

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

**Report Period February 1 – February 28, 2017**



PMOC Contract No. DTFT6014D00017

Project No. DC-27-5287, Task Order No. 0002, Work Order No. 04

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

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## **THIRD PARTY DISCLAIMER**

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

For projects funded through the FTA Full Funding Grant Agreements (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. DTFT6014D00017, 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 January 1, 2017.

## **MONITORING REPORT**

### **1.0 PROJECT STATUS**

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

As of the end of December 2016 (January 1, 2017, data date), MTACC reported that the overall engineering effort was 99.5% complete, based on Earned Value for Design Deliverables, compared with a planned status of 100.0%. MTACC's Cost Report (December 2016) shows that 94.7% of the overall "EIS and Engineering" category has been invoiced and 94.9% of the "Design" category (including \$10 million Design Settlement) has been invoiced.

#### Status of Construction Packages Not Awarded:

On Contract CM015 (48<sup>th</sup> St. Entrance), the MTA Board had previously approved the design agreement with the building owner, Rudin Management Corporation (RMC). RMC agreed to provide the designs for the relocation of the existing interior utilities and to complete some limited

structural design. MTA is continuing discussions with RMC and is nearing completion of the required easements and construction agreements. Turner Construction was awarded the utility construction contract and started work in August 2016. The utility relocations are approximately 65% complete and Phase 1 is forecast to be completed by April 30, 2017. The GEC is reviewing shop drawings for coordination with the CM015 work scope and is approving the shop drawings. MTACC Counsel has started legal review of Division 1 in the specifications. Submittal will be made to the NYC Department of Buildings upon incorporation of all comments and issuance of the signed and sealed plans. Bid advertisement had been scheduled for September 27, 2016, was revised to November 29, 2016, then to February 28, 2017, and is now forecast in mid-March 2017. Delays through 2016 and into 2017 will be 7.5 months.

Contract CH058A will include construction of the Tunnel B/C Approach Structure. The 90% design submission was made on June 17, 2016, and the ESA Project Management Team (PMT)/GEC team has received comments from the ESA Construction Manager and LIRR. The 90% package was sent to Amtrak on October 28, 2016. MTACC received Amtrak comments on the CH058A package during February 2017. An updated FHA03 design package was submitted to Amtrak in mid-February 2017 to reflect changes made in support of CH058A regarding required catenary and track alterations

Contract CH058B will include construction of the East Bound Re-route. The GEC has been developing the scope of work for finalizing the tunnel design based on a cut-and-cover construction method. LIRR has agreed to the track outages required to support the cut-and-cover construction but has requested additional rail traffic simulations from their consultant. The simulation proposal was submitted in November 2016 and the simulations are now in progress. The rail traffic simulation outcomes will not impact the design for Contract CH058B. MTACC has directed ESA to proceed with design finalization of CH058B based on using the cut-and-cover tunnel construction method and without the Temporary Eastbound LIRR Passenger (TELP) Track. The Contract CQ033, Mid-Day Storage Yard Facility, bid package has been completed and the contract was advertised in October 2016 and bids were opened on February 23, 2017. Through February 2017, work continued on resolving remaining issues, which are listed below. Selected design or specification changes have been included in bid addenda. Other changes will be made by change order after contract award as detailed below.

- ESA-PMT continues to work with LIRR on labor clearance for track and traction power work.
- The CQ033 package requires design variance approvals regarding LIRR track standards and clearances in order to provide sufficient yard capacity to store twenty-four 12-car train-sets. All track standard and clearance issues with LIRR were resolved in late May 2016, although a waiver is still required from NYSDOT to resolve the track vertical and horizontal clearance issues. In early July 2016, LIRR submitted a waiver request to NYSDOT regarding the substandard clearances required by the design. MTACC received 5 questions from the NYSDOT and provided responses the same day, February 14, 2017. NYSDOT approval was received on February 23, 2017. The PMOC notes that it has taken over 7 months for LIRR to obtain this approval.
- GEC continues work on the eight items in PCO-211 that include changes for cost savings as well as LIRR's request to revise the variance package for geometric

alignment and vertical track clearance for underground pipelines. The PMT has indicated that a number of these changes have been added to the contract by addendum, but other changes, including many of those for cost savings, will be added through contract modifications after construction contract award.

The package was advertised on October 20, 2016, with plans available for pick-up on October 24, 2016. At that time, the forecast bid due date was December 22, 2016 but was delayed three more times to the bid opening on February 23, 2017. Delays through 2016 and into 2017 now total 8 months.

Contract CH057D, Harold Track Work, is a new package whose work scope is currently being finalized by the PMT and the CM. Preparations for a labor clearance request to LIRR continue and meetings with the unions are ongoing.

Contract CS086, Systems Package 2 - Tunnel Systems, is a stand-alone package. MTACC reports that PCO C184 to finalize the package was approved and the GEC has completed the work. The 100% design submission was forwarded to LIRR on October 21, 2016, for review and comments were returned. The scope of this change order includes a refresh of the package and changes control of Plaza Interlocking from Penn Station Control Center to the GCT Train Operations Center. The scope of work of PCO C184 does not include Positive Train Control (PTC) design, which will be provided by LIRR. Based on when LIRR completes the PTC design, the PTC scope will be added to the CS086 contract either by addendum before bidding or by contract modification after award. The bid advertisement date is now forecast for March 1, 2017, a delay of almost two months from the previously forecast date of January 10, 2017. Delays through 2016 and into 2017 will be five months.

FOA33A, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for yard access to Amtrak via Sub 4 to Line 2. ESA met with Amtrak and there is one outstanding issue. When the issue is resolved, ESA will re-issue the 100% design package.

FOA33B, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for yard access to Amtrak via Sub 3 to Line 4. Amtrak, LIRR and ESA plan to meet in the near future to discuss the diamond crossover proposed in the design package.

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

In Contract CS179, Systems Facilities Package No.1, the backlog of submittal and RFI reviews noted in earlier reports is, once again, 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) are impacting its ability to complete design work, causing delays to the contract schedule. MTACC acknowledges that the response time on many submittals and RFIs has exceeded the 30-day turn-around time period stipulated in the contract. However, the contractor's assertion that this issue is causing overall contract delays cannot be evaluated until the contractor provides an accurate and comprehensive contract schedule that includes an acceptable Integrated System Testing Plan (ISTP) and ISTP schedule. The completion of the 10 Control System final designs has yet to be achieved; and, as of the end of February 2017, is 11 months late. Any further delay in the completion of the designs could jeopardize the timely completion of this contract. Further, the PMOC notes that MTACC has yet to receive any "formal acceptance" or "final approval" of any of the Control Systems final designs from the LIRR. The contractor is also responsible for the design, installation, and testing of 19 "Non-Control" systems. As it did in previous Monthly Progress Reports (MPRs), MTACC notes in its December 2016

MPR that the contractor's progress on these non-control system designs is falling behind schedule and will cause delays to the fabrication of equipment racks. Also, two Buy/Ship America issues remain unresolved, both of which could impact designs already in progress.

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 information presented for this CS084 contract comes from discussions at a mid-February 2017 Progress Meeting that reviewed contract progress for January 2017 and from the MTACC's December 2016 ESA Monthly Progress report (MPR). The contractor continues to perform site surveys and submit design documentation. Issues related to the tunnel SCADA system design remain unresolved, allowing the contractor to continue to contend that the lack of clarity on SCADA has caused delays to its contract schedule. In its December 2016 MPR, MTACC continues to cite a March 2020 Substantial Completion date, a date that does not, as yet, take into account previously identified coordination issues with other ESA contractors or the contractor's assertions of MTA-imposed delays resulting from the LIRR's continuing inability to provide timely comments on design submittals. Six of the seven interim contract Milestones are already delayed and will continue to be delayed on a day-to-day basis, according to the contractor, until the designs are approved and the clarifications are determined. The ESA CS084 project controls group will need to perform a detailed analysis of the contractor's schedule to determine the validity of the contractor's assertions. 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, an updated VS086 schedule that could be used to more effectively manage this contract has yet to be developed and interim milestones on this contract range from 12 to 23 months behind schedule. The contractor continues to raise concerns over the timeliness of responses from the MTA on design submittals and inquiries; asserting that the lack of timely responses is causing day-to-day delays in the progression of the work. The contractor contends that coordination efforts with other ESA contractors pose potential delays to the timely completion of its work. MTACC needs to make key design decisions that have the potential to impact designs already in progress. Additional information regarding specific System designs for the VS086 contract is provided later in Section 1.0c., under VS086.

## **b. Procurement**

The ESA Cost Report for December 2016 (January 1, 2017, data date) showed that total procurement activity for the project was 84.4% complete, with \$8.59 billion awarded out of the \$10.178 billion current projected budget.

Contract CQ033, Mid-Day Storage Yard Facility, was advertised on October 20, 2016, with bid sets available starting October 24, 2016. The Pre-Bid conference/site tour was held on November 10, 2016. The bid date had been extended from December 22, 2016, to January 19, 2017 and then to February 17, 2017. Total bid advertisement delay during 2016 was six months and total bid date delay is two months.

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

- CM015, 48<sup>th</sup> Street Entrance – Advertise date delayed two months from January 5, 2017 to February 28, 2017 and is now estimated for mid-March 2017; Bid due date TBD. Total bid advertisement delay since January 1, 2016, is six and a half months.
- CS086, Systems Package 2-Tunnel Systems – Advertise date delayed two months from January 10, 2017 to March 1, 2017; Bid due date TBD. Total bid advertisement delay since January 1, 2016, is eleven months.

### c. Construction

The PMT reported in its 4Q2016 Progress Report (January 1, 2017, data date) that total construction progress reached 67.3% complete versus 72.0% planned.

**CM005 - Manhattan South Structures:** The Substantial Completion of this contract was declared retroactively for April 22, 2016.

Construction Progress: ESA reports CM005 as a completed contract with an open status. MTACC and the contractor continued negotiations on close out, CPRs, and the pending transfer of remaining work to follow-on contracts. The project site was turned over to the CM007 contractor in early October 2016.

**CM006 – Manhattan North Structures:** As of January 1, 2017, MTACC slightly decreased its Forecast at Completion for CM006 to \$355,569,976. The MTACC forecast for Substantial Completion (SC) remained at June 1, 2017. ESA reported the contractor’s last schedule update showed a completion date about a month beyond SC, based on a single work shift. In February, the contractor started a second shift to mitigate the reported late date. Actual construction progress for December 2016 was 1.0% versus 1.7% planned. Cumulative progress through January 1, 2017, was 91.0% actual versus 94.3% planned.

Construction Progress: During February 2017, the CM006 contractor continued rehabilitation/remediation work at the 63<sup>rd</sup> St. Tunnels and Structures, which includes: CMU walls, infill walls, conduit bench, conduits, and manholes. The contractor continued arch construction at the GCT 3 Crossover Cavern, working two shifts. Duct bench construction continued in Tunnel WB3, between 55<sup>th</sup> St. and the GCT 3 Crossover Cavern. Arch construction also continued in connecting Tunnels 303 and 304. The CM006 contractor continued wall, slab, and arch concrete construction at the 55<sup>th</sup> St. Vent Facility. Contact and chemical grouting continued at several locations. Miscellaneous door, hardware and guard rail installation continued at the 50<sup>th</sup> St. Air Plenum and 53<sup>rd</sup> St. Sump, along with door and hardware installation at various locations.

**CM007 - GCT Station Caverns and Track:** As of January 1, 2017, the MTACC Forecast at Completion for CM007 remained at \$712,311,733. The MTACC forecast for Substantial Completion remained at January 28, 2020. Actual versus planned monthly progress and cumulative progress will be reported when available from MTACC, after development of the cost curve. ESA reports this contract to be approximately 6% complete.

Construction Progress: During February 2017, the CM007 contractor continued to process submittals for review and prepare for readiness reviews. The contractor continued Mezzanine level slab and Upper level column construction at the East and West Caverns south back of house. The CM007 contractor also continued the following construction in the East and West Caverns: waterproofing, Mezzanine level precast beams and panel installation followed by exterior concrete closure wall construction and repair of damaged arch anchor bolts installed by previous contractor. The precast subcontractor continued production casting of beams and panels at their upstate NY

facility. The start of pneumatically applied concrete (PAC) installation in the East and West Cavern sidewalls and Mezzanine walls is pending MTA approval of PAC Mockup. The contractor completed takeover of the temporary ventilation systems. There were no track construction activities this month, as materials and installation are pending MTA and LIRR review and approval. The eighth monthly Construction Progress Meeting, scheduled for February 9, 2017, was canceled due to inclement weather. ESA reported a differing site condition regarding East and West Cavern wall rebar dowels installed by a previous contractor that may impact the installation of precast beams; ESA mitigated schedule impact by allowing remediation work to begin.

**CM014A – Concourse and Facilities Fit-Out Early Work:** MTACC reports that, through January 1, 2017, the project forecast cost at completion remained at \$57,984,365. MTACC continues to report that Substantial Completion will be retroactively declared for November 15, 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. Final Completion is now being reported as February 1, 2017. Cumulative construction progress remained at 97.0% versus 100.0% planned. This has generally remained the same through 1Q2017, and indicates that there has been very little progress since June 2016.

Construction Progress: Through February 1, 2017, progress in completing the remaining equipment testing continued to be very slow. This continues to include SCADA programming and testing, which is only partially complete. The ongoing delay in completing the SCADA testing is due to a problem between the SCADA communications equipment and all of the equipment in other rooms. This problem has persisted for some time. Through January 2017, the B30 Substation for this project has not been turned over to the follow-on CM014B contractor pending completion of testing. The F6 Breaker in the B30 equipment is designated for temporary/permanent power in the Caverns (CM007). The CM014A contractor continues to provide 2 electricians to man this feed in case there is a trip in the breaker. This watch occurs only during the periods when the CM007 contractor is working on site and will remain in effect until the substation is turned over to CM014B. A change order is being completed for the CM014A contractor to provide and maintain temporary air conditioning units in the equipment rooms to mitigate the large heat buildup in the rooms from the energized equipment. This issue will be permanently resolved once the HVAC system installed by the CM014B contractor is operational. Another change order is being prepared for the contractor to make changes to the SCADA equipment.

**CM014B – Concourse and Facilities Fit-Out:** MTACC reports that, through January 1, 2016, the forecast cost at completion remained at \$463,617,500. The forecast Substantial Completion date remained January 21, 2019. However, the contractor's schedule update for November 1, 2016, shows substantial completion as January 31, 2020. MTACC has advised that they are taking exception to some of the contractor's schedule logic and negotiations continue. Ongoing delays impacting the original August 18, 2018, Substantial Completion date have included late critical structural steel submittals, fabrication, delivery, late removal of existing unforeseen obstructions by MNR, and issues with the availability of subcontractors to perform finish work in the 4 Wellways. Actual construction progress for December 2016, was 4.4% versus 15.2% planned. Cumulative progress as of January 1, 2016, was 28.5% actual versus 74.0% planned.



Construction Progress: Through February 28, 2017, surveying in the concourse continued and will be on-going throughout this contract.

TA Force Account Work – Flagging is ongoing at Track #115 for unloading of work trains. Track outages and flagging continue at night for the T-01 elevator work along Tracks #30 and #112. Flagging continues at Tracks #39-42 for electrical relocations for the Biltmore Connection.

Milestone #1 (Complete Terminal Management Center, Communication Room C-2 & Communication Closet C-5) – Architectural work is complete, along with punch list work. Drawings for the new purge system for the FM200 fire suppression have been completed and transmitted to the CM office. This does not currently impede the CS179 contractor from performing its work in this area.

Milestone #2 (50<sup>th</sup> St. Room CR102, Tunnel Fan Room, Electrical Room #126 & ICC Room), June 4, 2016; now April 2017 – This milestone is complete and the delays have been mitigated.

Milestone #3 (Comm. Closets CC-C1, CC-C2, CC-C6, MTAPD and BCS Conduit), August 4, 2016 – This milestone is complete. Access to these rooms has been given to the CS179 contractor.

Milestone #4 (Comm. Closets CC-C3, CC-7, & Room B3265) March 5, 2017; now June 5, 2017 – Construction of the rooms is underway. CS179 has submitted the current UPS equipment group sizes. The required size of the room doors must be verified, along with the size of the feeders required for the new larger capacity UPS for these rooms. Communication Closet CC-C7 has been determined to be too small and LIRR has agreed that the room will be extended. LIRR has also agreed to the relocation of some FM200 bottles. Spray on fireproofing and insulation takes place at night and architectural finishes installation continues.

Milestone #5 (Completion of 44th St. Ventilation Building), June 4, 2017; now December 13, 2017 – CM014B will be on site for “buttoning up” the building façade in June 2017. CS179 has an access restraint until August 2017. CS179 wants the CH014B contractor to delay until CS179 can install the mechanical equipment. This change in work sequence is under discussion. The completion of utility work (previously in the CM004 contract) continues along the north side of E. 44th St.

Milestone #5A (Completion of 48th St. Entrance) November 25, 2016, now October 2017-MTACC is considering transferring some of the scope of this milestone to the upcoming CM015 contract. Impacting this delay is the added scope of addressing a deteriorated structural beam for MNR. This added scope will result in the beam being replaced now, while the area is open, in lieu of having MNR replace it later and likely delay the upcoming CM015 contract.

Concourse (Madison Yard): Stantec Repairs (repairs to MTA and privately owned existing building columns and related structures in Madison Yard) continue throughout and nears completion. Third Party Inspections continue for concrete, shotcrete, rebar, masonry, bolting, welding, and firestops. Electricians continue to install Con Ed switches in the Meter Room, along with grounding and conduit and wiring installation throughout. Plumbers continued to trench and backfill underslab plumbing core drilling for penetrations.

Three -Story Building: Construction of building foundations and placement of the #308 and #309 Shafts were completed.

Shaft #3 (Elevators #1, #2 and Stair 22): Delivery of material and installation of the stair #22 continued.

Biltmore Connection: Conduit relocation and platform demolition continues on the MNR Express Level at night.

Wellways: The re-sequencing of the work has been agreed upon between CM014B and Schindler. Dismantling of the work platforms began in Wellways #1 and #2 and the delivery and installation of the escalators will begin March 6, 2017.

A mockup has been installed in Wellway #3 for the glass wall tile and fiberglass backup panel installation continued in Wellways #3 and #4.

Dining Concourse Connection: Mobilization began for the installation of Escalators #30 and #31.

Elevator T-01: Erection of concrete block continued.

East 48<sup>th</sup> St. Entrance: Coring and installation of permanent sewer pipe in 415 Park Building was completed.

East 50<sup>th</sup> St. Vent Building: CMU erection in the Elevator #9 Shaft was completed. Electrical feeder work continued throughout.

North Transfer Station: Excavation for utilities/footings and installation of structures continued. Installation of underground plumbing continued.

### **Systems Contracts:**

**CS084 - Traction Power System Package #4** - The information presented for this CS084 contract comes from discussions at a mid-February 2017 Progress Meeting that reviewed contract progress for January 2017 and from the MTACC's December 2016 ESA Monthly Progress Report (MPR).

**Status:** In its December 2016 ESA Monthly Progress Report (MPR), the MTACC reports that the Budget and Forecast for the CS084 contract remained at the \$79,717,772 level previously reported. In its September 2016 MPR, the MTACCC reported a December 2019 Substantial Completion (SC) date. In its two subsequent MPRs, the MTACC reported delays to the SC date; finally resulting in the March 2020 SC date reported in its November 2016 MPR. In its December 2016 MPR, the MTACC continues to cite March 2020; however, this date does not take into account previously identified coordination issues with other ESA contractors or the CS084 contractor's assertions of MTA-imposed delays resulting from a lack of timely responses to, and approvals of, design submittals. The "Design" section below provides more details regarding these designs. In its December 2016 ESA MPR, MTACC shows actual progress at 11.5% versus a planned 59.0%. In its November 2017 MPR, MTACC shows actual progress at 11.4% versus planned progress of 63.5%; a 0.1% increase in actual work versus a 2.2% increase in planned progress for the month of December 2016. While the numbers are based on actual versus projected costs, not physical construction efforts, the actual versus planned progress numbers indicate that this contract is significantly behind schedule, and falling further behind schedule on a month-to-month basis. The contractor contends 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 precludes the contractor from performing construction activities. The contractor continues to indicate that six of seven interim 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. Without an in-depth analysis of the status of the scheduled work activities, it is not possible to determine the status of the progress of physical work on this contract. 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. The contractor continues to assert that previous delays in receiving comments back from MTACC on the C08 facility switchgear, SCADA requirements, PLC information, and the general C08 substation design impacted its ability to meet its own original design, procurement, fabrication, and installation schedules. MTACC worked with LIRR senior management and the General Engineering Consultant (GEC) to, as the PMOC acknowledged in a previous report, achieve a significant reduction in the backlog of submittal responses; however, that backlog is worsening once again. The two most critical outstanding design issues are the approval of the switchgear for the C08 substation and the resolution of SCADA requirements and equipment. The design of the C08 Substation is now the primary critical path for the contract, and, the continuing delay in approving the switchgear for this location is, per the contractor, causing a day-to-day delay in the overall contract schedule. The design issues related to the SCADA equipment and requirements are complex and, per the contractor, are impacting the design completion of the remaining seven (7) substations (C01 through C07). Further, while MTACC indicates in its December 2016 MPR that all SCADA issues have been resolved, as of mid-February 2017, discussions between MTACC, the contractor, and the LIRR continue in an effort to reach consensus on the SCADA requirements and equipment. The contractor continues to indicate that the lack of clarity on the SCADA requirements has caused delays to its contract schedule and that a Time Impact Analysis will be submitted because of this issue. Several previously noted design issues for the Vernon facility (i.e., DC cable routing, floor penetrations to track level, and room beam height issues) remain as open items that need to be concluded by the MTACC so as not to delay the contract. The PMOC continues to have concerns about the length of time it is taking to provide responses to design submittals and address the various design approval issues.

Construction Progress: The PMOC previously reported that, while the extra L3 electrical service was completed and turned over to the MTA, the MTA had yet to energize two of the LIRR signal huts because there is some additional work (the installation of panel heaters, a transformer, and lightning arrestors) that must take place. Issues regarding the installation methodology were resolved and the contractor will submit a cost proposal to MTACC to progress this extra work. Other than the contractor performing site surveys and meeting with other contractors on coordination issues, there is no active on-site construction work taking place at this time on the CS084 contract. As previously reported, CS084 work in the Vernon (C05) facility cannot begin until all water infiltration issues at the facility are resolved by the CS179 contractor. MTACC had previously advised the contractor that access to the affected C05 room would not be possible until February 2017, to which the contractor cited this access restraint as one more item impacting its ability to meet its contract schedule. However, at a recent CS179 progress meeting, it was noted that the water infiltration remediation effort on the equipment room floor slab was not entirely successful and requires further remediation efforts. This additional remediation, along with that of the room access hatch, will further delay CS084 access to this room. In its December 2016 ESA MPR, MTACC indicates that a transfer of construction work scope from this contract to either the

CH058A or the CS179 contract is being considered to address the installation of positive and negative DC traction power cabling for the C08 substation. The contract calls for this cabling, which is necessary to perform the testing of the C08 substation and the integrated and dynamic testing of all the CS084 substations, to be installed in MTA-provided ductwork between the C08 substation and the track. Because procurement efforts on other ESA contracts were delayed, the CS084 contract schedule now calls for the testing to be performed before the ductwork is installed under any other contract; thus the consideration to transfer the cable installation and substation testing to another contract that will still be active once the ductwork is installed. The PMOC notes that should the “live load” (dynamic) testing of the C08 substation and, consequently, the contractually required integrated live load testing of all the CS084 substations be transferred to another contract, work performance accountability issues could arise if test results are other than satisfactory. This concern and a recommendation on addressing the concern are noted in Section No. 7 of this report.

**CS179 – Systems Package No. 1:** In its December 2016 MPR, MTACC shows that the CS179 Budget remains at the previously reported value of \$606,938,540, while the \$616,601,492 Forecast decreased by \$1,575,438 from previous reports. The December 2016 MPR indicates that the contract is only 32.7% complete versus the 54.3% planned progress. These progress numbers, which are based on actual versus projected costs and not physical work activities, continue to imply that the contract is significantly behind schedule. MTACC is continuing its evaluation of the contractor’s monthly schedule updates and has rejected several recent ones because the contractor has yet to submit a comprehensive recovery schedule that includes an “approved” Integrated System Testing Plan (ISTP) and ISTP schedule. In January 2017, the contractor submitted a revised draft ISTP; and, in February 2017, the contractor submitted a draft ISTP schedule. Both the ISTP and the ISTP schedule are under review by MTACC. Only when MTACC is assured through its evaluation that the contractor’s schedule and ISTP submissions are comprehensive and reasonably executable will it be possible to perform an analysis of the contract schedule to validate contractor assertions regarding delays. Despite the continuing, now 11-month, slippage in the completion of the Control System designs, the MTA’s reported Substantial Completion (SC) date for this contract remains at July 1, 2020; an approximate seven-month delay from the original November 19, 2019, SC date. The discussion of any potential delay to the established July 2020 SC date has not taken place at any of the monthly progress meetings attended by the PMOC. MTACC reports that the two remaining required Contract Options (Option Nos. 4 and 5) will be exercised, as scheduled, in 2017. There are still two potential Buy/Ship America issues that pose schedule risks to the successful and timely completion of this contract. The ESA CS179 CM advised that a Buy/Ship America waiver request letter for the HVAC equipment was submitted to the FTA in October 2016. At a CS179 contract progress meeting that discussed contract progress through February 2017, the ESA CS179 CM advised that a Buy/Ship America waiver request for similar HVAC equipment being used on another project located in Indiana was recently granted by the FTA. The PMOC requested MTACC to provide any documentation it has that substantiates this waiver approval. However, the waiver request letter for the video display panels is still under review by MTA Legal staff and MTACC is not able to forecast a date when the MTA Legal staff would complete its review. One additional potential Buy/Ship America issue was identified several months ago; that of the two contract-specified Public Address (PA) speakers that were once USA-made but are now manufactured in China. At the most recent CS179 monthly progress meeting, the CS179 CM indicated that an American-made public address (PA) speaker that could

possibly replace one of the two non-compliant PA speakers specified in the contract documents was identified. MTACC sent documentation related to this PA speaker to the LIRR for review and approval for use on this contract. A search continues for an American-made PA speaker that can replace the other, currently non-compliant, required PA speaker.

Design Progress: The CS179 contractor continues to work on the design development of the various contractually required Control and Non-Control systems. As of the end of February 2017, the completion of the final designs of the 10 Control Systems is still an open item that is already 11 months late. A Final Design Review (FDR) meeting between MTACC, the contractor, the GEC, and the LIRR on the CCTV and Security Management System (SMS) must still be scheduled. As noted in previous reports, the reduction of the backlog of submittal and RFI reviews remains as an issue and, despite some initial limited improvement resulting from action by MTACC, is once again worsening. A continued focus on reducing the backlog and ensuring timely responses on future submittals and RFIs is needed. Further, as of the end of February 2017, the LIRR has not provided any “formal” notification to MTACC that any of the Control System final designs are “accepted” or “approved”. The risk here is 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 PMOC will continue to follow this important aspect of the design process. The contractor continues to contend that the extended FDR approval dates are a result of the lack of answers to design questions. Any further delay in the resolution of the design issues and the approval of the final designs could jeopardize the timely completion of this contract. In addition to the “Control” system designs, the contractor is also responsible for the design, fabrication, installation, and testing of 19 “Non-Control” systems. Twice now, MTACC advised in its MPRs that the contractor’s progress on these non-control system designs is falling behind schedule and will cause delays to the fabrication of equipment racks. The PMOC has requested that the ESA CS179 CM provide progress data on each of these systems to identify the extent and impact of any reported delays. The contractor continues to state that other design and coordination issues are causing schedule delays. MTACC will need to evaluate these assertions against an updated contract schedule that includes both the revised Milestone dates developed as part of contract Modification No. 18 and a complete and comprehensive Integrated System Testing Plan schedule.

Construction Progress: During January 2017, the CS179 contractor continued various elements of work (installation of conduit, cable, fire stopping, fire standpipe, etc.) in the tunnels and at the B10; Vernon; 12<sup>th</sup> St.; 39<sup>th</sup> St., and Queens Plaza facilities. To date, water infiltration issues were identified at five locations: Vernon, Roosevelt, 12<sup>th</sup> St., 23<sup>rd</sup> St. and 29<sup>th</sup> St. Water infiltration remediation work was performed at the Vernon, 23<sup>rd</sup> St., and 29<sup>th</sup> St. facilities. Initially, the remediation work for the room floor slab at Vernon and the grouting work at the 23<sup>rd</sup> and 29<sup>th</sup> Street facilities appeared to be effective. However, new water infiltration areas in the 29<sup>th</sup> Street facility are now apparent; and, a time-lapse video of the Traction Power Substation (TPSS) room in Vernon identified additional water infiltration between the walls and the floor slab. Additional discussions are underway to identify a way to permanently stop the water infiltration in the room. Solving this water infiltration problem in the Vernon TPSS room is a critical contract milestone, one that is already 16 months late, and it impacts the ESA CS084 (Traction Power Systems) contractor’s ability to access the room and complete its work. Upcoming work includes conduit installation and excavation work at the 2<sup>nd</sup> Avenue facility, mobilization and conduit installations at the 38<sup>th</sup> Street facility, and conduit and fire standpipe installations in the Manhattan Tunnels. In

December 2016, the subcontractor responsible for system designs and equipment fabrication, assembly, and testing advised that it was moving forward on the procurement of Control Systems equipment based on the Control System final designs presented at the various Final Design Review (FDR) meetings. As a result, assembly of equipment racks in the subcontractor's off-site facility continues. Currently, there continue to be seven Stop Work Orders (SWOs) on this contract. Two of the SWOs will be deleted from the CS179 contract via a contract modification. All five of the remaining SWOs need to be resolved by MTACC. Although the GEC is working on designs and solutions to these SWOs, no date is available for the completion of the designs or for when the SWOs will be rescinded.

**Contract VS086, Systems Package 3, Signal Equipment Procurement:** In its December 2016 ESA Monthly Progress Report, MTACC indicates that both the Forecast and Budget for this contract remain at \$21,835,022. While the October 14, 2019, forecasted SC date remains the same as it was when established at contract award, five interim contract milestones continue to show delays of anywhere from 12 to 23 months. MTACC indicates in its report that it is currently in discussions with the contractor to re-establish interim milestone dates, while still maintaining an October 2019 substantial completion date. The use of an updated/re-baselined schedule once MTACC and the contractor agree on revised interim milestone dates will be helpful for MTACC to effectively manage this contract. In its January 2017 report, the PMOC raised concerns about establishing revised interim contract milestone dates that did not include the known outstanding design issues; as the effectiveness of using a potentially incomplete schedule as a management tool could then be significantly diminished. MTACC appears to be moving forward with a two-step approach to modify the contract's interim Milestones by preparing to first issue a contract modification to identify new milestones agreed to in mid-2016; and then, after any additional schedule impacts related to the known design issues are quantified, issue another contract modification to address those impacts. The PMOC agrees that this two-step approach, while not optimal, will at least create a contract schedule that MTACC can use to begin a more aggressive approach to effectively manage this contract.

Design Progress: There is no change in the previously reported contractor complaints over the timeliness of responses from the MTA on design submittals and inquiries. The contractor continues to assert that the lack of timely responses is causing day-to-day delays in the progression of the work. The contractor previously indicated that the design of the Plaza Interlocking Central Instrument Room (CIR) was a critical design that needed to be completed without delay and that there were several other design issues that required a resolution or direction from the MTA. Additionally, the contractor indicated that coordination efforts with the CS179 contractor related to signal system software being supplied by a CS179 subcontractor needed to be established to facilitate the Factory Integrated Acceptance Testing (FIAT) of some of the signal equipment and that any delay in the receipt of this software would seriously impact the scheduled FIAT. Further, the ESA VS086 CM indicates that the LIRR will use specialized track circuit equipment supplied by the contractor to bench test a "demonstration" track circuit and then find a place on the LIRR's Right-of-Way to field test the circuit before authorizing the use of this specialized equipment for this contract. The time frame for completing the bench and field testing of this equipment that the contractor says is necessary for the overall system design is, at this time, unknown; making any schedule forecast for this activity impossible. These design and delivery software issues remain as outstanding items. Finally, the LIRR had recently requested that the contractor replace the incandescent lights in the signal units with Light Emitting Diodes (LEDs); a change to the contract

requirements and to designs already underway. To address this request, MTACC is progressing a contract modification that will authorize the GEC to perform a study to identify the feasibility of replacing the tunnel signal units currently designed to use incandescent light bulbs with signal units that use LEDs. If it is determined that LED signal units for the tunnels are possible, then MTACC and the LIRR will need to decide if this potential contract change is warranted; and, if it is, quickly progress a contract modification to minimize any impact to the design completion date.

### **Queens Contracts:**

**CQ032 – Plaza Substation and Queens Structures:** As of January 1, 2017, MTACC reported that the Forecast at Completion for CQ032 decreased slightly to \$264,700,647. MTACC reports the Forecast for Substantial Completion (SC) remained March 2, 2017, due to delayed completion of the Yard Services Building. Actual construction progress for December 2016 was 0.2% versus 0.6% planned. Cumulative progress through January 1, 2017, was 98.8% actual versus 100.0% planned.

Construction Progress: During February 2017, the CQ032 contractor continued finish work in the Yard Services Building (YSB) and expects to complete all work in March 2017. Work continued on miscellaneous civil site work items. ESA is awaiting final Con-Ed approval and activation of the gas line service connection to the YSB. There was no water remediation activity this past month. The CQ032 contractor continued preparation of as-built/closeout documentation and punch list activity. ESA continued contract de-scoping activity to transfer remaining work items to other contracts including the work at the 23<sup>rd</sup> St. facility, 2 vent shafts on the west side of 23<sup>rd</sup> St. along with architectural items, spray-on fireproofing of the Amtrak North Runner bridge, painting of walls and ceilings in Plaza Interlocking area rooms, and yard site work including: beam barrier, landscaping, paving, and a curb cut at Northern Blvd. for the existing NYCT vent.

### **Harold Interlocking Contracts:**

**CH057 – Harold Structures Part III:** MTACC's Forecast at Completion for the CH057 contract decreased slightly during December 2016 to \$92,361,565. The MTACC forecast for Substantial Completion changed by one day to July 6, 2017. Actual construction progress for December 2016 was 4.1% versus 6.7% planned. Cumulative progress through December 31, 2016, was 68.2% actual versus 81.3% planned (based on cost incurred rather than actual construction).

Construction Progress: During February 2017, the CH057 contractor installed new Signal Bridge #23 near 48<sup>th</sup> St., resumed installation of catenary poles in various locations in Harold Interlocking, installed 4 hatch covers in LIRR transformer cases to progress construction of the signal power separation system, continued wayside electric installations, and began construction of the new LIRR MM2 Track near 48<sup>th</sup> St.

**CH057A – Part 3 Westbound Bypass:** MTACC's Forecast at Completion for the CH057A contract decreased slightly during December 2016 to \$160,977,671. The MTACC forecast for Substantial Completion was extended by 9 weeks to March 30, 2018. Actual construction progress for December 2016 was 2.9% versus 5.0% planned. Cumulative progress through December 31, 2016, was 46.0% actual versus 52.5% planned (based on cost incurred rather than actual construction).

Construction Progress: During February 2017, the CH057A contractor continued to place re-bar and sidewall concrete in the East Approach Structure (east of Honeywell Avenue only) and the

West Approach Structure of the Westbound Bypass (WBY), completed placement of secant piles around the perimeter of the pump room at the WBY pump station and installed 3 catenary poles in Harold Interlocking. The “jacked box” tunnel shield to excavate the WBY Tunnel under Amtrak Lines 2 and 4 remained idle during the month as MTACC and the contractor continued to explore causes for the original alignment problems and possible solutions. There has been no tunnel shield progress for 7 months since August 2, 2016.

#### **Railroad Force Account Contracts:**

**FHA01 – Harold Stage 1 Amtrak:** MTACC’s Forecast at Completion for FHA01 remained at \$18,824,861 during December 2016. The MTACC forecast for Substantial Completion was extended by 4-1/2 months to July 6, 2017. Actual construction progress for December 2016 was 0.0% versus 0.0% planned. Cumulative progress through December 31, 2016, was 98.8% actual versus 100.0% planned (based on cost incurred rather than actual construction).

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

**FHA02 – Harold Stage 2 Amtrak:** MTACC’s Forecast at Completion for FHA02 remained at \$60,150,231 during December 2016. The MTACC forecast for Substantial Completion remained at May 20, 2018. Actual construction progress for December 2016 was 0.1% versus 0.0% planned. Cumulative progress through December 31, 2016, was 85.4% actual versus 81.0% planned (based on cost incurred rather than actual construction).

Construction Progress: During February 2017, Amtrak Electric Traction (ET) personnel continued construction of the new AC overhead catenary system over the new RPR Track (Relocated Primary Route Track) and the existing LIRR Eastward Passenger Track, a distance of 3,600’. To date, construction is approximately 90% complete.

**FQA65 – Loop Interlocking Amtrak:** MTACC’s Forecast at Completion for FQA65 remained at \$33,287,863 during December 2016. The MTACC forecast for Substantial Completion remained at July 16, 2023. Actual construction progress for December 2016 was 0.0% versus 1.7% planned. Cumulative progress through December 31, 2016, was 20.0% versus 60.8% 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: During February 2017, Amtrak C&S personnel resumed installation of signal and snow melter cables along existing Loop 1 between the F2J signal case and the Amtrak car wash.

**FHL01 – Harold Stage 1 LIRR:** MTACC’s Forecast at Completion for FHL01 remained at \$24,379,363 during December 2016. The MTACC forecast for Substantial Completion was extended by one month to July 31, 2017. Actual construction progress for December 2017 was 1.1% versus 0.0% planned. Cumulative progress through December 31, 2016, was 89.7% actual versus 100.0% planned (based on cost incurred rather than actual construction).

Construction Progress: During February 2017, LIRR 3<sup>rd</sup> Rail personnel continued to excavate and install conduits from the main line tracks in Harold Interlocking to the new G02 Substation for the 50T51, 60T61, and 70T71 control cables and the N4, R1, R6, R7, and R10 reactors.

**FHL02 – Harold Stage 2 LIRR:** MTACC’s Forecast at Completion for FHL02 remained at \$92,932,559 during December 2016. The MTACC forecast for Substantial Completion remained



at April 15, 2020. Actual construction progress for December 2016 was 1.2% versus 0.0% planned. Cumulative progress through December 31, 2016, was 97.4% versus 100.0% planned (based on cost incurred rather than actual construction).

Construction Progress: During February 2017, LIRR Signal personnel continued to install signal, snow melter, and track cables at the “H1”, “H2”, “H3”, and “H6” CILs, make various signal circuit revisions (ESA501, ESA600B, and Ansaldo 100A) in the Harold, “H1”, “H6”, and new and existing Location 30 CILs, and installed a foundation for the new 69W signal. LIRR High Tension personnel supported a 3<sup>rd</sup> Party contractor to install 4-100kVA transformers in the Location H and 23 CILs for the new signal power separation system along the #135 signal circuit and replaced the existing 1031Q feeder cable at the G03 Substation.

#### **d. Quality Assurance and Quality Control (QA/QC)**

**ESA Quality Management:** A new system for Quarterly Quality Oversight (QO) was developed in 4Q2016 and has been reviewed by ESA Quality Management staff. The first QO performed under this new system was for CH057 (on February 01, 2017). The following QOs reportedly took place in February 2017. Once the reports are issued, they will be reviewed by the PMOC:

- CH057
- CS179
- CM006
- CM007
- CHO57A

ESA Quality Management reported that the GEC Quality and Quality Team meetings were cancelled for the month of February. These meetings were rescheduled moving forward, and will resume on March 10, 2017. Specific quality concerns, by contract, are listed below.

**CM005:** All work has stopped on site. MTACC and the contractor continued negotiations on close out, CPRs, and the pending transfer of remaining work to follow-on contracts. Approximately ten (10) Nonconformance Reports (NCRs) remain open.

**CM006:** There are fifty-seven (57) open NCRs, approximately one-third have “Use-As-Is” status pending closure paperwork.

**CH057:** There were three new NCRs opened in February, for a total of 20 NCRs on the contract. These three NCRs are currently under review by the contractor for corrective action, as well as two prior NCRs that remain open (5 total open NCRs on the contract).

**CH061A:** The Quality Plan was reviewed by the ESA Quality Manager and returned with comments for revision and resubmittal.



Table 2.2, below, shows the current IPS critical path of work through Harold contracts and has changed somewhat since the previous update. 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: January 1, 2017 IPS Critical Path**

<b>Contract &amp; General Activities</b>	<b>Duration (CDs)</b>	<b>Start</b>	<b>Finish</b>
FHL02: Signal Power Separation Work	54	01-Jan-17	24-Feb-17
FHL02: CIL Cutovers Pre-Testing and Cutovers	447	27-Feb-17	20-May-18
CH057D/FHA/L03: NE Quadrant Preparatory Work, Outage, and B/C Approach Preparatory Work	116	21-May-18	14-Sep-18
FHA/L04/FHL02: Switch Installation & Removals	70	17-Sep-18	26-Nov-18
CH058A/CH058: Track B/C Approach Work	638	26-Nov-18	25-Aug-20
FHL04: Testing & Cutover of 4C	46	26-Aug-20	11-Oct-20
Train Contract Staffs LIRR Prior to 3 Months Period	29	15-Oct-20	13-Nov-20
LIRR 3 Month Period	89	14-Nov-20	11-Feb-21
<b>Target Revenue Service Date</b>			<b>11-Feb-21</b>
<b>Late Revenue Service Date</b>			<b>13-Dec-22</b>

Discussion of Progress Leading up to Critical Start of CIL Pre-Cutover Testing:

ESA has reported this month that there are four predecessors controlling the start of critical Harold CIL pre-cutover testing: completion of LIRR signal power separation; completion of ARINC screen shots; completion of software simulations; and completion of CIL software package updates. Over the progress period, the controlling work changed from the ARINC resequencing screen shots to the work leading up to the signal power separation at H1/H2/H5/H6 CILs.

The PMOC analyzed these paths of work over the update period in order to determine progress made and/or delays encountered. In the following sets of figures, the black bars represent actual progress made; the light blue bars and lines represent planned progress and logic from the previous IPS update; and the dark blue bars and lines represent planned progress and logic from the current IPS update.

Path through Signal Power Separation:

The PMT reports that the controlling path of work along the Program, as of the January 1, 2017 IPS update runs through the completion of signal power separation for the H1/H2/H5/H6 CILs. The activities involved, and the progress made over the update period can be seen below. The blue line represents the path of activities contained in the previous IPS update, while the red line represents the path of work in the current IPS update – both leading to the start of critical CIL pre-cutover testing.

**Figure 2-1: Program Critical Work – LIRR Signal Power Separation**

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Path through Signal Power Separation	IPS	Start	Finish	2016		2017		
				NOV	DEC	JAN	FEB	MAR
FHL02-31130: GEC submits Power Flow Study	1-Dec	9/1/2016 A	12/16/2016	█	█			
	1-Jan	9/1/2016 A	1/13/2017	█	█	█		
FHL02-31150: Step 1: CH053 - Complete Punch List items, Training for LIRR and Perform Load test of Woodside MG	1-Dec	11/29/2016 A	12/6/2016	█	█			
	1-Jan	11/29/2016 A	1/20/2017	█	█	█		
FHL02-31160: Feed Signal Circuit #135 with Woodside MG, and to verify Phase polarity at existing Harold CIL, H and 23 cases	1-Dec	12/16/2016	12/18/2016					
	1-Jan	1/21/2017	1/21/2017					
FHL02-31170: Amtrak Sub44 to feed reserve circuit #135 Feed signal circuit #134 with wood side MG and Burn-in for a week	1-Dec	12/18/2016	12/28/2016					
	1-Jan	1/21/2017	2/19/2017					
FHL02-30240: Install Hatch (2 weekends) - By contractor through CH057	1-Dec	1/7/2017	1/8/2017					
	1-Jan	1/28/2017	1/29/2017					
FHL02-30220: Install Transformer	1-Dec	1/9/2017	1/13/2017					
	1-Jan	2/20/2017	2/23/2017					
FHL02-31180: 91 6 Hz Power to H1/H2/H5/H6 CIL's - To be isolated from Sub 44	1-Dec	1/14/2017	1/14/2017					
	1-Jan	2/24/2017	2/24/2017					
FHL02-CSR1160: Pre-Testing - H1/H2/H5/H6/Loc 30	1-Dec	2/21/2017	5/4/2018					
	1-Jan	2/27/2017	5/4/2018					

Analyzing the progress of this work as reported in the January 1, 2017 IPS compared against the December 1, 2016 IPS shows that the planned path of work through signal power separation has been delayed over the update period and therefore, different activities now control the start of critical CIL Cutover Pre-Testing. The logic contained within the December 1, 2016 IPS showed that the start of CIL Cutover Pre-Testing needed signal power separation work to be complete;

In the previous IPS update, this path of work was shown to be driven by FHL02-31130: GEC submits Power Flow Study. However, in the January 1, 2017 IPS, the driving activity for the signal power separation path of work is now FHL02-31150: Step 1: CH053 – Complete Punch List items, Training for LIRR and Perform Load test of Woodside MG, as this work experienced a larger extended duration than FHL02-31130, as shown circled in Figure 2-1, above (1). It appears that the extended duration of FHL02-31150 has both caused it to drive the signal power separation path of work; and b) consumed any float between the signal power separation path of work and the critical start of CIL Cutover Pre-Testing.

Path through ARINC Screen Shots:

The PMT’s January 1, 2017 IPS reports that the path of work controlling the ESA Program runs through work related to ARINC screen shots. The activities involved and the progress made over the update period can be seen as follows:

**Figure 2-2: Program Critical Work – ARINC Screen Shots**

Path through ARINC Software	IPS	Start	Finish	2016		2017		
				NOV	DEC	JAN	FEB	MAR
FHL02-CSR1180: H5/H6/L30 Arinc Resequencing screen shot changes	1-Dec	10/29/2016 A	2/1/2017	█	█			
	1-Jan	10/29/2016 A	1/31/2017	█	█			
FHL02-CSR210: Arinc Resequencing screen shots on site installation/Test/Resolve issues	1-Dec	2/2/2017	2/20/2017				█	
	1-Jan	2/1/2017	2/24/2017				█	
FHL02-CSR290: Ready to start testing / Revision	1-Dec	-	2/20/2017				█	
	1-Jan	-	2/24/2017				█	
FHL02-CSR1160: Pre-Testing - H1/H2/H5/H6/Loc 30	1-Dec	2/21/2017	5/4/2018					█
	1-Jan	2/27/2017	5/4/2018					█

As can be seen above, this path of work made expected progress over the reporting period and, as of the January 1, 2017 IPS data date, was still on schedule. What appears to be a minor calendar effect has delayed the forecasted completion of this work from February 20 to 24, 2017. This work is concurrent to the path of work needed for signal power separation, shown above.

**90-Day Look-Ahead of Program Critical Milestones:**

Table 2-3, below, shows Program-critical 90 day Look-Ahead milestone dates reported in the January 1, 2017 IPS. Please note that, while FHL02-CSR290, below, is not shown on the PMT’s “Harold Critical Path Activities” contained within the January 1, 2017 IPS Report, the PMOC considers this milestone critical, as it is the driving predecessor for the start of Program-critical CIL Cutover Pre-testing within the IPS logic.

**Table 2-3: Critical Milestones 90 Day Look-Ahead (from ESA January 1, 2017 IPS)**

Activity ID	Activity Name	Start	Finish	█
<b>FHL02: Harold Amtrak and LIRR Force Account</b>				
FHL02-CSR290	Ready to start testing / revision		20-Feb-17	█

**Program Secondary Path – Manhattan/Systems:**

The PMT’s January 1, 2017 IPS reports that the controlling work for the Manhattan/Systems portion of the Program continues to be led by the CM007 East Cavern Headings, with precast, closure pours, and wall work. Critical work at Manhattan/Systems is then reported to go through East Cavern electrical work, still under CM007, and into CS179 Integrated Systems Testing (IST).

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The forecasted completion of CS179 [REDACTED] [REDACTED] remained unchanged at July 1, 2020 [REDACTED]

Over the update period, the completion date of the Precast Elements – Fabrication and Delivery was forecasted to occur 22 calendar days earlier than expected in the previous update, from February 9, 2018 to January 18, 2018. This forecasted savings to the completion of the Precast Elements Fabrication and Delivery has not impacted the Manhattan/Systems longest path of work, as all major remaining forecasted dates have remained unchanged.

**Upcoming Contract Procurements:**

Table 2-4, below, shows the status of current and upcoming Contract procurements, as reported in the January 1, 2017 IPS Progress Report, with a discussion of any changes below the table.

**Table 2-4: Future Procurement Schedule**

<b>Contract Description</b>	<b>Advertise Date</b>	<b>Bid Date</b>	<b>NTP</b>	<b>Project Period</b>	<b>Substantial Completion</b>
<b>CH061A Tunnel A</b>	5/31/2016 (A)	08/2/2016 (A)	01/27/2017 (A)	16 Months	05/29/2018
<b>CQ033 Mid-Day Storage Yard</b>	10/20/2016 (A)	02/17/2017	03/17/2017	40 Months	07/15/2020
<b>CM015 48<sup>th</sup> Street Entrance</b>	02/28/2017	05/10/2017	06/16/2017	33 Months	03/18/2020
<b>CS086 Systems Package 2: Signal Installation</b>	03/01/2017	05/01/2017	05/30/2017	37 Months	07/01/2020
<b>CH057A: Harold Trackwork</b>	12/06/2017	04/17/2018	06/18/2018	26 Months	08/25/2020
<b>CH057D: Harold Trackwork</b>	10/25/2017	01/25/2018	02/26/2018	15 Months	06/02/2019
<b>QMP-1 Civil / Neighborhood Beautification</b>	10/20/2016 (A)	01/05/2017 (A)	02/17/2017	10 Months	12/08/2017
<b>QMP-2 Lighting / CCTV Security</b>	02/23/2017	04/12/2017	05/30/2017	13 Months	07/02/2018

Forecasted work related to the procurement of CH061A: Tunnel A, has remained unchanged over the update period. The NTP for the CH061A Contract did occur on January 27, 2017, and the

contract is still forecasted to have a duration of 16 months, with expected Substantial Completion planned to occur on May 29, 2018.

The forecasted Bid Date for CQ033: Mid-Day Storage Yard, has been delayed since the December 1, 2016 IPS by approximately one month, from January 19, 2017 to February 17, 2017. The planned remaining milestone dates related to the procurement of CQ033 have also been forecasted to be proportionally delayed. The planned NTP date for CQ033 has moved from February 22, 2017, to March 17, 2017, over the update period. The expected construction timeframe remained the same at 40 months, with the current Substantial Completion date forecasted to be July 15, 2020. This is an approximately three-week forecasted delay to the Substantial Completion date for CQ033 over the update period.

The forecasted dates for the procurement of CM015: 48<sup>th</sup> Street Entrance were delayed over the update period, a trend that has continued since the previous update period. The planned Advertise Date was delayed by approximately one month, the planned Bid Date was delayed approximately two weeks, and the forecasted date for NTP was delayed ten calendar days. The planned Project Period remained the same at 33 months, and the forecasted Substantial Completion date was delayed nine calendar days. Over the last two months, the IPS has reported an almost day-for-day delay to the Advertise Date. The PMT's IPS Report notes that the delay to the Advertise Date is related to the GEC's update to drawings.

The planned dates for the Advertise Date, Bid Date, and NTP dates of future contract CS086 - Systems Package 2, Signal Installation, were delayed over the update period. The Advertise Date and Bid Date were delayed approximately five weeks since the previous IPS update, while the planned NTP date was delayed by approximately one week. The PMT reported that the planned duration of the contract decreased by one month and the expected Substantial Completion date remained the same at July 1, 2020.

Some of the forecasted dates for the procurement of CH057D: Harold Track Work (PW1/NH1/WBY) experienced a delay over the update period. The Advertise Date was delayed approximately five weeks, from August 15 to October 25, 2017; and the Bid Due Date was delayed approximately five weeks from December 1, 2017, to January 25, 2018. The forecasted NTP remained almost unchanged, while the Substantial Completion date moved from May 24 to June 2, 2019.

Regarding the planned procurement dates for CH058A: Harold Track Work (B/C Structure/Catenary Structure), the Advertise Date remained the same at December 6, 2017, while the Bid Due Date was delayed from February 5 to April 17, 2018. The remaining NTP and Substantial Completion Dates remained the same over the update period, forecast to be June 18, 2018, and August 25, 2020, respectively.

The forecasted Bid Date for QMP-1: Civil/Neighborhood Beautification of January 5, 2017, was reported to have been achieved over the update period. However, the planned NTP and Substantial Completion Dates from the previous update were delayed by approximately one month, respectively. The planned procurement dates for QMP-2: Lighting/CCTV Security, remained the same over the update period.

### **PMOC Concerns:**

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

1. The PMOC is concerned that the current path of work controlling the start of Program-critical CIL pre-cutover testing continues to experience delays.
2. The PMOC is concerned regarding the delay to the forecasted procurement dates for future contracts. The forecasted Bid Due, NTP, and Substantial Completion dates for CQ033: Mid-Day Storage Yard all were delayed approximately three weeks over the update period. The forecasted dates related to the procurement of CM015: 48<sup>th</sup> Street Entrance were also delayed over the update period.
3. The PMOC is concerned about the continuous changes made to the IPS that affect the forecasted Program's critical path and the lack of comments regarding this work by the PMT in its IPS Report. For example, over the update period, activities that the PMT reported were previously driving critical work appear to have been removed from the IPS and are no longer controlling the critical work, as noted in Figure 2-1 above. The PMOC recommends that the PMT address changes like this to the Program's critical path and consider adding a section to the IPS Report that addresses work under Contract FHL02, which has been controlling the Program's critical path for over six months.



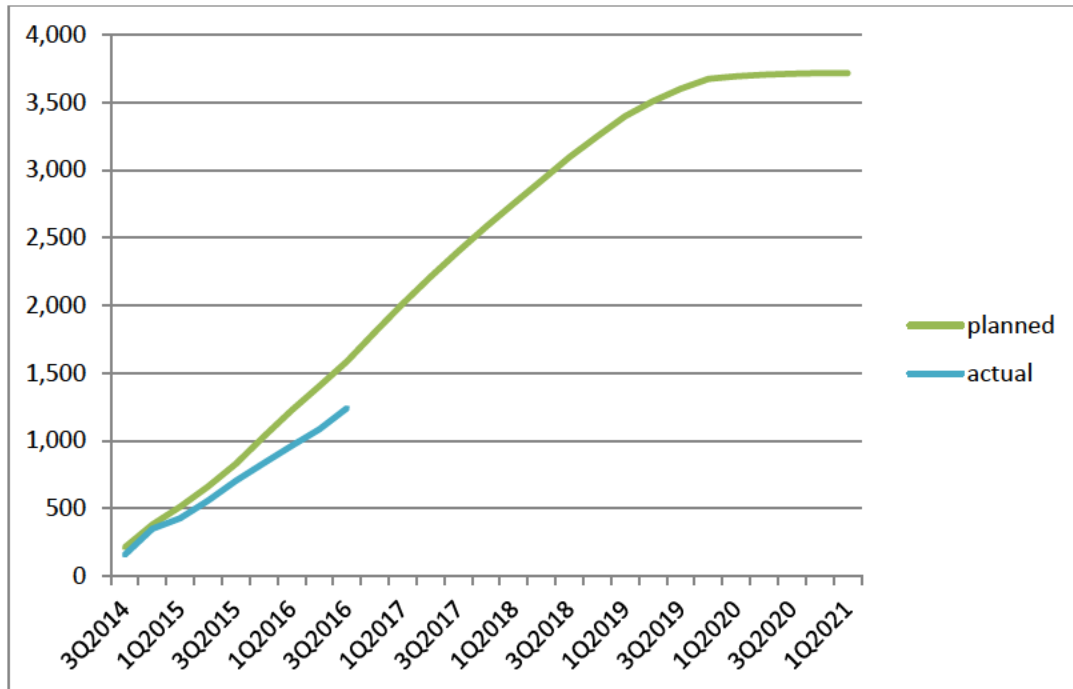
### 3.0 COST DATA

**Funding:** The approval of the 2015 – 2019 Capital Plan has eliminated the cost uncertainty associated with funding interruptions, at least in the near term. ESA indicates that it will request further amendments to the MTA Capital Plans (both 2010 to 2014 and 2015 to 2019), seeking funding for the Owner Controlled Insurance Program (OCIP) and Force Account related overruns and other project scope additions. As of January 31, 2017, neither of these ESA Capital Plan Amendments has been finalized and MTACC has not provided forecast dates for submission and approval.

**Budget/Cost:** The ESA 4<sup>th</sup> Quarter 2016 Progress Report (January 1 data date) shows that the actual total project progress was 67.6% versus 70.8% planned against the Current Baseline Budget (CBB) of \$10.178 billion. Total actual construction progress was 67.3% versus 72.0% planned based on the total invoiced amount of construction. Details of the project budget and expenditures are shown in Appendix B, Tables 2 and 3. A PMOC review of the ESA Planned Cash Flow Chart shows that it is based on the MTACC February 2021 Revenue Service Date. This now aligns with the Target Revenue Service date resulting from the July 1, 2016, data date of the IPS. Through 3Q2016, the actual cumulative construction amount invoiced is 94.4% of what was planned. Since the 2014 re-baseline, the actual cumulative construction amount spent is 78.2% of the planned construction spending through 3Q2016. As shown in Table 3-1, the divergence between plan and actual spending is increasing, suggesting a worsening trend. The PMOC is concerned that the continued inability to achieve the planned construction spending rate may impact ESA's ability to achieve their target Revenue Service Date. This spending trend and future projections are shown in Tables 3-1 and 3-2 below.

**Table 3-1: Planned vs Actual Construction Cash Flow**

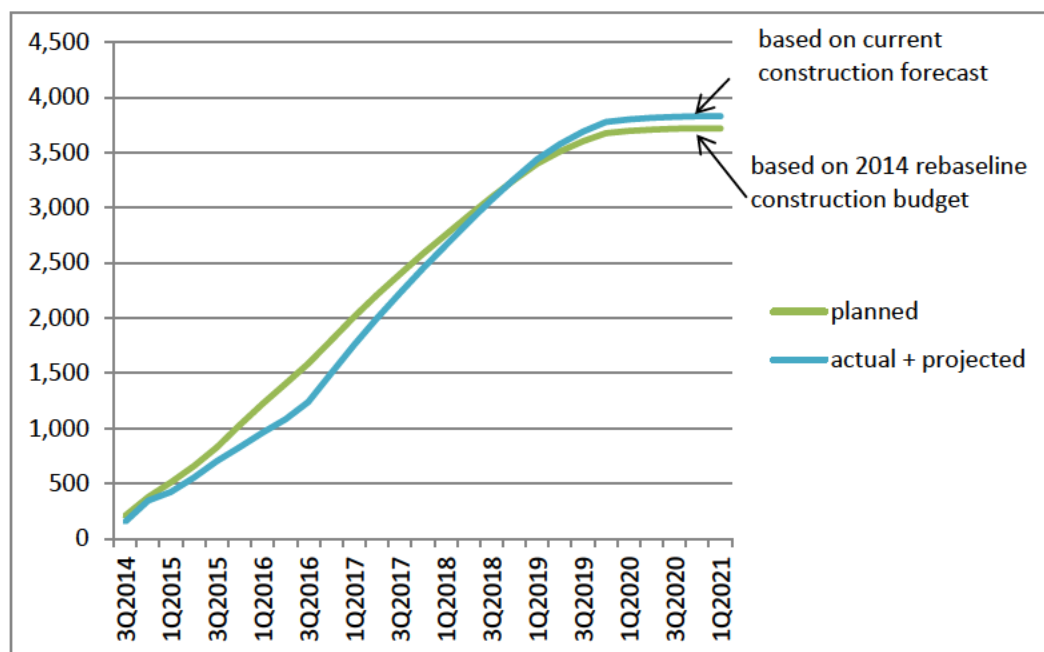
The "planned" curve shows construction cash flow that was planned by ESA at the 2014 re-baselining in order to reach revenue service by the 1Q2021. The vertical axis is \$million, starting at \$0 at the time of the re-baselining. The "actual" curve, up to the 3Q2016, shows actual construction spending as reported by ESA.



**Construction Cash Flow at 3Q2016 – Starting at 2014 Rebaseline**

**Table 3-2: Actual & Projected Construction Cash Flow to Early RSD**

The "planned" curve shows construction cash flow that was planned by ESA at the 2014 re-baselining in order to reach revenue service by the 1Q2021. At that time, the total construction budget was \$7.38 billion. The vertical axis is \$million, starting at \$0 at the time of the re-baselining. The "actual" curve, up to 3Q2016, shows actual construction spending as reported by ESA. The "projected" portion of that curve, from 1Q2016 through 1Q2021, shows the PMOC's projected construction spending rate to reach the current \$7.48 billion final construction budget by the 1Q2021.



**Construction Cash Flow - Starting at 2014 Rebaseline**

Several significant items were discussed at the recent Monthly Cost Review meetings:

- As related to the previously reported cost increases, the ESA study indicates that \$111.4 million in additional Amtrak and LIRR Force Account costs will be required to complete the ESA FFGA scope (Revenue Service), while \$245 million in additional FA costs to complete the full Harold Rev. 14-4M Alignment, including the Regional Investment scope. This study does not include any Third Party contract delay costs for extended overhead and indirect costs resulting from the lack of required force account resources.

ESA indicated that it will pursue recovery of the increase in Force Account and OCIP costs as well as OICs on Contract CM014B and other identified cost overruns through MTA funding by seeking amendments to the Capital Plan. In November 2016, ESA indicated that it was their understanding that MTACC will present these additional costs to the MTA Board in December 2016. In December 2016, ESA advised that the MTACC's 2015-2019 Capital Plan Amendment presentation to the MTA Board at the December 2016 meeting did not include the ESA cost items. Based on a meeting with the MTA Chairman, it was

decided that the ESA additional cost items will be presented in 2Q2017 as a separate Capital Plan Amendment. In February 2017, ESA reported that the ESA Capital Fund Amendment has been further postponed and a late completion target established as the 1<sup>st</sup> Quarter 2018. ESA has not received specific forecast dates regarding any aspect of the ESA Capital Plan Amendment.

- It should be noted that ESA has not yet incorporated the additional amounts for either FA construction or OCIP in their budget forecasts, indicating that MTACC approval for the forecast change has yet to occur. The PMOC believes that these are known costs that will be incurred and, therefore, should be included in the budget forecasts.

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

**PMOC Concerns:**

The following summarizes the PMOC’s concerns regarding cost and budget issues:

■ [REDACTED]

■ Current contract delays, and potential future delays, may result in cost increases on the following contracts:

- CS179 – Late completion of final design and resulting schedule compression to hold start of Integrated Systems Testing.
- CS084 – Late completion of final design has delayed fabrication of some traction power equipment.
- CS086 – Incorporation of Positive Train Control into ESA signal system.



Amtrak Force Account resources will be needed to support the hardening work, which could further reduce the Amtrak resources available to support the ESA Harold Re-Sequencing Plan. During July 2016, Amtrak advised MTACC that it plans to start work on the total track replacement in ERT Lines 3 and 4 during 4Q2016. There is also concern that track outages required for the hardening work may conflict with ESA needs to support completion of the planned Harold work, including the High Speed Rail scope, by 2020. To date, however, Amtrak has not provided any details to MTACC regarding the scheduling of the ERT Lines 3 and 4 hardening work or impact on force account resource availability to support the ESA work in the Harold Interlocking. However, no noticeable impacts to availability of Amtrak force account resources during the October 2016 to February 2017 time period were observed due to work in ERT Lines 3 and 4. The PMOC does note, however, that according to the ESA-PMT, Amtrak's decision about taking ERT Line 2 out of service first, in 2019, for the 18-month reconstruction work is not expected to directly impact the completion of the Harold work needed to commence LIRR service into GCT. Amtrak's decision will, however, impact Contract CH058B, Harold Structures – Part 3B, Eastbound Re-Route - a Regional Investment initiative that is not required to provide the connection for LIRR service to GCT. The ESA-PMT has indicated that there is no work-around plan for this situation, during which ERT Line 1 would have to be taken out of service in order to construct the Eastbound Re-Route.

## 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):** The FTA requested MTACC to update its TCC Plan in response to the FTA/PMOC comments that were generated in November 2013 as a result of significant changes in key ESA upper management level positions. MTACC submitted its revised Technical Capacity and Capability Plan (ESA and SAS) on April 13, 2015. The PMOC returned comments to the FTA on May 7, 2015. MTACC submitted a revised TCC Plan in response to FTA/PMOC comments on June 12, 2015. In August 2015, the PMOC provided the FTA with its evaluation of MTACC responses to the PMOC review comments and recommended a meeting with MTACC to resolve remaining issues. The FTA subsequently provided MTACC with the evaluation. MTACC responded with a reply on September 24, 2015.
- **Continuing ELPEP Compliance:** The following ELPEP components continue to need improvement: 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. The ESA Risk Manager continues to work toward re-establishing risk management as one of the key inputs to the decision-making process. To assist MTACC with focusing efforts on improving ELPEP compliance in the remaining areas, the PMOC has started to re-evaluate the situation based on the current revisions of the CMP, SMP, and RMP and expects to complete this effort during 1Q2017.

- **Project Management Plan:** The PMOC completed its review and evaluation of MTACC's revisions and responses and submitted its findings to FTA-RII in 4Q2014. MTACC subsequently submitted a revised Rev. 10 on March 13, 2015, that included updated information on the Change Control Committee. The revised Rev. 10 of the PMP was reviewed by the PMOC against the PMOC's evaluation in 4Q2014. The PMOC continues to coordinate with MTACC, arranging working meetings with ESA chapter authors and the corresponding PMOC reviewers to resolve the remaining outstanding FTA/PMOC evaluation comments. Several working meetings have been held since June 2015 and continued through December 2015. MTACC and the PMOC are working to schedule the few remaining meetings with ESA chapter authors required to complete this process. MTACC submitted the next revision to the PMP in June 2016 that reflects ESA organizational changes along with some additional updates and revisions to certain sections. The PMOC is currently reviewing these changes and is nearing completion of its evaluation.

- [REDACTED]

The PMOC notes that, since June 2013, the ESA project has continued to be non-compliant with ELPEP and is not meeting some of the more important requirements of the Schedule Management Plan (SMP) and Cost Management Plan (CMP) sub-plans to the PMP, as noted above. The PMOC believes that this continues to be a deficiency and needs to be corrected. The PMOC does note, however, progress in certain areas. The PMOC's major areas of concern include:

- **Schedule Management Plan (SMP):** The ESA project remains partially non-compliant with requirements for Integrated Project Schedule (IPS) Updating, Forecasting, [REDACTED] against a current baseline schedule. The revised SMP was submitted in 4Q2015 and the PMOC completed its review in June 2016. Review comments were forwarded to MTACC on July 15, 2016, and a working meeting was held on August 25, 2016, to review, discuss, and resolve the comments. MTACC has followed up with the agreed upon revisions to the SMP and has completed its responses in the review comment matrix. During October 2016, MTACC submitted the completed review comment matrix and a revised SMP. The PMOC has completed its evaluation, found no significant issues and provided its findings, including the remaining comments requiring resolution, to the FTA in November 2016. The FTA subsequently forwarded the PMOC's comments to MTACC. In January 2017, MTACC submitted additional documents to the FTA and PMOC in response to the remaining comments. These documents are currently under review by the PMOC.
- **Cost Management Plan (CMP):** The ESA project remains partially non-compliant with requirements for Project Level EAC Forecasting, Project Level EAC Forecast Validation, [REDACTED] and Secondary Mitigation. The PMOC has noted some improvement in a number of areas, but additional work

is needed in other areas. After progressing with resolution of many PMOC comments, the PMOC met with MTACC in November 2015 to focus on the remaining issues. MTACC continued working on additional agreed upon revisions and evaluated the PMOC's recommendations in six areas. MTACC provided an initial draft of the revised CMP on December 15, 2015, and the PMOC completed its review in early June 2016. MTACC and the PMOC met on June 22, 2016, to review the PMOC comments. During October 2016, MTACC submitted the completed review comment matrix and a revised CMP. The PMOC has completed its evaluation, which concluded that the CMP is acceptable and provided it to the FTA with the comment close-out details in November 2016. The FTA subsequently notified MTACC accordingly.

**Revisions to the ELPEP Document:**

[REDACTED]  
[REDACTED] The PMOC's recommendations were presented at several meetings with the MTACC in 2015. [REDACTED]  
[REDACTED]

[REDACTED] The PMOC continues work on a draft revision to the ELPEP document that reflects these agreements.



## 6.0 SAFETY AND SECURITY

Table 6-1, below, shows the PMOC Calculated and ESA Reported Lost Time and Recordable injury ratios through December 31, 2016. The PMOC developed this table to demonstrate the effectiveness of ESA's most recent safety efforts rather than its cumulative safety record, which ESA uses to report in each of its monthly reports. The PMOC believes that this provides a more accurate measure of ESA's current safety performance than its cumulative record does.

**Table 6-1: ESA 2016 Lost Time and Recordable Injury Ratios**

	Lost Time Ratio	Recordable Ratio
2016 BLS Ratios (used by OSHA)	1.7	3.0
PMOC Calculated ESA December 2016 Ratios	2.22	2.22
PMOC Calculated ESA CY2016 Ratios	0.71	1.98
ESA Reported Ratio (Cumulative since beginning of project as of December 31, 2016)	1.84	ESA does not report cumulative Recordable Injury Rates

Additionally, the ESA PMT did not report any significant security issues during December 2016.

## 7.0 ISSUES AND RECOMMENDATIONS

**Design:** The PMT design management team needs to focus on achieving intermediate milestones in a timely fashion and work 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 results in time-consuming and costly re-design work by the GEC.

All of the above factors contribute to the continuing delays in completing the bid documents for the near term contract procurements. The PMOC recommends that the PMT engage the upper level management of stakeholders involved to assist in resolution of the more serious issues.

The GEC continues to be challenged to meet the schedule requirements for review of design submittals from the CS084 and CS179 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 recent efforts by senior management to resolve these issues, but notes that more improvement is needed.

The PMOC notes that late completion of the design for Contract CQ033, Mid-Day Storage Yard Facility, has delayed procurement significantly. This situation has caused Contract CQ033 to appear on the Manhattan/Systems critical path and may impact the Integrated Systems Testing under Contract CS179.

**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 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) and minimize shifting scope for the remainder of the project.

**Water Infiltration Concerns Regarding Systems Contracts CS179 and CS084:** The PMOC remains concerned about the numerous water infiltration issues in the equipment rooms and the remediation efforts that need to be (and are currently being) implemented to provide permanent water infiltration mitigation in rooms with electronic equipment. The GEC's proposed remediation methodologies for the various locations should, in theory, mitigate the water infiltration issues. However, as was already experienced at the Vernon facility with the unsuccessful attempt to remediate the water infiltration by grouting floor slab cracks, theoretical solutions do not always work under actual field conditions. The successful mitigation of the water infiltration problem can only be validated after remediation work is complete. Further, if, after implementation, one of the water infiltration remediation methodologies is not entirely successful

in preventing water infiltration, it may be necessary to develop another strategy; which could further impact the design and construction processes on the Systems contracts.

The PMOC remains concerned about the long-term effectiveness of the water infiltration remediation efforts currently being undertaken at the Vernon and 29<sup>th</sup> Street facilities. The executed remediation effort at the 29<sup>th</sup> Street facility worked to stop the originally identified water infiltration problems; however, additional water infiltration areas are now apparent. Continuing mitigation (grouting) work is needed here. In the Vernon TPSS room, the contractor used a time-lapse camera system to ascertain if the floor slab remediation work was effective. Findings indicate that there are still some water infiltration problems between the walls and the floor slab. Now, additional discussions are needed to find another solution that will permanently stop the water infiltration.

Additional Water Infiltration Concerns - On CQ032 the contractor performed two phases of grouting in the former EAC and Launch Block areas. While the grouting has significantly remediated infiltration, ESA's goal of zero infiltration was not achieved, and continued remediation activity is likely to be transferred to a follow-on contract. Also, an apparent existing infiltration condition over work installed by the CM006 contract remains to be addressed under the F Line subway at York Ave.

**Contract CS179:** As noted in previous reports, the PMOC remains concerned that Buy/Ship America compliance issues remain as significant risks to the timely and successful completion of this contract. MTACC needs to quickly move forward with its intent to request any Buy/Ship America waivers for the potential non-compliance issues so as not to adversely impact the CS179 and overall ESA project schedules. To date, only one of the two identified waiver requests has been submitted to the FTA. The Buy/Ship America waiver request process can be a lengthy one, with no guarantee that a waiver will be granted. The sooner the waiver request documentation is finalized and submitted to the FTA, the sooner the MTA will know if alternative strategies and/or equipment are required to fulfill the contract's operational functionality requirements.

Additionally, the PMOC remains concerned that late completion of reviews of contractor design submittals by MTA has caused the design completion date to slip over 11 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 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 continues to have concerns about the length of time it is taking to provide responses and designs to mitigate the various issues and approve substation and equipment designs that the contractor continues to assert are delaying the completion of contract Milestones. MTACC should prioritize the delivery of requested design information related to the PLCs, the approval of substation switchgear equipment, and the execution of SCADA-related contract modifications to preclude any further impact to substation design and fabrication. Additionally, the PMOC has a concern regarding the testing of the C08 substation and the integrated testing of all the substations installed under the CS084 contract. Should the "live load" (dynamic) testing of the C08 substation and, consequently, the contractually required integrated live load testing of all the CS084 substations be transferred to another contract, work performance accountability issues could arise if test results are other than satisfactory. The MTA might want to consider

transferring the installation of the ductwork to another contractor, while leaving the requirement for the installation and testing of the cable and substations under the CS084 contract. This could be accomplished by temporarily “de-mobilizing” the CS084 contract for a short period of time and then “re-mobilizing” the CS084 contractor to perform all the testing. That way, any issues or problems that might surface during the testing period are still the responsibility of the CS084 contractor eliminating any “finger-pointing” between multiple contractors.

**Contract VS086:** The PMOC is concerned that MTACC does not have a current updated schedule to use to effectively manage this contract. There are also concerns regarding design decisions that must still be made by the MTA that could impact designs that are already in progress.

**Project Budget:**

[REDACTED]

**Project Schedule:** The PMOC is still concerned that, as stated by the PMT, Amtrak is not providing enough resources to support the ESA’s scheduled critical work. The PMT has stated that it will continue to meet with Amtrak and has obtained clearances to transfer Amtrak work to 3<sup>rd</sup> parties to try to partially mitigate schedule delays. The PMOC is also concerned about the lack of definition to the IPS activity representing CIL pre-cutover testing, as this consumes approximately 18 months of the Program critical path. The PMT has stated that it has not yet received this information from LIRR. The PMOC’s primary concerns include continued delay trending on force account work completion and changes to what is driving the Program’s critical path.

**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 the worksite time and access constraints, as well as the characteristics of underground construction work that limit productivity improvements. Delays have already started to accumulate and the PMOC believes that any meaningful schedule recovery will be difficult, at best. The PMOC is particularly concerned about delays to the completion of final systems designs on Contracts CS179, CS084, and VS086, and the potential schedule and cost impacts. Managing inter-contract handoffs and interfaces will be challenging and represents significant MTACC-retained risks. The PMOC has recognized 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

presented by the CM007 schedule that the PMOC considers very aggressive or the coordination challenges with the existing CM014B and CS084 contracts and the future CS086 contract.

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. 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:

- Program Funding (2015-19 Capital Plan issue resolved in May 2016; current forecast cost growth funding will rely on Capital Plan amendment and other sources);
- Recovery of lost time due to significant schedule delays on Contracts CM014B, CS179 and CS084;
- Successful execution of multiple hand-off interfaces across several contracts;
- Contractor access and work area coordination in Manhattan;
- Duration of integrated systems testing;
- Continued availability of adequate Amtrak and LIRR force account resources [increasing risk trend noted from 3Q2015 through February 2017];
- Continued availability of required track outages in Harold Interlocking. [Starting in September 2016, fewer priority weekend track outages have been available]; and,
- 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.

Although MTACC continues to actively engage Amtrak to develop some specific mitigations for certain risks and work on strategies for mitigating many of the other identified risks, the PMOC notes that continued shortcomings in provision of adequate force account resources continues to adversely impact the current Harold schedule and has caused the remaining Harold work to become the ESA program schedule critical path. Many external stakeholder 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. However, the situation has not improved and the PMOC recommends that the PMT actively engage executive management in MTACC and MTA to assist with resolution of this problem.

## APPENDIX A - ACRONYMS

AFI	Allowance for Indeterminates
ARRA	American Recovery and Reinvestment Act
BLS	Bureau of Labor Statistics
C&S	Communication and Signals
CCC	Change Control Committee
CCTV	Closed Circuit Television
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
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
NTP	Notice to Proceed
NYCT	New York City Transit
OCIP	Owner Controlled Insurance Program
PAC	Pneumatically Applied Concrete
PCO	Proposed Change Order
PMOC	Project Management Oversight Contractor (Urban Engineers)
PMP	Project Management Plan
PMT	ESA Project Management Team
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
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
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**

	FFGA				MTA's Current Baseline Budget (CBB)		Expenditures December 31 2016	
	Original FFGA (Millions)	Amended FFGA (Millions)	(% of Grand Total Cost)	Obligated	(Millions)	(% of Grand Total Cost)	(Millions)	(% of CBB)
Grand Total Cost	\$ 7,386	\$ 12,038	100.00%	\$ 4,724	\$ 11,214	100.00%	7364.5	65.67%
Financing Cost	\$ 1,036		14.03%	\$ 617	\$ 1,036	9.24%	617.6	59.61%
Financing Cost		\$ 1,116	9.27%					
Total Project Cost	\$ 6,350		85.97%	\$ 4,107	\$ 10,178	90.76%	6746.9	66.29%
Total Project Cost		\$ 10,922	90.73%					
Federal Share	\$ 2,683		36.33%	\$ 1,148	\$ 2,699	24.07%	1968.2	72.92%
Federal Share		\$ 2,683	22.29%					
5309 New Starts share	\$ 2,632		35.63%	\$ 1,098	\$ 2,437	21.73%	1706.1	70.01%
5309 New Starts share		\$ 2,632	21.86%					
Non New Starts share	\$ 51		0.69%	\$ 50	\$ 67	0.60%	66.7	99.55%
Non New Starts share		\$ 51	0.42%					
ARRA	\$ -	\$ -	0.00%	\$ -	\$ 195	1.74%	195.4	100.21%
Local Share	\$ 3,667		49.65%	\$ 2,959	\$ 7,479	66.69%	4778.7	63.89%
Local Share		\$ 8,239	68.44%					

**Table 3: Project Budget and Invoices as of December 31, 2016**

Elements	Baseline Total Budget (June 2014)	Current Baseline Budget (December 2016)	Actual Awards (December 2016)	Paid to Date (December 2016)	Actual % Budget Paid (December 2016)
Construction	\$ 7,379,296,706	\$ 7,499,906,985	\$ 6,628,199,148	\$ 4,919,310,280	65.59%
Soft Costs					
Subtotal	\$ 2,798,474,304	\$ 2,677,864,025	\$ 1,970,958,419	\$ 1,827,612,536	68.25%
Engineering	\$ 720,615,810	\$ 723,521,828	\$ 699,211,257	\$ 687,406,459	95.01%
OCIP	\$ 282,613,620	\$ 307,613,620	\$ 290,470,653	\$ 282,195,276	91.74%
Project Mgmt.	\$ 972,168,644	\$ 972,168,644	\$ 862,759,840	\$ 741,985,182	76.32%
Real Estate	\$ 182,076,230	\$ 178,049,776	\$ 118,516,669	\$ 116,025,619	65.16%
Rolling Stock	\$ 202,000,000	\$ 202,000,000	\$ -	\$ -	0.00%

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

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

Standard Cost Category	FFGA	June 2014 Project Budget	Amended FFGA	Mar-16	Jun-16	Sep-16	Dec-16	CBB Variance from FFGA	CBB Variance from Amended FFGA
				Current Budget	Current Budget	Current Budget	Current Budget		
10 - Guideway & Track Elements	\$ 1,989	\$ 3,405	\$ 3,353	\$ 3,443	\$ 3,467	\$ 3,475	\$ 3,486	75.27%	3.96%
20 - Stations, Stops, Terminals, Intermodal	\$ 1,169	\$ 2,238	\$ 2,327	\$ 2,314	\$ 2,326	\$ 2,325	\$ 2,328	99.16%	0.06%
30 - Support Facilities (Yards, Shops, Admin)	\$ 356	\$ 474	\$ 451	\$ 472	\$ 473	\$ 472	\$ 472	32.70%	4.80%
40 - Site Work and Special Conditions	\$ 205	\$ 611	\$ 562	\$ 594	\$ 594	\$ 592	\$ 588	186.89%	4.57%
50 - Systems	\$ 619	\$ 606	\$ 628	\$ 569	\$ 568	\$ 582	\$ 580	-6.32%	-7.61%
60 - ROW, Land, Existing Improvements	\$ 165	\$ 219	\$ 192	\$ 216	\$ 215	\$ 215	\$ 215	30.53%	12.04%
70 - Vehicles	\$ 494	\$ 210	\$ 880	\$ 210	\$ 210	\$ 210	\$ 210	-57.50%	-76.13%
80 - Professional Services	\$ 1,184	\$ 1,975	\$ 1,809	\$ 1,977	\$ 1,978	\$ 1,978	\$ 2,003	69.20%	10.74%
100 - Financing Cost	\$ 1,036	\$ 1,036	\$ 1,116	\$ 1,036	\$ 1,036	\$ 1,036	\$ 1,036	0.00%	-7.20%

**Table 5: Quarterly ESA Planned Cash Flow- Actuals to Date and Actuals Remaining (as of 3Q2016)**

Quarter/year	Construction \$(000)	Engineering \$(000)	OCIP \$(000)	Project Mgmt. \$(000)	Real Estate \$(000)	Rolling Stock \$(000)
<b>Paid To Date</b>	<b>3,660,194,771</b>	<b>646,377,892</b>	<b>155,604,955</b>	<b>580,041,291</b>	<b>112,634,547</b>	<b>0</b>
<b>Remaining</b>	<b>3,719,144,273</b>	<b>74,237,918</b>	<b>127,008,665</b>	<b>392,127,353</b>	<b>69,441,683</b>	<b>202,000,000</b>
3Q2014	209,340,620	-3,311,163	4,774,951	16,667,454	0	0
4Q2014	168,280,817	-3,290,689	4,774,951	16,667,454	75,948	0
1Q2015	134,568,200	-3,183,384	4,619,246	16,123,950	4,506,241	0
2Q2015	147,357,357	-3,290,689	4,774,951	16,667,454	4,658,137	0
3Q2015	169,688,509	-3,290,689	4,774,951	16,667,454	4,658,137	0
4Q2015	201,239,698	-3,290,689	4,774,951	16,667,454	4,658,137	0
1Q2016	193,275,933	-3,219,153	4,671,147	16,305,118	4,556,873	0
2Q2016	180,854,738	-3,290,689	4,774,951	16,667,454	4,658,137	8,666,545
3Q2016	181,988,455	-1,983,850	4,774,951	16,652,320	4,658,137	13,070,855
<b>Remaining Planned</b>	<b>2,132,549,946</b>	<b>102,388,913</b>	<b>84,293,615</b>	<b>243,041,241</b>	<b>37,011,936</b>	<b>180,262,600</b>
<b>Remaining Actual</b>	<b>2,704,296,244</b>	<b>47,441,129</b>	<b>16,499,229</b>	<b>246,922,443</b>	<b>62,142,125</b>	<b>202,000,000</b>
4Q2016	214,173,807	6,728,414	4,774,951	15,971,281	4,658,137	13,070,855
1Q2017	210,556,624	6,509,009	4,619,246	15,450,479	4,506,241	12,644,631
2Q2017	199,737,103	6,728,414	4,774,951	15,971,281	4,658,137	13,070,855
3Q2017	189,382,506	6,728,414	4,774,951	15,971,281	4,658,137	13,070,855
4Q2017	182,084,699	6,728,414	4,774,951	15,971,281	4,658,137	13,070,855
1Q2018	174,210,593	6,509,009	4,619,246	15,450,479	4,506,241	12,644,631
2Q2018	170,524,739	6,728,414	4,774,951	15,971,281	4,658,137	13,070,855
3Q2018	168,497,619	6,728,414	4,774,951	15,971,281	4,658,137	14,014,767
4Q2018	155,245,094	6,728,414	4,774,951	15,971,281	50,632	14,014,767
1Q2019	148,441,548	6,509,009	4,619,246	15,450,479	0	13,557,764
2Q2019	110,893,994	6,728,414	4,774,951	15,971,281	0	14,014,767
3Q2019	93,559,944	6,728,414	4,774,951	15,971,281	0	14,014,767
4Q2019	71,649,848	6,728,414	4,774,951	15,971,281	0	14,014,767
1Q2020	20,704,406	6,582,144	4,671,147	15,624,080	0	5,043,553
2Q2020	11,682,057	6,728,414	4,774,951	15,971,281	0	943,912
3Q2020	7,573,078	2,267,183	4,947,825	5,381,627	0	0
4Q2020	2,750,374	0	5,035,679	0	0	0
1Q2021	881,913	0	3,256,771	0	0	0
2Q2021	0	0	0	0	0	0

**Table 6: MTA ESA Project Summary by FTA Standardized Cost Categories  
2014 Re-plan (\$ in Thousands)**

Standard Cost Category	FFGA	June 2014 Project Budget	Amended FFGA	Dec-16		
				Current Budget	Awarded Value	Paid to Date
10 - Guideway & Track Elements	\$1,988,742	\$ 3,405,464	\$ 3,353,399	\$ 3,486,097	\$3,242,919	\$2,559,126
20 - Stations, Stops, Terminals, Intermodal	\$1,168,655	\$ 2,238,235	\$ 2,326,752	\$ 2,328,142	\$2,169,674	\$1,294,682
30 - Support Facilities (Yards, Shops, Admin)	\$ 356,264	\$ 474,177	\$ 450,757	\$ 472,417	\$ 230,537	\$ 212,900
40 - Site Work and Special Conditions	\$ 205,105	\$ 610,570	\$ 562,461	\$ 588,117	\$ 480,503	\$ 474,498
50 - Systems	\$ 619,343	\$ 605,592	\$ 627,657	\$ 579,874	\$ 459,407	\$ 335,233
60 - ROW, Land, Existing Improvements	\$ 165,280	\$ 219,397	\$ 192,225	\$ 215,371	\$ 155,838	\$ 153,347
70 - Vehicles	\$ 493,982	\$ 209,938	\$ 879,530	\$ 209,938	\$ 7,838	\$ 5,549
80 - Professional Services	\$1,184,000	\$ 1,975,398	\$ 1,808,989	\$ 2,003,304	\$1,852,442	\$1,711,587
Estimated Financing Cost	\$1,036,100	\$ 1,036,100	\$ 1,116,454			

**Table 7: ESA Core Accountability Items**

Project Status:		Original at FFGA	Amended FFGA	Current*	ELPEP **
Cost	Cost Estimate	\$7.386B	\$10,922B	\$10.178B	\$8.119B
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Schedule	RSD	December 31, 2013	December 31, 2023	December 2022	April 30, 2018
Total Project Percent Complete Project Performance Rate(Since 2014 ESA "Re-Plan)		Based on Invoiced Amount		67.6% actual vs 70.8% planned (ESA Figure)	
		Based on Earned Value*** ±		78.2% (PMOC Calculation of construction spending at 3Q2016 planned vs actual since re-baselining). Actual cumulative construction amount invoiced since project start is 94.4% of original plan.	
Major Issue	Status			Comments	
Project Schedule	[REDACTED]			<p>The PMOC remains concerned about developments during 2016 with regard to the remaining work in Harold Interlocking.</p> <ul style="list-style-type: none"> <li>[REDACTED]</li> <li>[REDACTED]</li> <li>The Harold critical path has now become the ESA Program Critical Path; and,</li> <li>Amtrak's decision to take ERT Line 2 out of service for an extended period will not support the ESA planning to complete all of the remaining Harold work, including the High Speed Rail work, by 2021.</li> </ul>	
Harold Re-planning	Based on continuing issues with inadequate railroad force account support, ESA completed a Harold schedule re-sequencing in December 2014, also known as "ESA First", that advances work elements required for the new LIRR service to GCT and delays the FRA funded High Speed Rail Work beyond 2017. The 2015 Harold Re-Sequenced schedule advanced completion of ESA elements but did not achieve goals due to insufficient Amtrak force account support. The schedule was again re-evaluated in 2016 and the ESA Program Critical Path now passes through the remaining work in the Harold Interlocking.			Work in Harold Interlocking is subject to influences outside of the control of ESA. Continuing issues with the level of Amtrak force account support, for the "ESA First" schedule, has further delayed completion of the Harold Interlocking work and has forced it onto the ESA Program Critical Path. New issues in 2016 included: reduced priority weekend track outages; increased demand for track foremen to provide access/protection; Amtrak Program to harden Lines 3 and 4 prior to extended outages for ERT Lines 1 and 2 beginning in 2019.	

\*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.

\*\*\*In this case, Earned Value refers to the PMOC's calculation of actual Construction Cost (paid to date) versus ESA's planned Construction Cost based on planned payments established at the rebaselining of 2014.