

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

**Report Period May 1 – May 31, 2019**

PMOC Contract No. DTFT60D1400017

Project No. DC-27-5287, Task Order No. 0002, Work Order No. 08

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Length of time on project: Thirteen years on Project for Urban Engineers

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### Third Party Disclaimer

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

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

## EXECUTIVE SUMMARY

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

Overall Program Status: The Overall Program is 77.7% actual versus 77.8% as-planned (based on invoice cost and April 2018 EAC forecast).

Construction Status: The Construction Status is 81.2% actual versus 81.6% as-planned (based on invoice cost and April 2018 EAC forecast).

Contracts (None)

Awarded/Completed:

Construction Progress Issues: CM014B, CS084, CS179, CS086.

Program Funding: Total program funding is \$10,335 million, which is sufficient for the MTACC forecasts through December 2020.

Program Cost and Budget: Total remaining contingencies decreased to (b)(4) million (b)(4)

Integrated Project Schedule: The target RSD forecast is February 14, 2022. The ESA program critical path is controlled by Manhattan/Systems work.

Risk Management: 12 major risks remain.

Harold Interlocking: No Issues.

Key Stakeholder Issues: LIRR – Late resolution of CS179, CS084, CS086, and VS086 issues; late completion of Positive Train Control Design.  
Amtrak – Continuing Force Account availability issues; Electric Traction improved availability.

MTACC - Change Order processing issues, GEC CPS support for Contractor Submittals, Redesigns, RFIs, Field Conditions.

Construction Safety: 0.91 – Lost Time and 1.82 Recordable BLS Injury ratios during April 2019; both slight increases from March 2019.

ELPEP Compliance: MTACC reported Schedule Contingency is only 27 CDs above ELPEP minimum; Cost is \$410 million above ELPEP min.

Project Management Plan: MTACC is updating PMP/Sub-plans to reflect major management, organizational, and process changes (in progress).

Buy America: One CS179 Issue – Small Split HVAC units (waiver requested).

All Project Sponsor cost and schedule data included in this report is based on the MTACC East Side Access Q1 2019 Quarterly Progress Report and referenced in this report as the ESA Q1 2019 Report, which has a Cost and Schedule data date of April 1, 2019. 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 and quality management activities on the East Side Access (ESA) Mega-Project managed by MTA Capital Construction (MTACC) with MTA as the Sponsor and financed by the FTA FFGA.

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## MONITORING REPORT

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### 1.0 PROJECT STATUS

#### a. Engineering Design and Construction Phase Services

In the ESA Q1 2019 Report, the PMT reported the overall engineering effort at 86.0% complete compared to planned completion of 86.5%. Since the ESA July 2018 MPR, the PMT calculates summary Engineering progress as a percentage of the \$871.8 million April 2018 EAC forecast of engineering costs.

#### **Status of Construction Packages Advertised**

CH063 Electric Traction Catenary Work: RFQ advertised online on January 4, 2019; documents were made available on January 14, 2019. During the April 2019 Harold Oversight meeting, ESA informed the PMOC that award of the CH063 contract will be deferred until Q4 2019 due to continued improvement in Amtrak's electric traction construction for the ESA project, other scope revisions and re-advertising.

#### **Status of Construction Packages Not Awarded**

CM015 – 48<sup>th</sup> Street Entrance: Design work remained suspended through April 2019. MTA has notified the building owner that construction of the 48<sup>th</sup> St. Entrance has been deferred. Based on code compliance requirements, an emergency exit to street level will need to be provided in the interim. The GEC is developing the design for this feature and the PMT is coordinating design development with the owners of the existing buildings at 270 Park Avenue and 415 Madison Avenue. The concept for this exit is due on May 1, 2019, after which it will be reviewed by ESA, MNR, and LIRR.

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. As a result of the approval that MTACC received from the CCC in March 2019, as described in FQA33B below, this option has been deferred indefinitely.

FQA33B, Mid-Day Storage Yard Facility – Amtrak F/ A, includes provision for what was originally a second west end yard access to the Amtrak mainline through a connection from Sub 3 to Line 4. During March 2019, however, MTACC received CCC approval to pursue this option for the west end MDSY exit. Correspondingly, the funding for the FQA33A Line 2 connection option will be transferred to the FQA33B Sub 3 to Line 4 option.

#### **Status of Positive Train Control Design**

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. MTACC will be installing, testing, and commissioning PTC for all track and signal systems built under the ESA Program.

- LIRR had been expected to complete the PTC design by March 31, 2018, but this was not achieved. MTACC earlier reported that LIRR had been expected to complete the PTC design in January 2019, but this has been delayed due to resolving GEC/LIRR comments on the GCT3 and GCT4 application logic submittals. The PTC design was not completed as of May 31, 2019.
- The GEC has prepared initial scope design modifications to Contracts CS179, VS086, and CS086, which will provide for the LIRR designed PTC overlay onto the

ESA systems. The GEC has provided LIRR with the proposed changes for PTC on these contracts to insure coordination with the LIRR PTC requirements. The PMOC notes that these changes cannot be finalized until LIRR completes the PTC design. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086.

### **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. As of the end of May 2019, there are 190 contractor submittals awaiting a response from the MTA, with over 100 of them exceeding the contractually required 30-day turn around. The contractor continues to assert that overdue responses on design submittals and RFIs, unresolved NOCs, and numerous SWOs are impacting the completion of design work and delaying the contract schedule. MTACC has made an improvement in issuing Contractor Proposal Requests (CPRs) for the previously approved contractor's Notices of Change (NOC); reducing the number of outstanding CPRs from 18 to 9. However, the number of unanswered contractor NOCs has risen from 7 to 14 as of the end of May 2019. MTACC and the contractor developed a new Incremental Integrated System Test (IST) Plan that identifies the system tests, the testing methodologies, and testing schedule for all the systems provided under this contract. The completion of FD for all 10 Control Systems, which was scheduled for completion 37 months ago, has not occurred yet and the completion of FD for all 19 Non-Control Systems continues to be delayed. The full impact of the Control and Non-Control System FD delays on contract progress remains undetermined at this time. One Buy/Ship America issue (previously noted) that could impact design and construction also remains unresolved.

CS084, Traction Power Systems Package 4: Issues related to construction and schedule coordination with other contractors continue to impact progress on the contract. Some design issues related to water remediation methodologies in spaces designated for CS084 equipment and other identified field construction issues also remain open. A plan for remediation of specification non-conformance issues related to the track monuments has yet to be developed.

VS086, Systems Package 3 – Signal Equipment Procurement: Work on the design to incorporate Positive Train Control (PTC) requires a contract modification that must still be developed and negotiated. The GEC will have completed PTC design scope documents available for submission to the contractor by the end of June 2019. An issue regarding the software source code for the SCADA software is under discussion and negotiation with the SCADA designer.

CS086, Tunnel Systems Package 2 – Signal Installation: The conformed contract documents and drawings were finalized and distributed in May 2019. The contractor received information regarding the revised cable lengths and has ordered the cables required for the contract. A contract modification to address the changes incorporated into the conformed contract documents is required.

#### **b. Procurement**

The ESA March 2019 MPR shows that total procurement for the ESA Program is 85.2% complete, with total awards at \$9,489.6 million. Since the ESA July 2018 MPR, the PMT calculates summary procurement progress as a percentage of the \$11,133 million April 2018 EAC forecast of all ESA program costs. Active procurements include:

- CH063 Electric Traction Catenary Work, 3rd Party: This will be a negotiated procurement using the RFP process. The contract includes design-build ET catenary relocation work for Mid-Day Storage Yard and completion of all the remaining catenary work required for operational readiness in Harold Interlocking. RFQ advertised online on January 4, 2019; qualification submittals were originally due on February 27, 2019, but MTACC extended the deadline to March 13, 2019, due to many vendor questions. ESA is currently revising the scope of work to include the MDSY connections, previously included in Contract CH064, and to reduce the catenary work due. Based on these changes, the forecast dates currently are: reissue bid documents by June 30, 2019; bids due October 16, 2019; NTP on December 2, 2019.

Contract CM015, 48<sup>th</sup> Street Entrance, is on hold pending an agreement between MTA and the owner of 415 Madison Avenue.

**c. Construction**

In the ESA Q1 2019 Report, MTACC reported that total construction progress reached 81.2% complete compared with planned progress of 81.6%. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the \$8,014 million April 2018 EAC forecast of construction costs. The percentage of work complete, as shown throughout this report, is calculated using invoiced costs to represent construction progress. The current contract and force account budgets equal the amounts that are allocated in the MTA Impact accounting system and are used for percentage calculations for individual contracts.

**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	350.2	11.4	346.0	356.0	100.0%	98.8%	6/1/17	3/1/19	1
	nc	nc	nc	nc	nc	nc	nc	nc	(-60cd)	
	361.6	350.2	11.4	346.0	356.0	100.0%	98.8%	6/1/17	4/30/19	
CM007	709.3	666.8	42.5	451.6	720.5	78.1%	67.7%	1/28/20	7/7/20	
	nc	+1.6	(-1.6)	+17.0	+2.4	+1.6%	+2.4%	nc	+32cd	
	709.3	665.2	44.1	434.6	718.1	76.5%	65.3%	1/28/20	6/5/20	
CM014B	484.7	471.8	12.9	354.3	593.5	98.5%	75.1%	8/18/18	6/25/20	
	nc	+1.4	(-1.4)	+22.0	(-1.4)	+0.6%	+4.5%	nc	(-165cd)	
	484.7	470.4	14.3	332.3	594.9	97.9%	70.6%	8/18/18	12/7/20	
VM014	46.9	34.9	12.0	28.7	48.7	NA	82.1%	10/25/19	3/23/20	
	nc	nc	nc	nc	nc	NA	nc	nc	nc	
	46.9	34.9	12.0	28.7	48.7	NA	82.1%	10/25/19	3/23/20	

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

Please refer to the contract narratives for additional information.

1. Substantial completion declared.

**CM006 – Manhattan North Structures:**

Schedule: The ESA Q1 2019 MPR reports Milestone MS#3, Substantial Completion (SC), was issued on March 1, 2019, and MS#4, Final Completion, forecast on June 1, 2019. Open work items and open NCRs are transferred to contract CS179 and contract CM007.

### **CM007 – GCT Station Caverns and Track:**

Schedule: The ESA Q1 2019 MPR projects Milestone #4 (Track & 3<sup>rd</sup> Rail Work Complete) by February 7, 2020 (-184 CDs; the TIA/recovery schedule is still under review); Milestone #5 (Substations US1 and US2 Complete) is forecast to April 22, 2019 (-80 CDs; not achieved and likely to push again); Milestone #5A (Caverns Ready for Integrated Systems Testing) is forecast to December 30, 2019 (-145 CDs); Milestone #6 (All Caverns and Tunnel Work Complete) is forecast to July 7, 2020 (-203 CDs); and, Milestone #6A (Substantial Completion) is forecast to July 7, 2020 (-160 CDs).

Construction Progress: South and North Back of House, East and West: Continued mezzanine and lower level electrical work, and upper and lower level MEP work; and CMU wall installation.

Cross Passages #3, 4, 5, and 6: Continued installation of glass tiles.

GCT 6: Access to lower level on hi-rail equipment via ramp from this location continued.

East Cavern: Continued light fixture installation lower and mezzanine levels; Continued miscellaneous steel items, sprinkler drops, intumescent painting, and ceiling installation; Continued installation of escalators 51, 52, 57 and 58, and continued installation of elevators 5 and 18.

West Cavern: Continued light fixture installation lower and mezzanine levels; Continued miscellaneous steel items, sprinkler drops, intumescent painting, and ceiling installation; Continued installation of elevator 19, and continued installation of escalators 61, 62, and 66.

Track: Continued track construction in the upper level Caverns and lower level Tunnel Track; Continued third rail installation. Continued turnout construction. Continued qualification testing of Special Trackwork DFF assemblies. As of May 19, 2019, ESA reports overall Track Construction at 61.0% completion.

Architectural: Through Q1 2019, Architectural Wall work was approximately 16.5% complete. Architectural Ceiling progress was at approximately 16.8%. Architectural Floor progress was approximately 20% complete.

### **CM014B – Concourse and Facilities Fit-Out:**

Schedule: The ESA Q1 2019 MPR reports that this contract was 75% complete vs. 98.5% planned. MTACC recently reached a settlement on the Time Impact Analysis (TIA). The settlement has been approved by the MTA Board. The schedule impact is that the contractor is now on a 7-Day Construction Acceleration Plan. The new contract date for Substantial Completion is June 2020, excluding completion of LIRR concourse within footprint of foundation work for 270 Park Avenue. The Biltmore Room Substantial Completion date is October 2020.

Through May 31, 2019, the structural steel erection remained at 75% complete by piece and 69% by weight. As previously reported, this work not only has been proceeding very slowly and is impacting the schedule and the CS179 contract, but has been at this percentage of completion since December 2018. Cumulative metal ceiling deck progress continued at 28% complete. HVAC Piping (Chilling System) was 45% complete.

Construction Progress: Electricians continued with installation of branch and device conduit, Ticket Area systems conduit, Wellway lights, 45<sup>th</sup> St. Node lights, rough-in and overhead racks.

Plumbers continue installation of domestic water piping, CCU testing, and installation of gutter drains throughout the Concourse. Mechanical work continues with the installation of air plenums, AHU units, ducts, and sprinkler piping & heads. Installation of the marble stone wall finish is

ongoing in public areas from south to north. Installation of the suspended ceiling system continues throughout the Concourse from south to north.

Biltmore Connection: MNR outage for tracks 39/40 is continues. Demolition of the Biltmore level slab is complete. Temporary steel installation is complete. Demolition of Biltmore Level steel is complete at MNR Tracks 39/40. This work continues on the tertiary critical path for the contract.

Wellways: In the Wellways, escalator maintenance is ongoing, one day every 2 months. In Wellway #1, installation of the glass tile curtainwall is continuing. Installation of the Stainless Steel reveals continues. In Wellway #2, installation for glass tile curtainwall is ongoing along with the glass tile along the incline. In Wellway #3, Machine Room installation and escalator build up continues and are scheduled to be completed July 2019. In Wellway #4, Machine Room installation and escalator build up continues and are scheduled to be completed July 2019.

47<sup>th</sup> Street Cross Passage: The expanded 47<sup>th</sup> St. Entrance temporarily replaces the delayed 48<sup>th</sup> St. Entrance (CM015) and becomes the only entrance at the northern end of the Concourse. At Elevator #13, installation is complete and acceptance by MNR is pending. This unit is to be turned over to MNR and the paperwork and processes for that turnover are being negotiated. The work at Tracks 36/35 at the MNR Express Track for the construction of the modifications/additions to the Passageway “U Tub”, needed to install Escalator #32, has begun. Construction of the formwork for the new stairs from the Concourse to the Cross Passageway is underway.

270 Park Building: The independent contractor for JPMC is scheduled to begin work on the foundations and shear walls in Q3 2019. This work is between E. 47<sup>th</sup> and E. 48<sup>th</sup> Streets. The CCM office has begun to discuss this upcoming activity and the preparations that are being taken. The independent contractor continues with layout and core drilling in the area between E 47<sup>th</sup> and E 48<sup>th</sup> Streets.

**VM014 – Vertical Circulation Elements (Escalators and Elevators):**

Schedule: In its Q1 2019 MPR MTACC reports that 82.1% of the contract value was invoiced and 78.4% paid.

Construction Progress: For CM007 as of Q1 2019, all of the 16 Escalators and 6 Elevators have been delivered to the site. All elevators and escalators are in various stages of installation. For CM014B, all 22 escalators have been fabricated and delivered. All elevator fabrication has been completed, with the exception of El #10 (50<sup>th</sup> St. Vent Building). EL #22 (Biltmore Connection) delivery was completed in May 2019. Further, the contractor is preparing, on request by MTACC, a timeline for engineering, fabrication and delivery of the 9 escalators for future contract CM015. (48<sup>th</sup> Street Entrance)

**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	263.6	1.8	261.5	264.6	100.0%	99.2%	9/6/16	3/1/19	1
	nc	nc	nc	nc	+0.2	nc	nc	nc	(-119cd)	
	265.4	263.6	1.8	261.5	264.4	100.0%	99.2%	9/6/16	6/28/19	
CQ033	326.1	313.0	13.1	190.3	349.3	66.0%	60.8%	8/10/20	10/31/20	
	+1.1	+1.2	nc	+10.7	+1.2	nc	+3.2%	+723cd	(-164cd)	
	325.0	311.8	13.1	179.6	348.1	66.0%	57.6%	8/18/18	4/13/21	

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

Please refer to the contract narratives for additional information.

1. Substantial completion declared.



### **CQ032 – Plaza Substation and Queens Structures:**

Schedule: The ESA Q1 2019 MPR reports Milestone MS#6, Substantial Completion (SC), accepted as March 1, 2019, and forecasts Milestone MS#7, Final Completion, by June 1, 2019. ESA reports the CQ032 contract will complete items pertaining to bench repairs, concrete defects, and corrective action for open NCRs, submittals, and deliverables. The Yard Services Building and punch list items were turned over to the CS179 contract.

Construction Progress: The CQ032 contractor continued the following activities: work regarding closure of open NCRs, work to eliminate water infiltration conditions, and tunnel duct bench remediation. Eleven NCRs remain open.

### **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 Storage Yard (MDSY). AR#2 requires the installation of new catenary poles and Amtrak wire transfers, and pole locations are obstructed by an Amtrak signal trough. The contractor requires both AR#1 and #2 to install underground duct banks to complete the YS Track, followed by Integrated Testing. The ESA Q1 MPR projects Milestone MS#6 Substantial Completion (SC) for October 31, 202, -82 days.

Construction Progress: The contractor continued the following activities: CAM Platform work continued; Storage Building and Toilet Service Building foundation construction continued, to be followed by CMU wall construction to start end May 2019; Personnel Access Bridge roof installation continued; Water main, Storm Pipe, Fire Line, and Underdrain installation continued; Yard Lighting fixtures installation continued; Duct bank construction continued; Traction power installation continued. SOE and excavation work at Tunnel D Approach continued. Under deck light fixture installation: Queens Boulevard Bridge, Honeywell Bridge. Preparation work for CIL building installations continued. New Arch Street track construction punch list work continued. Track construction for Tracks M1 through M10 is scheduled to start mid-June 2019.

## **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	597.4	9.5	491.3	707.3	87.2%	82.2%	7/1/20	11/25/21	1
	nc	+11.4	(-11.4)	+12.0	(-1.1)	nc	+1.8%	nc	nc	
	606.9	586.0	20.9	479.3	708.4	87.2%	80.4%	7/1/20	11/25/21	
CS084	79.7	73.8	6.0	25.7	83.3	92.4%	34.8%	12/2/19	4/29/21	1
	nc	nc	nc	+2.7	+0.1	(0.3%)	+3.6%	nc	nc	
	79.7	73.8	6.0	23.0	83.2	92.7%	31.2%	12/2/19	4/29/21	
CS086	60.9	53.0	7.9	0.5	61.1	TBD	nc	2/21/21	2/21/21	
	nc	nc	nc	+0.5	+0.2	NA	nc	nc	nc	
	60.9	53.0	7.9	--	60.9	TBD	nc	2/21/21	2/21/21	
VS086	21.8	20.2	1.7	16.0	21.6	NA	79.5%	10/14/19	1/24/20	1
	nc	+0.3	(-0.2)	+1.2	(-0.1)	NA	+6.0%	nc	nc	
	21.8	19.9	1.9	14.8	21.7	NA	73.5%	10/14/19	1/24/20	
VH051	30.2	29.7	0.5	29.6	30.2	NA	99.8%	4/30/15	5/31/21	
	nc	nc	nc	nc	nc	NA	+0.1%	nc	nc	
	30.2	29.7	0.5	29.6	30.2	NA	99.7%	4/30/15	5/31/21	

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

Please refer to the contract narratives for additional information.

1. Forecast SC is based on the approved schedule that does not account for open unresolved issues.

### **CS179 – Systems Package 1 – Facilities Systems:**

**Schedule:** At the April 2019 MTA board meeting, MTACC provided MTA Board members with its Plan to complete the ESA Project. As part of that Plan, MTACC included an Integrated System Test Plan (ISTP) to meet the testing requirements of the Project. ESA will present the Incremental IST to the FTA and the PMOC during June 2019. Besides assessing if the new ISTP addresses the contractual testing requirements, the PMOC will be looking to see if the schedule addresses the concerns previously noted with the CS179 contract schedule. Those concerns are if the schedule:

1. Is based on the premise that all submitted designs are final;
2. Considers that all field work is ready-to-go as currently understood;
3. Takes into consideration any impact from the open NOCs; and,
4. Addresses any impacts to the contract work from SWOs that remain in effect past the data date of the schedules.

**Design Progress:** The final approval of all 10 control system Final Designs (FDs), a critical activity, is now 37 months late. MTACC Senior Management indicates that the LIRR has formally approved 8 out of the 10 Control System FDs. The Centralized Train Control (CTC) system continues to undergo design modifications to conform to signal circuit design information provided by the VS086 Signal design contractor. 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 continues to contend that the lack of resolution on open items (e.g., the open NOCs) is the primary cause for these delays; and, that any continued progress on system designs and equipment testing is being severely hampered by

unanswered RFIs and unissued CPRs that have the potential to alter existing designs. However, the contractor continues to move forward with the development and submission of test plans.

Construction Progress: In May 2019, the CS179 contractor continued to actively progress installation of conduit, cable, fire stopping, fire standpipe, lighting, vent fans, etc. in the tunnels and at the ventilation and various substation facilities where access was available and conditions warranted. Local testing of installed equipment and cabling is also underway. Coordination issues with other contractors, unexpected field conditions, unresolved design issues, water infiltration remediation efforts, open NOCs/CPRs, and numerous Stop Work Orders (17 as of the end of May 2019) continue to impact further and efficient progress. Environmental conditions regarding water and moisture in the various equipment rooms and the “open” type equipment racks remains as an unresolved item of discussion between MTACC, LIRR, and the contractor. Factory testing of the Tunnel SCADA Control System equipment was completed in May 2019; but factory testing for the last 4 of the 10 Control Systems and 8 of the 19 Non-Control Systems has yet to occur due to the lack of approved test procedures. The contractor contends that the test procedures for these 12 systems are either “on-hold” or still in development pending the resolution of contract interface coordination issues, Stop Work Orders, and resolution of RFIs and NOCs.

#### **CS084 – Tunnel Systems Package 4 – Traction Power Systems:**

Schedule: In its May 2019 monthly schedule update, the contractor indicates an April 2021 substantial completion date, which coincides with the S/C date being reported by MTACC. The contractor continued to indicate that all of the delays are as a result of late approval of substation designs, unresolved issues, and obstructions in CS084 work areas from other ESA contractors, SWOs, and site access restraints. Additionally, CS084 contract schedule milestones will be adjusted after a track installation phasing plan is developed to coordinate construction along with the CS084, CS179, and CM007 contracts.

Design Progress: The design focus continues to be on developing solutions to issues identified during site surveys and construction activities. As these issues are identified, the GEC is being tasked to develop design solutions.

One other design related issue remains as an open item – that of agreement between the SCADA software designer and MTA regarding the submission of software “source code” to the MTA. The designer (DMC/Siemens) contends that submission of the source code for this proprietary software is neither required nor acceptable to them and MTA (LIRR) insists that it be provided. Negotiations between the parties are on-going.

Construction Progress: A considerable amount of equipment for the substations has been fabricated and delivered to storage, where it will remain until the TPSS rooms for those substations are ready for their installation of the substation equipment. The contractor continues to cite coordination issues, design approval delays, access restraints, stop work orders, and differing site conditions as its reasons why work at the various locations cannot progress. Progress on addressing the issues continues to be exceedingly slow, as a significant number of the cited issues involve coordination with other contracts and require the development and issuance of contract modifications to various contracts.

MTA had the contractual obligation to provide 26 Inductive Reactors to the contractor for installation at various locations. The contractor initially refused to accept these reactors based on concerns about apparent damage to some units and notified MTACC of this problem. Considerable discussions regarding the condition and utilization of the reactors ensued and continue; and, as of the end of May 2019, only one of the reactors had been installed. MTACC

now indicates that the reactors at C04 and C01/C02, identified in the original contract documents, are no longer needed to provide broken rail protection – they will be eliminated from the contract via a contract modification. The rest of the originally identified reactors are still required and no further inspection of their condition has been made as of the end of May 2019

The PMOC previously reported significant quality issues related to the failure of transformers while undergoing hi-pot testing. The last of the transformer testing, including the second re-test of one of the repaired transformers, is now scheduled to take place in June 2019. Previously reported discussions and decisions regarding the long-term viability of transformers manufactured and tested prior to the modification of the fabrication process remain as items yet to be finalized between the LIRR and MTACC.

Corrective action to address non-conformance issues with track monuments (conduit turn ups at track level for routing of traction power cables) continues to be a significant issue. Based on the findings of initial inspections of the existing monuments, MTACC issued an RFP to the contractor to develop “mock-up” jumper cables for three different types of monument layouts identified during the inspections. If these mock-ups are acceptable to LIRR, than the PMOC notes that any decision that feeder leads of different lengths could present a problem for long-term maintenance to the LIRR. There are approximately 453 track monument locations and almost 2,100 feeder leads required throughout the ESA territory.

Two other previously reported significant issues dealing with the installation of traction power cables were resolved. LIRR agreed to allow the splicing of feeder cables in various cable boxes, which addresses the issues related to splicing and the excessive bending issue in the various conduit runs installed by other ESA contractors.

The contractor has identified a possible solution to the issue noted in previous reports regarding the delivery of traction power equipment to the C01/C02 substations. The contractor plans to install the C01/C02 equipment in mid-June 2019; a plan that requires MTACC to provide a continuous track installation from the Queens bell mouth to the C01/C02 substation area. This activity needs to be closely coordinated with the CM007 contractor who is installing the tracks.

Both the contractor and MTACC report that the C03 substation rooms are still impacted by significant water infiltration; and, no solution is apparent at this time. Other water and conduit obstruction issues have been identified at the C03 and C04 substations and are being evaluated for remediation. Significant work on conduit repair/re-installation from the C04 substation to the Con Edison manhole is needed; and, permits to work in 63rd street will be required to perform the work. Other issues, caused by other ESA contractors, regarding floor levelness and condition are apparent at several locations, requiring remediation efforts. MTACC wants the CS084 contractor to perform this extra work; however, the CS084 contractor is not in agreement with this plan and negotiations regarding this work continue.

The FAT for the C08 substation is scheduled to occur in mid-June 2019, with delivery anticipated in mid-July 2019. The GEC, MTACC, and LIRR will attend the FAT. Installation of some traction power cables from the C08 substation to several manholes outside the substation is planned to start in mid-June 2019. Further installations of traction power cables from these manholes to the track are dependent on the installation of the missing manhole and conduit system previously reported and now part of the CH058A contract.

The PMOC remains concerned about many issues, including:

1. TPSS equipment delivery methodology (means and methods);
2. Installation of the C08 traction power cables due to missing conduit and manholes;

3. Transformer hi-pot testing failures and long-term viability of the transformers;
4. Verification of existing conduit and manholes in several substations;
5. Coordination with other contractors;
6. Possible damage to the MTA-provided inductive reactors due to improper storage and handling by MTA;
7. Extent of non-conformance of track monuments; and
8. Water infiltration issues in the facilities.

### **VS086 – Systems Package 3, Signal Equipment Procurement:**

Schedule: The milestones for this contract must be modified to accurately evaluate progress. MTACC continues to indicate that a contract modification for incorporation of PTC requirements and incorporation of construction phase services to assist the CS086 contractor during installation and testing of the signal equipment will extend the contract substantial completion date.

Design Progress: MTACC reports that the GEC will complete the specifications and drawings for incorporation of PTC design and installation work in the VS086 and CS086 contracts by the end of June 2019. Once the GEC’s PTC work is finished, MTACC will prepare contract modification documentation to request that the VS086 and CS086 contractors perform the required PTC design and installation work.

The previously noted issue of Electro-Magnetic Interference (EMI) with ESA signal and communications equipment remains as an unresolved open issue and the contractor continues to submit documentation to validate a waiver request to delete this contract requirement.

MTACC indicates that LIRR requested software change to the train control software related to application logic is required to address an issue with train throughput. Once this software is modified to address this issue, all the contractually required software will be complete.

MTACC indicates that LIRR completed its testing of the TRU-III track circuit equipment and approved its use on LIRR property.

The GEC and the VS086 contractor are working on consolidating and aligning all the cable drawings that the CS086 contractor needs to perform its installations.

Equipment Fabrication and Delivery Progress: MTACC reports that all the contractually required signaling equipment has been delivered to the CS086 storage area.

The Factory Integrated Acceptance Testing (FIAT), which must be performed to test the interlocking designs and equipment as a composite systems package must still be accomplished. Design data from the CS179 contractor is required to perform the FIAT, and MTACC continues to indicate that this design data is still under development by the CS179 contractor. Therefore, the forecasted date for the FIAT, which will be conducted at the ESA site, remains undetermined at this time.

### **CS086 – Tunnel Systems Package 2 – Signal Installation**

Schedule: The contractor’s baseline schedule was “conditionally” approved in April 2019, with cost and labor information correlated with the schedule activities yet to be submitted. The last monthly update of the contractor’s schedule indicates an approximate six-month delay in contract work due to site access issues.

Design/Construction Progress:

- The contractor continued to advise that the Plaza Interlocking equipment room has a major water infiltration issue that needs to be addressed.
- In April 2019, the contractor finished performing surveys of equipment locations to identify any issues (e.g., water infiltration, obstructions, etc.) at those sites. The contractor submitted its lists of issues to MTACC; and, joint meetings between CS086, CS179, the GEC, MTACC and LIRR are being held twice a week to discuss any corrective action that may need to be taken.
- The contractor continues to advise that Room 4G36 is too small to fit all the proposed equipment – this still needs to be verified by MTACC. If it is ultimately determined that the equipment will not fit in the existing room, a re-design of equipment layouts and cable routing and lengths could be required.
- MTACC sent revised cable drawings to the contractor and the contractor has now ordered the cable required to perform the contract work. MTACC advised that it is preparing to negotiate a contract modification with the contractor to address the cable length changes.
- MTACC has also issued the revised conformed CS086 contract documents and drawings.
- The contractor will install a “mock up” of a typical signal case installation at Case 2G20 in the GCT6 interlocking area (a case that currently has no identified interferences) to identify any potential installation issues (e.g., dynamic envelope encroachment) that might preclude installation of signal cases at particular signal locations.
- The contractor continues to advise that it is being impacted by the lack of access to locations and the lack of contractually obligated track time. MTACC is investigating this issue and evaluating contract language to identify any compensable delay that might be afforded to the contractor.

**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
CH057D	29.6	23.1	6.6	21.3	29.4	100.0%	92.3%	1/31/19	3/10/19	1
	nc	+0.3	(-0.2)	+1.4	(-0.9)	nc	+5.1%	nc	nc	
	29.6	22.8	6.8	19.9	30.3	100.0%	87.2%	1/31/19	3/10/19	
CH058A	68.7	62.8	5.9	7.5	73.0	12.6%	11.9%	3/17/21	3/17/21	
	nc	+0.4	(-0.5)	+4.3	(-0.9)	+4.0%	+6.7%	nc	nc	
	68.7	62.4	6.4	3.2	73.9	8.6%	5.2%	3/17/21	3/17/21	

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

1. Substantial completion declared.

**CH057D – Harold Trackwork Part 3:**

Schedule: Although the CH057D contract achieved Substantial Completion on March 10, 2019, the contractor continued to do miscellaneous construction prior to Final Completion, which is scheduled for June 7, 2019.

Construction Progress: During May 2019, the contractor continued to flash butt weld miscellaneous rail ends on the Westbound Bypass Track.

**CH058A – Harold Structures – B/C Approach**

Schedule: The CH058A contractor did not complete any specific milestones during May 2019.

Construction Progress: During May 2019, the contractor continued to install worksite fencing, continued to install soldier piles east of the 39<sup>th</sup> Street Bridge, completed installation of mini-piles west of the bridge, and continued excavation for and installation of electric traction conduit between C08 Substation and Harold Interlocking.

**Railroad Force Account Contracts**

Costs and substantial completion dates are tabulated below for active Force Account packages. Railroad Force Account agreements do not contain schedule requirements, so the PMOC will not report on schedules in this section. Additionally, since adoption of the “ESA First” schedule, ESA discontinued references to the former “Stages” of Harold construction, although it has not done so for the cost components of Harold work.

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
FHA02	60.9 nc 60.9	60.8 nc 60.8	0.1 nc 0.1	60.8 nc 60.8	61.4 nc 61.4	100.0% nc 100.0%	99.9% nc 99.9%	8/15/17 nc 8/15/17	1/24/21 (-28cd) 2/21/21	1
FHA03	12.7 nc 12.7	5.2 nc 5.2	7.5 nc 7.5	5.4 +0.4 5.0	14.4 (-0.4) 14.8	99.0% nc 99.0%	42.8% +3.3% 39.5%	7/25/18 nc 7/25/18	6/2/25 nc 6/2/25	1
FHL01	29.1 nc 29.1	29.0 nc 29.0	0.2 nc 0.2	28.8 +0.2 28.6	34.9 +0.2 34.7	100.0% nc 100.0%	98.9% +0.9% 98.0%	4/9/15 nc 4/9/15	8/31/19 +171cd 3/13/19	1
FHL02	114.8 nc 114.8	114.8 nc 114.8	-- nc --	114.8 nc 114.8	126.7 +2.9 123.8	100.0% nc 100.0%	100.0% nc 100.0%	11/25/16 nc 11/25/16	8/30/21 nc 8/30/21	1
FHL03	20.6 nc 20.6	2.7 nc 2.7	17.9 nc 17.9	18.0 nc 18.0	47.7 nc 47.7	100.0% nc 100.0%	50.1% nc 50.1%	8/14/17 nc 8/14/17	4/28/24 nc 4/28/24	1

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

1. Invoice percent complete is calculated using the current approved budget.

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

During May 2019, Amtrak ET personnel completed catenary modifications in “R” Interlocking that will allow the CQ033 contractor to construct Mid-Day Storage Yard track at the east end of the yard. Additionally, ET personnel continued to make catenary modifications on Sub 3 and Sub 4 Tracks in “Q” Interlocking that will allow the CQ033 contractor to construct track in that area. Amtrak C&S personnel continued to install signal trough around Loop 2 Track between Loop and “T” Interlockings.

**FHL01, FHL02, and FHL03 – Harold Stages 1, 2, and 3 LIRR:**

During May 2019, LIRR ET personnel completed removal of reusable electric traction equipment from the old G02 Substation (although there is still some ConEd equipment that must be removed before building demolition can be started) and continued miscellaneous 3<sup>rd</sup> rail reconfigurations in Harold Interlocking. The G02 work completed all of LIRR’s former Stage 1 construction. As a result, the PMOC will no longer report on FHL01. LIRR Signal personnel continued to support the CH058A contractor’s B/C Tunnel construction and continued miscellaneous signal work in the NEQ, SEQ, and Westbound Bypass work areas.

#### **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 Q1 2019 Report. The PMOC continues to monitor developments regarding the following concerns, but notes that there were no final resolutions during May 2019:

1. The Contract CS084 transformer test failures that occurred in 2017 and 2018 as well as the concerns about the condition of the 26 inductive reactors provided by MTACC to the CS084 Contractor.
2. Potential out of tolerance as-built bench wall clearance for railcars in ESA tunnels.
3. Potential out of tolerance as-built conditions for the new track monuments that house the conduits for the traction power cables at the track connection locations.

## **2.0 SCHEDULE DATA**

### **Status and Schedule Contingency**

The schedule information in this report is based on IPS 116 (data date April 1, 2019) and IPS Progress Report. The forecast for the Target Revenue Service Date (RSD) remained February 14, 2022, and the Public RSD remained December 13, 2022. The IPS schedule was prepared using the MTACC alternative IPS procedure.

The remaining program schedule contingency identified in IPS 116 is 302 calendar days to the Public RSD, unchanged from that which was reported in IPS 115. The ESA Program contingency is only 27 calendar days above the minimum required FTA ELPEP schedule contingency, and 692 calendar days less than the 994 calendar day duration that was established in the July 1, 2014 IPS re-baseline.

In IPS 116, the Manhattan/Systems work path has no float and it remains the critical path of the ESA program. As shown in Appendix B, ESA Critical Path Chart, the float on the paths through the three main ESA program work areas are: 1) Manhattan/Systems (no float); 2) Harold Interlocking (136 CDs float); and, 3) Queens (280 CDs float). The PMOC notes that float on the Manhattan/Systems and Harold Interlocking paths is measured to the start of LIRR Final Systems Testing and that the float on the Queens (Mid-Day Storage Yard) path is measured to the start of LIRR FRA Testing (signals and power) and includes the subsequent float to the start of LIRR Final Systems Testing.

Table 2.1 shows dates, remaining durations, and contingencies for the Target, Public, and FFGA Revenue Service Dates.



**Table 2.1: Schedule Contingency – ESA IPS 116 – April 1, 2019**

	IPS 115 – Mar. 1, 2019		IPS 116 – Apr. 1, 2019	
	Date	Cal. Days	Date	Cal. Days
<b>Target RSD Contingency</b>				
Duration Remaining to Target RSD	2/14/22	1,081	2/14/22	1,050
Remaining Target RSD Contingency		0		0
Remaining IPS Contingency Percent		0.0%		0.0%
<b>Public RSD Contingency</b>				
Duration Remaining to Late RSD	12/13/22	1,383	12/13/22	1,352
Remaining Public RSD Contingency		302		302
Contingency Percent of IPS Duration		21.8%		22.3%
<b>FFGA RSD Contingency</b>				
Duration Remaining to FFGA RSD	12/31/23	1,766	12/31/23	1,735
Remaining FFGA RSD Contingency †		685		685
Contingency Percent of IPS Duration		38.8%		39.5%

Notes: † This duration is the difference between the Target RSD and the FFGA RSD.

**Program Primary Critical Path – Manhattan/Systems**

The ESA program primary critical path in IPS 116 remains through Manhattan/Systems work and ends on November 25, 2021. Table 2.2 shows the contracts and work that comprise the Manhattan/Systems path as reported in this update. There were no significant changes to the scope that comprises the Manhattan/Systems path in IPS 116, and its end date is unchanged from IPS 115.

**Table 2.2: Primary Critical Path – IPS 116 – April 1, 2019**

Activity Name	Duration	Start	Finish
<b>CM007 - GCT Station Caverns and Track</b>			
West cavern upper conduit, circuits for communications, FA, smoke, and ceilings	600	11-Jun-18 A	31-Jan-20
<b>CS179 System Package 1 – Facilities Systems</b>			
East Cavern Upper conduit, wire, and Phase 3 Zone 1 local testing for communications systems to completion	228	31-Jan-20	14-Sep-20
GCT Phase 3 Zone 1 IST complete BCS interface testing	78	14-Sep-20	30-Nov-20
GCT Phase 3 IST for Fire Alarm complete	115	23-Nov-20	17-Mar-21
Issue Contingency	254	17-Mar-21	25-Nov-21
<b>Program Activities</b>			
LIRR Final Testing and Previews †	81	25-Nov-21	13-Feb-22
<b>Target Revenue Service Date</b>			<b>14-Feb-22</b>
ESA Program-Level Contingency	302	15-Feb-22	13-Dec-22
<b>Public Revenue Service Date</b>			<b>13-Dec-22</b>

Notes: † Successor to Manhattan/Systems, Queens, and Harold Interlocking paths.

The IPS schedule is based on MTACC’s plan for Incremental IST, which will be incorporated into the IPS now that contract modifications for CS179 and CM014B were approved in April 2019. The MTACC is anticipating that the target RSD may improve by 1 month with these changes.

Additional modifications may be necessary for contracts CM007, CM014B, CS179, VS/CS084. The Issue Contingency activity will be removed from the IPS schedule when the CS179 detailed IST activities are incorporated into the IPS.

### **Discussion of Progress along the Critical Path**

The Manhattan/Systems critical path completion date in IPS 116 is November 25, 2021, unchanged from IPS 115.

The Manhattan/Systems longest path is unchanged from IPS 115. It runs through CM007 construction of west cavern upper level conduit and fixtures for communications, fire alarm, smoke exhaust, facility power, and ceiling finishes; then through CS179 construction of east cavern upper level conduit, wire, and local testing for communications systems, and completion of local testing for Phase 3 Zone 1. The path continues with Phase 3 Zone 1 IST of the BCS and interfacing systems to achieve the BCS IST milestone; followed by Phase 3 IST of the fire alarm system and interfaces to complete Phase 3 IST. The CS179 Issue Contingency comprises the final ten months of the path, ending in November 2021 as it did in IPS 115. From this point the path runs through LIRR final testing and previews and concludes with the Target RSD on February 14, 2022.

There was one Manhattan/Systems path coordination point milestone in IPS 116 that was scheduled for completion in March 2019, however it was not completed and the forecast date slipped by one month. There is a risk that the lack of progress through coordination points will result in the need for more concurrent work in the period leading up to and during IST than had been planned, which may complicate and impede progress.

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

Appendix B, Table 6, shows the ESA Program activities on the primary critical Manhattan/Systems work path that are planned for the next 90 days as forecast in IPS 116.

#### **Sub Program Longest Path – Harold Interlocking**

Harold Interlocking work path is the second longest of the three ESA program areas in IPS 116. The Harold path concludes on July 13, 2021, the same date as in IPS 115.

The work that comprises the Harold Interlocking path remains generally unchanged since IPS 115. The path begins with prep work and installation of piles for the B/C approach structure; construction of the base slab; construction of the structural box; and followed by completion of civil and track work for the B/C approach. The path continues through CH063 and Access Restraint 2 to perform critical catenary work at the Amtrak 2 to Westward LIRR Passenger track connection (W crossover) above the B/C approach structure. The Harold path then continues FHL04 LIRR Force Account to cut over the W crossover and B/C approach track, third rail and signals. From the end of the Harold construction, there are 136 CDs of float to the LIRR final testing activity on the ESA program critical path (Manhattan/Systems work).

#### **Sub Program Longest Path – Queens**

The Queens (Mid-Day Storage Yard) work path is longest of the three ESA program areas in IPS 116. The Queens path gained approximately 5 months during the update period, and now ends in October 2020. The total float on the Queens longest path is 280 CDs, which is split with 196 CDs before the FRA testing activity and an additional 84 CDs after.

The work that comprises the Queens path remains generally unchanged since IPS 115. There was a significant time savings however, due to the contract modification that revised the sequence of planned construction. The critical path starts with track installation leading to the installation of the MID8 CIL. The path continues with the wire pulling and cable pulling for communications

and PA systems, followed by commissioning and integrated testing, and the path ends in October 2020. This is followed by 196 CDs of float to the FRA testing activity, and then 84 CDs of float to the LIRR final testing activity on the ESA program critical path (Manhattan/Systems work).

**Upcoming Contract Procurements**

Table 2.4 shows the status of current and upcoming contract procurements as reported in IPS 116 (April 1, 2019).

**Table 2.4: Procurement Schedule**

<b>Contract Description</b>	<b>Advertise Date</b>	<b>Bid Date</b>	<b>NTP</b>	<b>Project Length</b>	<b>Substantial Completion</b>
CH063: ET Catenary Work 3rd Party	1/4/19 A	9/15/19	11/25/19	22 mos.	10/25/21

**CH063 Electric Traction Catenary Work, 3rd Party:** MTA issued a RFP on January 4, 2019, for the design-build contract. Qualification submittals were extended to March 13, 2019 due to vendor questions. The current plan is to reissue bid documents by June 30, 2019, receive bids on October 16, 2019, and issue a NTP on December 2, 2019.

**PMOC Concerns**

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

1. Concerns continue about the Manhattan/Systems work path. While MTACC has reduced the uncertainties concerning Incremental IST schedule with contract modifications to CM014B and CS 179 (not yet executed), the risks remain for prosecution of the schedule due to the effect of construction activity stacking. Additionally, the redevelopment of 270 Park Avenue does not have an agreed upon schedule. Future schedules may show the shifts in the critical path, further delays, and reduction of the Issues Contingency.
2. The PMOC has ongoing concerns about the significant schedule changes that resulted in shifts in scope on the Manhattan/Systems schedule path, which drives the ESA Program Critical Path. While the MTACC has reached agreement with the CS0179 and CM014B contractors for the Incremental IST schedule, other Manhattan/Systems contracts remain near critical and may exert a significant influence on the critical path.
3. The ESA program schedule contingency is 302 CDs, which is only 27 CDs above the minimum required FTA ELPEP schedule contingency. The ability of the MTACC to maintain the FTA minimum until the next ELPEP hold point (95% constructed; Q4 2020) is at risk due to the uncertainties about the Manhattan/Systems schedule, the greatest of which is execution of the approved plan for the Incremental IST.
4. Progress on CS084, Tunnel Systems Package 4 – Traction Power, is slow and is currently reported as 34.6% complete compared with as-planned progress of 92.4%. The PMOC observes that much of the work has had day-for-day delays in each IPS update. The PMT is working with the contractor to develop 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 continue to analyze options to recover the schedule with a focus on major electrical equipment submittals and layouts, identifying major issues, and, determining corrective measures.
5. The PMOC is concerned about the lack of progress indicated by coordination point activities not achieving scheduled completion dates to advance IST. This indicates the

evolving nature of the schedule, which needs to be finalized so that it can be a reliable management tool. The MTACC has recognized the need to add a significant number of coordination points to the schedule to manage the work. If not addressed, the lack of progress will result in the need to perform more work concurrently leading up to and during IST than had been planned, which will further complicate and impede progress.

6. The CM014B contractor's capability to complete the 25% of its remaining work in the 14 months prior to forecast SC of June 2020. The PMOC believes that this is overly optimistic based on the contractor's historic construction performance.

### **3.0 COST DATA**

#### **Budget/Cost**

In the ESA Q1 2019 Report, the PMT reported that the total project progress is 77.7% complete compared to as-planned progress of 77.8% of the \$11,133 million April 2018 EAC forecast. The report also shows that construction progress reached 81.2% compared with planned progress of 81.6% of the \$8,014 million April 2018 EAC forecast, based on invoiced construction costs. Contract percentage calculations use the amount that has been allocated to each contract in the MTA Impact accounting system for the budget.

#### **Contingency**

The ESA Q1 2019 Report, shows that contingencies in the current budget total (b)(4) million, which includes unallocated contingencies of (b)(4) million and allocated contingencies of (b)(4) million. Refer to Table 3.1. The total contingency is (b)(4) million above the ELPEP contingency amount of \$260 million.

Unallocated contingencies increased by (b)(4) million and allocated contingencies decreased by (b)(4) million for a total decrease of all contingencies of (b)(4) million. These revisions are in line with the EAC forecast that was presented to the MTA board in April 2018. The high value of the Project-Wide Reserve reflects MTACC's strategy of holding significant funds as contingencies and then releasing them to specific projects on an as-needed basis, commensurate with construction progress. This approach tends to artificially inflate the program contingency and reduces the accuracy of contract completion percentages. The MTACC cost plan anticipates drawing contingencies down to \$117 million by the end of December 2020 and then replenishing the contingencies and the balance of the ESA program budgets with funds from the 2020-2024 Capital Plan. The ESA program contingencies are not being drawn down as fast as the MTACC had anticipated due to the slower than expected resolution of the contract modifications for IST and schedule.

The PMOC remains concerned about future demands on the program's contingencies until the MTA 2020–2024 Capital Plan is funded and the related budget adjustments are performed.

**Table 3.1: ESA Cost Contingency (Costs shown in millions)**

Contingency	June 2014 Baseline	Dec 2018	Jan 2019	Feb 2019	Mar 2019				
<b>Allocated Contingency</b>									
Pre-Award Contingency (AFI)	112.7 m	(b)(4)							
Post-Award Contingency (AWO)	266.3 m								
<b>Allocated Contingency Subtotal</b>	379.0 m								
<b>Unallocated Contingency</b>									
Project-Wide Reserve	439.0 m								
<b>Total Contingencies</b>	818.0 m								

**Change Orders/Budget Adjustments**

The ESA Q1 2019 Report, lists 12 change orders with magnitudes greater than \$100,000 that were executed in March 2019. The net value of these change orders was \$5.5 million.

**Table 3.2: Executed Change Order Log (magnitude > \$100,000)**

Contract	Description / Mod No.	Amount
CH058A	B-931 structures demolition (mod. 1)	450,000
CM007	Overhead drain line per RFI 323 (mod. 59)	346,550
CM007	63rd Street CMU additions (mod. 70)	455,000
CM007	US-1 & US-2 breaker replacement equipment procurement (mod. 81)	645,870
CM014B	Public area cable trays, non-public area cable trays, and seismic restraints (CPR-103, CPR-126, CPR-169) (mod. 196)	1,320,058
CQ033	Miscellaneous catenary (mod. 31)	1,130,000
CS179	CS084 remote control disconnect switches (mod. 179)	287,000
CS179	GCT cavern fire alarm (mod. 185)	183,000
CS179	GCT cavern linear heat detection deletion (mod. 192)	(103,711)
CS179	Cross flue TVF power (mod. 180)	526,905
CS179	Signal power connection (mod. 191)	144,149
CS179	Plaza door modifications (mod. 199)	124,500

**Funding**

Budget Amendment 3 to the 2015–2019 Capital Plan has been incorporated into the ESA program budget. This action added \$157 million (local funds) and increased the overall ESA program budget from \$10,178 million to a new value of \$10,335 million.

Federal Funding: The total Federal funding commitment to the ESA project is \$2,698.8 million, of which all of the funds have been effectively drawn down as of March 1, 2019.

Local Funding: The budget for Local Funding is \$7,636.4 million, of which \$5,949.8 million has been expended through April 1, 2019. Financing costs are funded separately from other local sources.

**PMOC Concerns and Recommendations**

1. The PMOC is concerned that MTACC’s strategy of holding funding as contingencies rather than funding contract budgets to their projected value results in an overstatement of both the contract completion percentages and the total value of unallocated contingencies. While this

strategy retains maximum flexibility for the MTACC, it differs from the generally accepted practice of committing to budgets for known program costs and tends to artificially inflate the program contingency and reduces the accuracy of contract completion percentages. The PMOC anticipates that the budgets will be updated after major contract modifications are executed and when the 2020–2024 Capital Plan is adopted.

2. The MTACC is preparing its 2020–2024 Capital Plan, which is anticipated to include approximately \$800 million to complete the ESA program and replenish contingencies. MTACC anticipates bringing the capital plan request to the MTA board in the third quarter of 2019. The MTACC cost plan forecasts drawing contingencies down to approximately \$117 million at the end of December 2020, which, should it occur, would be less than the ELPEP minimum. It is anticipated that these topics would be addressed in the MTACC recovery plan that is now anticipated in the Q3 2019. This future potential funding constraint could be a major risk.
3. The MTACC issued modifications for contracts CS179 and CM014B to resolve the major open cost and schedule issues and to incorporate Incremental IST. At the present time only the CM014B modification is fully executed. The MTACC is working with CM007 to incorporate the schedule changes in that contract. The implications of the changes on contracts CS084, VS/CS086, and CQ033 are yet to be determined. Additionally, ongoing and possible future delays may result in increasing costs for the following contracts:
  - CS084 – the late completion of final design has delayed the completion of fabrication of some traction power equipment; transformer test failures and resolution of potential damage to some of the 26 inductive reactors provided by MTACC.
  - VS086 and CS086 – incorporation of Positive Train Control into the ESA signal system and technology issues.

#### **4.0 RISK MANAGEMENT**

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

##### **Harold Interlocking – ESA Risk**

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

Through April 2019, MTACC continued to adjust the “ESA First” Harold Re-Sequencing plan 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, although the noticeable improvements that have been recently reported appeared to have been sustained through May 2019 for LIRR direct Force Account work and Amtrak ET support.

###### **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. During March 2019, MTACC indicated that Amtrak may advance ERT 2 reconstruction to 2023, although this has not yet been formalized. The risk remains that tunnel systems reliability or safety issues might require Amtrak to make emergency repairs on either Line 1, 2, or 4 at any time between now and the RSD of December 2022. Should this occur, the remaining ESA construction work in Harold Interlocking, as well as the systems testing, start-up, and commissioning for Tracks A, B/C, and

D, could be delayed and potentially impact the MTACC RSD of December 2022. There is less likelihood, however, that such an event would impact the FFGA RSD of December 2023.

### **LIRR Positive Train Control (PTC) Risk**

This risk has two distinct elements, as discussed here.

- a.) LIRR may divert some force account resources away from support for the ESA work to provide support for LIRR's system-wide, i.e., non-ESA, PTC work currently underway.
- b.) LIRR did not complete PTC design in either Q1 2018, as earlier projected, or January 2019, as more recently projected, due to resolution of GEC/LIRR comments on the GCT3 and GCT4 application logic submittals. This delay continued through May 2019. The GEC acknowledges that the required associated design changes for ESA Contracts VS086, CS086, and CS179 cannot be completed until the PTC is finalized. The PMOC continues to monitor this situation to determine what schedule risk this situation presents to the three cited ESA contracts and also with regard to finalization of the CS179 Integrated System Testing Plan and Schedule. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086.

### **Capital Funding Risk**

MTACC has forecasted a need for approximately \$800 million in the 2020–2024 Capital Plan. The PMOC remains concerned that – until the 2020-2024 Capital Plan is approved – this potential future funding constraint may significantly impact the program budget and schedule as well as the start of Revenue Service.

### **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. Through May 2019, the LIRR continued to evaluate proposals for the vehicles during the second of its two-step RFP procurement process, the contract for which it originally expected to award in June 2019. During May 2019, however, ESA informed the PMOC that the award will be delayed until July 2019. Due to the complex nature of such procurements, the PMOC believes that LIRR's July 2019 award date continues to be overly optimistic.

### **Manhattan/Systems Performance Risk**

The Manhattan/Systems path is at risk for future open/unresolved issues. Contract modifications for CS179 and CM014B have been issued to address Incremental IST, which needs to be incorporated in the IPS and in contract modifications for interfacing contracts, as necessary. Additionally, MTACC is working through the implications that the reconstruction of 270 Park Avenue could have on the ESA program. Without better definitions of the scopes of work, schedule impacts cannot be accurately forecast.

### **JP Morgan Chase Redevelopment at 270 Park Avenue**

Foundation and substructure systems required for the planned new JP Morgan Chase (JPMC) building at 270 Park Avenue will impact construction for the new LIRR Concourse at GCT. There are potential schedule impacts to the ESA design and construction work. More detailed information from ESA-PMT was provided during Q1 2019. Ongoing MTA, MTACC-ESA, and JPMC discussion continued through May 2019. All MTA costs-to-date have been reimbursable by JPMC and all related MTACC-ESA work is being performed by a dedicated team so not to impact the management and technical services being provided for the ESA program. MTACC has

taken the position that there will be no schedule delays to the forecast RSD and no additional costs to MTA as a result of this work. The MTA/MTACC – JPMC Memorandum of Understanding was approved at the March 2019 MTA Board meeting and executed by both parties on March 31, 2019. The follow-on MTA/MTACC-JPMC Construction Agreement was not completed as of May 31, 2019, as previously forecast by ESA.

## 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 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 updated the TCC Plan in Q3 2017. In April 2018, FTA advised MTACC to incorporate its current updates and commence with a subsequent revision that addresses management changes resulting from the MTACC Six-Point Plan for ESA. All aforementioned updates will be consolidated in a draft that was anticipated, but not met, in December 2018. MTACC provided the draft TCC Plan during May 2019.
- **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 continues to note progress in two previously identified areas – Issues Management and Timely Decision Making, particularly when responding to new issues arising from 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, that the PMOC reviewed and the FTA accepted in 2017.
- **Cost/Schedule Contingency:** MTACC, the FTA and the PMOC are in agreement 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 MTACC has reported that the Schedule Contingency remains only 27 CDs above ELPEP minimum. The total Cost Contingency is \$409.6 million above the ELPEP minimum contingency of \$260 million.

The PMOC notes that, with completion and approval 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: Alternative 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. An updated draft was issued in December 2018.
- **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. An updated draft was issued in December 2018.

- **Risk Management Plan:** ESA submitted the updated Risk Management Plan in Q4 2017. 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. An updated draft was issued in December 2018.
- **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 ESA PMT is preparing draft updates of the Project, Cost, Schedule, Risk Management, Contract Packaging, and Technical Capacity and Capability Plans. These will document the changes called for by the incorporation of the MTACC Six-Point Plan for ESA to reduce future programmatic risks. MTACC issued updated drafts for the CMP, SMP, and RMP in December 2018 as well as the CPP in January 2019. The PMP will be updated based on changes made to the revised Sub-Plans.

**Revisions to the ELPEP Document:** MTACC submitted an updated ELPEP with suggested revisions in Q3 2017. In April 2018, FTA advised MTACC to re-evaluate its proposed updates in consideration of the revised EAC, budget, and IPS, as well as organizational, management, and process changes resulting from implementation of the MTACC Six-Point Plan to reduce risk on the ESA project.

## 6.0 SAFETY AND SECURITY

Based on safety information supplied by MTA, the PMOC-calculated ESA Injury Ratios for April 2019 were 0.91 for Lost Time Injuries (LTI) and 1.82 for Recordable Injuries (RI). Both were below Bureau of Labor Statistics (BLS) 2019 Safety Guidelines of 1.5 for LTI and 2.5 for RI. Additionally, MTACC did not report any significant security issues in the ESA Q1 2019 MPR.

## 7.0 ISSUES AND RECOMMENDATIONS

**Design:** The PMT design management team needs to focus on the timely achievement of time-critical intermediate milestones and work closely with the GEC to provide the required Construction Phase Services for schedule critical construction/procurement efforts as determined by the PMO Analytics Group. 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 improve coordinating 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.

## **Water Infiltration Concerns Regarding Contracts CS179, CS084, CS086, 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, the CS179 and CS084 contractors continue to advise MTACC of additional water infiltration issues in areas where work access has come available, including Plaza Interlocking facility rooms and equipment rack configurations. Furthermore, water and PAC remediation issues remain in several areas under CQ032: the former Launch Block area of the Plaza, the Amtrak Bridge area, the Plaza, and the former Early Access Chamber area.

**Contract CQ032:** Potential out of tolerance as-built railcar clearance with the newly constructed bench wall in the ESA tunnels. There are now nine NCRs related to tunnel duct bench clearance as-built deviations and remediation for train clearance requirements. Current status: Draft contractor proposals are under MTACC review for repair work.

**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 contractor's monthly schedule submissions;
- Resolution and implementation of coordination issues;
- ESA PMT responses to contractor NOCs and issuance of CPRs; and,
- Timely design review and approvals to the contractor's design submittals and Requests for Information.

**Contract CS084:** The PMOC remains concerned about the following issues:

1. Equipment delivery methodology (means and methods);
2. Installation of the C08 traction power cables due to missing conduit and manholes;
3. Transformer hi-pot testing failures and long-term viability of the transformers;
4. Verification of existing conduit and manholes in several substations;
5. Coordination with other contractors;
6. Possible damage to the MTA-provided inductive reactors due to improper storage and handling by MTA;
7. Extent of non-conformance of track monuments and potential remediation; and,
8. Water infiltration issues in the facilities.

**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. Issues regarding the acceptability of "open-type" racks and PTC design incorporation need to be expeditiously resolved.

**Contract CS086:** MTACC and the contractor need to address the noted water infiltration issues and expeditiously correct any deficiencies noted during inspections of the work sites to enable the timely progression of the contract work. The completion of a track installation phasing and usage plan with the CM007 contract needs to be expedited to avoid any further access restraint delays.

**Project Funding:** The project is at risk due to the anticipated need for approximately \$800 million to address additional costs that were forecast by the PMT in the April 2018 program reassessment. Interim funding needs through December 2020 have been addressed. The PMOC is concerned about future potential impacts on the program budget and schedule if there are delays in funding the ESA program in the 2020–2024 Capital Plan.

**Project Budget:** The PMOC is concerned about MTACC’s unconventional strategy of holding significant contingencies that would only be released to specific projects on an as-needed basis commensurate with construction progress and based on future contract modifications. While MTACC’s strategy retains maximum flexibility, it differs from the generally accepted practice of committing funds to budgets for known program costs. The PMOC is concerned that the strategy results in an overstatement of both the contract completion percentages and the total value of unallocated contingencies at any point in time.

**Project Schedule:** The PMOC remains concerned about the remaining program schedule contingency of 302 calendar days that is only 27 calendar days above the ELPEP minimum. IPS 116 shows that Manhattan/Systems work is the primary critical path for the ESA program, which has unresolved issues including the redevelopment at 270 Park Avenue. Additionally, Manhattan/Systems contracts that are not on the critical path include CS084, CM007, and CS086, each of which has its own schedule challenges that may not be readily apparent due to the linear nature of critical path reporting.

**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 has been, and will continue to be, very challenging and represents a significant MTACC-retained risk. The PMOC believes that achieving 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 (long term risk realized in Q2 2018);
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 and effectiveness of Incremental IST;
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 (Improved performance noted through May 2019);
9. Remaining schedule path float will be used in the near future and Manhattan/Systems path will become critical (risk realized in April 2018);
10. Coordination risk retained by MTACC in Manhattan and the ESA tunnels with regard to construction and testing interface management for the systems work;
11. CS084 equipment issues involving transformers, 3 hi-pot test failures, and final resolution of concerns about MTACC provided inductive reactor equipment;
12. Foundation systems required for the new JP Morgan/Chase (JPMC) building at 270 Park Avenue may impact construction of the new LIRR Concourse in GCT. Ongoing MTA, MTACC-ESA, and JPMC discussion continued through May 2019.

Specific remaining risks for the Harold Interlocking work, previously identified by MTACC, include the following:

1. **Funding:** Funding constraints (risk realized in Q2 2017; short-term risk resolved through December 2020; long-term risk remains).
2. **Amtrak Support:** Ongoing/future Regional Projects requiring extensive Amtrak support.
3. **Reconstruction of Existing Amtrak ERT Lines 1 and 2:** Earlier deferred until 2025 after the ESA program; now possibly rescheduled to 2023, just after ESA RSD. The risk now is from the impact of unplanned emergency tunnel repairs.

## APPENDIX A – ACRONYMS

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



**APPENDIX B – TABLES**

**Table 1: Summary of Critical Dates**

Program Milestone	FFGA	Forecast (F) Date, Actual (A) Date		Amended FFGA ***
		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.  
 \*\*\* Source – Amended FFGA, August 2016

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

	FFGA			MTA Current Baseline Budget (CBB)			Expenditures April 1, 2019	
	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%	10,107.2	11,451.5	100.0%	9,057.5	79.1%
Financing Cost	1,036.0		14.0%	617.6	1,116.5	9.7%	617.6	55.3%
		1,116.5	9.3%					
Total Project Cost	6,350.0		86.0%	9,489.6	10,335.1	90.3%	8,439.9	81.7%
		10,922.0	90.7%					
Federal Share	2,683.0		36.3%	2,698.8	2,698.8	23.6%	2,698.8	99.9%
		2,698.8	22.4%					
5309 New Starts share	2,632.0		35.6%	2,436.7	2,436.7	21.3%	2,436.8	99.9%
		2,436.7	20.2%					
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	99.9%
Local Share	3,667.0		49.6%	6,790.8	7,636.2	66.7%	5,741.1	75.2%
		8,223.2	68.3%					

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

Elements	Baseline Budget June 2014	April 2018 EAC Forecast	April 1, 2019			
			Current Budget (interim)	Actual Awards	Invoiced Costs	Inv. Pct. of Budget
Construction Subtotal	7,379.3	8,014.1	7,537.9	7,289.3	6,506.0	86.3%
Soft Costs Subtotal	2,359.5	2,852.2	2,278.7	2,200.3	2,142.5	94.0%
Engineering	720.6	871.8	795.0	766.6	750.1	94.3%
OCIP	282.6	457.4	379.2	379.2	372.6	98.2%
Project Mgmt.	972.2	1,117.3	972.0	932.5	901.8	92.8%
Real Estate	182.1	203.7	124.9	119.2	117.9	94.3%
Rolling Stock	202.0	202.0	7.5	2.7	0.2	3.0%
Contingency Subtotal	439.0	267.0	518.6	--	--	--
Total w/o Financing	10,177.8	11,133.3	10,335.1	9,489.6	8,648.5	83.7%

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

**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 2019 CBB	Feb 2019 CBB	Mar 2019 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 - Guideway & Track Elements	1,988.7	3,405.5	3,353.4	3,403	3,403	3,401	71.0%	1.4%
20 - Stations, Stops, Terminals, Intermodal	1,168.7	2,238.2	2,326.8	2,290	2,287	2,287	95.7%	-1.7%
30 - Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	558.6	558.6	559.7	57.1%	24.2%
40 - Site Work and Special Conditions	205.1	610.6	562.5	525.4	530.6	530.6	158.7%	-5.7%
50 - Systems	619.3	605.6	627.7	713.6	713.6	713.6	15.2%	13.7%
60 - ROW, Land, Existing Improvements	165.3	219.4	192.2	162.3	162.3	162.3	-1.8%	-15.6%
70 - Vehicles	494.0	209.9	879.5	15.4	15.4	15.4	-96.9%	-98.2%
80 - Professional Services	1,184.0	1,975.4	1,809.0	2,115	2,146	2,146	81.3%	18.6%
90 - Unallocated Contingency	168.5	439.0	720.2	(b)(4)				
Subtotal	6,349.9	10,177.8	10,922.0	(b)(4)				
100 - Finance Cost	1,036.1	1,036.1	1,116.5	(b)(4)				
Total	7,386.0	11,213.9	12,038.5	(b)(4)				



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

Standard Cost Category	FFGA	June 2014		April 1, 2019		
		Project Budget	Amended FFGA	Current Budget	Awarded Value	Paid to Date
10 - Guideway & Track Elements	1,988.7	3,405.5	3,353.4	3,401.4	3,309.1	3,032.6
20 - Stations, Stops, Terminals, Intermodal	1,168.7	2,238.2	2,326.8	2,287.4	2,220.6	1,853.7
30 - Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	559.7	546.3	395.8
40 - Site Work and Special Conditions	205.1	610.6	562.5	530.6	504.3	512.7
50 - Systems	619.3	605.6	627.7	713.6	663.8	469.0
60 - ROW, Land, Existing Improvements	165.3	219.4	192.2	162.3	156.6	155.2
70 - Vehicles	494.0	209.9	879.5	15.4	10.6	5.8
80 - Professional Services	1,184.0	1,975.4	1,809.0	2,146.2	2,078.3	2,015.1
90 - Unallocated Contingency	168.5	439.0	720.2	(b)(4)	--	--
Subtotal	6,349.9	10,177.8	10,922.0	(b)(4)	9,489.6	8,439.9
100 - Finance Cost	1,036.1	1,036.1	1,116.5	(b)(4)		
Total	7,386.0	11,213.9	12,038.5	(b)(4)		

**Table 6: Program Critical Dates 90 Day Look-Ahead – IPS 116 – April 1, 2019**

<b>Act. Id.</b>	<b>Name</b>	<b>Start</b>	<b>Finish</b>	<b>Float</b>
<b>CM007</b>	<b>GCT Station Caverns and Track</b>			
WC.FOH.UPP ER.755	Universal Support System	11-Jun-18A	12-Apr-19	2
WC.FOH.UPP ER.760	Supports For Signage	12-Apr-19	19-Apr-19	2
P2-17880	WC- Elect- Install Upper Platform Branch Circuit Conduits (GL 3-12)	05-Sep-18A	13-May-19	2
P2-17890	WC-Elect-Install Upper Platform Comm Conduits (GL 3-12)	13-May-19	20-May-19	2
P2-17910	WC-Elect-Install Upper Platform Fire Alarm Conduits (GL 3-12)	19-Nov-18A	3-Jun-19	2
P2-17920	WC-Elect-Install Upper Platform Smoke Exhaust Control Conduits (GL 3-12)	19-Nov-18A	14-Jun-19	2
P2-17930	WC-Elect-Install Upper Platform Power, Receptacle and Lighting Panels (GL 3-12)	14-Jun-19	28-Jun-19	2
P2-17940	WC- Elect- Install Upper Platform Transformer (Dry Type) (GL 3-12)	28-Jun-19	8-Jul-19	2
P2-17950	WC- Elect- Install Upper Platform Branch Circuit Conductors (GL 3-12)	8-Jul-19	29-Jul-19	2

**Table 7: ESA Core Accountability Items**

Project Status		Original at FFGA	Amended FFGA	Current	ELPEP **
<b>Cost</b>	Cost Estimate	\$7,386 M	\$10,922 M	\$10,335 M*	\$8,119 M
<b>Contingency</b>	Unallocated /Risk Contingency	\$169.0 M	\$720.2 M	(b)(4)	
	Total Contingency (Allocated plus Unallocated)	\$738.7 M	\$1,068.2 M	(b)(4)	
<b>Schedule</b>	RSD	Dec. 31, 2013	Dec. 31, 2023	Dec. 2022	April 30, 2018
<b>Total Project Percent Complete</b>		Based on Invoiced Amount	77.7% actual vs. 77.8% planned (ESA calc.†)		
<b>Project Performance Rate Since 2014 ESA Re-Plan</b>		Based on Earned Value	83.0% (PMOC calculation of construction spending at 1Q 2019 planned vs. actual since re-baselining)		
<b>Contracts</b>	Total contracts awarded to date		\$9,490 M	85.2% (PMOC calculation†)	
	Total construction contracts awarded to date		\$7,289 M	91.0% (PMOC calculation†)	
<b>Major Issue</b>	<b>Status</b>		<b>Comments</b>		
Project Funding and Budget	The total program budget is \$10,335.1 million, including (b)(4) million in unallocated contingencies.		The MTACC needs an additional approximately \$800 million in the 2020-2024 Capital Plan to complete the ESA program. Unallocated contingencies, (b)(4) million, will be used to fund contracts that are not currently fully budgeted.		
Project Cost	The ESA PMT updated the ESA program budgets based on the approval of Budget Amendment 3 for the 2015-2019 Capital Plan. The April 2018 EAC is \$11,133 million. The Amended FFGA Baseline Cost Estimate is \$10,922 million.		If the 2020-2024 Capital Plan is not approved for the required ESA funds, then there may be significant impacts to the completion of current contracts, award of remaining contracts, and/or completion of railroad force account work. Concerns remain about the time elapsed in resolving the open Cost and Schedule issues and, ultimately, their cost impacts.		
Project Schedule	The primary critical and near-critical paths to target RSD, including float, are: <ul style="list-style-type: none"> <li>▪ Manhattan/Systems – no float (critical path)</li> <li>▪ Harold Interlocking – 136 CDs</li> <li>▪ Mid-day Storage Yard (Queens) – 280 CDs</li> </ul> The target RSD forecast remains on February 14, 2022. The public RSD remains December 13, 2022. The Amended FFGA Revenue Operations Date is December 2023.		There remain 34 months to the target RSD, which is followed by 9.9 months program float to the public RSD. The PMOC is concerned that until uncertainties related to Incremental IST and redevelopment of 270 Park Avenue are addressed, future schedules may show the shifts in the critical path, further delays, and may impact the program schedule contingency.		
Manhattan/Systems Schedule Path	IPS 116 shows that the ESA Program Critical Path runs through the Manhattan/Systems contracts. This work path has several major open/unresolved issues having potentially significant schedule impacts: incremental IST (diminished); and, the major redevelopment of 270 Park Avenue.		Concerns continue for the ESA program Manhattan/Systems critical path. The Manhattan/-Systems path completion date is November 25, 2021, in IPS 116. This schedule has significant unresolved issues. Acceptable work progress along this schedule path relies heavily on the effectiveness of MTACC/ESA coordination efforts across the seven area contracts.		

Notes: \* The cost estimate total budget was established in the May 2018 current baseline budget.

\*\* 2010 Enterprise Level Project Execution Plan (ELPEP) reflecting medium level of risk mitigation, excluding financing cost of \$1,116 million.

† ESA April 2018 EAC forecast: Construction \$8,014.1 million; Engineering \$871.8 million; Soft Cost \$1,980.4 million; Contingency (b)(4) million; and, Total (b)(4) million