

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

Report Period October 1 – October 31, 2017



PMOC Contract No. DTFT60D1400017

Project No. DC-27-5287, Task Order No. 0002, Work Order No. 05

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

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THIRD PARTY DISCLAIMER

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For projects funded through the FTA Full Funding Grant Agreements (FFGAs) 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.

REPORT FORMAT AND FOCUS

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

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

All Project Sponsor cost and schedule data included in this report is based on the status date of September 1, 2017, that corresponds to MTACC's "East Side Access August 2017 Progress Report" and is referenced as ESA August 2017 Progress Report in this PMOC Report.

MONITORING REPORT

1.0 PROJECT STATUS

a. Engineering Design and Construction Phase Services

In the ESA August 2017 Monthly Progress Report, MTACC reported that the overall Engineering effort is 98.9% complete vs. 100% planned. MTACC's August 2017 Total Cost Report shows 97.3% of the overall EIS and Engineering budget has been invoiced and 97.4% of the Design budget has been invoiced.

Status of Construction Packages Advertised:

Contract CS086, Systems Package 2 - Tunnel Systems, was advertised on August 10, 2017. A single proposal was submitted on October 31, 2017. This will be a negotiated procurement using the RFP method. Based on when LIRR completes the design for Positive Train Control (PTC),

the PTC scope will be added to the CS086 contract either by addendum before bidding or by contract modification after award. See the Procurement section below for more details.

Status of Construction Packages Not Awarded:

On Contract CM015 (48th St. Entrance), MTA had been meeting with the building owner to advance and finalize the Work and Easement Agreements, but discussions were temporarily suspended pending the building owner's evaluation of the impacts that the new Midtown Manhattan zoning changes may have on the owner's 415 Madison Avenue Building. The parties were reportedly near final agreement, however, the owner has again requested that significant additional work be included in the design scope. Discussions between MTA/MTACC and the building owner have resumed, but further changes to the NYC East Midtown Zoning regulations have apparently shifted the cost of the 48th Street Entrance facility back to MTA. Final disposition will be based on the outcome of MTA/MTACC negotiations with the building owner and subsequent MTA/MTACC management level decisions. Design work on this package remained suspended through October 2017. The PMOC notes that MTACC-ESA is developing an alternative LIRR GCT entrance at 47th Street.

Contract CH058A, Harold Structures – Part 3A, B/C Approach will include construction of the Tunnel B/C Approach Structure. During October 2017, NYCDOT continued its review of the updated package (plans and specifications), that was revised to incorporate the alternate support of excavation involving maintenance and support of the piers for the existing 39th Street Bridge. The scope of the required catenary work for Amtrak Force Account FHA04A has been finalized and is included in PCO 222. GEC continued work on this PCO based on a retro-active authorization. PCO 222 (R3) was issued to the GEC and they have completed the technical proposal. The 100% design package is due on December 15, 2017.

Contract CH057D, Harold Track Work, is a new package that includes completion of all the remaining track work in the Harold Interlocking Northeast and Southeast Quadrants. The package scope of work has been finalized by the PMT and the CM. MTACC has obtained labor clearance from LIRR for track work only. ESA continues to seek labor clearance for third-rail work. The 90% design package was submitted on August 1, 2017. The 100% design milestone was achieved during October 2017.

FQA33A, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for yard access to Amtrak via Sub 4 to Line 2. Amtrak has requested that ESA develop the full scope of exiting routes from the Mid-Day Storage Yard (MDSY) for review of the required associated changes to Penn Station Control Center. ESA met with LIRR to discuss Option C, an alternative MDSY exit route. The GEC is also evaluating another MDSY exit route alternative, Option D. ESA has met with LIRR to present all exit schemes and an LIRR decision is now expected during November 2017. Upon completion of the reviews and a decision by LIRR, ESA/LIRR plan to meet with Amtrak to review all of the exit schemes from the Mid-Day Storage Yard to Penn Station. The four MDSY exit schemes are configured as follows:

1. Original design with Amtrak and LIRR diamond crossovers
2. Option A + Option B
3. Option C
4. Option A + Option D

Option C replaces both Options A and B, deletes the Amtrak diamond crossover and provides access to ERT Lines 2 and 4. Option D requires Option A to access ERT Lines 2 and 4; deletes both the Amtrak and LIRR diamond crossovers.

FQA33B, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for a second yard access to Amtrak via Sub 3 to Line 4. Amtrak, LIRR, and ESA have met to discuss the diamond crossover proposed in the design package. An earlier study about this proposed track alignment was completed. The GEC developed an alternative track alignment that does not include the diamond crossover. The GEC has completed its review of the additional exiting scheme, Option D. ESA has met with LIRR to present all exit schemes and an LIRR decision is now expected during November 2017. Upon completion of the reviews and a decision by LIRR, ESA/LIRR plan to meet with Amtrak to review all of the exit schemes from the Mid-Day Storage Yard to Penn Station. The 100% design package is temporarily on hold awaiting a final decision based on the exiting option study. See “FQA33A, Mid-Day Storage Yard Facility – Amtrak F/A”, above, for a summary of the four MDSY exit options and the four exit schemes.

Status of Positive Train Control Design by LIRR

The MOU between MTACC and LIRR for the implementation of Positive Train Control (PTC) on ESA has been executed, and the associated “Technical Concurrence Document” has now been agreed upon by both MTACC and LIRR. LIRR continues to advance the PTC design that is currently forecast to be completed by December 31, 2017. LIRR provided the GEC with “advanced design” documents several months ago for their use in starting to prepare for modifications to contracts CS179, VS086, and CS086 to provide for overlay of the LIRR designed PTC onto the ESA systems.

The GEC is ready to begin work on designs to enable the LIRR-designed PTC system to be incorporated into ESA territory. Once the LIRR and GEC finish the respective designs, MTACC will need to issue contract modifications to the CS179 and VS086 contracts – and possibly the CS086 contract, depending on the timing of the completion of the designs and the award of the CS086 contract.

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

On Contract CS179, Systems Facilities Package No.1, the backlog of submittal and RFI reviews noted in earlier reports continues to be an area of primary focus for the Contract CS179 project team. The contractor continues to assert that overdue responses on design submittals and Requests for Information (RFIs), and unresolved Notices of Change (NOCs), are impacting its ability to complete design work, causing delays to the contract schedule. The contractor continues to note that there are 47 NOCs, 40 of which MTACC was to issue Contractor Proposal Requests (CPRs) for, that are contributing to its ability to finalize designs. The completion of Final Designs (FDs) of all 10 Control Systems, an activity that was scheduled for completion 20 months ago, has not occurred yet; and, the FDs of the 19 Non-Control Systems is also delayed. The full impact of these delays to the Control and Non-Control Systems FDs to the contract’s progress remains undetermined at this time. Previously noted Buy/Ship America issues that could impact design completion also remain unresolved. Additional information regarding specific System designs for the CS179 contract is provided later in Section 1.0c., under CS179.

On Contract CS084, Traction Power Systems Package 4, the contractor contends that unresolved issues related to the tunnel SCADA system and MTA-initiated re-design requirements on the C08

substation continue to impose day-to-day delays of design completions on this contract. The contractor indicates that its current schedule shows a three-month slippage from that previously noted in the contract's substantial completion date; a slippage from June 2020 to September 2020. All of the contract Milestones are already delayed and will, according to the contractor, continue to be delayed on a day-to-day basis until the design issues are clarified and the designs are approved. Additional information regarding specific System designs for the CS084 contract is provided later in Section 1.0c., under CS084.

On Contract VS086, Systems Package 3 – Signal Equipment Procurement, the contractor continues to raise concerns over the timeliness of responses from MTACC on design submittals and inquiries; asserting that the lack of timely responses is causing day-to-day delays in the progression of the work. MTACC needs to make key design decisions that have the potential to impact designs already in progress, interim contract milestones, and the overall substantial completion of this contract. Additional information regarding specific System designs for the VS086 contract is provided later in Section 1.0c., under VS086.

b. Procurement

MTACC's Total Cost Report for August 2017 shows that total procurement for the project was 88.2% complete, with \$8.974 billion awarded of the \$10.178 billion current project budget (ESA Program only).

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

- CM015, 48th Street Entrance – In June 2017, the ESA-PMT advised that all design work on this package was suspended. Total bid advertisement delay through 2016 and into 2017 is fourteen months. There was no change in status during October 2017. The PMOC notes that MTACC-ESA is developing an alternative LIRR GCT entrance at 47th Street.
- CS086, Systems Package 2-Tunnel Systems – Advertised August 10, 2017; Proposals due October 20, 2017. Total proposal advertisement delay through 2016 and into 2017 is fifteen months.

Contract CS086 will be a negotiated procurement using the RFP method. The bid package was made available on August 21, 2017, and the pre-proposal tour was held on August 31, 2017. One proposal was submitted on October 31, 2017. Notice to Proceed is forecast on January 2, 2018.

c. Construction

In the ESA August 2017 Monthly Progress Report, MTACC reported that total construction progress reached 72.5% complete vs. 77.8% planned.

CM006 – Manhattan North Structures: As of September 1, 2017, MTACC decreased slightly its Forecast at Completion for CM006 to \$355,597,579. The MTACC forecast for Substantial Completion (SC) slipped to October 11, 2017 from August 31, 2017. Actual construction progress for August 2017 was 0.1% versus 0.0% planned. Cumulative progress through September 1, 2017, was 98.7% actual versus 100.0% planned.

Construction Progress: During October 2017, the CM006 contractor continued to complete remaining base contract work elements. The contractor continued punch list work items and completion of NCR work throughout the project.

CM007 - GCT Station Caverns and Track: MTACC reports in its August 2017 that through September 1, 2017, the forecast cost at completion for CM007 was reduced to \$706,954,378 from the previous \$712,311,733. The MTACC forecast for Substantial Completion is now June 6, 2020 from the previous April 6, 2020, approximately 129 calendar days later than the contractual date of January 28, 2020, due to continued impact from the delays in RTB (resilient tie block) and DFF (direct fixation fasteners) Special Track submittals & approvals. Actual construction progress for August 2017 was 1.9% versus 4.2% planned. Cumulative progress through September 1, 2017, was 21.4% actual versus 29.7% planned.

Schedule

Milestone #4 (Track & Third Rail Work Complete), August 7, 2019; previously December 27, 2019; now April 8, 2020 – Impacts to this milestone continues to be due to delays in LIRR review and approval of the Resilient Tie Block (RTB) submittals. Also impacted by this delay is Milestone #6A, Substantial Completion and Contract CS084, Traction Power Systems. Through October 31 2017, Special Trackwork submittals and approvals are outstanding. The contractor has, however, has begun both RTB & DFF trackwork where possible.

Track Installation – Through October 29, 2017, Cumulative track progress was at 7.1%. The Progress Curve shows this work starting approximately 6 months behind the Late Finish baseline date. Through October 29 setting of ties/plinths was at 12.1% complete, covering 7,467lf (linear feet) of track.

Precast Concrete Installation Overview –Through October 29, 2017, 69.7% of the precast had been set and completed (1,585 pieces out of an approximate 2,774). This percent complete reflects precast pieces set (including beams and deck), rebar installed, post tensioning/grouting, and concrete closure pours. Precast fabrication is complete.

Construction Progress: In the Caverns (East and West) the large cranes (2) have been demobilized and removed from the site.

South Back of House, East: Installation of rebar and placement of the last upper slab section nears completion. Stripping of Mezzanine and Upper Level shoring is scheduled for October 30, 2017.

South Back of House, West: The contractor continued with forming, rebar, and placement of Lower Level Platform walls.

North Back of House, East: Installation of electrical conduit continues throughout. Installation of HVAC piping is ongoing. Placement of Lower Level platform walls nears completion. Erection of CMU walls is complete.

North Back of House, West: Installation of electrical conduit continues throughout. Installation of HVAC piping is ongoing. Erection of CMU walls nears completion.

Cross Passageway #1: Installation of waterproofing, sub-soil drain, and drainage stone nears completion. Placement of invert is beginning.

Cross Passageway #2: Waterproofing nears completion. Installation of drainage stone, rebar, and placement of invert nears completion.

West Cavern: Waterproofing continues throughout wherever final rebar and lining is not complete. Post tensioning, removal of shoring, and closure pours continue after setting the beams. Installation of under platform conduit, fire standpipe, and ductwork at the Lower Level platform is ongoing. Excavation of, forming and placing Escalator #62 pit walls continues. Core drilling for anchor bolts replacement of anchor bolts in the arch is ongoing. Installation of smoke plenum precast is scheduled to begin installation October 31, 2017.

East Cavern: Waterproofing continues throughout wherever final rebar and lining is not complete. Placement of PAC wall liner follows waterproofing installation. Setting of Upper Level beams and precast panel decking continues and post tensioning, removal of shoring, forming/placing closure concrete follows.

Track: At Track WB1, placement of concrete plinths for the DFF track between Stations 157+45 & 153+45 continued. Setting of track and installation of temporary plates and fasteners is ongoing. Formwork and final alignment continues along Stations 149+50 – 145+50. At Tracks A & D, setting of the RTB and track is ongoing. At Track A, setting of ties, rail threading and clipping continues for the RTB track.

CM014A – Concourse and Facilities Fit-Out Early Work: MTACC reports in its August 2017 report that the forecast cost at completion for CM014A was reduced slightly to \$58,117,478 from the previous \$58,175,904. MTACC continues to report that Substantial Completion will be retroactively declared for, November 1, 2015. The MTACC Project Office has advised the PMOC that this retroactive date is the result of negotiations with the contractor and their bonding company, which have not yet been concluded. Cumulative construction progress remained at 96.4% versus 100.0% planned with 0% monthly progress. This has generally remained the same through 2Q2017 and into August 2017.

Construction Progress: During October 2017, the contractor cleaned all power equipment and associated rooms, and on October 16, 2017, after a walkthrough with the respective parties, the B30 Substation was turned over by MTACC to the CM014B contractor. The CM014B contractor is now responsible for operation and maintenance of the B30 Substation including the LIRR requirement to replace the installed stranded wiring with twisted wire. This will require shutting down the B-30 Substation to complete the work.

CM014B – Concourse and Facilities Fit-Out: Through September 1, 2017, MTACC reports in its August 2017 report that the forecast cost at completion increased to \$487,312,109 from the previous \$486,178,233. The forecast Substantial Completion date was extended to March 4, 2020 from a previous December 24, 2019. The contract continues to be impacted by earlier delays, including late critical structural steel submittals, fabrication, and delivery; late removal of existing unforeseen obstructions by MNR; and issues with the availability of subcontractors to perform finish work in the four (4) Wellways.

Actual construction progress for August 2017 was 2.7% versus 2.1% planned. Cumulative progress, as of September 1, 2017, was 43.1% actual versus 75.5% planned.

Schedule: The CCM reported that through October 31, 2017, the contract was approximately 45% complete.

Milestone #4 (Comm. Closets CC-C3, CC-C7, & Room B3265); was originally March 5, 2017; extended to May 25, 2017; then August 25, 2017; now April 1, 2018 – This milestone has been

further extended to April 1, 2018, due to continued slow progress in executing change order for FM200 issues; the required increase in the room size for Communications Closet CC-C7.

Milestone #5 (44th St. Vent Building) June 4, 2017 – This milestone has been extended to December 29, 2017. The CCM has temporarily placed installation to the ground level storefront on hold in order to allow for the CS179 contractor to deliver and install the fans. Fit-out of the interior is ongoing.

Milestone #5A (Completion of 48th St. Entrance) November 25, 2016 – This was delayed until October 2, 2017, and is now projected to April 3, 2018. The elevator shaft work is progressing. The elevator head house has been approved.

Structural Steel work is now the primary critical path. The Biltmore Room construction is now the secondary critical path. Through October 30, 2017, MTACC reported that structural steel erection was 20% complete by piece count and 23% complete by tonnage.

Construction Progress: Through September 1, 2017, surveying in the concourse continued and will be ongoing throughout this contract.

TA Force Account Work – Flagging is ongoing at Tracks #115, #123, and #125 for unloading of work trains.

Concourse (Madison Yard): Safety walkthroughs take place weekly and housekeeping, dust control and safety items are addressed daily and are ongoing. Flagging is ongoing where the work interfaces with MNR track operations. Tracks #115 & #125 are used for material/equipment/services into and out of the site. Stantec Repairs continue throughout and near completion. 3rd Party Inspections continue for concrete, shotcrete, rebar, masonry, bolting, welding, and firestops. Structural steel deliveries are ongoing and steel erection continues from south to north. Tube steel was completed in Shaft #4. Erection of joists and metal decking continues in Tiles 3613 and 3605. Electricians continued with installation of overhead conduits and feeders for the B20 Substation and MV cable pulling for Unit Substations 7 & 10. Work on available boxes for electronic doors continues. Installation of communication racks is ongoing in Tiles 3113 & 3114. Installation of fire line mains and branches in Tile 3127 and Service Corridor C3524 nears completion. Mechanical work continues with the installation of Air Handling Units (AHU) and Fan Coil Units (FCU) throughout the Concourse. Installation of steam piping to the Heating Plant nears completion. Painting of block walls and columns continues throughout Zones 1-4. Placement of the final concrete slab invert remains approximately 95% complete throughout the Concourse.

Shaft #4: Installation of Stair #23 continues and installation of sleeves nears completion.

Biltmore Connection: Conduit and relocation work continues at the Express Level at night. This work continues on the secondary critical path for the contract.

Biltmore El #22: The contractor has access to the 335 Madison Ave. building. Excavation of rock at the Concourse Level is complete and forming and placement of walls to the sub-basement level continues.

Wellways: Installation of sprinkler heads in the trusses is ongoing in the escalators in Wellway #1. Removal of rigging continues. In Wellway #2, all 4 escalators have been set. Splicing and fit-out of the units continue. In Wellway #3, ceiling grid installation continues, glass tile

installation is complete and curtain wall installation continues. In Wellway #4, installation of glass tiles nears completion.

Dining Concourse Connection: The schedule shows that In-Contract maintenance for the escalators has started, but recent site visits do not verify that.

Elevator T-01: Installation of Elevator #14 continues.

44th Street Vent Building: Installation of Elevator #12 continues. Storefront façade installation is on hold, pending installation of fans and resolution of the sloping sidewalk issue.

45th Street Cross Passageway (CPW): Elevator #21 is for the start of testing. Once testing is complete, In-Contract maintenance will begin.

47th Street Cross Passage: At Elevator #13 a Stop Work Order has been directed because the contractor has uncovered unforeseen conditions. The elevator shaft does not extend as far down as expected and needed to take the elevator down to the Concourse. The contractor will shore up the existing shaft walls and extend the shaft and the shaft walls. This work is also held up in the MTACC change order process.

East 48th St. Entrance: Backfilling north side under the decking nears completion. Formwork, rebar and preparation for the elevator shaft walls is ongoing. Work to install the hoist beam for stair installation, and installation of the Head House began.

East 50th St. Vent Building: The Vent Building is in full fit-out mode. Work includes installation of outlet wires, pull boxes, light conduit and light fixtures, and conduit for ConEd connection at the Property Line Boxes.

VM014 –Vertical Circulation Elements (Escalators & Elevators)

Status: Through September 1, 2017, MTACC reports in its August 2017 report that the forecast cost at completion has been reduced slightly to \$45,528,329 from the previous \$45,589,023. Forecast Substantial Completion remains April 24, 2020. There is no progress curve included in the report for this contract, but the PMOC is aware that Phase II, Fabrication, and Phase III, Installation, continues to progress. However, MTACC continues to report that, through August 2017, the contractor has completed 40.6% of the work. The Phase III (installation) portion of the contract is solely dependent on access availability provided by the CM007, CM014B, and upcoming CM015 contracts. The contractor continues to report that the access dates that they receive from the CM014B contractor continue to be extended and the PMOC projects that this contract substantial completion date will be extended.

Construction Progress: There are 47 total escalators and 21 total elevators currently in the contract.

Lift Net: The contractor is reviewing with Lift Net the emergency power signals going through the system controllers.

Elevator #10: LIRR has advised that there will not be a need for recall programming for this elevator/lift. LIRR Security is deciding whether they prefer to use a card reader control. PMOC Note: Elevator #10 is a non-personnel unit located in the through driveway in the 50th St. Vent Building and operates more like a street lift than a standard elevator. The contractor remains concerned that the current details for the elevator do not protect it from water, dirt, etc. They have provided recommendations to correct the problems but the CM has not finalized a response.

Elevator #12: This is the freight elevator in the 44th Vent Building, which opens to the street. Field dimensions taken by SEC indicate that the existing degree of slope in the sidewalk will impede construction of a level door sill for the elevator. This issue has been turned over to CM014-B for action. This contractor needs a Stop Work Order for the work from CM014B.

Fabrication & Delivery: The contractor confirmed the following delivery dates: EL #17 (44th St. Vent Bldg.) – January 18, 2018; EL #22 (Biltmore Rm) – February 18, 2018; First escalators for CM007 – July 18, 2018. However, in this meeting the contractor placed doubt on these dates by advising that in the weekly schedule updates from CM014B, the SEC access dates continue to be pushed back.

Biltmore Room Connection: The contractor has been previously advised by the CM014B contractor that they will not make any provisions to allow SEC to rig the Biltmore Room escalators into place. At this meeting the contractor further advised that the CM014B contractor still hasn't answered the most recent RFI on the rigging. It will take 2-3 weeks to have any rigging plan approved. This affects the manufacturing process of these units, which is currently underway.

Systems Contracts:

CS084 - Tunnel Systems Package 4 – Traction Power Systems - The information presented for this CS084 contract comes from discussions at a mid-October 2017 Progress Meeting that reviewed contract progress up to October 9, 2017, and from the MTACC's August 2017 ESA Monthly Progress Report (MPR).

Status: In its August 2017 ESA Progress Report (MPR), MTACC reports that the Budget and Forecast for the CS084 contract remained at the \$79,717,772 level previously reported. MTA indicates that the Substantial Completion (SC) date for this contract, which it previously reported was in June 2020, has now slipped to September 2020 due to delays forecast for the installation of track under Contract CM007. The contractor's most recent schedule update (data as of the end of October 2017) shows an August 2020 substantial completion date; a three-month slippage from the previous month's forecast of June 2020. The "Design" section below provides more details regarding this and other design issues identified by the contractor. In its August 2017 MPR, MTACC indicates that the 2.6% work progress during the period was significantly higher than the planned 1.1% amount; and, MTACC reports an actual cumulative progress at 15.6% versus a planned 68%. While these numbers are based on actual versus projected costs, not physical construction efforts, the actual versus planned progress numbers indicate that this contract continues to be significantly behind schedule; and, falling further behind schedule on a month-to-month basis. The contractor continues to contend that the variance in the actual versus planned progress is because: 1) funds have not been expended as originally projected due to delays in approving the substation designs and equipment; 2) fabrication of the substations and procurement of equipment cannot progress until designs are approved; and, 3) the lack of access to substation rooms contributed, and in some cases continues to contribute, to the preclusion of the contractor from performing construction activities. The contractor continues to indicate that all of the contract Milestones are delayed as a result of delays associated with the approval of substation designs and the resolution of Supervisory Control and Data Acquisition (SCADA) requirements. The PMOC continues to recommend that, in order to make tracking of actual versus planned progress more useful as a management tool, MTACC and the contractor should consider modifying the MTACC's Progress Curve to reflect the current and projected progression of the contract.

Design Progress: The contractor continued with the transmission of contractual submittals and its design development of the substations and various equipment. The contractor continues to assert that previous delays in receiving comments back from MTACC on the C08 facility switchgear, SCADA requirements, PLC information, and general C08 substation design impacted its ability to meet its own original design, procurement, fabrication, and installation schedules. Over the last several months, the GEC's submittal/comment review duration significantly improved. However, despite continued interaction by MTACC senior management with LIRR senior management, the LIRR's submittal/comment review process is still in need of improvement and remains an item of concern. The design of the C08 Substation continues to be the primary critical path for the contract; and, the continuing delay in approving the designs for this location are, per the contractor, causing a day-to-day delay in the overall contract schedule. The main issue now is the need for a re-design of the C08 communications and storage rooms, as all the communications and systems equipment being supplied by the CS179 contractor will not fit in the established communications room as currently designed. The CS084 contractor advised MTACC that it needs information about the communications equipment and its requirements to re-design the C08 rooms and ensure that all structural requirements for the pre-fabricated building are adequate. One other potentially major design issue was identified in October 2017 that is related to cable size requirements for the C06/C07 substations. MTACC is investigating the issues and will determine if any contract changes are needed. The PMOC continues to have concerns about the length of time it is taking to address the various design approval issues.

Construction Progress: The PMOC previously reported that the modification for the completion of the extra L3 Electrical Service work was issued and that both the contractor and MTACC wanted to complete the work in August 2017. However, the scheduling of that work has proven to be elusive; and, the work is now scheduled for mid-November 2017. Other than the contractor performing site surveys and meeting with other contractors on coordination issues, the only active on-site construction work taking place at this time on the CS084 contract is cable tray installation work at the Vernon (C05) facility. The work at this location is limited because there are still open issues that require remediation action by the CS179 contractor – water infiltration is one of them; and, an MTACC-issued Stop Work Order (SWO) will remain in effect until MTACC issues a contract modification to address issues with the Traction Power Substation (TPSS) room. Over the past several months, the contractor performed pre-turnover inspections of the eight substation areas. The contractor developed and presented to MTACC what the contractor contends is a “deficiencies” list precluding it from either beginning construction activities in, or completing designs for, the specific facilities. Of the eight substation facilities in the CS084 contract, only one, the C04 substation, is not noted with any deficiencies precluding the start of construction by the contractor. MTACC is reviewing the list for validity and indicates that it will take any required appropriate action. However, both MTACC and the contractor are reviewing the possibility of re-sequencing the order of work in the substations to begin the C04 work as soon as possible. In past reports, the PMOC noted a significant issue regarding the installation of traction power feeder cables from the C08 substation to the tracks, due to the lack of MTA-supplied ductwork and manholes between the substation foundation and the track. MTACC indicates that the installation of this manhole and ductwork system will be done under Contract CH058A; which, per MTACC's August 2017 MPR, is scheduled for advertisement in January 2018 and Notice to Proceed in June 2018. The PMOC previously raised concerns with MTACC that surveys of the remaining substation to determine the availability and viability of conduit and manhole systems between the substations and the tracks had not been conducted. To date, no additional surveys have been

conducted and this concern and a recommendation on addressing the concern are noted in Section No. 7 of this report.

CS179 – Systems Package 1 – Facilities Systems: In its August 2017 Monthly Progress Report (MPR), the MTACC notes that the contract Forecast cost of \$605,590,857 once again falls within the established \$606,938,540 Budget. In its August 2017 MPR, MTACC shows a progress curve for the CS179 contract that presents actual contract progress as 59.5% versus a planned 60.3%. While these numbers imply that the contractor has made significant progress over the last several months, it is noted that these progress percentages are based on actual versus projected costs, not physical construction efforts. Further, the “planned” progress is based on the original contract scope and planning, which does not take into account any approved or anticipated scope changes. In its August 2017 MPR, MTACC reports that the Substantial Completion (SC) date for this contract slipped almost two months, to November 29, 2020 from October 1, 2020, since its last report. This slippage is, per MTACC, due to impacts from the handover of the caverns under the CM007 contract. The contractor continues to show an SC date as being on-target for July 1, 2020. However, MTACC questions the validity of the contractor’s schedule because of numerous disagreements over logic ties, activity durations, out of sequence activities, and the contractor’s ability to complete over 5,000 activities by September 1, 2018 to begin the Integrated Systems Testing (IST) . The PMOC agrees that the contractor’s schedule appears to be unrealistic, especially considering that at the most recent contract Progress meeting, the contractor acknowledged that its schedule: 1) is based on the premise that all submitted designs are final; 2) considers that all field work is “a go” as currently understood; 3) [REDACTED] 4) does not take into consideration any impact from the 47 open NOCs it submitted; and 5) does not address any impacts to the contract work from Stop Work Orders (SWOs) that remain in effect past the data date of the schedule. MTACC indicates that it wants all parties to develop a “realistic” schedule by the end of November 2017. MTACC’s August 2017 MPR indicates that two contract Options must still be executed; however, as the PMOC reported in its last report, all 11 of the identified contract Options were exercised by the end of July 2017. The three previously reported Buy/Ship America issues that pose schedule risks to the completion of this contract (HVAC units, public address system speakers, and video monitor display panels) remain as unresolved items. There are also 47 NOCs of Change (NOCs), 40 of which MTACC agreed to issue Contractor Proposal Requests (CPRs) for, that are contributing to the contractor’s ability to finalize its system designs.

Design Progress: Only 7 of the 10 Control System Final Designs (FDs) are approved at this time; making this critical activity 20 months late. This lack of approval of the Control System FDs raises the risk that if the LIRR, for whatever reason, does not approve any specific Control System’s final design, any equipment already procured for that particular Control System might need to be replaced to meet the LIRR requirements. The contractor is also responsible for the design, installation, and testing of 19 “Non-Control” systems; several of which have design progress falling behind schedule due to impacts from the open NOC/CPRs and design clarifications needed from the MTACC. The contractor is moving forward with the fabrication of equipment racks based on its interpretation of the FDs it submitted, even if the FD is unapproved; raising the risk that assembled racks may require modification if the FDs, as submitted, need to be changed.

Construction Progress: In October 2017, the CS179 contractor continued with a substantial amount of various elements of work (installation of conduit, cable, fire stopping, fire standpipe,

lighting, etc.) in the tunnels and at the various substation facilities where access was available and conditions warranted. Coordination issues with other contractors, unexpected field conditions, unresolved design issues, and open NOCs/CPRs continue to impact further progress; and, a number of Stop Work Orders (SWOs) are in effect as a result.

Contract VS086, Systems Package 3, Signal Equipment Procurement: The information presented below for the VS086 contract comes from discussions at a mid-October 2017 progress meeting that reviewed contract progress up to October 19, 2017, and from the MTACC's August 2017 ESA Monthly Progress Report (MPR). In its August 2017 MPR, MTACC indicates a Budget of \$21,835,022 for this contract; and, due to potential modifications to add Positive Train Control (PTC) to the design and to modify the Plaza Interlocking design to accommodate a LIRR-requested change, a Forecast cost of \$22,064,475. MTACC continues to show an October 14, 2019, SC date. In July 2017, MTACC issued a contract modification to adjust the interim milestones for this contract. However, in October 2017, both MTACC and the contractor agreed that the contract milestones need to be re-baselined again to address open design, fabrication, and testing issues noted in previous PMOC reports and in the Design section below. It is unclear when this schedule refinement will take place; or, if it will impact the overall substantial completion date of this contract.

Design Progress: As has been observed on other ESA Systems contracts being managed by MTACC, the contractor continues to raise concerns over the timeliness of responses from the MTA on design submittals and inquiries and asserts that this lack of timely responses caused, and continues to cause, day-to-day delays in the progression of the work. The contractor continues to indicate that the design of the Plaza Interlocking is a critical design that needs to be completed without delay and that there are several other design issues that required a resolution or direction from the MTA. There are five major design issues cited by the contractor that continue to impact progress towards design completion. The five issues are: 1) Light Emitting diodes (LEDs) for tunnel lighting signal units; 2) use of TRU-III track circuit equipment; 3) inclusion of Positive Train Control (PTC) in the signal design; 4) design and use of ATT-20 track circuit equipment; and, 5) use of Low-Smoke-Zero-Halogen (LSZH) case wiring.

- 1) LEDs for Tunnel Signal Units: The contractor is supplying the LIRR with a sample lighting unit for evaluation. The LIRR needs to determine if the proposed unit is acceptable. No date for the completion of that evaluation or decision is available at this time. However, the contractor notes that its current design utilizes incandescent bulbs for lighting and the use of LEDs will necessitate a re-design effort that could further impact contract milestone dates.
- 2) TRU-III Track Circuit: The LIRR reported that field testing of the demo equipment provided by the contractor started in October 2017 and should be completed within eight months. A date for reaching a decision about the use of this type circuit remains undetermined; and, even though it could pose a significant risk to the timely completion of the VS086 contract, this entire activity is not incorporated into any VS086 contract schedule.
- 3) Positive Train Control: The contractor must incorporate any PTC design into its overall signal design. While a Memorandum of Understanding (MOU) between the LIRR and MTACC was established to address administrative elements of the incorporation and implementation of PTC, the technical requirements that need to be incorporated into various ESA Systems are included in the "Technical Concurrence Document" that is

currently in review and needs to be agreed upon by all parties. In its August 2017 MPR, MTACC notes that once the technical requirements are finalized, a modification to the VS086 contract must be developed and executed before the contractor can complete its final design. MTACC further notes that any impact on overall design completion, equipment procurement, and schedule can only be determined when the modification is approved. The VS086 contractor has already raised concerns about the delay in identifying technical PTC requirements, indicating that any LIRR requirements that might cause a change in the “current direction (unspecified)” of the VS086 design, could have an adverse impact on design, equipment, and schedule.

- 4) ATT-20 Track Circuit: The contractor continues to note that the addition of the ATT-20 track circuit may impact interim milestone dates for delivery of equipment; a risk the PMOC noted in its previous reports. MTACC has yet to develop and issue a contract modification to add the use of the ATT-20 track circuit to the contract. The potential impact, if any, to the contract schedule can't be quantified until the modification is finalized and issued.
- 5) LSZH Wiring: The contractor provided LSZH wire samples from two alternate wire manufacturers to the MTA for evaluation and a Field Change Request (FCR) to MTACC to request approval of one of the two wire samples. The LIRR needs to evaluate the two samples and determine if either one is approved for use. The requirement to use LSZH wiring for the Plaza Interlocking signal cases is a disputed item in that the LIRR insists that it is a contract requirement, while the contractor indicates that there is a conflict in the contract documents that might allow the use of regular, non-LSZH wiring, in the signal cases. Nevertheless, both MTACC and the contractor agree that the resolution of this LSZH issue will delay the delivery of the signal cases for the Plaza Interlocking; and, consequently, the Factory Acceptance Test (FAT) of the Plaza Interlocking. The impact, if any, on the contract milestones or overall substantial completion date cannot be quantified until a new FAT date is established.

Queens Contracts:

CQ032 – Plaza Substation and Queens Structures: **CQ032 – Plaza Substation and Queens Structures:** As of September 1, 2017, MTACC reported that the Forecast at Completion for CQ032 decreased slightly to \$263,175,577. MTACC reports the Forecast for Substantial Completion (SC) slipped to October 30, 2017 from September 29, 2017 last month. ESA reported SC was not achieved, and now forecasts this to occur December 1, 2017. Actual construction progress for August 2017 remained 0.0% versus 0.0% planned. Cumulative progress through September 1, 2017, is 99.3% actual versus 100.0% planned.

Construction Progress: During October 2017, the CQ032 contractor continued punch list work and the preparation of close-out deliverables. ESA reported that SC remains dependent on completing these items: as-built information, O&M Manuals, training, NCR resolution, etc. ESA also reported discussion to further remediation effort to deal with the ongoing water infiltration at the previously designated Early Access Chamber (EAC) and TBM Launch Block areas.

CQ033 – Mid-Day Storage Yard Facility: As of September 1, 2017, MTACC reported the Forecast at Completion for CQ033 remained at \$308,045,850. The MTACC Forecast for Substantial Completion remained at August 10, 2020. A progress curve for CQ033 has not been established yet, so no monthly or cumulative progress is available.

Construction Progress: During October 2017, the CQ033 contractor continued Yard Lighting foundation installation and began pole installation, continued detention pipe installation, completed Yard Master and NYAR building demolition work, and the first weekend track outage for the Montauk Bridge demo was completed at month's end.

Harold Interlocking Contracts:

CH057A – Part 3 Westbound Bypass: MTACC's Forecast at Completion for the CH057A contract decreased slightly to \$162,558,642 during August 2017. The MTACC forecast for Substantial Completion was reset to October 30, 2017, as a result of negotiations between MTACC and the contractor to end the contract (as explained below). Actual construction progress for August 2017 was 0.9% versus 5.4% planned. Cumulative construction progress through August 31, 2017, was 55.8% actual versus 91.4% planned (based on cost incurred rather than actual construction).

Construction Progress: During October 2017, the CH057A contractor continued to demobilize and remove its equipment from the Westbound Bypass worksites as MTACC and the contractor continued to negotiate terms to end the contract. Uncompleted work scope from CH057A will be transferred to an untitled future contract.

CH061A – Track A Cut and Cover Structure: MTACC's Forecast at Completion for the CH061A contract decreased slightly to \$42,061,740 during August 2017 due to execution of a contract modification. The MTACC forecast for Substantial Completion remained at May 28, 2018. Actual construction progress for August 2017 was 6.9% versus 11.2% planned. Cumulative progress through August 31, 2017, was 25.0% actual versus 52.0% planned (based on cost incurred rather than actual construction progress). This discrepancy is largely due to the previous delay in obtaining NYCDOT approval to underpin the 39th St. overhead bridge, but recent construction has begun to reduce the lag in actual versus planned progress.

Construction Progress: During October 2017, the CH061A contractor continued to excavate the flowable fill at the west end of the Tunnel A Approach Structure that was originally installed by the CQ031 contractor, continued to construct mechanical room facilities, support of excavation (SOE), and poured a concrete invert west of the 39th St. bridge, began grading the Approach Structure east of 39th St. bridge, and continued miscellaneous preparations to install catenary poles at the Montauk Cutoff and LIRR PW2 Track jobsites.

Railroad Force Account Contracts:

FHA01 – Harold Stage 1 Amtrak: MTACC's Forecast at Completion for FHA01 remained at \$18,824,861 during August 2017. The MTACC forecast for Substantial Completion remained at July 7, 2018. Actual construction for August 2017 was 0.0% versus 0.0% planned. Cumulative construction through August 31, 2017, was 98.9% actual versus 100.0% planned (based on cost incurred rather than actual construction).

Construction Progress: Amtrak did not perform any significant direct FHA01 construction during October 2017.

FHA02 – Harold Stage 2 Amtrak: MTACC's Forecast at Completion for FHA02 remained at \$66,440,848 during August 2017. The MTACC forecast for Substantial Completion remained at July 7, 2018. Actual construction progress for August 2017 was 0.4% versus 0.0% planned.

Cumulative progress through August 31, 2017, was 89.2% actual versus 86.7% planned (based on cost incurred rather than actual construction).

Construction Progress: During October 2017, Amtrak Electric Traction (ET) personnel continued to make miscellaneous catenary modifications at the B907W, B908, B923, B924, B929 catenary structures and completed installation of the F-4S3 catenary switch.

FQA65 – Loop Interlocking Amtrak: MTACC’s Forecast for Completion for FQA65 remained at \$33,287,863 during August 2017. The MTACC forecast for Substantial Completion remained at July 29, 2023. Actual construction progress for August 2017 was 0.0% versus 0.4% planned. Cumulative progress through August 31, 2017, was 19.1% actual versus 86.9% planned (based on cost incurred rather than actual construction). The PMOC is not concerned about this large discrepancy due to the current forecast Substantial Completion date.

Construction Progress: Amtrak did not perform any significant direct FQA65 construction during October 2017.

FHL01 – Harold Stage 1 LIRR: MTACC’s Forecast at Completion for FHL01 remained at \$24,379,364 during August 2017. The MTACC forecast for Substantial Completion was extended by 9 days to April 18, 2018. Actual construction progress for August 2017 was 1.5% versus 0.0% planned. Cumulative progress through August 31, 2017, was 100.0% actual versus 100.0% planned (based on cost incurred rather than actual construction).

Construction Progress: During October 2017, LIRR 3rd Rail personnel continued installation of and began termination of 3rd rail cables into the new G02 Substation. 3rd Rail personnel also continued to install 3rd rail and snow-melt cables at various new turnouts in Harold Interlocking.

FHL02 – Harold Stage 2 LIRR: MTACC’s Forecast at Completion for FHL02 increased to \$96,564,345 during August 2017, although MTACC did not explain the increase. The PMOC notes, however, that this is the MTACC budget for FHL02 and all Force Account funding has historically been allocated as the need arose. Actual construction progress for August 2017 was 1.5% versus 0.0% planned. Cumulative progress through August 31, 2017, was 90.0% actual versus 100.0% planned (based on cost incurred rather than actual construction).

Construction Progress: During October 2017, LIRR Signal personnel continued FRA pre-testing at the new “H1”, “H2”, “H5”, “H6”, and Location 30 CILs and successfully completed 3 of a total of 6 55-hour pre-cutover testing weekends. Additionally, LIRR Signal personnel completed installation of signal conduits to the #6197E and #6197EA switch machines and signal cable installation between the phase break and the “H5” CIL. LIRR Communications personnel installed communications cable between the phase break west of new “H2” CIL and “H1” CIL. LIRR 3rd Rail personnel continued to install and terminate 3rd rail cables from trackside locations into the new G02 Substation.

d. Quality Assurance and Quality Control

Quarterly Quality Oversight (QOQs): QOQ audits for the second quarter of 2017 were performed in September 2017. The contractors have been advised of their respective audit results and findings and the reports have been issued. Construction contract auditing follows the quality audit format established in the first quarter of 2017. This format augments the original QOQ element-based approach with an additional task and process-based approach which are combined in calculating an aggregate score. The third quarter 2017 QOQ Audits begin in November 2017.

Table 1.1 summarizes the most recent QO Audit results.

Table 1-1 – Second Quarter 2017 Quality Audit Results

Contract	Overall Score	Product	Score	Process	Score
CH057	89%	§05650 Track	93%	§01450	87%
CH057A	87%	§03300 Cast-in-Place Concrete	92%	§01450	84%
CS179	74%	§13916 Fire Sprinkler	71%	§01450	82%
CH061A	87%	§02269 Soldier Piles/Lagging	94%	§01450	85%
CM014B	95%	§05120 Structural Steel	100%	§01450	93%
CM007	92%	§03361 Pneumatically applied concrete	94%	§01450	91%
CM006	88%	§03300 Cast-in-Place Concrete	87%	§01450	88%

Nonconformance Reports (NCRs): Table 1.2 provides a summary of NCR status for the major active ESA contracts, as provided in MTA-ESA September 2017 contractor NCR logs. The table shows the numbers of NCRs that are closed, open for less than 90 days, and open for more than 90 days. NCR data is included for the most active ESA construction contracts over the most recent four quarters for which data is available.

Table 1-2– NCR Aging Summary

Contract	Criteria	4Q 2016	1Q 2017	2Q 2017	3Q 2017*
CM007	< 90 days Open	N/A	2	7	17
	> 90 days Open	N/A	N/A	1	2
	Total Open	N/A	2	8	19
	Total Closed	N/A	--	2	3
	Total NCRs	N/A	2	10	22

Contract	Criteria	4Q 2016	1Q 2017	2Q 2017	3Q 2017*
CM014B	< 90 days Open	--	--	--	3
	> 90 days Open	2	7	8	5
	Total Open	2	7	8	8
	Total Closed	15	19	18	22
	Total NCRs	17	26	26	30
CQ032	< 90 days Open	3	5	3	--
	> 90 days Open	1	1	5	15
	Total Open	4	6	8	15
	Total Closed	92	94	95	96
	Total NCRs	96	100	103	110
CH053	< 90 days Open	--	--	--	--
	> 90 days Open	1	--	--	--
	Total Open	1	--	--	--
	Total Closed	90	91	91	94
	Total NCRs	91	91	91	94
CH057	< 90 days Open	7	5	6	--
	> 90 days Open	4	--	1	6
	Total Open	11	5	7	6
	Total Closed	--	11	15	18
	Total NCRs	11	16	22	24
CH057A	< 90 days Open	7	1	1	1
	> 90 days Open	3	3	3	2
	Total Open	4	4	4	3
	Total Closed	10	13	13	16
	Total NCRs	14	17	17	19
CS179	< 90 days Open	9	4	--	3
	> 90 days Open	7	13	15	12
	Total Open	16	17	15	15
	Total Closed	15	18	20	24
	Total NCRs	31	35	35	39

*Note: The 3Q 2017 PMOC data is from the MTA-ESA September 2017 NCR

controlled by CH061A: Tunnel A, then CQ033. Following is a more detailed discussion of the progress and changes to each area's longest path.

Program Critical Path-Harold Interlocking:

ESA reported in its September 1, 2017 IPS that the Program critical path remains running through work in Harold Interlocking. However, over the update period additional CH058A and FHL04 activities were added to the critical path, delaying the forecasted Target RSD by 63 calendar days, from February 21 to April 15, 2021. ESA indicated that this was due to constructability reviews that caused revisions to the planned work in these areas. [REDACTED]

[REDACTED] It should be noted that CH058A is expected to be awarded early next year and a review of the Contract milestones to determine any additional impact to the Program will be important.

Table 2.2, below, shows the current IPS critical path of work through Harold contracts. The progress made through the update period and any major changes made to the IPS are described in further detail below the table:

Table 2-2: September 1, 2017 IPS Critical Path

Contract & General Activities	Duration (CDs)	Start	Finish
FHL02: CIL Cutovers Pre-Testing and Cutovers	261	1-Sep-17	20-May-18
CH057D/FHA03/FHL03/FHL04: NE Quadrant Preparatory Work, Outage, and B/C Approach Preparatory Work, Switch Work	160	21-May-18	28-Oct-18
FHL02: Harold CIL Decommissioning	28	29-Oct-18	26-Nov-18
CH058A: Track B/C Approach Work & Catenary Structures	665	26-Nov-18	21-Sep-20
FHL04: Testing & Cutover of 4C	84	23-Sep-20	16-Dec-20
Train Contract Staffs LIRR Prior to 3 Months Period	31	17-Dec-20	17-Jan-21
LIRR 3 Month Period	89	18-Jan-21	17-Apr-21
Target Revenue Service Date			15-Apr-21
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Late Revenue Service Date			13-Dec-22

Discussion of Progress along the Critical Path:

As of August 1, 2017, the start of the update period, controlling critical activity FHL02-CSR1230 had a remaining duration of 9 work days on a 5-day calendar, and was expected to complete on August 11, 2017. The August 1, 2017 update also showed that successor critical path activities FHL02-CSR1240 and FHL02-CSR1270 were to occur sequentially in a finish-to-start logical relationship:

Figure 2-1: August 1, 2017 IPS Initial Critical Path

Activity ID	Activity Name	Current Duration	Start	Finish
FHL02-CSR1230	H1/H2/H5/H6/30 TSR Pre-cutover testing	9	29-Apr-17	11-Aug-17
FHL02.MS.00095	Cutover #L-2 Service for H3, H4 CIL's	0		01-Aug-17
FHL02-CSR1240	H5/H6/30 South Pre-Cutover Testing	50	14-Aug-17	23-Oct-17
FHL02-CSR1270	H1/H2/30 North Pre-Cutover Testing	80	24-Oct-17	15-Feb-18

The September 1, 2017 IPS shows that over the update period, controlling critical path activity FHL02-CSR1230 actually completed on August 25, 2017, a delay of 11 calendar days. However, this update also showed retroactive out-of-sequence (OOS) actual start dates for successor activities FHL-CSR1240 and FHL-CSR1270 in July; it is unclear why this wasn't captured in the August 1, 2017 IPS update. Additionally, other contemporaneous documents provided to the PMOC show this work started on August 28, 2017. Therefore, the PMOC has concerns regarding the accuracy of the dates in the IPS, which is a major concern.

The August 1, 2017 IPS update showed critical path activity FHL02-CSR1240 was planned to start after the completion of FHL02-CSR1230, on August 14, 2017, and had a remaining duration of 50 work days, with an expected completion date of October 23, 2017. The September 1, 2017 IPS shows an actual start date of July 3, 2017 for FHL02-CSR1240, and a remaining duration of 45 work days, giving a new forecasted completion date of November 3, 2017 – a delay of 11 calendar days. Similarly, the August 1, 2017 IPS update projected that critical path activity FHL02-CSR1270 was to start after the completion of FHL02-CSR1240, on October 24, 2017, and complete after 80 work days on February 15, 2018. The September 1, 2017 IPS update reported that FHL02-CSR1270 actually began on July 7, 2017, and has a remaining duration of 77 work days, giving an expected completion date of February 23, 2018 – a delay of eight calendar days.

Figure 2-2: September 1, 2017 IPS Initial Critical Path

Activity ID	Activity Name	Original Duration	Remaining Duration	Activity % Complete	Start	Finish
FHL02-CSR1230	H1/H2/H5/H6/30 TSR Pre-cutover testing	15	0	100%	29-Apr-17 A	25-Aug-17 A
FHL02-CSR1240	H5/H6/30 South Pre-Cutover Testing	50	45	10%	03-Jul-17 A	03-Nov-17
FHL02-CSR1270	H1/H2/30 North Pre-Cutover Testing	80	77	3.75%	07-Jul-17 A	23-Feb-18

The progress of the critical path activities is extremely slow. For example, FHL02-CSR1240 began on July 3, 2017, and as of the data date (September 1, 2017), had made 5 work days of progress out of a planned duration of 50. This equates to 5 days of work over a period where the “FA – 5 Day per week” calendar is shown with 42 work days available. Similarly, the successor critical path activity FHL02-CSR1270: H1/H2/30 North Pre-Cutover Testing, was reported to have made three work days of progress over a period shown to have had 39 work days available. The September 1, 2017 IPS Report makes no mention of this lack of progress, but states that the IPS maintains the May 2018 cutover dates.

Over the update period, the planned completion of all critical Harold CIL Pre-Cutover testing shown in the IPS changed from February 15 to 23, 2018; a critical path delay of eight calendar days over the update period. However, this critical delay has been absorbed by schedule revisions to the remaining activities in the CIL pre-cutover testing sequence, noted in more detail below. The lack of progress made along these critical path activities is worrisome and it appears that the MTACC is using schedule revisions as way to keep a forecasted end date from changing.

Discussion of Changes to the Critical Path:

Between the August 1 and September 1, 2017 IPS updates, schedule revisions were made which affected the Program’s critical path through Harold work. [REDACTED]

[REDACTED] This revision kept the same forecasted cutover dates about the same between the schedule updates. The remaining critical path contained no changes until November 26, 2018.

Additional schedule revisions to forecasted CH058A and FHL04 work, indicated to have been the result of constructability reviews, affected the Program’s critical path after November 26, 2018. The IPS Report states that:

The changes were made to the CH058A schedule which increased the construction duration of the contract. This is primarily due to the introduction of a revised CH058A construction schedule based on a modified construction staging plan and updated production rates. As a result, the critical path of CH058A has shifted to the construction activities for 39th street underpinning and the completion of the track work for the B/C Approach Structures. The substantial completion date for CH058A is now September 25, 2020 compared to August 21, 2020 in the previous IPS update. The change also pushed out the Cutover Stage 4C, LIRR Testing and the Revenue Service date by 65 calendar days. [REDACTED]

As a result of these changes, new CH058A and FHL04 activities were added to the critical path over the update period, essentially adding one month to critical CH058A work and one month to critical FHL04 work. This doubled duration of critical FHL04 work – from 49 calendar days to 84 calendar days. [REDACTED]

90-Day Look-Ahead of Program Critical Milestones:

Table 2.3, below, shows the Program-critical dates in the IPS forecasted to occur within the next 90 days, as reported in the September 1, 2017 IPS.

Table 2-3: Program Critical Dates 90 Day Look-Ahead (from ESA September 1, 2017 IPS)

Activity ID	Activity Name	Start	Finish	[REDACTED]
FHL02-CSR1240	H5/H6/30 South Pre-cutover Testing	3-Jul-17 A	3-Nov-17	[REDACTED]
FHL02-CSR1270	H1/H2/30 North Pre-cutover Testing	7-Jul-17 A	23-Feb-18	[REDACTED]

Sub Program Longest Path – Manhattan/Systems:

The September 1, 2017 IPS Report notes that the Manhattan/Systems longest path changed over the update period. The August 1, 2017 IPS showed the longest path controlled by CM007 Resilient Tie Block (RTB) approvals and then CM007 trackwork, leading into CS086 work. The September 1, 2017 IPS shows the longest path still controlled by CM007, but now electrical submittal

activities and West Cavern electrical work control the path, leading into CS179 work. It appears that this was a result of schedule revisions made by the PMT:

CM007 IPS schedule was revised to reflect the contractor's correction to durations of certain track work activities per Specification Section 01140. The change resulted in an improvement to the substantial completion from 7/17/2020 last month to 6/5/2020 for the current update. However, the interface between CM007 and CS179 in the caverns is not correctly represented by the contractor in either the CM007, CS179 construction schedules or in the composite schedule. In order for CS179 to perform IST for the BCS and the field network, closets in the GCT cavern must be turned over from CM007. The PMT has revised the IPS to reflect the proper sequencing ahead of the contractor's revisions.

The PMT also noted that revisions to the IPS concerning interfaces between CM007 and CS179, and the CS179 IST tasks and logic, should be expected to continue as more details are developed.

Sub Program Longest Path – Queens:

ESA also reported a change to the longest path of the Queens path of work. The August 1, 2017 IPS update showed the longest path to be all CQ033 work, while the September 1, 2017 IPS update shows the initial critical path to be controlled by CH061A work, and then lead into CQ033 work. The longest path activities for the CQ033 contract also changed, from previously being controlled by substation work, to currently being controlled by catenary, track and switch, utilities, and signal cable work to substantial completion, forecasted to occur on August 10, 2020. The forecasted substantial completion date for CQ033 has not changed over the previous three months.

Upcoming Contract Procurements:

Table 2.4, below, shows the status of current and upcoming Contract procurements, as reported in the September 1, 2017 IPS Progress Report, with a discussion of any changes below the table.

Table 2-4: Future Procurement Schedule

Contract Description	Advertise Date	Bid Date	NTP	Project Period	Substantial Completion
CM015 48th Street Entrance**	TBD	TBD	11/22/2017*	TBD	8/18/2020*
CS086 Systems Package 2: Signal Installation	8/10/2017 A	10/17/2017	1/2/2018	35 Months	7/01/2020
CH058A: B/C Tunnel	1/4/2018	4/17/2018	6/18/2018	27 Months	9/25/2020
CH057D: Harold Trackwork	10/26/2017	1/29/2018	2/28/2018	15 Months	6/2/2019

*The table in the September 1, 2017 IPS Report shows these values as "TBD." The dates above were taken from the IPS schedule file itself.

**MTACC reports that design work on this contract was suspended in June 2017.

The procurement process for CM015: 48th Street Entrance continue to be on hold. The June 1, 2017 IPS Report notes ongoing discussions with the building owner regarding zoning changes. The forecasted NTP and substantial completion dates shown in the September 1, 2017 IPS reflect a day-for-day delay over the previous quarter. The IPS Report notes that the discussions are still ongoing.

The procurement process for CS086: Systems Package 2: Signal Installation has progressed as forecasted over the update period; however, the expected project period increased by two months.

This impacted the planned substantial completion date, which was delayed from October 1 to November 30, 2020 over the update period.

The forecasted procurement dates for CH057D: Harold Trackwork, all remained relatively the same over the IPS update period.

The forecasted advertise date for CH058A: B/C Tunnel were all delayed by approximately one month over the IPS update period; but the remaining planned procurement dates remained the same. However, the planned project period increased by one month, giving a one-month delay to the forecasted substantial completion date, from August 21 to September 25, 2020.

PMOC Concerns:

The following summarizes the PMOC's concerns about the IPS:

1. The PMOC is concerned with the continued schedule revisions to the Program's critical path, which appear aimed primarily at keeping a forecasted end date from changing.
2. The PMOC is also concerned about the discrepancy between dates shown in the IPS and other contemporaneous MTACC documents for critical path activities. Related to this issue is the retroactive recording of actual dates for critical path activities FHL02-CSR1240 and FHL02-CSR1270, which should have been captured in the August 1, 2017 IPS update.
3. The PMOC remains concerned with the lack of progress on CS084. The June 1, 2017 IPS reports that CS084 is currently at 12% complete compared to a plan of 72% complete. Very little progress was made over the previous few IPS updates and ESA has stated that it hopes to achieve an improved fabrication schedule once all equipment is approved. This may take a long time, as the May 1, 2017 IPS projects the last piece of major equipment submittal to be approved on April 30, 2018 (CO3: 55th Street – various equipment submittals). [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] However, the PMOC is concerned that the CM084 contractor will not be able to achieve any substantial schedule recovery. The resulting delay to the forecast Substantial Completion may now be controlling the Manhattan/Systems schedule path. [REDACTED]

4. [REDACTED]
[REDACTED]
[REDACTED] This is significant and indicates that achieving the February 2021 RSD is potentially at risk.

3.0 COST DATA

Funding: The ESA PMT is investigating ways to utilize existing funds until they can be supplemented in the 2020–2024 Capital Plan to provide for several anticipated cost increases. [REDACTED]

[REDACTED]

Budget/Cost: The PMT reported in the August 2017 Monthly Progress Report that the actual total project progress was 72.8% compared with planned progress of 76.7% of the \$10.178 billion Current Baseline Budget (CBB). The ESA August 2017 Monthly Progress Report also shows that actual construction progress reached 72.5% of the CBB compared with planned progress of 77.8%, based on invoiced construction costs. (Details of the project budget and expenditures are shown in Appendix B, Tables 2 and 3.)

As related to the previously reported cost increases, an ESA study in 2016 by the PMT indicated that \$111.4 million in additional Amtrak and LIRR Force Account (FA) costs would be needed to complete the ESA FFGA scope (Revenue Service), while \$245 million in additional FA costs will be needed to complete the full Harold 14-4M alignment, including the Regional Investment scope. It was also previously reported that it was anticipated that an additional \$191 million would be needed to fund the OCIP insurance program through February 2022.

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Change Orders / Budget Adjustments

The PMT reported that six construction Change Orders were executed during August 2017 with magnitudes greater than \$100,000. These change orders are listed below:

CH057	EO Switch Pads and Equipment (mod. 24)	\$970,558
CH057	MM4 Running Rail (mod. 29)	\$160,794
CM007	Deletion of Antenna Conduit (mod. 18)	(\$635,405)
CS084	Layer 3 Switches (mod. 6)	\$106,000
VH051A	Excusable Time Extension and 30 Loc CIL Extra Lift (mod. 16)	\$140,897
GEC	Revisions to CQ033, VQ033 and FQL33A (mod. 142)	\$1,819,778

PMOC Concerns

1. ESA PMT has not included the costs of the items noted above in the project forecasts, indicating that MTACC executive approval has yet to occur for these changes. PMOC believes that, to the extent that these are known costs that will be incurred, they therefore should be accounted for in the project forecasts.
2. The PMOC believes that additional funding may be required for the ESA project budgets when the cost forecasts are updated. [REDACTED]
[REDACTED] The MTA has deferred action on addressing anticipated shortfalls in project funding until development of the 2020–2024 Capital Plan. This funding constraint is a potential major risk.
3. Current construction delays, and the possibility of future delays, may result in cost increases on the following contracts:
 - CS179 – the late completion of final design and resulting schedule compression to hold start of Integrated Systems Testing.
 - CS084 – the late completion of final design has delayed fabrication of some traction power equipment.
 - VS086 and CS086 – incorporation of Positive Train Control into the ESA signal system; and, technology issues.
4. Actual construction expenditures (as represented by invoiced costs, i.e. preliminary/pencil-copy DCBs) continue to lag significantly behind the planned/scheduled construction

expenditures. This may be a negative indication about the ESA project's ability to achieve the target date for revenue operations.

4.0 RISK MANAGEMENT

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

Harold Interlocking Risk Review

During 2Q2017, the ESA Risk Manager, working with the consultant risk assessment facilitator, conducted a comprehensive risk review of the remaining work in the Harold Interlocking required to be completed to provide LIRR service into the new LIRR rail station at Grand Central Terminal. Work includes all third-party construction contractor work as well as all Amtrak and LIRR direct force account construction work. Also considered was Amtrak and LIRR force account provision of required access and protection in support of all of the remaining contract construction work. The preparation meeting to review the cost and schedule risk models was held on April 7, 2017. The risk workshop to evaluate the risks and quantify the probability of occurrence and cost and schedule impacts was held over a three-day period, April 19, 20, and 21, 2017. Participants included ESA staff associated with the Harold work, the ESA Project Management Team (select members), the GEC, MTA-OCO, the PMOC, ESA-CM, ESA-IEC, Amtrak, and LIRR. The risk assessment facilitator's draft Risk Report is now expected to be available in November 2017.

Harold Interlocking – ESA Risk

Harold Re-sequencing Plan (“ESA First”)

With regard to the “ESA First” Harold Re-sequencing Plan developed in December 2014 and implemented in 2015, the PMOC has noted that, during 2015 and into 2016, the PMT had been reporting that Amtrak has not been able to provide even the reduced level of force account resources that had been planned in support of the ESA schedule. The Harold Schedule Plan was re-evaluated and further adjusted in early 2016 to account for the recent experience of the project, making work package changes to accommodate the railroad force account resource constraints. The impacts caused by the insufficient Amtrak support have been reduced but not yet eliminated and this situation continues to be a challenge for MTACC.

Amtrak Preparation for Extended East River Tunnel Outages

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 3 and 4 in preparation for extended outages for ERT Lines 1 and 2 to complete Hurricane Sandy damage-related reconstruction work, now planned for 2019. Earlier this year, MTACC advised the PMOC that Amtrak hardening work on Line 3 was complete. The PMOC noted at the time that the Line 3 work had minimal impact on East Side Access construction during the period that it was underway. There is also concern that track outages required for the remaining hardening work in ERT Lines 1 and 4 may conflict with ESA needs to support completion of the planned Harold work through 2017 and 2018. However, no noticeable impacts to availability of Amtrak force account resources through October 2017 were observed attributable to any known work in the ERT Lines 1 and 4.

Amtrak 2017 Accelerated New York Penn Station Track Work

A new risk emerged during April 2017 involving Amtrak's ability to provide sufficient force account resources to support the planned ESA work in the Harold Interlocking based on Amtrak plans to advance and accelerate a project for extensive reconstruction of the NEC track turnout

5.0 ELPEP COMPLIANCE SUMMARY

The current status of each of the remaining main ELPEP components is summarized as follows:

- **Technical Capacity and Capability (TCC):** Several years ago, the FTA requested MTACC to update its TCC Plan in response to the FTA/PMOC comments that were generated as a result of significant changes in key ESA upper management level positions that were made at that time. In response, MTACC submitted its revised Technical Capacity and Capability Plan (ESA and SAS). MTACC has recently indicated that it will review the TCC Plan and propose revisions, if required, to reflect the current status of the Program. MTACC submitted an updated TCC Plan in September 2017 and the PMOC continues its review of the plan.
- **Continuing ELPEP Compliance:** The ESA project should continue to make additional improvements in the following areas: Management Decision; Design Development; Change Control Committee (CCC) Process and Results; Stakeholder Management; Procurement; and Risk-Informed Decision Making. The PMOC has noted progress in two previously identified areas – Issues Management and Timely Decision Making, particularly when responding to new issues arising with the railroads’ Force Account resource availability, track outages, and other issues regarding the remaining work in the Harold Interlocking. **Project Management Plan:** The PMOC completed its evaluation of the current version of the PMP, Rev. 10, concluded that it is acceptable, and provided the FTA with comment close-out details earlier this year. The FTA subsequently notified MTACC that the FTA accepts Revision 10 of the ESA PMP.
- [REDACTED]

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

- **Schedule Management Plan (SMP):** The ESA project should continue to make additional improvements in the following areas: Integrated Project Schedule (IPS) Updating, Forecasting, [REDACTED] against a current baseline schedule. The PMOC completed its final evaluation of the current revision of the SMP, concluded that the SMP is acceptable, and provided the FTA with comment close-out details earlier this year. The FTA subsequently notified MTACC that the FTA has accepted the current revision of the SMP.
- **Cost Management Plan (CMP):** The ESA project should continue to make additional improvements in the following areas: Project Level EAC Forecasting, Project Level EAC Forecast Validation, [REDACTED] and Secondary Mitigation. The PMOC completed its final evaluation, concluded that the CMP is acceptable, and provided the FTA with the comment close-out details late last year. The FTA subsequently notified MTACC that the FTA has accepted the current revision of the CMP.

Revisions to the ELPEP Document: [REDACTED]
[REDACTED]
[REDACTED] [REDACTED]
[REDACTED]

[REDACTED] MTACC submitted an updated ELPEP with suggested revisions in September 2017 and the PMOC continues its review of the proposed revisions.

6.0 SAFETY AND SECURITY

Table 6.1*, below, shows the PMOC calculated and ESA reported Lost Time and Recordable Injury Ratios through September 30, 2017.

Table 6.1*: ESA 2017 Lost Time and Recordable Injury Ratios

	Lost Time Ratio	Recordable Ratio
2017 BLS Ratios (used by OSHA)	1.7	2.8
PMOC Calculated ESA September 2017 Ratios	0.0	0.0
PMOC Calculated ESA CY2017 Ratios	0.21	0.74
ESA Reported Ratio (Cumulative since beginning of project as of September 30, 2017)	1.72	3.82

Additionally, the ESA PMT did not report any significant security issues during June 2017.

*PMOC- developed table based on September 30, 2017, ESA “Cumulative Profiles of Lost Time and Recordable Injury Rates” report. The PMOC believes that this demonstrates the effectiveness of ESA’s most recent safety efforts.

7.0 ISSUES AND RECOMMENDATIONS

Design: The PMT design management team needs to focus on achieving intermediate milestones in a timely fashion and working closely with the GEC to facilitate finalization of the scope of work for the remaining procurement and construction packages. The continued shifting of scope between packages has made finalizing design documents and drawings very challenging and time consuming.

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 expected; and,
- LIRR is making changes that alter the design basis and result in time-consuming and costly re-design work by the GEC.

The above factors have contributed to the continuing delays in completing the bid documents for several contract procurements over the last 2 years. This situation has already adversely impacted the program schedule with regard to Contract CQ033. The PMOC recommends that the PMT engage the upper level management of the stakeholders involved to assist in resolution of the more significant issues.

Both the GEC and LIRR continue to be challenged to meet the schedule requirements for review of design and equipment submittals from the CS084, CS179 and VS086 contractors. The PMT needs to continue to monitor this situation and to also better coordinate the associated LIRR reviews. These shortcomings point to insufficient technical capacity and capability in the particular design support areas. The PMOC acknowledges the efforts by senior management to resolve these issues and recognizes that some short-term improvements were achieved, but notes that more sustained effort is needed.

Procurement: The lack of stability in the contracting strategy and Contract Packaging Plan remains a concern. Scope shifting among different packages delays completion and finalization of the required design packages, caused significant delays to the procurement schedules during 2016 and into 2017, and makes it difficult to fully understand the impact of these changes to the overall ESA Program. The PMOC continues to recommend that the ESA PMT make an effort to adhere to the current version of the Contract Packaging Plan (CPP), Revision 11.0, and minimize shifting scope for the remainder of the project.

Water Infiltration Concerns Regarding Systems Contracts CS179 and CS084: The PMOC remains concerned about water infiltration issues in the equipment rooms and the remediation efforts implemented to provide permanent water infiltration mitigation in rooms with electrical and electronic equipment. After several remediation methodologies were tried with only limited success, MTACC adopted other methods to resolve the water infiltration problems. Several of the revised methodologies were implemented; and, at least in the short-term, appear to have addressed the issue at the locations where they were used. However, the successful mitigation of the water infiltration problem can only be validated after remediation work is complete. The PMOC's concern relates to the long-term results of any remediation and the LIRR's acceptance of any location that appears to have any water infiltration problem at the time of facility acceptance.

Additional Water Infiltration Concerns: On CQ032, ESA reported that a continued remediation effort is being planned under this contract to deal with the ongoing water infiltration in the former Early Access Chamber and Tunnel Boring Machine Launch Block areas. Also, regarding water

infiltration conditions under the F Line subway at York Ave., ESA has requested the CM006 subcontractor to demonstrate the infill flow rate meets the specification. The PMOC notes that lack of progress in remediating these types of water infiltration is delaying turnover of these affected spaces to the follow-on systems contractors.

Contract CS179: The PMOC has continuing concerns regarding the timely preparation and submission of any Buy/Ship America waiver requests for potentially non-compliant material or equipment on the CS179 contract. Extended delays in providing compliant material or equipment could have a significant impact on the timely completion of this work. The PMOC still has concerns about the water infiltration issues in the equipment rooms that are identified and whether proposed mitigation remedies will prove to be successful over the long-term. The PMOC is also concerned about the significant number of Notice of Change (NOC) submissions and CPRs that remain as open items impacting the timely progression of the contract work. The PMOC believes that MTACC needs to focus on addressing those CPRs and NOCs and quickly issue contract modifications where appropriate. Lastly, the PMOC continues to be concerned about late completion of systems' design reviews and approvals; but, acknowledges all the stepped-up efforts by MTACC's senior management to identify issues and implement corrective actions.

Additionally, the PMOC remains concerned that late completion of reviews of contractor design submittals by MTA has caused the design completion date for the last of the ten Control Systems to slip over 16 months, which could jeopardize the timely completion of this contract. The ESA-PMT, working with the GEC and LIRR, needs to effectively manage the design review process to obtain the requisite design approvals and prevent any further schedule slippage. The PMOC notes that the problems with the timely completion of design reviews and approvals have delayed completion of designs on both the 10 Control Systems and the 19 Non-Control Systems.

Contract CS084: The PMOC remains concerned that design issues related to the SCADA system and the C08 pre-fabricated substation structure remain unresolved. MTACC needs to prioritize the resolution of these design issues so as to preclude any further impact to substation design and fabrication. Further, MTACC needs to determine the validity of the contractor's list of deficiencies at the various substation locations and take whatever appropriate action that may be necessary to get the contractor working at the various locations. The PMOC continues to be concerned about the availability and viability of conduit and manhole systems between the substation traction power rooms and the tracks; and, the PMOC continues to recommend that surveys at the various sites be conducted to determine the availability and viability of these systems.

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

Project Funding: During 2Q2017, a new risk developed based on the decision that there will be no stand-alone ESA amendment to the 2015-2019 Capital Plan to provide additional funding for forecast cost overruns for OCIP, railroad force account, CM014B OICs, and continuation of professional services under the PM/CM, CCM, and GEC contracts. This presents a new risk of

funding constraint. The PMOC is concerned about the potentially significant impacts to the program budget and schedule, as well as the target Revenue Service Date. The specific cost, budget, and schedule impacts will not be known until ESA completes its re-evaluation of the current budget and schedule. Details are not expected until January 2018.

Project Budget: [REDACTED]

[REDACTED] As noted in Section 3.0 above, the Force Account forecasts and OCIP increases alone are likely to add at \$300 million to the budget, without consideration of Third-Party contract extended overhead costs. In addition, the PMOC anticipates cost overruns for the PM/CM, CCM, and GEC contracts for extending professional services through the target RSD in April 2021. [REDACTED]

Project Schedule: The PMOC remains concerned about the ability of the Program to make expected progress along the critical path through Harold CIL cutover pre-testing. Delays to this work could consequently impact LIRR's ability to make key cutover dates in May 2018. It is also expected that any delay to the planned May 2018 cutover for the critical Harold CILs may also have a magnified impact on the program schedule, as the track outages needed for this work must be obtained with sufficient notice. This is a continuing concern.

The PMOC also continues to be concerned with continuing delays related to procurement of future contracts. The design and procurement process for CM015 continues to be on hold due to issues with the building owner and zoning.

[REDACTED] This is a concern because CH058A has not been awarded yet, and it is possible that once a baseline schedule for that contract is submitted, it may contain additional changes that could adversely impact the IPS.

Risk Management: The segmentation of construction packages has created multiple inter-contract interfaces and milestones. In the PMOC's opinion, the probability of successfully achieving all of them is low, and leads to the possibility of a ripple effect of delays and coordination difficulties between contracts. There is very limited opportunity, at best, for the contractors to make up any of the time lost to interface delays due to work site time and access constraints. Should delays start to accumulate, recovery will likely not be possible. Managing inter-contract handoffs and interfaces will be challenging and represents significant MTACC-retained risks. The PMOC does recognize the PMT's efforts to mitigate some of the potential cost exposure by negotiating adjustments to schedule constraints across the four ESA contracts currently held by the same contractor (CM006, CM007, CS179, and CQ032). These mitigations, however, are not necessarily effective in solving either the productivity challenges that result from the CM007 schedule that the PMOC considers very aggressive or the management challenges of coordinating the designs, functionality, and installation of the 10 control systems and 19 non-control systems.

The PMOC remains concerned about the coordination risk retained by MTACC on the completion of the work in Manhattan, especially construction and testing interface management for the systems work as well as turnover of completed areas to the systems contractors. When combined

with the extensive scope re-configuration changes associated with Harold Interlocking work, the PMOC believes that this may create significant changes to the overall project risk profile.

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

- a) Program Funding – 2015-19 Capital Plan issue resolved in May 2016; current forecast cost growth funding had been expected to rely on Capital Plan amendment and other sources; now potential risk of funding constraint due to 2Q2017 decision that there will be no stand-alone ESA amendment to the 2015-2019 Capital Plan;
- b) Recovery of lost time due to significant schedule delays on Contracts CM014B, CS179, and CS084 [PMOC notes improved productivity on CS179 during 3Q2017] ;
- c) Successful execution of multiple hand-off interfaces across several contracts;
- d) Contractor access and work area coordination in Manhattan;
- e) Duration of integrated systems testing;
- f) Continued availability of adequate Amtrak and LIRR force account resources for both railroad direct construction and third-party contractor support in Harold Interlocking (increasing risk trend noted in 4Q2015 through July 2017);
- g) Continued availability of required track outages in Harold Interlocking - Starting in September 2016, fewer priority weekend track outages have been available; now the eight scheduled weekend outages in 2017 are at risk due to Amtrak’s accelerated project for extensive reconstruction of the NEC track turnout area between New York Penn Station and the existing Amtrak Hudson River tunnels;
- h) Maintaining adequate schedule performance of the remaining work in Harold Interlocking, now the ESA program critical path, that is dependent on a very high level of planning and coordination between third-party contractors and the LIRR and Amtrak force account management for both access and protection and direct labor work (increasing risk trend noted in 3Q2016 through October 2017); and,

■ [REDACTED]

The comprehensive Harold risk review conducted in April 2017 identified a number of potentially significant risks that could delay completion of the critical work in Harold Interlocking planned for 2017-18 and cause a significant delay to the Revenue Service Date. These risks include the following:

A. Major Risks included in the Risk Assessment

- 1. Positive Train Control: Installation, testing, and activation of Positive Train Control by LIRR in Harold Interlocking to meet the December 31, 2018, FRA mandated deadline. Risk is not well defined because scope and schedule details have not been finalized. Possible mitigation: LIRR had planned, in August 2017, to formally request the FRA for a waiver to

extend the requirement to have PTC operational in the Harold Interlocking beyond the deadline of by December 31, 2018, based on the interlocking's status as an active construction area. LIRR submitted the formal waiver request to the FRA in early October 2017.

2. LIRR Force Account Performance: Ability of LIRR force account resources to provide both a very high level of support for third-party contractor access and protection and adequate productivity for significantly increased direct labor work involving track, 3rd rail, and signals, in accordance with the current ESA schedule plan.
 3. Northeast Quadrant Rail Work: Ability of MTACC-ESA, Amtrak, and LIRR to fully prepare for and execute the remaining work in the Northeast Quadrant in Harold Interlocking, in accordance with the current ESA schedule plan, on a very tight schedule involving major Amtrak and LIRR track outages. Preparation work includes obtaining all required track turnouts and necessary track materials for the planned work.
 4. LIRR CIL Cutovers: Ability of LIRR to complete the pre-testing and final cutovers of CILs H1/H2/H5/H6/Loc 30 in accordance with the current ESA schedule plan.
 5. Contract CH058A Preparation Work: Ability of Amtrak and LIRR force account resources to complete, in accordance with the current ESA schedule plan, all track, catenary, and third-rail work required prior to NTP for CH058A.
- B. Potential Risks with Major Schedule Impacts – Not Included in Risk Assessment
1. ESA Project funding constraints (Now realized in 2Q2017);
 2. Ongoing and future “Regional Projects” requiring extensive support from Amtrak including: NYPS 2017-18 Track Rehabilitation (Now realized in 2Q2017 moderate impact except for delay to 2017 priority weekend track outages for Harold work.); Moynihan Station; Gateway; MNR to NYPS.
 3. Amtrak program to reconstruct existing ERT Lines 1 and 2, starting with Line 2 in 2019. Risk is not well defined because Amtrak scope and schedule details have not been finalized and presented to MTA-LIRR.

The PMOC notes that, although MTACC has actively engaged Amtrak to develop some specific mitigations for certain risks and continues to work on strategies for mitigating many of the other identified risks, continued shortcomings in provision of adequate force account resources have adversely impacted the current Harold schedule and have caused the remaining Harold work to become the ESA program schedule critical path. Many external stakeholder issues including the Harold work and other systems issues with Amtrak and LIRR will remain beyond MTACC's direct control, however, and are likely to complicate development and acceptance of the specific problem resolutions that are essential to completion of the ESA project. The PMOC recognizes that MTACC and ESA have been proactive in dealing with these issues as they arise and also recognizes ESA's efforts to re-baseline the remaining work in Harold Interlocking to reflect more realistic expectations of Amtrak support. The PMOC also recognizes MTACC's efforts to partially mitigate the risk of insufficient Amtrak force account resources for support of the ESA Harold work, MTACC has retained a consultant to develop an Amtrak resource schedule that

includes the Amtrak force account needs for all of Amtrak's project commitments in the New York Metropolitan region, including ESA. However, the situation still needs to be improved and the PMOC recommends that the PMT actively engage executive management in MTACC and MTA to assist with resolution of outstanding issues with Amtrak and LIRR.

Through October 2017, the Moynihan Station project continued as Amtrak's top priority for assignment of the local division force account resources. The PMOC's position has been that this situation needed to change as soon as possible in order for Amtrak to be able to provide the required force account resources and track outages required to support ESA's schedule for completion of the remaining work in the Harold Interlocking. Amtrak's support is especially important now through the end of 2018, a period that is critical to completing the planned Harold work in support of the MTACC target RSD of February 2021. However, this situation changed significantly during April 2017 as discussed in the following paragraph.

A new risk emerged during April 2017 involving Amtrak's ability to provide sufficient force account resources to support the planned ESA work in Harold Interlocking based on Amtrak plans to advance and accelerate its project for reconstruction of the NEC track turnout area between New York Penn Station and the existing Amtrak Hudson River tunnels. This new risk has been realized based on ESA reporting that the Amtrak force account resource availability for the ESA Harold Interlocking work dropped noticeably in May 2017 and continuing through August 2017. ESA was able to reduce the impact by re-sequencing and re-planning the critical work in Harold Interlocking. The most significant schedule impact was the delay to the planned eight priority weekend track outages for 2017 required to support the forecast CIL cutovers during May 2018. ESA re-planned the work so that only six weekend outages are needed and rescheduled the effort twice that delayed the outages for October and November 2017. The PMOC notes that the track outages scheduled for October 2017 did take place and all of the planned work was completed.

APPENDIX A - ACRONYMS

AFI	Allowance for Indeterminates
ARRA	American Recovery and Reinvestment Act
BLS	Bureau of Labor Statistics
BSA	Buy/Ship America
C&S	Communication and Signals
CCC	Change Control Committee
CCTV	Closed Circuit Television
CD	Calendar Day
CIL	Central Instrument Location
CIR	Central Instrument Room
CM	ESA Construction Manager assigned to each contract
CMP	Cost Management Plan
CMU	Concrete Masonry Unit
ConEd	Consolidate Edison Company
CPOC	Capital Program Oversight Committee
CPP	Contract Packaging Plan
CPR	Contractor Proposal Request
DC	Direct Current
ELPEP	Enterprise Level Project Execution Plan
ESA	East Side Access
ET	Electric Traction
FA	Force Account
FAT	Factory Acceptance Testing
FDR	Final Design Review
FFGA	Full Funding Grant Agreement
FIAT	Factory Integrated Acceptance Testing
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GCT	Grand Central Terminal
GEC	General Engineering Consultant
HVAC	Heat, Ventilation and Air Conditioning

IPS	Integrated Project Schedule
ISTP	Integrated System Test Plan
LIRR	Long Island Rail Road
MNR	Metro-North Railroad
MOD	Contract Modification
MPR	Monthly Progress Report
MTA	Metropolitan Transportation Authority
MTACC	Metropolitan Transportation Authority Capital Construction
N/A	Not Applicable
NCR	Nonconformance Report
NOC	Notice of Change
NTP	Notice to Proceed
NYCT	New York City Transit
OCIP	Owner Controlled Insurance Program
PAC	Pneumatically Applied Concrete
PCO	Proposed Change Order
PLC	Program Logic Control
PMOC	Project Management Oversight Contractor (Urban Engineers)
PMP	Project Management Plan
PMT	ESA Project Management Team
PR	Progress Report
QA	Quality Assurance
QPR	Quarterly Progress Report
RFI	Request for Information
RFP	Request for Proposal
RMC	Rudin Management Corporation
RMP	Risk Management Plan
ROD	Revenue Operations Date
ROW	Right of Way
RPR	Relocated Primary Route
RSD	Revenue Service Date
RTB	Resilient Tie Block

SC	Substantial Completion
SCADA	Supervisory Control and Data Acquisition
SDR	Second Design Review
SMP	Schedule Management Plan
SMS	Security Management System
SWO	Stop Work Order
TCC	Technical Capacity and Capability
TELP	Temporary Eastbound LIRR Passenger
TPSS	Traction Power Substation
TSR	Track and Signal Route
WBY	Westbound Bypass Tunnel
YSB	Yard Services Building

APPENDIX B – TABLES

Table 1: Summary of Critical Dates

	FFGA	Forecast (F) Completion, Actual (A) Start		Amended FFGA Dates
		Project Sponsor*	PMOC**	
Begin Construction	September 2001	September 2001(A)	September 2001(A)	September 2001
Construction Complete	December 2013	December 2022 (F)	September 2023(F)**	December 2023
Revenue Service	December 2013	December 2022 (F)	September 2023 (F)	December 2023

* Source – Project Sponsor forecast Revenue Operations Date per information presented to the MTA CPOC in June 2014.

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

Table 2: Project Budget/Cost Table (\$ in millions)

	FFGA			MTA Current Baseline Budget (CBB)			Expenditures August 31, 2017	
	Original FFGA	Amended FFGA	Pct. of FFGA	Obligated	CBB	Pct. of Total CBB	Expenditures	Pct. of CBB
Grand Total	7,386.0m	12,038.0m	100.00%	4,724.0m	11,214.0m	100.00%	7,853.4m	70.03%
Financing Cost	1,036.0m		14.03%	617.0m	1,036.0m	9.24%	617.6m	59.61%
		1,116.0m	9.27%					
Total Project Cost	6,350.0m	10,922.0m	85.97% 90.73%	4,107.0m	10,178.0m	90.76%	7,235.8m	71.09%
Federal Share	2,683.0m		36.33%	1,148.0m	2,699.0m	24.07%	2,524.0m	93.52%
		2,683.0m	22.29%					
5309 New Starts share	2,632.0m	2,632.0m	35.63% 21.86%	1,098.0m	2,437.0m	21.73%	2,261.9m	92.81%
Non New Starts share	51.0m		0.69%	50.0m	67.0m	0.60%	66.7m	99.55%
		51.0m	0.42%					
ARRA	0.0m	0.0m	0.00%	0.0m	195.0m	1.74%	195.4m	100.21%
Local Share	3,667.0m		49.65%	2,959.0m	7,479.0m	66.69%	4,711.8m	63.00%
		8,239.0m	68.44%					

Table 3: Project Budget and Invoices

Elements	Baseline Budget June 2014	August 2017			
		Current Budget	Actual Awards	Inv. to Date	Inv. Pct. of Budget
Construction Subtotal	7,379.3 m	7,543.6 m	6,958.8 m	5,322.3 m	70.55%
Soft Costs Subtotal	2,798.5 m	2,634.2 m	2,015.3 m	1,913.5 m	72.64%
Engineering	720.6 m	735.9 m	732.7 m	710.6 m	96.55%
OCIP	282.6 m	307.6 m	300.8 m	300.4 m	97.64%
Project Mgmt.	972.2 m	972.2 m	862.7 m	785.3 m	80.78%
Real Estate	182.1 m	178.0 m	119.2 m	117.3 m	65.90%
Rolling Stock	202.0 m	202.0 m	--	--	0.00%

Note: ESA is currently carrying the Rolling Stock Reserve as an off-line cost, not in the Budget

Table 4: Comparison of Standard Cost Categories: FFGA vs. CBB

Standard Cost Category	FFGA	June 2014 Project Budget	Amended FFGA	Dec 2016 CBB	Mar 2017 CBB	June 2017 CBB	CBB / FFGA Variance	CBB / Amende d FFGA Variance
10 - Guideway & Track Elements	1,989 m	3,405 m	3,353 m	3,486 m	3,486 m	3,504 m	76.21%	4.50%
20 - Stations, Stops, Terminals, Intermodal	1,169 m	2,238 m	2,327 m	2,328 m	2,328 m	2,327 m	99.08%	-0.01%
30 - Support Facilities (Yards, Shops, Admin)	356 m	474 m	451 m	472 m	472 m	506 m	42.06%	12.28%
40 - Site Work and Special Conditions	205 m	611 m	562 m	588 m	588 m	568 m	176.83%	0.95%
50 - Systems	619 m	606 m	628 m	580 m	580 m	578 m	-6.76%	-7.99%
60 - ROW, Land, Existing Improvements	165 m	219 m	192 m	215 m	215 m	215 m	30.31%	12.04%
70 - Vehicles	494 m	210 m	880 m	210 m	210 m	210 m	-57.50%	-76.13%
80 - Professional Services	1,184 m	1,975 m	1,809 m	2,003 m	2,003 m	2,013 m	69.98%	11.25%
100 - Financing Cost	1,036 m	1,036 m	1,116 m	1,036 m	1,036 m	1,036 m	0.00%	-7.20%

Table 5: Quarterly Actual and Planned Cash Flow

Year - Quarter	Construction	Engineering	OCIP	Project Management	Real Estate	Rolling Stock
Prior Payments >	3,660.2 m	646.4 m	155.6 m	580.0 m	112.6 m	--
Remaining >	3,719.1 m	74.2 m	127.0 m	392.1 m	69.4 m	202.0 m
2014 3Q	209.3 m	(-3.3 m)	4.8 m	16.7 m	--	--
4Q	168.3 m	(-3.3 m)	4.8 m	16.7 m	0.1 m	--
2015 1Q	134.6 m	(-3.2 m)	4.6 m	16.1 m	4.5 m	--
2Q	147.4 m	(-3.3 m)	4.8 m	16.7 m	4.7 m	--
3Q	169.7 m	(-3.3 m)	4.8 m	16.7 m	4.7 m	--
4Q	201.2 m	(-3.3 m)	4.8 m	16.7 m	4.7 m	--
2016 1Q	193.3 m	(-3.2 m)	4.7 m	16.3 m	4.6 m	--
2Q	180.9 m	(-3.3 m)	4.8 m	16.7 m	4.7 m	8.7 m
3Q	182.0 m	(-2.0 m)	4.8 m	16.7 m	4.7 m	13.1 m
4Q	214.2 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
2017 1Q	210.6 m	6.5 m	4.6 m	15.5 m	4.5 m	12.6 m
2Q	199.7 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
Remaining Planned	1,508.1 m	82.4 m	70.1 m	195.6 m	23.2 m	141.5 m
Remaining Actual	2,150.5 m	27.5 m	7.9 m	189.0 m	60.8 m	202.0 m
3Q	189.4 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
4Q	182.1 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
2018 1Q	174.2 m	6.5 m	4.6 m	15.5 m	4.5 m	12.6 m
2Q	170.5 m	6.7 m	4.8 m	16.0 m	4.7 m	13.1 m
3Q	168.5 m	6.7 m	4.8 m	16.0 m	4.7 m	14.0 m
4Q	155.2 m	6.7 m	4.8 m	16.0 m	0.1 m	14.0 m
2019 1Q	148.4 m	6.5 m	4.6 m	15.5 m	--	13.6 m
2Q	110.9 m	6.7 m	4.8 m	16.0 m	--	14.0 m
3Q	93.6 m	6.7 m	4.8 m	16.0 m	--	14.0 m
4Q	71.6 m	6.7 m	4.8 m	16.0 m	--	14.0 m
2020 1Q	20.7 m	6.6 m	4.7 m	15.6 m	--	5.0 m
2Q	11.7 m	6.7 m	4.8 m	16.0 m	--	0.9 m
3Q	7.6 m	2.3 m	4.9 m	5.4 m	--	--
4Q	2.8 m	--	5.0 m	--	--	--
2021 1Q	0.9 m	--	3.3 m	--	--	--
2Q	--	--	--	--	--	--
3Q	--	--	--	--	--	--
4Q	--	--	--	--	--	--

Table 6: Summary by FTA Standardized Cost Categories

Standard Cost Category	FFGA	June 2014		MPR August 2017		
		Project Budget	Amended FFGA	Current Budget	Awarded Value	Paid to Date
10 - Guideway & Track Elements	1,989 m	3,405 m	3,353 m	3,506.6 m	3,280.1 m	2,788.5 m
20 - Stations, Stops, Terminals, Intermodal	1,169 m	2,238 m	2,327 m	2,326.5 m	2,180.6 m	1,438.2 m
30 - Support Facilities (Yards, Shops, Admin)	356 m	474 m	451 m	509.7 m	489.9 m	218.5 m
40 - Site Work and Special Conditions	205 m	611 m	562 m	568.2 m	491.6 m	481.0 m
50 - Systems	619 m	606 m	628 m	587.3 m	471.4 m	353.2 m
60 - ROW, Land, Existing Improvements	165 m	219 m	192 m	215.4 m	156.5 m	154.7 m
70 - Vehicles	494 m	210 m	880 m	209.9 m	7.8 m	5.5 m
80 - Professional Services	1,184 m	1,975 m	1,809 m	2,015.7 m	1,896.2 m	1,796.2 m
████████████████████	██████	██████	██████	██████	██████	██████
██████	██████	██████	██████	██████	██████	██████
100 - Financing Cost	1,036 m	1,036 m	1,116 m	1,036.1 m		
██████	██████	██████	██████	██████		

Table 7: ESA Core Accountability Items

Project Status		Original at FFGA	Amended FFGA	Current*	ELPEP **
Cost	Cost Estimate	\$7.386 B	\$10.922 B	\$10.178 B	\$8.119 B
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Schedule	RSD	Dec. 31, 2013	Dec. 31, 2023	Dec. 2022	April 30, 2018
Total Project Percent Complete		Based on Invoiced Amount		72.8% actual vs. 76.7% planned (ESA calc.)	
Project Performance Rate (Since 2014 ESA "Re-Plan")		Based on Earned Value		77.6% (PMOC calculation of construction spending at 2Q2017 planned vs. actual since re-baselining)	
Contracts		Total contracts awarded to date		\$8.974 B	88.2% of total awards
		Total construction contracts awarded to date		\$6.96 B	92.2% of construction awards
Major Issue	Status			Comments	
[REDACTED]	[REDACTED]			[REDACTED]	
[REDACTED]	[REDACTED]			[REDACTED]	
[REDACTED]	[REDACTED]			[REDACTED]	
Project Cost	MTACC has identified significant forecast cost overruns: <ul style="list-style-type: none"> OCIP - \$190 million Railroad Force Account - \$110 million (FFGA scope) OICs for Contract CM014B - \$65 million PM/CM, CCM, GEC Services – (TBD) Schedule delays due to funding constraints (see above) may result in additional escalation costs. Review of forecast cost overruns based on new funding constraint continued during October 2017.			ESA-PMT is continues the evaluation the cost of continued PM/CM, CCM, and GEC Services to the target RSD. The current PMT funding strategy (see above) may delay the completion of current contracts, the award of remaining contracts, and the completion of railroad force account work. The resulting added cost escalation could be significant.	
[REDACTED]	[REDACTED]			[REDACTED]	
[REDACTED]	[REDACTED]			[REDACTED]	
[REDACTED]	[REDACTED]			[REDACTED]	
[REDACTED]	[REDACTED]			[REDACTED]	
[REDACTED]	[REDACTED]			[REDACTED]	
Harold Schedule	The schedule for the remaining ESA work in the Harold Interlocking has been revised several times since the June 2014 Program Schedule re-baseline; December 2014 ("ESA First"); 2015 ("Harold Re-Sequencing"); 1Q2016 schedule adjustment resulting in the Program critical path passing through the Harold work. Primary cause for all the revisions is continuing inadequate railroad force account support due to other higher priority Amtrak projects in the region. This issue has continued to challenge ESA through 3Q2017. During 2Q2017, a new risk emerged due to Amtrak's accelerated project to complete extensive reconstruction of the NEC track turnout area between New York Penn Station and the existing Amtrak Hudson River tunnels.			Primary impacts due to Amtrak's NY Penn Station Project include: <ul style="list-style-type: none"> Eight scheduled priority weekend track outages in 2017 for support of pre-testing of schedule critical Harold CIL cutovers in May 2018 are at risk; ESA rescheduled six priority weekend track outages to the end of November 2017; the three scheduled for October 2017 were completed. Current Amtrak support to ongoing Harold work: impact through 3Q2017 is moderate; Amtrak has completed its current plan ahead of the September 1, 2017 planned completion date.	

*Current Budget was approved by MTA CPOC in June 2014.

** 2010 Enterprise Level Project Execution Plan (ELPEP) reflecting medium level of risk mitigation, excluding financing cost of \$1,116 million. This is currently being re-evaluated.