2.1 Readiness to Enter PE**

Status:

Preliminary Engineering (PE) began in December 2001.

#### **1.2.2 Readiness to Enter Final Design**

Status:

Final Design began in April 2006.

### **1.2.3 Record of Decision**

Status:

The Record of Decision (ROD) was dated July 8, 2004.

### **1.2.4 Readiness to Execute FFGA**

Status:

The Full Funding Grant Agreement (FFGA) was dated November 19, 2007.

### **1.2.5 Readiness to Bid Construction Work**

Status:

The PMOC's implementation of the OP53 reviews during *December* 2010 included the following actions:

- Scheduled and conducted two internal progress meetings per week and prepared and issued meeting minutes for SAS 2B and 5C Contract reviews, and general information on other SAS contract reviews to be performed;
- Distributed additional package-level design documents directly, through internal server access, and through an FTP server to OP53 Review Team;
- The OP53 review of the 2B and 5C packages continued with the research of needed documents in the EDMS system, and further chronology development;
- Reviewed pertinent, new MTACC procedures for ongoing OP53 reviews;
- Assembled *additional* 2B and 5C design documents and continued OP53 reviews; Some 4B OP53 report sections were also updated;
- *Continued analyses and development of various Contract 2B report sections; Also performed some updating of 4B report sections.*

Observation:

*Despite requests, the PMOC has still not received a price or cost analysis of the C-26007 Bid.*

*The MTA Procurement Policy/Instruction Manual – IV-A.16 identifies that FTA requires that a price analysis be performed on every procurement action even where a cost analysis is called for. A price analysis, as defined, means the process of examining and evaluating a proposed price without evaluating its separate cost elements and proposed profit.*

*The Design Consultant's (DHA) PMP (7.1.4) states that DHA performs constructability reviews as the design progresses. Also, DHA's contract Scope of Work (3.1.14) states that "...At each stage of the project a constructability review shall be made and formally documented...". Further, DHA Contract Modification 38 required DHA to perform a formal constructability review of the combined 72<sup>nd</sup> Street Contracts 4A/B/C. MTACC included in MTACC Project Procedure No. DE.04, Rev. 0, that they will be responsible for independent reviews. PMOC did identify and review constructability reviews performed by MTACC at 60% and 95% design, but has not found Final Design constructability reviews by DHA.*

Concerns and Recommendations:

- *PMOC recommends that a price analysis be performed on every procurement action even where a cost analysis is called for in accordance with the MTA Procurement Policy/Instruction Manual – IV-A.16.*
- PMOC recommends that MTACC's Design Consultant perform constructability reviews of contracts in design in accordance with their contract Scope of Work.

**1.2.6 Readiness for Revenue Operations**

Status:

- Concept of Operation Plan has been approved.
- System Testing Plan is under development and has been reviewed by NYCT.
- The system safety analysis has been completed as part of the design effort. Safety and Security Conformance Checklist for each station has been developed and submitted to NYCT for approval.
- Preliminary testing and commissioning activities have been included in the IPS to ensure adequate time for this function.

Observation:

Preparatory activities that will support revenue operations have progressed satisfactorily to date and support the currently forecast Revenue Service Date.

Concerns:

*None at this time.*

## 2.0 PROJECT SCOPE

### 2.1 Status & Quality: Design/Procurement/Construction

#### 2.1.1 Engineering and Design

##### Status:

*The following table summarizes Final Design Completion Dates as reported by the MTACC via the most recent update of the Integrated Project Schedule (IPS) update #53, dated December 1, 2010.*

**Table 2-1: Design Completion Dates**

<b>Contract</b>	<b>Description</b>	<b>IPS Update #52</b>	<b>IPS Update #53</b>
Contract-26010 (2B)	96 <sup>th</sup> Street Station Finishes and (MEP)	11/2/10	11/02/10A
Contract-26011 (4C)	72 <sup>nd</sup> Street Station Finishes and MEP	06/02/10A	06/02/10A
Contract-26008 (5B)	86 <sup>th</sup> Street Station Cavern Construction	09/30/10A	09/30/10A
Contract-26012 (5C)	86 <sup>th</sup> Street Station Finishes and MEP	10/27/10A	10/27/10A
Contract-26009 (6)	Systems –Track, Power, Signals and Communications	10/26/10A	10/26/10A

##### Observation:

*As of this update, MTACC is reporting that design is 100% complete. The PMOC has not received 100% Design Memorandums for C2B, C5B, C5C and C6.*

##### Concerns and Recommendations:

*The MTACC committed to providing the PMOC with 100% Design Memorandums promptly upon their completion. The PMOC is concerned that this documentation has not been provided, even in cases where design has been reported as 100% complete for several months.*

#### 2.1.2 Procurement

##### Status:

*There were no construction package advertisements or bid openings during December 2010. Two significant events were originally scheduled to occur in December 2010:*

- *Contract C3 was scheduled to be awarded on December 17, 2010. Due to an extended review period by the MTA, this award was postponed until approximately January 14, 2011.*

- *The bid opening for construction package C5B was initially scheduled for December 21, 2010, but was subsequently postponed until January 11, 2011.*

*Adequate float exists in the schedule to ensure that no delays to the Revenue Service Date will result from these delays. A summary of “milestones” for ongoing or near-term procurements are as follows:*

**Table 2-1: Construction Procurement Milestones**

<b>Activity #</b>	<b>Description</b>	<b>Date*</b>	<b>Comment</b>
<b>Contract C-26006 (C3): 63<sup>rd</sup> Street Station Upgrade</b>			
C3 PR25	Procurement (IFB) Advertise & Bid	06/24/10A	Evaluation of low bidder by MTA is ongoing.
C3 PR30	Open Bids	11/04/10A	
C3 PR40	Award Contract C3	01/14/11	
<b>Contract C-26008 (C5B): 86<sup>th</sup> Street Station Cavern &amp; Heavy Civil</b>			
C5B 20m	Procurement – Advertise C5B Bid Package	10/25/10A	Bid date postponed until 01/11/11.
C5B 25d	Procurement (IFB) Open Bids	01/11/11	
C5B PR40	Award Contract 5B	03/29/11	
<b>Contract C-26009 (C6): Systems</b>			
SYPR20e	Authorization to Advertise	09/10/10A	<i>Forecast contract award date delayed</i>
SYPR 20k	Prep RFP Short List	11/29/10A	
SYPR 25t	Issue RFP	01/13/11	
SYPR30d	Submit Proposals	04/08/11	
SYPR40	Award Contract	07/06/11	

\* Note: All dates reference IPS Update #53 (DD=12/01/10) U.N.O.

**Observations and Analysis:**

*IPS Update #48 (DD=07/01/10) forecast the award of C-26009 on 05/03/11. Over the subsequent five months, this forecast award date has been delayed by two months, to the current forecast of 07/06/11. This package is one of the most important on the project. In terms of*

*schedule performance, this delay of approximately 40% has not been explained or otherwise justified.*

*Based on IPS Update #53, procurement for this package began on 09/10/10. Through the data date of 12/01/10, 56 working days had elapsed, yet progress of only 43 days of scheduled activity have been achieved. This results in an “inefficiency factor” of  $56/43 = 30\%$ . If this inefficiency is projected over the forecast remaining duration of six months, the award date of this package will slip to approximately 09/01/11.*

*In addition, the PMOC questions the scheduled durations for several of the remaining procurement activities. The duration of several activities appears excessive, while others appear inadequate.*

#### Concerns and Recommendations:

*In terms of schedule performance, the procurement of C-26009 has been extremely poor. If current performance is projected over the remaining duration of the procurement, the package will be “near-critical” on the date of award.*

*The PMOC recommends the MTACC critically review the remaining schedule for the procurement of this package and develop a revised procurement schedule that recovers the two months that have been lost over the recent five-month period.*

### **2.1.3 Construction**

#### Status:

There are four active construction contracts on the SAS project. *Construction progress on these contracts through December 2010 includes:*

- **Contract C-26002 (C1) –TBM tunnels from 92nd Street to 63rd Street**
  - *Mining of TBM west tunnel was completed to contract limit (4996 LF) on December 6, 2010, and mining of TBM Extension (AWO #92) commenced immediately thereafter. 982lf of the 2209 LF of extension have been mined through December 29, 2010, achieving an average of 54.6 LF/day.*
  - *Set-up of freeze plant, connections and pressure test complete. Freeze operations are scheduled to start mid-January 2011 based on current production of TBM. Safety inspections & FDNY approval expected week of January 3rd, 2011.*
  - *Commenced test pit work for installation of ground instrumentation to monitor freeze area.*
  - *Cellar Tie work at 1808, 1804 & 1834 nearing completion. Work at 1814 is still pending sidewalk shed removal.*
  - *Sidewalk improvements/Good Neighborhood Program initiatives continue.*
- **Contract C-26005 (C2A) 96th Street Station Heavy Civil, Structural and Utility Relocation**
  - *Completed sewer backfill and sheeting removal between MH 97-3 to MH 98-1, eliminated sewer line from MH 98-1 to SC 98-1; and completed MH 98-1.*
  - *Completed 18” sewer installation between MH 96-3 and SC 96-1.*

- Started excavation for sewer manhole MH 98-3 and MH 98-4.
- Completed west side Con Edison duct and manhole installation; turned over to Con Edison for cable pulling and splicing.
- Con Edison and ECS pulled and spliced cables between 95th and 98th Sts on the east side of 2nd Avenue.
- Completed jet grouting at the North wall of building 1873 2nd Avenue.
- Completed cellar door work at buildings 1867 and 1869 between 96th and 97th Sts.
- Completed the cracks repairs inside building 1873 enabling tenant's move-in.
- **Contract C-26007 (C4B) 72<sup>nd</sup> Street Station Mining and Lining**
  - Preliminary CPM Schedule conditionally accepted.
  - Re-submission of the detailed CPM Baseline Schedule expected during the week of January 10, 2011.
  - Test Blast currently forecast for week of January 10, 2011.
  - Mobilization of key equipment for rock excavation at 69<sup>th</sup> & 72<sup>nd</sup> Street Access Shafts continues.
  - Mobilization & set-up of MPT and temporary utilities to support construction operations continues.
  - Ground & Building Instrumentation Installation continues.
- **Contract C-26013 (C5A) 86th Street Station Excavation, Utility Relocation and Road Decking**
  - Con Ed continues cable pulling & splicing work along the east side of Second Ave. between 82<sup>nd</sup> and 84th streets.
  - As part of Schedule initiative, completed installation of new sewer pipe and MHs on west side of Second Ave. The fourth traffic lane was restored on December 3, 2010.
  - Completed tie-in of the north & south 12" steel gas main to 30" gas main.
  - Continued electric/water/sewer service work at various locations.
  - Completed contract sewer work to contract limit and continued working extension to sewer work beyond limit as part of AWO #49.
  - Coordinating Con-Ed tin-in with excavation for 30" gas main in "common trench" with the 16" sewer main.
  - Mobilized soldier pile work at the north & south shafts on December 29th, 2010.

Observations:

Key elements of work or issues requiring resolution in the near future to avoid delays to the work are described below.

For Contract C1 - As of December 31, 2010, TBM progress is summarized as follows:

Second Avenue Subway TBM Summary - PMOC Projection							
Date	Station	Total Progress	Unit	Period Progress	Work Days/Period	Progress/Period	Unit
5/27/2010							
6/8/2010	Sta 1221+89.0	0.0		261.0	16	16.31	LFWD
6/29/2010	Sta 1219+28.0	261.0	LF	374.2	22	17.01	LFWD
7/29/2010	Sta 1215+02.96	635.2	LF	1292.8	18	71.82	LFWD
8/31/2010	Sta 1202+61.0	1928.0	LF	1054.0	17	62.00	LFWD
9/29/2010	Sta 1192+07	2982.0	LF	769.0	24	32.04	LFWD
11/2/2010	Sta 1183+85.72	3751.0	LF	877.0	20	43.85	LFWD
11/30/2010	Sta 1175+09.17	4628.0	LF	368.0	4	92.00	LFWD
12/6/2010	Sta 1171+93	4996.0	LF	392.0	6	65.33	LFWD
	Original limit, TBM-1						
12/14/2010	Sta 167+48.8	5388.0	LF	883.5	18	49.08	LFWD
1/9/2011	Sta 158+65.6	6271.5	LF				
Total To Date		6271.5	LF		145	43.25	LFWD
				943.5	22	43.25	LFWD
Forecast							
2/8/2011	Sta 1150+00	7215.0	LF				
Complete TBM-1							
3/8/2011					20		
4/12/2011					25		
4/12/2011	Sta 1221+89	0.0	LF				
				7827	181	43.25	LFWD
12/21/2011	Sta 1143+80	7827.0	LF				

- *TBM production improved significantly during December 2010. Base contract work on the west bore was completed on December 6, 2010 and additional work added via AWO #92 commenced immediately. Completion of the west bore is currently forecast for February 2011.*
- *As previously reported, the contractor has accepted responsibility for 82 WD of delay through June 1, 2010. TBM-related delays to date are also considered to be the contractor's responsibility. These delays are currently estimated at 45 WD. To date, no Recovery Plan or other indication how the Contractor intends to recover this time has been presented.*



- Transfer of the concrete lining of the east bore (72nd to 86th Streets) from contract C1 to contract C4B is anticipated to satisfy New York City Fire Department (NYCFD) requirements and coordinate the work of these packages. *To date, a proposal detailing the corresponding schedule reduction has not been submitted by the Contractor.*
- *Contractor compliance with safety requirements & FDNY approval required to charge freeze plant w/Ammonia for starting ground freezing.*

For Contract C2A:

- *A temporary “work around” for the ECS ductbank interference with sewer line at SC 95-2 was approved; the work is underway.*
- *Additional field investigation is required and is underway to resolve the ECS MH interference with Slurry wall panel at 95th Street.*
- *MTACC and CCM are evaluating the Contractor’s cost proposal for Schedule Recovery/Mitigation (AWO #48).*
- *C1 and C2A are coordinating resolution of the water main conflict with TBM ducts.*
- *Additional 60” Water Main – DEP approval, Fabrication, Installation requiring Shut-down.*
- *DOT approval is required for Lane/Sidewalk closure between 97th and 99th Streets to support water line work.*

For Contract C4B:

- *Blasting Coordination w/C1 TBM Mining Contract.*
- *Reaction to Contractor’s proposed plan to build an enclosure around the muck conveyor/loading operation at street level. Early verification that this structure conforms to FEIS requirements is considered very important.*
- *Vacating of Commercial Space by January 15, 2011 to support demolition of Ancillary #2*

For Contract C5A:

- *Approval of modified Manhole “F” at 87th St intersection, to facilitate completion of modified “F” roof and ducts entering MH.*
- *ECS/Verizon completion of cable pulls within existing spare ducts by mid-January 2011.*
- *Con Ed schedule improvement for cable pulling and splicing work at north end for powering Chase Bldg.*
- *Coordination of Blasting operations at the North & South Shaft with C1 TBM mining Operations & CIP Concrete Work.*
- *Completion of east side conduit and MHs including new MH “Z” by end of January 2011 to facilitate inner-duct installation to coincide with “unrelated February outage”.*

### Concerns and Recommendations:

*MTACC continues to make progress in resolving problem issues and avoiding major construction delays. However, the PMOC considers an improvement in the processing times for AWOs to be an area requiring improvement.*

#### **2.1.4 Force Account (FA) Contracts**

##### Status:

*As of December 31, 2010, \$142,637.00 of the \$33,000,000 FA budget has been expended.*

##### Observation:

*While MTACC is heavily involved in construction, it does not have its own employees to support these activities. It relies on NYCT in-house labor for this purpose. NYCT employees have specialized skills and will perform flagging, general orders, work trains, access and protection, inspections, and crowd control for the SAS project. These employees have been thoroughly trained and have gained expertise in NYCT operating procedures as they relate to providing a safe and effective work environment. The force account requirements are documented in the SAS Force Account Plan. The plan gives a description and a cost estimate of the NYCT services required to support construction activities for each individual contract.*

##### Concerns and Recommendation:

None

#### **2.1.5 Operational Readiness**

##### Status:

*NYCT has developed a Concept of Operations Plan for the SAS Project. Operational Readiness will be validated during NYCT's Pre-Revenue Service testing scheduled from March 21, 2016 to June 15, 2016 (Reference IPS update #53 dated December 2010).*

##### Observation:

*The specific tests with its associated durations that NYCT will perform during Pre-Revenue Service testing are not identified on the IPS.*

##### Concerns and Recommendation:

The PMOC recommends that the Concept of Operations Plan be updated to reflect any changes from the optimization effort which could affect the SAS project. *An Operational Readiness review will be performed as outlined in FTA's OP #54.*

#### **2.2 Third-Party Agreement**

##### Status:

*The PMP is being revised to address Interagency Coordination (Section 13.0) which will address: Interagency Agreements with Utility Providers; Tracking Interagency Inputs; Agreements with Other City Agencies; Protection of the Railroads During Construction; and Mitigation. As stated in the Section 13.1, MTACC/NYCT will enter into cooperative and Force Account agreements as needed with other agencies and utility providers for the Project. The*

*Project shall execute rate agreements for each contract with utility agency/company when there is force account work to be done to support construction.*

Observation:

*The revised PMP adequately addresses the subject of Third-Party Agreements.*

Concerns and Recommendation:

None

**2.3 Contract Packages and Delivery Methods**

Status:

Phase 1 of the Second Avenue Subway will be delivered via ten separate construction packages. All construction contract packages will be delivered through a design-bid-build process utilizing a fixed price construction contract. Competitive procurements are based on NYCT standard procedures. Specific procurement procedures for each open construction contract package are shown in the following table.

**Table 2-1 Construction Procurement Method and Status**

			<b>Procurement</b>	
<b>No.</b>	<b>Contract</b>	<b>Description</b>	<b>Type</b>	<b>Status</b>
C2B	C-26010	96th Street Station: construction of the entrances and ancillary facilities, architectural finishes and MEP equipment.	RFP	<i>Design Completed</i>
C4C	C-26011	72nd Street Station: construction of ancillary finishes, station finishes and MEP equipment.	RFP	<i>Design Completed</i>
C3	C-26006	63rd Street Station: renovation of existing station involving open-cut excavation for the construction of entrance and ancillary facilities.	IFB	<i>Bids Received</i>
C5B	C-26008	86th Street Station: construction of the station cavern, entrances and access shafts.	IFB	<i>Design Completed</i>
C5C	C-26012	86th Street Station: construction of the ancillary facilities, station finishes and MEP equipment.	RFP	<i>Design Completed</i>
C6	C-26009	Systems, Power, Signals and Communications; includes the installation of the low-vibration track, aluminum rail, way-side signals, and all communication components, integration of the communication network with the NEP SCADA system and commissioning the system for revenue service.	RFP	<i>RFP Process Started</i>

Observation:

Construction packages are primarily location-based and consist of one line-section package, eight station packages and one system's package. The project scope has been allocated to the various contract packages in a logical manner to facilitate a reasonable and efficient construction sequence. MTACC has proactively adjusted scope among the contract packages in response to delay mitigation or schedule acceleration opportunities as they have arisen.

Concerns and Recommendations:

None

## **2.4 Vehicles**

Status:

NYCT has stated in their Rail Fleet Management Plan and at project progress meetings that the purchase of vehicles for the SAS program may be cancelled based on NYCT projections for their fleet requirements to support the service including the SAS Phase 1 project. FTA and the PMOC have requested analysis to back up the NYCT calculations which according to the RFMP are based on a change to the NYCT fleet spare factor. *A revised RFMP has been generated by NYCT which bases the justification for not purchasing additional vehicles for the SAS project on the inclusion of service reductions in the calculation of fleet requirements.*

Observations:

*The PMOC had requested certain clarifications of the decision to decrease the total fleet spare factor and, thereby, the fleet requirement, by increasing the maintenance intervals for new millennium cars.*

*NYCT has revised their RFMP to no longer link the change to SMI intervals to the availability of vehicles for the SAS Phase I service, a previous concern reported by the PMOC. The RFMP accounts for recent service cuts, which significantly increase the fleet spare factor. The delay to vehicle orders to meet fleet growth on other "B" division lines will also be postponed. Additional cars to support the "Q" line rerouting portion of SAS would reassign service reduction cars as necessary. The PMOC noted however that the total requirement for SAS Phase I service is 132 cars based on additional vehicles for the "W" service.*

*The NYCT RFMP now indicates that the 80 R-179 Option 2 cars is NYCT's preferred choice for satisfying Phase I of SAS, pending funding availability, however the recent service reductions provide ample spare vehicles, allowing NYCT to maintain a higher spare factor than before.*

Concerns and Recommendations:

*Should NYCT experience future growth or other circumstances that require the reversal of service reductions implemented in 2010, this issue, combined with the inclusion of vehicle orders that are not funded, could present challenges meeting service when the SAS service is initiated, requiring the identification of funds for the purchase of additional vehicles.*

## 2.5 Property Acquisition and Real Estate

### Status:

*Title for 13 properties was vested on December 13, 2010. New relocations associated with fee acquisition of 300 E 72<sup>nd</sup> Street include, 3 residential and 2 commercial tenants. Property required to be handed over to contractor end of 2011.*

### Observation:

Revisions requires for 2 appraisals submitted to FTA, Block 1417, Lot 45 – 200-201 East 63<sup>rd</sup> Street and Block 1397, Lot 61 – 124-126 East 63<sup>rd</sup> Street. MTA will re-submit and send out offer letters to property owners upon receipt of approval from FTA.

<b># Parcels Identified</b>	<b># Parcels Closed</b>	<b># Parcels Under Contract</b>	<b># Parcels In Negotiation</b>	<b># Parcels In Appraisal</b>	<b># Parcels In Condemnation</b>	<b># Parcels Right of Occupancy</b>
<b>95</b>	<b>91</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>94</b>	<b>88</b>

### Concerns and Recommendations:

*PMOC recommends a site visit in first quarter 2011 to review status of condemnations and files; verify schedule of completion of all rock bolt temporary easements; meet with MTA Real Estate to discuss cost to cure on interior building utilities and how it impacts schedule deliverables; and review property management plan for FTA compliance under OP23. PMOC will review the temporary relocations and verify cost to complete budgets and schedules.*

## 2.6 Community Relations

### Status:

*As part of its community relations program, MTACC performs extensive public and community outreach. During the 4<sup>th</sup> Quarter, MTACC prepared and posted on-site schedules describing construction work for each of the active construction contracts. MTACC continued to field questions via the field office telephone, SAS Hotline and MTA web mail regarding all aspects of the project. They also sent notification e-mails to elected officials and Community Boards 8 and 11 regarding significant upcoming work and meet with the Second Avenue Business Association. The community relations representative continued to support the bi-weekly job progress meetings and made known any concerns of the community that needed to be addressed. A task force has been formed called “The Good Neighbor Initiative”. It is intended to increase side walk width and cleanliness, standardize the look of construction barriers, paint barriers, increase the use of signage and improve overall cleanness of work zone areas.*

### Observation:

*Responses to community and business concerns are timely. The project recognizes that more community buy-in is needed to minimize the probability of community distress.*

### Concerns and Recommendations:

None

### **3.0 PROJECT MANAGEMENT PLAN AND SUB-PLANS**

#### Status:

*Update of the Project Management Plan is ongoing. MTACC has identified Candidate Revisions for each section of the PMP and documented the required changes on Candidate Revision Forms. The updates have been prioritized and the individuals responsible for updating the sections were identified. A revised (Draft) PMP is anticipated in early January 2011.*

#### Observations:

The SAS Project Management Team is being proactive in updating the PMP in that all Candidate Revisions were identified ahead of schedule. Utilization of the Candidate Revision Forms, which identifies the originator, sponsor, the reason for the change, motivating factor for the revision, notes, comments and approvals, is an effective tool in assuring compliance with the ELPEP.

#### Concerns and Recommendations:

*Update of the plans should be a high priority and recourses should be made available to address comments from the FTA/PMOC.*

### **3.1 PMP Sub Plan**

#### Status:

As part of the Candidate Revision process for the update of the PMP, the Sub-Plans have been identified and will be referenced in the section of the PMP which relates to its subject matter. The Sub-Plans will be updated to assure consistency with the PMP.

#### Observations:

SAS Sub-Plan documents to be referenced consist of: Project Quality Manual, Quality Assurance Plan, Risk Management Plan, Design Criteria Manual, Cost Management Plan, Schedule Management Plan, Project Design Quality Manual, Real Estate Acquisition Plan, Real Estate Acquisition Management Plan, Contingency Management Plan, and Quality Implementation Procedure.

#### Concerns and Recommendations:

None

### **3.2 Project Procedures**

#### Status:

*MTACC has issued 66 out of approximately 75 identified procedures. This represents an additional 7 new procedures since the September 2010 comprehensive report.*

#### Observation:

*Progress on the development of the procedures has been extremely slow since the initial surge in February and March 2010. The MTACC was not able to implement these procedures in accordance with its initial commitment to have all of them in use by April 12, 2010. Based on its performance during the last several months, the PMOC believes that the MTACC will not be able to complete development of all 75 procedures until March 31, 2011, at the earliest. In that*

*the procedures will be replacing previous procedures of the same type, the review and update of the PMP through the ELPEP process is not contingent upon the completion of these procedures.*

**Concerns and Recommendations:**

*The PMOC is concerned that it has taken nine months for the MTACC to develop its last 21 procedures and that the process is not yet complete. The PMOC is also concerned that until its various user organizations are fully trained and the procedures are in widespread use, the MTACC may have difficulty in its compliance with the ELPEP provisions.*

*The PMOC recommends that the MTACC require its contractor to develop the remainder of the procedures and to concurrently put the finishing touches on the training program as quickly as possible. The PMOC also recommends that the MTACC commit to accomplish the procedure development and begin the training program before the end of 1Q-2011. Furthermore, the PMOC recommends that the MTACC also develop a program to monitor compliance among its various organizations.*

**4.0 PROJECT SCHEDULE STATUS**

**4.1 Schedule Status**

**Status:**

*IPS Update #53 was received on January 05, 2011 and is based on a Data Date of December 01, 2010. Update #53 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 continues to forecast completion of all construction on 07/15/16, with 165 calendar days of contingency until its committed RSD of 12/30/16.*

**Table 4-1: Summary of Critical Dates**

	FFGA	Forecast Completion	
		Grantee	PMOC
Begin Construction	January 1, 2007	03/20/2007A	03/20/2007A
Construction Complete	December 31, 2013	May 15, 2016	October 2017
Revenue Service	June 30, 2014	December 30, 2016	February 2018

*During the month of December 2010, progress continued on the four (4) active construction packages: C-26002 (C1) TBM Tunneling and 96th Street Box, C-26005 (C2A) 96th Site Work and Heavy Civil, C-26013 (C5A) Open Cuts and Utility Relocation, and C-26007 72<sup>nd</sup> Street station Cavern mining & Lining (C4B). The IPS does not currently reflect the C4B contractor’s work plan. The C4B Preliminary CPM was submitted and approved in December 2010. It contains a detail schedule for the first 90 days of the project and a summary of all remaining work. The C4B detailed CPM was reviewed by the CCM and returned as “Revise and Resubmit” in December 2010. It is anticipated that an acceptable package schedule for C4B will be received in January 2011 and incorporated in the next update of the IPS.*

Observations and Analysis:

Completion of the west bore base contract work (December 6, 2011) represents the accomplishment of a significant milestone. Compared to the Rev #3, Update 29 which is currently considered the baseline schedule:

<i>Act #</i>	<i>Description</i>	<i>IPS Update #29 DD=11/30/08</i>	<i>IPS Update #53 DD=12/01/10</i>	<i>Difference (WD)</i>
S6100c	Mine West Tunnel; Launch Box to 72 <sup>nd</sup> Street	20-Jun-10	6-Dec-10	123

In October 2010, the MTACC reported (via IPS #50) that the schedule durations for TBM mining of the East Tunnel had been revised based on the actual production rates achieved during the West Tunnel drive. The resulting schedule for the East Tunnel between the Launch Box and 72<sup>nd</sup> Street is summarized as follows:

<i>Act #</i>	<i>Description</i>	<i>IPS#53 Duration</i>	<i>Start</i>	<i>Finish</i>
S9100b	TBM 2nd Run - Mine East Tunnel 94th Street Launch Box to 86th St	29	5- May- 11	15- Jun-11
S9100c	TBM 2nd Run - Mine East Tunnel 94th Street Launch Box to 72nd No. X-Over	65	16- Jun-11	16- Sep-11
	<b>TOTAL</b>	94		

Concerns and Recommendations:

The PMOC is concerned about the forecast duration of the East TBM Bore. MTACC is currently forecasting duration of 94 WD from the 96<sup>th</sup> Street Launch Box to 72<sup>nd</sup> Street. The recently completed base contract portion of the west drive required 138 WD to bore a similar distance. Assuming geotechnical conditions to be similar, it appears the current forecast of duration for the East Bore may be somewhat understated. The “near-critical” status of this path necessitates that activity durations be thoroughly validated. The PMOC recommends a review of the forecast durations for the East Bore and an update of IPS as necessary.

**4.2 90-Day Look-Ahead**

Status:

Based on the Integrated Project Schedule (IPS) Update #53, major activities that can be anticipated over the upcoming 90 days include the following:



**Table 4-2: 90-Day Look-Ahead Schedule**

<i>Activity ID</i>	<i>Start</i>	<i>Finish</i>	<i>Note</i>
<b><i>C1- TBM Construction – Tunnel 96th Box (91st to 95th)</i></b>			
<i>TBM 1<sup>st</sup> Run – Mine West Tunnel from 96<sup>th</sup> Street Launch Box to 65<sup>th</sup> Street</i>	<i>05/27/10A</i>	<i>02/28/11</i>	<i>1</i>
<i>Verify Freeze Zone Complete</i>		<i>2/17/11</i>	<i>1</i>
<b><i>C2B – 96<sup>th</sup> Street Station concrete and Finishes &amp; MEP</i></b>			
<i>Advertise for construction bids</i>	<i>03/09/11</i>		
<b><i>C3 - 63rd Street Station Upgrade (IFB)</i></b>			
<i>Award Contract</i>		<i>01/17/11</i>	<i>2</i>
<b><i>C5B – 86<sup>th</sup> St. Station Mining &amp; Lining (IFB)</i></b>			
<i>Advertise</i>	<i>10/25/10A</i>		
<i>Bid Opening</i>		<i>01/11/11</i>	<i>3</i>
<i>Award</i>		<i>03/11/11</i>	
<b><i>C6 – Systems (RFP)</i></b>			
<i>RFP Available to Proposers</i>	<i>01/13/11</i>		
<i>Submit Proposals</i>	<i>03/29/11</i>		

Observations and Analysis:

*90-Day Look-Ahead Notes:*

1. *Startup of freeze plant subject to coordination with TBM progress.*
2. *Award delayed due to extended MTA review of bids.*
3. *Delayed from original date of 01/21/10.*

*90-day forecast for C4B is not included. Schedule for this package is currently under review.*

Concerns and Recommendations:

*None at this time.*

**4.3 Critical Path Activities**

Status:

*The project critical path experienced 8 WD of delay during December 2010. The delay was the result of delays resolving the interference between an existing ECS Ductbank and installation of the new sewer line between 95<sup>th</sup> and 96th Street. Table 4-3 summarizes the critical path contained in IPS Update #53.*

**Table 4-3: Critical Path Activities**

Activity ID		Update #53 Duration	Start	Finish
<b>C5</b>	<b>86th Street Station</b>	<b>1286</b>	<b>1-Dec-10</b>	<b>27-Sep-15</b>
C5A	86th Station - Excavation & Utility Work	251	1-Dec-10	27-Sep-11
C5B	86th Station - Mining & Lining	551	10-Oct-11	20-Nov-13
C5C	86th Station - Architectural & MEP Finishes	435	20-Nov-13	24-Jul-15
C6	System Installation (86th Street Station)	170	12-Jan-15	4-Sep-15
<b>C6</b>	<b>Systems (Track, Signal, Traction Power &amp; Communication)</b>	<b>185</b>	<b>7-Sep-15</b>	<b>20-May-16</b>
C6	Construction	185	7-Sep-15	20-May-16
<b>NYCT</b>	<b>Pre-Revenue Operation Test &amp; Revenue Service</b>	<b>85</b>	<b>21-Mar-16</b>	<b>15-Jul-16</b>
	Phase 1 Substantial Completion	0	15-Jul-16	15-Jul-16
	<b>Phase 1 Schedule Contingency</b>	<b>120</b>	<b>18-Jul-16</b>	<b>30-Dec-16</b>
	Completion w-Schedule Contingency	120	18-Jul-16	30-Dec-16

*The formal IPS critical path, as reported, is initiated by Contract 5A utility relocations and shaft excavations. In October 2011, upon completion of the south shaft by C5A, the critical path is “handed off” to Contract 5B where it follows the south cavern excavation and structural concrete work until November 2013, when the critical path shifts to Contract 5C. This Contract continues with the structural construction and turns over select work areas to Contract 6 in September 2015. Systems installation continues through May 2016, followed by system testing and startup activities. The calculated completion of Phase 1 is currently July 15, 2016, which provides 120 WD of contingency (float) for the RSD on December 30, 2016, which is unchanged from the last update.*

**Observations:**

*There are several additional “near-critical” paths in the IPS:*

- *The Contract 1 TBM Mining is only 6 days off the current critical path and must also be considered a critical path because any significant delay to this path will impact the overall project RSD. The handoff from the TBM mining operation to the 86<sup>th</sup> Street Station north cavern excavation is scheduled for January 2012. As a result of this independent, “near critical” path, all cavern excavation for the 86<sup>th</sup> Street Station (both north and south caverns) is within six working days or less of the project critical path. As noted in previous reports, some “flexibility” exists between the TBM mining and the handoffs to C4B and C5C cavern excavation. For this reason, the critical path extending from C5A → C5B → C5C → C6 is considered the governing critical path for the project.*

*MTACC is investigating methods to reduce durations along this near critical path thereby increasing float to 25 CD (or more) in accordance with the ELPEP. One alternative under consideration involves increasing the assumed cavern excavation production rate from 200 CY/day to about 250 CY/day. Other alternatives include mandating a six-day work week and refining logic ties for tighter inter and intra-contract relationships.*

*These types of schedule manipulations may provide relief “on paper”; however, the assumptions must be reasonably achievable by the construction contractors at a cost that can be supported by the project. Any production rate changes or manipulation of work activity relationships must be thoroughly validated prior to incorporation to ensure they are not interim patches that cannot reasonably be achieved.*

- *Utility-related delays to contract C2A appear to have created another “near-critical” path with 29 WD of float. This path extends through C2A structural work between 97<sup>th</sup> and 99<sup>th</sup> Streets. On April 24, 2013, this path is “handed off” to C4B Mezzanine Construction between 95<sup>th</sup> and 97<sup>th</sup> Streets. This path follows the work in this area until July 14, 2014, when the path is handed to the C6 Systems installation contractor.*

*The PMOC considers a path with 29 WD of float to be “near-critical” on a project of this magnitude and duration. This is an independent path; any substantial loss of time could overtake the critical path and control the Revenue Service Date. The MTACC has initiated schedule improvement initiatives for C2A to overcome the impacts of previous delays. The effects of these initiatives have been incorporated in the IPS. Similar additional initiatives may be necessary.*

- *Contract C4C currently contains two independent float paths of 41 WD. The initial path originates with construction procurement, the second flows through C4B handoff of Ancillary #2. The path continues with C4C construction and turnover to Contract C6 in August 2014.*

*The PMOC has performed a Monte Carlo simulation to determine the criticality index of the SAS schedule milestones. The Criticality Index of an activity (task) can be expressed as a ratio between 0 and 100%. The Criticality Index expresses how often a particular task was on the Critical Path during the analysis. Tasks with a high Criticality Index are more likely to cause delay to the project as they are more likely to be on the Critical Path. If a task does not exist for some iteration (e.g. it is probabilistic), then it is marked as not being critical. For example, a task that existed for 50% of the iterations and was critical 50% of the time it existed would have a Criticality Index of 25%. The table below identifies those activities with a substantial risk of becoming critical and thereby affecting the project RSD.*

**Table 4-4: 2010 Milestone's Criticality Index**

<i>Description</i>	<i>Start</i>	<i>Finish</i>	<i>Critical</i>	<i>Criticality Index</i>	<i>TF</i>
<i>C4B Substantial Completion</i>		<i>10/31/13</i>		<i>0</i>	<i>373</i>
<i>86th Street Station Available for Mining</i>		<i>1/31/12</i>		<i>99.4</i>	<i>3</i>
<i>Phase1 Construction Complete w/Contingency</i>		<i>12/30/16</i>	<i>Critical</i>	<i>100</i>	<i>0</i>
<i>Complete Stage 3S (South Area - West Side)</i>		<i>4/28/11</i>	<i>Critical</i>	<i>98</i>	<i>0</i>
<i>C5A - Substantial Completion</i>		<i>9/27/11</i>	<i>Critical</i>	<i>98</i>	<i>0</i>
<i>Contract 6 Substantial Completion</i>		<i>5/20/16</i>	<i>Critical</i>	<i>100</i>	<i>0</i>
<i>Hand-off from C5B (for Station Concrete Work)</i>		<i>11/19/13</i>	<i>Critical</i>	<i>99.9</i>	<i>0</i>
<i>MS#1 - Handover Main Cavern, Mainline Tunnel Btwn 72nd St &amp; 86th St Sta, &amp; Anc #1 to C5C</i>		<i>11/19/13</i>	<i>Critical</i>	<i>99.9</i>	<i>0</i>
<i>Tunnel Available for Track/Systems Installation (72-63 South)</i>		<i>9/18/13</i>		<i>3.1</i>	<i>106</i>
<i>Phase1 Construction Complete</i>		<i>7/15/16</i>	<i>Critical</i>	<i>100</i>	<i>0</i>
<i>Revenue Service Date</i>		<i>7/15/16</i>	<i>Critical</i>	<i>100</i>	<i>0</i>
<i>C5C Substantial Completion</i>		<i>10/6/15</i>		<i>0</i>	<i>163</i>
<i>Hand-off from C5C to C6 (86th Station Area Track Work by C6)</i>		<i>10/5/15</i>		<i>0</i>	<i>164</i>
<i>Hand-off from C2A to C2B for Station Concrete 95th to 97th Streets</i>		<i>4/12/13</i>		<i>69.6</i>	<i>37</i>
<i>Contract C2A Substantial Completion</i>		<i>4/12/13</i>		<i>69.6</i>	<i>37</i>
<i>Milestone 3 - C26005 Substantial Completion (NOA + 43.25 Months)</i>		<i>4/12/13</i>		<i>69.6</i>	<i>37</i>
<i>Hand-off from C2A to C2B Station Concrete 95th to 97th Streets</i>		<i>4/12/13</i>		<i>69.6</i>	<i>38</i>
<i>Mezz. Ready for First Fix MEP (C2B HO2.3)</i>		<i>11/6/13</i>		<i>13.3</i>	<i>79</i>
<i>Hand-off from C4B C4C (Cavern Concrete Work)</i>		<i>5/6/13</i>		<i>0</i>	<i>123</i>
<i>Hand-off from C4B to C4C 72nd St Shaft Closed</i>		<i>5/6/13</i>		<i>52.6</i>	<i>53</i>
<i>Hand-off from C4B to C4C (Ancillary #1)</i>		<i>5/6/13</i>		<i>33</i>	<i>55</i>
<i>Hand-off from C5A to C5B (for South Shaft Mechanical Mining)</i>		<i>10/10/11</i>	<i>Critical</i>	<i>98</i>	<i>0</i>

<i>Description</i>	<i>Start</i>	<i>Finish</i>	<i>Critical</i>	<i>Criticality Index</i>	<i>TF</i>
<i>C4B Substantial Completion</i>		<i>10/31/13</i>		<i>0</i>	<i>373</i>
<i>MTA Property Delivery to Contractor (Ent. 3)</i>		<i>12/08/11</i>		<i>0</i>	<i>424</i>
<i>CI Milestone No. 1 72nd Street Station Available for Mining</i>		<i>1/4/11</i>		<i>20.6</i>	<i>70</i>
<i>Station LAN Ready for MEP Testing (from System to C Contractor)</i>	<i>4/5/2015</i>			<i>98.8</i>	<i>1</i>
<i>86th St. Public Space Ready for System Installation (PA)</i>	<i>11/28/14</i>			<i>89</i>	<i>22</i>
<i>72nd St. Anc. #1 Space Ready for System Installation (SE)</i>	<i>07/30/14</i>			<i>33.1</i>	<i>53</i>

*This type of analysis will be used as an “early warning system” to focus attention on activities and areas with a high risk of adversely impacting the project schedule.*

**Concerns and Recommendations:**

*Due to the complexity of the project and the time required to effectively respond to schedule challenges, the PMOC considers independent float paths within 50 WD to be “near critical”. The PMOC will monitor these paths and seek to identify mitigation strategies that can be offset the effects of the delays.*

*Maintaining significant separation between the critical path and near critical paths recognizes the imperfections in the CPM model and aids in reducing “cross-talk” between paths and focusing attention on primary issues.*

*The PMOC recommends MTACC develop mitigation strategies for each of the near-critical paths previously discussed as an aid in implementation if the 25 WD threshold is breached.*

**4.4 Compliance with Schedule Management Plan**

**Status:**

The PMOC has established a structured review of the MTACC’s compliance with its Schedule Management Plan, developed as part of the overall ELPEP process. The initial formal review was conducted this period.

**Observations and Analysis:**

Schedule Management Plan compliance is based upon achieving four (4) “Beneficial Outcomes” identified in the ELPEP and related documents.

1. Establish the IPS’ usefulness as a management tool for the planning and organizing the work, and as a decision support tool for evaluation of alternatives and risk-based scenarios.
2. MTACC is actively managing and controlling individual packages and the overall project with input from and consideration of the project schedule.

3. Provide reliable forecasts of the SAS revenue service date (RSD) and other major accomplishments.
4. Facilitate communication of project time-related information, priorities, issues, and changes, as may be required.

*Specific Processes, Products and Metrics cited in the ELPEP and companion documents, supporting each “Beneficial Outcome” have been summarized and grouped in a worksheet (see Appendix H) to facilitate the review. A summary of the review conducted this period:*

- *MTACC “Conforms” to 20 of 24 performance measures.*
- *MTACC “Does Not Conform” to 3 of 24 performance measures.*
- *Information was incomplete on 1 of 24 performance measures. The situation wherein the schedule activity linkage to a WBS or functional equivalent has not occurred to date.*
- *“Schedule Resiliency” is interpreted as the schedule’s ability to recover after experiencing a deformation or external stressor. MTACC has introduced several alternative to recover float along near-critical paths, however, to date these alternative have not been proven to be achievable or practical.*

Of note is the fact that MTACC does not conform to Item 1.3 of the PMOC evaluation checklist wherein the difference between the project critical path and the next most critical path shall be no less than 25 CD of float. This nonconformance is acknowledged by MTACC.

In general, the PMOC notes that MTACC is realizing the beneficial outcomes established by the ELPEP. Based upon this analysis, the MTACC IPS currently “Conforms” to the Schedule Management requirements established by the ELPEP.

#### Concerns and Recommendations:

*The ELPEP-specified 25 CD threshold for “near-critical” paths is not adequate for a project of this magnitude and complexity. A duration of 25 CD is marginally adequate for the initial development of practical mitigation strategies. Actual validation and implementation requires significantly more time. The PMOC recommends monitoring all independent “near critical” paths less than 50 WD of float. Development of mitigation strategies should be initiated at that level so that prompt implementation can occur should the float decrease to the 25 WD level.*

*Updated TBM forecasting has resulted in a secondary critical path with float less than the ELPEP-specified 25 CD minimum. MTACC acknowledges this non-conformance. The PMOC is concerned about the MTACC’s ability to mitigate the delays which have resulted in this condition. The PMOC considers it likely that the TBM-originated path will become critical and control the RSD over the next several updates.*

## 5.0 PROJECT COST STATUS

### 5.1 Budget/Cost

#### Status:

The FFGA baseline budget and current working budget are broken down into Standard Cost Categories in year of expenditure dollars as follows:

**Table 5-1: Allocation of Current Working Budget to Standard Cost Categories**

Standard 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.

*The PMOC notes that this MTACC's CWB omits the cost for new Rolling Stock or corresponding reduction in funding and that this CWB does not represent an approved budget modification in any form.*

*As previously reported in November 2010, the updated Phase 1 Cost Estimate (Revision 8) included a reduction in direct construction cost and escalation of approximately \$50.4 million.*

The PMOC questioned this reduction and considers it inconsistent with recent comparisons of project construction cost estimates vs. bid received. The PMOC requested MTACC to conduct a complete review and validation of these estimate revisions. To date, no results from this effort have been received.

Observation and Analysis:

The MTACC has updated 100% design cost estimates for all construction packages remaining to bid. When these estimates are validated, a revised EAC for construction can be developed.

MTACC has indicated that it will prepare a detailed EAC for all project cost elements. This did not occur in December 2010.

Conclusions and Recommendations:

Construction cost increases will be the primary driver of cost variances, however a comprehensive EAC for the entire project is an important element of overall cost management. PMOC recommends this effort be completed as soon as possible.

**5.2 Cost Variance Analysis**

Status:

In November 2010, the PMOC independently forecast the construction cost EAC based upon relevant information received during that period. During December 2010, no additional information was developed or received that would significantly impact the previous forecast. The PMOC anticipates the following events or information will be developed in January 2011:

- Contract 3 construction contract award.
- Validation and possible revision of Cost Estimate Revision 8 (previously discussed).
- Contract C5B bid results.
- Additional AWO tracking information.

Observation

Based upon receipt of this information, the PMOC anticipates a revision to the construction cost EAC will be developed in January 2011.

For completeness and information, the construction cost EAC developed in November 2010 is reproduced in the following section.

Observation and Analysis:

For packages bid to date, a summary of estimated vs. bid price is as follows:

**Table 5-3: Estimate(\*) vs. Bid History**

<i>Package</i>	<i>Estimate \$</i>	<i>Reference</i>	<i>Bid Price</i>	<i>+/- (%)</i>
<i>C1; TBM Tunneling</i>	<i>\$319,000,000</i>	<i>Estimate Rev. 5, 08/30/06</i>	<i>\$337,025,000</i>	<i>5.65%</i>
<i>C2A; 96<sup>th</sup> St. Station Utility &amp; Heavy Civil</i>	<i>\$261,000,000</i>	<i>Estimate Rev. 6, 07/11/08</i>	<i>\$325,000,000</i>	<i>24.52%</i>



**Table 5-3: Estimate(\*) vs. Bid History**

<i>Package</i>	<i>Estimate \$</i>	<i>Reference</i>	<i>Bid Price</i>	<i>+/- (%)</i>
<i>C5A; 86<sup>th</sup> St. Station Utilities</i>	<i>\$25,000,000</i>	<i>Estimate Rev. 6, 07/11/08</i>	<i>\$34,070,000</i>	<i>36.28%</i>
<i>C4B; 72<sup>nd</sup> St. Station Heavy Civil &amp; Mining</i>	<i>\$448,035,000</i>	<i>Estimate Rev. 7, 10/08/09</i>	<i>\$447,180,260</i>	<i>-0.19%</i>
<i>C3: 63<sup>rd</sup> St. Station Upgrade</i>	<i>\$148,771,000</i>	<i>Estimate Rev. 8 (draft) 10/29/10</i>	<i>\$176,450,000</i>	<i>18.61%</i>
	<i>\$1,201,806,000</i>		<i>\$1,319,725,260</i>	<i>9.81%</i>

\* In this table, Estimate = Est. Cost of Construction + AFI  
 C3 Bid Price assumes approval of low bidder.

In forecasting the total project EAC, the significant variance between estimate and bids received shown in Table 5-3 must be considered. Adding this bidding experience variance to the Revision #8 estimate of remaining preconstruction packages results in the following:

**Table 5-4: Experience Adjusted Cost Estimates**

<i>In Design/Pre-Bid Process</i>		<i>Estimated (Rev 8)</i>	<i>AFI %</i>	<i>Estimate w/AFI</i>	<i>Estimate Variance</i>	<i>Adjusted Estimate</i>
<i>2B</i>	<i>96<sup>th</sup> Street Station Shell Concrete, Backfill, Permanent Utilities and Street Restoration</i>	<i>\$370,185,000</i>	<i>1.1</i>	<i>\$407,203,500</i>	<i>12.00%</i>	<i>\$456,067,920</i>
<i>4C</i>	<i>72<sup>nd</sup> Street Station, Ancillary and Entrance Concrete, Architectural Finishes and MEP</i>	<i>\$231,376,000</i>	<i>1.1</i>	<i>\$253,964,234</i>	<i>12.00%</i>	<i>\$284,439,942</i>
<i>5B</i>	<i>86<sup>th</sup> Street Station Mining and Lining</i>	<i>\$358,418,000</i>	<i>1.1</i>	<i>\$330,968,158</i>	<i>0.00%</i>	<i>\$330,968,158</i>
<i>5C</i>	<i>86<sup>th</sup> Street Station Architectural, Conveying Systems, Mechanical, Electrical and Plumbing</i>	<i>\$227,644,000</i>	<i>1.1</i>	<i>\$261,772,594</i>	<i>12.00%</i>	<i>\$293,185,305</i>
<i>6</i>	<i>Track, Signal, Power, Communication &amp; MEP System Equipment</i>	<i>\$230,522,000</i>	<i>1.1</i>	<i>\$232,973,463</i>	<i>8.00%</i>	<i>\$251,611,340</i>
<i>Subtotal Pre-Bid Contracts:</i>		<i>\$1,418,145,000</i>		<i>\$1,486,881,949</i>		<i>\$1,616,272,665</i>
<i>Subtotal Active Construction Contracts:</i>						<i>\$1,319,725,260</i>
<i>TOTAL:</i>						<i>\$2,935,997,925</i>

Based upon change order experience to date, modified AWO% has been applied to the current contract or forecast values for preconstruction packages. This results in the following:

**Table 5-5: Updated EAC Forecast Summary**

	<i>Description</i>	<i>Contract/Forecast</i>	<i>AWO %</i>	<i>EAC</i>
1	<i>TBM Tunneling</i>	<i>\$337,025,000</i>	<i>16.96%</i>	<i>\$394,188,081</i>
2A	<i>96<sup>th</sup> Street Station; Excavation &amp; Heavy Civil</i>	<i>\$325,000,000</i>	<i>8.70%</i>	<i>\$353,283,542</i>
2B	<i>96<sup>th</sup> Street Station Shell Concrete, Arch &amp; MEP</i>	<i>\$456,067,920</i>	<i>14.00%</i>	<i>\$519,917,429</i>
3	<i>63<sup>rd</sup> Street and Lexington Avenue Station</i>	<i>\$176,450,000</i>	<i>14.00%</i>	<i>\$201,153,000</i>
4B	<i>72<sup>nd</sup> Street Station Excavation &amp; Heavy Civil</i>	<i>\$447,180,000</i>	<i>14.00%</i>	<i>\$509,785,200</i>
4C	<i>72<sup>nd</sup> Street Station, Shell Concrete, Arch &amp; MEP</i>	<i>\$285,055,232</i>	<i>14.00%</i>	<i>\$324,962,964</i>
5A	<i>86<sup>th</sup> Street Station Open Cuts and Utility Relocations</i>	<i>\$34,070,000</i>	<i>25.22%</i>	<i>\$42,664,092</i>
5B	<i>86<sup>th</sup> Street Station Mining and Lining</i>	<i>\$394,259,800</i>	<i>14.00%</i>	<i>\$449,456,172</i>
5C	<i>86<sup>th</sup> Street Station Shell Concrete, Arch &amp; MEP</i>	<i>\$280,457,408</i>	<i>14.00%</i>	<i>\$319,721,445</i>
6	<i>Track, Signal, Power, Communication &amp; MEP System Equipment</i>	<i>\$273,860,136</i>	<i>14.00%</i>	<i>\$312,200,555</i>
		<i>\$3,009,425,496</i>		<i>\$ 3,427,332,480</i>

**Conclusions and Recommendations:**

*The PMOC forecast EAC of \$3,427,332,480 should be compared to the current MTACC forecast EAC of \$3,263,717,000. The variance of \$163,615,480 (overrun) should be compared to the PMOC's previous construction EAC forecast \$14,289,943 (overrun) presented in the September Monthly Report.*

*The negative result of this forecast is the primary result of Construction Estimate Revision 8 and the resulting estimate/bid variance for Contract 3. The PMOC recommends a complete evaluation of both results to see if this forecast correctly interprets their results. Any adjustments to this forecast will be presented in subsequent monthly reports.*


**5.3 Project Funding Status**

**Federal**

Total Federal participation is currently \$1,350,692,821. Appropriated, obligated and disbursements are shown below:

**Table 5-6: Appropriated and Obligated Funds**

<b>Grant Number</b>	<b>Amount (\$)</b>	<b>Obligated (\$)</b>	<b>Disbursement (\$) thru <i>December 31, 2010</i></b>
NY-03-0397	\$4,980,026	\$4,980,026	\$4,980,026
NY-03-0408	\$1,967,165	\$1,967,165	\$1,967,165
NY-03-0408-01	\$1,968,358	\$1,968,358	\$1,968,358
NY-03-0408-02	\$24,502,500	\$24,502,500	\$24,502,500
NY-03-0408-03	0	0	0
NY-03-0408-04	0	0	0
NY-03-0408-05	\$167,810,300	\$167,810,300	\$166,005,776
NY-03-0408-06	\$274,920,030	\$274,920,030	0
NY-17-X001-00	\$2,459,821	\$2,459,821	\$2,459,821
NY-36-001-00*	\$78,870,000	\$78,870,000	\$78,870,000
NY-95-X009-00	\$25,633,000	\$25,633,000	\$8,652,432
NY-95-X015-00	\$45,800,000	\$45,800,000	0
<b>Total</b>	<b>\$628,911,200.00</b>	<b>\$628,911,200.00</b>	<b>\$289,406,078.00</b>

\* Denotes American Recovery and Reinvestment Act (ARRA) funds

## **Local**

*Local funds totaling \$813,283,755 have been spent as of December 31, 2010. MTA's approved 2000-2004 and 2005-2009 Capital Programs included \$1,050 million and \$1,914 million respectively for SAS Phase 1. The proposed 2010-2014 Capital Program budgets \$1,487 million to complete the SAS Phase 1 project.*

## **6.0 PROJECT RISK**

### **6.1 Initial Risk Assessment**

No change this period.

### **6.2 Risk Updates**

Status:

No updates for this period.

### **6.3 Risk Management Status**

Status:

MTACC has provided a preview of its risk-based EAC/cost contingency usage methodology. The PMOC considers this a very positive step in integrating the risk assessment and cost management processes.

### Observation and Analysis:

Over the recent quarter, risk assessments have been prepared for Contract Packages 3, 4B and 5B. To date, the primary usage of these assessments has been to validate previously assumed cost contingencies included in the project cost estimates and review the probability of completing the package within the allocated time period.

Efforts to identify risks retained during the construction period have started, but have not progressed significantly or yielded information to assist in managing the packages through the construction phase.

### Conclusions and Recommendations:

Identification and estimation of project cost and schedule risk is becoming an established component of project management. The practical integration and use of risk analyses in the management of construction needs further development in order to gain the full benefit of these analyses. The PMOC anticipates progress in this area over the upcoming quarter.

## **6.4 Risk Mitigation Actions**

### Status:

*Risk monitoring and mitigation is on-going and being performed per the SAS Risk Management Program which is documented in the PMP. Monthly meetings are being held to address priority risks. Through November 2010 the project has held eight Risk Mitigation Meetings. A Risk Register has been developed and maintained on the Project since late 2002. The present Risk Register is being update to include Risk Mitigation Meeting proceedings as of November 2010.*

### Observation:

*SAS Project Management is being proactive in its efforts to monitor and mitigate risk. From the initial Risk Mitigation and through all subsequent meetings held to date, the Project has been focusing on those risks that DHA indicated in its December 2009 Risk Analysis Report as the risks that contribute the most to the contingency requirements.*

### Concerns and Recommendations:

None

## **6.5 Cost and Schedule Contingency**

### **6.5.1 Cost Contingency**

#### Status:

The ELPEP requires the MTACC to develop a Cost Contingency Management Plan (CCMP), which will define how the MTACC will forecast required contingency funds, manage and transfer all project cost contingency funds, and how the minimum level of contingency will be maintained. The MTACC submitted an updated CCMP, which is currently under review. MTACC has agreed to maintain minimum contingency balances referenced in the ELPEP:

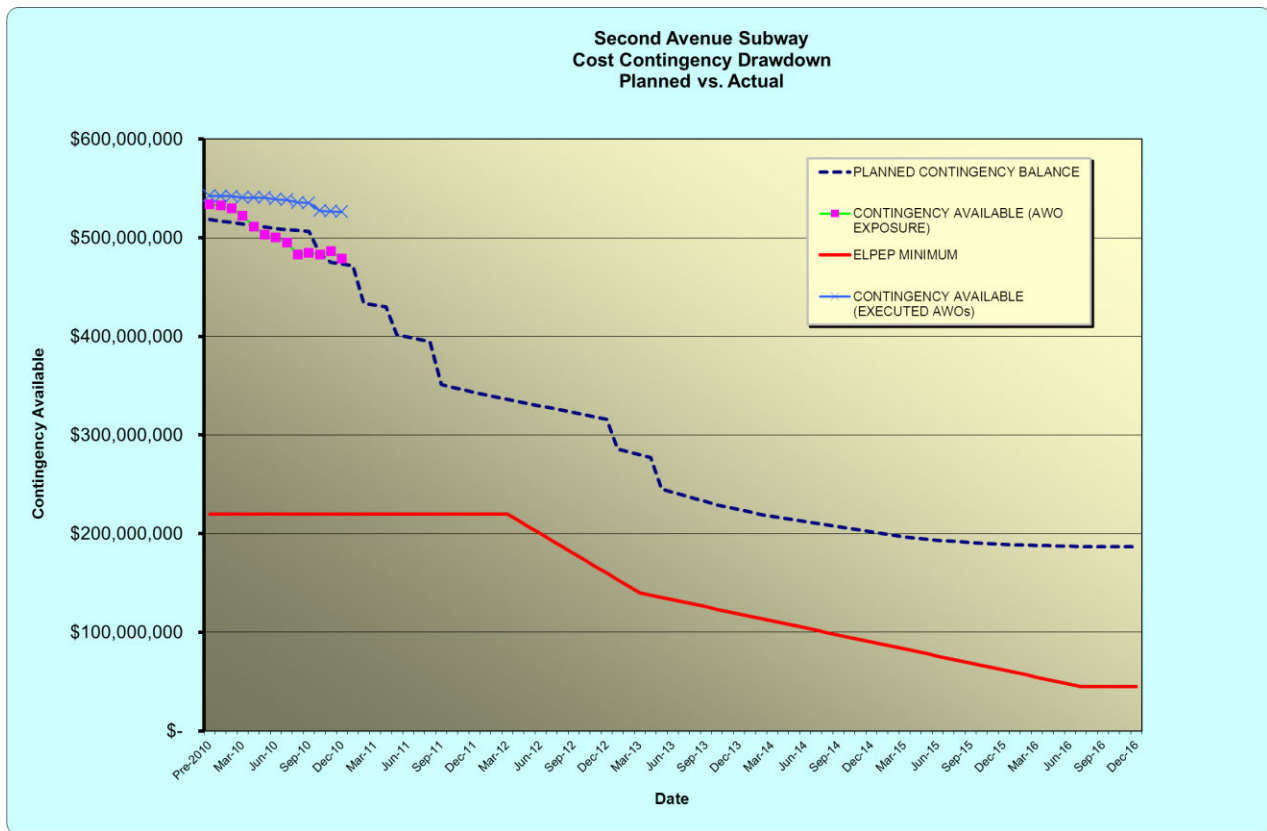
- \$220 million through 90% Bid and 50% Construction
- \$140 million through 100% Bid and 85% Construction
- \$45 million through Start Up and Pre-Revenue Operations

Observations and Analysis:

Using the MTACC’s methodology, the PMOC has developed a contingency analysis for the project. Through December 2010, cost contingency status is summarized as follows:

<i>Planned Balance:</i>	\$ 473,530,201
<i>Actual Balance (using executed AWOs):</i>	\$ 526,200,279
<i>Actual Balance (using AWO Exposure):</i>	\$ 478,710,956

*In graphic form:*



The ELPEP and the MTACC Draft Cost Management Plan do not currently specify how the Actual Drawdown is to be calculated for comparison with the required ELPEP minimum. In the opinion of the PMOC, Actual Drawdown should be calculated using the “AWO Exposure” value tabulated in the monthly AWO tracking logs. Contingency balance using both “AWO Exposure” and “Executed AWOs” is presented in the graphic above.

*Significant changes which occurred during December 2010 include:*

1. AWO reporting for C-26007 (72<sup>nd</sup> Street Cavern Exc./Heavy Civil) was initiated. The AWO exposure reported to date is < \$150K.
2. Total AWOs executed during the period equaled \$517,950, while new AWO Exposure reported for the period equaled \$7,673,557.

- In December 2010, a Potential Exposure of \$6,577,396 was assigned to C-26005, AWO#48. This AWO represents the cost of utility delays and subsequent utility and slurry wall construction resequencing initiated to recover lost time.

**Concerns and Recommendations:**

MTACC is using a rigorous and disciplined methodology for tracking and reporting on construction contract cost growth. *The PMOC recommends the following refinements to this methodology:*

- Contingency usage is based upon an evaluation of the construction phase only. Construction cost is expected to be the primary driver of contingency usage, however, other elements of the project may draw upon (or provide surplus) contingency funds. The current methodology should be extended to include all design phase and other project soft costs, to provide a total picture of contingency usage.
- Construction contingency usage should be based upon “AWO Exposure” as discussed above.

**6.5.1 Schedule Contingency**

**Status:**

*Schedule contingency reported by MTACC, based upon Update #53 of the SAS IPS exceeds threshold limits established by the ELPEP. Schedule contingency measured against MTACC’s RSD commitment date of 12/31/16 is 165 CD. When measured against the FTA/PMOC RSD estimate of 02/28/18, the contingency is currently 589 CD.*

**Observations:**

*The revision in schedule contingency contained in Update #53 is the result of an 8 WD delay to the critical path resulting from utility interferences encountered on the C5A package.*

**Table 6-1: Schedule Contingency\***

<b>IPS Update #</b>	<b>48</b>	<b>49</b>	<b>50</b>	<b>51</b>	<b>52</b>	<b>53</b>
<b>Data Date</b>	07/01/10	08/01/10	09/01/10	10/01/10	11/01/10	12/01/10
<b>Contingency (CD)</b>						
<i>RSD=12/31/2016</i>	165	127	165	185	172	165
<i>RSD=02/28/2018</i>	589	551	589	617	604	589

*\*Estimated by PMOC based on IPS Update #53, provided by MTACC*

It is the PMOC’s opinion that the current IPS is a reasonable model of the SAS construction phase and that the contingencies shown above are reasonable indicators of the current schedule status of the project.

**Concerns and Recommendations:**

*The PMOC will continue to evaluate the IPS for reasonableness and suggest improvements to enhance its reliability as a forecasting tool.*



Number with Date Initiated	Section	Issue/Recommendation	Criticality
SAS-10-Jan10	3.2 PMP Sub-Plans	<p>MTACC is required to develop and finalize a Cost and Schedule Management Plan, and a Cost and Schedule Contingency Management Plan for the SAS in conformance with ELPEP requirements within 60 days of January 15, 2010. The PMOC is concerned that the 60-day requirement may not be met.</p> <p><b>Update:</b> This process is ongoing. Schedule Management Plan complete; conditional approval forwarded by FTA on October 25, 2010. Review of Cost and Cost Contingency Management Plan is in progress.</p>	2
SAS-11-Jan10	3.3 Procedures	<p>The PMOC is concerned whether the new procedures will actually be utilized by the different operating agencies within the MTACC, given that NYCT will implement SAS, and the procedures of the SAS PMP reflect the NYCT quality management system.</p> <p><b>PMOC Recommendation:</b> The PMOC recommends that the MTACC develop a process to assure itself that all of these procedures are in use on all of its projects. An example of such a process would be a new procedure distribution system that would require the recipients (the individual Project Managers) to acknowledge receipt of each new procedure as it is released for implementation. This system could be monitored by the parent MTACC to assure implementation across all its organizations and provide it with the opportunity to correct any non-conformances as they develop.</p>	2
SAS-12-Oct10	2.1.3 Construction	<p>MTACC should develop contingency plans for contract coordination issues that may result from continuing delay to TBM mining. This primarily involves Contracts 4B and 5B, where TBM mining may impact proposed work sequencing.</p> <p><b>Update (November 2010):</b> TBM progress should not significantly affect C4B. TBM progress will affect the period during which blasting is permitted; this has been anticipated in the C4B contract documents.</p> <p><b>Update (December 2010):</b> TBM progress improved significantly during December</p>	2



Number with Date Initiated	Section	Issue/Recommendation	Criticality
		<i>2010. Coordination of blasting periods with C4B appears effective.</i>	
SAS-13- Oct10	2.5 Real Estate	<p>The PMOC proposes to conduct a detailed review of the current status of condemnation, business tenant relocation, temporary rock bolt easements, and cost to cure of interior building utilities. Evaluation of the adequacy of the current Real Estate budget and any potential cost overrun/under run exposure is included.</p> <p><b><u>Update (November 2010):</u></b> No progress this period. PMOC to follow-up.</p> <p><b><u>Update (December 2010):</u></b> <i>This work is scheduled to commence in January 2011.</i></p>	2
SAS-14- Oct10	4.1 Schedule Status	<p>Confirm detailed coordination between TBM and ground freeze activities. Confirm active monitoring and forecasting of progress and performance thresholds to support decision making.</p> <p><b><u>Update (November 2010):</u></b> PMOC has confirmed that the MTACC, through the CCM is reviewing the status of these activities on a weekly basis.</p> <p><b><u>Update (December 2010):</u></b> <i>PMOC has verified coordination of TBM progress with startup of ground freezing activity by MTACC/CCM. Startup of freeze plant scheduled for mid-January.</i></p>	2
SAS-15- Oct10	4.4 SMP Compliance	<p>The PMOC recommends the addition of schedule activities representing the “dustoff” phase for Contracts 2B, 4C and 5C were not added this period. Adding these activities to the IPS will enhance its usefulness, reliability and provide improved visibility for these tasks.</p> <p><b><u>Update (November 2010):</u></b> Not completed to date. PMOC to follow up.</p> <p><b><u>Update (December 2010):</u></b> <i>Not completed to date. PMOC to follow up.</i></p>	2

Number with Date Initiated	Section	Issue/Recommendation	Criticality
SAS-16- Oct10	5.1 Budget/Cost	<p>The PMOC recommends validation of the MTACC's Update #8 of the Phase 1 Project Estimate prior to accepting the stated savings generally in excess of \$50 million.</p> <p><b><u>Update (November 2010):</u></b> MTACC reports this effort is in progress.</p> <p><b><u>Update (December 2010):</u></b> No results received to date. PMOC to follow up.</p>	2
SAS-17- Oct10	6.2 Risk Updates	<p>Reconciliation of the current cost estimate values with those used in the risk assessment for Contract C3 and, if necessary, adjustment of the results and conclusions of that analysis.</p> <p><b><u>Update (November 2010):</u></b> The C3 risk assessment concluded that current funds allocated for this package should be adequate.</p> <p><b><u>Update (December 2010):</u></b> No further action. This item will be closed.</p>	2
SAS-18- Oct10	6.5.1 Schedule Contingency	<p>The PMOC will review the SAS Project Team's distribution and allocation of schedule contingency.</p> <p><b><u>Update (November 2010):</u></b> MTACC has allocated schedule contingency to select schedule events on a limited basis to reflect a degree of risk or uncertainty in achieving a proposed modification or mitigation to the involved activities. This is not a return to the "handoff activity" contingency distribution methodology. PMOC will monitor this practice monthly to ensure schedule results are not being manipulated through this practice.</p> <p><b><u>Update (December 2010):</u></b> The PMOC has reviewed the IPS for indication of manipulation through the use of negative lags or similar processes. It is the PMOC's opinion that the IPS is a reasonable model of the manner in which this project is planned to be performed. PMOC will continue to review.</p>	2
SAS-19-	4.3	PMOC will utilize 50-WD threshold for identification of "near-critical" float paths.	2

Number with Date Initiated	Section	Issue/Recommendation	Criticality
Dec10	Critical Path Activities	MTACC to identify and investigate potential mitigation strategies at this level to aid in implementation if the 25 WD threshold is breached.	
SAS-20-Dec10	2.1.3	Processing duration for AWOs is excessive. The average processing duration currently equals the published MTA maximum duration of 90 days. Improvement is required to facilitate contractor cooperation and reduce risk of “backlash” through perceived unfair treatment.	1
SAS-21-Dec10	2.1.2 Procurement	Excessive recent delay to C-26009 package is noted. PMOC recommends MTACC initiate corrective action and/or develop “recovery schedule” to regain time lost.	2
SAS-22-Dec10	2.1.1 Design	MTACC has reported 100% design complete for several packages for which 100% Design Memorandums have not been published. PMOC requests distribution of these Memorandums ASAP.	2

**8.0 GRANTEE ACTIONS FROM QUARTERLY AND MONTHLY MEETINGS**

**Priority in Criticality column**

1 – Critical

2 – Near Critical

Number with Date Initiated	Section	Grantee Actions	Criticality	Projected Resolution
SAS-A17-Aug08	2.4 Vehicles	<p>The PMOC requested additional information regarding certain statements in the draft Rail Fleet Management Plan:</p> <ul style="list-style-type: none"> <li>▪ NYCT should provide a test plan for increasing the period between inspections of the new technology fleet.</li> <li>▪ NYCT should explain why, in light of the ongoing state of good repair fleet replacement program, the cars financed under the SAS project are no longer needed.</li> <li>▪ MTACC should explain why they are considering removing the vehicles from the project scope without reducing the project funding.</li> </ul> <p><b>Update:</b> The supply of vehicles for SAS Phase 1 will be addressed in the Draft Fleet Management Plan, scheduled for distribution in July 2010.</p> <p><b>Update:</b> A Draft Fleet Management Plan was not submitted during July 2010. This item remains open.</p> <p><b>Update:</b> As of August 31, 2010, a Draft Fleet Management Plan has not been submitted.</p> <p><b>Update:</b> A Draft Fleet Management Plan was received, reviewed with comments provided to the FTA.</p>	2	7/30/10

Number with Date Initiated	Section	Grantee Actions	Criticality	Projected Resolution
SAS-A18-Aug08	ELPEP Updates	<p>The change in the Contingency Drawdown Curve, particularly the latent contingency, needs to be clarified.</p> <p><b>Update:</b> At the quarterly meeting, a new contingency drawdown curve was presented. Management of the contingency is being addressed in the newly required Cost Contingency Management Plan.</p> <p><b>Update:</b> The latest submission of the Cost Contingency Management Plan is under review. MTACC has initiated contingency management and reporting which generally conforms to the requirements of the ELPEP.</p>	2	6/30/10

## APPENDIX A -- LIST OF ACRONYMS

AFI	Allowance for Indeterminates
ARRA	American Recovery and Reinvestment Act
AWO	Additional Work Order
BCE	Baseline Cost Estimate
BFMP	Bus Fleet Management Plan
CCM	Consultant Construction Manager
CD	Calendar Day
CMAQ	Congestion Mitigation and Air Quality
CPM	Critical Path Method
CPRB	Capital Program Review Board
CR	Candidate Revision
DHA	DMJM+Harris and ARUP
DOB	New York City Department of Buildings
EAC	Estimate at Completion
ELPEP	Enterprise Level Project Execution Plan
FD	Final Design
FEIS	Final Environmental Impact Statement
FFGA	Full Funding Grant Agreement
FTA	Federal Transit Administration
HLRP	Housing of Last Resort Plan
IFP	Invitation for Proposal
IPS	Integrated Project Schedule
<i>LF</i>	<i>Linear Feet</i>
MEP	Mechanical, Electrical, Plumbing
MTACC	Metropolitan Transportation Authority – Capital Construction
N/A	Not Applicable
NTP	Notice to Proceed
NYCDEP	New York City Department of Environmental Protection
NYCT	New York City Transit
PE	Preliminary Engineering
PMOC	Project Management Oversight Contractor (Urban Engineers)
PMP	Project Management Plan
PQM	Project Quality Manual
RAMP	Real Estate Acquisition Management Plan
RFMP	Rail Fleet Management Plan
RFP	Request for Proposal
ROD	Record of Decision
ROD	Revenue Operations Date
RSD	Revenue Service Date
S3	Skanska, Schiavone and Shea
SAS	Second Avenue Subway
SCC	Standard Cost Categories

SSMP	Safety and Security Management Plan
SSOA	State Safety Oversight Agency
SSPP	System Safety Program Plan
TBD	To Be Determined
TBM	Tunnel Boring Machine
TCC	Technical Capacity and Capability Plan
TIA	Time Impact Analyses

**APPENDIX B-- PROJECT OVERVIEW AND MAP**  
**(Project Map is transmitted in a separate file)**

Date: December 31, 2010

Project Name: Second Avenue Subway

Grantee: Metropolitan Transportation Authority

FTA Regional Contact: Mr. Hans Point du Jour

FTA Headquarters Contact: Mr. Dale Wegner

**Scope**

Description: The project will connect Manhattan’s Central Harlem area with the downtown financial district, relieving congested conditions on the Lexington Avenue line. The current project scope includes: tunneling; station/ancillary facilities; track, signal, and electrical work; vehicle procurement; and all other subway systems necessary for operation. The current phase, Phase 1 of 4, will provide an Initial Operating Segment (IOS) from 96<sup>th</sup> Street to 63<sup>rd</sup> Street, and will connect with the existing Broadway Line that extends to Lower Manhattan and Brooklyn. Subsequent phases will extend the line northward to 125<sup>th</sup> Street and to the southern terminus at Hanover Square in Lower Manhattan.

Guideway: Phase 1 is 2.3 miles long, from 63<sup>rd</sup> Street to 105<sup>th</sup> Street. It is a two-track project that is below grade in tunnels, and does not include any shared use track.

Stations: In Phase 1 there are: two new mined stations located at 72<sup>nd</sup> and 86<sup>th</sup> Streets, one new cut and cover station at 96<sup>th</sup> Street, and major modifications of the existing 63<sup>rd</sup> Street Station on the Broadway Line.

Support Facilities: There are no additional support facilities planned for Phase 1 of the project.

Vehicles: MTA envisions the need for eight-and-one-half train sets to satisfy the Phase 1 operating requirements (7) and to provide sufficient spares (1½).

**Ridership Forecast:** Upon completion of Phase 1, ridership is expected to be 191,000 per average weekday (MTA’s Regional Travel Forecast Model).

**Schedule**

12/20/01	Approval Entry to PE	06/12	Estimated Rev Ops at Entry to PE
04/18/06	Approval Entry to FD	03/14	Estimated Rev Ops at Entry to FD
11/19/07	FFGA Signed	06/30/14	Estimated Rev Ops at FFGA
12/30/16	Revenue Operations Date at date of this report (MTA schedule)		



12.76%	Percent Complete Construction at <i>December 31, 2010</i>		
33.3%	Percent Complete Time based on Rev Ops Date of December 30, 2016		
12/20/01	Approval Entry to PE	06/12	Estimated Rev Ops at Entry to PE
04/18/06	Approval Entry to FD	03/14	Estimated Rev Ops at Entry to FD
11/19/07	FFGA Signed	06/30/14	Estimated Rev Ops at FFGA
12/30/16	Revenue Operations Date at date of this report (MTA schedule)		
11.91%	Percent Complete Construction at September 30, 2010		
33.3%	Percent Complete Time based on Rev Ops Date of December 30, 2016		

**Cost (\$)**

3,839 M	Total Project Cost (\$YOE) at Approval Entry to PE (w/o Financing Costs)
3,880 M	Total Project Cost (\$YOE) at Approval Entry to FD (w/o Financing Costs)
4,866 M	Total Project Cost (\$YOE) at FFGA signed (w/ \$816 M Financing Costs)
4,673 M	Total Project Cost (\$YOE) at Revenue Operations (w/o Financing Costs)
5,489 M	Total Project Cost (\$YOE) at date of this report including \$ 816 M in Finance Charges
1,103M	Amount of Expenditures at date of this report from Total Project Budget of \$4,673M
32.75	Percent Complete based on Expenditures at date of this report
*	Total Project Contingency remaining (allocated and unallocated contingency)

\* Being revisited as a result of the Enterprise Level Project Execution Plan

## APPENDIX C – LESSONS LEARNED

### Lessons Learned Table for 4th Quarter 2010

#	Date	Phase	Category	Subject	Lessons Learned
1	Oct-09	Construction	Schedule	Delays to excavation caused by adjacent Fragile Buildings	The PMOC recommended and MTACC adopted a plan to review the stability of all of the buildings affected by the Second Avenue Subway project. MTACC instructed their Designer to review all the buildings along the project. Furthermore, they have the designer developing shoring plans for the fragile buildings and including this work in the future contracts. In this way the stabilization work cannot delay the contracts as it is part of the contract.
2	Nov-09	Construction	Schedule	3 <sup>rd</sup> Party Utilities changed the size of an electric volt after construction began.	The PMOC recommended that MTACC get the utility companies to agree that once they have approved the plans, they cannot make major changes after award. MTACC's SAS Project Executive is meeting with the utilities to work out this problem.
	March 10	Construction		No new lessons learned this period.	
	June 10	Construction		No new lessons learned this period.	
	Sept 10	Construction		No new lessons learned this period.	
	Dec 10	Construction		No new lessons learned this period.	

**APPENDIX D – PMOC STATUS REPORT**

**(This is a separate attachment covering both East Side Access and Second Avenue Subway projects)**

**APPENDIX E – SAFETY AND SECURITY CHECKLIST**

<b>Project Overview</b>			
Project mode (Rail, Bus, BRT, Multimode)	Rail		
Project phase (Preliminary Engineering, Design, Construction, or Start-up)	Design and Construction		
Project Delivery Method (Design/Build, Design/Build/Operate/Maintain, CMGC, etc.)	Design/Bid/Build		
<b>Project Plans</b>	<b>Version</b>	<b>Review by FTA</b>	<b>Status</b>
Safety and Security Management Plan	7041.01.007308-0	11/15/07	Approved by FTA
Safety and Security Certification Plan			Certification by New York State Public Transportation Safety Board (NYSPTSB)
System Safety Program Plan			
System Security Plan or Security and Emergency Preparedness Plan (SEPP)			
Construction Safety and Security Plan		N	Each construction contractor is assigned the responsibility for developing a Construction Safety and Security Program Plan, as defined in the Contract Documents.
<b>Safety and Security Authority</b>			
Is the grantee subject to 49 CFR Part 659 state safety oversight requirements?	Y		
Has the state designated an oversight agency as per Part 659.9?	Y		NYSPTSB
Has the oversight agency reviewed and approved the grantee's SSPP as per Part 659.17?	Y		The NYSTB issued a letter of recertification on September 2, 2010.
Has the oversight agency reviewed and approved the grantee's Security Plan or SEPP as per Part 659.21?			
Did the oversight agency participate in the last Quarterly Program Review Meeting?	N		
Has the grantee submitted its safety	N		

<b>Project Overview</b>		
certification plan to the oversight agency?		
Has the grantee implemented security directives issues by the Department Homeland Security, Transportation Security Administration?	Y	
<b>SSMP Monitoring</b>	Y/N	<b>Notes/Status</b>
Is the SSMP project-specific, clearly demonstrating the scope of safety and security activities for this project?	Y	
Grantee reviews the SSMP and related project plans to determine if updates are necessary?	Y	
Does the grantee implement a process through which the Designated Function (DF) for Safety and DF for Security are integrated into the overall project management team? Please specify.	Y	
Does the grantee maintain a regularly scheduled report on the status of safety and security activities?	Y	Activity included in the monthly and quarterly reports from the grantee.
Has the grantee established staffing requirements, procedures and authority for safety and security activities throughout all project phases?	Y	Responsibilities during the design and construction phases identified
Does the grantee update the safety and security responsibility matrix/organizational chart as necessary?	Y	
Has the grantee allocated sufficient resources to oversee or carry out safety and security activities?	Y	
Has the grantee developed hazard and vulnerability analysis techniques, including specific types of analysis to be performed during different project phases?	Y	Included in Appendix F of the SSMP
Does the grantee implement regularly scheduled meetings to track to resolution any identified hazards and/or vulnerabilities?	Y	Frequency to be increased
Does the grantee monitor the progress of safety and security activities throughout all project phases? Please describe briefly.	Y	Three active construction contracts being daily monitored by the CCM with oversight being performed by the grantee.

<b>Project Overview</b>		
Does the grantee ensure the conduct of preliminary hazard and vulnerability analyses? Please specify analyses conducted.	Y	Hazard and Vulnerability Analysis
Has the grantee ensured the development of safety design criteria?	Y	Included in SAS project Design Criteria Manual
Has the grantee ensured the development of security design criteria?	Y	Included in SAS project Design Criteria Manual
Has the grantee ensured conformance with safety and security requirements in design?	Y	Ongoing part of design review process
Has the grantee verified conformance with safety and security requirements in equipment and materials procurement?	Y	
Has the grantee verified construction specification conformance?	Y	Reference Section D3.4 Construction Criteria Conformance of the SSMP
Has the grantee identified safety and security critical tests to be performed prior to passenger operations?	Y	Reference Section D3.2 Certification Items List of SSMP
Has the grantee verified conformance with safety and security requirements during testing, inspection and start-up phases?	NA	Project is currently in the Design/Construction Phase
Does the grantee evaluated change orders, design waivers, or test variances for potential hazards and /or vulnerabilities?	Y	Part of formal configuration control process
Has the grantee ensured the performance of safety and security analyses for proposed work-arounds?	NA	
Has the grantee demonstrated through meetings or other methods, the integration of safety and security in the following: Activation Plan and Procedures Integrated Test Plan and Procedures Operations and Maintenance Plan Emergency Operations Plan	Y	
Has the grantee issued final safety and security certification?	N	To be covered as part of the testing in Contract 6
Has the grantee issued the final safety and security verification report?	N	To be covered as part of the testing in Contract 6
<b>Construction Safety</b>		

<b>Project Overview</b>		
Does the grantee have a documented/implemented Contractor Safety Program with which it expects contractors to comply?	Y	
Does the grantee's contractor(s) have a documented companywide safety and security program plan?	Y	
Does the grantee's contractor(s) have a site-specific safety and security program plan?	Y	Reference sections 011150 Safety Requirements and 011160 Security Requirements of the Contract Terms and Conditions
Provide the grantee's OSHA statistics compared to the national average for the same type of work?	<i>OSHA Year-to-Date Recordable and Lost Time accident rates are 5.28 and 2.30 respectively thru November 30, 2010</i>	National Average 4.2 and 2.2 respectively
If the comparison is not favorable, what actions are being taken by the grantee to improve its safety record?	NA	
Does the grantee conduct site audits of the contractor's performance versus required safety/security procedures?	Y	
<b>Federal Railroad Administration</b>		
If shared track: has grantee submitted its waiver request application to FRA? (Please identify specific regulations for which waivers are being requested)	NA	
If shared corridor: has grantee specified specific measures to address shared corridor safety concerns?	NA	
Is the Collision Hazard Analysis underway?	NA	
Other FRA required Hazard Analysis – Fencing, etc.?	NA	
Does the project have Quiet Zones?	NA	
Does FRA attend the Quarterly Review Meetings?	NA	

**APPENDIX F – ON-SITE PICTURES**



**C1 – Tunnel Boring Machine in West Tunnel**

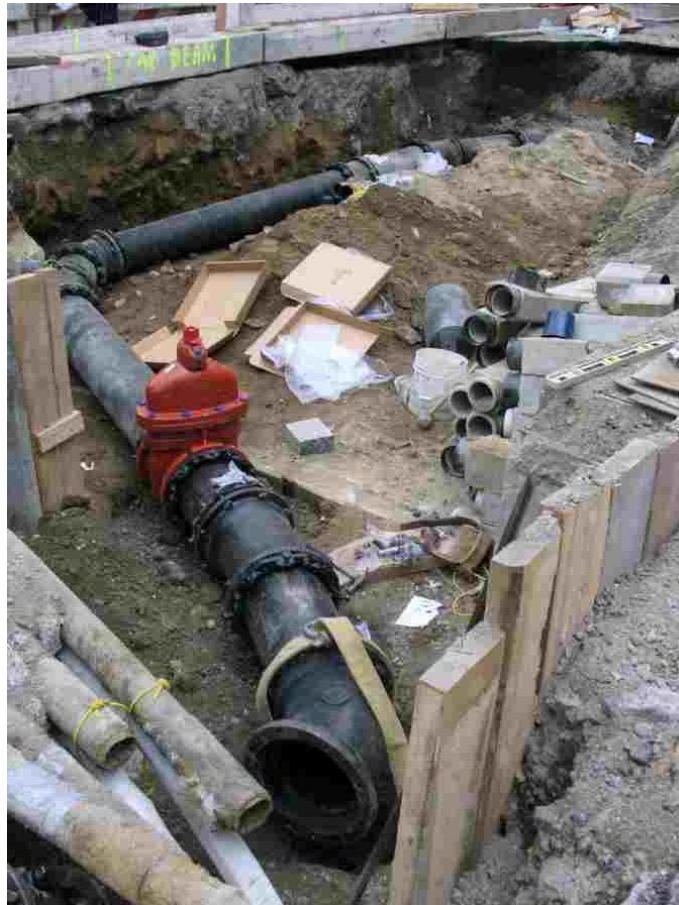


**C1 – Muck Train Removing Rock from West Tunnel**





**C1 – West Tunnel – Currently 5,978 linear feet**



**C2A – Installation of 12” Water Main -- SW Corner 97<sup>th</sup> St. & 2<sup>nd</sup> Ave.**



**C2A – Installation of Secant Pile Guide Wall at Ancillary 2 -- W Corner of 97<sup>th</sup> St. and 2<sup>nd</sup> Ave.**



**Installation of 12" HP Gas Main -- NW Corner of 96<sup>th</sup> St. and 2<sup>nd</sup> Ave.**

## **APPENDIX G – READINESS TO BID CONSTRUCTION WORK (OP53)**

### Status:

The PMOC’s implementation of the OP53 reviews during December, 2010 included the following actions:

- Scheduled and conducted two internal progress meetings per week (excluding dates conflicting with FTA meeting reviews) and prepared and issued meeting minutes for SAS 2B, 4B, 5B, and 5C Contract review, and general information on other SAS contract reviews to be performed;
- Participated in a brief, initial review meeting with FTA on OP53 products developed including Contract 4B chronology, on December 13, 2010 at 1 Bowling Green offices of FTA.;
- Distributed additional package-level design documents directly, through internal server access, and through an FTP server to OP53 Review Team;
- Assembled and distributed additional guidance documents for OP53 review team;
- The OP53 review of the 2B, 4B, and 5C package continued with the research of needed documents in the EDMS system, and assembly of available documents for chronology development;
- Produced “hard” copies, of the latest Contract 4B OP53 report;
- Prepared development of Contract 5C Structural Package Level evaluations.

### Observation:

- *#1 The MTA Procurement Policy/Instruction Manual – IV-A.16 identifies that FTA requires that a price analysis be performed on every procurement action even where a cost analysis is called for. A price analysis as defined means the process of examining and evaluating a proposed price without evaluating its separate cost elements and proposed profit. The MTA Procurement Manual states: “Every effort should be expended to ensure that the Authority receives full value for the goods' and services it procures and that prices which are recommended for award are considered ‘Fair and Reasonable’. A cost/price analysis is the instrument that provides the basis for rendering that determination, as well as being a process reflected in the Staff Summary for award”. The PMOC has still not seen a price or cost analysis of the C-26007 Bid, and notes that the Staff Summary did not contain one.*
- *#2 The Design Consultant’s (DHA) PMP (7.1.4) states that DHA performs constructability reviews as the design progresses. Also, DHA’s contract Scope of Work (3.1.14) states that “...At each stage of the project a constructability review shall be made and formally documented...”. Further, DHA Contract Modification 38 required DHA to perform a formal constructability review of the combined 72<sup>nd</sup> Street Contracts 4A/B/C. MTACC included in MTACC Project Procedure No. DE.04 , Rev. 0, that they will be responsible for independent reviews . PMOC did identify and review constructability reviews performed by MTACC at 60%*

*and 95% design, but has not found Final Design constructability reviews by DHA. DHA did provide participation of a reviewer with construction background at Final Design submittals. However DHA's Quality Implementation Procedure (QIP) No. P8.5 Preparation, Review, and Approval of Drawings, provides guidelines, information and procedure to the design team for development of final design including constructability reviews. Thirteen criteria (P8.5.3.5) are listed as guidelines for these reviews. The PMOC did not find DHA Final Design constructability reports or reviews that addressed these many of these issues in a substantive manner. The criteria are as follows:*

- Checking for realistic scheduling of work activities.*
- Checking the proposed construction schedule for compatibility with the Owner's on-going operations, schedules, and maintenance of services.*
- Checking for proper sequencing of operations.*
- Checking for adequate rights-of-way and access to construction areas.*
- Verifying adequacy of areas reserved for Contractor's work, laydown, and storage areas.*
- Checking for interference with traffic, utilities, and other ongoing or sequential contract work by others.*
- Addressing the need for unusual construction materials and equipment.*
- Checking for use of appropriate materials, and up-to-date designs and technology.*
- Checking final design drawings against specifications and design criteria for inconsistencies or ambiguities that could lead to schedule delays, disputes, and possible legal actions.*
- Verifying that details shown are adequate to assure proper erection and construction sequencing.*
- Considering community impacts as described in the Construction Environmental Protection Plan (CEPP), such as noise and dust.*
- Considering governmental regulations that safeguard the environment, the workplace, and the public.*
- Documentation of this review by the DDT or the DDT's designee(s) shall be per P8.5.3.7 of this QIP.*

**Concerns and Recommendations:**

- *Related to Observation #1, PMOC recommends that a price analysis be performed on every procurement action even where a cost analysis is called for in accordance with the MTA Procurement Policy/Instruction Manual – IV-A.16.*
- *Related to Observation #2, PMOC recommends that MTACC's Design Consultant perform constructability reviews of contracts in design in accordance with their contract Scope of Work.*

**APPENDIX H – SCHEDULE MANAGEMENT PLAN (SMP) CHECKLIST  
(SEE ATTACHED)**