

PMOC MONTHLY REPORT
East Side Access (MTACC-ESA) Project
Metropolitan Transportation Authority
New York, New York

Report Period May 1 – May 31, 2018

PMOC Contract No. DTFT60D1400017

Project No. DC-27-5287, Task Order No. 0002, Work Order No. 06

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

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Third Party Disclaimer

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EXECUTIVE SUMMARY

This summary highlights key events and important issues for the current month.

Overall Program Status: The current Overall Program is 77.1% complete versus 81.4% planned (based on invoice cost).

Construction Status: The Construction Status is 77.5% complete versus 82.5% planned (based on invoice cost).

Contracts

Awarded/Completed: None awarded or completed during May 2018.

Construction Progress Issues: CM014B, CS084, VS086

Program Funding: MTA announced, in April, the need for additional \$956 million in local funding; Capital Plan amendment submitted for partial funding supplement to 2020.

Program Cost and Budget: (b)(4)

Integrated Project Schedule: Revised forecast target RSD delayed from May 2021 to February 2022; MTACC initiated use of “Alternate IPS”; ESA Program Critical Path now Manhattan/Systems

Risk Management: The Accelerated Amtrak Penn Station Program, Jan. 2018-May 2018 had minimal impact; risks to date mitigated; 10 major risks remain.

Harold Interlocking: Completed 3 signal test pre-cutover weekends during May 2018, bringing total completed weekends to 9 of a total of 10. Testing remains on schedule for the CIL cutover start in June 2018.

Key Stakeholder Issues: LIRR –Late resolution of CS179, CS084, and VS086 issues.
Amtrak – Continuing Force Account availability issues; Electric Traction improved availability.
MTACC - Change Order processing issues, GEC CPS support for Contractor Submittals, redesigns, RFIs, and Field Conditions.

Construction Safety: 2.31 - Lost Time and 3.46 – Recordable BLS Injury ratios during April 2018.

ELPEP Compliance: No issues.

Project Management Plan: No issues.

All Project Sponsor cost and schedule data included in this report is based on the MTACC East Side Access 1st Quarter 2018 (January, February, March) Progress Report, referenced in this report as the ESA Quarterly Progress Report 1Q 2018, which has a cost and schedule data date of April 1, 2018. Unless otherwise noted, all progress percentages in this report are based on invoiced costs, not actual construction.

Report Format and Focus

This report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT60D1400017, Task Order No. 0002. Its purpose is to provide information and data to assist the FTA as it continually monitors the Project Sponsor’s technical capability and capacity to execute a project efficiently and effectively, and hence, whether the Project Sponsor continues to be ready to receive federal funds for further project development.

This report covers the project management activities on the East Side Access (ESA) Mega-Project managed by MTA Capital Construction (MTACC) with MTA as the Project Sponsor and financed by the FTA FFGA. The PMOC notes that the FFGA Amendment was fully executed with MTA's sign-off on August 2, 2016. The amended FFGA incorporates the changes in the Baseline Cost Estimate and Revenue Service Date that have occurred since 2006 when the original FFGA was signed.

MONITORING REPORT

1.0 PROJECT STATUS

a. Engineering Design and Construction Phase Services

The ESA February 2018 MPR shows that the overall Engineering effort is 98.5% complete as compared with the planned completion of 100% and that 98.0% of the overall EIS and Engineering budget has been invoiced, including the Design budget, of which 98.2% has been invoiced.

Status of Construction Packages Advertised

CS086 Tunnel Systems Package 2 – Signal Installation: Negotiations concluded in May 2018. Contract will be presented at the MTA Board Meeting in June 2018 with award forecast in July 2018.

CH058A Harold Structures Part 3A, B/C Approach Structure, was advertised on May 8, 2018.

Status of Construction Packages Not Awarded

CM015 – 48th Street Entrance: Design work remained suspended through May 2018. MTA has notified the building owner that construction of the 48th St. Entrance has been deferred.

Alternate 47th Street Entrance (proposed modification to Contract CM014B)

MTACC-ESA is developing an alternative LIRR GCT entrance at 47th Street and has approved the associated GEC contract modification. MTACC-ESA is preparing a Technical Memorandum for the FTA. The 60% package was submitted on May 14, 2018. LIRR comments on 60% package were returned with MNR comments pending. 100% FIO drawings are forecast to be available by June 30, 2018, with final package expected by August 31, 2018 after resolution of comments.

CH058A, Harold Structures – Part 3A, B/C Approach, will include construction of the Tunnel B/C approach structure and demolition of the existing LIRR G02 Substation. Bid package preparation continued through early May 2018. The contract was advertised on May 8, 2018, with a forecast bid opening on July 9, 2018.

FQA33A, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for west end yard access to the Amtrak mainline through a connection from Sub 4 to Line 2. All yard exit options are presently being considered by ESA, Amtrak, and LIRR. The design package has been completed with incorporated LIRR review comments. Amtrak raised five earlier 90% design review issues that had not been satisfactorily resolved and the GEC continued resolution of issues through May 2018. Amtrak design concurrence is now expected in July 2018. This will be the only exit route from the MDSY that will be provided under the ESA Program.

FQA33B, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for a second west end yard access to the Amtrak mainline through a connection from Sub 3 to Line 4. The FQA33B 100% design package remains temporarily on hold pending finalization and approval of the Sub 4 to Line 2 connection, the primary exit, to be built under FQA33A (see above). The second exit route will be constructed by Amtrak after Contract CQ033 completes the MDSY and upon arranging the funding source from LIRR.

FQL33, Mid-Day Storage Yard Facility – LIRR F/A, provides LIRR force account construction support for CQ033. LIRR has returned comments on the 100% design package that included some revisions to the ET work package. The GEC incorporated the LIRR comments and returned a

revised submission to LIRR in April 2018. LIRR returned additional comments on May 8, 2018. GEC revised the package and returned to LIRR for final review and approval.

Positive Train Control: The MOU between MTACC and LIRR for the implementation of Positive Train Control (PTC) on ESA was executed and the Technical Concurrence Document has been agreed upon by MTACC and LIRR.

- LIRR had been expected to complete the PTC design by March 31, 2018, but this was not achieved. MTACC now reports that LIRR will not complete the PTC design until later in 2018.
- The GEC has prepared initial scoping of design modifications to Contracts CS179, VS086, and CS086, which will provide for the LIRR designed PTC overlay onto the ESA systems primarily by providing systems “infrastructure” including cable raceways, cabinets, and additional rack space. The GEC has provided LIRR with the proposed changes for PTC on these contracts at the various design stages to insure coordination with the LIRR PTC requirements.
- In early October 2017, LIRR formally requested the FRA to waive the requirement to have PTC operational in the Harold Interlocking by December 31, 2018, based on the interlocking’s status as an active construction area. LIRR subsequently submitted a revised waiver request to the FRA in late December 2017 and received the FRA’s response on May 2, 2018. LIRR is required to submit to the FRA, within 90 days, the revised PTC Implementation Plan with LIRR’s proposed alternate schedule.

Status of MTACC and LIRR Review and Approval of Systems Contractors’ Final Designs

CS179, Systems Facilities Package No.1: The backlog of overdue submittals and RFI reviews noted in earlier reports continues to be a significant unresolved issue for the CS179 project team. The contractor continues to assert that overdue responses on design submittals and Requests for Information (RFI), unresolved Notices of Change (NOC), and numerous Stop Work Orders (SWOs) are impacting the completion of design work and delaying the contract schedule. The contractor continues to note that there are 46 NOCs, 31 for which MTACC was to issue Contractor Proposal Requests (CPRs), contributing to its inability to finalize the design. The completion of Final Design (FD) for all 10 Control Systems, which was scheduled for completion 25 months ago, has not occurred yet and the completion of FD for all 19 Non-Control Systems is also delayed. The full impact of the Control and Non-Control System FD delays on contract progress remains undetermined at this time. Previously noted Buy/Ship America issues that could impact design completion also remain unresolved.

CS084, Traction Power Systems Package 4: While the contractor continues to contend that unresolved design issues, differing site conditions, and coordination issues caused delays to the execution of this contract, some progress is being made on the fabrication and delivery of equipment. The contractor indicates that all of the contract milestones are already delayed and both the contractor and MTACC agree that contract milestones need to be updated once all the open issues are resolved.

VS086, Systems Package 3 – Signal Equipment Procurement: The contractor continues to raise concerns over the timeliness of responses from MTACC on design submittals and inquiries and asserts that the lack of timely responses continues to cause delays in the progression of the work. MTACC and LIRR need to make key design decisions that have the potential to impact designs

already in progress, interim contract milestones, and the overall substantial completion of this contract.

b. Procurement

The 1Q2018 MPR shows that total procurement for the ESA project was 88.9% complete, with \$9.05 billion awarded of the \$10.178 billion current project budget (ESA Program only).

The status of the remaining major near-term procurements is summarized below:

- **CS086 Tunnel Systems Package 2 – Signal Installation:** The contract is being procured as a RFP. The negotiations with the single proposer concluded in early May 2018. Contract will be presented at the MTA Board Meeting in June 2018 with award forecast in July 2018.
- **CH058A Harold Structures Part 3A, B/C Approach Structure,** was advertised on May 8, 2018, with bid opening forecast for July 9, 2018.

c. Construction

In the 1Q2018 MPR, MTACC reported that total construction progress reached 77.5% complete compared to as-planned progress of 82.5%. The percentage of work complete, as shown throughout this report, is calculated using invoiced costs and current awards, rather than actual construction progress.

Manhattan Contracts

Costs and substantial completion dates are tabulated below for active Manhattan contracts.

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CM006	361.6 nc 361.6	350.2 nc 350.2	11.4 nc 11.4	346.0 nc 346.0	352.8 nc 352.8	100.0% nc 100.0%	98.8% nc 98.8%	6/1/17 nc 6/1/17	6/15/18 +1cd 6/16/18	
CM007	712.3 nc 712.3	662.2 +0.2 662.4	50.2 (-0.3) 49.9	261.1 +16.6 277.7	704.9 (-1.1) 703.8	45.4% nc 45.4%	39.4% +2.5% 41.9%	1/28/20 nc 1/28/20	6/26/20 nc 6/26/20	
CM014A	61.1 nc 61.1	60.5 nc 60.5	0.6 nc 0.6	58.8 +0.3 59.1	58.1 nc 58.1	100.0% nc 100.0%	97.1% +0.5% 97.6%	9/7/15 nc 9/7/15	4/16/18 +75cd 6/30/18	1
CM014B	463.6 nc 463.6	447.5 +0.2 447.7	16.1 (-0.2) 15.9	235.4 +7.7 243.1	498.0 (-1.4) 496.6	85.8% nc 85.8%	52.6% +1.7% 54.3%	8/18/18 nc 8/18/18	5/18/20 nc 5/18/20	
VM014	46.2 nc 46.2	34.9 nc 34.9	11.3 nc 11.3	24.5 (-1.1) 23.4	45.5 (-0.3) 45.2	NA NA NA	70.2% (3.3%) 66.9%	10/25/19 nc 10/25/19	10/16/20 0 (-207cd) 3/23/20	

Notes: Costs in millions; line 1 = prior value; line 2 = period change – nc = no change; and, line 3 = current value.

Please refer to the contract narratives for additional information.

1. The substantial completion date has not been declared.

CM006 – Manhattan North Structures:

Schedule: MTACC is currently projecting, MS#3, Substantial Completion (SC), by June 16, 2018, and MS#4, Final Completion, at September 14, 2018.

Construction Progress: Through May 2018, the CM006 contractor continued to complete base contract work, water remediation repairs, and open NCR work necessary for SC.

CM007 – GCT Station Caverns and Track:

Schedule: Milestone #4 (Track & 3rd Rail Complete) August 7, 2019, now February 7, 2020. MTACC continues to note that this is -184 days from the original. At the May 10, 2018 monthly progress meeting, MTACC advised that the contractor has submitted its TIA (Time Impact Analysis) for the STRTB (Special Trackwork RTB) delay. The contractor is developing a recovery schedule.

Milestone #5 (Substations US1 and US2 Complete) June 7, 2018, now December 3, 2018. The substation units are set in place, but are not connected yet.

Milestone #5A (Caverns Ready for Integrated Testing) August 7, 2019.

Milestone #6 (All Caverns and Tunnel Work Complete) December 16, 2019; now February 7, 2020. MTACC notes that this milestone remains at -53 days.

Milestone #6A (Substantial Completion) January 28, 2020, now June 26, 2018. MTACC notes that this milestone is at 98 days. MTACC notes that this milestone is at -150 days.

Construction Progress:

South Back of House, East and West: Installation of electrical and communication conduits is ongoing. Installation of HVAC, Fire Standpipe and Sprinkler piping is ongoing. Erection of Lower Level CMU walls resumed May 29, 2018 on the west side.

North Back of House, East: Installation of Upper Level under platform electrical and communication conduits continues. Painting of CMU walls nears completion. Erection of Lower Level CMU walls will resume June 11, 2018.

North Back of House, West: Installation of electrical and communication conduit continues throughout. Installation of HVAC, Fire Standpipe, and Sprinkler piping is ongoing.

East Cavern: Fire protection installation at the Mezzanine Level nears completion. Wall forms for Elevator #18 near completion. Installation of the precast Smoke Plenum continues.

West Cavern: Installation of Upper Level under slab electrical and communication conduit is ongoing. Installation of Upper Level under-platform electrical and communication conduits continues. Installation of knee walls along the east and node walls nears completion. Electrical conduit continues at the Mezzanine Level. C23 framing is ongoing at the Mezzanine and Lower Levels. The Lower Level ceiling mockup nears completion.

Precast Progress: Through May 27, 2018, MTACC reports that precast in the Caverns (East and West Caverns) was 81.8% complete. Platform Precast in the Caverns was 44.3% complete. Smoke Plenum precast in the Cavern was 85.4% complete.

Track: Rail destressing is underway at Track A, Track B/C, Track D, and Track WB-1 in the 63rd Street Tunnel. Concrete placement nears completion at LT 303. Installation of inlets and track drains nears completion at LT 302/P302. Third Rail installation is underway in Tunnel WB3. Track material is being mobilized at 301 and GCT 5 for Switch #531. The contractor reported in the May 10, 2018 Monthly Progress Meeting that Trackwork was approximately 25% complete. Additionally, through May 27, 2018, MTACC reports that Track and 3rd Rail Overall Progress was 27.8% complete.

CM014A – Concourse and Facilities Fit-Out Early Work:

MTACC reports that the contractor completed its Final Inspection with the CCU (Code Compliance Unit). The final submitted As-Built Documents were approved May 18, 2018. Substantial Completion was achieved on May 23, 2018. Turnover of all rooms CM014B is scheduled for June 15, 2018.

CM014B – Concourse and Facilities Fit-Out:

Schedule: Milestone #4 (Comm. Closets CC-C3, CC-C7, and Room B3265); originally March 5, 2017; previously April 1, 2018 – This milestone has been split into 2 completion dates. For MS#4A, the FM200 gas bottles have been relocated and MS#4B remains May 20, 2018, for extension of room CC-C7. The Change Order for this work has been signed and the work is underway.

Milestone #5 (44th St. Vent Building) June 4, 2017, now June 2018. The fans have been installed in Shaft #1 by the CS179 contractor. This contractor has resumed installation of the building storefront.

Milestone #5A (Completion of 48th St. Entrance) November 25, 2016 – CM014B completion of the 48th Street Entrance itself was completed by May 26, 2018, as projected. Additional work was included in this milestone, however, which has delayed completion of this milestone beyond May 31, 2018.

Milestone #6 (Communication Closets CC-C4, CC-C8) May 20, 2018. There has been no further update.

The design of the 47th Street Entrance is now the primary critical path. Structural steel work has now become the secondary critical path and is significantly behind schedule. The Biltmore Room construction is the tertiary critical path.

Construction Progress: Through May 29, 2018, the structural steel work was 63% by piece and 56% complete by weight. Cumulative metal deck progress was 19% complete. This work is proceeding very slowly and is impacting the schedule and the CS179 contract. Electricians continued with installation of racks and conduits throughout and work for Unit Substations (US) #3 and #4 nears completion. Mechanical work continues with the installation of ductwork. Installation of “Q” Deck continued. Painting of the Fire Standpipe (FSP) and sprinkler pipe, throughout Zones 1-4 is ongoing. Installation of architectural suspended ceiling grid system is underway.

Biltmore Connection: Outages on the MNR Express Level are being seriously impacted by the temporary summer usage of this area by Amtrak once again this summer as Amtrak diverts its Empire Service from New York Penn Station to Grand Central Terminal. This will continue to approximately September 2018.

Wellways: CM014B is mobilizing to re-enter Wellway #1 for architectural finish work. Shakeout of rigging steel is underway at Wellway #4. In Wellways #3 and #4, removal of scaffolding is complete. VM014 mobilization into the Wellways #3 and #4 is pending.

47th Street Cross Passage: This area has become the primary activity on the Critical Path because of the redesign of the entrance to compensate for the apparent loss of access to the previously designed 48th Street Entrance. Work continues in the EL #13 Machinery Room.

East 50th Street Vent Building: The Vent Building continues in full fit-out mode. Work includes door security at the 2nd, 1st, and street levels.

VM014 – Vertical Circulation Elements (Escalators and Elevators):

Schedule: In its 1Q2018 Report, MTACC reports that all elevators for Contract CM014B have been fabricated and delivered to the New Jersey storage warehouse, with the exceptions of EL #10 (50th St. Vent Building) and EL #22 (Biltmore Room). December 28, 2018, is the contractor’s target date to begin work on EL #10.

Although this contract has milestones covering fabrication and delivery of escalators and elevators, the real schedule for those areas is driven by the respective schedules and access dates provided by the CM014B and CM007 contractors.

Construction Progress: In Wellways #3 and #4, all work by the CM014B and CS179 contractors is complete. The VM014 contractor is mobilizing and erecting the structural steel rigging, beginning at Wellway #4. CM014B is mobilizing to begin erecting scaffolding in Wellways #1 and #2. At CM007, access dates and equipment delivery dates have been established. The first delivery of the mezzanine level escalators is scheduled to begin in July 2018. Work is underway with installation of EL #17 (TMC), EL #20 (Biltmore) and EL #9 (50th St.).

Queens Contracts

Costs and substantial completion dates are tabulated below for active Queens Contracts:

	Current Budget	Appr’d Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CQ032	265.4	261.5	4.0	260.6	263.2	100.0%	99.7%	9/6/16	6/29/18	
	nc	nc	nc	(-0.3)	nc	nc	(0.1%)	nc	nc	
	265.4	261.5	4.0	260.3	263.2	100.0%	99.6%	9/6/16	6/29/18	
CQ033	308.0	294.7	13.4	65.2	322.1	NA	22.1%	8/10/20	12/9/20	
	nc	nc	(-0.1)	+7.5	+2.3	NA	+2.6%	nc	(-1cd)	
	308.0	294.7	13.3	72.7	324.4	NA	24.7%	8/10/20	12/8/20	

Notes: Costs in millions; line 1 = prior value; line 2 = period change – nc = no change; and, line 3 = current value. Please refer to the contract narratives for additional information.

CQ032 – Plaza Substation and Queens Structures:

Schedule: MTACC is currently projecting, MS#6, Substantial Completion (SC), by June 29, 2018, and MS#7, Final Completion, at September 28, 2018.

Construction Progress: During May 2018, the CQ032 contractor continued to complete required documentation, efforts to eliminate water infiltration conditions, and act on open NCR work necessary for SC.

CQ033 – Mid-Day Storage Yard Facility:

Schedule: MTACC reports that Milestones MS#1, MS#2, MS#3, and MS#4 have been achieved. Milestones MS#4A (Start Integrated Testing), MS#5 (YS Track Completion), and MS#6 (Substantial Completion) are impacted by the delay of Access Restraints AR#1 and AR#2. AR#1 requires Amtrak to remove rail located at the west end of the Mid-Day Yard. AR#2 requires the installation of new catenary poles and Amtrak wire transfers. The pole locations are obstructed by an Amtrak signal trough. The contractor requires both AR#1 and AR#2 to install underground ductbanks to complete the YS Track, followed by Integrated Testing. MTACC forecasts MS#6 at November 15, 2020, at -97 calendar days.

Construction Progress: During May 2018, the CQ033 contractor continued: Personnel Access Bridge foundation work, expected to be completed in June 2018; street utilities installation; site detention, sanitary sewer, water, and storm pipe installation; Plaza gate installation; Yard lighting pole installation; CAM Platform work; and traction power ductbank work.

Systems Contracts

Costs and substantial completion dates are tabulated below for active Systems contracts:

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CS179	606.9	565.4	41.5	386.2	621.7	70.9%	68.3%	7/1/20	1/19/21	1
	nc	nc	nc	+7.3	+0.4	nc	+1.3%	nc	+90cd	
	606.9	565.4	41.5	393.5	622.1	70.9%	69.6%	7/1/20	4/19/21	
CS084	79.7	72.9	6.8	11.9	79.8	78.0%	16.2%	12/2/19	10/27/20	1
	nc	nc	nc	nc	nc	nc	nc	nc	+30cd	
	79.7	72.9	6.8	11.9	79.8	78.0%	16.2%	12/2/19	11/26/20	
VS086	21.8	19.9	1.9	8.8	22.1	NA	44.4%	10/14/19	10/14/19	1
	nc	nc	nc	+0.3	nc	NA	+1.1%	nc	nc	
	21.8	19.9	1.9	9.1	22.1	NA	45.5%	10/14/19	10/14/19	
VH051	30.2	29.5	0.7	28.8	30.1	NA	97.6%	4/30/15	5/20/18	
	nc	nc	nc	+0.4	nc	NA	+1.5%	nc	nc	
	30.2	29.5	0.7	29.2	30.1	NA	99.1%	4/30/15	5/20/18	

Notes: Costs in millions; line 1 = prior value; line 2 = period change – nc = no change; and, line 3 = current value.

Please refer to the contract narratives for additional information.

- Forecast SC is based on the approved schedule that does not account for open unresolved issues. The PMOC believes that addressing open issues will have significant negative impact on SC dates.

CS084 – Tunnel Systems Package 4 – Traction Power Systems:

Schedule: The information for CS084 is supplemented by discussions at an early-May 2018 Progress Meeting that reviewed contract progress up to May 9, 2018. The contractor continues to contend that the variance in the actual versus planned progress is because: 1) funds are not being expended as originally projected due to delays in approving the substation designs and equipment; 2) fabrication of the substations and procurement of equipment is behind schedule because designs were not approved as forecast; and, 3) the lack of unlimited access to all substation rooms has precluded the contractor from performing many construction activities. However, a significant portion of the required substation equipment has recently been released for fabrication, which will now cause the invoiced costs to increase at a faster pace. The contractor continues to indicate that all of the contract milestones are delayed as a result of delays associated with the approval of substation designs, unresolved issues, and site access restraints. The timely development and issuance of necessary contract modifications on this contract and other contracts for which work is required to progress the CS084 work, continue to be an issue requiring improvement.

Design Progress: The contractor continues to assert that previous delays in receiving comments from MTACC for C08 facility switchgear, SCADA requirements, PLC information, and general C08 substation design impacted its ability to meet its own original design, procurement, fabrication, and installation schedules. Despite continued interaction by MTACC senior management with LIRR senior management, the LIRR’s submittal/comment review process is still in need of improvement and remains an item of concern. In April 2018, the contractor advised that the current design for the C08 pre-fabricated substation building is approved and the design was released for fabrication. The contractor continued to advise MTACC that it still needs some

SCADA information to complete the programming of the SCADA equipment. Design issues for cable routing and for alleviation of interfering obstructions from other contracts remain unresolved. The PMOC continues to have concerns about the length of time it is taking to address the various design approval issues.

Construction Progress: The C05 substation equipment was delivered to storage, where it will remain until the C05 TPSS room is ready for its installation. The contractor continues to cite coordination issues, design approval delays, access restraints, and differing site conditions as its reasons why work at the various locations cannot progress. MTACC issued Stop Work Orders (SWO) at various locations to provide time to address some of the differing site conditions and to issue contract modifications, where appropriate. Dates for lifting the SWOs are still undetermined. With the exception of construction work at the CO5 substation, every one of the remaining six regular substation facilities (C01/C02, C03, C04, and C06/C07) has some level of noted deficiencies precluding the start of significant construction by the contractor. Progress on addressing the issues is limited, as a number of the cited issues involve coordination with other contracts and will require the development and issuance of contract modifications to various contracts. The PMOC continues to be of the opinion that there are four (4) issues of concern on this contract that pose a significant risk to its timely completion; 1) the equipment delivery methodology for the C01/C02 substations; 2) the solution for the installation of the apparent missing conduit and manhole system for the C08 substation; 3) the failure of a second traction power transformer during hi-pot (high potential) testing; and 4) the lack of knowledge of the viability of the existing conduit and manhole systems for several other substations. The second failure of a required transformer while undergoing hi-pot testing is a significant manufacturing quality issue related to all the transformers provided under this contract. The investigation into the cause of this failure was completed and it revealed that an incorrect procedure was used during the fabrication process. This raises significant concerns about the long-term operational capability of all the transformers manufactured under this contract before the identification and correction of this incorrect fabrication procedure was implemented. The contractor continues to raise concerns about the sequencing of activities by other contractors to allow for the installation of traction power cable from the C08 substation to the tracks. MTACC indicates that it advertised a construction contract (CH058A) that addresses the installation of the required manhole and conduit system between the C08 substation and the tracks. However, the schedule interface between this new contract and the CS084 contract, one that will ensure the comprehensive integrated testing of all the CS084 substations, is a potential issue.

CS179 – Systems Package 1 – Facilities Systems:

Schedule: While MTACC reports that the SC date for this contract is April 2021; it also reports that the contractor shows an SC date of January 29, 2021. The PMOC questions the validity of achieving substantial completion in either January or April of 2021, because both the contractor's schedule and MTACC's IPS: 1) are based on the premise that all submitted designs are final (which is not the case); 2) consider that all field work is ready-to-go as currently understood (which is not the case); 3) do not include any design or testing contingency; 4) do not take into consideration any impact from the open NOCs; and, 5) do not address any impacts to the contract work from SWOs that remain in effect past the data date of the schedules. Further, MTACC and the contractor have yet to develop a comprehensive Integrated System Test Plan (ISTP) for all the Systems being installed on the ESA Project. MTACC's goal to develop a realistic schedule remains elusive. Three Buy/Ship America issues, small HVAC units, public address system speakers, and video monitor display panels remain unresolved. These open Buy America compliance issues pose schedule risks to the successful and timely completion of this contract. There are also 46 NOCs,

31 of which MTACC agreed to issue Contractor Proposal Requests (CPR), that are contributing to the contractor's inability to finalize the system designs. MTACC's inability to develop and issue promised CPRs for the NOCs is a significant issue impacting progress on the contract.

Design Progress: The approval of all 10 control system Final Designs (FDs), a critical activity, is now 25 months late, with the LIRR still providing formal approval for only 7 out of the 10 Control System FDs. The contractor is also responsible to design, install, and test 19 Non-Control systems; several of which, according to the contractor, continue to have FD progress falling behind schedule. The contractor contends that the lack of resolution on open items (e.g., the open NOCs) is the primary cause for these delays. Despite not having LIRR approval of the FDs for the various Control and Non-Control Systems, the contractor continues to move forward with the development of test plans and equipment fabrication. Moving forward without approved designs on equipment procurement and fabrication is, as previously noted by the PMOC, a risk to the timely completion of this contract due to possible non-acceptance by LIRR. The contractor continues to indicate that any continued progress on both these efforts is being severely hampered by unanswered RFIs and unissued CPRs that have the potential to alter existing designs.

Construction Progress: In May 2018, the CS179 contractor continued to progress a substantial amount of various elements of work (installation of conduit, cable, fire stopping, fire standpipe, lighting, etc.) in the tunnels and at the various substation facilities where access was available and conditions warranted. Coordination issues with other contractors, unexpected field conditions, unresolved design issues, water infiltration remediation efforts, open NOCs/CPRs, and numerous Stop Work Orders continue to impact further progress. The subcontractor developing the Control and Non-Control systems continues to request information from MTACC to enable it to finalize testing plans and procedures, as well as plans for system training; but, due to the many open NOCs/CPRs and RFIs, MTACC has been unable to provide much of that information.

VS086 – Systems Package 3, Signal Equipment Procurement:

Schedule: The information for VS086 is supplemented by discussions at a late-May 2018 progress meeting that reviewed progress up to May 24, 2018. In July 2017, MTACC issued a contract modification to adjust the interim milestones for this contract. However, in October 2017, both MTACC and the contractor agreed that the contract milestones need to be re-baselined again to address open design, fabrication, and testing issues noted in previous PMOC reports and under Design Progress, below. It remains unclear when this schedule refinement will take place or if it will impact the contract substantial completion date. The timely development and issuance of contract modifications continues to be an issue impacting progress. MTACC further notes that any impact on overall design completion, equipment procurement, and schedule can only be determined when design issues are resolved and contract modifications, if any, are approved.

Design Progress: The contractor continues to raise concerns over the timeliness of responses from the MTA on design submittals and inquiries and asserts that this lack of timely responses caused, and continues to cause, delays in the progression of the work. There are now three (3) major unresolved design issues cited by the contractor that continue to impact progress towards design completion: 1) the approval and use of light emitting diodes (LED) for tunnel signal units; 2) the approval and use of TRU-III track circuit equipment; and 3) a delay in Factory Acceptance Testing (FAT) and Factory Integrated Acceptance Testing (FIAT) of equipment and systems. Very little progress on resolving these issues is apparent to the PMOC.

Equipment Fabrication Progress: The approval and use of Low Smoke Zero Halogen (LSZH) wire in the signal cases was resolved and, based on delivery of the last consignment of the wire, the contractor forecasts that the Plaza Interlocking FAT will occur sometime in July 2018. The re-

wiring of signal cases already fabricated and tested will have an, as yet undetermined, impact on the commercial aspects of this contract. Once the Plaza Interlocking successfully passes the FAT, a 2 to 3 day activity that is scheduled to occur in July 2018, the FIAT of this equipment and the software and equipment developed by the CS179 contractor will occur. Questions regarding the logistics of this FIAT remain unresolved, as the CS179 equipment is located in New Jersey and the Plaza Interlocking equipment provided under this VS086 contract is located in South Carolina. Further, both the VS086 contractor and the LIRR insist that, from warranty, installation, and operational perspectives, the CS086 and CS179 contractors need to attend the FIAT, which is a potential schedule issue because the CS086 contract has yet to be awarded. The delivery of Plaza Interlocking, which was originally planned for April 2017, is significantly delayed and a new delivery date is undetermined at this time. As a result, the impact of this delay on the overall contract is unknown.

Harold Interlocking Contracts

Costs and substantial completion dates are tabulated below for active Harold contracts:

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CH061A	42.0	34.4	7.5	19.7	39.2	84.5%	57.6%	5/28/18	6/14/18	
	nc	nc	nc	+2.1	(-0.4)	nc	+5.6%	8	nc	
	42.0	34.4	7.5	21.8	38.8	84.5%	63.2%	nc 5/28/18	6/14/18	

Notes: Costs in millions; line 1 = prior value; line 2 = period change – nc = no change; and, line 3 = current value. Please refer to the contract narratives for additional information.

CH061A – Track A Cut and Cover Structure:

Schedule: The remaining milestones for CH061A, MS#3, Substantial Completion, and MS#4, Final Completion, are on schedule for June 14, 2018, and August 23, 2018, respectively.

Construction Progress: During May 2018, the CH061A contractor completed construction of the west end (former portal end) of the Tunnel A tunnel structure and began to backfill the area. The contractor also continued to construct interior rooms in the Mechanical Room and to place sidewall re-bar and concrete at the east end of the structure (the trough area which interfaces with the CH053 trough constructed several years ago).

Railroad Force Account Contracts

Costs and substantial completion dates are tabulated below for active Force Account contracts:

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
FHA01	18.8 nc 18.8	18.8 nc 18.8	-- nc --	18.6 nc 18.6	18.8 nc 18.8	100.0% nc 100.0%	99.0% nc 99.0%	2/4/16 nc 2/4/16	9/30/19 nc 9/30/19	1
FHA02	60.2 nc 60.2	38.8 +21.4 60.2	21.4 (-21.4) --	56.3 +0.1 56.4	60.2 nc 60.2	100.0% nc 100.0%	93.7% +0.1% 93.8%	8/15/17 nc 8/15/17	6/16/19 nc 6/16/19	1
FHL01	27.3 nc 27.3	20.8 +6.5 27.3	6.5 (-6.5) --	26.5 +0.1 26.6	27.3 nc 27.3	100.0% nc 100.0%	97.3% nc 97.3%	1/31/19 nc 1/31/19	1/31/19 nc 1/31/19	1
FHL02	96.6 nc 96.6	48.2 +48.4 96.6	48.4 (-48.4) --	96.4 nc 96.4	96.6 nc 96.6	100.0% nc 100.0%	99.9% nc 99.9%	11/25/16 nc 11/25/16	8/26/20 nc 8/26/20	1

Notes: Costs in millions; line 1 = prior value; line 2 = period change – nc = no change; and, line 3 = current value. Please refer to the contract narratives for additional information.

1. Contract Awards for Force Account work are made on an as needed basis. Actual Cumulative % Complete based on Total Budget Value, not Approved Contract.

FHA01 – Harold Stage 1 Amtrak:

Construction Progress: Amtrak did not perform any significant Stage 1 construction during May 2018. The PMOC is not concerned about this because the remaining Stage 1 work will only take one day and is presently scheduled to be done after the LIRR CIL cutovers in July 2018.

FHA02 and FHA03 – Harold Stage 2 and Stage 3 Amtrak:

Construction Progress: During May 2018, Amtrak C&S personnel continued to install, splice, terminate, and test signal cables along its New Haven tracks east of Harold Interlocking in support of the LIRR CIL cutovers scheduled for June and July 2018. The PMOC remains concerned, however, that Amtrak Electric Traction (ET) work in support of the LIRR Northeast Quadrant (NEQ) turnout installations, which is scheduled to begin shortly after the CIL cutovers, may not be complete on time and might limit the quantity of turnouts that are planned for installation.

FQA65 – Loop Interlocking Amtrak:

The PMOC notes that FQA65 is a Regional Investment project that will provide independent utility not required for LIRR service into GCT, although it can impact the FFGA Harold scope of work by placing additional demands for scarce Amtrak force account resources.

Construction Progress: Amtrak did not perform any significant FQA65 construction during May 2018. The PMOC is not concerned about this because it is not a critical component of the “ESA First” construction schedule. As such, it will not be required for several years. Therefore, the PMOC will suspend reporting on this work package.

FHL01 – Harold Stage 1 LIRR:

Construction Progress: During May 2018, LIRR 3rd Rail Electric Traction personnel resumed FHL01 Stage 1 construction with installation of temporary 3rd Rail cables into the new G02 Substation.

FHL02 and FHL03 – Harold Stages 2 and 3 LIRR:

Construction Progress: During May 2018, LIRR signal personnel continued Stage 2 and Stage 3 work by performing FRA signal tests and other pre-cutover activities in preparation for the

cutovers of the new “H1”, “H2”, “H5”, “H6”, and Location 30 Central Instrument Locations (CILs), which are scheduled for June and July 2018. During May 2018, signal personnel successfully completed 3 extended weekend “pre-cutover” tests precedent to the actual cutovers, which brought the total number of successful weekend pre-tests to 9 of a total of 10.

d. Quality Assurance and Quality Control

The PMOC reports Quality Assurance/Control issues in its quarterly comprehensive reports. MTACC did not report any significant issues regarding Quality Assurance or Quality Control in its ESA Quarterly Progress Report 1Q2018. The PMOC continues to track developments regarding the Contract CS084 transformer test failures in April 2017 and February 2018.

2.0 SCHEDULE DATA

Status and Schedule Contingency

The schedule information in this report is based on ESA (Alternative) Integrated Project Schedule (IPS) 104 (data date: April 1, 2018) and IPS Progress Report. In this IPS update, the Target Revenue Service Date (RSD) was pushed out to February 21, 2022. The Late RSD remained on December 13, 2022, as previously forecast.

It is notable that the April 1, 2018 IPS update was prepared using a modified scheduling procedure developed by MTACC. The revised procedure is identified as the Alternative Integrated Project Schedule; however, MTACC continues to identify the schedule by the IPS acronym for simplicity. The PMOC will follow this precedent to minimize confusion – with the understanding that henceforth the IPS schedule development will use the new Alternative procedure.

In brief, MTACC’s approach to the new alternative IPS – which supersedes the existing IPS – is as follows: the new/re-tooled IPS is no longer a summarized schedule but is a level of effort summarization of the contract schedules with coordination between the program contracts; issues without a clear path forward are not included in the new IPS, until the MTA has certainty around how they will be resolved (these issues will be included in the Master Coordination Schedule; MCS); and, if a contract schedule is not approved by the MTA in a given month, the IPS team will work to update progress in the new IPS to reflect a picture of progress.

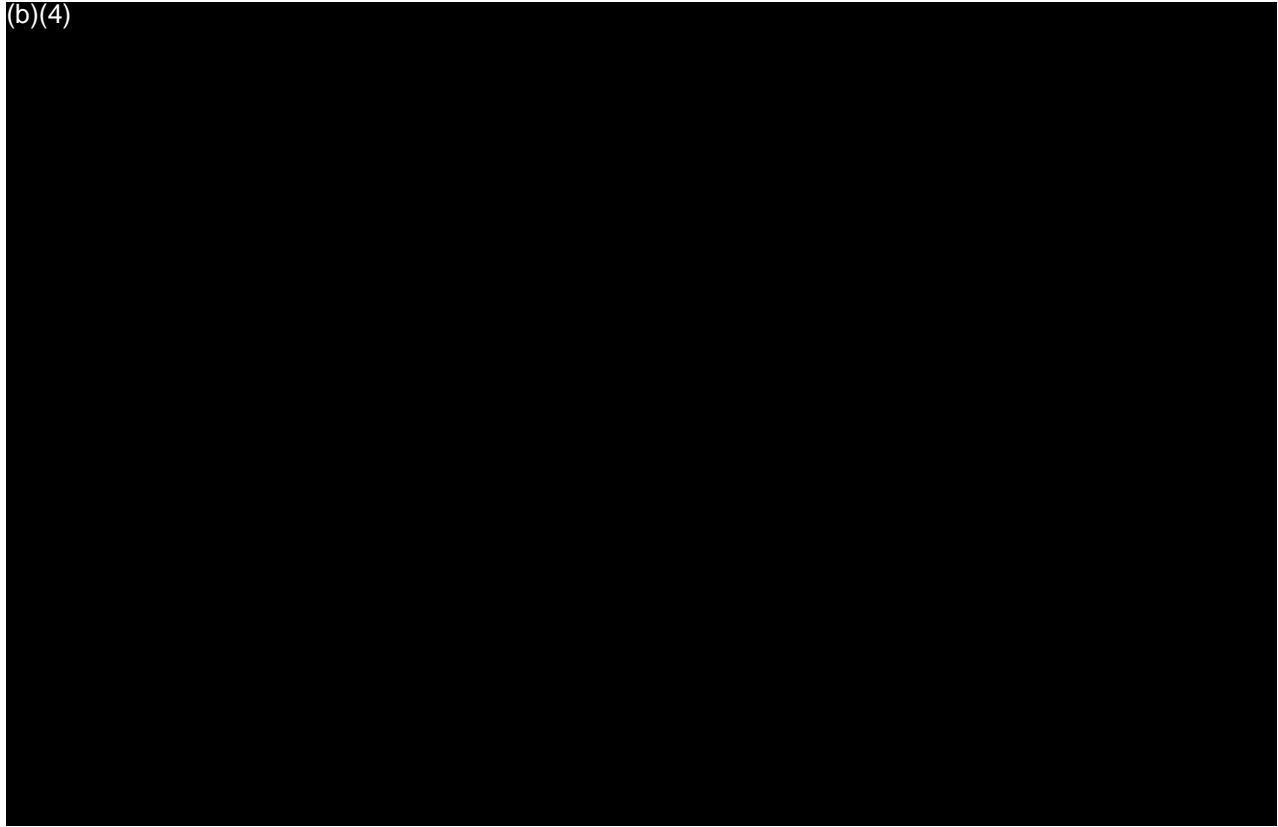
MTACC’s shift to the new alternative IPS includes a fragnet for a framework schedule for MTACC’s proposal for Incremental Integrated Systems Testing. MTACC made two additional significant changes to the IPS with the inclusion of an activity for FRA testing after the completion of critical path work and inclusion of an activity for contingency time to be used, if needed, to address currently unknown issues.

(b)(4)



As shown in Chart 1, the three primary program critical paths in IPS 104 are: 1) Manhattan/Systems work (no float); 2) work in Queens (131 CDs float); and, 3) work in Harold Interlocking (166 CDs float). Float on the Queens work path (Mid-Day Storage Yard) is being managed to the start of the FRA Testing (signals and power) activity and the float on the Harold Interlocking work path is being managed to the start of the LIRR Final Systems Test activity.

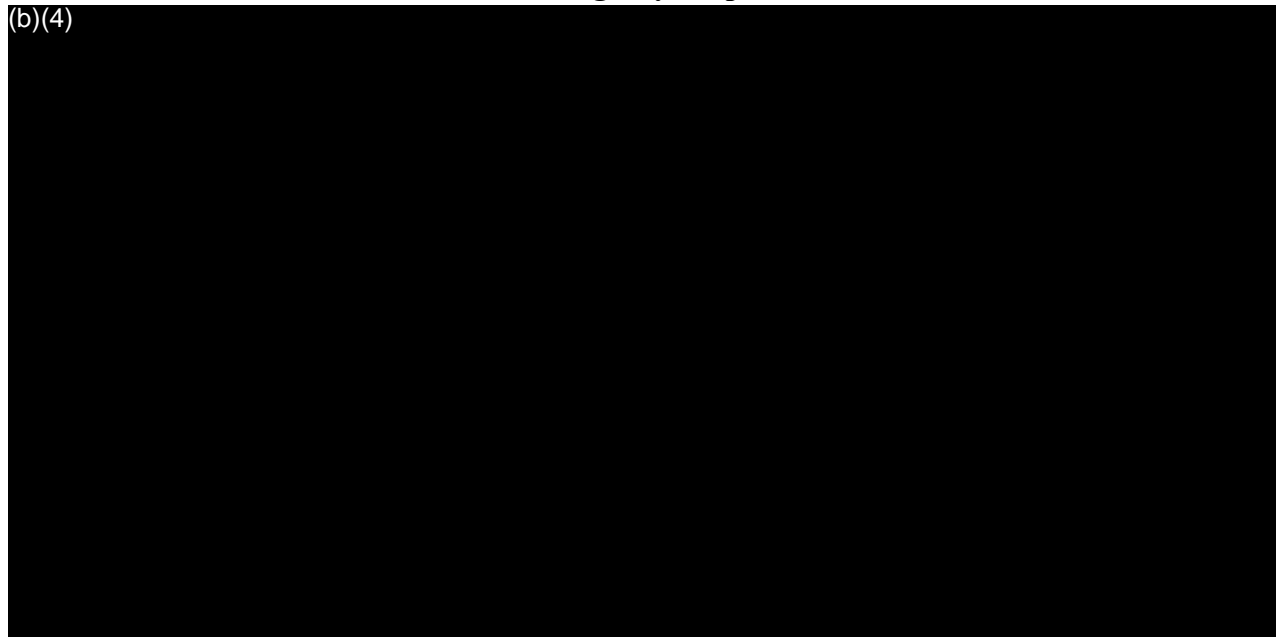
Chart 1 – Comparison of IPS Critical Paths and Contingencies



Revenue Service Dates. A

Table 2.1: Schedule Contingency – April 1, 2018 ESA IPS 104

(b)(4)

A large black rectangular redaction box covers the content of Table 2.1. The text "(b)(4)" is visible in the top-left corner of this redacted area.

Program Primary Critical Path – Manhattan/Systems

The primary critical path in the ESA April 1, 2018 IPS has shifted to follow Manhattan/Systems work, rather than Harold Interlocking work, and ends on March 26, 2021 (no float remaining).

Table 2.2 shows the work and contracts that comprise the Manhattan/Systems work path through the Late/Public RSD along with forecast start and finish dates, as reported in the April 1, 2018 IPS.

The change to the primary critical path in the April 1, 2018 IPS resulted from the insertion of a (fragnet) schedule for Incremental Integrated Systems Testing of CS179. The incremental systems testing is an approach by which modular elements of the systems will be tested first by facility and then by phase (Phases 1 through 5) before proceeding with full system testing. The key benefits of the pivot towards incremental IST include:

- Advancing of facility, local testing, and integrated systems testing ahead of schedule
- Prioritization of change orders based on sequencing of systems testing and construction
- Utilization of forward looking controls and predictive analytics built on the MCS

Please note that the incremental testing approach is an MTACC proposal that has not yet been accepted by any of the contracts that would be impacted (CM007, CM014B, CS179, CS084). Therefore, dates and contingency forecasts in the April 1, 2018 IPS are subject to execution of agreements with the contractors to begin incremental testing on or around the April 2019 ESA need date. If not started in this timeframe, the program contingency could be impacted.

The MTACC made two additional significant changes to the IPS that affected the Manhattan/Systems and other critical paths. These changes were the inclusion of an FRA testing activity after the completion of critical path work (on Manhattan/Systems and Queens work paths) and inclusion of an activity for contingency time to be used, if needed, to address currently unknown issues before the Target RSD.

Table 2.2: Primary Critical Path – April 1, 2018 IPS

Contract / Scope	Duration	Start	Finish
CM014B – GCT Concourse and Facilities Fit-Out			
Rig and set steel, install metal decking, and install fans and ducts in Zone 1 of GCT Concourse	145	1-Feb-18	26-Jun-18
Set stone panels on walls and columns, install terrazzo floors, set retail front finishes in Zone 1 of GCT concourse	594	27-Jun-18	11-Feb-20
CS179 – System Package 1 – Facilities Systems			
Install, terminate and site test security, fire alarm, PA/VMS, telephone, radio and BMs devices in Zone 1 of GCT concourse and local test devices	224	11-Feb-20	22-Sep-20
Start Phase 3 IST in Zone 1			22-Sep-20
Phase 3 Backbone Communication Systems and Fire Alarm IST in all zones	185	22-Sep-20	26-Mar-21
Phase 3 IST complete			26-Mar-21
LIRR Activities			
FRA Testing (Signal & Power) †	112	26-Mar-21	16-Jul-21
Final Systems Test (30-Day “No Primary Failure”) ‡	28	16-Jul-21	13-Aug-21
Initial & Final Preview (8 Weekends)	50	14-Aug-21	3-Oct-21
Program Activities			
Allowance for issues	140	4-Oct-21	21-Feb-22
Target Revenue Service Date			21-Feb-22
ESA Program Schedule Contingency		(b)(4)	
Late / Public Revenue Service Date			

Notes: † Successor to Manhattan/Systems critical path and Queens critical path.
‡ Successor to Harold Interlocking critical path.

Discussion of Progress along the Critical Path

The Manhattan/Systems work path has become the primary critical path for the ESA project due to inclusion of the MTACC incremental IST testing fragnet, which also added two months to the completion of the Manhattan/Systems work path. The change to an Incremental IST approach also resulted in Contract CM014B becoming the driver on the Manhattan portion of the work path rather than CM007, which drove the path previously. The critical path now begins with CM014B MEP work and finishes and then continues on to CS179 device installation and local testing in GCT Zone 1. The completion of this work leads to the start of Phase 3 backbone communication system IST and then Phase 3 fire alarm testing. At this point, LIRR FRA testing for signals and traction power (new activity) begins, which is followed by LIRR final testing and previews. This is followed by contingency time to address impacts by issues which are not known at this time, leading to a Target RSD of February 21, 2022.

90-Day Look-Ahead of Program Critical Activities/Milestones

Table 2.3 shows the Program critical dates in the April 1, 2018 IPS forecast to occur within the next 90 days.

Table 2.3: Program Critical Dates 90 Day Look-Ahead – April 1, 2018 IPS

Activity	Name	Start	Finish	Float
CM014B				
14010B	Rig & Set Columns, Beams & Joists (Not Supported by CMU) - Tile 3114	01-Feb-18 A	2-Apr-18	0
15500	Rig & Set Columns, Beams & Joists (Not Supported by CMU) - (Tile - 3125)	16-Feb-18 A	3-Apr-18	0
15250D	Rig & Set Columns, Beams & Joists (Not Supported by CMU) - (Tile - 3122)	4-Apr-18	23-Apr-18	0
15252D	Plumb & Bolt Columns, Beams & Joists (Not Supported by CMU) - (Tile - 3122)	24-Apr-18	4-May-18	0
15252C	Plumb & Bolt Columns, Beams & Joists (Not Supported by CMU) - (Tile - 3111)	10-Mar-18 A	7-May-18	0
15258C	Install Metal Decking & Pour Stops on Steel (Supported by Masonry Walls) - (Tile - 3111)	16-Mar-18 A	10-May-18	0
15254C	Install Metal Decking & Pour Stops on Steel (Not Supported by CMU) - (Tile - 3111)	16-Mar-18 A	10-May-18	0
15260C	Place Concrete on Metal Deck at Fire-Rated Rooms - (Tile - 3111)	10-May-18	10-May-18	0
15262	Install Roofing/Gutters on Q-Deck/Drip Pan - (Tile - 3111)	20-Mar-18 A	22-May-18	0
15262D	Install Liquid Applied Membrane on Q-Deck/Drip Pan - (Tile - 3111)	23-May-18	31-May-18	0
20052	Install Hangers & Supports for Mechanical Piping System - (Tile 3101)	1-Jun-18	4-Jun-18	0
20056	Install Hot Water Piping (Mechanical) - (Tile 3101)	5-Jun-18	11-Jun-18	0
20016	Install Fans - (Tile 3101)	12-Jun-18	15-Jun-18	0
20032	Install Duct Insulation - (Tile 3101)	18-Jun-18	22-Jun-18	0
20024	Install Air Outlets - (Tile 3101)	25-Jun-18	25-Jun-18	0
20050A	FIAT - AHU-C43-13 - (Tile 3101)	26-Jun-18	26-Jun-18	0
MEP-3101	MEP Complete - (Tile 3101) - Col Ln; 1 to 9		26-Jun-18	0

Sub Program Longest Path – Queens

The April 1, 2018 IPS shows that the Queens work path changed during the update period and that, while it completes 24 CDs earlier than in the prior IPS, the float on the path has increased to 131 CDs due to changes on the other paths. MTACC reports that the Queens path continues to show delays to the signal trough work, which prevents on time catenary installation at the demolished Montauk cutoff structures. The completion of the catenary work is currently planned for February 2019 (a delay of 5 months). The follow-on power, communications, track, switch and signal work path has shifted to the Thomson Avenue to Queens Boulevard area (from the Queens Boulevard to Honeywell Avenue area). The subsequent CQ033 testing still begins in July 2020 but completes about 1 month earlier at substantial completion in November 2020. This is followed by 166 CDs of float leading to the start of LIRR FRA testing for signals and power in March 2021, at which point this path merges with the Manhattan/Systems critical path.

Sub Program Longest Path – Harold Interlocking

The April 1, 2018 IPS shows that the Harold Interlocking critical path remained the same this update period and that, while it completes approximately 1 week later, the float on the path has increased to 166 CDs due to changes on the other paths. While completion of the FHL02 pre-cutover testing remains as a risk, ESA has been successfully completing the work as scheduled due, in part, to MTACC’s efforts in coordinating the Regional Schedule among LIRR, Amtrak, and metropolitan area stakeholders. The dates shown in the IPS for the Harold cutover work are coordinated with the Regional Schedule.

The Harold CIL cutovers are followed by the CH057D construction of the northeast quadrant (NEQ). NEQ track work requires an extended, 30 day track outages during July and August 2018. The CH057D construction continues on to southeast quadrant (SEQ) track work and Tunnel B/C preparation work. If LIRR cannot support SEQ construction as scheduled, the Harold critical path may be impacted by 4 to 5 months because the removal of the freight tracks must precede construction of the B/C approach structure by CH058A. The construction schedule of CH058A is driven by underpinning 39th Street; completion and backfilling the box structure; and, installation of the duct bench (to sta. 1206+05); as well as completion of civil and track work for the B/C approach structures (beyond sta. 1206+05). This construction is followed by handovers to CM007 (track), CS084 (traction power), CS086 (signals), and CS179 (communications) up to sta. 1206+05; and, the LIRR FHL04 force account track and signal installation, and testing and cutover for the B/C track between sta. 1206+05 and Harold. The milestone – All Harold ESA Complete – Ready for RSD (HAROLDSC10TO) – is currently February 2, 2021, which gives the Harold critical path 5.4 months of float to the start of LIRR final systems testing in July 2021, at which point where the path merges with the project critical path through Manhattan/system.

The PMOC notes that the schedules for two of these contracts – CH057D and CH058A – are preliminary. CH057D was awarded in April 12, 2018, and CH058A was advertised on May 8, 2018.

Upcoming Contract Procurements

Table 2.4 shows the status of current and upcoming contract procurements, as reported in the April 1, 2018 IPS.

Table 2.4: Procurement Schedule

Contract Description	Advertise Date	Bid Date	NTP	Project Length	Substantial Completion
CS086: Tunnel Systems Package 2 – Tunnel Signals	8/10/17A	10/31/17A	6/1/2018	29 mos.	11/2/20
CH058A: B/C Tunnel	5/8/18A	7/10/18	8/10/18	27 mos.	11/9/20

Negotiations concluded in early May 2018 for CS086, Tunnel Systems Package 2 – Signal Installation, for the RFP received on October 31, 2017, from a single proposer. MTACC plans to recommend award to the MTA board for ratification at the June 20, 2018 board meeting.

CH058A, B/C Tunnel, was advertised on May 8, 2018, with the Notice to Proceed anticipated to be August 10, 2018. LIRR resource availability to support Southeast Quadrant work may delay the procurement of CH058A. MTACC and LIRR are reviewing steps to mitigate the delay.

The procurement of CM015, 48th Street Entrance, has been removed from active reporting until agreements with the property owner can be completed. The PMOC notes that the PMT is

developing alternative access at 47th Street – to be built by contract modification under the existing ESA CM014B Contract – and that the CM015 48th Street entrance will not be critical to the completion of the ESA program

PMOC Concerns

The PMOC has the following observations and concerns about the ESA schedule:

1. (b)(4)
2. Concerns continue about the ESA critical path through Manhattan/Systems work, which has no float to the Target RSD. This schedule is predicated on acceptance of the Incremental IST approach by the contractors and their agreement on acceptable schedule dates. PMOC notes that acceptable work progress along this schedule path, now the ESA Program Critical Path, relies heavily on the effectiveness of MTACC/ESA coordination efforts.
3. Concerns continue regarding LIRR support for the CH057D contractor to do the Southeast Quadrant work and the need for 3rd party labor approvals.
4. Concerns continue regarding procurement of CH058A B/C Tunnel Approach. Continuing delays to this contract have pushed out its completion. The PMOC recommends that this contract be awarded and a contractor schedule be obtained as soon as possible so that inter-contract milestones and interfaces can be validated.
5. Progress on CS084, Tunnel Systems Package 4 – Traction Power, is slow and is currently reported at 16.2% complete vs. 79.4% as planned. The PMOC observes that much of the work has had day-for-day delays in each IPS update period. The PMT is working with the contractor to get a realistic schedule; however, the PMOC believes that a revised schedule will incorporate delays in the delivery of equipment that will push out milestone dates. The PMOC recommends that ESA analyze options to recover the schedule; focusing on major electrical equipment submittals and layouts; identifying major issues; and determining corrective measures.
6. Concerns continue for the delays in the procurement of CS086, Tunnel Systems Package 2 – Signal Installation. With the award of CS086 potentially delayed until July 2018, the PMOC is concerned that the delays may eventually impact the Program schedule.

3.0 COST DATA

MTACC Comprehensive Review of ESA Program – April 2018

On April 23, 2018, MTACC announced the results of its review of the ESA program. Specifically, the project team is forecasting that the program cost is now \$11,133 million, an increase of \$956 million above the June 2014 budget of \$10,178 million. The PMOC notes that the revised EAC, \$11,133 million, exceeds the amended FFGA Baseline Cost Estimate (BCE) of \$10,922 million.

Table 3.1: Budget Comparison – 2014 Replan, Current, and 2018 Proposed

	2014 Replan Budget	Current Budget April 1, 2018	New 2018 Forecast	Change from 2014 Replan	Percent Change	Change from Current	Percent Change
Third Party	6,619.6m	6,726.1m	7,054.3m	+434.7m	+6.6%	+328.2m	+4.9%
Force Account	759.7m	829.3m	959.8m	+200.1m	+26.3%	+130.5m	+15.7%
Soft Costs	1,874.9m	1,889.8m	2,192.9m	+318.0m	+17.0%	+303.1m	+16.0%
OCIP	282.6m	307.6m	457.4m	+174.7m	+61.8%	+149.7m	+48.7%
Rolling Stock	202.0m	202.0m	202.0m	--	+0.0%	--	+0.0%
Unallocated Contingency	(b)(4)						
Total	(b)(4)						

Until such time as the program budgets are revised, the PMOC will continue to use only the usual reports and data that MTACC provides each month.

Budget/Cost

The PMT reported in the 1Q2018 MPR (data date: April 1, 2018) that total project progress was 77.1% compared with planned progress of 81.4% of the \$10.178 billion Current Baseline Budget (CBB). The report also shows that construction progress reached 77.5% complete of the CBB compared with planned progress of 82.5%, based on invoiced construction costs. (Details of the project budget and expenditures are shown in report Appendix B and report section 1.0-c.)

At the April 23, 2018 MTA board meeting, MTACC received approval to reallocate \$349.6 million of ESA funds from current and prior Capital Plans and temporarily transfer (i.e. borrow) \$157 million from the 2015–2019 Regional Investment program for the ESA program. These changes have not been incorporated into the ESA program as of April 1, 2018.

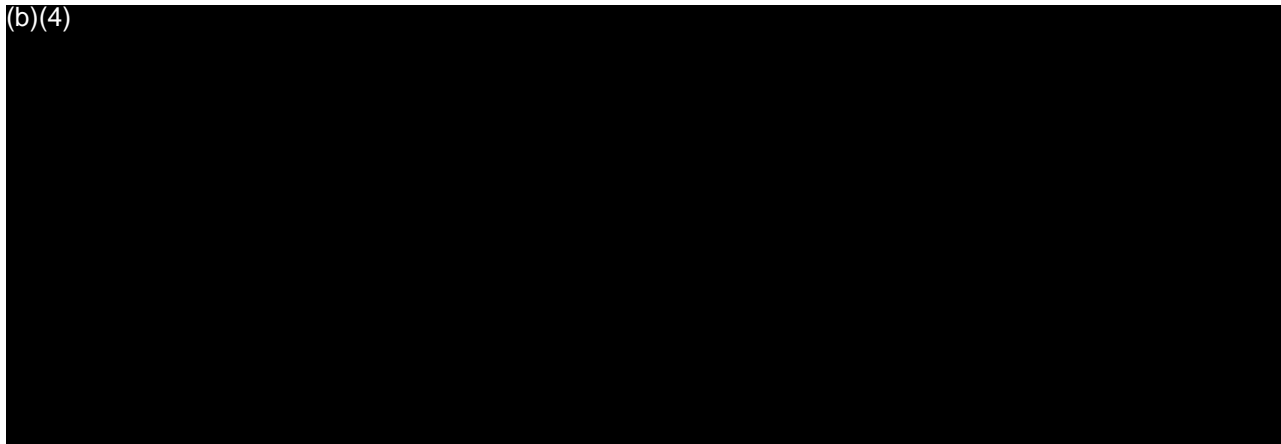
(b)(4)

Contingency

(b)(4)

The PMOC anticipates that contingencies will be supplemented with the incorporation of additional funding approved at the April 23, 2018 CPOC meeting. However, the PMOC remains concerned about future demands on the program’s contingencies until the MTA 2020–2024 Capital Plan is funded/authorized and the related budget adjustments are performed.

Table 3.2: ESA Cost Contingency



Change Orders/Budget Adjustments

The March MPR 2018 lists six executed construction Change Orders executed in March 2018 with magnitudes greater than \$100,000.

Table 3.3: Change Order Log (magnitude > \$100,000)

Contract	Description / Mod No.	Amount
CM007	Upper Tail Track Arch Extension (mod. 31)	\$183,015
CS179	39th Street Conduit Issue Corrections (mod. 46)	\$326,974
CS179	Plaza Conduit Openings (mod. 75)	\$131,555
VQ033	CIL Redundant Processors and West End Changes (mod. 7)	\$2,900,000
GEC	Miscellaneous task order services (mod. 137)	\$149,000
GEC	CH057D force account support (mod. 154)	\$373,944

Funding

On April 25, 2018 the MTA board authorized the MTACC to reallocate \$349.6 million of ESA funds from current and prior Capital Plans and temporarily transfer (i.e. borrow) \$157 million from the 2015–2019 Regional Investment program for the ESA program. The Capital Plan Review Board approved these changes on May 31, 2018. The changes have not been incorporated into the ESA program as of May 1, 2018.

Federal Funding: The total Federal funding commitment to the ESA project is \$2.699 billion, of which \$2.698 billion was expended through April 1, 2018.

Local Funding: The budget for Local Funding is \$7.479 billion, of which \$4.972 billion was expended through April 1, 2018. Financing costs are funded separately by local sources.

PMOC Concerns

1. The PMOC understands that additional funding is necessary for the ESA program based on the review conducted by MTACC. This includes a pending interim budget revision that will infuse the ESA project with an additional \$157 million (from the Regional Investment program) for work through 2020. The MTACC review also identified the need for \$956 million to be funded in the 2020–2024 Capital Plan for the ESA program (and to restore the \$157 million to the Regional Investment program). A funding constraint could be a major risk.

2. Ongoing and possible future delays may result in increasing costs for the following contracts:
 - CS179 – the late completion of systems designs and extended schedule for incremental Integrated Systems Testing.
 - CS084 – the late completion of final design has delayed fabrication of some traction power equipment.
 - VS086 and CS086 – incorporation of Positive Train Control into the ESA signal system and technology issues.
3. Construction expenditures (i.e. invoiced costs, preliminary/pencil-copy DCBs) continue to lag significantly behind the planned/scheduled expenditures. This may be a negative indicator for the ESA project’s ability to achieve the target date for revenue operations.

4.0 RISK MANAGEMENT

The PMOC focuses here on discussion of the most critical risks.

Harold Interlocking Risk Review

During 2Q2017, the ESA Risk Manager, working with the consultant risk assessment facilitator, conducted a comprehensive risk review of the remaining work in Harold Interlocking required to provide LIRR service into the new LIRR rail station at Grand Central Terminal. The risk workshop to evaluate the risks and quantify the probability of occurrence and cost and schedule impacts was held over a three-day period and included the primary stakeholders and the PMOC. MTACC continues to finalize the summary of the risk review results. The PMOC notes that, as of the April 1, 2018 Alternate IPS update, the Harold schedule path is no longer the ESA Program Critical Path.

Harold Interlocking – ESA Risk

Harold Re-Sequencing Plan (“ESA First”) Risk

Through May 2018, MTACC continued to adjust the “ESA First” Harold Re-sequencing to accommodate railroad force account constraints. As a result, the impacts caused by insufficient Amtrak support were reduced during this period, but not totally eliminated. This situation continues to be a challenge for MTACC.

Amtrak Preparation for Extended East River Tunnel Outages Risk

The PMOC has continuing concerns regarding the impact to the ESA Harold work due to the Amtrak program to harden East River Tunnel (ERT) Lines 1 and 4 in preparation for extended outages for ERT Lines 1 and 2 to complete Hurricane Sandy damage-related reconstruction work, originally planned for 2019, and now deferred until 2025, starting with Line 2. Amtrak has provided no details regarding how this change might affect the remaining predecessor hardening work for ERT Lines 1 and 4. The risk remains that reliability issues might require Amtrak to make emergency repairs on either Line 1, 2, or 4 at any time between now and 2025.

LIRR Positive Train Control (PTC) Risk

There are two potentially significant impacts of PTC implementation: first, design changes to active Contracts CS179, VS086, and pending Contract CS086; second, potential delay to the remaining ESA Harold work after the planned May 2018 LIRR CIL cutovers, should FRA not grant LIRR’s waiver request to postpone the December 31, 2018, deadline for PTC operation in Harold. If FRA does not grant LIRR’s waiver request, LIRR may be required to significantly reduce its support for the ESA work in Harold in order to install, test, and activate PTC by the end

of 2018. The PMOC notes that the original waiver request submitted in October 2017 was revised and re-submitted in December 2017 and LIRR received the FRA's response on May 2, 2018. LIRR is required to submit to the FRA, within 90 days, the revised PTC Implementation Plan with LIRR's proposed alternate schedule. LIRR was not able to complete PTC design in 1Q2018, as earlier projected, and design completion is now expected later in 2018. The GEC does not believe that this will be a problem because ESA/GEC has been coordinating with LIRR regarding the required PTC design changes for the associated ESA Contracts VS086, CS086, and CS179. The PMOC is following up with the PMT to determine if this situation presents any schedule risk to the three cited ESA contracts.

Capital Funding Risk

The PMOC is concerned about potential impacts to the program budget coming from additional costs and their possible impact on achieving the target Revenue Service Date, based on the need for an additional \$956 million as identified in the PMT cost review. This risk has been lessened by the pending budget adjustment, which will provide \$157 million for use by the ESA program.

ESA Vehicle Risk

The PMOC remains concerned about the schedule slippage of the LIRR federal vehicle procurement program for the M-9A vehicles because it has the potential to significantly impact delivery of the vehicles, and, hence, MTACC's Revenue Service Date. The PMOC notes that, although the LIRR issued the Phase I, "Qualifications", portion of the two part competitive RFP procurement in November 2017, it had not issued the Phase II, "Cost/Technical", portion by the end of May 2018 as it continued to review vendors' "Qualifications" submissions. The procurement schedule is based on a December 2018 contract award and will require that the prospective vendors' submissions for both the Phase I and Phase II portions of the RFP are complete and satisfactory. The PMOC is growing increasingly concerned that the December 2018 award may not be met based on the amount of time and effort normally involved with a procurement of this type.

Manhattan/Systems Performance Risk

The primary PMOC concern since September 2017 has been that it is likely that the Manhattan/Systems schedule path could become critical at any time going forward. On April 23, 2018, MTACC announced the results of its review of the project schedule and acknowledged that delays along the Manhattan/Systems schedule path are now forecast to be 11 months and that this schedule path has become the ESA program critical path. This significant change was reflected in the April 1, 2018 Alternate IPS update.

5.0 ELPEP COMPLIANCE SUMMARY

The current status of each of the remaining main Enterprise Level Project Execution Plan (ELPEP) components is summarized as follows:

- **Technical Capacity and Capability:** MTACC previously indicated that it will review the Technical Capacity and Capability (TCC) Plan and propose revisions, if required, to reflect the current status of the Program. MTACC submitted an updated TCC Plan in 3Q2017. In April 2018, FTA advised MTACC to incorporate its current updates and then commence with a subsequent revision that addresses management changes resulting from the MTACC Six-Point Plan for ESA.

- **Continuing ELPEP Compliance:** The ESA project should continue to make additional improvements in the following areas: Management Decision; Design Development; Change Control Committee (CCC) Process and Results; Stakeholder Management; Procurement; and Risk-Informed Decision Making. The PMOC has noted progress in two previously identified areas – Issues Management and Timely Decision Making, particularly when responding to new issues arising with the railroads’ Force Account resource availability, track outages, and other issues regarding the remaining work in Harold Interlocking.
- **Project Management Plan:** MTACC is using the current version of the PMP, Rev. 10, which the FTA accepted in 2017.
- **Cost/Schedule Contingency:** MTACC has reached agreement with the FTA and the PMOC on the ELPEP minimum cost and schedule contingency hold points, levels, and drawdowns. MTACC continues to report the cost and schedule contingency levels against the ELPEP minimums in its quarterly reports to the FTA.

The PMOC notes that, with completion of the most recent Schedule Management Plan and Cost Management Plan updates, as well as the FFGA amendment, the ESA project is better able to generally remain compliant with ELPEP.

- **Schedule Management Plan:** The ESA project should continue to make additional improvements to the Schedule Management Plan (SMP) in the following areas: Integrated Project Schedule (IPS) Updating, Forecasting, and Schedule Contingency Management against a current baseline schedule. MTACC is using Rev. 2 of the SMP, dated September 2016.
- **Cost Management Plan:** The ESA project should continue to make additional improvements to the Cost Management Plan (CMP) in the following areas: Project Level EAC Forecasting, Project Level EAC Forecast Validation, and MTACC Cost Contingency Management and Secondary Mitigation. MTACC is using Rev. 2 of the CMP, dated October 2016.
- **Risk Management Plan:** ESA submitted the updated Risk Management Plan in 4Q2017. In April 2018, the FTA advised MTACC to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTACC Six-Point Plan for ESA.
- **Project Quality Manual:** ESA submitted the updated Project Quality Manual in February 2018. In April 2018, FTA advised MTACC to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTACC Six-Point Plan for ESA.

The PMOC anticipates the need for the PMT to update one or all of the Project, Cost, and/or Schedule Management Plans to document changes called for by the incorporation of the MTACC Six-Point Plan for ESA to reduce potential programmatic risks.

Revisions to the ELPEP Document: As part of the process of updating the ELPEP document, the PMOC completed an independent evaluation of the minimum required future cost and schedule contingencies. During 1Q2016, MTACC and the ESA PMT accepted the FTA/PMOC recommended ELPEP cost and schedule contingency hold points, values, and curves for the remainder of the program. MTACC submitted an updated ELPEP with suggested revisions in

3Q2017. In April 2018, FTA advised MTACC to re-evaluate its proposed updates in consideration of the changes resulting from the MTACC Six-Point Plan for ESA.

6.0 SAFETY AND SECURITY

Based on safety information supplied by MTA, the PMOC calculated ESA Injury Ratios for CY2018 through April 30, 2018, were 2.31 for Lost Time Injuries (LTI) and 3.46 for Recordable Injuries (RI). Both were above the 2018 Bureau of Labor Statistics (BLS) Safety Guidelines for 1.7 for LTI and 2.8 for RI. Additionally, ESA did not report any significant security issues in its March 2018 Monthly Report.

7.0 ISSUES AND RECOMMENDATIONS

Design: The PMT design management team needs to focus on the timely achievement of intermediate milestones and working closely with the GEC to facilitate finalization of the scopes of work for remaining procurement and construction packages.

Also, the PMOC has observed the following:

- Approvals from the railroads, both LIRR and Amtrak, and other outside stakeholders, are requiring considerably more time than planned; and,
- LIRR is making changes that alter the design basis and result in time-consuming and costly re-design work by the GEC.

The ESA PMT needs to continue to monitor and better coordinate the interface of design reviews and equipment approvals between the GEC and LIRR for the CS084, CS179, and VS086 contracts. These shortcomings indicate possible technical capacity and capability issues in the particular design support areas. The PMOC acknowledges the efforts by senior management to resolve these issues and recognizes that some short-term improvements have been achieved, but notes that more sustained effort is needed.

Procurement: The lack of stability in the contracting strategy and Contract Packaging Plan (CPP) remains a concern. Scope shifting among different packages delays completion and finalization of the required design packages and resulted in significant delays to the procurement schedules during 2016, 2017, and into 2018. The PMOC continues to recommend that the ESA PMT make an effort to adhere to the current version of the CPP, Rev. 11.0, and minimize shifting scope for the remainder of the project.

Water Infiltration Concerns Regarding Contracts CS179, CS084, and CQ032:

The PMOC remains concerned about the numerous water infiltration issues in the electrical and electronic equipment rooms either constructed by, or provided for, these contracts. The PMOC notes that, while a number of the water remediation efforts employed have been successful, others have not; and, this has caused delays to construction work. Further, in May 2018, the CS179 contractor advised MTACC of more water infiltration issues in areas where work access was recently granted.

Contract CS179: The PMOC recommends that the ESA PMT continue making improvements regarding the PMOC's following concerns for CS179:

- Timely delivery and discussion about the contractors' monthly schedule submissions;
- Timely preparation and submission of documentation for two potential Buy/Ship America issues;

- ESA PMT responses to contractor NOCs and issuance of CPRs; and,
- Timely design review and approvals to contractor’s design submittals.

Contract CS084: MTACC should prioritize the execution of contract modifications to preclude any further impact to substation design and fabrication. Additionally, the PMOC remains concerned about the issue related to the installation of traction power feeder cables between the C08 substation and the track, the live load (dynamic) testing of the C08 Substation, the integrated testing of all CS084 substations, management of coordination issues related to work area access issues with other contractors, and the resolution of access issues for the delivery of substation equipment at the C01/C02 substations. Also, no additional surveys have been conducted to verify availability of required conduit/manhole system for each TPSS.

Contract VS086: The PMOC remains concerned that there is no accurate and comprehensive schedule in place that would allow MTACC to effectively manage this contract and encourages MTACC to quickly complete discussions regarding the development of such a schedule that addresses all the issues currently identified on this contract. The PMOC is concerned that design decisions are not being made in a timely manner. The PMOC encourages the MTACC management team on this contract to work with the LIRR and the GEC to provide timely answers and comments to design questions and submittals.

Project Funding: The project is at risk due to an anticipated \$956 million in additional costs that were forecast by the PMT in April 2018 during its program re-assessment that need to be accounted for in the project forecast and for which consideration of additional funding needs to be addressed. Interim funding needs through December 2020, have been addressed with the approval of Amendment No. 3 to the 2015–2019 Capital Plan by both the MTA Board and the Capital Program Review Board. The PMOC is concerned about future potential impacts on the program budget and schedule, as well as the Revenue Service Date, if there are issues regarding approval of the additional ESA funding in the 2020-2024 Capital Plan. MTACC needs to submit its Capital Plan by the January 2019 MTA Board Meeting.

Project Budget: (b)(4)

[Redacted]

Project Schedule: (b)(4)

[Redacted]

Risk Management: The segmentation of construction packages has created multiple inter-contract interfaces and milestones. In the PMOC’s opinion, managing inter-contract handoffs and interfaces will continue to be very challenging and represents significant MTACC-retained risks. The PMOC does recognize the PMT’s efforts to mitigate some of the potential cost exposure by negotiating adjustments to schedule constraints across the four ESA contracts currently held by the same contractor (CM006, CM007, CS179, and CQ032). However, the PMOC believes that

any meaningful schedule recovery, especially for Contracts CM014B, CS179, and CS084, will be difficult at best.

The PMOC considers the major remaining risks for the East Side Access Program to be:

1. Program Funding – update of the program budgets and inclusion in the MTA Capital Plan (risk realized in 2Q2018);
2. Recovery of lost time due to significant schedule delays on CM014B and CS084;
3. Successful execution of multiple hand-off interfaces across several contracts;
4. Contractor access and work area coordination in Manhattan;
5. Duration of integrated systems testing;
6. Continued availability of adequate Amtrak and LIRR force account resources;
7. Continued availability of required track outages in Harold Interlocking;
8. Maintaining adequate schedule performance of the remaining work in Harold Interlocking;
9. Remaining schedule path float will be used in the near future and Manhattan/Systems path will become critical (risk realized in April 2018); and,
10. Coordination risk retained by MTACC in Manhattan and the ESA tunnels with regard to construction and testing interface management for the systems work.

The comprehensive Harold risk review conducted in April 2017 identified a number of potentially significant risks that could delay completion of the critical work in Harold Interlocking planned for 2017-18. The PMOC notes, however, that with the recent change of the ESA Program Critical Path from the Harold schedule path to the Manhattan/Systems schedule path, future delays to completion of the Harold work are likely to have much less impact on the Revenue Service Date.

The risks modeled in the review included the following:

A. Major Risks included in the Risk Assessment

1. Positive Train Control: Implementation of Positive Train Control in Harold Interlocking to the degree necessary to achieve the December 31, 2018, FRA deadline. Risk is not well defined because scope and schedule details have not been finalized. Possible mitigation: LIRR submitted the formal waiver request to the FRA in early October 2017 to postpone this requirement based on Harold remaining an active construction area after 2018. LIRR submitted a revision to its original waiver request in December 2017. FRA replied on May 2, 2018, and LIRR must resubmit its revised PTC Implementation Plan by August 2, 2018.
2. LIRR Force Account Performance: Ability of LIRR force account resources to provide both a very high level of support for third-party contractor access and protection and adequate productivity for significantly increased direct labor work involving track, 3rd rail, and signals, in accordance with the current ESA schedule.
3. Northeast Quadrant Rail Work: Ability of MTACC-ESA, Amtrak, and LIRR to fully complete the planned work in the Northeast Quadrant in Harold Interlocking, as per the current ESA schedule, on a very tight schedule involving major Amtrak and LIRR track outages.
4. LIRR CIL Cutovers: Ability of LIRR to complete the pre-testing and final cutovers of CILs H1/H2/H5/H6/Loc 30 in accordance with the current ESA schedule plan.
5. CH058A Preparation Work: Ability of Amtrak and LIRR force account resources to complete, in accordance with the current ESA schedule plan, all track, catenary, and third-rail work required prior to NTP for CH058A.

B. Potential Risks with Major Schedule Impacts – Not Included in Risk Assessment

1. ESA Project funding constraints (risk realized in 2Q2017);
2. Ongoing and future Regional Projects requiring extensive support from Amtrak; and,
3. Amtrak program to reconstruct existing ERT Lines 1 and 2 has apparently been deferred until after the ESA program. The risk now is from the impact of unplanned emergency tunnel repairs.

The PMOC notes that, although MTACC continues to engage Amtrak to develop some specific mitigations for certain risks and continues to work on strategies for mitigating many of the other identified risks, continued shortcomings in provision of adequate force account resources adversely impacted the Harold schedule and, at that time, caused the remaining Harold work to become the ESA program schedule critical path. During February 2018, this became a significant problem, particularly with regard to Amtrak Electric Traction (ET) support and recovery has taken almost 3 months. The PMOC recognizes that MTACC and ESA have been proactive in dealing with these issues as they arise and also recognizes ESA's efforts to re-baseline the remaining work in Harold Interlocking to reflect more realistic expectations of Amtrak support. However, the situation still requires improvement and the PMOC recommends that the PMT actively engage executive management in MTACC and MTA to assist with resolution of outstanding issues with Amtrak and LIRR.

The ESA risk profile changed significantly based upon the MTACC's current ESA program re-assessment of April 2018 that acknowledged that the Manhattan/Systems schedule path has become the ESA program critical path and has delayed the Target RSD by approximately by 9 months.

APPENDIX A – ACRONYMS

AFI	Allowance for Indeterminates	IST	Integrated System Test
ARRA	American Recovery and Reinvestment Act	LIRR	Long Island Rail Road
AWO	Additional Work Order	LSZH	Low Smoke Zero Halogen
BIM	Building Information Model	MNR	Metro-North Railroad
BLS	Bureau of Labor Statistics	MOD	Contract Modification
BSA	Buy/Ship America	MPR	Monthly Progress Report
C&S	Communication and Signals	MTA	Metropolitan Transportation Authority
CBB	Current Baseline Budget	MTACC	Metropolitan Transportation Authority Capital Construction
CCC	Change Control Committee	NCR	Nonconformance Report
CCM	Consultant Construction Manager	NOC	Notice of Change
CCTV	Closed Circuit Television	NTP	Notice to Proceed
CD	Calendar Day	NYCT	New York City Transit
CIL	Central Instrument Location	OCIP	Owner Controlled Insurance Program
CIR	Central Instrument Room	PAC	Pneumatically Applied Concrete
CM	ESA Construction Manager assigned to each contract	PCO	Proposed Change Order
CMP	Cost Management Plan	PLC	Program Logic Control
CMU	Concrete Masonry Unit	PMOC	Project Management Oversight Contractor (Urban Engineers)
ConEd	Consolidate Edison Company	PMP	Project Management Plan
CPOC	Capital Program Oversight Committee	PMT	ESA Project Management Team
CPP	Contract Packaging Plan	QA	Quality Assurance
CPR	Contractor Proposal Request	QPR	Quarterly Progress Report
DC	Direct Current	RFI	Request for Information
DCB	Detail Cost Breakdown	RFP	Request for Proposal
DFF	Direct Fixation Fastener	RMP	Risk Management Plan
EAC	Estimate at Completion	ROD	Revenue Operations Date
ELPEP	Enterprise Level Project Execution Plan	ROW	Right of Way
ERT	East River Tunnel	RPR	Relocated Primary Route
ESA	East Side Access	RSD	Revenue Service Date
ET	Electric Traction	RTB	Resilient Tie Block
F/A	Force Account	SC	Substantial Completion
FAT	Factory Acceptance Testing	SCADA	Supervisory Control and Data Acquisition
FD	Final Design	SDR	Second Design Review
FFGA	Full Funding Grant Agreement	SLCS	Signal Local Control System
FIAT	Factory Integrated Acceptance Testing	SMP	Schedule Management Plan
FRA	Federal Railroad Administration	SMS	Security Management System
FTA	Federal Transit Administration	SWO	Stop Work Order
GCT	Grand Central Terminal	TCC	Technical Capacity and Capability
GEC	General Engineering Consultant	TPSS	Traction Power Substation
HVAC	Heat, Ventilation and Air Conditioning	TSR	Track and Signal Route
IPS	Integrated Project Schedule	WBY	Westbound Bypass Tunnel
		YSB	Yard Services Building

APPENDIX B – TABLES

Table 1: Summary of Critical Dates

Program Milestone	FFGA	Forecast (F) Date, Actual (A) Date		Amended FFGA Dates
		Project Sponsor*	PMOC**	
Begin Construction	Sept. 2001	Sept. 2001 (A)	Sept. 2001 (A)	Sept. 2001
Construction Complete	Dec. 2013	Dec. 2022 (F)	Sept. 2023 (F)**	Dec. 2023
Revenue Service	Dec. 2013	Dec. 2022 (F)	Sept. 2023 (F)	Dec. 2023

Notes: * Project Sponsor forecast Revenue Operations Date per presentation the MTA CPOC in June 2014.

** Source –Based on PMOC 2014 schedule trending analysis representing a medium degree of mitigation.

Table 2: Project Budget / Cost Table
(Cost shown in millions)

	FFGA				MTA Current Baseline Budget (CBB)		Expenditures April 1, 2018	
	Original FFGA	Amended FFGA	Pct. of FFGA	Obligated	CBB	Pct. of Total CBB	Expenditures	Pct. of CBB
Grand Total	7,386.0	12,038.5	100.0%	9,872.9	11,214.0	100.0%	8,287.6	73.9%
Financing Cost	1,036.0		14.0%	617.6	1,036.0	9.2%	617.6	59.6%
		1,116.5	9.3%					
Total Project Cost	6,350.0		86.0%	9,255.3	10,177.8	90.8%	7,670.0	75.4%
		10,922.0	90.7%					
Federal Share	2,683.0		36.3%	2,698.8	2,698.8	24.1%	2,698.0	100.0%
		2,698.8	22.4%					
5309 New Starts share	2,632.0		35.6%	2,436.7	2,436.7	21.7%	2,436.0	100.0%
		2,632.1	21.9%					
Non New Starts share	51.0		0.7%	66.6	66.6	0.6%	66.6	99.9%
		66.6	0.6%					
ARRA	0.0	195.4	1.6%	195.4	195.4	1.7%	195.4	100.0%
Local Share	3,667.0		49.6%	6,556.5	7,479.0	66.7%	4,972.0	66.5%
		8,223.2	68.3%					

Table 3: Project Budget and Invoices
(Cost shown in millions)

Note: ESA carries the Rolling Stock Reserve as an off-line cost, outside the program budget

Elements	Baseline Budget June 2014	March 2018			
		Current Budget	Actual Awards	Invoiced to Date	Inv. Pct. of Budget
Construction Subtotal	7,379.3	7,555.4	7,019.6	5,694.8	75.37%
Soft Costs Subtotal	2,798.5	2,622.4	2,031.1	1,975.2	75.32%
Engineering	720.6	739.6	738.7	726.0	98.16%
OCIP	282.6	307.6	307.6	307.4	99.92%
Project Mgmt.	972.2	972.2	862.9	824.0	84.76%
Real Estate	182.1	178.0	119.2	117.8	66.14%
Rolling Stock	202.0	202.0	2.7	0.1	0.04%
Program Reserve	439.0	223.0	--	--	--
Total w/o Financing	10,177.8	10,177.8	9,050.7	7,670.0	75.36%

Table 4: Comparison of Standard Cost Categories: FFGA vs. CBB
(Cost shown in millions)

Standard Cost Category	FFGA	June 2014 Project Budget	Amended FFGA	Jan 2018 CBB	Feb 2018 CBB	Mar 2018 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 - Guideway & Track Elements	1,988.7	3,405.5	3,353.4	3,412.3	3,413.0	3,413.0	71.6%	1.8%
20 - Stations, Stops, Terminals, Intermodal	1,168.7	2,238.2	2,326.8	2,327.7	2,327.7	2,327.7	99.2%	0.0%
30 - Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	513.1	513.1	516.0	44.8%	14.5%
40 - Site Work and Special Conditions	205.1	610.6	562.5	560.7	560.7	560.7	173.4%	-0.3%
50 - Systems	619.3	605.6	627.7	690.4	692.6	692.6	11.8%	10.3%
60 - ROW, Land, Existing Improvements	165.3	219.4	192.2	215.4	215.4	215.4	30.3%	12.0%
70 - Vehicles	494.0	209.9	879.5	209.9	209.9	209.9	-57.5%	-76.1%
80 - Professional Services	1,184.0	1,975.4	1,809.0	2,015.7	2,019.3	2,019.3	70.6%	11.6%
90 - Unallocated Contingency	(b)(4)							
Subtotal								
100 - Finance Cost								
Total								

Table 5: Summary by FTA Standard Cost Categories
(Costs shown in millions)

Standard Cost Category	FFGA	June 2014		April 1, 2018		
		Project Budget	Amended FFGA	Current Budget	Awarded Value	Paid to Date
10 - Guideway & Track Elements	1,988.7	3,405.5	3,353.4	3,413.0	3,212.5	2,852.2
20 - Stations, Stops, Terminals, Intermodal	1,168.7	2,238.2	2,326.8	2,327.7	2,194.3	1,617.3
30 - Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	516.0	502.6	265.7
40 - Site Work and Special Conditions	205.1	610.6	562.5	560.7	490.8	496.0
50 - Systems	619.3	605.6	627.7	692.6	574.2	420.7
60 - ROW, Land, Existing Improvements	165.3	219.4	192.2	215.4	156.5	155.1
70 - Vehicles	494.0	209.9	879.5	209.9	10.6	5.6
80 - Professional Services	1,184.0	1,975.4	1,809.0	2,019.3	1,909.2	1,857.3
90 - Unallocated Contingency	(b)(4)					
Subtotal						
100 - Finance Cost						
Total						

Table 6: Quarterly Actual and Planned Cash Flow – June 2014 Plan
(Cost shown in millions)

Year – Quarter	Construc- tion	Engineer ing	OCIP	Project Management	Real Estate	Rolling Stock
Prior Payments >	3,660.2	646.4	155.6	580.0	112.6	--
Remaining >	3,719.1	74.2	127.0	392.1	69.4	202.0
2014 3Q	209.3	(-3.3)	4.8	16.7	--	--
4Q	168.3	(-3.3)	4.8	16.7	0.1	--
2015 1Q	134.6	(-3.2)	4.6	16.1	4.5	--
2Q	147.4	(-3.3)	4.8	16.7	4.7	--
3Q	169.7	(-3.3)	4.8	16.7	4.7	--
4Q	201.2	(-3.3)	4.8	16.7	4.7	--
2016 1Q	193.3	(-3.2)	4.7	16.3	4.6	--
2Q	180.9	(-3.3)	4.8	16.7	4.7	8.7
3Q	182.0	(-2.0)	4.8	16.7	4.7	13.1
4Q	214.2	6.7	4.8	16.0	4.7	13.1
2017 1Q	210.6	6.5	4.6	15.5	4.5	12.6
2Q	199.7	6.7	4.8	16.0	4.7	13.1
3Q	189.4 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
4Q	182.1 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
2018 1Q	182.1 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
Remaining Planned >	954.5 m	62.2 m	55.8 m	147.7 m	9.2 m	102.3 m
Remaining Actual >	1,953.2 m	20.1 m	7.3 m	168.3 m	60.7 m	202.0 m
2Q	170.5 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
3Q	168.5 m	6.7 m	4.8 m	16.0 m	4.7 m	14.0 m
4Q	155.2 m	6.7 m	4.8 m	16.0 m	0.1 m	14.0 m
2019 1Q	148.4 m	6.5 m	4.6 m	15.5 m	--	13.6 m
2Q	110.9 m	6.7 m	4.8 m	16.0 m	--	14.0 m
3Q	93.6 m	6.7 m	4.8 m	16.0 m	--	14.0 m
4Q	71.6 m	6.7 m	4.8 m	16.0 m	--	14.0 m
2020 1Q	20.7 m	6.6 m	4.7 m	15.6 m	--	5.0 m
2Q	11.7 m	6.7 m	4.8 m	16.0 m	--	0.9 m
3Q	7.6 m	2.3 m	4.9 m	5.4 m	--	--
4Q	2.8 m	--	5.0 m	--	--	--
2021 1Q	0.9 m	--	3.3 m	--	--	--
2Q	954.5 m	62.2 m	55.8 m	147.7 m	9.2 m	102.3 m
3Q	--	--	--	--	--	--
4Q	--	--	--	--	--	--

Note: * Remaining Actual cost is calculated by PMOC as: current budget (CBB) less amount invoiced.

Table 7: ESA Core Accountability Items

Project Status		Original at FFGA	Amended FFGA	Current*	ELPEP **
Cost	Cost Estimate	\$7,386 M	\$10,922 M	\$10,178 M	\$8,119 M
Contingency	Unallocated /Risk Contingency	(b)(4)			
	Total Contingency (Allocated plus Unallocated)	(b)(4)			
Schedule	RSD	Dec. 31, 2013	Dec. 31, 2023	Dec. 2022	April 30, 2018
Total Project Percent Complete		Based on Invoiced Amount	77.1% actual vs. 84.1% planned (ESA calc.)		
Project Performance Rate Since 2014 ESA Re-Plan		Based on Earned Value	69.8% (PMOC calculation of construction spending at 1Q 2018 planned vs. actual since re-baselining)		
Contracts	Total contracts awarded to date		\$9.050 B	88.9% of total awards	
	Total construction contracts awarded to date		\$7.050 B	93.8% of construction awards	
Major Issue	Status		Comments		
Project Funding and Budget	The ESA PMT completed a comprehensive cost review for the ESA program and forecasts a need to increase the budget by approximately \$956 million.		MTACC received approvals for a Capital Plan Amendment in May 2018 to address program needs to 2020. The funding strategy requires \$956 million in the 2020 – 2024 Capital Plan. (b)(4)		
Project Cost	In April 2018, MTACC identified the need for additional funding of approximately \$956 million, including: <ul style="list-style-type: none"> ▪ Third Party 328.2m ▪ Force Account 130.5m ▪ Soft Costs 303.1m ▪ OCIP 149.8m ▪ (b)(4) If funding constraints are realized, schedule delays may result in additional escalation costs.		If the 2020-2024 Capital Plan amendment is not approved for the required ESA funds, there may be significant impacts to the completion of current contracts, award of remaining contracts, and/or completion of railroad force account work.		
Project Schedule	<u>Alternative IPS Reporting:</u> The primary critical and near-critical paths to target RSD include: <ul style="list-style-type: none"> ▪ Manhattan/Systems – 0 CDs float (critical path) ▪ Midday Storage Yard (Queens) – 131 CDs float ▪ Harold Interlocking – 166 CDs float The target RSD is now reported for February 2022, a delay of 8.9 months from the previous IPS update. The public RSD remains December 2022. The Amended FFGA Revenue Operations Date is December 2023. Funding constraints (see above) may cause schedule delays.		<u>Alternative IPS Reporting:</u> The remaining schedule floats, 0 CDs on primary critical path, and 131 CDs and 166 CDs, on the two near critical paths, will be monitored for the \$1.7 billion of construction work scheduled to be completed in the remaining 47 months to the target RSD. There may be additional delays due to the potential funding constraint discussed above.		
Manh./ Systems Schedule Path	The April 1, 2018 Alternative IPS includes a change to the ESA Program Critical Path – the primary path now runs through the Manhattan/Systems work rather than through the Harold Interlocking work. Completion of the Manhattan/Systems work path has been delayed 66 CDs; however, the path to the Target RSD has been delayed by 8.9 months due to the delay of 1.7 months on the primary critical path and 7.2 months for LIRR activities (Testing, Training, etc.) and issue resolution.		Concerns continue about the ESA critical path through Manhattan/Systems work, which has no float to the Target RSD. This schedule is predicated on acceptance of the Incremental IST approach by the contractors and their agreement on acceptable schedule dates. Acceptable work progress along this schedule path, now the ESA Program Critical Path, relies heavily on the effectiveness of MTACC/ESA coordination efforts across 7 contracts.		

Notes: * Current Cost (EAC) was presented to MTA CPOC in April 2018.

**2010 ELPEP reflecting medium level of risk mitigation, excluding financing cost of \$1,116 million. This is currently being re-evaluated.